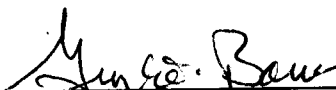
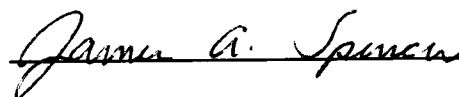


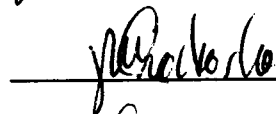
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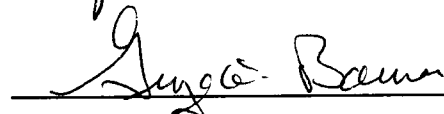
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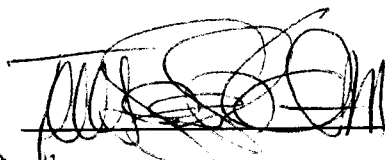

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Date

July 17, 1992

**Planning for
Wetlands Protection:**

The Use of Regulation in Support of "No Net Loss"

A Thesis

Presented for the

Master of Science in Planning

Degree

The University of Tennessee, Knoxville

Teresa M. Salazar-Catron

August, 1992

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ABSTRACT

Wetlands are a valuable natural resource providing numerous functions that promote the public health, safety and welfare. Unfortunately, over 52% of the nation's wetland habitat has been lost, and continues to be lost at a rate of 290,000 acres per year. Threats to wetland habitat stem from numerous areas, the greatest being agriculture, which is responsible for over 87% of the nation's annual net loss. However, urbanization also contributes heavily to this loss, often indirectly through displacement of agricultural lands which then turn to wetland areas for maintaining their practices.

In 1988, the Bush administration presented the national policy for wetlands protection--"no net loss". This policy promotes the ideal of preserving at current levels the nation's wetland resource base through use of permitting, regulation, and mitigation. The success of such a policy is dependant upon its implementation and enforcement at all levels of government: federal, state and local.

The primary method of implementation at the federal level is wetlands permitting by way of Section 404 provisions in the *Clean Water Act*. These permits have proven to be an effective method for protecting wetlands, but do not present a comprehensive approach to wetlands protection. This is indicative of the "piecemeal" approach to wetlands protection currently employed by the federal government. States attempt to alleviate this problem by improving upon federal programs by way of their own permitting programs and comprehensive plans. These programs are in turn refined and

implemented at the local level, where wetlands are protected through use of local comprehensive plans and land use restrictions. State and local programs are the methods by which federal policies are implemented.

The state of Florida and the City of Jacksonville have made use of comprehensive planning and permitting regulations to protect their wetlands resources. These efforts have resulted in the slowing of the state's annual net wetlands loss. This comprehensive approach to wetlands protection appears to offer the best form of wetlands protection. However, within the state of Florida, the comprehensive program is not without faults. Foremost among these are the numerous exemptions for activities that have adverse impacts on wetland functions. In order for comprehensive programs to truly be effective, they must promote wetlands protection in the face of special interests that often distract from the goals at hand. Such a firm stand established as part of a definitive national policy is necessary for the success of "no net loss".

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INTRODUCTION

Wetlands constitute something of a moving target around which planners, environmentalists and legislators attempt protectionist policy and regulation. This is basically done on a hit or miss basis due to the lack of a definitive scientific basis from which to draw. Instead of developing a truly comprehensive approach to wetlands protection that works under the umbrella of the economic concerns which counter their protection, wetlands are caught in a patchwork of regulation that does little to prevent their net loss and adversely impacts individual economic interests (Graham, 1990). The lack of a clear-cut definition for wetlands and the numerous attempts to legislate wetlands according to different standards are good examples of this problem. However, as understanding of the ecological value of wetlands increases, the acceptance of a need to protect this resource grows. As wetlands continue to disappear at the alarming rate of 290,000 acres per year, the need becomes ever more apparent that action must be taken to protect them (Dahl & Johnson, 1991).

Wetlands have an important ecological value; this is undeniable (Mitsch & Gosselink, 1986). However, the ability of society to preserve wetlands before the loss becomes too great is disputable. Planners have the unique challenge of being in a position to change the course of history. Through environmental legislation, through use of planning tools, and through implementation of federal policies, planners have the opportunity to devise innovative means of protecting the nation's wetlands resources

without placing excessive burden on the economic system. Currently, many states and municipalities are taking this initiative, experimenting with state "critical area plans" and developing supplementary wetlands protection ordinances for their zoning laws (Burke et al., 1988). By investigating and documenting the means, successful or not, by which states and municipalities are pursuing the "no-net-loss" goal of wetlands protection, it may be possible to derive a model "action plan" for the fulfillment of that goal.

Study purpose and scope

This study presents an overview of the current regulatory methods of wetlands protection and the federal policies that drive them by identifying regulation of wetlands at the federal, state, and local government level. At the federal level, legislation and policy that set the stage for state and municipal action is addressed. At the state and local levels, the means by which wetlands are regulated are identified and the implications that these regulations hold for planning are discussed. Additionally, the ways in which planning strategy has developed to accommodate regulation and comply with policy are reviewed. The study also presents the problems and opportunities found in the application of wetland regulation and protectionist planning strategies. It is hoped that this study could lead to the development of a base from which a definitive legislative policy may be drawn, thus leading to implementation efforts at the state and local level that would achieve the President's goal of "no-net-loss". In order to accomplish this, similar studies in every state would need to be done. However, at this level, the thesis provides a starting point, providing a descriptive analysis of current planning and

regulatory activities in one state (Florida) and one municipality in that state (Jacksonville).

The choice of Florida and Jacksonville as case study areas was made for several reasons. First was the convenience that they offer to the author who has family living in Jacksonville. This convenience allowed research at minimal cost for travel and lodging from Tennessee. The second reason relates to the physical characteristics of the state. Over 30% of Florida's land area and 23% of Jacksonville's land area is classified as wetlands (Jacksonville Planning Department [JPD], 1990a). A wide variety of wetland types are represented in the state including inland freshwater wetlands and coastal wetlands. Thus application of wetlands regulation within the state can act as an example readily applicable to other states with modification. A third reason is the comprehensive planning and wetlands legislation currently in place in Florida; a state whose wetlands policy is based on the federal goal of "no net loss" (JPD, 1990b). Jacksonville is currently growing at an astonishing rate, its population having increased almost 30% since 1970 (JPD, 1990a). Development pressure resulting from such growth presents a significant challenge to the "no net loss" goal. A study of Florida and Jacksonville allows a presentation of some of the conflicts that arise from protection legislation and the efforts developed to counter them.

While the study presents an overview of the wetlands issue from the federal to local government level, it is impossible to achieve a truly comprehensive discussion of the issue considering its dynamic nature and the changes which are occurring even now in federal policy. Therefore, this study is limited to policy, legislation and regulation

that are *currently in place*. It does not attempt to speculate on the impact of pending legislation, on comprehensive plan revisions that may be under way in Jacksonville, nor on any other such *expected* activities. Additionally, this study does not produce a recommended model or standard for wetlands protection, nor place one strategy over another as a preferred alternative. It merely states the facts and provides comment on established successes or failures of reviewed strategies. The primary objective of the study is to describe the use of wetlands regulation in state and municipal planning strategy and the subsequent impacts of that strategy on wetlands protection.

Research questions

The following research questions are pursued in this study:

- (1) *What regulations at the federal, state, and local level are currently in place that impact wetlands protection?*

When planners approach the issue of wetlands protection, a review of existing legislation is necessary to understand the framework in which they work. Without this background, planners are ineffective at developing proper strategies for achieving the "no-net-loss" goal.

- (2) *In what way are these regulations incorporated into planning strategy at the state level? at the local level?*

The methods by which planners plan and the tools they use to implement their strategies are subject to numerous federal, state, and local laws, and the judicial interpretations of these laws. Thus, wetlands protection policy and regulation will impact the way in which

planners do their jobs. Planners must remain aware of the legal implications inherent in their work.

- (3) *How are wetlands regulated in Florida? Who has the authority to regulate wetlands or activities that take place in wetlands and how? What is the goal of wetland regulation at the state level?*

Oftentimes, regulation of wetlands at the state level is developed independently of federal legislation, as is the case in Florida (Richard Hamann, personal communication, April 20, 1992). Florida's regulation of wetland areas is more restrictive than at the federal level, and carries significant implications for municipalities charged with their implementation. Planners must be aware of the regulating agencies who carry authority over their actions or the activities of others, especially as regards environmentally sensitive areas. Additionally, because state goals are implemented at the municipal level, planners must remain aware of the political ramifications of their planning policies.

- (4) *How are wetlands regulated in Jacksonville? How are these regulations enforced and by whom? How do they fulfill local goals for wetlands protection?*

The City of Jacksonville, Florida, has 23% of its land area located in wetlands (JPD, 1990b). As growth pressures increase, and wetlands protection efforts increase concurrently, city planners must be extremely careful about how they implement their planning strategies. They must provide the guidance necessary for the orderly growth of their city, yet they are legally obliged to protect areas placed in jeopardy by this growth. By developing a knowledge base of regulating agencies and building a good

relationship with these groups, many of the planning problems inherent in the above processes can be mitigated.

- (5) *How will planning strategies developed at the local level affect wetlands protection (in view of "no-net-loss")?*

Once a planning strategy is determined for a locality, the implementation of that strategy will have a profound effect on wetlands protection. For instance, a zoning ordinance containing a provision protecting "critical environmental areas" will have a less positive impact on wetlands protection than an ordinance containing a provision specifically addressing wetlands and their allowable uses. Thus, the study hopes to identify the reciprocal effects of planning on wetlands protection.

Research method

The author bases the study on the assumption that wetlands are a valuable natural resource requiring protection from further loss and degradation. She presents the methods used to protect this resource at the federal, state, and local level through a review of the following:

1. *Existing literature:* Federal and State statutes and administrative codes dealing with wetlands protection in the United States and the State of Florida were reviewed. Additionally, planning strategy and legislation, including zoning laws, comprehensive plans, and enabling legislation in place in Jacksonville, Fla., were investigated to determine their ability to serve as effective tools for wetlands protection.

2. *Interviews:* The following individuals were consulted for information on regulation and planning for wetlands:

Sandy Seig-Ross	United States Environmental Protection Agency
Mike Eaton	Florida Department of Environmental Regulation
Wally Esser	The St. John's River Water Management District
Kenneth Berk	" " "
Ken Heatherington	The North Florida Regional Planning Council
Richard Hamann	The College of Law, University of Florida--Gainesville
Theresa Snyder	Jacksonville Municipal Planning Department
Ken Avery	" " "
Dana Morton	Jacksonville Department of Bio-Environmental Services
Betsey Duerling	" " "

Interviews were structured around a preliminary thesis outline allowing augmentation of the outline where needed.

Benefits of research

The benefits of this study are found in the education of the author and readers on such a high profile issue as wetlands. Wetlands are growing in importance in the political arena, and all activity coming out of this political debate will impact planners. By providing a volume which discusses the wetlands protection issue and presents the protection efforts of one state and one municipality, interested readers may become more aware of the implications that wetlands hold for the implementation of planning policy

as well as the potential methods for dealing with them. Such an awareness can be expanded to nearly all environmentally sensitive areas, allowing the planner to provide environmentally sound planning services.

On a higher level, this study also serves to emphasize the need to remain "in touch" with the environment. Man has adapted to the environment and is thriving in it. If he allows the continued degradation of this environment, he places himself in a position of jeopardy. Man has a great technological ability to adapt, but technology cannot match evolution. At some point, man will succumb to the changing environment. Planners are in a position to shape the future. This study will help readers to appreciate this fact and remind them to work in cooperation with environmental constraints such as wetlands, and promote a symbiotic relationship between man and the environment.

CHAPTER 1

WETLANDS

An Overview of the Issue

Wetlands defined

What is a wetland? This simple question is actually quite difficult to answer and would produce a myriad of complicated answers, each describing a wetland using vastly different criteria. Found typically at the interface between truly terrestrial ecosystems and truly aquatic systems, wetlands are *ecotones*, edge habitats or transition zones between dry land and deep water (Mitsch & Gosselink, 1986). This "zone" of transition can be applied to numerous types of ecosystems including cypress swamps, sphagnum bogs, and streamside riparian habitats. In fact, the term wetlands is somewhat misleading in that there are many types of wetlands that remain dry part of the year (Salvesen, 1991). As the U.S. Fish and Wildlife Service (FWS) concedes, "there is no single, correct, indisputable, ecologically sound definition for wetlands, primarily because of the diversity of wetlands and because the demarcation between dry and wet environments lies along a continuum" (Burke et al., 1988).

There are, however, three key features which have been identified as being common to all wetlands, and which serve as identifying criteria for delineation as a wetland. These are: (1) that wetlands are distinguished by the presence of water at some time during the growing season of each year; (2) that wetlands have unique soils (hydric

soils) that differ significantly from adjacent soils; and (3) that wetlands support predominantly *hydrophytic* vegetation, plants that are adapted to wet conditions (Mitsch & Gosselink, 1990; & Cowardin et al., 1979). Boundaries of wetlands are difficult to determine, though Cowardin et al. (1979) presents the following guides:

The upland limit of wetland is designated as (1) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover¹; (2) the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or (3) in the case of wetlands without vegetation or soil, the boundary between land that is flooded or saturated at some time during the growing season and land that is not. (p. 3)

Again, this is very general, and requires a great deal of record-keeping during the year to allow for accurate delineation. In fact, when it comes to mapping of wetlands, delineation is seen as somewhat arbitrary. This is the plague of wetlands, that they "are a half-way world between terrestrial and aquatic ecosystems and exhibit some of the characteristics of each" (Mitsch & Gosselink, 1990, p. 16).

The evolution of wetlands definition

Numerous attempts have been made to resolve the question of wetland definition, and all attempts have met with controversy. One of the earliest undertakings was a 1956 FWS publication known as "Circular 39". In it, wetlands were identified as "lowlands covered with shallow and sometimes temporary or intermittent waters" (Mitsch & Gosselink, 1986, p. 17). This definition was created to assist in the task of inventorying wetlands that remained in the U.S., primarily for purposes of identifying and protecting

¹Where mesophytic vegetation includes plants adapted to grow under medium conditions of moisture, and xerophytic vegetation refers to plants adapted to grow under very dry or desert conditions.

wetlands as waterfowl habitats. This habitat role was to be the saving grace for many wetland areas during a time when government policy was "fill and develop".

In 1979, the FWS presented what was the most comprehensive definition of wetlands yet in its publication *Classification of Wetlands and Deepwater Habitats of the United States*. Written again primarily for purposes of inventory, this definition introduced as standard the "three criteria" policy. Reflecting the general definition above, the FWS designated wetlands to be:

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. ... [W]etlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year. (p. 3)

While this definition served well as a scientific basis, it did not meet the needs of a well defined, quantitative definition required for legal tests. As the regulation of wetlands increased, the number of government agencies having responsibility over wetlands increased, each developing their own standards and definitions for wetlands in support of their individual responsibilities. Most notable is the 1987 Corps of Engineers' (COE) *Wetlands Delineation Manual*, developed in support of the Section 404 permitting program of the Clean Water Act to be discussed later. This definition states that wetlands are:

those areas that are inundated or saturated by surface or groundwater 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 soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (p. 13)

Several diagnostic characteristics for each of the three basic criteria are provided along with lists of specific wetland "indicators" to allow definitive identification. These indicators include plant species known to inhabit wetlands, soils classified as hydric by the Soil Conservation Service (SCS), and required water depths during the growing season. The diagnostic tests are qualified by a statement that "a minimum of one positive wetland indicator *from each parameter* [italics added] (hydrology, soil, and vegetation) must be found in order to make a positive wetland determination" (COE, 1987, p. 14).

While this definition proved useful for regulatory purposes, it carried little weight with other environmental agencies including the Environmental Protection Agency (EPA) who maintains a monitoring responsibility over Section 404 permits, and COE state districts who are not required to use the manual (EPA, 1991). The EPA, FWS, and SCS continued to identify wetlands according to their own standards, often resulting in confusing and inconsistent determinations of wetland boundaries, until 1989 when these three agencies along with the COE developed an interagency cooperative publication, the *Federal Manual for Identifying and Delineating Jurisdictional Wetlands*. This manual was designed to combine the major points of the definitions followed by the four agencies into one single manual to be adopted and used by them as a federal standard. It follows the "three criteria" standard used by the COE, and requires that *each* of the three criteria must be in evidence for positive identification. As with the 1987 COE manual, various technical criteria are provided to assist in determination (Federal Interagency Committee for Wetland Delineation [FIC], 1989).

At the time of publication, it was anticipated that revisions would be required in the future. After two years of trial use, revisions to the manual were proposed and published in the *Federal Register* on August 14, 1991. These revisions are highly controversial, not so much for their scientific basis as for their political ramifications. The *Federal Manual* is looked upon as a statement of policy by the federal government, and revisions to that policy have met with resistance (EPA, 1991). This controversy will be discussed later in the section addressing federal policy. It is mentioned here, though, due to its impact upon definitional problems. While the proposed revisions are under review, each of the four agencies has reverted back to use of previously held standards, reintroducing inconsistent wetlands determination. Adding to the confusion is the concession made by the government that lands delineated as wetlands under the guidelines established in the *Federal Manual* may be re-evaluated according to standards used prior to its publication (EPA, 1991). Thus the effort has been lost for the moment.

Wetlands classification and types

The FWS, in its *Classification of Wetlands and Deepwater Habitats of the United States*, developed an extensive classification system for wetlands for purposes of scientific inventory. Wetlands are classified into five major systems: Marine, Estuarine, Riverine, Lacustrine, and Palustrine (Figure 1). Marine systems are descriptive of deepwater habitats and are not addressed here. Wetland systems primarily denote the physical location of wetlands on the land. Estuarine wetlands are descriptive of tidal embayments, while Palustrine wetlands are found inland along freshwater streams and

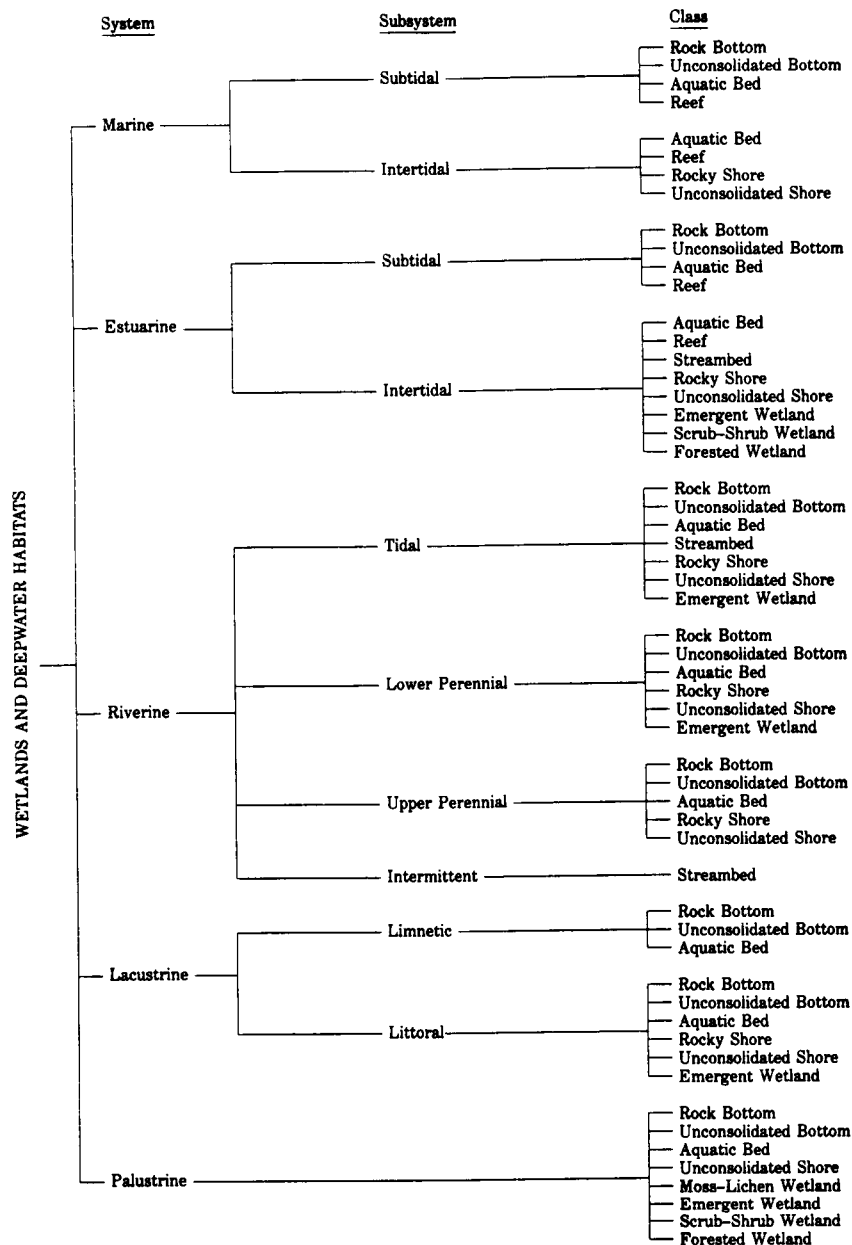


Figure 1. Classification hierarchy of wetlands and deepwater habitats, showing Systems, Subsystems, and Classes.

Source: Cowardin, L.M., Carter, V., & LaRoe, E.T. (1979). *Classification of Wetlands and Deepwater Habitats of the United States* (FWS Publication FWS/OBS-79/31). Washington, DC: U.S. Government Printing Office.

lakes, with the remaining classifications describing areas "in-between" (Cowardin et al., 1979). Figure 2 provides a graphic description of these systems. The major systems are then broken down into subsystems, typically coastal (or tidal) and inland.

The class in which a wetland is placed is generally descriptive of the appearance of the habitat in terms of dominant vegetative life form or composition of the substrate.

Summarizing Cowardin et al. (1979), the major classes can be described as follows:

Rock Bottom: wetlands ... with substrates having an areal cover of stones, boulders, or bedrock 75% or greater and vegetative cover of less than 30%.

Unconsolidated Bottom: wetlands ... with at least 25% cover of particles smaller than stones, and a vegetative cover of less than 30%.

Aquatic Bed: wetlands ... dominated by plants that grow principally on or below the surface of the water for most of the growing season in most years.

Reef: ridge-like or mound-like structures formed by the colonization and growth of sedentary invertebrates.

Streambed: wetland[s] ... within the Intermittent subsystem of the Riverine system ... and ... tidal channels ... that are completely dewatered at low tide.

Rocky Shore: wetland[s] characterized by bedrock, stones, or boulders which singly or in combination have an areal cover of 75% or more and an areal coverage by vegetation of less than 30%.

Unconsolidated Shore: all wetland[s] ... having ... unconsolidated substrates with less than 75% areal cover of stones, boulders, or bedrock ... [and] less than 30% areal cover of vegetation other than pioneering plants.

Emergent Wetland: [wetlands] characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.

Scrub-Shrub Wetland: includes areas dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions.

Forested Wetland: [wetlands] characterized by woody vegetation that is 6 m tall or taller. (pp. 13-21)

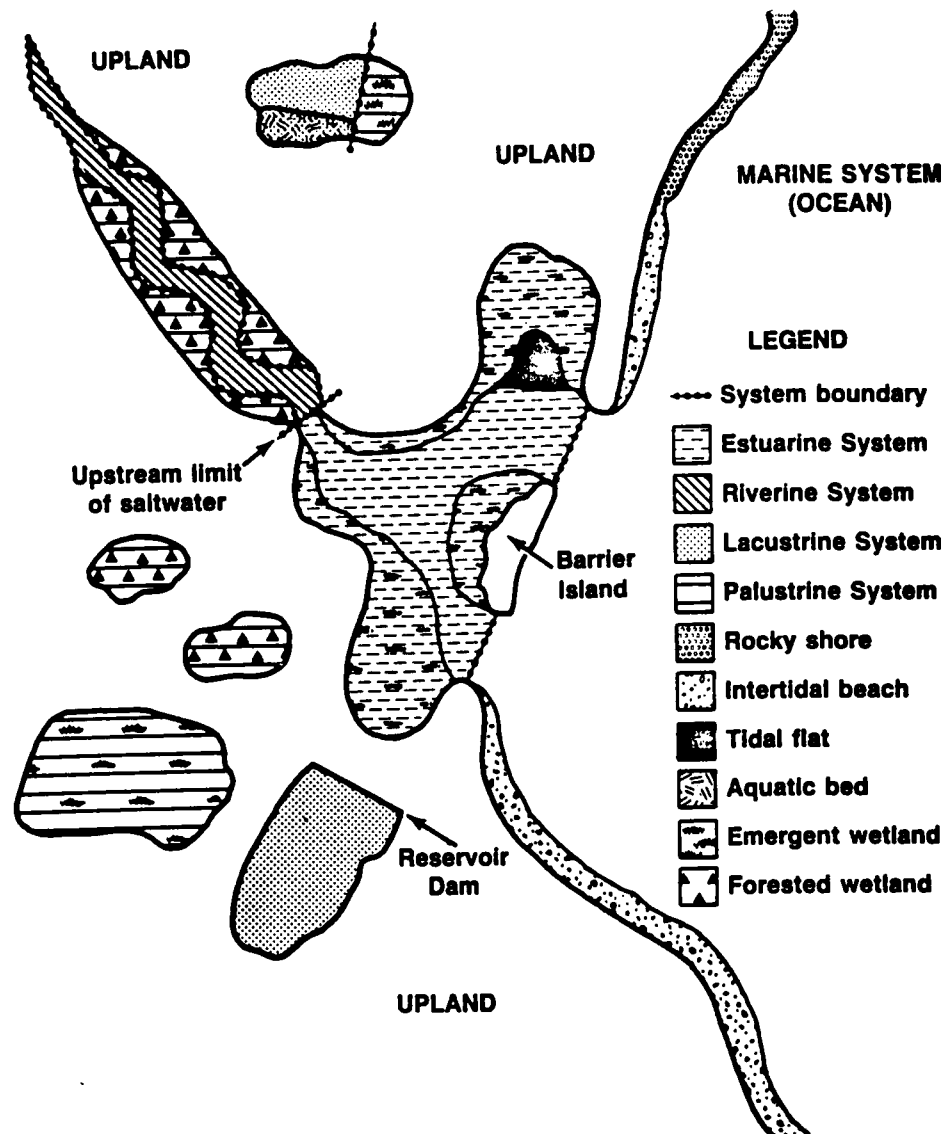


Figure 2. Diagram showing major wetland and deepwater habitat systems.

Source: Tiner, R.W. (1984). *Wetlands of the United States: Current Status and Recent Trends*. Washington, DC: U.S. Fish and Wildlife Service.

For general purposes, wetlands are typically viewed in terms of being coastal and inland. The primary factors that distinguish which of these two types a wetland falls under are: (1) location (coastal or inland), (2) salinity (saltwater or freshwater), and (3) dominant vegetation (marsh, swamp or bog) (Office of Technology Assessment [OTA], 1984). Summarizing descriptions in *Wetlands: Their Use and Regulation* (OTA, 1984), coastal wetlands consist of the following types:

Coastal Salt Marshes: Salt marshes that are alternately inundated and drained by the rise and fall of the tide. Plant and animal species characteristic of this type of wetland are few in number and similar in nature due to the extreme conditions (rapidly changing water level, salinity, and temperature) to which they have adapted.

Mangrove Swamps: Mangrove is a term denoting any salt-tolerant, intertidal tree species. Thus mangrove swamps are wetlands predominantly inhabited by mangroves. These specialized wetlands are limited primarily to Florida, with some small mangrove swamps existing in south Louisiana.

Tidal Freshwater Marshes: Tidal freshwater marshes occur in almost every coastal state, and are most abundant in estuaries along the mid-Atlantic coast. They are characterized by an abundant mix of grasses and broadleaf species. (p. 31)

Freshwater wetlands are very different in nature, and contain the following wetland types:

Inland Freshwater Marshes: Occurring at most any latitude, these marshes have water depths ranging from 6" to 3'. Marsh vegetation is characterized by soft-stemmed plants, grasses, sedges, and rushes that emerge above the surface of the marsh.

Inland Saline Marshes: These wetlands occur primarily in shallow lake basins in the Western United States, and are typically saturated during the growing season, covered by as much as 2' to 3' of water.

Bogs: Bogs occur in shallow lake basins, flat uplands, and sluggish streams. The soil is typically saturated and supports a spongy covering of mosses. Woody and herbaceous vegetation are also found here.

Tundra: Tundra is a wet arctic grassland dominated by lichens, sphagnum, mosses, grasses, sedges, and dwarf woody plants. The surface is often dotted with ponds when not completely frozen.

Shrub Swamp: These typically occur along sluggish streams and floodplains. The soil is saturated during the growing season and covered by as much as 6" of water.

Wooded Swamps: Swamps that occur mostly along sluggish streams, floodplains, flat uplands, and very shallow lake basins. Soil is saturated to within a few inches of the surface during the growing season, and often covered by as much as 1' to 2' of water.

Bottom Lands and Riparian Habitat: Areas adjacent to rivers and streams, typically recognized as bottom land hardwood and floodplain forests. Riparian ecosystems are unique, having a high species diversity, high species density, and high productivity. Soil saturation varies based primarily upon flood levels. (pp. 29-30)

The classification of wetlands is highly important for reasons of inventory and scientific study. Inventory allows scientists and administrators to quantify the continued loss of varying wetland types over time. Categorizing losses is important in prioritizing protection efforts for wetlands, as wetland types are the primary driver in determining their value to the natural and manmade environment.

Wetland function and value

Why are wetlands important? It is only recently that scientists have been able to answer this question with the data necessary to substantiate it. Understanding the true function of wetlands in the natural environment leads scientists and administrators into an understanding of their value, for it is the *function* of the wetland that imparts its *value*. However, the ecological value of wetlands is somewhat intangible, for ecological value is not quantifiable in the traditional sense. When the *value* of some entity is discussed, the word "connotes something worthy, desirable, or useful to humans" (Mitsch

& Gosselink, 1986, p. 393), not necessarily to the ecosystem. As Mitsch and Gosselink (1986) summarized,

... values arise out of ... functional ecological processes ... but are determined ... by the location of a particular wetland, the human population pressures on it, and the extent of the resource. (p. 393)

Major wetland values can be categorized into three groups: (1) fish and wildlife values, (2) environmental quality values, and (3) socioeconomic values (Tiner, 1984) which are subdivided as follows:

Fish and Wildlife Values

- Fish and shellfish habitat
- Waterfowl and other bird habitat
- Furbearer and other wildlife habitat

Environmental Quality Values

- Water quality maintenance
 - Pollution filter
 - Sediment removal
 - Oxygen production
 - Nutrient recycling
 - Chemical and nutrient absorption
- Aquatic productivity
- Microclimate regulator
- World climate (ozone layer)

Socio-economic Values

- Flood control
- Wave damage protection
- Erosion control
- Groundwater recharge and water supply
- Timber and other natural products
- Energy source (peat)
- Livestock grazing
- Fishing and shellfishing
- Hunting and trapping
- Recreation
- Aesthetics
- Education and scientific research

(Tiner, 1984, p. 13)

"Many scientists believe that maintaining a diversity of species is insurance for the future health of the world" (Burke et al., 1988, p. 8). Fish and wildlife values reflect the role that wetlands play in providing habitat for many forms of fish and wildlife. While some animals use wetlands as reproduction and nursery grounds, many spend their entire lives there. Many types of fish and wildlife inhabit wetlands for feeding purposes and drinking water. Additionally, wetlands are crucial to the survival of many endangered animal species such as the red-bellied turtle and the bog turtle (Tiner, 1984). Why should society be concerned with this role as habitat? In terms of commerce, approximately two-thirds of the major U.S. commercial fishes depend on wetlands as nurseries and spawning grounds, with about 60% of the commercial landings between 1956 and 1975 harvesting wetland dependant fish (Tiner, 1984). In Louisiana alone, 75% of commercial marine species are wetland dependant, equating to about \$128 million in the state's annual seafood catch (Salvesen, 1991).

Often termed the "kidneys of the landscape" (Mitsch & Gosselink, 1986, p. 3), wetlands perform a variety of functions which maintain water quality despite human intervention. This is achieved through: (1) nutrient removal, thus preventing eutrophication or over-enrichment of water; (2) processing of chemical and organic wastes, in essence performing the same tasks that water treatment systems do though at a reduced scale; and (3) reducing sediment loads of water. This third factor is especially important to the reduction of siltation in ports and harbors. Additionally, by reducing sediment load, toxins and other heavy metals are "settled out" of runoff prior to its reaching receiving streams and rivers (Tiner, 1984). The implications here are exciting

as the use of natural or created wetlands gains acceptance as a viable, and significantly less expensive form of wastewater treatment. The forested wetlands along the Alcovy River in Georgia provide an excellent example where the 2,300 acre Alcovy River Swamp has been valued at approximately \$1 million per year for water pollution control (Salvesen, 1991). It should be noted, though, that the treatment capabilities of wetlands are finite; loading and assimilation capacities differ among wetland types and can be easily overwhelmed (Tiner, 1984).

Socioeconomic values include the more recognizable benefits associated with wetlands. The nature of wetlands as "transition zones" places them in a position that mitigates the adverse effects of flooding, soil erosion, and groundwater recharge. Wetlands intercept storm runoff, store excess water, and reduce runoff peaks, allowing slower discharge of excess runoff over time (Mitsch & Gosselink, 1986). Translated into dollars, wetlands provide a "least cost" solution to flood control. This is best evidenced in COE studies of the Charles River Basin in Massachusetts. In 1976, the COE initiated a study to identify alternatives for flood protection in the Charles River watershed. Alternatives included a 55,000 acre-foot reservoir, an extensive system of walls and dikes, and the perpetual protection of 8,500 acres of wetlands. It was found that if 40% of the wetlands were destroyed, flood damages would increase by \$3 million annually. Loss of all wetlands in the basin would cause an average annual flood damage cost of \$17 million (Tiner, 1984). Thus, protection of the River Basin was best served by wetland preservation. In the Passaic River Valley in New Jersey, wetlands that once

provided natural flood control have been destroyed by extensive development, resulting in an estimated cost of \$1.5 billion for flood control efforts (Salvesen, 1991).

A variety of natural products come from wetlands including timber, fish and shellfish, peat, cranberries, blueberries, wild rice, and a variety of furbearing mammals (Burke et al., 1988). In fact, wetlands are among the most productive ecosystems in the world, as shown in Figure 3. There are an estimated 82 million acres of commercial forested wetlands in the U.S., having a commercial value in the billions of dollars. The standing value of southern wetland forest alone is estimated at \$8 billion (Tiner, 1984). The furs harvested from wetland mammals such as beaver, muskrat, mink, and otter yielded roughly \$35.5 million in 1976, rising in 1980 to over \$74 million (Tiner, 1984; Salvesen, 1991).

Recreational and aesthetic values are often considered the hardest to assign a monetary value, though in reality these numbers are probably the most reliable and telling descriptors of wetland value. Recreational activities that take place around wetlands include hunting and fishing, hiking, nature observation, photography, swimming, and boating. In terms of commercial dollars, over 5.3 million people spent \$638 million on migratory waterfowl hunting in 1980. Sports fisherman spent over \$13.1 billion catching wetland dependant fishes in 1975. And again in 1980, 55 million people spent almost \$10 billion observing and photographing waterfowl and other wetland birds (Tiner, 1984; Salvesen, 1991). The value of wetlands as a natural resource is indisputable.

RELATIVE PRODUCTIVITY OF VARIOUS ECOSYSTEMS

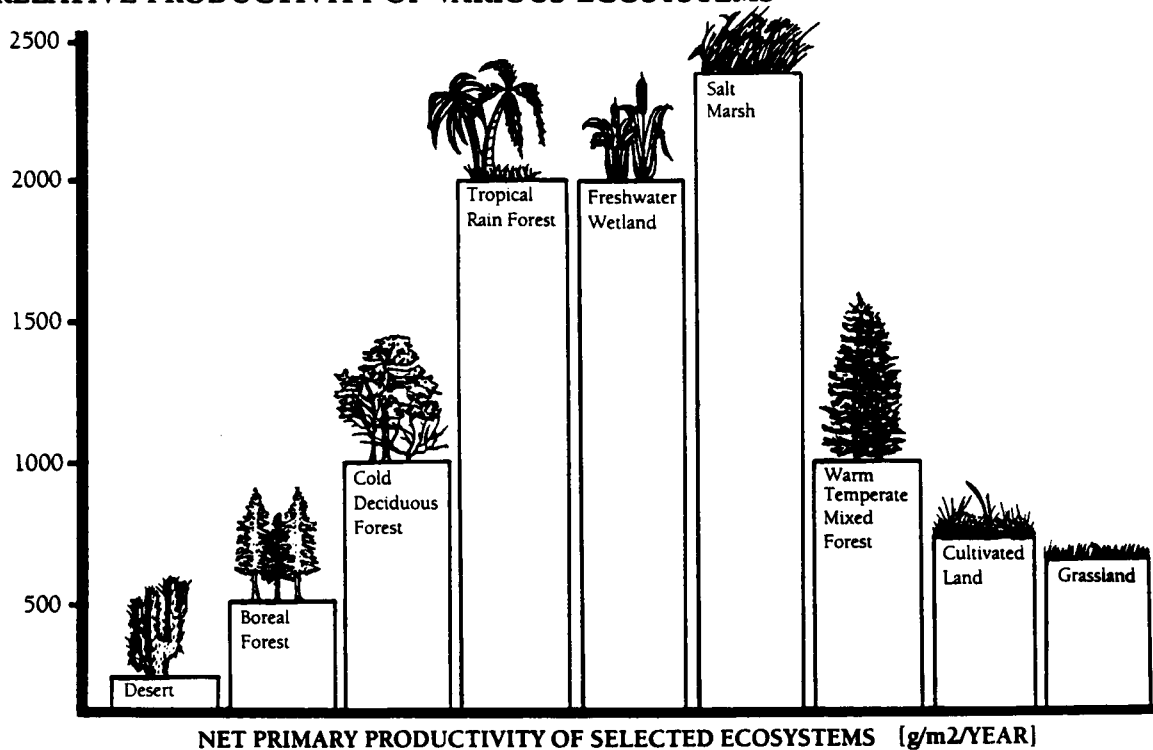


Figure 3. Relative productivity of wetland ecosystems in relation to others.

Source: Tiner, R.W. (1984). *Wetlands of the United States: Current Status and Recent Trends*. Washington, DC: U.S. Fish and Wildlife Service.

The threat of loss

Man's understanding of the important ecological function of wetlands has been slow to develop, as has his appreciation of the intrinsic values described previously. Just as a theoretical understanding of the need for planning is widely accepted, the theoretical need to maintain and protect wetlands is accepted and supported. The difficulty lies in specific methods, for protection requires a sacrifice on the part of society, one that individuals are often unwilling to make. This is evidenced by the significant wetland losses recorded for the continental U.S. over the past 200 years, shown in Table 1.

It has been estimated that approximately 215 million acres of wetlands existed in the coterminous U.S. at the time of the nation's settlement (Tiner, 1984). In the mid-1980's, there were 103.3 million acres of wetlands, translating into a net loss of approximately 111.7 million acres (or 52%). Over 2.6 million acres are known to have been lost during a study period between the mid-1970's and the mid-1980's (Dahl & Johnson, 1991). Of this number, 98% of the losses were freshwater wetlands, with the Palustrine systems suffering the highest loss at 3.3 million acres². The remaining percentage of loss were coastal wetlands (Dahl & Johnson, 1991). The current average annual loss is calculated to be 290,000 acres, down from an estimate of 458,000 acres per year in the mid-1970's. A promising sign, this trend is due primarily to the increased attention being paid wetlands, and the increase in legislative activity surrounding them. These numbers do not indicate, though, that the trend of loss is

²The difference between total Palustrine losses and the total net loss of wetlands during the study period is explained by the artificial creation of other classes of wetlands in mitigative attempts to slow net loss trends.

Table 1. State ranking of wetland losses in the past 200 years.

State	Wetlands lost (%)	State	Wetlands lost (%)
California	-91	Kansas	-48
Ohio	-90	Florida	-46
Iowa	-89	Louisiana	-46
Missouri	-87	Wisconsin	-46
Indiana	-87	Minnesota	-42
Illinois	-85	Virginia	-42
Kentucky	-81	New Jersey	-39
Connecticut	-74	Wyoming	-38
Maryland	-73	Oregon	-38
Arkansas	-72	Rhode Island	-37
Oklahoma	-67	Arizona	-36
New York	-60	South Dakota	-35
Mississippi	-59	Vermont	-35
Tennessee	-59	Nebraska	-35
Pennsylvania	-56	New Mexico	-33
Idaho	-56	Washington	-31
Delaware	-54	Utah	-30
Nevada	-52	Massachusetts	-28
Texas	-52	Montana	-27
Alabama	-50	South Carolina	-27
Colorado	-50	West Virginia	-24
Michigan	-50	Georgia	-23
North Carolina	-49	Maine	-20
North Dakota	-49	Hawaii	-12

Source: World Resources Institute. (1991). *Environmental Almanac* (1992 ed.). Boston, MA: Houghton Mifflin Company.

reversing itself; rather losses are continuing at an alarming rate (Tiner, 1984; Dahl & Johnson, 1991).

There are many forces which contribute to the loss of wetland habitat, both natural and human. As taken from Burke et al. (1988), these forces can be defined as follows:

Human Threats: Direct

- Drainage for crop production, timber production and mosquito control
- Dredging and stream channelization for navigation channels, flood protection, coastal housing developments, and reservoir maintenance
- Filling for dredged spoil and other solid waste disposal, roads and highways, and commercial, residential, and industrial development
- Construction of dikes, dams, levees, and seawalls for flood control, water supply, irrigation, and storm protection
- Discharge of materials (e.g. pesticides, herbicides, other pollutants, nutrient loading from domestic sewage and agricultural runoff, and sediments from dredging and filling, agricultural and other land development) into waters and wetlands
- Mining of wetland soils for peat, coal, sand, gravel, phosphate and other materials

Human Threats: Indirect

- Sediment diversion by dams, deep channels and other structures
- Hydrologic alterations by canals, spoil banks, roads, and other structures
- Subsidence due to extraction of groundwater, oil, gas, sulphur, and other minerals

Natural Threats

- Subsidence (including natural rise of sea level)
 - Droughts
 - Hurricanes and other storms
 - Erosion and accretion
 - Biotic effects, e.g., muskrat, nutria, and goose "eat-outs"
- (p. 10)

Human threats far outweigh the natural threats, due primarily to two overriding pressures felt by wetlands: agricultural and economic growth and development.

Agriculture is the leading cause of wetlands losses as shown in Figure 4. From the mid-1950's to the mid-1970's, agricultural conversions were responsible for 87% of freshwater wetlands losses. This percentage was reduced to 54% between the mid-1970's and the mid-1980's, due primarily to increased regulation of farming activities in wetland areas (Dahl & Johnson, 1991). Wetlands are lost to agriculture by two primary means: direct conversion by draining and/or clearing and indirect conversions associated with normal agricultural activities. Because normal farming activities are exempted from permit requirements under Section 404 of the Clean Water Act, direct conversions are the most damaging (OTA, 1984). However, as will be discussed later, regulations under the "Swampbuster" legislation are helping to curb agricultural conversions.

A basic reason for the large number of agricultural conversions is the second overriding concern--economics. "Economic factors ... and government policies often are cited as reasons for converting wetlands to agricultural use" (OTA, 1984). The more a farmer is able to plant, the more return he receives on his land. And so it is with regard to conflicts arising from urban economic use of wetlands. Urbanization impacts wetland loss both directly and indirectly. Directly, urbanization was responsible for 5% of wetlands losses between the mid-1970's and the mid-1980's (Dahl & Johnson, 1991). Its greatest threat is to coastal wetlands, where development pressure continues to increase. As stated in the *Environmental Almanac* (World Resources Institute [WRI], 1991), "nearly 53% of the nation's population lives in a 50-mile-wide corridor bordering

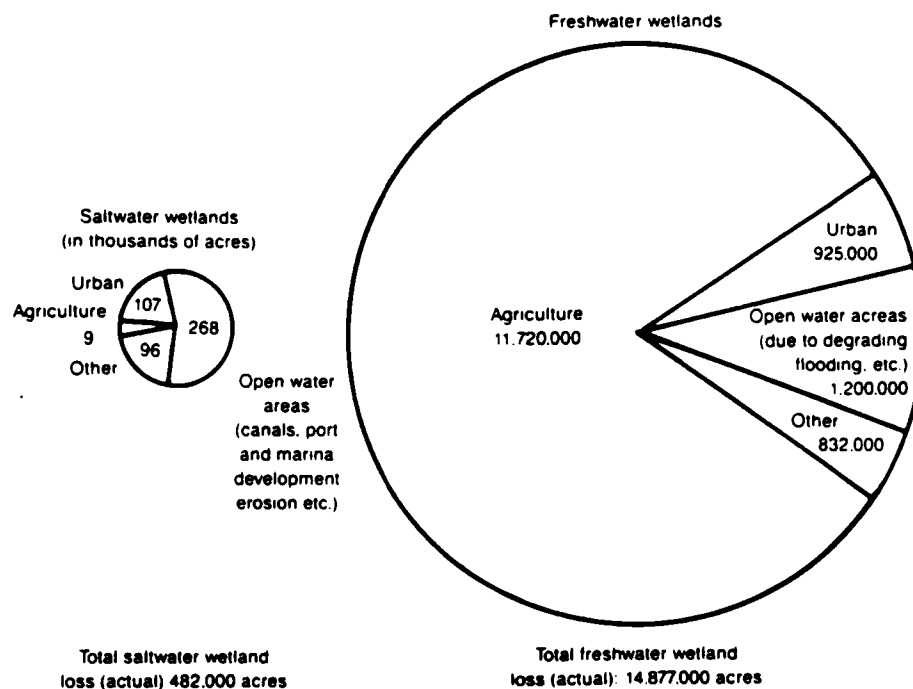


Figure 4. Wetlands conversions, mid-1950's to mid-1970's.

Source: The Conservation Foundation. (1988). *Protecting America's Wetlands: an Action Agenda*. The Final Report of the National Wetlands Policy Forum. Washington, DC: The Conservation Foundation.

the coast. ... Scientists estimate that population growth in this coastal corridor will continue to increase, intensifying the pressure for shoreline development" (p. 140).

Indirect threats to wetlands are best described in *Wetlands: Their Use and Regulation* (OTA, 1984), and serve as a partial explanation for the high amount of agricultural conversions:

Pressures on agricultural lands from urban use ... may increase demands for agricultural land on wetlands in some parts of the country. For example, in south Florida, land use data for a single county between 1972 and 1980 showed that 23,767 acres of wetlands were converted to agricultural use while 655 acres were urbanized. During that same period, 24,539 acres of agricultural lands were lost to urbanization. Thus it appears that urbanization displaces agriculture, which then moves into wetland areas. (p. 111)

Whatever the causes of wetland loss, the fact remains that it is continuing at an alarming rate. Man is a part of a natural system, tied inextricably to the many parts that make up that system, including wetlands. The threat to wetlands lies in man's complacency towards them, thus, in the ecological sense, making him a threat to himself. Society must gain an ecological appreciation of wetlands before that threat will disappear. As Hunter (1989) writes,

The basic insight of ecology is that all living things exist in interrelated systems; nothing exists in isolation. The world system is web-like; to pluck one strand is to cause all to vibrate; whatever happens to one part has ramifications for all the rest. Our actions are not individual but social; they reverberate throughout the whole ecosystem. (p. 258)

If man allows the continued destruction of wetlands, ecosystems proven invaluable to the natural environment as well as the manmade one, then he allows the eventual destruction of himself. The need is set for a definitive wetlands policy, developed within the

political arena. For it is in this arena that the stage is set for definitive action, backed by regulation, that would reverse the trends of the past.

CHAPTER 2

THE FEDERAL FRAMEWORK

I. An Environmental Policy for Wetlands

Overview of environmental policy

Wetlands are one of numerous environmental policy issues faced by legislators today within the political arena. It has taken a long and dedicated effort by grassroots organizations to bring wetlands to the forefront. Patience has paid off as "umbrella" issues such as clean air and clean water move to the wayside, making room for such subordinate yet equally important issues as wetlands protection, nonpoint source pollution, and acid rain. Since the 1970's, when Americans experienced the "rebirth" of their environmental consciousness, environmental issues have moved to the forefront in political thinking. This new consciousness "colors virtually all decisions made by corporations, by federal, state, and local government operating units, and by many ordinary citizens" (Portney, 1990). However, this consciousness is not pervasive, and like all new ideals, it has a limited calling. It is difficult to change, especially when faced with the potential of losing something in the process. For wetlands, ideological conflict is the primary problem facing development of a definitive policy (OTA, 184).

This ideological conflict can best be described as the attempt to discern what best serves the public interest. As described previously, wetlands have significant public value. Yet at the micro level, where an individual's property or business interests are

concerned, intrinsic value shifts from the ecological to the economic. "The conflict between developers and conservationists over wetlands often is viewed as an issue that involves questions of public good as opposed to private gain" (OTA, 1984, p. 37). Faced with these two powerful interests, public good and private gain (economic drivers), legislators struggle with the wetlands issue, and struggle with defining a policy for it. They have the difficult task of ensuring "that the value of the resulting output is greater than that which must be sacrificed" (Portney, 1990, p. 15).

Environmental policy (which encompasses the wetlands issue) is a very complex, confusing, emotional, and highly volatile arena in which to work. At the federal level, where national wetlands policy begins, environmental policy making is found to have three characteristics which influence its development. First, policy making is a *process* that "involves a number of related decisions originating from different institutions and actors ranging across the whole domain of the federal government and private institutions" (Rosenbaum, 1991, p. 68). This process is continuous, evolving in reaction to the multiple stimuli that approach from all directions on this vast stage. Second is the fact that policy makers (and legislators) can seldom act without restraint. The political environment in which these people work places numerous restrictions on their activities including, among others, institutional rules and biases, statutory laws, constitutional separation of powers, political courtesies, and constituent expectations (Rosenbaum, 1991). Third, and probably most visible to the public eye, is the fact that policy making is a "volatile mixture of politics and science that readily erupts into controversy among politicians, bureaucrats, and scientists over their appropriate roles in the process, as well

as over the proper interpretation and use of scientific data on policy questions" (Rosenbaum, 1991, p. 68). Like oil and water, science and politics do not mix, and this conflict has resulted in one of the greatest impediments to developing definitive environmental policy for any issue including wetlands, where the scientific basis for policy remains questionable.

The cycle of policy development

"The *political system*, a subsystem of the social system, consists of all actions related to making the authoritative allocation of values for society. It is the social subsystem peculiarly responsible for goal attainment in the society as a whole" (Schoettle, 1968, p. 169). Once a social demand (or issue) has been input into the political system, the cycle of policy development follows a fairly reasonable and predictable order. There are five phases typically involved in this process: (1) agenda setting, (2) formulation and legitimation, (3) implementation, (4) assessment and reformulation, and (5) policy termination. Agenda setting is basically "the politics of getting problems to government" (Jones, 1978). It is the politics involved in placing enough importance on an issue and with such urgency that government officials are compelled to take action. This means getting the issue on legislative calendars, setting it before legislative committees, or placing it on a priority list for bill introduction (Rosenbaum, 1991). Essentially, it is "placing an issue where institutions and individuals with public authority can make a response and feel a need to do so" (Rosenbaum, 1991, p. 69).

Once on the government agenda, policy issues go through a phase in which political goals are set, plans and proposals for achieving these goals are reviewed, and means for implementing these plans are selected. All of this activity typically takes place at the Congressional level. Legitimation is essentially the authorization of these policy proposals. Usually in the form of executive orders, public votes, or public statute, legitimation invests the proposed policy with the authority to evoke public acceptance (Rosenbaum, 1991). "Public policies remain statements of intention until they are translated into operational programs" (Rosenbaum, 1991, p. 70). Thus, the success of public policy depends upon the implementation strategy supporting it.

Assessment and reformulation involves the evaluation of the social impacts of the proposed policy. Assessment is a judgement concerning the "desirability" of such impacts, which results in reformulation, attempts to mitigate the less desirable impacts (Rosenbaum, 1991). This is a circular process, assessing and reformulating numerous times during the policy making process until an acceptable outcome is achieved. As Schoettle (1968) states:

The *outputs* of the political system are the *decisions* and *actions* of the authoritative political system which to some extent satisfy the demands of the social system. ... Having produced outputs, the authoritative policy makers can expect the members of the social system at large to respond to them. Information concerning this response is then communicated to the authorities who in turn may respond with further policy outputs. It is this continuing, *never-ending* [italics added] flow of policy, dependent upon feedback, between the authoritative political system and the society which approximates the policy-making process. (p. 169)

Policy termination is the "deliberate conclusion or succession of specific governmental functions, programs, policies, or organizations" (Rosenbaum, 1991, p. 70).

Termination in this formal sense rarely takes place due to the bureaucracy contained in the process for taking such action. What is more likely is the continued process of reformulation described above which seems to give public policy a sense of immortality (Rosenbaum, 1991). Schoettle (1968) concludes:

The view of the policy-making process as a succession of strategies of disjointed incrementalism, seems to fail to account for new policy departures: dramatic breaks with the past such as the atomic bomb or the space program. However, such events can be treated as *random disturbances* [italics added] in the otherwise *stable and incremental* [italics added] policy-making process, only momentarily producing a fluctuation in the old patterns of policy making which quickly reassert themselves. (p. 179)

Economics of environmental policy

As a subsystem of the social system, social concerns drive public policy. One such driver, which serves as an adversary to environmental policy development, is economic policy. While Portney (1990) states that "economics, if carefully used, can play a valuable role in improving environmental regulation" (p. 280), he qualifies this belief by defining the major political problem facing environmental policy: that "the costs of additional protection might be judged by society to be too great if the added ... benefits are relatively small. [This is] the rule rather than the exception in environmental and other policy areas" (p. 14). The impact of environmental policies on the economy is a continual preoccupation among policy makers and the society they serve; and economic conditions, in turn, influence environmental policy (Rosenbaum, 1991).

The impact of environmental policy is typically looked at in terms of its positive or negative influence on the Gross National Product (GNP). Any policies that appear

to adversely affect economic growth, market positions, or business investments, are likely to garner more critical attention than those that appear benign (Rosenbaum, 1991). Unfortunately, environmental policies are typically viewed as having adverse impacts due to the restrictions, regulations, and stringent protection standards faced by businesses as a result of policy. Environmental policies and their supportive regulations do create major public and private costs. For example, "between 1975 and 1986, U.S. public and private expenditures for pollution abatement and control exceeded \$564 billion ... about 60% [of which] ... was paid by the private sector" (Rosenbaum, 1991, p. 81). The benefits achieved through such expenditures are intangible, thus making it difficult for policy makers to determine whether the benefits equal or outweigh the costs.

However, support for the need to regulate and protect the environment grows producing a shift in perspective which views environmental regulation positively, holding a potential to increase the nation's economic health through job creation and increased standards of living. As Senator Al Gore states in *Earth in the Balance*, "the entire U.S. government ought to understand the economic significance of a *healthy environment* as a kind of *infrastructure* supporting future productivity [italics added]." (p.194) This infrastructure is viewed not only in terms of raw natural resources but in terms of the research and development of new technologies that promote a sustainable environment. As Senator Gore continues, these technologies "can be an important benefit to set against all the costs of environmental degradation" through job creation and satisfaction of global demand for environmentally sound products.

The controversy surrounding cost-benefit analysis has left legislators working in a void, reacting to responses received from both sides (environmentalists and economists). Cost-benefit analysis is generally viewed to lack the precision necessary for accurate accounting (Portney, 1990), though arguments can be made both ways, for and against its use. In support of cost-benefit analysis, Rosenbaum (1991) states that:

at the very least, [cost-benefit analysis] points decision makers to the most economically desirable, or cost-effective, policies for achieving a regulatory goal. ... [At times], cost-benefit analysis can ... identify policies that are both economically and environmentally wiser than those currently implemented. (p. 129)

Opposing views typically come from environmentalists who feel that cost-benefit calculations are easily distorted to the advantage of regulated interests. Their greatest argument relies on the inherent difficulty in monetizing environmental benefits. How much is clean air or clean water worth? Many feel that attempting to apply a dollar value to such ethereal values reduces their worth, turning these benefits into commodities that can be "priced, bought, and sold" (Rosenbaum, 1991, p. 131).

However this controversy is resolved, if it can be, it will probably not provide any new element to the equation as to the true impact of environmental policy and regulation on the nation's economy; if that impact can be said to truly exist. As Portney (1990) explains, the private sector, in 1981, was forced to spend approximately \$52 billion in efforts to comply with environmental regulations.

While annual expenditures of \$52 billion or more are hardly trivial, they are small in comparison to a \$5 trillion GNP like that of the United States. Thus it is unlikely that environmental or other regulatory programs on the present scale will ever be found to exert a significant impact on the measured performance of the economy. (p. 11)

A federal policy for wetlands

Historically, the federal policy concerning wetlands has been one of destruction. Because the general public was unaware of the important ecological role played by wetlands, they were viewed as wastelands, lands whose best use was to be filled and developed; "a good wetland was a drained wetland" (Mitsch & Gosselink, 1986). In 1849, Congress passed the *Swamp Land Act* to aid in settlement efforts. Extended and amended over the ensuing years, this Act was designed to decrease federal involvement in flood control and drainage by transferring federally owned wetlands to the states for reclamation. For almost 100 years after the establishment of this Act, wetlands were actively destroyed for purposes of development without any thought to the natural consequences. During this time, over 65 million acres of wetlands were lost. Additionally, as part of the U.S. Department of Agriculture's Conservation Program between 1940 and 1977, an estimated 57 million acres of wet farmland, including wetlands, were drained or converted to cropland (Mitsch & Gosselink, 1986). These acts represented the first wetlands policies of the U.S. government, policies obviously leaning towards wetland elimination.

Slowly, as understanding of the importance of wetlands grew in conjunction with the environmental movement, this policy began to shift from one of destruction to protection. The earliest vestiges of concern for wetlands are seen in the efforts of hunters and fisherman eager to preserve waterfowl and fish habitats important to their sports. These efforts resulted in programs such as the sale of "Duck Stamps", the proceeds of which were used by the FWS to acquire wetland areas (Mitsch & Gosselink,

1986). The value of wetlands as habitat began to be recognized during this period, yet it was not enough in the face of other economic concerns to elevate wetlands protection to a high priority. Thus the overriding policy remained one of elimination.

In 1956, the FWS released the results of the first "wetlands inventory" (OTA, 1984). The losses described therein astounded scientists and conservationists who started a grassroots effort towards preservation. The environmental movement of the 1970's furthered these efforts, bringing environmental issues to the forefront of political activity. Passage of the *National Environmental Policy Act* (NEPA) of 1969, prompted federal and state programs to shift, however slowly, from an emphasis on economic benefit towards one concerned with the impact of human activities on natural ecosystems (Hollis et al., 1988).

Wetlands were one ecosystem to benefit under the new mandate to document and mitigate environmental impacts. But due to their complex nature, a definitive protection policy was slow in coming, and a comprehensive look at wetlands protection has never been accomplished. In 1977, President Jimmy Carter released Executive Order 11990, the most definitive policy statement made to date on the federal attitude towards wetlands. This order, entitled *Protection of Wetlands*, mandated that:

Each [Federal] agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for (1) acquiring, managing, and disposing of Federal lands and facilities; and (2) providing Federally undertaken, financed, or assisted construction and improvements; and (3) conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.

Despite this classic example of federal leadership, wetlands policy has continued to develop in a piecemeal approach, providing regulation only in answer to specific concerns rather than holistic ones. The Federal government attempts to act in response to public concerns, but public opinion is not well formed outside scientific and conservationist circles. People are unsure about their feelings towards wetlands because of the lack of scientific data available, and because of the threat their protection imposes on the most basic of American held beliefs, property ownership and its associated rights (Steinhart, 1991).

No net loss

In 1988, the first inklings of a comprehensive approach to wetland policy emerged with a three-word campaign pledge by the President-elect: "No Net Loss". A great deal of controversy surrounds this pledge and continues to grow as implementation strategies are developed in keeping with the policy it suggests--no net loss of wetlands. This pledge was based primarily on recommendations made by The Conservation Foundation (TCF). In 1987, the EPA requested that TCF convene a National Wetlands Policy Forum in support of efforts to develop a comprehensive national wetlands policy. Foremost among the policy recommendations put forth by the Forum was the need "to achieve no overall net loss of the nation's remaining wetlands base" (The Conservation Foundation [TCF], 1988). The recommendations made by the Forum received welcoming support from federal agencies responsible for wetlands, including the EPA

and COE who subsequently filed a memorandum-of-agreement to work together in carrying out these recommendations (Graham, 1990).

However, as mentioned above, a policy is only as good as its implementation strategy. Since the time that the "no-net-loss" pledge was made, the Bush administration has wavered on the issue, initiating activities and regulations that would seem to renege on that pledge. Providing little leadership on the wetlands issue in the early years of his term, President Bush finally released his comprehensive plan for protecting the nation's wetlands in August of 1991 (EPA, 1991). Developed in three parts, the plan is designed to slow and eventually stop the net loss of the nation's wetlands; "a significant step towards the President's goal of no net loss" (EPA, 1991). The plan proposes to (1) strengthen wetlands acquisition programs and other efforts to protect wetlands; (2) revise the interagency manual defining wetlands to ensure that it is workable; and (3) improve and streamline the current regulatory system (EPA, 1991).

The first part of the plan outlines numerous proposals for wetlands acquisition through a number of regulatory and nonregulatory means, including the purchase of up to one million acres of wetlands by fiscal year 1993, and a revision of Executive Order 11990. No action has yet been taken with regard to this initiative, and reaction is minimal. The second part, revision of the *Federal Manual* has met with a great deal of resistance. Released in August, 1991, the revisions are currently undergoing extensive review. Many feel that if the revisions are passed, millions of acres of once protected wetlands will be lost; a seeming contradiction to the intent of the comprehensive plan (Pope, 1991). At issue are the scientific criteria to be used in determination of positive

wetlands identification. Designed to "streamline" delineation efforts and prevent misidentification, the revisions require, among other things, that (1) wetlands be inundated for 15 or more consecutive days, or saturated to the surface for 21 or more consecutive days during the growing season, raised from a 7 day criterion in the 1989 manual; (2) that soils must be saturated to the soil surface, a more restrictive criterion than the requirement of saturation to within 18" of the surface in the previous manual; (3) the elimination of hydric soil and hydrophytic vegetation from the list of field indicators of wetlands; and (4) the separation of hydrology indicators into primary and secondary indicators, reducing the number of field indicators allowable for field verification (EPA, 1991).

The *Federal Manual* is a statement of policy of the federal government. Such significant changes would seem to reflect significant changes to the overall comprehensive policy. The revisions proposed in the *Federal Manual* could open thousands if not millions of acres of wetlands to development. One estimate says that up to a third of the 100 million acres left standing could be affected ("Wetlands proposal", 1991). It will be close to a year before the fate of the proposed revisions is known (Sandy Sieg-Ross, personal communication, March 10, 1991); and the fate of the "no-net-loss" policy hangs in the balance.

The third part of the plan involves efforts to streamline federal regulation. Proposed are changes to the permitting process managed by the COE which would allow default approvals for agency inactivity after 6 months. The plan would also develop a categorization scheme for wetlands based upon function, value, and the relative scarcity

of a certain class of wetland. This would seem to place into danger smaller wetland habitats whose size limit their ecological impact. A large portion of wetland losses are due to the cumulative impact of the loss of wetlands one acre or less in size (Laycock, 1991). By categorizing them, the threat to these smaller wetlands increases and "no-net-loss is ... nickled and dimed to death by the loss of an acre here and a dozen acres there" (Graham, 1991, p. 106). *Mitigation Banking* is a concept introduced into this part of the Presidential plan as a potential way to lessen the impact of small losses. Salvesen (1991) explains the mitigation banking process as follows:

A degraded wetland is purchased and restored (or a wetland is created) by one party, such as a government agency; this restored site becomes the bank; the values of the restored wetland are somehow quantified and used as "credits" that can later be withdrawn, at a price, to compensate for unavoidable wetlands fills. The price of the credits covers the cost of acquisition, restoration, and operation. (p. 5)

The attraction here is that rather than creating small, isolated wetlands to compensate for each wetland alteration, one large contiguous wetland can be created to mitigate many individual alterations (Salvesen, 1991). This mitigation strategy would seem to support the "no-net-loss" policy while continuing to allow economic development. However, there are many concerns as to whether such a system would actually work, and many environmentalists continue to oppose this and other elements of the President's plan as a step away from his pledge. Pope (1991) summarizes the actions of the President on wetlands policy in the following manner:

George Bush has convincingly portrayed himself as a man of good will on environmental matters, but his actions reveal a leader of profoundly unrevolutionary temperament. When faced with the compelling need to move forward, he has chosen--inexcusably--to stand still. (p. 23)

And so it would appear that the national wetlands policy, despite large amounts of attention, stands still. The Federal government has accomplished little in developing an implementation plan that would support the stated "no-net-loss" policy. Additionally, on the heels of the release of his wetlands protection plan, President Bush, in his address before Congress on the State of the Union on January 28, 1992, called for a "90 day moratorium on all new federal regulations that could hinder growth". With numerous pieces of legislation on the table that concern wetlands protection, the moratorium could sound the death knell for positive protection activity. "A moratorium would be a step back to the days of confusion" ("Congressman asks", 1991). By equating federal regulation to hindrance of growth, the President has revived the old bias against federal environmental regulation, leaving the ability to implement sound environmental policy at the federal level questionable.

The fact remains that policy implementation requires the introduction of authoritative backing through legislation, and "wetland protection in the U.S. is accomplished by two primary techniques: (1) acquisition of priority wetlands, and (2) regulation of wetland uses" (Tiner, 1984, p. 54). The threat this moratorium places on pending legislation may be indicative of the federal effort to increase the role of the states in answer to the call for "no-net-loss". Of the many policy issues that are a part of wetlands protection, one question remains at the base of the wavering attitude within the federal government, "should federal involvement in protecting wetlands be increased or decreased?" (OTA, 1984) This in itself is a controversial issue, arguments may be made both ways, and the question cannot be answered here. However, by studying the

current federal role relative to existing legislation and identifying any problem areas, it may be possible to make assumptions about which type of government, through regulatory means, would best serve this national wetlands policy.

II. Wetlands Legislation

Overview of existing legislation

As with the inconsistent approach to policy development for wetlands protection, the passage of legislation for the protection of wetlands has followed a fairly haphazard history. As mentioned, throughout much of the nation's history the policy toward wetlands was one of elimination. As such, regulation of wetland use was practically nonexistent, and wetlands were never addressed directly in federal legislation until recently. Typically, wetland protection resulted as a "side-effect" of other regulations having some other related purpose. For example, the *Pittman-Robertson Act* of 1937, and the *Dingell-Johnson Act* of 1950 were enacted for purposes of acquisition, restoration, and maintenance of wildlife areas and commercial fish habitats (Platt, 1991). Laws such as these were instigated by efforts of sportsman eager to preserve their hunting and fishing areas. These habitats more often than not were wetland areas; thus, these Acts were the earliest active efforts of the Federal government to acquire and preserve wetlands (Platt, 1991).

This very new idea of preservation of wildlife habitat (and wetlands) began to gain increased emphasis as the role of the FWS as an advisor to regulators increased with

time. The *Fish and Wildlife Coordination Act* of 1934 (and as amended in 1946, 1958, and 1977) helped to affirm this role by requiring the COE to consider the comments of the FWS and other fish and wildlife agencies prior to issuing dredge and fill permits (Salvesen, 1991). For the first time, environmental concerns were given equal consideration in influencing federal actions (OTA, 1984). The acquisition of wildlife habitats continued under numerous pieces of legislation designed to preserve important commercial wildlife and fishes. The *Wetlands Loan Act* of 1961 (and as amended and extended through the ensuing years to 1988) was passed to "promote the conservation of migratory waterfowl by the acquisition of wetlands and other essential waterfowl habitat". This act provided interest-free loan advances towards the purchase of wetland habitat. As of 1983, \$147 million had been appropriated and used for wetland purchase. It is interesting to note that in this early stage of wetland protection, the *value* placed upon wetlands was linked inextricably to their *commercial* productivity.

The *Emergency Wetlands Resources Act* (EWRA) of 1986 was the next iteration of the *Wetlands Loan Act*. In addition to extending the previous Act and continuing to fund acquisition of wetland habitat, this Act established the *National Wetlands Priority Conservation Plan* and the *National Wetlands Inventory* project, which calls for the complete mapping and inventory of all wetlands in the United States. Decennial reports are due to Congress as part of this project in order to maintain continuous records of the status and trends of wetland losses (EWRA, 1986).

At this point it becomes necessary to note the impact of federal policy activity on legislation. Following passage of the *National Environmental Policy Act* (NEPA) in 1969

and the introduction of Executive Order 11990 in 1977, the emphasis of legislative activity at the federal level began to shift from economic concerns to ecological ones. NEPA is perhaps one of the most profound pieces of legislation to come out of the federal government. It "ushered in" the environmental decade of the 1970's and reflected the public's concern that "unfettered economic growth was spoiling the water, air, and land on which all life depends" (Salvesen, 1991, p. 22). Among the stated purposes of this legislation was the desire to reconcile the conflicts between economic growth and environmental protection. It required all federal agencies to consider the impact of their activities on the environment through use of an *Environmental Impact Statement* (EIS) which itemized these impacts, and designated that:

all agencies of the federal government shall ... insure that presently unquantified environmental amenities and values be given appropriate consideration in decision-making along with economic and technical considerations... (NEPA, 1969).

This law placed ecological considerations on an equal footing with economic ones, and for the first time provided the legal backing to support it. It shifted the traditional method of viewing ecological value in terms of commercial benefit to one of viewing ecological value through the benefits of maintaining a sound environment (Hollis et al., 1988).

Laws enacted which followed the NEPA mandate include the *Endangered Species Act* of 1973 which was designed to protect rare plants and animals in danger of extinction. This act requires Federal agencies to "ensure that any action authorized will not jeopardize endangered or threatened species directly, nor hurt or destroy their habitat" (Salvesen, 1991). The implications for wetlands here are obvious, as one of

their stated values is serving as habitat for numerous endangered species. Thus the goals of NEPA were realized in the recognition given to the benefits associated with the preservation of endangered species; ethereal benefits which exemplify the move from the economic to the ecological.

In terms of federal activity that would impact the environment, several laws were passed which limited the actions that citizens, whether in the public or private interest, could take in areas that contained wetlands. Three of these laws have evolved to play probably the most important roles in wetland protection; they are the *Coastal Zone Management Act* (CZMA) of 1972, the *Federal Water Pollution Control Act* of 1972 and the 1977 amendments, commonly known as the *Clean Water Act* (CWA), and the *Food Security Act* of 1985 and its 1990 amendments. The CZMA, passed in the face of increased coastal degradation, is a far-reaching federal planning program that has protected coastal wetlands through use of individual state management programs set up to mitigate further damage (Platt, 1991). Salvesen (1991) describes the program as one that:

provides financial incentives for states to adopt federally approved coastal zone management programs to protect coastal resources, which include beaches, barrier islands, barrier reefs, dunes, and wetlands. Federal actions, such as offshore oils leasing, must conform with a federally approved state program. ... Approved state programs must: 1) delineate the coastal zone boundary; 2) indicate which activities are permissible within the defined coastal zone; 3) inventory special resource areas requiring protection; 4) establish a policy framework to guide decisions about appropriate resource use and protection; and 5) include sufficient legal authority to implement the program. (p. 23)

While this Act did not address wetland protection specifically, wetlands are considered to be a high priority natural resource requiring protection under the state management plans (Mitsch & Gosselink, 1986).

After 1977, when Executive Order 11990 was set in place, environmental protection legislation began to incorporate the mandated responsibilities of wetlands protection. The *Clean Water Act* was established to protect the general public from the dangers associated with polluted waters and maintain a high level of water quality. Charged to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (CWA, 1977), the Act established numerous programs charged with the task of minimizing pollution *discharge* into the nation's waters. Under the CWA, wetlands are regulated by the Section 404 program. This program is often erroneously called the "Federal Wetlands Program" due to the fact that it has had the highest measurable influence on wetlands protection (Platt, 1991). In fact, wetlands and their protection are not even mentioned in the text of the legislation.

Section 404 supplemented the authority given the COE under the *Rivers and Harbors Act* of 1899 to prohibit "unauthorized obstruction or alteration of any navigable water of the United States in the absence of a permit from the COE" (Platt, 1991, p. 330). As part of Section 404, the regulatory authority of the COE was extended to include all "waters of the United States" (CWA, 1972). The COE are unwitting proprietors over wetlands. When first enacted, the COE narrowly interpreted "waters of the United States" to apply only to navigable waters. However, in the landmark court

decision *Natural Resources Defense Council v. Calloway*, the term "waters" was expanded to include a wide range of land-water phenomenon including:

- "Navigable waters" (including waters which once were navigable or that could be made navigable, and including all tidal waters)
 - All interstate waters including interstate wetlands
 - "All other waters ... the use, degradation or destruction of which could affect interstate or foreign commerce"
 - Impoundments of waters described above
 - Tributaries of waters described above
 - The territorial sea
 - Wetlands adjacent to the waters described above
- (Platt, 1991, p. 331)

Section 404 is specifically concerned with the discharge of dredge or fill material into these "waters". Thus, wetlands are protected from any non-permitted dredge or fill activities as mandated by the Section 404 program and Executive Order 11990. The process for obtaining a permit under Section 404 is highly complex (see Figure 5), with the decision to issue a permit resting with the district engineer, and based upon a number of factors including conservation, economics, and aesthetics (Mitsch & Gosselink, 1986). The impact that an activity would have on the ecological value of a wetland *must* be taken into account during permit review. This consideration is ensured by the fact that the Section 404 program requires permits issued under this program to follow EPA guidelines which state, among other things, that:

no discharge of dredged or fill material shall be permitted if there is a *practicable alternative* to the proposed discharge which would have less adverse impact on the aquatic ecosystem ... [and that] ... no discharge of dredged or fill material shall be permitted which will cause or contribute to *significant degradation* of the waters of the U.S. (Salvesen, 1991, p. 24)

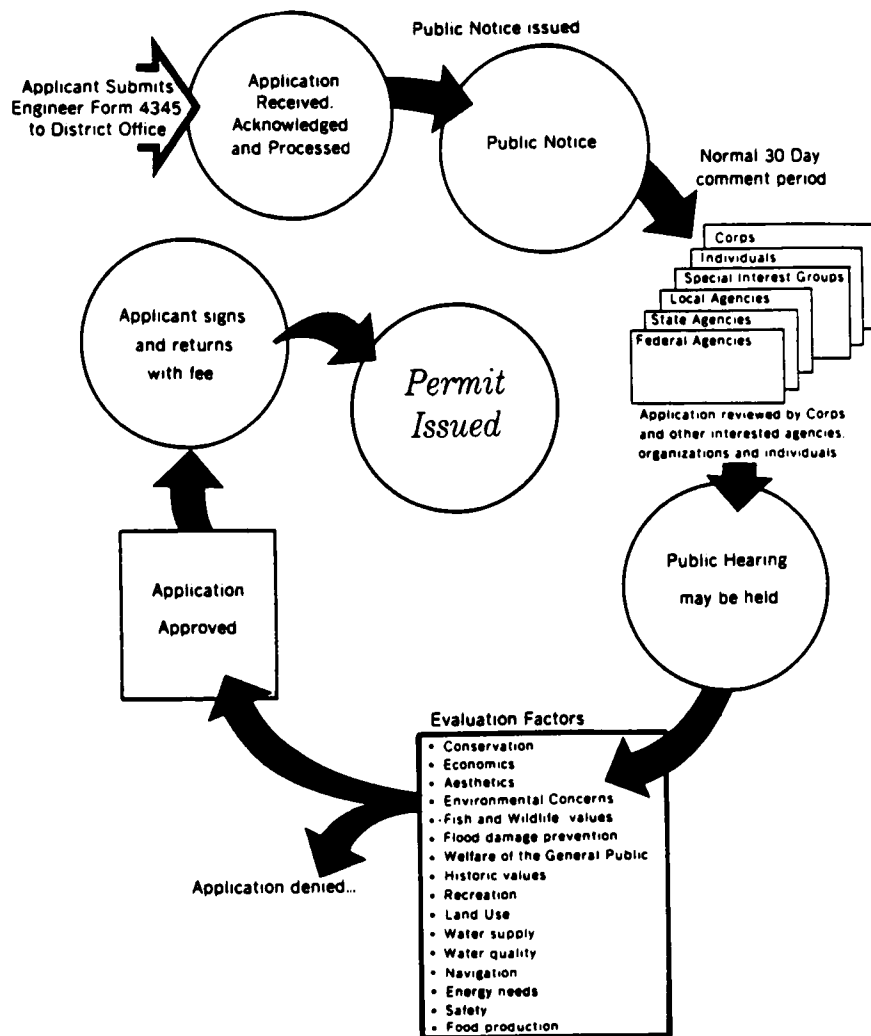


Figure 5. Typical COE review process for a 404 dredge and fill permit request.

Source: Mitsch, W.J., & Gosselink, J.G. (1986). *Wetlands*. New York, NY: Van Nostrand Reinhold.

Additionally, the EPA is empowered to veto any decision by the COE to issue a permit to fill in a wetland.

While Section 404 has been credited with slowing the loss of wetlands, it is not a comprehensive wetlands protection program and contains numerous problems and loopholes which allow continued, unregulated destruction. First is the fact that this program does not stop the discharge of materials into wetlands--it merely regulates it. Of the 15,000 individual permit applications received annually at the COE, approximately 10,000 (67%) are issued, 500 are denied (3%), and approximately 4,500 (30%) are withdrawn or are covered under a general permit (EPA, 1991). This record does not speak well to the goal of "no-net-loss".

The "general permit", allowed under the program for activities anticipated to cause "only minimal adverse effect[s] to the environment", is a permit which the COE may issue on a state, regional, or nationwide basis (Salvesen, 1991). Under nationwide permit #26, the most commonly used permit, all activities involving discharge of dredge and fill materials into *isolated waters* of ten acres or less are automatically authorized by the COE. However, an applicant is required to notify the COE of any such activities involving wetlands between 1 and 10 acres. If a wetland is under one acre, no action on the part of the applicant is necessary (EPA, 1991). This perpetuates the problem of large cumulative losses of wetlands through small, isolated cases. Laycock (1990) comments that "small size does not indicate that they [wetlands of one acre or less] are of less importance as wildlife habitat" (p. 98). Unfortunately, though, as small, isolated wetlands, the COE takes less notice and there is rarely an on-site inspection to verify that

regulations are not being broken. Laycock (1990) continues, saying that "in fiscal year 1989, the Corps handled some 1,500 notifications from developers and landowners planning to fill wet areas of one to ten acres. Of these, more than ninety percent went forward under the nationwide permit uncontested" (p. 99).

A third problem with the Section 404 program involves its statutory limits. The program only regulates the *discharge* of dredge or fill materials into wetlands. There are many activities that cause wetland damage that are not regulated including lowering of groundwater levels, flooding of wetlands, drainage of wetlands, and excavation of wetlands where the dredged material is disposed of on an upland site (EPA, 1991). Additionally, there are many activities *exempted* from permit requirement including:

normal farming, silviculture, and ranching activities such as plowing, seeding, cultivating, minor drainage, harvesting for the production of food, fiber, and forest products, or upland soil and water conservation practices; ... [and] maintenance, including emergency reconstruction of recently damaged parts, of currently serviceable structures such as dikes, dams, levees, groins, riprap, breakwaters, causeways, and bridge abutments or approaches, and transportation structures; ... [and] for construction and maintenance of farm or stock ponds or irrigation ditches ... (CWA, 1977)

One qualification is that farming exemptions pertain to established, on-going activities; any lands that have not been previously utilized for exempted activities are subject to review by the COE. The program also suffers from the confusion surrounding the definition of wetlands. While review of the *Federal Manual* revisions continues, the COE will use its 1987 manual for jurisdictional determination, emphasizing the lack of a definitive national policy.

The Section 404 program cannot be viewed as supporting the "no-net-loss" policy of the Bush administration. Despite the fact that ecological considerations are taken into account during the permit review process, Section 404 was not designed to be a comprehensive wetlands protection program, only a regulatory one concerned with maintaining obstacle-free interstate commerce. An interesting note here, though, and one which does, in part, support the policies of President Bush, is that the CZMA and Section 404 impart a great deal of responsibility to the states for wetland protection, if they choose to take it. Both programs require federal approval of state plans and regulations, and many states are taking the initiative to develop legislation under these programs that help to "fill in the regulatory gaps" found at the federal level (Salvesen, 1991).

The third piece of federal legislation having the greatest impact on wetlands protection is the *Food Security Act* (FSA) of 1985, and the so-called "Swampbuster" provision contained therein. Exempt from Section 404 permitting, and in keeping with policy set by the U.S. Department of Agriculture, conversion of wetlands to agricultural use remains the largest threat to wetlands protection. Swampbuster sought to change this trend by denying all federal farm benefits--mortgages, commodity support, crop disaster loans, etc.--to farmers or others who converted wetlands to dry cropland after the effective date of the Act (Burke et al., 1988). The 1985 legislation contained many flaws and loopholes that, to some degree, were addressed in the 1990 amendments to the Act. These amendments, as taken from the *National Wetlands Newsletter*, are summarized as follows:

Under the new Act, violations of swampbuster will be triggered by the time of drainage, as opposed to the time of planting a commodity crop in a drained field³. A refined penalty structure [graduated sanctions for violators] in the new Act provides for the imposition of fines from \$750 to \$10,000 where swampbuster violators can demonstrate that they acted in good faith, had not violated swampbuster more than once in the previous 10 years, and restored the converted wetland in accordance with a federally approved restoration plan. In addition, farmers who inadvertently drain wetlands once during a five-year period could avoid any penalty for a single minor violation, while second-time violators during this time period could be subject to fines ranging from \$500 to \$5,000. Farmers can protect and restore their wetlands through a new Wetlands Reserve program in which the federal government will pay farmers not to drain and plow wetlands. Moreover, the Act retained ... language that establishes that the Department of Agriculture must enroll one million acres in the reserve by 1995, with minimum 30-year easements ... [and] an amendment added ... forbids the use of Farmers Home Administration loans to drain wetlands. ("S. 2830", 1991, p. 15)

The 1990 Act contains a welcome new program known as the Wetlands Reserve program. This provision "holds great promise ... for long-term protection and restoration of agricultural wetlands" (Moyer, 1991), and is viewed by many as the wetlands protection "wave of the future". The key to this provision is the protective easements held for 30 years or longer. These long-term easements ensure the protection of wetlands well into the future. Protectionist federal policy is especially important here, for the easement program will be dependant upon the willingness and ability of the government to continue to pay the leases. Despite this innovative concept, there are still numerous policy related problems which plague the Act related to its minimal effects, mitigation, and graduated penalties provisions. First, under pressure from agricultural interest groups, Congress granted exemptions which allow farmers to convert wetlands

³The 1985 Act did not prevent the draining or conversion of wetlands; rather, a violation occurred only after a farmer actually planted a commodity crop on the drained wetland.

if the conversion is found to have "a minimal effect on the functional hydrological and biological value of the wetland, including the value to waterfowl and wildlife" (Moyer, 1991, p. 6). Second, Congress adopted a provision that "allows the conversion of frequently farmed wetlands if the wetland value, function, and acreage are mitigated by restoration of a prior converted wetland in the same general area" (Moyer, 1991, p. 6). Both of these provisions are susceptible to abuse without a proper monitoring mechanism in place. Additionally, the concept of mitigation through restoration remains an uncertain science, presenting a questionable alternative to the practice of protective regulation of their use (Salvesen, 1991; Moyer, 1991).

Third is the question of graduated sanctions. Many view this compromise as a way to maintain the "non-penalty" approach of the 1985 Act. Whether the graduated penalty system will provide the enforcement necessary to stop violations remains to be seen (Moyer, 1991). Other problems lie in mapping technology available to farmers subject to the Act's provisions, introducing problems of accurate delineation, and the controversy over definition. Does this act support the "no-net-loss" pledge? That remains unanswered at this early stage. However, Moyer (1991) concludes that:

... the 1990 Farm Bill must be successful if we are to have any hope of curbing the current rate of wetland loss, achieving no net loss of wetlands, or ever beginning to restore the nation's wetlands inventory. ... The fact is, this nation has not yet made a solid commitment to protecting its wetland resources. Society generally has good intentions regarding wetlands and has made major progress in some areas, but politicians still waver when they face the hard choices. Under these circumstances, the wetlands provisions of the new Act are a good step forward. (p. 7)

Pending wetlands legislation

At this time, and as mentioned above, this nation still does not have a definitive strategy in place for achieving the goal of no net loss. The piecemeal approach to wetlands protection continues as legislators regulate around the issue of wetlands protection. Recently, though, as if suddenly bit by the "environmental bug", the 102nd Congress has initiated a rash of legislative activity geared towards the development of a comprehensive wetlands policy and protection strategy. High on the agenda is the reauthorization of the *Clean Water Act*. Looming over its reauthorization are the problems inherent in the Section 404 program. Many are attempting to focus the reauthorization of the Act on the wetlands issue, though administrators such as William Reilly, head of the EPA, are doing all they can to avoid a reauthorization battle centered on this program (Davis, 1991a). They would prefer that wetlands be legislated separately and according to their own agenda.

H.R. 251, the proposed *Wetlands No Net Loss Act* of 1991, was introduced in January of 1991. This bill seeks to promote the conservation and enhancement of wetlands and prevent wetland losses by establishing several new wetlands protection programs at the national level including the Wetlands Preservation Trust, funded by the CWA and the Land and Conservation Fund. The Trust would acquire ownership interests in wetlands, former wetlands, and associated lands for their ultimate restoration or preservation ("H.R. 251", 1991). The bill also proposes the establishment of an Office of Wetlands Identification and Preservation within the FWS, and would require all federal agencies to maintain an inventory of all wetlands on lands held by that agency.

It also contains an amendment to the Section 404 program by expanding the number of activities requiring permitting ("H.R. 251", 1991). It is interesting to note that this bill pursues wetland protection at the national level, steering away from the "new federalism" which would place more responsibility on the states.

H.R. 404, the *Wetlands Protection and Regulatory Reform Act* of 1991, was introduced to reform procedures for issuing permits under Section 404, primarily by categorizing wetlands according to size, function, and value. This is a recurring theme among the many bills proposed in Congress. Whether reformation of the existing 404 program is the way to pursue "no-net-loss" remains to be seen. An affront to the Bush policy and wetlands protection plan was introduced through H.R. 1010, a bill to prohibit the implementation and use of the *Federal Manual*. This bill follows on the heels of the controversy surrounding release of the proposed revisions, and seeks to remove the threat that many landowners and developers fear from the wetlands definition within the manual.

H.R. 2400, the *Wetlands Stewardship Act* of 1991, was offered as a "compromise bill" to "provide a balanced approach to wetland conservation that protects our nation's wetlands resources while providing for the needs of landowners, industry, and commerce" ("H.R. 2400", 1991). The bill attempts to accomplish this mission through significant changes to the CWA and the FSA. It currently has little support ("H.R. 2400", 1991).

A bill that is garnering considerable support in Congress, and creating considerable controversy in the general public, is H.R. 1330, the *Comprehensive*

Wetlands Conservation and Management Act of 1991. This bill concentrates on completely reforming the Section 404 program within the context of the CWA, for purposes of making it a comprehensive conservation and management program for wetlands. The act would: (1) "tighten up the wetlands definition", providing a concise, structured program for delineating wetlands; (2) prioritize the remaining wetlands according to their ecological value and productivity; and (3) compensate owners whose lands were "taken" under the guise of wetlands preservation (Davis, 1991b). Under this proposal, "low value" wetlands would lose much of the protection they now enjoy. Additionally, by addressing the tricky subject of takings by way of environmental regulation, the bill opens the way to extensive litigation, not only on the issue of wetlands, but for all other environmental legislation as well.

Each of these bills appears to be following the pattern of reformulating existing legislation to achieve wetlands protection. These reformulations are characterized by developing a categorization scheme which would prioritize wetlands requiring protection, following similar proposals in the President's plan. Many bills attempt to establish federal reserve programs for wetlands acquisition, promoting the idea that acquisition serves as the greatest assurance of protection. What these bills lack is a truly comprehensive look at the wetlands problem. Until genuinely innovative legislation is proposed that promotes this comprehensive viewpoint, "no-net-loss" will not be accomplished, and the traditional problems facing current legislation, such as the takings question, will never be resolved. It is doubtful that such innovative legislation will come from the 102nd Congress. Partisan politics has created problems for attempts by the

legislative and executive branches of government to formulate any type of definitive policy or implementation strategy. As was written in *Nation's Cities Weekly*, much of the proposed congressional legislation and amendments to existing laws "are in response to the overwhelming opposition to the administration's implementation of the president's no-net-loss policy" ("Senate shows", 1991, p. 4).

III. Regulation in Practice

Legal issues of wetland regulation

Once legislation is enacted at the federal level, states and municipalities are provided the responsibility for interpreting and implementing these laws as best serves the needs and concerns of their citizens. The stated federal policy is "no net loss" of wetlands, and the federal strategy for achieving this is primarily by way of the Section 404 provisions, the CZMA, and the FSA. These strategies allow the states to accept a large amount of responsibility for regulation of wetlands, which is typically done in two ways: (1) indirectly, as part of broad regulatory and planning programs; and (2) directly, by enacting laws specifically to regulate activities in wetlands (Salvesen, 1991). At the local level, protection efforts revolve around third generation interpretation of federal regulations and implementation strategies for state initiatives. Local regulations include among others: (1) the zoning law which may include provisions for wetland protection; and (2) building, sanitary, and other codes which have the *effect* of protecting wetlands (OTA, 1984). These are planning strategies used to achieve particular goals, and states

and municipalities are enabled to impose special conditions or regulations in the interest of the public health, safety, and welfare. Planners play an important part in developing state and especially municipal planning strategy and regulation, and it is important that they understand the legal basis on which they stand, for these planning strategies are subject to many of the legal issues faced by environmental regulations today.

The primary legal issue faced by wetlands legislation, or any environmental legislation, is that of "takings"--the removal of all value or utility from private property through regulation. The "takings" problem is a constitutional one, derived from the Fifth amendment which provides that "private property [shall not] be taken for public use, without just compensation." Additionally, the Fourteenth amendment applies the federal takings clause to the states by stating that no state shall "deprive any person of ... property, without due process of law." Regulations imposed under the "police power", such as zoning laws, do not require compensation; however, if "regulation goes too far it will be recognized as a taking" (*Pennsylvania Coal Co. v. Mahon*, 1922). If a court holds that a land use regulation is a taking of property, it will invalidate the regulation. Additionally, as a result of *First English Evangelical Lutheran Church v. the County of Los Angeles* (1987), the court now requires the payment of damages as compensation for the temporary period during which the regulation was in effect, a "temporary taking" (Mandelker, 1988).

The determination as to whether a taking has resulted from an environmental regulation follows four basic theories: (1) the harm/benefit distinction; (2) the diminution of value test; (3) the investment-backed expectation test; and (4) the balancing test. The

harm/benefit distinction would distinguish between the use of a regulation to provide either a public benefit or prevent a private harm. As applied, this distinction would "uphold a land use regulation that prevents a harm to private landowners [such as flooding or subsidence] and invalidate a regulation that confers a public benefit [such as open space]" (Mandelker, 1988, p. 24). It is important to note that this doctrine will uphold a regulation seen to prevent a harm even if the resulting value of the land is zero (Hunter, 1989). There are some limits to the application of this theory, especially regarding the actual distinction between public harm and benefit. A regulation seen to prevent a harm, such as wetlands protection for purposes of maintaining water quality, is equally viewed as a public benefit, where wetlands protection provides open space and aesthetic features. This theory is viewed as unreliable because of its inherent manipulability (Hunter, 1989).

The diminution-of-value test is the most widely acclaimed determinant for takings. This test looks for the resultant value of a property after application of the regulation. "The regulation of a property is a ... taking if it deprives the [landowner] of all or most of the economic value of his land" (Hunter, 1989, p. 270). If there is a reasonable use left for the land that imparts value, then a taking has not occurred (Mandelker, 1988). There are some problems with this doctrine. First, there is no clear precedent set by the courts as to where to "draw the line" in specifying how much of a loss is necessary to determine a taking. Second, the economic loss identified on a property is self-serving. Lost value, as presented by a landowner, is typically determined by the *potential* value land may have under different circumstances. Third is the practical difficulty in defining

what part of a property is regulated. Where regulation impacts the value of only a portion of a whole property, should the economic loss be viewed in terms of the part affected or the whole property? (Mandelker, 1988; Hunter, 1989)

Investment-backed expectations involve the expectations a developer has regarding a particular property for a profitable return at the time of investment. This approach is looked at as an improvement upon the diminution-in-value test. The courts will identify a taking based upon expected value if the regulation was applied after investment, or if the developer was truly unaware of existing legislation (Hunter, 1989). These qualifications identify the problems inherent in the theory. First is the concept of expected value versus current or existing value. It is undecided as to which value applies or holds the greater weight. Additionally, it falls back upon the related questions of the economic loss theory concerning value of the whole and accurate definition of the loss. How does one define an expected loss? (Hunter, 1989)

The balancing test attempts to balance the loss suffered by a private landowner through regulation against the public purposes it serves (Mandelker, 1989). The difficulty here is in how to specify or detail public purposes in such a way that they can be compared to economic losses. A highly subjective test, the courts will not identify a taking if the social gain from the regulation outweighs the economic loss to the private landowner (Mandelker, 1988).

The greatest problem evident in these theories is the perpetuation in the judicial system of the primacy of economics over ecologic considerations in determining regulatory takings. In ruling for takings based upon economic interests, "the courts are

essentially applying the fifth amendment to preserve what they see as a socially desirable and constitutionally compelled goal for growth" (Hunter, 1989, p. 277). The problems faced by the courts are similar to those faced by regulators: that (1) the economy maintains a higher priority in terms of social costs and benefits; (2) the value of land in ecological terms is not easily interpreted into economic or market terms, thus biasing decisions against environmental benefits; and (3) the time frame involved in ecological consideration is far-reaching, creating questions requiring definition over the amount of interest held by future generations in terms of economic wealth versus environmental health (Hunter, 1989). Hunter (1989) concludes that:

The economics-based view of land currently in favor with the courts fails to appreciate completely the dual role of land. Land is the base of the ecological pyramid as well as being an economic factor of production to be bought and sold in a marketplace. The problem with viewing regulatory takings problems in economic terms is that the language of economics does not adequately embrace the land's ecological role. ... *An economic view of land fails to value, and thus to protect, the land's function as the base of the ecological pyramid on which human beings depend* [italics added]. (p. 280)

The test of wetlands regulation

Thus the stage is set for judicial interpretation of existing wetlands laws. As the previous discussion would suggest, judicial interpretation has "flip-flopped" on the constitutionality of wetlands regulation due to the lack of definite criteria by which to determine a taking. The *value* associated with wetlands in terms of economics or ecological concerns varies from judge to judge and state to state, often dependant upon the extent to which wetlands are a part of a state's makeup, and the subsequent emphasis

placed on these values as applied to takings will vary. Thus, what may constitute a taking in one state may subsequently be ruled otherwise in another. However, as has been seen in social attitudes and in federal policy-making, the courts swing like a pendulum, following changing social norms and moving slowly in both directions; the courts acknowledge the benefits of wetland preservation on one hand, yet defeat them in the name economics on the other.

Wetland regulations are particularly vulnerable to the takings clause because they "impose restrictive controls ... to preserve their [wetlands] environmental function by keeping them free from development." The takings problem arises out of the fact that they provide "regulatory benefits for the general public but concentrate their development restrictions on a limited group of landowners" (Mandelker, 1989, p. 449). One of the first wetlands cases to address a takings claim was *Morris Land Improvement Co. v. Township of Parsippany-Troy Hills* (1963) (Salvesen, 1991). In this case, the harm/benefit theory was used to strike down an ordinance that restrictively zoned a privately owned wetland. The court identified two purposes being served by the ordinance: (1) flood control, and (2) preservation of the land in its natural state to augment a neighboring wildlife refuge. Both purposes were identified as *providing a public benefit*, thus constituting a taking (Platt, 1991). Despite this defeat, this decision set a precedent by forcing the courts to acknowledge that wetlands benefits cannot be viewed in simple monetary terms. In the decision, Justice Hall acknowledged the important role that wetlands were playing in mitigating flood damage, but, lacking a precedent on the issue, he felt obliged to follow established rules and stated that the

ordinance "went too far", removing all viable economic use for the owner. He further stated that "public acquisition rather than regulation is required" (Platt, 1991, p. 242).

The *Morris Land* decision was later disqualified by numerous cases, including one, ironically, decided by the same judge. In *A.M.G. Associates v. Springfield Township* (1975), Justice Hall disallowed a taking, recognizing that "vital ecological and environmental considerations ... have brought about ... drastic land-use restrictions in furtherance of a policy designed to protect important public interests wide in scope and territory.... Cases arising in such a context may properly call for reexamination of some of the statements made 10 years ago in the ... Morris County Land case..." (Platt, 1991, p. 243). An interesting note is to view these cases in terms of the years in which they were heard; *Morris Land* happened prior to NEPA and the environmental movement, *A.M.G. Associates* after, illustrating the impact of the social shift in thought on the courts.

Perhaps the most important wetlands case ever heard was the landmark case *Just v. Marinette County* (1972). The *Just* case centered around a Wisconsin statute that required all counties to adopt a state-approved shoreland zoning ordinance. Marinette County's ordinance subsequently required a COE permit to fill wetlands located within 300' of navigable waters⁴. The Justs, who owned property containing wetlands which were regulated by the ordinance, claimed that the ordinance was a taking and proceeded to fill the wetlands without a permit for purposes of development (Salvesen, 1991; Platt,

⁴This case and the establishment of the ordinance in question took place prior to enactment of the FWPCA of 1972 and the Section 404 provisions contained therein.

1991). Resisting cease-and-desist orders, the Justs took their case all the way to the Wisconsin Supreme Court where they were defeated in a precedent-setting decision. The court found that the ordinance was a *reasonable exercise* of the police power to *prevent harm to environmental resources*. The ordinance was responsible for not only improving the public condition, but for preserving the natural environment from destruction by unregulated activity (Salvesen, 1991). Thus the courts turned away from the traditional economic view towards an ecological one.

This decision turned *Morris Land* on its head by identifying similar purposes behind the ordinance, yet viewing them as preventing harm rather than providing public good:

The Justs argue their property has been severely depreciated in value. But this depreciation of value is not based on the use of the land in its natural state but on what the land *would be* [italics added] worth ... While loss of value is to be considered in determining whether a restriction is a constructive taking, *value based upon changing the character of the land at the expense of harm to public rights is not an essential factor or controlling* [italics added]. (*Just v. Marinette*, 1972)

By holding that the loss in value felt by the Justs was "not controlling", the court identified the preservation of the existing environmental condition as having value. The court reviewed this case relative to existing takings law but, unsatisfied, introduced a new "natural use" theory by which it substantiated its decision. This theory incorporates ecological principles into judicial interpretation in three ways:

(1) it recognizes that land is part of the natural ecosystem on which man depends, (2) it recognizes that land is at the base of the ecological pyramid and that man's impact on land reverberates throughout the ecosystem, and (3) it enforces the responsibility of landowners toward the ecosystem by denying them the "right" to destroy the land's ecological capacity. (Hunter, 1989, p. 301)

This theory provided states and municipalities with the legal backing necessary to preserve the environment for its ecological value. Additionally, it upheld the legality of the permit process as a form of insurance against unregulated or potentially damaging activity (Hunter, 1989). As was written in the court's decision:

An owner of land has *no absolute and unlimited right* [italics added] to change the essential natural character of his land so as to use it for a purpose for which it was unsuited in its natural state and which injures the rights of others. The exercise of the police power in zoning must be reasonable and we think *it is not an unreasonable exercise of that power to prevent harm to public rights by limiting the use of private property to its natural uses* [italics added]. (*Just v. Marinette*, 1972)

In terms of the constitutionality of permit programs, especially the Section 404 program, *United States v. Riverside Bayview Homes* (1985) established the fact that the permit process, as in land use regulation, does not constitute a taking (Burke et al., 1988). As stated by the court:

the mere assertion of regulatory jurisdiction by a governmental body does not constitute a regulatory taking. ... A requirement that a person obtain a permit before engaging in a certain use of his or her property does not itself "take" the property in any sense; after all, the very existence of a permit system implies that permission may be granted, leaving the landowner free to use the property as desired. (*U.S. v. Riverside Bayview Homes*, 1985)

Thus, a statutory permit requirement is not a taking. A taking occurs as a result of the permit process only when a *permit denial* prevents an economically viable use of the land. In such cases the landowner must sue for compensation (Mandelker, 1988).

Another precedent setting case was *Penn Central Transportation v. New York City* (1978). While this case did not involve wetlands specifically, it introduced the "whole parcel rule" in response to problems associated with the traditional diminution-of-value

test. In the *Penn Central* case, the court upheld the application of an historic landmark designation of Grand Central Station in New York City, preventing Penn Central from constructing a high-rise office building in the air space above the terminal. In determining that a taking had not occurred, the court refused to separate the air rights from the terminal beneath and looked instead at the property as a whole (Salvesen, 1991). The impact this case had on wetlands regulation is further explained by Salvesen (1991):

The Supreme Court's refusal to split the property into discrete parcels and then decide if limitations on a particular parcel constitute a taking has significant implications for wetlands law. Many wetlands regulations restrict development in wetlands but allow development on the upland portion of a site. Under the "whole parcel" rule, such regulations *will not* [italics added] be considered a taking if the property owner is left with some *viable economic use for the remaining portion* [italics added] of the property. (p. 35)

This rule was successfully applied in the wetlands case *Deltona Corporation v. United States* (1981). In this case, Deltona Corporation purchased five tracts of land along the Gulf Coast for residential development. By 1969, they had applied for and received building permits for two of the tracts. In 1973, however, when they applied for permits for the other three tracts, the jurisdiction of the COE had expanded, and permit requirements were more stringent. As a result, Deltona was granted a permit for only one of the three tracts. Deltona sued claiming a taking. As Salvesen (1991) concludes:

The claims court found that the Corps' regulations substantially advanced legitimate and important governmental interests and did not deprive Deltona of all economically viable use of its property. The court noted that for the two tracts on which a permit was denied, Deltona still had over 111 acres of uplands it could develop without a permit from the Corps. (p. 36)

The permit process and the "whole parcel" rule did not fare well, though, in *Florida Rock Industry v. United States* (1985). In this case, the court held that the COE's denial of a permit to mine phosphate rock in a wetland constituted a taking because rock mining was the *only* economically viable use for the company's land (Salvesen, 1991). The permit was requested for a 90 acre portion of a 1,560 acre tract bought specifically for mining. By denying the permit, the COE removed the investment-backed expectations of the property. Additionally, the court felt that "for all practical purposes the property had no value after the denial. ... The government had not shown there was a real and actual post-denial market among real and knowledgeable investors who were aware of the regulatory restrictions on the property" (Mandelker, 1991).

In a similar case, *Loveladies Harbor, Inc. v. United States* (1990), the court also identified a taking where the COE denied a permit for filling 11.5 acres within approximately 50 acres of remaining undeveloped wet land owned by Loveladies Harbor. In its decision, the court refused to consider the property in its entirety, where over 200 acres of land had been profitably developed since 1956. Instead, the court looked only at the 11.5 acres in question, identifying a diminution in value of 98% based on the claim by the plaintiff that the "highest and best use" for the land was residential, and that the COE permit denial allowed only recreation and conservation uses. The court allowed the "expected value" assessments for residential use to serve as the basis by which it determined value diminution (Kusler & Meyers, 1990). These cases were a striking blow to the forward steps of *Just* and *Penn Central*. It is interesting to note that these cases

took place during the later portion of President Reagan's term, and the early half of President Bush's term; two periods in which environmental policy was placed at a low priority. The decisions are perhaps reflective of President Reagan's release of Executive Order 12630. This order directs federal agencies to "evaluate carefully the effects of their administrative, regulatory, and legislative actions on constitutionally protected property" in order to "prevent unnecessary takings" (Burke et al., 1988, p. 28). It was basically an attempt by the Reagan administration to limit government regulation of private property, thus dampening federal enthusiasm to regulate wetlands (Burke et al., 1988).

And so, at this point, it appears that after swinging towards the environment, the courts are beginning the swing back the other way. Once a precedent is set, it is soon reversed under separate interpretation, most notably in the state and federal courts where attitudes differ considerably towards the importance of wetlands protection. It may be, though, that the substantive guidance needed to lock the courts in one direction or the other may soon come. *Lucas v. South Carolina Coastal Council* (1991) was heard on appeal by the U.S. Supreme Court on March 4, 1992. A ruling is expected by the end of summer. This case involves two beachfront lots owned by Lucas on a South Carolina barrier island. The South Carolina *Beachfront Management Act* prevents any new permanent construction other than small decks or walkways for a number of environmental and public-safety reasons, enumerated in the Act, along beaches and dunes. Lucas wishes to build two homes on these lots and argues that the regulation constitutes a taking. The South Carolina State Supreme Court, in reviewing the case,

reversed a ruling by the district court in favor of Lucas, arguing that "the proposed development would constitute a public nuisance [by way of creating public harm], and is therefore exempt from any claim of a regulatory taking" ("Lucas v. South", 1991, p. 21).

It is unknown how the Supreme Court will rule on this case, but the implications for the future of wetlands regulation, and other environmental regulations, is obvious. Should the Court rule in favor of Lucas, the takings argument will be given more weight in terms of holding private economic expectations of value over preserving ecological value. In consideration of the *Florida Rock* and *Loveladies Harbor* cases, such a decision would confirm the swing of the judicial pendulum away from the ecological perspective.

Implications for states and municipalities

What does all this mean for states and municipalities? Basically that they must be careful in determining what types of regulation they use to protect wetlands. Burke et al. (1988) provides promising news that although "some wetland regulatory applications have led to successful takings claims in state courts, ... no wetland regulatory program has been invalidated in any jurisdiction" (p. 28). But it seems obvious that the judiciary is beginning to swing away somewhat from environmental concerns. They speak to the letter of the law, and at present, the law does not speak well to the comprehensive preservation of wetlands. A piecemeal policy approach has led to piecemeal legislation and, in turn, piecemeal preservation through litigation. States and municipalities have the unique opportunity to develop programs that make up for this

lack of leadership at the federal level; they just need keep in mind the legal precedents set before. Burke et al. (1988) offer several points, derived from such precedents, for guidance in developing state and local programs geared toward wetland preservation:

1. Regulations adopted for a valid public purpose and with an adequate basis in fact may substantially reduce land values without effecting a taking.
2. The impact of regulations must be evaluated for an entire piece of property (not just one portion) to determine whether a taking has occurred.
3. Public safety and the prevention of nuisances are paramount concerns of government, and no landowner has an intrinsic right to threaten public safety or cause nuisances.
4. Regulations will result in a taking only if they deny "all use" or all "economic use" of an entire property, including reasonable "investment-backed expectations." Even then, regulations may be valid under certain circumstances. (p. 28)

States, under the "new federalism", are being empowered and encouraged to construct their own comprehensive wetlands protection and management programs under the federal umbrella. In turn, they provide municipalities with the ability to implement state and federal policies in a way that meets the needs and concerns of local citizens. Proper implementation at the local level by way of legally backed local comprehensive plans and development restrictions is the key to "no-net-loss".

CHAPTER 3

STATE REGULATION OF WETLANDS

I. State Programs in General

Overview

The Federal government, through its current wetlands policy and supporting regulations, leaves a great deal of room to the states for interpretation and implementation. As part of the "new federalism" in which states are playing a more active, and the federal government a less active, role, states are given the options of 1) relying on federal legislation and administering it at the state level, 2) enacting their own legislation that is specific to the needs of the state, or 3) developing a combination of both that utilizes federal programs supported by state run programs which "fill in the gaps" found in federal legislation. Most states, rather than assuming federal programs, have primarily engaged in developing their own innovative programs (Burke et al., 1988). These programs are the method of implementation for federal policy.

There are a number of regulatory and nonregulatory methods available to states to protect wetlands. Regulatory methods consist of permitting, resource management and conservation legislation, and water quality legislation among others. Nonregulatory methods include state land acquisition programs, incentives to landowners, and easement programs among others (OTA, 1984). These two approaches have benefits and constraints, and both have exhibited some success and failure. Thus it is difficult to say

which approach is more effective. However, it can be said that the regulatory approach towards wetlands is gaining momentum, with the regulation of wetlands being the preferred alternative. Most states have some sort of wetlands protection regulation in place, and many others are developing it (Burke et al., 1988).

State regulatory programs address both inland and tidal wetlands, with the latter receiving the most attention. Of the 30 coastal states, most have enacted regulatory authority over coastal wetlands, and about 20 of these states have programs considered to be dominant over the Section 404 program (OTA, 1984). However, protection of inland or freshwater wetlands in these states lags behind, with only 14 regulating freshwater wetlands. Of the 20 inland states, only one, North Dakota, has enacted a state permitting program for freshwater wetlands independent of the federal Section 404 provisions (Salvesen, 1991). Such attention to coastal wetlands is seen as a result of the *Coastal Zone Management Act* of 1972 which promoted state development of coastal zone management programs protecting coastal resources (Burke et al., 1988). Isolated wetlands are generally not well regulated by the states, with permitting jurisdiction by state agencies limited to wetlands that are *contiguous*, meaning they are *directly tied* to waters of the state (OTA, 1984). However, as cumulative losses from small isolated wetlands mount, the need for protection is bringing about change in this policy (Laycock, 1990).

No two state programs are developed or administered in the same way, showing the specificity of these programs to the states themselves. For instance, Connecticut delegates wetlands protection responsibilities to local governments, while Massachusetts

delegates responsibility to over 300 conservation commissions whose activities are overseen by the state (Salvesen, 1991). Many state programs are modeled after federal legislation, incorporating federal wetlands definitions and guidelines for use. Others, however, develop their own definitions and strategies reflective of the state's needs or concerns. This results in varied definitions for jurisdictional wetlands among the states that often differ radically not only from other state definitions but from federal definitions as well. Most states rely on vegetation and soils to establish wetland boundaries, as opposed to the COE and EPA which rely on the three-criterion rules discussed previously (Salvesen, 1991). Regulatory programs are found to protect wetlands by both direct and indirect means, as discussed below.

Regulatory Programs--Direct

Direct regulatory programs include laws enacted specifically for the purpose of controlling activities in and protecting wetlands. Permitting is the most prominent method of direct regulation, and, for most state programs, the permit process is very similar to that of the COE's Section 404 permit process (Salvesen, 1991). Permitting is typically handled by state rather than local agencies, although local governments may be given the authority to veto approval of some projects (OTA, 1984). As with Section 404, permits are generally required for any activity involving dredging or filling of state jurisdictional wetlands. Applications are reviewed on a case-by-case basis and are usually approved on condition, where conditions often involve some form of mitigation for the loss of wetland habitat (Salvesen, 1991).

Many states establish jurisdiction over a wider range than the COE, thus providing greater protection. For example, over 70% of the wetlands regulated by New Jersey's preservation laws are not subject to COE permitting because they do not meet COE delineation criteria. Some states will establish jurisdiction over a smaller range than the COE, but will exempt fewer activities. For example, North Carolina's dredge and fill permitting legislation does not exempt agricultural or silvicultural activities, though their wetlands jurisdiction does not apply to forested wetland species (OTA, 1991). State permitting is typically established separately from the federal Section 404 program, and applications must be filed with both federal and state permitting agencies when both jurisdictions apply. The COE will usually approve permits contingent on state action, thus allowing the states an advisory role to federal permitting (Salvesen, 1991).

States are provided the option and encouraged by the federal government to assume administration of the Section 404 program. The EPA has the authority by way of the *Clean Water Act* to delegate permitting of nonnavigable waters to a state if it is able to meet certain minimum program criteria, including compliance with EPA and public notice guidelines. The COE retains authority over navigable waters and the EPA maintains the right to veto state decisions (Salvesen, 1991). State programs may be broader in scope or more stringent than the federal program, but any elements added to the program outside the defined authority of the federal government will not receive federal enforcement (Salvesen, 1991).

Though the federal government has been working to get more states to accept Section 404 responsibilities, very few states have been so inclined. In fact, only

Michigan has accepted this responsibility and developed an approved Section 404 permitting program (OTA, 1984). One reason for this lack of response is the fact that the federal program is very cumbersome and expensive to maintain. At a time when state budgets are tight, there is very little incentive for states to adopt the program in substitution of established state programs or as a first attempt at regulation (Salvesen, 1991).

Direct regulation of wetlands also may include the establishment of a state comprehensive wetlands protection act. Comprehensive legislation will typically regulate activities in wetlands through a permitting process, with the need for permits contingent upon the classification of a wetland as applied in the state legislation (Mantell et al., 1990). Classification is usually based upon the recognized value of particular wetland types within a state. Buffer zones are established for each classification, and acceptable uses within these wetlands outlined. A list of activities requiring permits are provided and some activities are prohibited outright (Mantell et al., 1990). New Jersey offers a good example of such comprehensive legislation in its *Freshwater Wetlands Protection Act*. This act requires a permit prior to any activity taking place in a wetland. Wetlands are classified into three categories with each category receiving special development rules. The act creates a buffer zone of 75 to 100 feet for "wetlands of exceptional resource value", and a buffer of 25 to 50 feet for wetlands of "intermediate resource value". Most of the activities regulated by the act are prohibited within these buffer zones (Mantell et al., 1990).

Regulatory Programs--Indirect

Indirect regulation of wetlands involves the use of legislation enacted for a primary purpose other than wetlands protection, but has the secondary effect of doing just that. The best example of this would be the coastal zone management programs developed by some states in answer to the federal CZMA. Most of these state wetlands protection efforts begin along the coasts and work their way inland, resulting, as mentioned, in coastal wetlands receiving considerably more attention than freshwater wetlands (Salvesen, 1991). Administration of coastal zone management programs is as varied as that of permitting programs. Some states delegate the responsibility to local government, while other states maintain direct control of all activities taking place in the coastal zone. Typically, though, states will establish guidelines or standards at the state level in the form of policies to which local governments must comply (Mantell et al., 1990).

State water quality standards are a second indirect way of protecting wetlands. States establish water quality programs, subject to the approval of the EPA, that regulate discharges into state waters. Having recognized the value of wetlands in assimilating pollutants and cleansing effluent discharges or stormwater runoff, states will regulate any activity taking place in wetlands that has the potential of degrading water quality. State water quality standards must be met by all proposed construction or other activity. Thus, wetlands are protected "by default", where the degradation of wetlands may lead to the degradation of water quality (Salvesen, 1991). Additionally, states often include

wetlands within the definition of state waters for purposes of maintaining water quality, placing wetlands directly under their permitting jurisdiction (Salvesen, 1991).

A number of regional programs aimed at protecting other natural resources have been developed which have the effect of indirectly protecting wetlands. For example, state "critical area" programs have received considerable use. These programs are usually designed to protect a natural resource determined to be critical to the health, safety and welfare of the state and its citizens (Salvesen, 1991). One example is the Maryland *Critical Area Act*. This act was created with the broad objectives of improving water quality and protecting fish and wildlife, but had the effect of protecting most of the wetlands in Maryland's Chesapeake Bay area. As described by Salvesen (1991), the act

established a program to limit development within 1,000 feet--the critical area--of tidal waters or tidal wetlands ... All new development in the critical area must include a 100-foot buffer zone along tidal waters and wetlands, and a 25-foot buffer for nontidal wetlands. Administered by local governments, which must adopt critical area plans that are consistent with criteria established by a statewide commission, the program aims to direct future growth away from the critical area and into areas that are already developed. (p. 46)

Indirect regulation of wetlands currently appears to be the preferred form of wetlands regulation among some states, especially inland states (OTA, 1984). This may be due to the lack of scientific knowledge on which to base wetlands-specific legislation. As it stands, most noncoastal states rely on federal programs, and their own ability to influence those programs, to control activities in wetlands. In fact, "roughly half of the states without wetlands programs listed state influence on federal actions as their most effective means of controlling wetland use" (OTA, 1984, p. 188).

Problems in state regulation

There are a number of problems that hinder the effectiveness of state regulation over wetlands. First and foremost is funding. For most of the states with wetlands programs, the major implementation problem is garnering the funding necessary to hire a sufficient number of staff with the appropriate expertise, and to monitor and enforce permitted activities (OTA, 1984). One reason for this is reduced federal funding for state wetlands programs that has occurred especially during the Reagan and Bush administrations (Pope, 1991). Another reason is the budget crisis affecting many states during economic recession. As told by the Office of Technology Assessment (1984),

Wetland-program budgets generally have not kept pace with inflation, and in most cases, have been static. ... Few states have come up with replacements for the Federal funding that will be lost, and few programs, whether dependant on federal funding or not, are likely to fare well when making funding requests from financially strapped State legislatures. (p. 193)

A second problem affecting regulatory efforts is the general lack of support for such legislation. While there is an acceptance of the need for protection of coastal wetlands due to their importance to major fishing and tourist industries, inland wetlands lack the firm regulatory support born from a connection with functional services and economic benefits (OTA, 1984). This is due to a number of factors including:

- *Lack of awareness of wetland values.* A few states (e.g. Tennessee, West Virginia, Kansas) commented that most residents are unfamiliar with wetland values and are unaware of wetland-protection programs such as 404.
- *Opposition to land use controls.* In some states (e.g. Colorado, Wisconsin, Arkansas, Tennessee), there is strong objection to wetland programs that appear to create de facto land use controls on private property.

- *Sensitivity to regulatory costs and the desire to promote development.* In many states, especially ones in which agriculture is an important industry (e.g. Florida), legislative and public sentiment tends to place a higher priority on development than on wetland preservation when the two goals conflict. Agencies in some states may be forced to bow to political pressure and to allow development that they otherwise would deny or modify.
(OTA, 1984, p. 194)

This last factor is one of the most threatening to wetlands. Agricultural activities are typically exempt from state regulatory programs as well as from the federal Section 404 provisions. And, as mentioned previously, agriculture is the leading cause of wetland loss in the United States today (Dahl & Johnson, 1991).

Another problem lies in the lack of sufficient technical information and expertise in wetland science. Most states, especially inland states without coastal resources, have very little data on the wetlands in their areas (OTA, 1984). Few states maintain records on the location, size, vegetation type, and wildlife habitat values of wetland areas affected by state water programs. For this reason, it is difficult for these states to determine wetland boundaries, resulting in the unintentioned loss of wetland habitat (OTA, 1984). Additionally, there is little data maintained on the strategies being developed to mitigate wetland losses. Mitigation is a fairly new concept being heavily pushed as a method of slowing the net loss of wetlands. It is a highly controversial concept primarily because of the inability to conclusively test the success of mitigation strategies (Salvesen, 1991). The mitigation concept is discussed further below.

Mitigation

Mitigation strategies allow activities within wetlands while maintaining "no net loss" of wetland acreage. Often established as conditions on which permit approval is based, mitigation strategies have developed a following among legislators who welcome them as a viable solution to the conflicts between commercial and conservationist interests (Salvesen, 1991). As mentioned, the federal government, via President Bush's three-pronged wetlands policy, is promoting the use of mitigation strategies to ensure "no net loss", especially the concept of mitigation banking (EPA, 1991). For this reason, a discussion of these strategies is called for relative to state use under the regulatory umbrella.

The choice of a mitigation strategy depends largely upon the type of project being considered, the size of the property, the size, condition, and position of the wetland in question, and the regulatory environment within the state. No mitigation strategy will work for every site, and not every strategy is welcomed as viable within every state (Salvesen, 1991). The mitigation strategies most accepted by the states can be divided into four categories which closely follow the definition for mitigation established by the Council on Environmental Quality⁵. These are: avoidance, restoration, enhancement, and creation. The following summarizes a thorough discussion of these strategies by Salvesen (1991).

⁵Mitigation options suggested by the Council on Environmental Quality in the National Environmental Policy Act include: 1) avoiding impacts through nonaction; 2) minimizing impacts by limiting the degree or magnitude of an action and its implementation; 3) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; 4) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and 5) compensating for the impact by replacing or providing substitute resources or environments (Mantell, 1990, p. 39).

Avoidance is looked upon as a first step strategy. "The best mitigation strategy for developers is to avoid building in wetlands in the first place by placing all buildings, roads, and parking lots in upland areas and keeping the wetlands open" (p. 70). The benefits to this strategy are simply defined--cost savings through avoidance of permitting procedures, design changes and other mitigation strategies, time savings through the same, and less aggravation in having to deal with a highly bureaucratic process. Additionally, considerable value may be added to a project through the aesthetic appeal offered by open space containing natural wetland habitat. Potential problems with this strategy are found in construction activities adjacent to wetlands. Oftentimes, avoiding the wetland does not guarantee its survival when the surrounding ecosystem undergoes significant change (Salvesen, 1991).

Restoration involves a trade-off of sorts with developers where construction permits within wetlands are granted on the condition that a degraded wetland of equal functional value and acreage be restored to its original condition. This option is currently the preferred of the other three alternatives primarily because restoration is viewed as providing compensation for a wetland loss with less risk of failure within the wetland ecosystem. However, this attitude is undergoing a change due to the fact that restoration does not support the "no net loss" goal. "Restoring a degraded wetland in exchange for filling a perfectly good one leads to a net loss of wetland acreage and values; a wetland, however damaged, is still a wetland" (p. 77). Restoration is generally only allowed where the size of the restored area is significantly larger than the area being filled (Salvesen, 1991).

Wetlands enhancement is "selectively enhancing a wetland to boost one desirable attribute, such as waterfowl habitat, over another, such as flood control" (p. 89). For example, a scrub-shrub, forested wetland may be excavated and converted to a pond with a fringe of emergent wetland plants providing habitat for aquatic species. This option is viewed favorably by developers as an alternative to the more expensive wetland creation. However, enhancement usually does not result in an equal exchange for wetland fills, and usually results in a net loss of wetland acreage. Additionally, it jeopardizes less desirable wetlands traits that are often more functional than the enhancement. For instance, a forested wetland may be enhanced to provide a well landscaped detention pond. Biologically, the forested wetland contains a greater amount of activity and thus greater function than the detention pond, though the detention pond may be more acceptable to neighboring residents. Enhancement does have its place, though. "It can create a more diverse overall ecosystem ... but like many other forms of mitigation, enhancement involves tradeoffs" (Salvesen, 1991, p. 89).

The final category of mitigation is wetlands creation. This is viewed as a last step in the mitigation process because of the uncertainty involved. The science of creation is new and involves the establishment of wetlands "from scratch"; turning dry woods into swamps and sandy shores into salt marshes. Creation is highly controversial and fraught with uncertainty due to the dynamic and complex nature of wetlands. It is generally agreed that "it is nearly impossible to replicate ... all wetland values and functions" (p. 70), yet many try in an effort to meet permit conditions calling for "no net loss". As Salvesen (1991) explains,

The delicate interdependencies among wetlands plants and animals are not fully known and therefore difficult to recreate. Superficially, artificial wetlands may appear equal to natural wetlands, but on closer inspection subtle, but important, differences often emerge. For example, created and natural wetlands may contain similar plant mixes, but a new wetland may lack the nutrient-cycling capabilities and productivity of a natural wetland. Ideally, the created wetland should provide the same functions, such as flood control or groundwater recharge, as the destroyed wetland. Realistically, replacing all wetlands functions is difficult. Furthermore, a newly created wetland is a disturbed wetland, and weeds ... thrive on disturbance. ... In addition, even successfully created wetlands may become targets for development. (pp. 95-96)

Mitigation has its strengths and weaknesses, and the controversy over its use will likely continue for some time. However, it does offer alternatives that support to some degree the goal of "no net loss" for state wetlands. Until conclusive evidence is drawn about the effectiveness of mitigation strategies, it may be considered by state legislators and planners as a potential option for mitigating wetland loss in the face of increasing development pressures.

II. The State of Florida

Wetland types, values and current status

Florida has approximately 11.4 million acres of wetlands, covering about 30% of the state's total land area, more than any other state except Alaska (Florida Department of Environmental Regulation [FDER], 1990a). It is home to a large diversity of wetland types including mangroves, salt marshes, wet prairies, freshwater marshes, cypress and tupelo swamps, and bottomland hardwood forests, all of which serve a variety of functions (WRI, 1991).

Florida's coastal wetlands provide habitat for a number of wading birds including herons, egrets, ibises, spoonbills, and storks. The wetlands are biologically rich and productive, and important to both commercial and sports fisheries (WRI, 1991). Freshwater marshes, the most famous of which are the Everglades, help to filter water entering lakes and streams, removing silt and other pollutants, and slow the flow of water, lessening the effects of flooding (FDER, 1990a). They also provide important habitat to 20% of the Atlantic flyway's wintering waterfowl--nearly 1 million birds (WRI, 1991). Forested freshwater swamps are found mostly in river and stream floodplains. They provide valuable wildlife habitat and help to filter pollutants from the water. Additionally, many freshwater swamps provide groundwater aquifer recharge (FDER, 1990a).

Florida's wetlands are valuable ecologically, aesthetically and economically. Ecologically, their value is found through their abilities to conserve water, recharge groundwater, filter pollutants, slow flood waters, stabilize coastal shorelines, and buffer the effects of storms (FDER, 1990a). Aesthetically, wetlands provide open space for recreational use and enjoyment. The broad diversity of plant and animal life provide continual entertainment for outdoor lovers, and they provide a welcome relief from the extensive urbanization of many of Florida's cities.

Economically, wetlands play a large part in supporting the state's commercial and recreational fishing industries, as well as the tourist industry (Bailey, 1985). Establishing a monetary value for wetlands is difficult; most will calculate their value to be equal to

the gross revenue that a particular wetland is found to produce (FDER, 1990a). For example,

... commercial fishermen netted \$3.8 million worth of shrimp off the Franklin County coast in 1987. Thus, the wetland areas around Apalachicola Bay -- where young shrimp grow to maturity -- were worth at least \$3.8 million that year. (FDER, 1990a, p. 5)

Additionally, the Florida Game and Freshwater Fish Commission estimated that 1.5 million people spend \$50 million annually in pursuit of recreational fishing, while the commercial fishing industry contributes nearly \$100 million annually to the Florida economy (Bailey, 1985). The economic value of wetlands is spread much further than to its immediate benefactors in commercial fishing. Wetlands indirectly support the income earned by seafood dealers, supermarkets, and restaurants who all purchase from commercial fisheries. Also, wetlands produce tourism dollars which benefit local businesses, motels, restaurants, etc. (FDER, 1990a).

Despite this acknowledgement of "value" to the state, Florida's attitude historically has been inhospitable to wetlands; the state's philosophy was "dike, ditch, and drain" in support of urban and agricultural development. Many of its wetlands and rivers were permanently altered by canals and dikes that criss-cross the state--the Kissimmee River canal being one example (Salvesen, 1991). Over 46% of Florida's wetlands, equating to over 12 million acres, have been lost since 1850 and are continuing to be lost at a rate of 26,000 acres per year (WRI, 1991; FDER, 1991). Of this number, nearly 75% is Palustrine emergent wetlands including freshwater marshes, wet prairies, and everglades (Hefner, 1986). Loss of wetland acreage has been accompanied by a

corresponding loss of fish and wildlife, including numerous threatened and endangered species (FDER, 1991).

Wetlands loss within the state results from a number of threats including increased urbanization and agriculture (Hefner, 1986). Small urban and industrial developments continue to impact unprotected, isolated wetlands, while agriculture, the single largest cause of wetland loss, continues to drain existing wetlands little affected by current state regulations (Hefner, 1986). One estimate by the FDER places wetlands losses to agriculture at 80% of total annual net loss (Mike Eaton, personal communication, April 13, 1992), a significant proportion.

Florida's annual wetland losses account for nearly 10% of the national annual average loss (WRI, 1991). Florida is in a position to take a leadership role in the development of wetlands legislation and planning strategies that serve to protect such an important resource, and to a degree they have. Through direct and indirect regulation, Florida has developed one of the most comprehensive protection frameworks of all the states, incorporating coastal zone management, permitting regulations, and comprehensive planning legislation into its protection strategy (Salvesen, 1991).

The evolution of Florida wetlands regulation

As mentioned, Florida's attitude towards wetlands has been somewhat inhospitable in the past, reflected by its legislative history. However, this attitude has been changing as an awareness of the value that wetlands contribute to the welfare of the state has grown. But the fact remains that until passage of the *Warren S. Henderson Wetlands*

Protection Act of 1984, Florida lacked legislation explicitly protecting wetlands (Hamann, 1985). Since that time, significant steps have been made towards slowing wetland loss.

Legislation of wetlands, and the State's jurisdiction over them, have evolved concurrently with each other, reflective of the growing awareness and pressures to protect these resources (Richard Hamann, personal communication, April 20, 1992). This evolution can be seen to closely follow the evolution of protection legislation at the federal level in terms of the extent of protection and its timing during the environmental era. In its early years, Florida promoted the dredging and filling of its wetlands to support settlement efforts in the new state. Hamann (1985) describes these early years which set the policy for years to come.

Most of Florida's wetlands were once owned by the state. When admitted to the Union in 1845, it gained title to the navigable waters. Another 22 million acres of swamp and overflow lands, comprising almost 2/3 of the state, were acquired under the Swamplands Act of 1850 ... The state immediately began alienating these lands in a complex, corrupt series of deals promoting railroads, canal and drainage companies and real estate speculation. *The objective was to facilitate conversion of lands viewed as useless into productive agricultural and residential communities* [italics added]. (p. 41)

This goal of growth was well achieved with over 46% of the state's wetlands having been lost. The consequences of rapid growth and wetland loss included a diminished water supply, degraded water quality, and fewer and less diverse populations of fish and wildlife (Hamann, 1985).

Increasing concern over whether Florida's economy could be sustained without the services provided by wetlands eventually prompted the state to establish jurisdictional control over its wetlands resources by reasserting its ownership interests over submerged

lands (Hamann, 1985). However, by the time this action took place, so many submerged lands had been sold that it was necessary to establish regulatory controls over activities impacting wetlands. Thus was the birth of Florida's permitting program. In 1957, under Chapter 253, Florida Statutes (F.S.), the state established a broad range of environmental criteria to be considered during dredge and fill permit review for activities impacting navigable or tidal waters. Florida's wetlands protection efforts thus began with the state's navigable waters, excluding nonnavigable waters and adjacent wetlands (Hamann, 1985).

Limitations in this permitting system began to surface in the early 1960's, including severe shortcomings found in the state's jurisdictional coverage over wetlands. By restricting permitting activity to navigable waters, the state's jurisdiction did not extend above the *mean high water mark* (Richard Hamann, personal communication, April 20, 1992). This meant that all contiguous wetlands found along river and stream banks were not protected despite their functional contribution to water quality. The recognition that many of these "borderline" wetlands were being lost led to further legislation in the late 1960's and early 1970's, a time when increased environmental awareness motivated legislators to act on threats to important natural resources (Richard Hamann, personal communication, April 20, 1992).

In 1967, the *Florida Air and Water Pollution Control Act* was passed and codified as a portion of Chapter 403, F. S. (§§ 403.011-403.4153) (Hamann, 1985; Morris, 1985). Under this legislation, the state asserted regulatory authority over "stationary installations" discharging effluent into state waters. In other words, the state began to

regulate point sources of pollution (Richard Hamann, personal communication, April 20, 1992). The key here is that *dredge and fill activities* taking place in state waters were identified as a point source, thus subject to stricter regulatory review. The state's jurisdictional waters were redefined to include some lands above the mean high water mark, outside of navigable waters but *contiguous* to them, where the *landward extent* of state waters was determined by dominant vegetation, using a species list containing approximately 75 wetland species (Hamann, 1985). Under this legislation, adjacent wetlands were now protected by the state, but only to the degree that water quality standards would be violated, and isolated wetlands received no protection.

The act underwent numerous refinements in the ensuing years, and in 1975, regulatory authority under Chapters 253 & 403 was transferred to the new Florida Department of Environmental Regulation (FDER). The FDER was responsible for regulating water quality in state waters as defined by these statutes. Where wetlands were concerned, the FDER concentrated solely on water quality issues involving point source polluters (Richard Hamann, personal communication, April 20, 1992). Supporting Chapter 403 provisions is the *Florida Water Resources Act* of 1972. This act, codified under Chapter 373, F. S. (§§ 373.403-373.4596), was concerned with the protection of state water resources *at the surface*. The act creates seven water management districts within the state whose responsibility is to maintain water quality through management of surface waters. The districts' regulatory control involves permitting of stormwater management systems throughout the state. Additionally, as directed under Chapter 403, these districts may assume permitting responsibility from the

FDER for dredge and fill activities, but only where they involve surface-water management. The act does not address wetlands specifically except in its mandate that each district adopt permitting criteria for isolated wetlands which do not fall under the jurisdiction of the FDER. Thus, the state's jurisdiction was expanded to include isolated wetlands, though they are regulated only to the extent that they are part of a stormwater management system (F. S. § 373.414, 1991).

The jurisdictional limitations in Chapters 403, 253 and 373, and a reluctance on the part of the FDER to take a leadership role in enforcing wetlands protection, reminiscent of the COE attitude towards Section 404 responsibilities, contributed to ever increasing concern over wetlands loss. In 1984, these concerns forced the state legislature to make wetlands protection "their highest priority" (Hamann, 1985). That year, the state passed the *Warren S. Henderson Wetlands Protection Act* (F. S. §§ 403.91-403.938, 1991). This act had the effect of expanding the jurisdiction of the FDER (acting for the state) over a considerably larger area by increasing the number of plant species used for delineation to approximately 300 and expanding regulated activities beyond dredge and fill to include surface water management. The emphasis of FDER actions remained water quality, though they were forced to increase their attention to the protection of wetlands (Hamann, 1985). The act was codified under Chapter 403, though its purpose was intended to unify the jurisdictional area and permit considerations in existing Chapters 403 & 253 into one statute, thus enhancing the protection of wetlands (Morris, 1985). All regulations as they currently exist and their impacts on wetlands

protection are discussed more fully in the following section, Current Wetlands Regulation.

An aside to the permitting history of the state is the evolution of planning legislation which has had some indirect effects on wetlands protection. Prior to 1972, very little effort was made at the state level to adopt or require the development of comprehensive plans at either the state, regional or local level (Florida Department of Community Affairs [FDCA], 1987). In 1972, the state passed the *Florida State Comprehensive Planning Act*, F. S. §§ 186.001-186.031 (1991), which required the state to establish goals and policies that would guide state decision-making, and serve as a framework for regional planning efforts. A subsection of the act, known as the *Florida Regional Planning Council Act*, F. S. §§ 186.501-186.515 (1991), established regional planning councils within the state responsible for producing regional plans which implement state goals at the regional level. These acts were concerned with policy planning, setting guidelines for action and decision-making at the state and regional level; their impact, however, was slight without a true implementation mechanism in place (FDCA, 1987)

Prior to 1975, local governments had the authority to adopt whatever plans they thought necessary to carry out their responsibilities by way of a broad set of powers assigned them by the Florida Constitution and Statutes (FDCA, 1987). In 1975, Florida passed the *Local Government Comprehensive Planning Act*, F. S. §§ 163.160-163.315 (1991), which required each local government to prepare a comprehensive plan that addressed a number of topics relating to the orderly growth of their jurisdictions (FDCA,

1987). However, a number of shortcomings in the act soon became apparent during its implementation. These included: 1) the lack of a method for the state to monitor and enforce its comments and requests regarding the consistency of the plans with state and regional plans; 2) a lack of staying power within the plan, meaning that development continued to drive the shape of the plan rather than vice versa, resulting in numerous and continuous amendments to the plan; and 3) the lack of enforcement provisions for upholding the plan in court (FDCA, 1987). In an effort to curb these problems, the act was revised and updated in 1986, and entitled the *Local Government Comprehensive Planning and Land Development Regulation Act*, F. S. §§ 163.3161-163.3243 (FDCA, 1987). Under the new guidelines, local governments were given a list of required and optional topics to be addressed in their comprehensive plans, as well as the legal authority to enforce land use regulations under the guise of the plan. Additionally, it was required that all municipal plans comply with comprehensive plans established at the state and regional level, with the state holding approval authority over all plans. Thus the state fully entered into the comprehensive planning process (FDCA, 1987).

The effect of the state comprehensive planning process on wetlands protection is seen indirectly through use of land regulations enforced at the local government level. As Richard Hamann states, "comprehensive planning is permitting, ultimately" when enforced at the local level (personal communication, April 20, 1992). Use of land regulation by local governments and its enforcement for the purpose of protecting wetlands is discussed further in Chapter 4, *Local Regulation of Wetlands*, but is mentioned here for the purpose of identifying the means by which state comprehensive

planning can affect wetlands protection. Because local regulation must support the local comprehensive plan, and local comprehensive plans must be in compliance with state and regional plans, policies established at the state level will set the stage for the future of wetlands at the local level. State policies are discussed further in the following section.

Despite the growing attendance to wetlands through regulatory activity, wetland loss continues (WRI, 1991). It appears that *nonregulatory* means of wetlands protection, namely state land acquisition programs, are currently the most effective means for protecting the state's wetlands from degradation and loss (Richard Hamann, personal communication, April 20, 1992). This may be due to the fact that the regulatory programs in place are extremely complex, adding applicant confusion and frustration to the permit process. This breeds a distrust of the process and apathy towards wetlands where individual interests and investments are on the line (Dana Morton, personal communication, April 22, 1992). Agricultural exemptions in current state regulations also perpetuate the annual net loss, with acquisition serving as the only deterrent to this loss. Additionally, the regulation of wetlands at the state level can still be viewed as being in its infancy. Not enough time has passed to gauge the effectiveness of current legislation in terms of quantifiable data. But regulation of wetlands is necessary, for the ability of nonregulatory means, such as land acquisition, to protect wetlands is finite. It is necessary that a method remain in place for the state to assert some control over wetlands owned by individual interests.

Current wetlands regulation

Through both direct and indirect means, Florida has developed a comprehensive, though complex, regulatory system for protecting wetlands. Foremost among these regulations are permitting and comprehensive planning, to be discussed in detail below. Each of these are state innovations independent of federal programs, yet working concurrently with them to provide optimum coverage. The only federal program affecting wetlands in which Florida takes part is coastal zone management per the *Coastal Zone Management Act* (Salvesen, 1991).

Coastal zone management

Florida is one of only two states located entirely within the coastal zone as defined by the CZMA. Over 90% of the state is within 75 miles of the coast, and its highest point is only 345 feet above sea level (Salvesen, 1991). Florida's coastal zone management program is a "network" program, codified under Chapter 380, *Land and Water Management*, F. S. § 380.19-380.33, and entitled the *Florida Coastal Management Act* (FCMA) of 1978. It packages all regulations established by the state that impact coastal resources and presents them together as a cumulative method for protecting the coastal zone (Richard Hamann, personal communication, April 20, 1992). Because the entire state is within the coastal zone, practically all environmental and comprehensive planning laws are considered a part of the program, which the FDER has been authorized to administer. As written in the law:

The Legislature ... grants authorization for the Department of Environmental Regulation to compile a program based on existing statutes

and existing rules ... as a basis for receiving administrative funds under the federal Coastal Zone Management Act of 1972. ... It is the further intent of the Legislature that enactment of this legislation shall not amend existing statutes or provide additional regulatory authority to any governmental body except as otherwise provided ... (F. S. § 380.21(2), 1991)

The coastal zone program is written into the state's comprehensive plan, and its implementation is incorporated into each of the regulatory and nonregulatory programs established at the state, regional and local level.

The state coastal zone management plan shall be a part of the state comprehensive plan. It shall contain a boundary, policies, goals, and programs necessary to comply with the requirements of the federal Coastal Zone Management Act of 1972 ... [and] specifically delineate the role of state, regional, and local agencies in implementing the plan. (F. S. § 380.21(3b), 1991)

Implementation is left as much as possible to local governments and relies heavily on the success of the state's comprehensive planning process, which serves as the binding element keeping the program together. Thus the state places a great deal of responsibility for its coastal resources, and coastal wetlands, on local government. It relies heavily on a local government's ability to accept the challenge and to develop and enforce the appropriate land use regulations that will achieve the goals of the state's coastal management plan.

Permitting

As mentioned, the permitting process in Florida is regulated primarily by Chapters 253, 403 and 373, F. S., which describe the responsibilities and authorities held by the state regarding water quality and wetlands protection in waters of the state.

Chapter 253 grants regulatory jurisdiction to the FDER over certain activities, including dredging and filling, in the navigable waters of the state. Jurisdiction extends to the mean high water mark in coastal areas, and the ordinary high water mark of inland, navigable waters (Hamann, 1985; Morris, 1985). The test for navigability is similar to the federal test and primarily involves protection of interstate and intrastate commerce (Hamann, 1985). Because the intent of regulatory authority granted in this chapter are integrated into Chapter 403, it will not be discussed in depth, except to say that the primary purpose of this legislation is the protection of state navigable waters. Chapter provisions are similar in nature to provisions in the federal *Rivers and Harbors Act*, which protect navigable waters for purposes of interstate commerce. Additionally, the state seeks to protect its marine and aquatic resources to the extent that commercial industries would be affected by certain activities (Morris, 1985).

Chapter 403, *Environmental Control*, is the primary statute establishing state authority for permitting. It defines state and jurisdictional waters, establishes state policy towards pollution prevention, and presents administrative rules and decision criteria for the permit process. There are eight subsections within the statute addressing a number of state environmental concerns including electrical power plant siting, interstate environmental control, and resource recovery and management. The most important part of this statute, though, are §§ 403.91-403.938, commonly known as the *Warren S. Henderson Wetlands Protection Act* (Hamann, 1985). The act quickly sets the tone of Florida's policy towards wetlands protection when, in its preamble, it states that:

Florida's wetlands are a major component of the *essential characteristics* [italics added] that make this state an attractive place to live. ... [T]he

economic, urban, and agricultural development of this state has required the alteration, drainage, and development of wetlands. While state policy permitting the uncontrolled development of wetlands may have been appropriate in the past, continued uncontrolled elimination or disturbance of wetlands will cause extensive damage to the economic and recreational values which Florida's wetlands provide ... it is the policy of this state to establish ... regulatory programs which provide for the preservation and protection of Florida's wetlands. (Florida Administrative Code [F. A. C.] § 17-312.015(1), 1991)

Discussion of this statute will focus on wetlands protection provisions including the limits of FDER authority, FDER jurisdiction, and permit review and approval criteria.

As mentioned, the FDER is granted regulatory authority over dredging and filling in surface waters of the state. Surface waters are defined as "rivers, lakes, streams, springs, impoundments, and all other waters or bodies of water, including fresh, brackish, saline, tidal, or surface, or underground waters" (F. S. § 403.031(13), 1991). Wetlands are defined in the wetlands protection act as "those areas within the jurisdiction of the [FDER] pursuant to" delineation of the *landward extent* of waters (F. S. § 403.817 et seq., 1991), and are not defined *per se* in the statute. However, in the governing administrative rules for the FDER, wetlands are defined as

... those areas that are inundated or saturated by surface or groundwater with a frequency sufficient to support, and under normal conditions do support, a prevalence of vegetative or aquatic life that requires saturated or seasonably saturated soil conditions for growth and reproduction, such as swamps, marshes, bayheads, cypress ponds, sloughs, wet prairies, wet meadows, river overflows, mud flats and natural ponds. *This definition does not alter the [FDER's] jurisdiction over dredging and filling activities in wetlands as defined [by the wetlands protection act] [italics added].* (F. A. C. § 17-40.210, 1991)

The demarcation of landward extent of waters is the controlling factor in determining regulatory control. Thus, only those wetlands found within the landward extent of state

waters are protected under FDER permitting jurisdiction (Morris, 1985). Exempt from this authority are waters owned entirely by one person, or those that become dry each year and are entirely without standing water (Salvesen, 1991).

The FDER is given the power to delegate a portion of its permitting authority to the seven Water Management Districts (WMDs) as defined in Chapter 373, F. S. Currently, only the St. John's River Water Management District (SJRWMD) has been given this authority (Mike Eaton, personal communication, April 13, 1992). However, permitting authority carried by the WMDs covers only dredge and fill permits required as part of a surface water management system, as described under Chapter 373, F. S.

The FDER's permitting jurisdiction is determined according to rules set out in the Florida Administrative Code (F. A. C.) §§ 17-301.100-301.400 (1991). This section, entitled *Surface Waters of the State*, presents the methodology for determining the landward extent of waters, or the limits of FDER jurisdiction. Landward extent is determined primarily by dominant vegetation; a list containing approximately 300 plant species is provided. Indicator plants in Florida are divided into four groups: submerged species, transitional species, upland species, and ubiquitous species (Morris, 1985). The former two groups are used for demarcation. As the Rule states:

The line demarcating the landward extent of surface waters ... shall be established for any water body ... by dominant plant species. ... The existence of a surface water ... shall first be identified. Vegetation shall then be inspected moving landward. ... The line demarcating the landward extent ... shall be the boundary of the area where 1) the areal extent of submerged and transitional species ... is greater than 50% of all plant species in that stratum, *and* the areal extent of submerged species ... is greater than 10% of all species in that stratum, *and* the areal extent of the submerged species ... is greater than the areal extent of upland species in that stratum; or 2) the areal extent of the transitional species ... is greater

than 80% of all plant species in that stratum, *and* the areal extent or the submerged species ... is less than 10% of all plant species in that stratum, *and* the areal extent of the upland species ... is less than 10% of all plant species in that stratum [*italics added*]. (F. A. C. § 17-301.400(1a), 1991)

In the event that a clear demarcation cannot be provided through visual methods or aerial interpretation, a series of mathematical formulas are provided to determine areal extent using species density and plant canopy (F. A. C. § 17-301.400(1c), 1991). There are limits placed upon landward extent, as stated in § 17-301.400(6) (1991):

In no case shall the landward extent of waters of the state extend above the elevation of the one in 10-year recurring flood event or the area of land with standing or flowing water for more than 30 consecutive days per year calculated on an average annual basis, whichever is more landward.

Soils are used for demarcation of landward extent only if mapping by vegetation is not possible. Additionally, if an applicant disagrees with the demarcation established by the FDER, he may request a soils assessment as a secondary delineation method (Hamann, 1985). If hydric soils are present, the site is presumed to be "wet land", and demarcated to be within the landward extent of waters, thus subject to FDER jurisdiction. If hydric soils are not present, the area in question is removed from the FDER's jurisdiction (F. S. § 403.913(3), 1991). The burden of proof lies with the applicant (Hamann, 1985). It should be reiterated here that the landward extent of waters can only be measured *outward* from surface waters and must be *contiguous* to standing bodies of water. *Isolated* wetlands are therefore *not* within the permitting jurisdiction of the FDER.

There are a number of exemptions within the act, including, most importantly, an exemption for agricultural activities. These are defined as:

... all necessary farming and forestry operations which are normal and customary for the area, such as site preparation, clearing, fencing, contouring to prevent soil erosion, soil preparation, plowing, planting, harvesting, construction of access roads, and placement of bridges and culverts, provided such operations do not impede or divert the flow of surface waters. (F. S. § 403.927(4a), 1991)

Regulation of agricultural activities is delegated to the appropriate WMD, whose regulatory authority governs agricultural water management systems, per Chapter 373.

As stated in the act:

Agricultural activities and agricultural water management systems are ... not subject to the provisions of [the wetlands protection act], nor shall the [FDER] enforce water quality standards within an agricultural water management system. (F. S. § 403.927(2), 1991)

Thus, the state's greatest threat to wetlands is left unregulated by the state's strongest method of wetlands protection. Additional exemptions from the act include rock mining and certain types of residential subdivisions, though these exemptions have amortization periods of 10 years from the enactment of the law (Hamann, 1985).

Permit review and approval is based upon three "tests" established by the act. These are: 1) assurance that water quality criteria will not be violated, 2) assurance that the project is not contrary to the public interest, and 3) assurance that the cumulative impacts to which a project may contribute do not violate tests 1 & 2 (Hamann, 1985). Water quality is tested against standards set in F. A. C. § 17-302.100 et seq., *Surface Water Quality Standards* (1991). If the applicant can provide *reasonable* assurance that these standards will not be violated by dredge and fill activities, construction, or project operation, then approval may be granted based upon this test (Hamann, 1985). This is a quantifiable test and thus straightforward in its implementation.

The "public interest test", as it is commonly called, is much more subjective and subject to challenge, and often may be the sole determinant as to whether a permit is approved (Mike Eaton, personal communication, April 13, 1992). The public interest test sets forth seven criteria which the FDER must consider and *balance* during permit review. These are:

1. Whether the project will adversely affect the public health, safety, or welfare or the property of others;
 2. Whether the project will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats;
 3. Whether the project will adversely affect navigation or the flow of water or cause harmful erosion or shoaling;
 4. Whether the project will adversely affect the fishing or recreational values or marine productivity in the vicinity of the project;
 5. Whether the project will be of a temporary or permanent nature;
 6. Whether the project will adversely affect or will enhance significant historical and archeological resources ... ; and
 7. The current condition and relative function being performed by areas affected by the proposed activity.
- (F. S. § 403.918(2a), 1991)

If a project is proposed to be located in *Outstanding Florida Waters*⁶, the applicant must "provide reasonable assurance that the project will be *clearly in the public interest*" [italics added] (F. S. § 403.918, 1991).

If the project is unable to meet the public interest test, the FDER is obligated to provide the applicant with recommendations as to how the project may be changed or adjusted to meet the criteria (Hamann, 1985). Such recommendations typically include

⁶Outstanding Florida Waters are those water bodies found deserving of an added degree of protection--waters for which the FDER feels there should be no lowering of existing ambient water quality. Outstanding Florida waters include waters in national parks, refuges, seashores, preserves, marine sanctuaries, research reserves, etc. Complete descriptions of Outstanding Florida Waters are provided in F. A. C. § 17-301, 1991.

mitigation strategies acceptable to the FDER. Mitigation proposals are made only after the project has failed the public interest test; it is not a primary option for development and is meant to serve the interest of private landholders. As stated in the act, wetlands are regulated on the condition that these regulations are "consistent with private property rights and the balancing of vital interests of the state" (F. A. C. § 17-312.015(1c), 1991).

The FDER has identified several types of mitigation acceptable as a permit condition.

These are:

- Improvement of existing stressed, unproductive wetlands;
- Creation of wetlands from uplands;
- Creation of wetlands from deep aquatic areas;
- Conservation easements, deed restrictions, and land grants; and
- Recreation of wetlands after phosphate mining.

(Hankinson, 1985, p. 303)

The FDER does not accept cash donations to a mitigation banking account, donation of privately owned wetlands currently under FDER jurisdiction, or substitution of one wetland type for another as acceptable mitigation strategy (Lewis, 1985).

The third test for permit approval is consideration of the cumulative impact of the following:

- the applicant's proposal,
- existing projects,
- projects for which permits or jurisdictional determinations have been sought,
- certain large scale land development projects approved or under review; and
- other projects which may reasonably be expected to be located within the jurisdictional extent of waters, based upon land use restrictions and regulations.

(Hamann, 1985, p.56)

Cumulative impact review is somewhat controversial due to the fact that it attempts to apply water quality considerations and the public interest test to "unknowns" (Mike Eaton, personal communication, April 13, 1992). In other words, the FDER must make projections into the future about potential development and the associated impacts of that development as can be derived from the proposed activity. For example, if a dredge and fill permit is requested for purposes of bridge construction, the FDER must consider the potential future development impacts that could result from construction of the bridge to an as yet undeveloped area. Projections tend to be vague at best. Applications that pass each of the three tests are approved by the FDER. Once approved, most permits are valid for up to five years, though some are valid for ten. On special conditions, a permit's validity may be extended to a maximum 25 years. Conditions for such an extension include the expectation that construction will take longer than ten years to complete or if the activity permitted covers a significantly large area (FDER, 1990b).

Permitting under Chapter 403 is handled independently of federal Section 404 provisions, therefore wetlands that fall under COE jurisdiction will require a separate permit from the COE. However, joint applications are made available to applicants where both jurisdictions apply to prevent duplication of effort (Mike Eaton, personal communication, April 13, 1992). Additionally, where projects are found to affect surface water management systems, a separate permit may be required from the appropriate water management district. Thus, in some cases, three different permits from a federal, state, and regional agency may be required for a single project.

Permitting under Chapter 373, F. S., *Water Resources*, is defined under §§ 373.403-373.4596 (1991), *Management and Storage of Surface Waters*. Under this provision, the state's water management districts are authorized to permit construction or alteration of surface water management systems, be they commercial, industrial, or agricultural. Additionally, they may be delegated authority by the FDER to review dredge and fill permits (Wally Esser, personal communication, April 13, 1992). As mentioned, only one of seven districts, the St. John's Water Management District in northeast Florida, has been given this authority. Therefore, in most cases, WMD permitting is handled independently of FDER permitting, though the WMDs are allowed an advisory role to the FDER (Mike Eaton, personal communication, April 13, 1992).

Permits are required from the WMD:

... prior to the construction, alteration, operation, maintenance, removal, or abandonment of any dam, impoundment, reservoir, appurtenant work or works and for maintenance and operation of existing agricultural surface water management systems or the construction of new agricultural surface water management systems. (F. A. C. § 40C-4.041, 1991)

Permitting authority over wetlands is exercised by WMDs whenever a proposed activity:

- contains a surface water management system which serves an area of five or more contiguous acres of wetlands which has a direct hydrologic connection to: 1) a stream with a drainage area of five or more square miles, *or* 2) an impoundment with no outfall which is not wholly owned by the applicant and which is 10 acres or greater in size, *or* 3) a wetland not wholly owned by the applicant [*italics added*];
 - consists of or includes filling in, excavation in, or drainage of a wetland which is not isolated when any of the filling, excavation, is located within the Econlockhatchee River Hydrologic Basin;
 - is wholly or partially located within any isolated wetland.
- (St. John's River Water Management District [SJRWMD], 1991, p. 9)

Wetlands are identified according to WMD rules of delineation and jurisdiction. Discussion here will focus on their permitting process as it affects wetlands.

Wetlands fall under the jurisdiction of the WMD when they are identified as being impacted by the development of a stormwater management system (Wally Esser, personal communication, April 13, 1992). The administrative rules guiding WMD activity define wetlands as:

... hydrologically sensitive areas which are identified by being inundated or saturated by surface or ground water with a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (F. A. C. § 40C-4.021(11), 1991)

The WMDs exercise jurisdiction over waters of the state, according to the landward extent delineation, as well as over isolated wetlands (SJRWMD, 1991). Three indices are used to determine the presence of wetlands: 1) reliable hydrologic records, 2) a vegetative index, and 3) a soils index. Reliable hydrologic records must indicate that the area is inundated or saturated an average of 30 or more consecutive days per year. If such records are not available, a vegetative index is used and areas dominated by wetlands vegetation are so designated. If delineation by vegetation is not possible, soils are used to determine the presence of wetlands (SJRWMD, 1991). The water management districts maintain a listing of acceptable indicator plants and soils by which decisions are made. The process for determining landward extent using dominant vegetation is the same as that used by the FDER.

There are a number of criteria used by the WMDs to determine whether a permit will be allowed. Among these is the broad objective that "wetlands functions and water

quality must not be adversely impacted" (SJRWMD, 1991). Specifically, the applicant is asked to provide reasonable assurance that a proposed water management system will not impact wetlands functions "so as to cause adverse impacts to":

- (a) the habitat of fish, wildlife, and threatened or endangered species;
- (b) the abundance and diversity of fish, wildlife, and threatened or endangered species; and
- (b) the food sources of fish and wildlife, including those which are threatened or endangered. (SJRWMD, 1991, p. 44)

Thus the WMDs concentrate upon the habitat function of wetlands in terms of determining adverse impact. Isolated wetlands of one-half acre or less may be developed without the applicant providing reasonable assurance of compliance with the above criteria, provided the isolated wetland does not contribute to a cumulative benefit or function of value to fish and wildlife as determined by the WMD (SJRWMD, 1991).

When assessing the value of a wetland to fish and wildlife and threatened or endangered species, the WMD takes into account the following factors:

- (a) *size of the wetland* - larger wetlands ... support a greater diversity of species and have greater value than small wetlands;
 - (b) *hydrologic connection* - wetlands having a significant and regular hydrologic connection to off-site areas are generally more productive, support more consumer species, and ... have greater value ...;
 - (c) *condition of the wetland* - pristine wetlands generally have greater value than wetlands that have been drained, harvested, or otherwise altered;
 - (d) *unique wetlands* - [unique wetland communities] contribute significantly to the regional diversity of fish and wildlife and threatened and endangered species; and
 - (e) *surrounding landscape* - a wetland adjacent to or imbedded in one or more natural communities generally has more value than a wetland surrounded by man-altered habitat in a single community.
- (SJRWMD, 1991, p. 45)

There is a danger under WMD review criteria of contributing to net loss through the cumulative loss of small isolated wetlands, a problem acknowledged by the WMDs (Wally Esser, personal communication, April 13, 1992). Outside of fish and wildlife considerations, the WMD "cannot by permit authorize degradation of water quality below standards" set forth by FDER administrative rules, and "cannot authorize permits which modify the quantity of water discharged off-site if such discharge will cause adverse environmental or water quality impacts" (SJRWMD, 1991, p. 46). The WMDs are guided by the same standards regarding water quality as the FDER, the controlling agency over state water quality (Mike Eaton, personal communication, April 13, 1992).

The natural function of wetlands to assimilate pollutants and detain flood waters makes them an important element of natural surface water management systems. This function would seem to fit in well with manmade systems. The WMDs support the use of existing wetlands in proposed stormwater management systems, provided they meet certain standards (Wally Esser, personal communication, April 13, 1992). Termed *wetland stormwater management systems*, these systems must be permitted. In permitting these systems, the WMDs must ensure:

... that the wetlands stormwater management system is compatible with the ecological characteristics of the wetlands utilized for stormwater treatment and ... that water quality standards will not be violated by discharges from wetlands stormwater management system [*sic*]. (F. A. C. § 40C-42.0265(1), 1991)

To achieve these goals, the WMDs follow specific performance criteria for wetland stormwater management systems. These state that the only wetlands to be used for stormwater treatment are those: "1) which are connected to other waters by artificial

watercourses; *or* 2) which are connected to other waters solely by an intermittent watercourse; *or* 3) which are isolated wetlands [italics added]." (F. A. C. § 40C-42.0265(2), 1991).

Mitigation is allowed as a condition upon which permits are approved (SJRWMD, 1991). While the water management districts promote avoidance as the preferred alternative, mitigation is allowed if, like the FDER process, a permit application fails to satisfy all review criteria. The WMDs are obligated to consider mitigation strategy if such strategy will allow permit approval (SJRWMD, 1991). Mitigation policies and standards are the same as those of the FDER.

There are exemptions to the WMD permit requirements, the most important of which is agricultural activity. As stated in F. S. § 373.406(2):

Nothing herein, or in any rule, regulation or order adopted pursuant hereto, shall be construed to affect the right of any person engaged in the occupation of agriculture, silviculture, floriculture, or horticulture to alter the topography of any tract of land for purposes consistent with the practice of such occupation.

Under this exemption, the WMDs have identified a large number of activities presumed to be consistent with the above occupations including construction of access roads, water diversion, ponding, and troughing among others (SJRWMD, 1991, App. 8). Agricultural and silvicultural surface water management systems are generally permitted at the time of their inception. However, subsequent activities taking place within these systems are exempt from permit review requirements provided they are consistent with those occupations (SJRWMD, 1991).

Agricultural exemptions from the permitting processes of both the WMDs and the FDER are a significant problem for the protection of wetlands in the state. Exemptions stem from the strong lobby of state legislators by agricultural interests throughout the state (Dana Morton, personal communication, April 22, 1992). As mentioned, Florida has experienced a high rate of loss of freshwater wetlands to agricultural activity, close to 80% by one estimate (Mike Eaton, personal communication, April 13, 1992). Unfortunately, most attempts to regulate agricultural activities end in conflict resulting from the effort to prioritize preservation over agriculture. While it is acknowledged that wetlands are extremely valuable to Florida's economy and environment, Florida's highly productive agricultural system is of equal importance not only to the state but the nation as well. Florida's agricultural system produces year-round crops of citrus and other fruits and vegetables, supporting a large national demand (Tripp, 1985).

As it stands, agricultural activities, despite provisions set forth in Chapter 373, are not effectively regulated (Tripp, 1985). Regulatory authority over agriculture is deferred by the FDER to the WMDs, who in turn only regulate activities that are part of a surface water management system. Conversion activities which are highly destructive of wetlands, including rock plowing, clearing, and ponding, are not considered to be parts of a water management system and are therefore exempt from regulation (Tripp, 1985). Thus, despite its proactive work in establishing wetlands protection legislation, the state has shied away from regulating the one activity most responsible for wetland loss, and has effectively deferred protection responsibility to the federal government's "swampbuster" provisions (Tripp, 1985).

Another problem lies in the complexity of the permitting process, and its plurality. With three different agencies authorized to permit activities in wetlands, three different jurisdictions in place, and three different methods of defining and delineating wetlands, confusion abounds. Developers are frustrated, saying that too much land is regulated by too many different agencies; the complexity of the system is costly to their interests (Hamann, 1985). However, this complexity does seem to have the desired affect of promoting the avoidance of development in wetlands. Developers are seeking out more upland areas for development to escape the regulatory thumb; but this is done to the detriment of certain sensitive and valuable uplands (Salvesen, 1991). Complains one developer, the FDER is "preoccupied with preserving even very small wetlands at all costs, while allowing ... large, equally valuable upland forest to be destroyed" (Salvesen, 1991).

Both the FDER and the WMDs are required to monitor the effectiveness of their permitting programs, and it does appear that these programs are somewhat successful at slowing the net loss of wetlands. Testimony to this success is set forth by the FDER where, in the two years prior to passage of the wetlands protection act, the FDER permitted and authorized the destruction of approximately 7,500 acres of wetlands. In the year after its enactment, only 1,100 acres were destroyed as a result of FDER permits issued (FDER, 1991). However, it should be noted that during that same period, 2,000 acres of wetlands were lost to agricultural activities (FDER, 1991). Between the years 1984 and 1989, it has been calculated that there have been 4,314 acres of wetlands permanently lost through authorized FDER permits and 12,000 acres lost through WMD

permits. However, for that same period, there has been a net benefit to wetlands, through mitigation and preservation efforts, of 158,373 acres by permitted FDER activities, and a net benefit of 102,582 acres of wetlands by permitted WMD activities (FDER, 1990c). This would seem to present a fairly successful record. However, it should be noted again that these numbers represent losses and gains resulting from *permitted activities* only, and any losses or gains resulting from unregulated activities, which contribute to the annual net loss figures for the state, are not included (FDER, 1990c).

The impacts of state wetlands regulation on local planning are seen in the increased responsibilities given local governments to "fill the regulatory gaps" of state legislation using local land use regulation. During the development of comprehensive plans, local government representatives work continuously with state agencies to determine the needed scope of local regulation over wetlands (Mike Eaton, personal communication, April 13, 1992). Additionally, the reliability of local comprehensive plans is highly important to permitting agencies such as the FDER who rely on local land use plans and regulations to determine cumulative impacts during permit review (Hamann, 1985).

Comprehensive planning

There are three statutes which govern the comprehensive planning process in the state of Florida. These are F. S. §§ 163.3161-163.3243, the *Local Government Comprehensive Planning and Land Development Regulation Act*, Chapter 186, F. S.,

State and Regional Planning, and Chapter 187, F. S., the *State Comprehensive Plan*.

Discussion will begin with the latter two chapters to establish the context in which Chapter 163 provisions are implemented.

Chapter 186, F. S., contains two parts: the *Florida State Comprehensive Planning Act* of 1972 (§§ 186.001-186.031, 1991), and the *Florida Regional Planning Council Act* (§§ 186.501-186.515, 1991). This chapter, in both parts, was created to provide a policy guide for state and regional agencies (such as the FDER or the WMDs), as well as local governments who would have access to official policy statements relating to issues of concern to local government. These "policy plans" are meant to serve as a basis for planning and decision-making at the state, regional, and local level (FDCA, 1987). As stated in the statute, the intent of the state planning act is to produce a state policy plan that:

... guide[s] state and regional agency policies, especially those policies dealing with land use, water resources, and transportation system development. It is intended that state agency functional plans be effectively coordinated to facilitate the orderly, positive management of growth consistent with the public interest. (F. S. § 186.002(2), 1991)

Regional planning councils were established as the link between state policies and local implementation. As stated in the regional planning council statute:

It is the declared purpose of this act to establish a common system of regional planning councils for area-wide coordination and related cooperative activities of federal, state, and local governments; ensure a broadbased regional organization that can provide a truly regional perspective; and enhance the ability and opportunity of local governments to resolve issues and problems transcending their individual boundaries. (F. S. § 186.502(2), 1991)

Chapter 186 provisions mandated the preparation and adoption of a state comprehensive policy plan, the establishment of eleven regional planning districts, and the preparation and adoption of regional comprehensive policy plans. The Florida Department of Community Affairs is authorized to review and approve the plans, which are adopted officially by the Office of the Governor (FDCA, 1987).

The state comprehensive plan is codified under Chapter 187, F.S. It is meant to "provide long-range policy guidance for the orderly social, economic, and physical growth of the state" and can be considered the framework for the state planning process (F. S. § 186.101(1), 1991). It addresses numerous issues including education, the economy, the natural environment, energy, and housing among others. Wetlands are primarily impacted by policies set forth in the section *Natural Systems and Recreational Lands*, adopted as follows:

Goal -- Florida shall protect and acquire unique natural habitats and ecological systems, such as wetlands, tropical hardwood hammocks, palm hammocks, and virgin longleaf pine forests, and restore degraded natural systems to a functional condition.

Policies -- Conserve forests, wetlands, fish, marine life, and wildlife to maintain their environmental, economic, aesthetic, and recreational values.

Prohibit the destruction of endangered species and protect their habitats.

Establish an integrated regulatory program to assure the survival of endangered and threatened species within the state.

Promote the use of agricultural practices which are compatible with the protection of wildlife and natural systems.

Protect and restore the ecological functions of wetlands systems to ensure their long-term environmental, economic, and recreational value.

Emphasize the acquisition and maintenance of ecologically intact systems in all land and water planning, management, and regulation.
(F. S. § 187.201(10), 1991)

Other policies established by the plan which could indirectly affect wetlands include proactive policies directed towards increased housing and development. It is from such policies that conflicts arise at the local level, where local governments are forced to balance the goals of increased development with the goals of preservation. The state plan acknowledges the potential for conflict, and recognizes the need for increased resources at the local level for implementation. It therefore leaves a "back-out" provision stating that:

the goals and policies contained in the State Comprehensive Plan shall be *reasonably* [italics added] applied where they are economically and environmentally feasible, not contrary to the public interest, and consistent with the protection of private property rights. The plan shall be construed and applied as a whole, and no specific goal or policy in the plan shall be construed or applied in isolation from the other goals and policies in the plan. (F. S. § 187.101(3), 1991)

Thus local governments are given the freedom to interpret and implement state policies in a manner that is affordable and in keeping with local values and concerns.

Enactment of the *Local Government Comprehensive Planning and Land Development Regulation Act* (F. S. § 186.3161 et seq., 1991) serves as the "glue" which binds local government planning policies to those of the state and regional planning councils. Commonly known as the "growth management act", this act mandated the development of comprehensive plans at the local level that are *consistent* with state and regional policy plans. Additionally, the act contains enforcement mechanisms for the state that ensures local governments remain *in compliance* with requirements of the statute. The foremost method for enforcement is the use of financial sanctions (FDCA, 1987).

The act structures the comprehensive planning process into a "planning pyramid" (Figure 6), using a "top down" approach for ensuring consistency (FDCA, 1987). The top of the pyramid is the adopted state comprehensive plan. As mentioned, this plan sets forth state goals and the policies to be followed in implementing these goals. Local plans are prepared and reviewed against the state plan for compliance. It is not necessary that a local comprehensive plan adopt *all* policies set forth in the state plan, for the plan leaves an out for local governments by awarding them the authority to decide how to cope with conflicting policies. A local government's choice of policy direction cannot be challenged if it is supported by any policy in the state plan (FDCA, 1987). This ability of local governments to "pick and choose" the policies they wish to plan for is considered the greatest weakness in the comprehensive planning process (FDCA, 1987).

At the second level of the planning pyramid are the regional policy plans. In addition to the state plan, the local plan must also be consistent with the appropriate regional policy plan with one exception: if a local government files a challenge to any portion of the regional policy plan contesting its consistency with the state comprehensive plan, the plan of the local government filing the challenge need not comply with the challenged portion of the regional plan until 12 months after the resolution of that challenge (FDCA, 1987).

Local plans are the base of the planning pyramid and must be consistent with state and regional plans. Local plans are found to be consistent with these plans if they are *compatible with* and *further* such plans. *Compatible with* is defined to mean "not in conflict with" and *further* means "to take action in the direction of realizing goals or

-STATE PLANNING PYRAMID

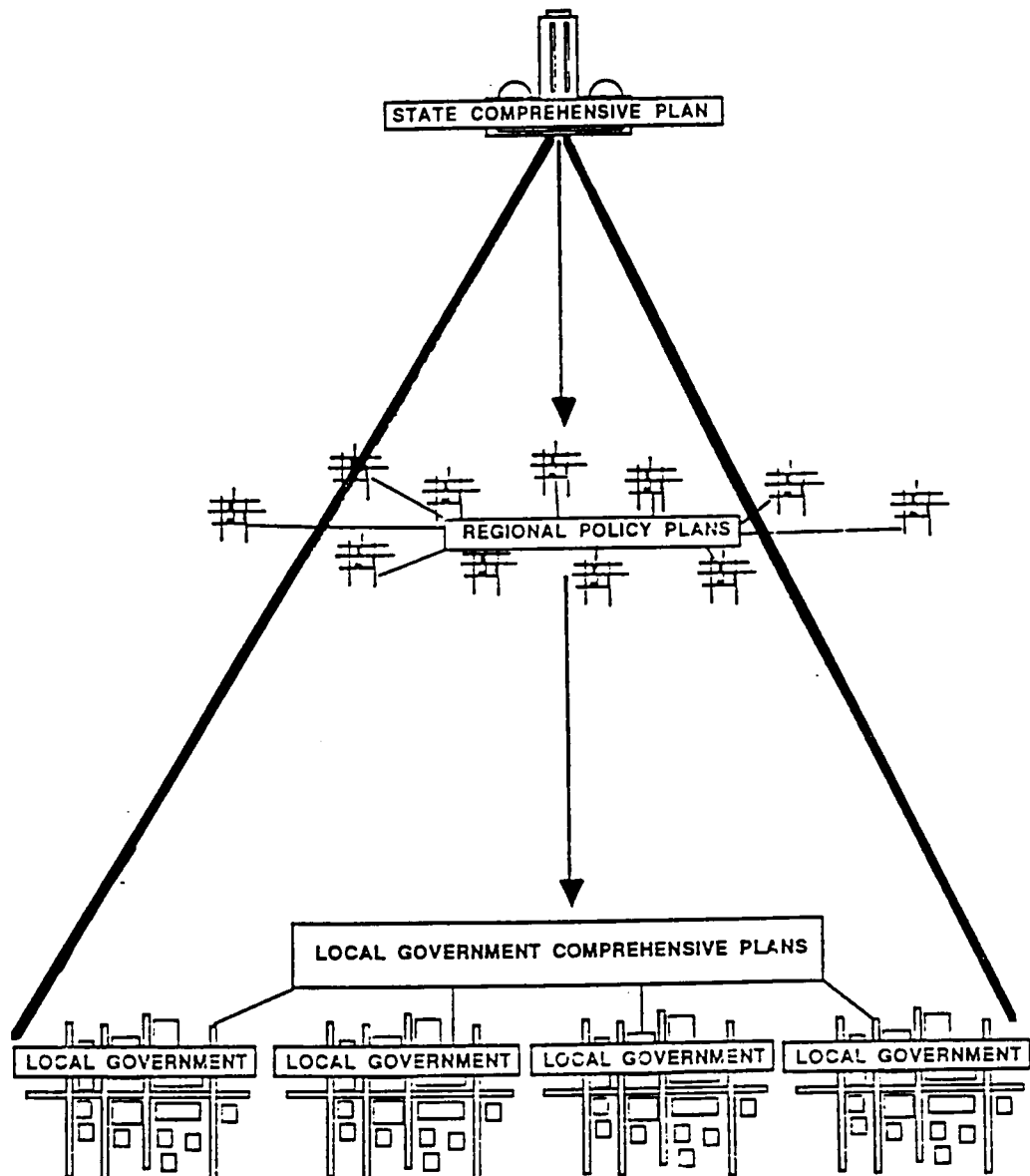


Figure 6. The Florida state planning pyramid.

Source: The Florida Department of Community Affairs. (1987). *Citizens Handbook to the Local Government Comprehensive Planning Act*. Tallahassee, FL: Department of Community Affairs.

policies of the state and regional plans" (F. S. § 163.3177(10a), 1991). The plans become increasingly detailed as they move down the planning pyramid, with the local plan being the most detailed, for it is the key to implementation of state policy. The act sets forth a number of elements to be incorporated into a local plan, and within each element are a number of required components. The purpose of creating such an outline is to set down in writing the planning direction and policies of the local government as drivers of regulatory action (FDCA, 1987). It should be noted here, though, that the act only *lists* required elements, it does not provide direction as to how the local government should approach that element. The level of commitment with which a local government approaches these elements is entirely at that government's discretion, the only proviso being that the local government must be able to justify its approach and demonstrate that it is a part of the comprehensive planning system (FDCA, 1987).

There are eight elements required of a local comprehensive plan. These are:

1. *A future land use plan element* designating proposed future general distribution, location and extent of the uses of land for residential uses, commercial uses, industry, agriculture, recreation, conservation, education, public buildings and grounds, other public facilities, and other categories of the public and private uses of the land.
2. *A traffic circulation element* consisting of the types, locations, and extent of existing and proposed major thoroughfares and transportation routes, including bicycle and pedestrian ways.
3. *A general sanitary sewer, solid waste, drainage, potable water, and natural groundwater aquifer recharge element* correlated to principles and guidelines for future land use, indicating ways to provide for future potable water, drainage, sanitary sewer, solid waste, and aquifer recharge protection requirements of the area.
4. *A conservation element* for the conservation, use, and protection of natural resources in the area, including air, water, water recharge areas, wetlands, waterwells, estuarine marshes, soils, beaches, shores, floodplains, rivers, bays, lakes, harbors, forests,

fisheries and wildlife, marine habitat, minerals, and other natural environmental resources.

5. *A recreation and open space element* indicating a comprehensive system of public and private sites for recreation.
6. *A housing element* consisting of standards, plans, and principles for the provision of [all forms of required housing].
7. *A coastal management element* (where applicable) setting forth the policies that shall guide the local government's decisions and program implementation with respect to the [coastal zone management program].
8. *An intergovernmental coordination element* showing relationships and stating principles and guidelines to be used in the accomplishment of coordination of the adopted comprehensive plan with the plans of [other local government agencies].

(F. S. § 163.3174(6a-h), 1991)

Planning and protection policies for wetlands are contained in the Conservation element, which provides extensive background information on wetlands and the local government's plan for protecting them in compliance with state desires.

Once these elements have been completed and approved by the state, the act requires that all subsequent land use regulations adopted by the local government shall be consistent with the comprehensive plan. As it states:

All land development regulations enacted or amended shall be consistent with the adopted comprehensive plan or element or portion thereof, and any land development regulations existing at the time of adoption which are not consistent with the adopted comprehensive plan or element or portion thereof shall be amended so as to be consistent. (F. S. § 163.3194(b), 1991)

The act provides an amortization schedule for local governments to come into compliance with this clause. However, the act is careful to establish that implementation should not be construed to involve the taking of private property without due process of law and the payment of just compensation (F. S. § 163.3194(4a), 1991). The act instructs the courts,

in reviewing local governmental action or development regulations established under this act, to:

... consider ... the reasonableness of the comprehensive plan ... relating to the issue justiciably raised or the appropriateness and completeness of the comprehensive plan ... in relation to the governmental action or development regulation under consideration. (F. S. § 163.3194(4a), 1991)

Land development regulations supporting the policies set forth in the plan are *required* by the act. They are the method of implementation for the plan. Included among the stated criteria for land regulations is the requirement for a *concurrency management system*, the policy for which the act received its common name. This criteria states that local land development regulations must contain a provision that:

... provides that public facilities and services meet or exceed the standards established in the capital improvements element ... and are available when needed for the development, or that development orders and permits are conditioned on the availability of these public facilities and services necessary to serve the proposed development. (F. S. § 163.3202(2g), 1991)

The impact that this planning legislation will have on wetlands protection is seen in the mandate for land regulations that further the policies and principles of the local, regional and state comprehensive plans. Land use regulations which regulate activities in wetlands must support the goal to "conserve, protect and restore the ecological functions of wetlands systems" (F. S. § 187.201(10), 1991). Conflict may arise in the implementation of these policies and the growth management system which limits development to areas where the infrastructure is there to support it. If the only areas available for development having appropriate infrastructure are wetlands, how does the

local government set the controlling priority? Such conflicts are indicative of the problems inherent in this legislation.

Another problem is the inconsistency of the concurrency management system with a second growth management mandate that local governments "strive to end urban sprawl" (Koenig, 1990). As the author of the legislation laments, "I wasn't smart enough to see that concurrency without funding equals urban sprawl", where development is driven outward into rural areas having the capacity to accept it per the regulation (Koenig, 1990). This statement can perhaps be applied to the above conflict involving wetlands, where development is driven into previously untouched wetland areas accessible to the needed infrastructure. Funding is also a problem, probably the biggest faced by local governments. There is little state funding for local governments attempting compliance with the statute, and many of these governments lack the enormous monetary resources required of such a comprehensive process (Theresa Snyder, personal communication, April 22, 1992). Yet they are required to come into compliance or face financial sanctions--a catch-22. Additionally, lack of funding for the concurrency provisions can curtail development, turning "growth management" into "no-growth management" (Koenig, 1992). For example, if funds are not available to improve roads that have reached their capacity, growth in that area may stop until funds are in place for improvements (Koenig, 1992). In any event, local governments are faced with the great responsibility of producing a plan that finds balance between ecological and economic concerns.

Pending

A number of new proposals are being heard before the Florida state legislature, the most important of which is the proposal to unify the wetlands definitions and jurisdictions of the FDER and the WMDs. Within this proposal are provisions that would: 1) allow the FDER authority to regulate isolated and contiguous wetlands; 2) add approximately 800 plant species to the vegetative index; and 3) nominate certain hydric soils for use as exclusive wetlands indicators, thus rejecting use of COE hydrology requirements as proposed in the *Federal Register* ("Wetlands legislation", 1992). This proposal would also involve the reorganization of permitting agencies into one single agency, combining the responsibilities of dredge and fill permitting and surface and stormwater management permitting, thus eliminating the need for WMDs ("Wetlands legislation", 1992).

Another proposal involves revising the current mitigation provisions. One part of this proposal would replace the term "mitigation" with "compensation", defining compensation to "encompass wetlands creation, enhancement and preservation, and preservation of associated upland buffers" (Settles, 1992, p. 16). Another alternative calls for the establishment of a statute that states that mitigation will not be considered a permitting criterion, but will be a condition of a permit once the permit is issued based upon other criteria (Settles, 1992). Mitigation banking is also being considered as a potentially viable mitigation alternative. The FDER would be responsible for establishing a mitigation banking task force responsible for outlining the procedures for maintaining a mitigation bank and determining what types of contributions are acceptable (Settles,

1992). There are also proposals to redefine regulations governing agricultural and silvicultural activities and the role of local government permitting ("Wetlands legislation", 1992). Each of these proposals, still in the process of refinement, has the potential of radically changing the way wetlands are protected within the state, as well as changing the role that local governments and planners play in wetlands protection efforts.

The test of state regulation

Three basic parts of Florida's wetlands regulatory system have been tested in the courts. These are: the public interest doctrine, part of the dredge and fill permit review process; the cumulative impact review, again a part of the permit process; and land use regulation, as mandated by the growth management act.

Florida's permitting decisions, as made by the FDER, have been challenged a number of times since the procedure has been in place, and more often than not are upheld in the courts (Mike Eaton, personal communication, April 13, 1992). There are two decisions that have set precedents in the applicability of the vague "public interest test" as set forth in F. S. § 403.918, *Criteria for granting or denying permits*. In *1800 Atlantic Developers v. Department of Environmental Regulation* (552 So. 2nd 946 (Fla. App. 1 Dist., 1989)), an appeal was made to the court concerning a hearing officer's⁷ recommendation to deny a dredge and fill permit for improvements to an eroded beach.

⁷According to § 17-103.155, F. A. C., "any person whose substantial interests may be affected by proposed or final agency action by the [FDER] may file a petition for formal administrative hearing ... if the person disputes the material facts upon which the [FDER's] action is based." The hearing officer will make a recommendation of approval or denial based upon a review of the material facts.

1800 Atlantic Developers requested a dredge and fill permit for the purpose of improving a private beach which had eroded due to the presence of a public boat ramp nearby. The proposed beach improvement fell within the boundary of the county beach restoration project, but also fell within an area designated as "Outstanding Florida Waters", a designation applied *after* filing of the permit. After a significant amount of negotiation in which the developers acquiesced to numerous mitigation requirements for which the FDER agreed to permit the project, the permit was denied based upon the hearing officer's finding that the project failed "to provide reasonable assurances that the project is clearly in the public interest", due to the fact that it was a private beach having use restrictions. Upon review of the case, the court reversed the permit denial and remanded the case for further action (*1800 Atlantic v. DER*, 1989).

The decision was reversed for number of administrative reasons including the fact that the FDER reneged on its intended approval because of the *hearing officer's* conclusion that the designated conditions set for approval were insufficient. This action was in direct conflict with F. S. § 403.918(2b), which states that the FDER, not the hearing officer, must consider and determine what measures are legally sufficient to mitigate adverse effects. Until the hearing, the FDER had concluded that the developer's actions were sufficient (*1800 Atlantic v. DER*, 1989). Most important, however, was review of the public interest test as applied in the case. The court found that it was incorrectly applied when the hearing officer interpreted this test to require "a significant public benefit" through public sharing of the beach once improved, and that "no public

need had been shown" for the project. The court countered these arguments by stating that:

... the [wetlands protection] statute does not specify "need" for the project as a relevant consideration in defining criteria for determining public interest. 1800 Atlantic's project was entirely on private property intended for the benefit of private users, and *it was not obligated to show a need or necessity* for the dredging and filling *in the sense of benefitting the public or the environment*. ... In cases where the dredging and filling would substantially degrade water quality or materially harm the natural environment, the fact that a substantial public need or benefit would be met by approving the project may be taken into consideration ... This is a purpose of the public interest test ... This project is consistent with the Key West beach restoration project and ... we hold ... that the applicant *need not show any particular need or net public benefit as a condition of obtaining the permit* [italics added]. Nor does the statute require that [the applicant] prove the absence of negative impacts from the project and demonstrate the creation of a net environmental or societal benefit to meet the public interest test. (*1800 Atlantic v. DER*, 1989)

This view of the public interest test more clearly defined the idea that "clearly in the public interest" did not necessarily mean that a project must *provide a public benefit*. The public interest test was meant to protect against the potential adverse affects of dredge and fill activities that would impact the public, such as degraded water quality (Hamann, 1985).

This purpose was further refined and upheld in *Sarasota County and Midnight Pass Society, Inc. v. Department of Environmental Regulation* (1991 WL 161053(Fla. Dept. of Env. Reg.)). In this case, set before the Secretary of the FDER for a final ruling, Sarasota County was protesting the denial of a dredge and fill permit to reopen a boating pass between Little Sarasota Bay and the Gulf of Mexico. The pass was closed when an emergency dredge and fill permit was awarded to neighboring land owners whose property was endangered by erosion and natural movement of the pass towards

their homes. The emergency permit was granted with the intent that a new pass would be constructed to the south of these properties. Attempts to build a new pass continually failed as dredged areas naturally refilled with sediment; other planned attempts to dredge it were subsequently abandoned and the pass remained closed. However, Sarasota County adopted a resolution determining that reopening of the pass was consistent with its comprehensive plan, and thus set out to develop extensive plans to reopen it permanently. These plans, as presented for permit approval, impacted numerous environmentally sensitive areas, including 44 acres of wetlands and other critical habitats. Additionally, the proposed dredge and fill activity impacted Outstanding Florida Waters (*Sarasota County v. DER*, 1991).

The permit was denied, and the decision upheld by the Secretary based upon the fact that "it was not established that the project [was] clearly in the public interest" (*Sarasota County v. DER*, 1991). In the final ruling, the Secretary acknowledged the finding of the *1800 Atlantic* decision that no net public benefit be shown. However, the Secretary was quick to point out numerous adverse affects related to implementation of the project that were *not clearly in the public interest*. As stated in the ruling:

Findings of fact [during the hearing] on balance establish that the project will adversely affect the conservation of fish and wildlife, including endangered or threatened species, or their habitats [and] ... will adversely affect the fishing or recreational values or marine productivity of the Bay [and] ... studies show that the current condition of the Bay makes it a valuable estuarine ecosystem which will be lost if the project is permitted [and] ... [the project] will provide a net benefit to navigation [and] ... the project will not adversely affect the public health, safety, or welfare. ... When I consider and balance all of these factors and their relevant facts, I conclude that the adverse impacts *outweigh* [italics added] any benefits, and therefore conclude that there has been no showing that the project is clearly in the public interest. (*Sarasota County v. DER*, 1991)

The secretary further elaborated that "the public interest test is much broader than a mere consideration of utility. Marine and estuarine ecosystems have their own unique environmental functions which are *not interchangeable* [italics added] in the marketplace of utility". Thus "clearly in the public interest" is shown not to be supportive of solely economic values but of aesthetic and ecological values as well. And so it is held that the public interest test does not necessarily require evidence of a public or social benefit resulting from the project, but does require *equal consideration* of ecological value when weighing these factors against economic benefit.

The public interest test takes into consideration the expected cumulative impacts contributed to by the project in question. Most tests of the cumulative impact doctrine have upheld its use as an appropriate cause for permit denial. In *The Conservancy, Inc v. A. Vernon Allen Builder, Inc.* (580 So. 2nd 772 (Fla. App. 1 Dist., 1991)), several environmental groups appealed the decision granting a dredge and fill permit to bring a sewer system to a coastal barrier island to service an existing resort community, currently using a septic field system, and support the potential development of 75 more estate homes. Modifications to the design of the project were suggested by the FDER and incorporated by the builder as a condition for permit approval. On appeal of that decision, environmental groups argued that the increased development would produce cumulative impacts environmentally devastating to the coastal barrier system.

The court upheld the cumulative impact concerns in reversing and remanding the approval decision, based upon two previous rulings. In *Del Campo v. Department of Environmental Regulation* (452 So. 2nd 1004 (Fla. App. 1 Dist., 1984)), the court held

that the *potential* for new, as yet unplanned, development must be taken into account during permit review and prior to the commitment of resources where the existence of environmentally sensitive areas may give cause for the denial of permits required for this potential development. Several years later, in *Peebles v. Department of Environmental Regulation* (12 FALR 1961 (April 11, 1990)), the court ruled that the cumulative impact of the potential for other similar projects to follow must be considered during permit review. As stated in that decision:

... the cumulative impact of granting Dr. Peebles' permit and similar permits *reasonably expected* [italics added] would result in an adverse impact on conservation of fish and wildlife, and ultimately would result in a violation of water quality standards. ... The record shows that reasonable assurance had been provided that the instant project, standing alone, would not result in water quality violations, but that water quality violations will occur and the project is contrary to the public interest when the *cumulative impact of reasonably expected future permit applications* [italics added] are taken into consideration. (*Peebles v. DER*, 1990)

The court in *Peebles* also held that cumulative impacts must be reviewed in support of the public interest test.

In the *Conservancy* case, the court disagreed with the appellees' argument that the development of 75 estate homes was speculative and not closely linked or causally related to the proposed dredging and filling operation. The court impressed upon the necessity "to consider what will be at the end of the pipeline", especially when evidence suggested devastating environmental impacts that could prevent permitting of any future development. Thus, by limiting review to the proposed development solely in relation to the design and implementation of the pipeline, the FDER "neglected the necessity in this case to consider potential secondary impacts"; the "devastating environmental

impacts" affecting the coastal barrier system and its natural buffering ability--a public interest concern (*Conservancy v. DER*, 1991). Thus the cumulative impact test was upheld as a viable and important consideration in permit review.

In one of the first major tests of the state's comprehensive planning law and the mandate for appropriate land use regulations furthering the goals of the plan, use of land use regulation for the protection of sensitive areas was set back. In *Reahard v. Lee County*, a land use designation delineating "resource protection areas" was found to be a taking of private property and the plaintiff awarded \$700,000 in damages (Russ, 1992). The property in question was a 40-acre parcel almost wholly covered with wetlands which the owners wished to subdivide and sell. The "resource protection area" designation applied to the property directed a maximum density of one residential unit per 40 acres. The parcel was a part of a larger 540-acre property bought 30 years previously and subdivided and sold over the ensuing years for a return over 32 times the original purchase price (Russ, 1992). The decision is currently on appeal, with a reversal expected for three reasons: 1) the county's land use designation was designed to prevent the substantial harm resulting from destruction of wetlands; 2) the land in question was part of a larger parcel out of which economically reasonable use had been derived, per the whole parcel rule; and 3) the ordinance in question, despite its restrictions, still permitted an economically viable use of the property (Russ, 1992). A decision on the appeal will not be known for some time, but this case presents some factors that local planners must consider when developing land use regulations. These

are: 1) the character of the governmental action; 2) its economic impact; and 3) its interference with reasonable investment-backed expectations (Russ, 1992).

The importance of judicial review of these state regulations lies in the appearance that the courts support the state's planning and wetlands protection regulations. This sets the stage for successful implementation at the local level.

Implications for local planners

Since 1970, the population in the state of Florida has nearly doubled and the state is expecting to be the nation's most populous (proportionate to land area) by the year 2000 (Koenig, 1990). Such tremendous population growth will have an enormous impact on undeveloped wetlands within urbanized areas. Yet, while local governments attempt to absorb this growth, they are faced with the challenge of continuing to support state goals of wetlands protection. Land use regulations designed for this purpose support, rather than usurp, the permitting authorities held by the state.

Local governments will typically defer permitting to state agencies (Mike Eaton, personal communication, April 13, 1992) due primarily to the lack of funding necessary to maintain such extensive programs. However, many local governments are developing permit programs which "fill in the gaps" found in state legislation. These programs are written into municipal codes and enforced by the city (Theresa Snyder, personal communication, April 22, 1992). Local governments are the key to successfully implementing state and federal policies for the protection of wetlands, and they play a delicate balancing game between local needs and state mandates. As Fulton (1991) states:

The underlying dilemma that local governments face in dealing with wetlands is the fact that the state and federal governments have the political clout to pass single-issue planning laws, while comprehensive planning is generally the responsibility of local government. (Fulton, 1991, p. 13)

The methods and strategies developed by local governments for implementing state and federal goals can take many forms, as will be discussed in the following chapter. The key is that local governments in Florida are provided the legislative backing to successfully implement them. Thus, through innovation at the local level, the goal of no net loss may be feasible.

CHAPTER 4

MUNICIPAL REGULATION OF WETLANDS

I. Municipal Programs in General

Overview

Following the progression of wetlands protection policy and regulation from the federal to state and now local level, it can be said that the principal means of wetlands protection outside the federal and state permitting programs is found in local regulatory programs (OTA, 1984). As with state programs, local programs can use either regulatory or nonregulatory methods for protection. Regulatory methods include zoning, subdivision regulations, floodplain regulations, building codes, sanitary codes, and mitigation regulations. Nonregulatory methods include public land acquisition, private land acquisition, easements, tax incentives, and public education (Burke et al., 1988; Mantell et al., 1990). Again, the preferred methods, and most effective for local governments, are regulatory due to the fact that regulations are relatively inexpensive, are timely, and typically account for the influence of the larger watershed area of which wetlands are a part. Additionally, regulations, if adequately enforced, provide a substantial amount of protection (Burke et al., 1988; Thurow et al., 1975).

This is not to say that nonregulatory methods do not play an important role in wetlands protection at the local level. On the contrary, nonregulatory programs, when used in support of regulatory programs, can provide a more comprehensive approach to

wetlands protection. However, regulation is a critical part of local programs, and the base upon which these programs are built (Burke et al., 1988). This study is concerned with regulatory approaches towards wetlands protection and will not address nonregulatory programs except to acknowledge their supportive role in protection efforts.

Zoning regulations are the most common form of wetland regulation found at the local level. They are typically adopted as part of a comprehensive zoning ordinance or as a separate set of use regulations, and will often include wetland boundary maps and protection standards (Burke et al., 1988). Zoning regulations share several basic common elements: 1) a statement of wetlands protection goals; 2) a definition of wetlands; 3) a list of prohibited or permitted uses or performance standards; and 4) implementation and enforcement procedures and noncompliance penalties (Morris, 1991).

Generally, goal statements found in wetlands ordinances call for the execution of state mandates for the protection of wetlands specifically, or of the public safety, health, and welfare generally (Morris, 1991). They are typically stated in any one of several sections of an ordinance including the preamble, goals, legislative purposes, or findings of fact section (Burke et al., 1988). Goal statements should justify the regulation of wetlands as the means by which state mandates are executed. Typically, the ordinance will provide such justification by citing specific functions or values associated with wetlands, and linking health and safety to the hazards inherent in construction within wetland environments (Burke et al., 1988). For example, within the Hillsborough County, Florida, wetlands protection ordinance, the preamble stresses the state requirement to control water pollution:

... Whereas, wetlands hydrological systems, which may seasonably appear to be dry, function as a vital part of the waters of Hillsborough County and constitute a productive and valuable public resource; and Whereas, the destruction or alteration of wetlands may reasonably be expected to cause water pollution ... ; and Whereas, *reasonable control and regulation* of activities that cause or may be expected to cause pollution, *are necessary for the protection and preservation of the public health, safety, and welfare* ... [italics added] (Burke et al., 1988, p. 31).

This emphasis on wetlands function relating to protection of public health and safety is highly important to the legality of the ordinance. As Thurow et al. (1975) state, localities must base their ordinances on "those functional qualities ... which relate to public safety and the prevention of nuisance-like uses of land" for the ordinances to be accepted and upheld in the courts (p. 47). Justification of the ordinance relative to the social or aesthetic benefits provided are generally looked upon "unfavorably" by the courts (Thurow et al., 1975), though there has been some shift towards acceptance of such benefits as legally defensible. Generally, though, some other underlying legal basis in nuisance or property law is required for judicial substantiation. In developing their ordinances, local governments and their planners must keep in mind the legal ramifications of their decisions.

Wetlands definitions will often differ radically among ordinances with some relying upon the "three criteria" definition set by the COE, and some taking a more narrow focus geared toward plant species or soils (Burke et al., 1988). Ordinances will typically specify plant species or soils specific to a locality (Morris, 1991). Problems arise from the lack of a standard which can be used by local governments to base their definitions on; the controversy surrounding the federal definition perpetuates this. A zoning regulation is applied according to the definitions established within that ordinance.

Until an acceptable standard is developed, the efficiency of a regulation remains in question where varying definitions bring varied application and subsequently, varied success (Mantell et al., 1990).

Often, definition or specification of wetlands within a community is accompanied by some type of wetlands mapping. Such maps are available from any number of sources including the National Wetlands Inventory, USGS, soil surveys, flood maps, or aerial photos. Use of maps such as these assist in determining wetlands boundaries as defined by the ordinance, and serve as good planning tools in support of land use assignments (Burke et al., 1988). Problems in the use of maps for zoning purposes lie in the dynamic nature of wetlands, whose constantly changing boundaries make it difficult for such maps to remain truly definitive. A potential method for successfully mapping wetlands in a zoning ordinance may involve the use of a "wetlands district overlay". Whole parcels affected by this overlay, no matter what portion of the parcel is covered, will be subject to special development regulations designed for the protection of wetlands. These regulations will require an on-site field delineation to determine the extent of a wetland at the time a change in zone or development is proposed. The use of on-site verification ensures the protection of these dynamic systems.

The bulk of a zoning regulation addresses all uses that are permitted as of right and those that are allowed with a special permit (i.e., conditional uses or special exceptions). It may also list any uses or activities that are expressly prohibited, such as landfilling, damming, or draining (Morris, 1991). "Specifying what activities will or will

not be allowed, and under what conditions, constitutes the essence of a wetland protection ordinance" (Burke et al., 1988, p. 36). Burke et al. (1988) continues:

... A broad assortment of approaches and regulatory techniques is available to planners [for wetlands protection]. There are no "right" methods that apply across the board. Instead, each jurisdiction's decision makers must evaluate what makes sense for their locality. Whether a locality uses general or specific performance standards, limits uses by activity types or density restrictions, or employs some combination of these and other techniques, certain objectives should be considered requisite for a successful protection program. Regardless of the activity to be controlled, protection and use standards should include provisions for: [1] eliminating or avoiding impacts to wetlands at the outset; [2] ensuring that approving a wetland use will not cause, or make worse, natural hazards; [3] protecting the natural functions of wetlands; [4] achieving consistency with other broader plans and regulations; and [5] minimizing impacts and restoring or replacing wetlands (mitigation) as necessary. (p. 36)

Eliminating or avoiding impacts may involve an assurance by the applicant that a development is water-dependant, or, for nonwater-dependant activities, that an alternative site capable of sustaining the proposed development is not available. Permit review for proposed activity within a wetland may include consideration of such a "water-dependency" test to drive developers away from wetlands, thus ensuring their protection (Burke et al., 1988). It should be noted that federal Section 404 provisions include such a test, and local governments that incorporate avoidance into their ordinances should establish standards in harmony with federal ones to avoid conflicting approval/denial decisions where both jurisdictions apply.

Ensuring no increase in hazard may be incorporated into an ordinance as a requirement that applicants provide the necessary technical information needed to properly determine potential impacts. Such information would then be considered during

permit review (Burke et al., 1988). Protecting natural functions "should be the ultimate objective of any wetland management program" (Burke et al., 1988, p. 37). Permit approval should be contingent upon the potential impacts that an activity may carry relative to a wetland's functional attributes. Such an assessment is difficult and may require consulting wetlands experts to aid in determining wetland function. A local government should develop guidelines as to what functions should be reviewed and how they are to be weighed during decision-making (Burke et al., 1988).

Consistency with other plans is an administrative matter that is important in maintaining a uniform local policy towards wetlands protection. In order to prevent confusion and allow efficient intergovernmental function, consistency between wetlands ordinances and other comprehensive or regulatory plans should be ensured (Burke et al., 1988).

Mitigation strategy at the local level is similar to its application at the state level, where mitigation is used to offset the loss of wetlands to development. It should be emphasized here, though, that mitigation should be used as a "last resort", and not used to rationalize the destruction of wetlands resources (Burke et al., 1988). When reviewing permit applications, administrators should be careful in their interpretation of this "thin line" as to where mitigation is an acceptable approval condition and where it is not.

Performance standards are set for the purpose of defining the conditions under which special exceptions or conditional uses may be permitted. They provide a way of avoiding "arbitrary and capricious" decisions over special permit applications through the establishment of review criteria to be considered, weighed, and resolved prior to issuance

of a permit (Morris, 1991; Burke et al., 1988). Performance standards within an ordinance may also address construction specifications relative to activity in or near wetlands, guidelines for impact evaluation relative to wetlands function, minimum lot-size requirements for building in wetlands, or buffer requirements to control activities within sensitive lands adjacent to wetlands (Burke et al., 1988; Thurow et al., 1975).

Implementation and enforcement of wetlands protection ordinances can be costly to local governments. Subsequently, many local governments will attempt to defray these costs by requiring permit-processing fees or performance bonds that will cover the costs associated with permit application review, and ensure that conditions for approval are carried out (Burke et al., 1988). Enforcement of ordinance provisions is also seen in penalties established for violations which may include fines, jail sentences, or a combination of both (Burke et al., 1988). It has been found, though, that the most effective penalty is the requirement that a violator mitigate the impacts of some activity caused to a wetland and restore it in its entirety if possible (Morris, 1991). The reason for this may be hesitancy on the part of the courts to impose fines or jail sentences for violations of zoning ordinances and other land use laws. Thus, these penalties do not provide adequate deterrence (Burke et al., 1988). As Burke et al. (1988) state:

Requiring restoration of disturbed wetlands can be an effective enforcement mechanism because it ensures that damage to the wetland will be minimized and that developers will not fill wetlands, considering a monetary fine as merely another development cost. (p. 48)

Additional powers that may be written into an ordinance to ensure enforcement are "stop-work" provisions that allow the administering authority the right to immediately stop an activity that is found to be in violation of the ordinance (Burke et al., 1988).

Enforcement, of course, is the key to successful wetlands protection. A failure to prosecute violators breeds a disrespect for the ordinance and a continued loss of wetlands. When adopting a wetlands protection ordinance, a local government must develop effective administration and enforcement procedures for the ordinance and ensure continued monetary support for these activities (Burke et al., 1988).

While zoning is the most prominent form of wetlands regulation at the local level, there are numerous other forms of regulation used to control activities in wetlands. Subdivision regulations may indirectly protect wetlands by prohibiting development in areas in which soil, subsoil, or flooding conditions would create a public safety problem. Additionally, many subdivision regulations include provisions or incentives for cluster or other type of special design development that encourages sensitivity to environmental constraints (Morris, 1991). Building and sanitary codes may also provide indirect protection through regulations governing the location and operation of sanitary systems or building construction. For instance, many sanitary codes disallow the placement of leach fields in high groundwater areas, or a particular building code may prohibit construction in flood-prone areas or unstable soils, all of which are characteristics of wetlands (Burke et al., 1988).

Floodplain regulations are another means for indirectly regulating wetlands, and one which many communities will use in the place of wetlands ordinances (Morris, 1991). Wetlands are often found within the 100-year floodplain due to their wet nature, and a floodplain ordinance would seem an appropriate place to regulate them. There is a three step process identified by Burke et al. (1988) for amending floodplain ordinances

to regulate wetlands. It consists of: 1) adding a wetlands definition to the ordinance; 2) adding an additional subdistrict that addresses wetlands areas; and 3) incorporating additional procedural requirements and land use restrictions relating to the new subdistrict. This process of amending floodplain regulations can significantly increase wetlands protection in areas that do not wish to adopt a wetlands ordinance *per se* but have a desire to protect wetlands (Burke et al., 1988). However, floodplain ordinances are designed for purposes other than wetlands protection and will allow many activities, such as filling, dredging, or draining, that are detrimental to wetlands. Typically, the only restriction in floodplain districts is that construction take place above a particular flood elevation (Burke et al., 1988).

Again, the key to the success of any regulation in protecting wetlands is its enforcement (Burke et al., 1988). When a local government takes on the responsibility of protecting wetlands through regulatory means, it must ensure that adequate funding and administrative support are in place to ensure regulatory viability. Without the power to enforce its regulations, a local government's attempt to protect its wetlands will undoubtedly fail.

II. The City of Jacksonville, Florida

History

The City of Jacksonville, Duval County, is located in the northeastern section of Florida, along the St. John's River at its mouth on the Atlantic Ocean (Figure 7).

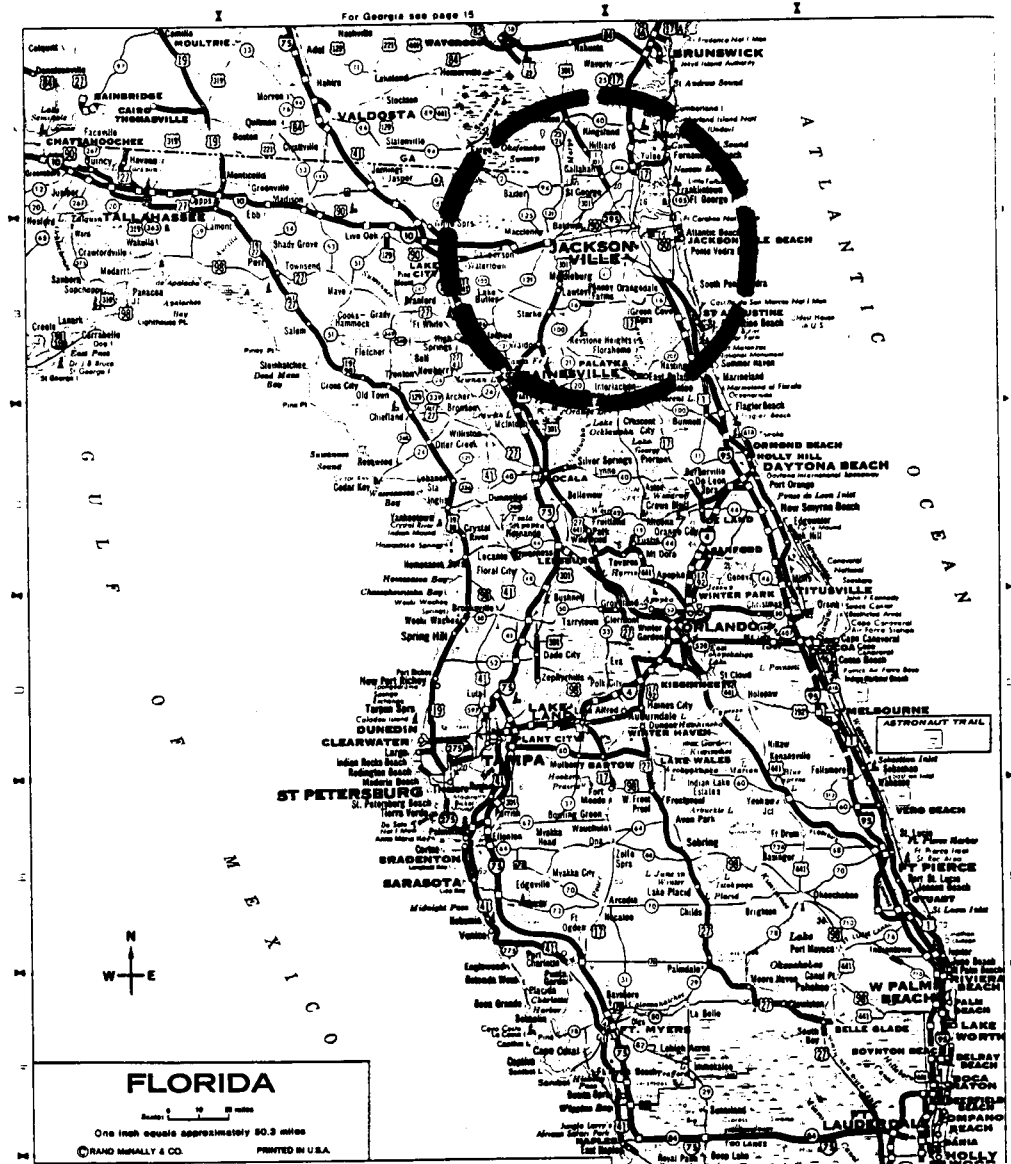


Figure 7. Location of Jacksonville, Florida.

Source: Rand McNally. (1988). *Road Atlas and Travel Guide*. Chicago, IL: Rand McNally & Company.

Jacksonville has a total land area of 835.8 square miles, forming the entirety of Duval County with the exception of four small incorporated areas covering 14.47 square miles and located predominantly along the Atlantic Ocean (JPD, 1990a).

Jacksonville's origin is tied to its strategic location along the St. John's River. Settled and surveyed for development in 1822, Jacksonville was a stopping point for traders traveling along the river, and became known as a major center for trade. As this reputation grew, so did its tourist attraction, with a large number of hotels and boarding houses opening to serve its increasing visitor population. The city continued to grow and soon expanded beyond its transportation base, accommodating healthy cotton and lumber industries which were provided close access to barge travel. Gradually, this agri-industrial base grew to become the predominant economic force in the city (JPD, 1990a). Currently, Jacksonville supports a well diversified economic base that includes governmental, military, and financial activities, real estate speculation, and manufacturing and distribution (JPD, 1990a). Providing heavy support to the economy are the presence of the U.S. Navy, which maintains three major bases within the city; the Port of Jacksonville, a major port of entry into the U.S. which is serviced by all forms of transportation; and the presence of several corporate headquarters including Prudential-Bache, Independent Life, and Barnett Bank (JPD, 1990a).

Existing conditions

Jacksonville's growth as a center for water-dependant trade and commerce is demonstrated in the layout of land uses within the city. As shown in Figure 8, Existing

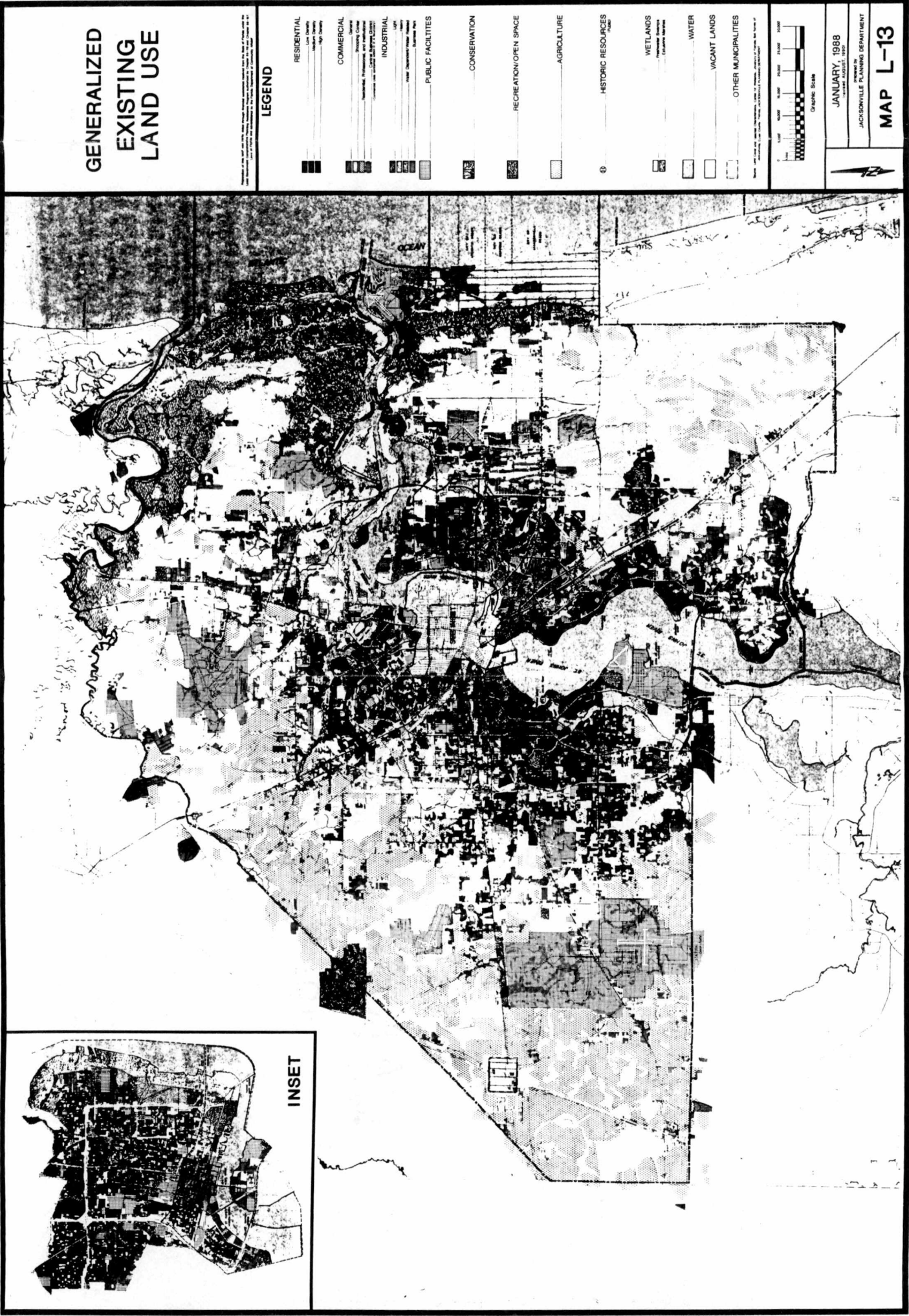


Figure 8.

Existing Land Use.

Source:

Jacksonville Planning Department. (1990a). *Comprehensive Plan 2010: Future Land Use Element*. Jacksonville, FL: JPD.

Land Use, most of the heavy industries are clustered along the north and west banks of the St. John's River. The Central Business District (CBD) serves as a vibrant city center for trade and commerce, housing medium and high intensity development. The area north of the St. John's River (the North planning district⁸) is isolated from the core of the city and remains sparsely populated and undeveloped, while areas to the south and east (Greater Arlington and Southeast planning districts) of the CBD are the fastest growing in terms of residential and commercial development (JPD, 1990a).

Jacksonville's urban design displays a radial street layout, overlain on the original surveyed grid pattern, with several major arterial highways and expressways radiating outward from the CBD. Development has followed these highways, allowing a dense city core, moderately dense development along the major arteries, and medium to low density development in the areas in between. Jacksonville has experienced significant urban sprawl during its growth (JPD, 1990a). Approximately 30% of the city's land area is developed for urban uses, 23% is reserved for agricultural uses, and the remainder supports a mix of public and low intensity uses. Dairy farming and silviculture are the two predominant agricultural land uses, both of which have been declining in the past several years (JPD, 1990a). Table 2 provides a breakdown of all land uses and their associated areas. Wetlands and other environmentally sensitive areas are not called out as a grouping in this breakdown. The areas that they encompass are collectively grouped into the land use within which they are found.

⁸Jacksonville is divided into six planning districts at which scale comprehensive plans are drawn and implemented. A map designating the location of the planning districts is located in the Appendix.

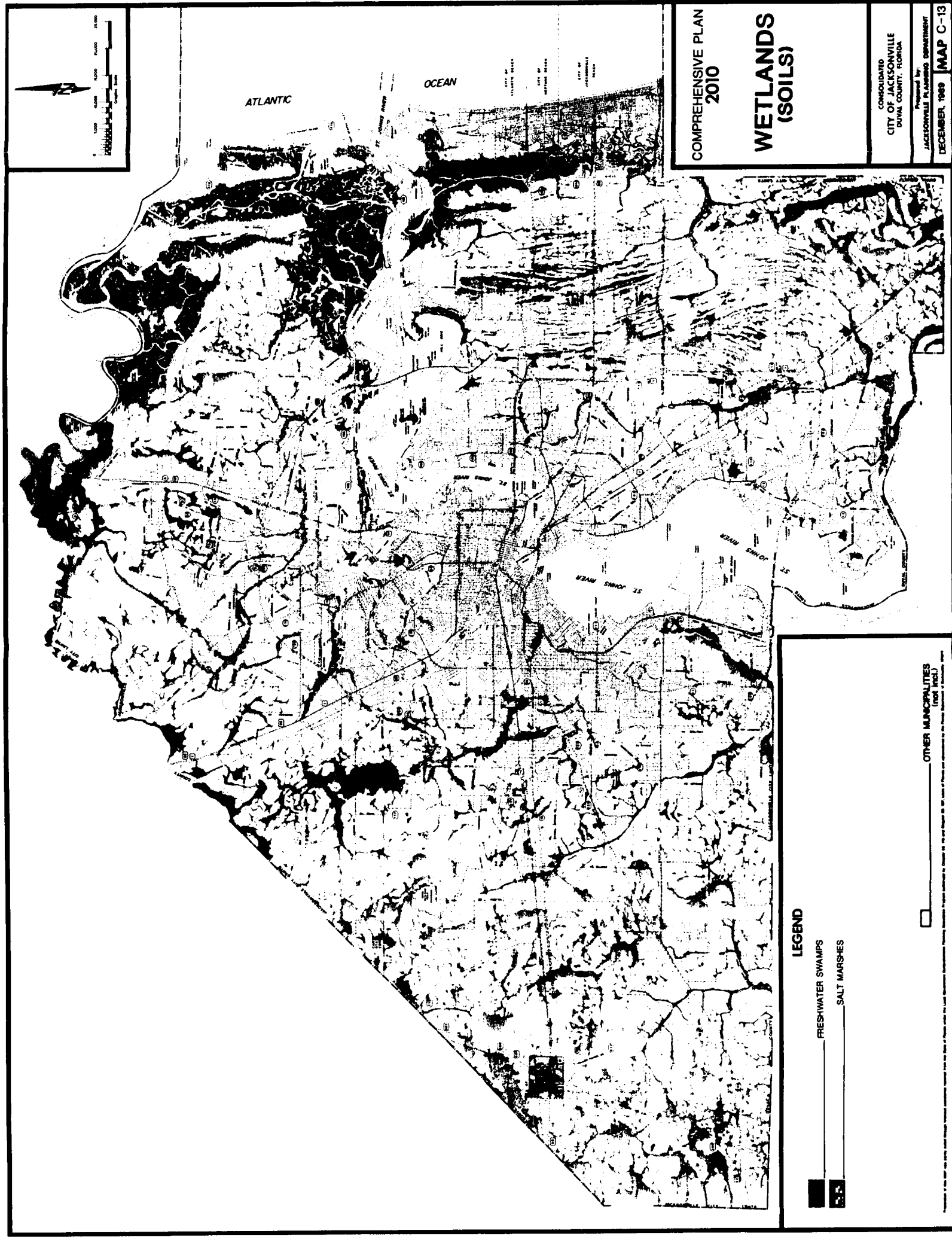
Table 2. Breakdown of existing land use in Jacksonville.

Land Use Category	Area (acres)	Percent of Total
Residential	75,269.12	14
Commercial	6,934.40	1
Industrial	10,142.72	2
Recreation and Open Space	5,478.18	1
Public Buildings and Facilities	56,170.25	11
Historic Resources	196.60	0
Conservation	6,202.00	1
Agriculture	127,620.00	24
Vacant	198,829.93	37
Water	47,398.20	9
Total Area	534,931.40	100

Source: Jacksonville Planning Department. (1990a). *Comprehensive Plan 2010: Future Land Use Element*. Jacksonville, FL: Jacksonville Planning Department.

There are heavy development pressures in Jacksonville resulting from diverse economic activities and the burgeoning population they support. Jacksonville's population has been growing steadily in the past several decades, increasing over 100% since 1950 from 293,180 residents to 648,476 residents in 1990. This growth has been accompanied by significant increases in housing demand and related service activities (JPD, 1990a). The new development answering this demand has been, and continues to be, concentrated in the south and eastern portions of the city, including the small incorporated cities located to the east, along the Atlantic coast, which are served by Jacksonville's infrastructure. Such movement towards the coast has a heavy impact on environmentally sensitive lands, including wetlands.

Jacksonville's environmental characteristic is typical of a coastal city. Elevation within the city ranges from sea level along the Atlantic Coast to 198 feet above mean sea level in the extreme southwestern section. The topography is characterized by gently undulating rolls consisting of a series of north-to-south parallel ridges that are interspersed with poorly drained areas and sizable swamps. The average annual rainfall for Jacksonville is approximately 53 inches, with half of that precipitation falling between June and September. A majority of the land area within the city has a slope of less than 4%, thus slopes are not a constraint to development. The primary problem is the combined effect of the low elevation, relatively high rainfall, and poor drainage which create large floodplains and scattered freshwater wetlands, and, along the coast, significant estuarine wetlands (JPD, 1990b). Figure 9 shows the locations of wetlands as mapped according to hydric soils, and Figure 10 shows the location of environment-



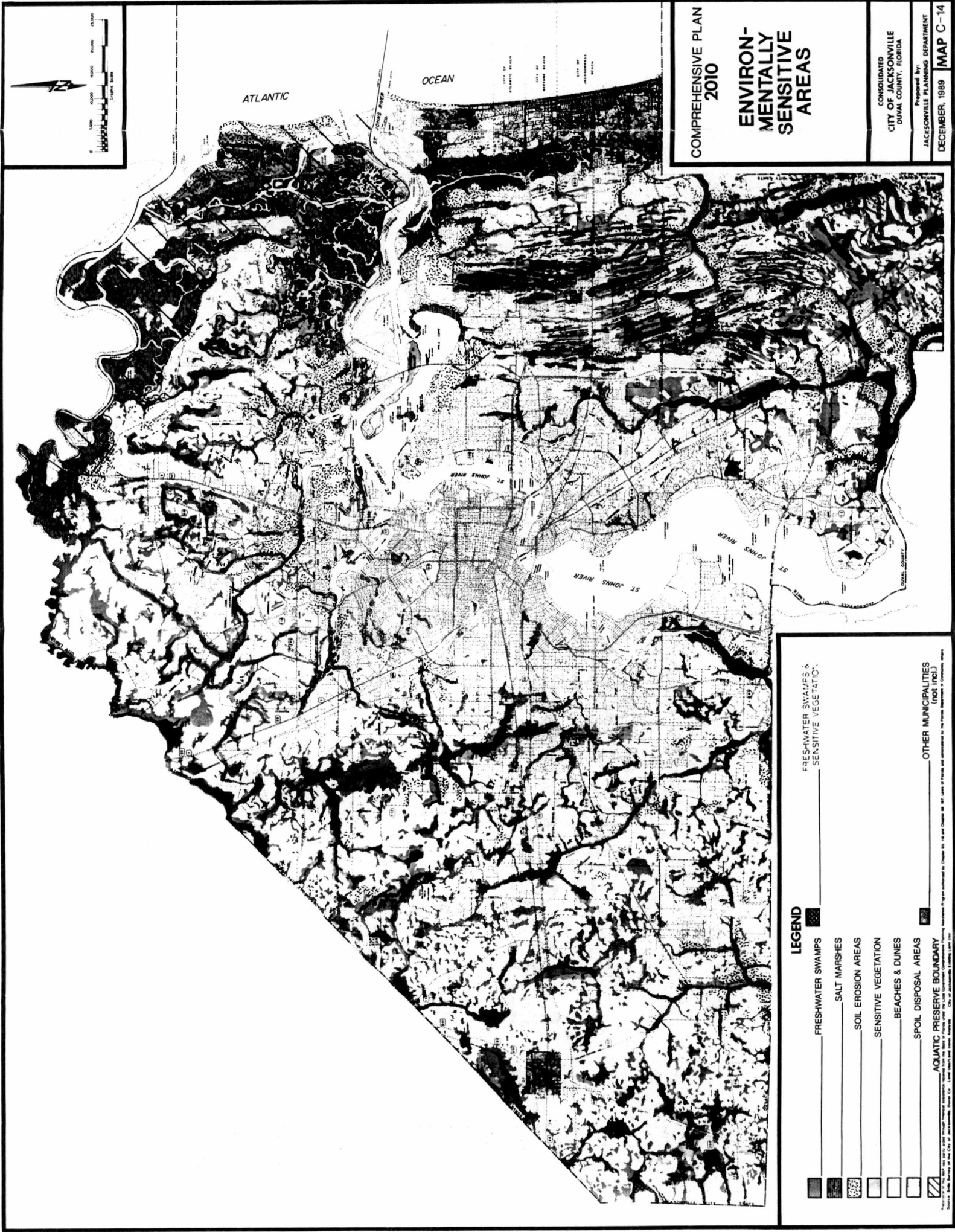


Figure 10. Location of environmentally sensitive areas.

Source: Jacksonville Planning Department. (1990b). *Comprehensive Plan 2010: Conservation/Coastal Element*. Jacksonville, FL: JPD.

ally sensitive areas within the city. Because wetlands in the state are determined primarily by vegetation, this map should not be used as defining wetlands boundaries. It is a planning tool only, allowing an estimation of areas prone to wetland establishment. It is currently the only "wetlands" map available to planners in Jacksonville (Theresa Snyder, personal communication, April 22, 1992). Wetland boundaries should be determined on a case-by-case basis subject to the rules of delineation for the appropriate agency.

Wetlands are encountered throughout the city, comprising approximately 23% of the total land area, and are located primarily along the St. John's River and its tributaries in the eastern portion of the city (JPD, 1990a). These areas are considered to be poorly suited for development due to excessive wetness and flooding potential. Jacksonville's wetlands can be categorized into two predominant groups: freshwater marshes and swamps, and tidal marshes. Freshwater marshes are the predominant type, found in lowlying areas along rivers or streams and in valleys and depressions above the influence of saltwater. They are saturated to the surface most of the year. Tidal marshes are found along large tidal embayments, influenced by the intrusion of saltwater and the tides. These are located primarily to the northeast of the city (JPD, 1990a).

Wetlands are considered to be a valuable natural resource in Jacksonville (JPD, 1990b). However, little consideration has been given to them as the city has grown. Since the late 1800's, the COE has filled numerous wetlands within a 15 mile perimeter of the St. John's River with spoil material, dredged from navigation channels regulated by them. Much of the upland area in the eastern portions of the city has developed on

this fill (JPD, 1990a). Protection of wetlands within the city has only occurred recently as a result of the state permitting regulations over dredge and fill activities in wetlands. However, as mentioned, the permitting process in Florida has only limited success, and many unpermitted activities continue to contribute to the average annual statewide wetland loss of 26,000 acres per year (FDER, 1991). In the state, exempt agricultural practices are found to heavily influence this number, and in Jacksonville, where agriculture encompasses nearly a fourth of the land area, the same is held true (JPD, 1990a). However, as mentioned, lands available for agricultural use are declining as urban development expands, and these two land uses serve as the primary sources of conflict with wetlands protection.

Projected conditions

Land use needs for almost all uses are projected to increase with the exception of agriculture. These needs are associated in large part with the projected growth patterns of the city. Jacksonville's overall resident population is projected to grow from the 1990 census figure of 648,476 to 780,533 in the year 2010, a 20% increase (JPD, 1990a). The key to the associated wetlands threats lies in the areas of the city expecting the most growth, as shown in Table 3 on the following page. The Greater Arlington and Southeast planning districts contain almost 50% of the city's total population. Combined they are projected to grow 44% through the year 2010. This places enormous development pressure on the vacant lands in those areas, including the extensive wetland areas located there. Currently, the Greater Arlington district contains 24,965.2 acres of

undeveloped land, of which 7,349.6, or 29%, is wetlands. The Southeast planning district has 67,016.8 acres of undeveloped land containing 22,431.3 acres of wetlands--over a third of its total. The Southwest district, which is expecting a population growth

Table 3. Population growth projections by planning district.

Planning District	Resident Population		
	1990	2010	Percent change
Urban Core	44,475	41,680	-6
Greater Arlington	159,563	173,967	+9
Southeast	148,331	200,926	+35
Southwest	124,148	155,432	+25
Northwest	132,584	152,036	+15
North	39,375	56,492	+43
Total Population	648,476	780,533	+20

Source: Jacksonville Planning Department. (1990a). *Comprehensive Plan 2010: Future Land Use Element*. Jacksonville, FL: Jacksonville Planning Department.

U.S. Department of Commerce, Bureau of the Census. (1990). *Census of Population and Housing*. Washington, DC: Department of the Census.

of 25%, has 75,390.4 acres of undeveloped land, of which only 3,192.1 acres is wetlands (JPD, 1990a). The Southwest district appears, from an environmental point of view, to be more capable of absorbing growth without endangering wetlands than the eastern districts. However, development continues to be concentrated in the southeast.

Projected development demands call for an increase in dwelling units of 97,911 by the year 2010. This equates to a total land area demand for housing of 26,588.5 acres (JPD, 1990a). A majority of this demand is expected to be fulfilled in the Greater

Arlington and Southeast districts. Demand for commercial development closely follows residential growth. Currently, commercial uses occupy land area at a ratio of 10.9 acres per 1000 people. This ratio is expected to grow to 12.75 acres per 1000 people in 2010 (JPD, 1990a). This equates to a projected need of 1,683.7 additional acres of commercial development for the city. Of this amount, 854.2 acres, nearly half of the projected amount, will be required in the Greater Arlington and Southeast districts. Industrial uses will grow moderately, with a projected need for 915.0 acres of land for heavy industry, and 2,135.4 acres required for light industry (JPD, 1990a).

Light industries are quickly moving into the suburban areas making use of newly developed business parks. The impact on the Greater Arlington and Southeast districts is currently unknown, though it is expected that a good portion of this new development will happen in these districts (JPD, 1990a). Public transportation will require an additional 3,401.7 acres to support new development. Again, this is expected to impact heavily in the Greater Arlington and Southeast districts. One of the first impacts is already being witnessed with the construction of a new highway connector through the Southeast district. Plans for the new highway show it travelling directly through an area of dense wetland habitat in the central portion of the district (JPD, 1990a). Residential and commercial development will likely follow this new roadway having significant impact on the wetlands in that area (Theresa Snyder, personal communication, April 22, 1992).

The location of the highway is highlighted in Figure 11, Environmental Constraints to Development. This figure overlays the two predominant constraints in the

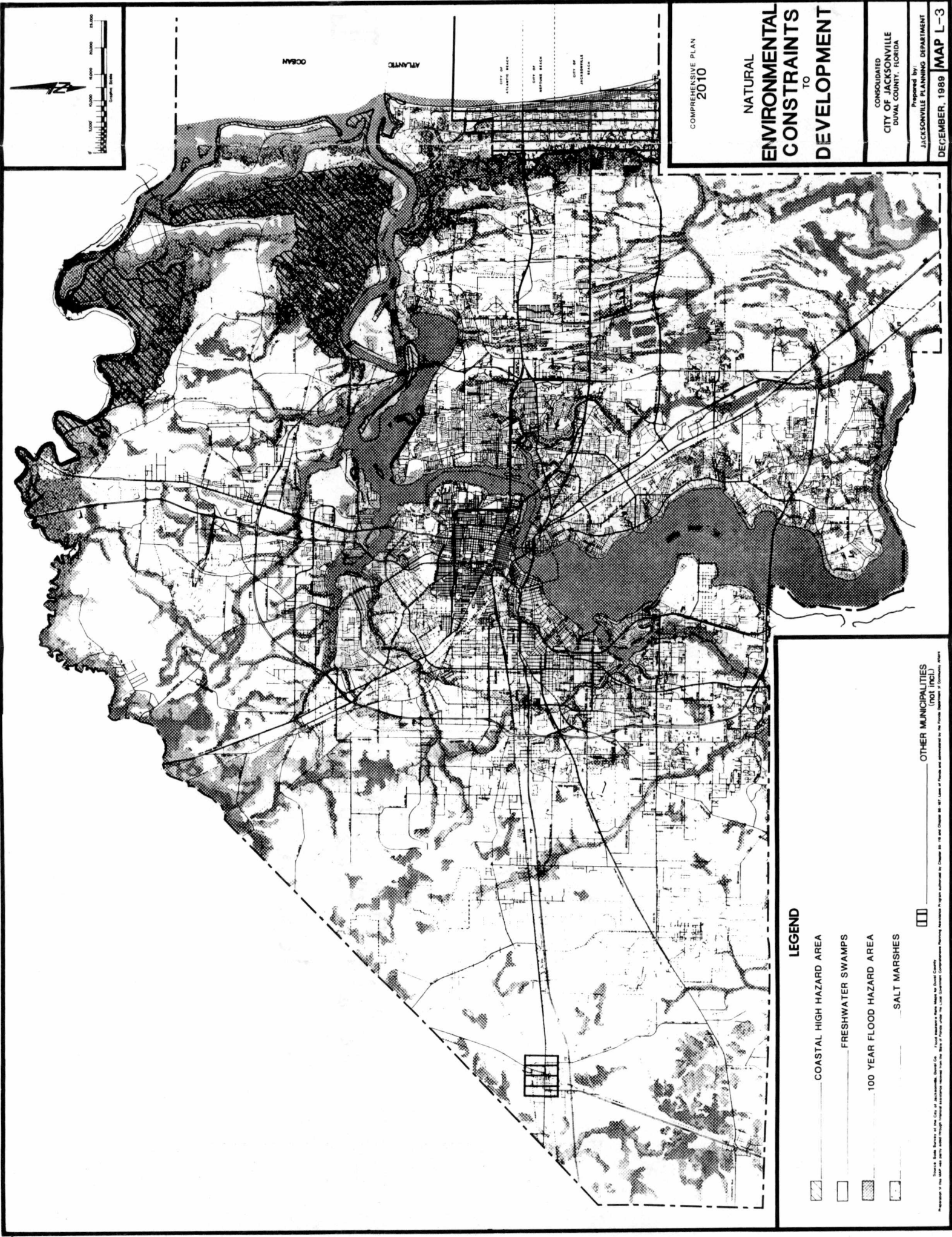


Figure 11. Environmental Constraints to Development.

Source: Jacksonville Planning Department. (1990a). *Comprehensive Plan 2010: Future Land Use Element.* Jacksonville, FL: JPD.

city, wetlands and floodplains, in an attempt to identify those areas poorly suited to development. As can be seen, the Southeast district, which expects the second largest increase in growth, also has the greatest environmental constraints. Conflict between protection efforts and development are already being felt and are expected to continue throughout the planning period (Theresa Snyder, personal communication, April 22, 1992). Future land use as projected for each of the six planning districts is provided in Appendix A. These maps help to illustrate the precarious position that wetlands hold in the face of such enormous growth.

Current planning strategies for wetlands protection

The City of Jacksonville protects its wetlands resource primarily by regulatory means, both directly and indirectly. Foremost among these is the comprehensive planning process as mandated by the state. As mentioned, local comprehensive plans must be consistent with and further the policies set forth in state and regional plans (DCA, 1987). State policies regarding wetlands were discussed in Chapter 3. The most important of these stated that the state shall "protect and restore the ecological functions of wetlands systems to ensure their long-term environmental, economic, and recreational value" (F. S. § 187.201(10), 1991). This policy is furthered at the regional and local levels.

Jacksonville is a part of the Northeast Florida Regional Planning Council (NFRPC) as established by Chapter 186, F. S. In its comprehensive regional policy plan, the NFRPC presented numerous detailed policies to guide development of local

comprehensive plans within its district. In introducing specific policies, the NFRPC states that:

... the Regional Council's policy is to *discourage any development in wetlands or floodplains* [italics added] and to minimize other impacts such as road crossings and pollution from runoff. These wetlands systems are important not only for their aesthetic beauty, but also for their value in storing flood waters, augmenting stream flow, filtering nutrients from polluted water and providing fish and wildlife habitat. (Northeast Florida Regional Planning Council [NFRPC], 1987, p. 188).

It further states that "many isolated wetlands which make up a significant regional resource are not adequately protected [by current regulations]", and calls for increased protection efforts by local governments through use of land use regulations (NFRPC, 1987). The following goal and policies were established for the region:

Regional Goal: By 1995, significant wetlands, uplands and floodplains should be protected through a coordinated management plan by Federal, State and local governments.

Policies: Wetland areas should be maintained or restored to provide natural cleansing of surface water runoff, to aid water storage, and for aquifer recharge.

Discourage alteration of and encourage incentives for preservation of natural/native vegetation along the region's waterways to prevent erosion, retard runoff, and preserve natural beauty.

Developments should be designed to protect the type, nature, and function of floodplains, wetlands, waterways, estuaries and lakes through methods such as limiting: encroachment, removal of native vegetation, pollution discharges, dredge and fill, and drainage.

Mitigation, where appropriate, should be provided when wetlands and marine habitats are impacted through development activities such as dredge and fill. Mitigation can include conservation of upland buffers and wetlands restoration. (NFRPC, 1987, p. 216-218).

These policies, as mandated, are carried down to the local level, and Jacksonville's local comprehensive plan contains an extensive policy section supporting the protection of wetlands. The plan introduces both policies and performance standards

that are to be used in decision-making where the fate of local wetlands is at stake. It begins by presenting the city's primary goal for wetlands protection:

To achieve *no further net loss* of the City's remaining wetlands ... and increase the quantity and quality of the City's wetlands resource over the long-term, as a way of supporting the goals of the National Wetlands Policy Forum to maintain and increase the nation's wetland resource base, and to protect and improve the water quality and fish and wildlife values of wetlands. (JPD, 1990b, p. 32)

Here the federal goal of "no net loss" has now worked its way down to the local level, where the methods for implementing this goal are established in the local plan and in local land use regulation which must support that goal. The city acknowledges that "wetlands have suffered extensively from development pressure ... [and that] encroachment remains a major issue for growth management" (JPD, 1990b, p. 32). It thus establishes four major objectives in support of the goal. The first of these calls for the development of a "coordinated program for the effective regulation and protection of wetlands" (JPD, 1990b, p. 32). This objective outlines the effort to increase the regulatory powers held by the city over wetlands, including greater powers over currently exempted activities such as agriculture, greater enforcement powers, and establishing a larger jurisdiction than is currently held by the state. In essence, Jacksonville hopes to become a regulatory "coordinator", facilitating existing regulatory efforts and supplementing them with its own stricter regulations, thus ensuring protection of the city's wetlands base (Theresa Snyder, personal communication, April 22, 1992; JPD, 1990b). The city proposes that the existing Bio-Environmental Services Division (BESD) be granted the role of coordinator, enhancing their position beyond that of advisor to state regulatory agencies (JPD, 1990b).

The greatest problem here, again, is funding. The city proposes to take on a great deal of permitting and enforcement responsibility which requires large amounts of funding to adequately carry out these duties. Currently, the state has not identified any funding increases for cities willing to take on these responsibilities, and in a time of recession, local budgets are tight (Theresa Snyder, personal communication, April 22, 1992). This presents an interesting dichotomy, where the state prefers that wetlands be addressed through comprehensive planning and local land use regulation, deferring responsibility for implementation to the local governments, yet not providing the funding necessary to implement this desire (Kenneth Berk, personal communication, April 13, 1992). Thus most localities prefer to leave regulatory authority to the state. Jacksonville is no exception in this respect, with its proactive wetlands policy reflecting state desires more so than local ones (Theresa Snyder, personal communication, April 22, 1992). A second problem with these policies lies in the enforcement provisions. Jacksonville is a very large city with a wetland area 23% of its total size (JPD, 1990b). Enforcing permit conditions over every wetland impacted by some activity is extremely difficult, as evidenced by the difficulties faced by federal and state agencies in managing their own regulatory programs (Laycock, 1990; FDER, 1991). Jacksonville has not yet established a method that would allow adequate enforcement of all permitted activities to ensure compliance, and, when developed, such a program will heavily tax the city's resources (Theresa Snyder, April 22, 1992).

The second objective established for Jacksonville calls for the development of "management and protection strategies for those contiguous and isolated wetlands which

have particular ecological values for the City" (JPD, 1990b, p.34). Supporting policies call for an identification and mapping process to define such areas. "Special Management Area Plans" will be prepared for these areas to ensure their protection in the face of development pressures. Performance standards are presented that limit allowable density in and near these special management areas, that strictly regulate the establishment of stormwater management systems near these areas, and that call for mitigation strategies in the event that some portion of a "special management area" is lost to development (JPD, 1990b).

The third objective calls for action on the part of the city to "implement immediate wetland protection efforts to complement" other programs in existence or planned for. Policies identified under this objective establish deadlines by which particular activities are to have been accomplished. This objective reflects an administrative aspect of the wetlands protection policies of the city (JPD, 1990b).

The fourth objective is probably the most important of the four presented, for it establishes city policy for the protection and conservation of wetlands through land regulation and mitigation. It again makes use of performance standards for development and outlines the process by which approval will be granted for activities proposed in or near wetland habitats (JPD, 1990b). Policy definition begins by presenting development review criteria, the emphasis of which is ensuring that development will not adversely affect the fish and wildlife values of a particular wetland. The city places the burden of proof on the developer by stating that the:

... developer must provide reasonable assurances that a proposed development will not impact wetlands functions so as to cause adverse impacts to :

- A. the habitat of fish, wildlife, and threatened or endangered species,
 - B. the abundance and diversity of fish, wildlife, and threatened or endangered species,
 - C. the food sources of fish and wildlife, including those which are threatened or endangered,
 - D. the water quality of the wetland, and
 - E. the flood storage and flood conveyance capabilities of the wetland.
- (JPD, 1990b, p. 35b).

The city determines wetland function and value using a checklist similar to that of the SJRWMD, looking at 1) the size of the wetland, 2) hydrologic connections to other off-site wetlands or bodies of water, 3) the condition of the wetland, 4) the uniqueness of the wetland, and 5) the surrounding landscape. These factors are weighed against the need and benefit of the proposed development for permit approval (JPD, 1990b).

Mitigation plays heavily into Jacksonville's wetlands policies supporting no net loss. While the city tends to downplay it as a condition of permit approval, it does establish strict rules about its use to offset a potential loss to development. As stated in the plan:

... the developer must provide reasonable assurance that the development will not cause adverse impact on wetlands functions which is not offset by mitigation, unless denial of the order would render such action to be a taking without compensation. ... Wetland mitigation will be acceptable only if the proposed design alternative minimizes, to the extent practicable, wetland impacts and the mitigation offsets adverse impacts to wetlands functions. ... The City shall consider wetland mitigation proposals on a case-by-case basis. Mitigation can consist of wetland creation, wetland enhancement, or in certain circumstances, placement of wetland or upland areas in conservation easement [*sic*]. (JPD, 1990b, pp. 35c-d)

The city requires that all proposed mitigation restore the wetlands functions lost to development through creation or enhancement of a similar type of wetland, and establishes guidelines by which the extent of mitigation required is determined, including ratios of restored wetland area to lost wetland area of up to 2:1 (JPD, 1990b).

As mentioned, Jacksonville does not accept regulatory responsibility without some reservation. The plan states that protection programs developed as policy for the city "shall not duplicate existing federal, state, or water management district programs", stating that permits issued by these agencies "provide the reasonable assurances necessary for compliance" with city policy (JPD, 1990b, p. 35f). However, the city reserves the right to veto any permit decision which it considers to be contrary to the policies established by the plan, especially concerning special management areas (JPD, 1990b).

This deference to state permitting regulations echoes the fact that permitting, according to Chapters 373 and 403 F. S., remains the driver of wetlands protection efforts in the city. While the comprehensive plan establishes policy and standards that aspire for wetlands protection, the permitting process at the federal, state and local level remains the primary method of implementation for protection policies (Kenneth Berk, personal communication, April 13, 1992). The city, in Chapter 714 of the Jacksonville Municipal Code (J. M. C.), has established requirements for dredge and fill permits for *any activity* taking place in submerged lands within the city. Unlike the state and federal regulations, agricultural activities are not exempt. However, an exemption is granted to those activities not exceeding "four thousand cubic yards of material placed in or removed from" waters of the state (J. M. C. § 714.111, 1990). "State waters" are

determined by the rules of the FDER. The city's permitting requirements are reviewed concurrently with FDER permit applications, but are required separately from them. Thus, it would seem that local permitting merely adds another layer to an already complex permitting process.

Following the state mandate to develop land use regulations that implement wetlands protection policy, Jacksonville has incorporated wetlands provisions into many of its local land use regulations. In Chapter 654, J. M. C., the Code of Subdivision Regulations, design standards are established for wetlands and lands adjacent to water bodies. The regulations begin by stating that "all developments must be in compliance with the Goals, Objectives and Policies found in the Comprehensive Plan" (J. M. C. § 654.119, 1990). The regulations emphasize the requirement of obtaining the appropriate permits for activities in wetlands, and outlaws any activity not having such permits. The city's Planning Commission is provided powers to prepare any special design standards necessary for a proposed development to remain in compliance with city policies (J. M. C. § 654.119, 1990). As stated in the ordinance:

Flexibility, good design, and layout for development of the land is encouraged to promote the preservation of historical and archeological sites, wetlands and environmentally sensitive areas, natural and native features of the land, and to provide recreation and open space. This shall be accomplished by clustering development, Planned Unit Developments, easements to the City of Jacksonville, State of Florida and Federal agencies, etc. (J. M. C. § 654.124, 1990)

Proposed subdivision plats must accurately delineate the locations of all wetlands and identify the methods being used to protect the resource or offset the impacts of development in order to gain approval.

Ironically, Jacksonville does not yet have a wetlands protection zoning ordinance in place, though the city is in the process of developing one in answer to concerns of the DCA. A draft ordinance was prepared approximately two years ago in an effort to afford better protection to the city's wetlands resources, but the ordinance was thrown out by Council for being too restrictive (Dana Morton, personal communication, April 22, 1992). Resistance to the ordinance came primarily from agricultural interests rather than development ones, in fear that these regulations would impact the large silvicultural industry still located in some of the more rural areas within the city limits.

Without a wetlands protection ordinance in place, the city has had to depend upon other elements of the zoning law and its floodplain ordinance to control activities in wetlands. The "density/intensity bonus" was developed to provide developers with incentives to avoid development in wetland and other environmentally sensitive areas (J. M. C. § 656.1401 et seq., 1991). As stated in the ordinance:

The purpose of [the density bonus] is to encourage new development and redevelopment that is designed to fulfill various goals, objectives and policies of the Comprehensive Plan. Meeting specific plan policies will allow the accumulation of bonus points, which translates into increased density and reduced parking and dimensional requirements. (J. M. C. § 656.1401, 1991)

Points are awarded to a development based upon a number of development standards established in the ordinance. For environmentally sensitive lands such as wetlands, the donation of a minimum of five acres of wetland habitat to a conservation easement will qualify for between 7 and 13 points, dependant upon the size of the donation and the value of the wetland. Accumulated points are then exchanged for a percentage increase in density, a percentage reduction in lot or yard size requirements, or a percentage

reduction in off-street parking requirements (J. M. C. § 656.1402-1403, 1991). One problem with this concept lies in the five-acre minimum requirement which leaves open the potential cumulative loss of small isolated wetlands. This program is popular among developers and city administrators, though, and the city hopes to build on such programs as an effective means of wetlands protection (Theresa Snyder, personal communication, April 22, 1992).

Jacksonville's floodplain regulations provide an indirect method for wetlands protection by regulating activities taking place within a designated floodplain district. Because many wetlands are located within floodplain areas, they are protected by default. However, as is typical of the use of floodplain ordinances to protect wetlands, not all activities destructive to wetlands habitat are disallowed because they are not threatened by flood activity. The Jacksonville floodplain ordinance was designed primarily to protect against the hazards associated with flooding (J. M. C. § 652.101, 1990). The ordinance permits uses deemed compatible with floodplain areas that do not pose a threat to the public safety, health or welfare. These activities include agriculture, industrial, commercial, and residential uses such as parking and lawns, recreational uses, and nonpermanent storage structures, many of which may adversely impact wetlands (J. M. C. § 652.104, 1990). Where wetlands are found in a floodplain, and an activity is proposed that may threaten the function of those wetlands, jurisdiction is deferred to the FDER for permitting.

As written in Chapter 163, F. S., Jacksonville and all municipalities are required to have in place a "concurrency management system" for growth management. While

not written with the intent to protect wetlands, this plan impacts wetlands protection efforts by the policies it establishes for growth management. Within Jacksonville, this regulation is written into Chapter 655, J. M. C., the stated purpose of which is to "ensure the availability of public facilities and the adequacy of those facilities at adopted levels of service concurrent with the impacts of development" (J. M. C. § 655.102, 1991). This ordinance restricts development to those sites having the infrastructure capable of sustaining it. The impact on wetlands protection is self evident where wetland sites previously left free from development now become more desirable due to their proximity to the required infrastructure. Such a danger is one of the primary conflicts evident in the comprehensive planning and land regulation process in Jacksonville. How does the city maintain proper growth management yet continue to protect its dwindling wetlands resources? The prioritization of development versus conservation is a source of continued conflict among Jacksonville planners (Theresa Snyder, personal communication, April 22, 1992).

Effectiveness of current planning strategy

There are a number of problems that have risen out of Jacksonville's current strategies for wetlands protection, the greatest of which is the incompatibility of promoting growth through infill development while protecting the city's remaining wetlands from that development. As Jacksonville heads into the next century and its projected growth patterns come to fruition, severe conflicts will come to the forefront

during attempts to prioritize planning issues. A good example lies in the housing needs of the city.

With Jacksonville's population expected to increase 20% in the next twenty years, a significant amount of housing will be necessary. This housing is expected to be predominantly single family, with 88% developed at an average gross density of less than 4 dwelling units per acre (JPD, 1990a). Such development requires an extensive amount of land. The comprehensive plan promotes infill development and calls upon the city to provide housing for residents at all levels of income. The problem here lies in the fact that housing costs in Jacksonville have been steadily increasing in the past several years. Affordable housing is becoming a dream as housing costs exceed the percentage of income available to support the housing market (JPD, 1990c). As written in the Regional Policy Plan:

... the median income Jacksonville family in 1970 could afford the median price new house on the market. In 1980, in contrast, only a few families who either earned more than the median level or had a large equity from a former home purchase were in the new home market. ... In summary, in 1980, 80% of Jacksonville's white families had incomes below qualifying for a conventional new single family home; 65% had incomes below qualifying for a conventional existing single family home. ... 93% of Jacksonville's black families had incomes below qualifying for a conventional new single family home; [while] 87% had incomes below qualifying for a conventional existing single family home. (NFRPC, 1987, p. 92)

The decreasing amount of vacant land free of environmental constraints, land use restrictions on environmentally sensitive lands, and growth management policies perpetuate this problem. Development regulations and codes that cover environmentally sensitive areas impose significant costs on the developer, which are in turn passed on to

the consumer. For instance, a degraded wetland area at an infill site promoted by the city's growth management strategy will cost more to develop in terms of permitting requirements, special design considerations and construction practices. Land use regulations such as those protecting wetlands impart an additional cost to the consumer that he is not yet ready to absorb. As stated in the Regional Policy Plan, "current regulations and the processes for their implementation frequently act to block provision of new housing types, construction techniques, and materials affordable to a majority of current and future residents" (NFRPC, 1987, p. 95). The plan goes on to say that:

Regulation of residential land use is essential for a number of important reasons. Among these is the need to conserve the natural environment to protect the health and security of all citizens, the investment of existing property owners, and to minimize long-term public costs. Experience has proven that the public will have to bear high future costs in the absence of health, safety and environmental constraints. However, it is equally essential that regulations and the regulatory process be periodically reviewed and updated in the context of technological, economic and demographic changes. This can ensure that, while retaining their necessary role of preventing future costs to the public, codes are not arbitrarily and inflexibly imposing costs on the housing consumer and the public. (NFRPC, 1987, p. 95)

Conflicts are also found in the text of state, regional and local policies. These plans attempt to satisfy the needs and concerns of all elements, be they of housing, environmental, or any other interest. In a city whose remaining vacant lands are 23% wetlands (JPD, 1990b), exclusive of any other environmental constraint, a pro-growth, pro-development yet pro-protection policy creates an enormous obstacle to the success of "no net loss". Other problems found in the current planning strategy again lie in funding. Without adequate funding in place to support the responsibilities of local

government to protect wetlands through land use regulation and enforcement, wetlands will continue to be lost to both agricultural and development interests.

The planning strategies mandated by the comprehensive planning process are still in their infancy, and it is difficult to determine whether they are successful or not. Despite the problems found inherent in the system, the planning process in Jacksonville is comprehensive, addressing not only permitting as a form of wetlands protection, but creating policies, performance standards and land use regulations that attempt to sustain the goal of "no net loss". In theory, the process should work. In practice it has difficulties (Theresa Snyder, personal communication, April 22, 1992). But these difficulties will be addressed as the plans are revised. Planning for wetlands protection is an iterative process, and as time goes on, it will be possible to see how these practices fare in protecting the city's remaining wetlands base. If successful, they may be applicable as a model for the protection of wetlands elsewhere.

CONCLUSION

Currently, there is no formal method available to state and local governments that provides a holistic view of the regulatory methods being developed and implemented across the nation. This study has merely scratched the surface in its presentation of federal, state (Florida), and local (Jacksonville) activities. However, a recent article in *Urban Land Magazine* entitled "The wetlands debate" succinctly outlined many of the issues faced by planners attempting protection of wetlands through use of regulation. All of these have been identified in the text of this study as impacting the effectiveness of regulatory practice at the federal, state, and local level. As outlined, these issues are identified as: 1) definition of federal jurisdiction, 2) regulation of isolated areas, 3) classification of wetlands, 4) federal decision-making, 5) federal/state relationships, 6) mitigation, 7) comprehensive planning, 8) judicial review and administrative appeals, and 9) private property issues (Albrecht, 1992). Resolution of these issues is the key to developing protection strategies that will effectively reverse the continuing trend of loss. The federal government must develop a comprehensive, orderly policy plan for wetlands that can be carried down to the state and local levels. Without it, the "piecemeal" legislative efforts currently being used will continue to result in "piecemeal" wetlands protection.

Definition of federal jurisdiction is a highly controversial issue, but an essential one to the effectiveness of regulation at any level (Albrecht, 1992). It is essential that

a standard definition of wetlands be developed at the federal level to guide policy-making at the state and local levels. As it stands, regulation of wetlands is convoluted by the complexity and plurality of federal jurisdiction. Four different federal agencies, the COE, EPA, SCS, and FWS, regulate activities in wetlands to some extent, each defining wetlands according to different criteria, and each defining their jurisdictions in a different way. The confusion this creates is compounded as regulation moves into states and municipalities, each of whom develop their own definitions and jurisdictions as befits their purposes (Salvesen, 1991). Jacksonville, Florida's regulatory jurisdiction is a good example of this where, in addition to federal agencies, there are three state agencies and one municipal agency regulating wetlands (FDER, 1990b; J. M. C. § 714.101 et seq., 1990). As mentioned in the text, the simple question of "what is a wetland?" does not have a single, simple answer. Until a standard definition is developed to guide protection efforts and allow true comparison monitoring of wetlands losses and gains, a national "no net loss" goal will not be achieved.

Regulation of isolated areas creates controversy due to the lack of understanding of their cumulative importance (Laycock, 1991). Albrecht (1992) asks the question, "should the federal government regulate small isolated wetlands that have no connection to the aquatic ecosystem, or should such areas be left to the states?" (p. 21). Many would insist that it is the role of the federal government to provide regulatory guidance to the states regarding such issues. Thus the federal government would regulate such areas and leave implementation to the states. However, the current administration is promoting the concept of "new federalism" which would grant this role to the states,

allowing them to regulate isolated wetlands in a manner conducive to their own state policies and existing regulations. The problems inherent in this method are seen in this study, where the effectiveness of state regulation of isolated wetlands varies from state to state (Salvesen, 1991).

In Florida, isolated wetlands are regulated by regional water management districts whose jurisdiction is constrained to those wetlands impacted by surface water management systems (SJRWMD, 1991). There are large gaps in Florida's regulatory programs. When applied across the nation, these gaps compound themselves as states regulate isolated wetlands in different ways according to local values. As mentioned, only 15 states currently have regulations in effect protecting isolated wetlands (Salvesen, 1991). This does not speak well to the ability or desire of the states to accept such a responsibility. Until a definitive policy is in place, and until a definitive scientific basis is developed that would support the need to protect small, isolated wetlands, "no net loss" of these wetlands will not be achieved; and this policy will continue to be "nickled and dimed to death by the loss of an acre here and a dozen acres there" (Graham, 1991, p. 106).

Classification of wetlands is moving to the forefront as a method by which federal, state, and local governments may balance wetlands protection with growth. However, as Albrecht (1992) asks, "should wetlands be classified according to value? Should lower-quality wetlands be subject to the same regulatory tests as high-quality wetlands?" (p. 21). These are difficult questions, and ones that have not been answered definitively at any governmental level. The conflict over whether wetlands are more

important than the economic growth of an area, no matter how small or degraded those wetlands are, remains one of the sore spots of wetlands regulation (Rosenbaum, 1991). It is difficult for any government to answer these questions because of the unknowns involved. Without the scientific basis on which to decide the actual quantitative or qualitative value of a wetland, how does one know whether classification is correct or adequately reflects the value of a wetland?

As discussed in the text, the federal government has deferred classification to the states. In Florida, permitting agencies have adopted review criteria which emphasize the fish and wildlife, water quality, and stormwater assimilation values of wetlands (SJRWMD, 1991). These criteria are carried down to the local level where development permits are based upon a determination of the value of the wetland to be impacted (JPD, 1990b). However, wetlands are reviewed on a case-by case basis; across the board classification is not used. Florida recognizes that such generalization often does not allow appropriate protection (JPD, 1990b). Can it be used effectively to support "no net loss"? This question cannot be answered reliably. In the case study area, the answer would seem to be no. However, as discussed in the overview of state activities, New Jersey has developed a classification system in its *Freshwater Wetlands Protection Act* which appears to be providing adequate protection of the state's wetlands resources (Mantell et al., 1990).

Without a scientific basis on which to construct classification programs, these programs have the potential of perpetuating loss of important wetland systems because their functions and values were misunderstood or overlooked. Dependence on a

classification system may perpetuate the nation's net loss of wetlands. However, the use of classification systems does allow a compromise between protection efforts and development interests. By classifying wetlands and planning around these classifications, there is potential for removing the ever increasing animosity between the two factions.

Federal decision-making refers to the question, "should a single agency be in charge?" (Albrecht, 1992, p. 21). This question can be applied to all three levels of government, where multiple agencies are found to maintain regulatory authority over wetlands protection. Florida proved to be an excellent example of this phenomenon where up to four state and local agencies carried permitting responsibility concurrently over wetlands in one county. Such plurality "muddies the waters" of the permit procedure, presenting a complex and confusing bureaucracy controlling activities in wetlands (Salvesen, 1991). It would be easier if, at each of the three levels of government, only one agency was in charge. This is the subject of continuing debate in Florida's Legislature ("Wetland's legislation", 1992). But whether it would be feasible, and whether current regulating agencies would be willing to "give up the reins" of wetlands protection remains to be seen.

Federal/State relationships are an important aspect in the effectiveness of wetlands protection. Albrecht (1992) asks, "should the federal government do more to encourage states to take over administration of the Section 404 program? Conversely, if Congress chooses to regulate all areas that qualify as wetlands, no matter how small or isolated, should it simply pass a federal land use act and preempt independent state regulation of wetlands?" (p. 21). These are very difficult questions. As discussed, very few states

are showing an interest to administer the Section 404 program. Without significant incentives from the federal government, it is doubtful that such a trend will change (Salvesen, 1991). However, despite the recognition of Section 404 as the primary method of wetlands regulation, it is not without its faults. Many states, in viewing the shortcomings of the program, have developed programs that are significantly better at regulating wetlands (Salvesen, 1991). As with Florida, the state program is significantly more comprehensive than the federal one, providing a greater degree of protection than that afforded by Section 404. Thus states have a proven ability to regulate wetlands and guarantee their protection if they will exercise their powers to do so.

Passage of a national land use law that would preempt state regulation may cause more harm than good. With states implementing federal policy (Burke et al., 1988), handing down legislation that supersedes state regulation would be a step away from the "new federalism", and serve to complicate state and local methods of wetlands protection. On the other hand, it may serve to consolidate existing state legislation into a single comprehensive protection program. Florida's implementation of the federal CZMA is a good example where numerous regulations were consolidated into one coastal program, bound together by the state's comprehensive plan. However, such programs place enormous responsibility on local governments who are charged with implementation through land use regulations (F. S. 186.001 et seq., 1991). This could eventually lead to a "grinding halt" in program administration when local governments become overwhelmed by administrative duties and are not provided adequate funding for them.

Mitigation continues to promote controversy, again due to the lack of a scientific basis by which to adequately assess whether these efforts are truly successful at mitigating wetlands losses. Albrecht (1992) poses the following questions which are at the heart of the mitigation controversy: "Does mitigation work? What role should it play in the permitting process?" (p. 21). Currently, federal, state and local governments view mitigation favorably as a method for offsetting wetlands losses due to development. Mitigation is used as a condition for permit approvals. Florida has shown significant wetlands benefits due to use of mitigation (FDER, 1991), and though the state tends to downplay its use preferring avoidance, mitigation is used as a viable alternative for protecting development rights while maintaining "no net loss". As was discussed, Florida's permitting agencies are obligated to instruct permit applicants on strategies which will allow permit approval if applications fail other review tests (Hamann, 1985). It appears that mitigation offers a good balancing strategy for governments that allows continued growth and development without the cost of wetland loss.

Comprehensive planning presents the question of its role in federal, state and municipal wetlands protection. The closest program at the federal level is the CZMA, which is implemented at the state and local levels. Few states currently have comprehensive planning laws that adequately address wetlands protection, although Florida provides a good example of how comprehensive planning can be used by a state to manage wetlands protection efforts. As mentioned, Florida's state government prefers that wetlands protection be regulated through the planning process (Kenneth Berk, personal communication, April 13, 1992). It establishes policies at the state level that

are carried down through the local level that promote wetlands protection. At the local level, land use regulations are implemented that promote "no net loss". Such a system, in support of federal and state permitting programs appears to provide a comprehensive approach to wetlands protection that is lacking in most permit programs. Comprehensive plans can provide the policy direction necessary for practical legislation and regulations that protect wetlands. The key is maintaining a uniform policy that works at all levels of government, and that maintains a balance between growth and development and environmental protection.

Implementation of policies established in a comprehensive plan must be careful not to impinge on vested property rights, or appear to promote the taking of property without just compensation. Such appearances perpetuate the conflict between property rights and conservation. This is the question behind the private property issue: "how can the regulatory program be administered to preserve wetlands and at the same time allow private property owners to make reasonable use of their land?" (Albrecht, 1992, p. 21). In developing land use regulations, planners must remain aware of the legal ramifications of those regulations. They must bear in mind: 1) the character of the action, does it protect the public health, safety and welfare? 2) the economic impact of the action, does it remove the economic viability of private property? and 3) does the action interfere with the reasonable use or reasonable investment-backed expectations of the property? (Russ, 1992). The taking of private property, where such takings are found to occur, is the greatest threat to effective regulation of activities in wetlands, and it is important that regulations be passed with great care to avoid such conflict.

Regulation is by far the most effective method of planning for wetlands protection at all three levels of government (Burke et al., 1988). Wetlands are regulated in numerous ways, indirectly and directly through permitting processes and comprehensive planning. The State of Florida has developed a comprehensive method for protecting its wetlands resources consisting of comprehensive planning, land use regulation, and wetlands permitting. There are problems, though, in this method, and Florida continues to fall short of its stated goal of "no net loss". Foremost among these problems are the exemptions granted to agriculture through intense lobbying efforts (Dana Morton, personal communication, April 22, 1992). Until agricultural activities are more restrictively regulated in terms of wetlands protection, the high percentage of wetlands lost annually to agriculture will remain. Agriculture presents an enormous whole in current wetlands regulation--a whole not yet filled due to the powerful agricultural lobby in federal and state government. As long as legislators are swayed by such independent interests, the goals and policies being pursued by regulation will not come to fruition. Such is the case at all levels of government (Rosenbaum, 1991). The time has come for legislators to develop a definitive policy guiding the wetlands protection issue. Legislation must have a single path to follow, and private interests must be educated about the need for such strict policies. Until such straightforward guidance is available to governments, "no net loss" will never happen.

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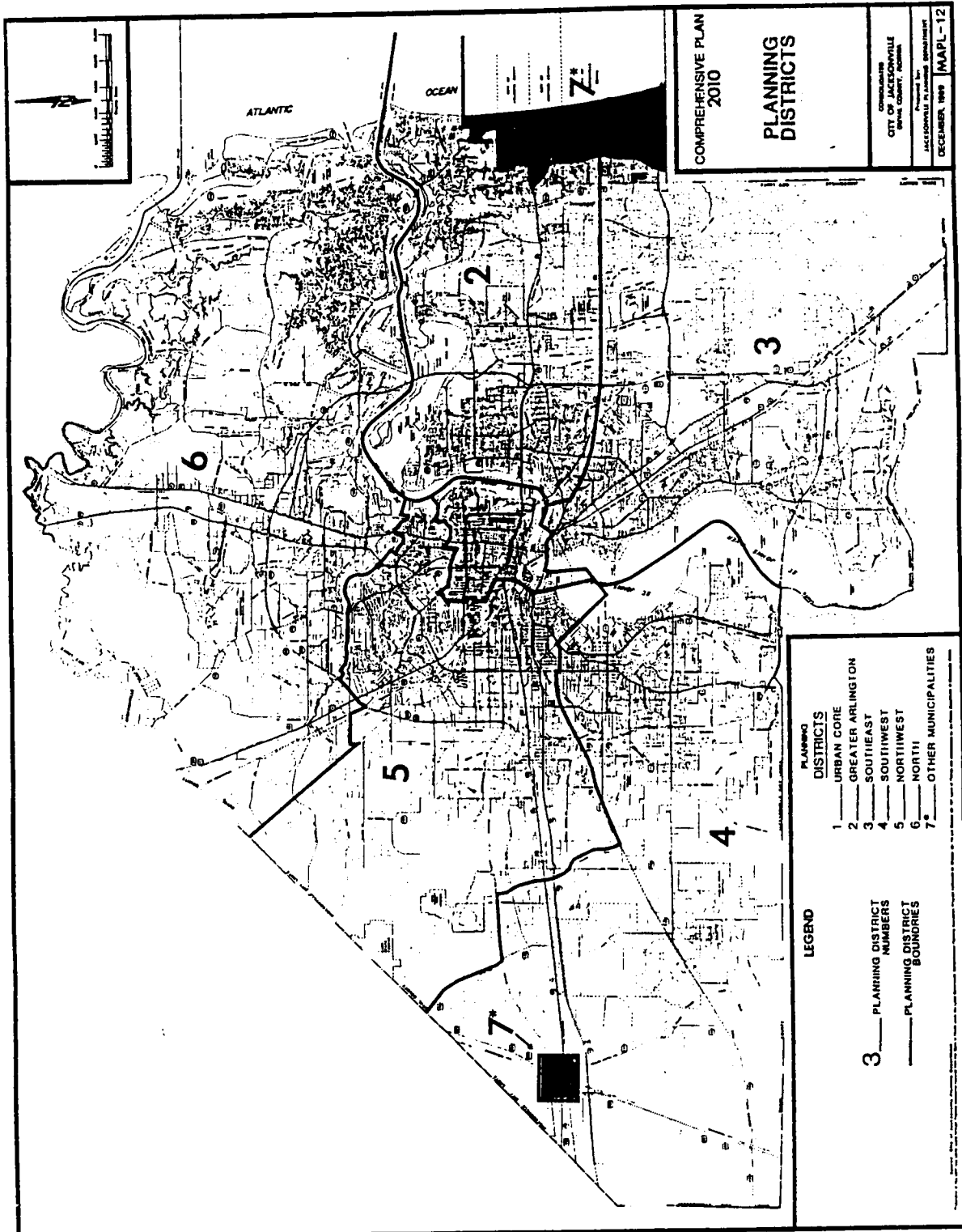
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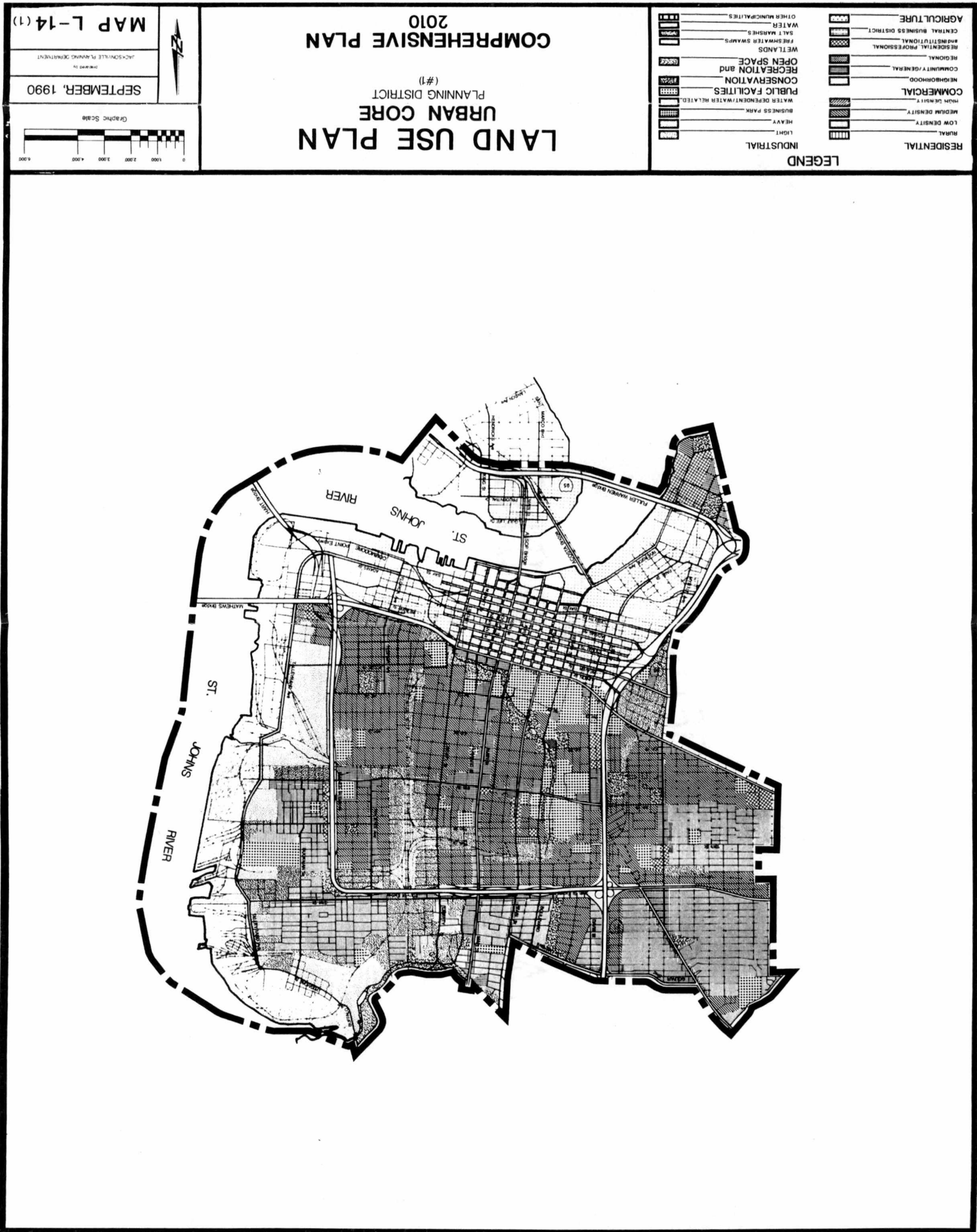
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APPENDICES

APPENDIX A







LEGEND	
RESIDENTIAL	INDUSTRIAL
RURAL	LIGHT
LOW DENSITY	HEAVY
MEDIUM DENSITY	BUSINESS PARK
HIGH DENSITY	WATER DEPENDENT/WATER RELATED
COMMERCIAL	PUBLIC FACILITIES
NEIGHBORHOOD	CONSERVATION
COMMUNITY/GENERAL	RECREATION and OPEN SPACE
REGIONAL	WETLANDS
RESIDENTIAL PROX/ESSONAL	FRESHWATER SWAMPS
INSTITUTIONAL	SALT MARSHES
CENTRAL BUSINESS DISTRICT	WATER
AGRICULTURE	OTHER MUNICIPALITIES

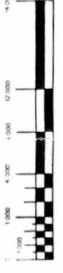
LAND USE PLAN
ARLINGTON
PLANNING DISTRICT
(#2)
COMPREHENSIVE PLAN
2010



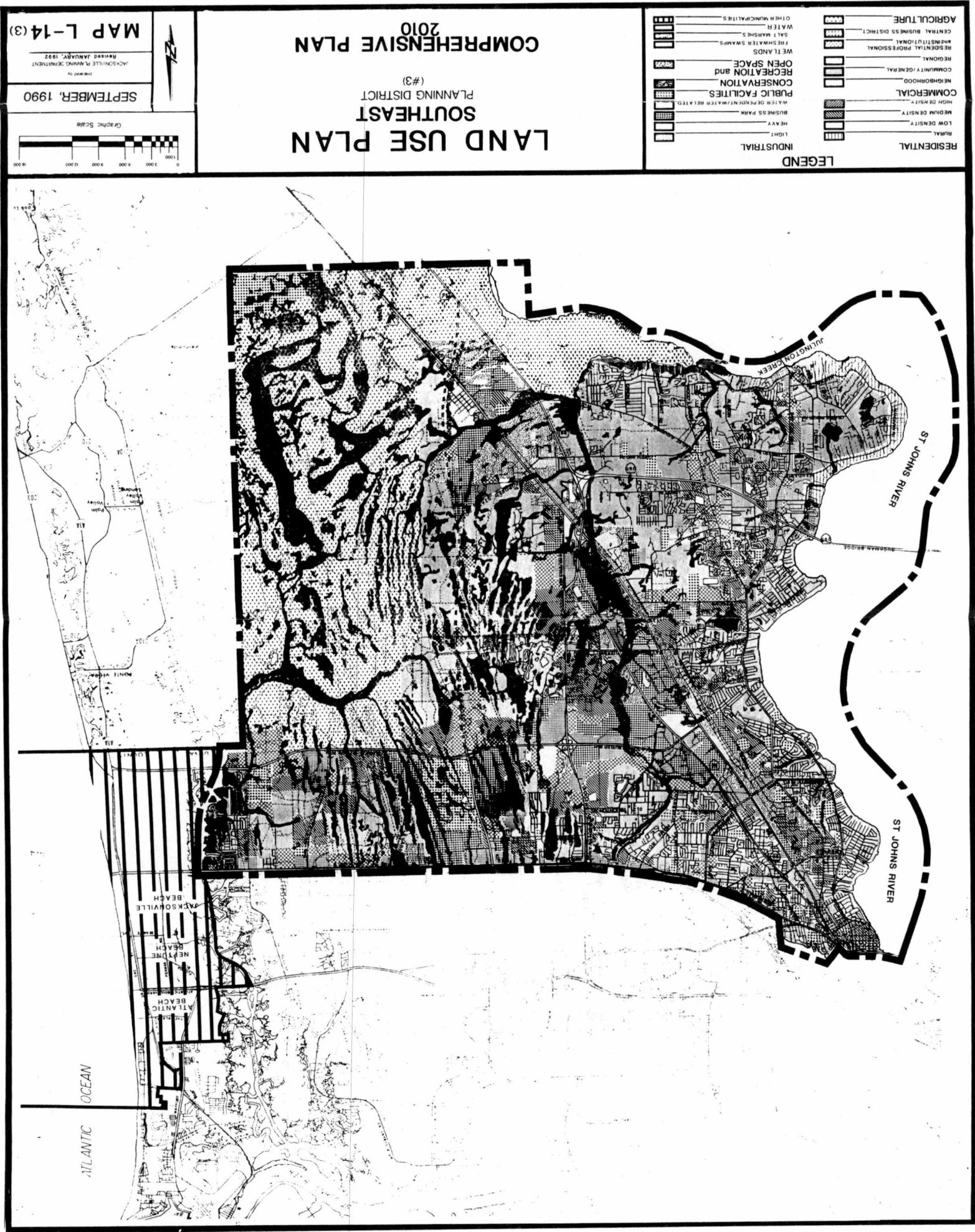
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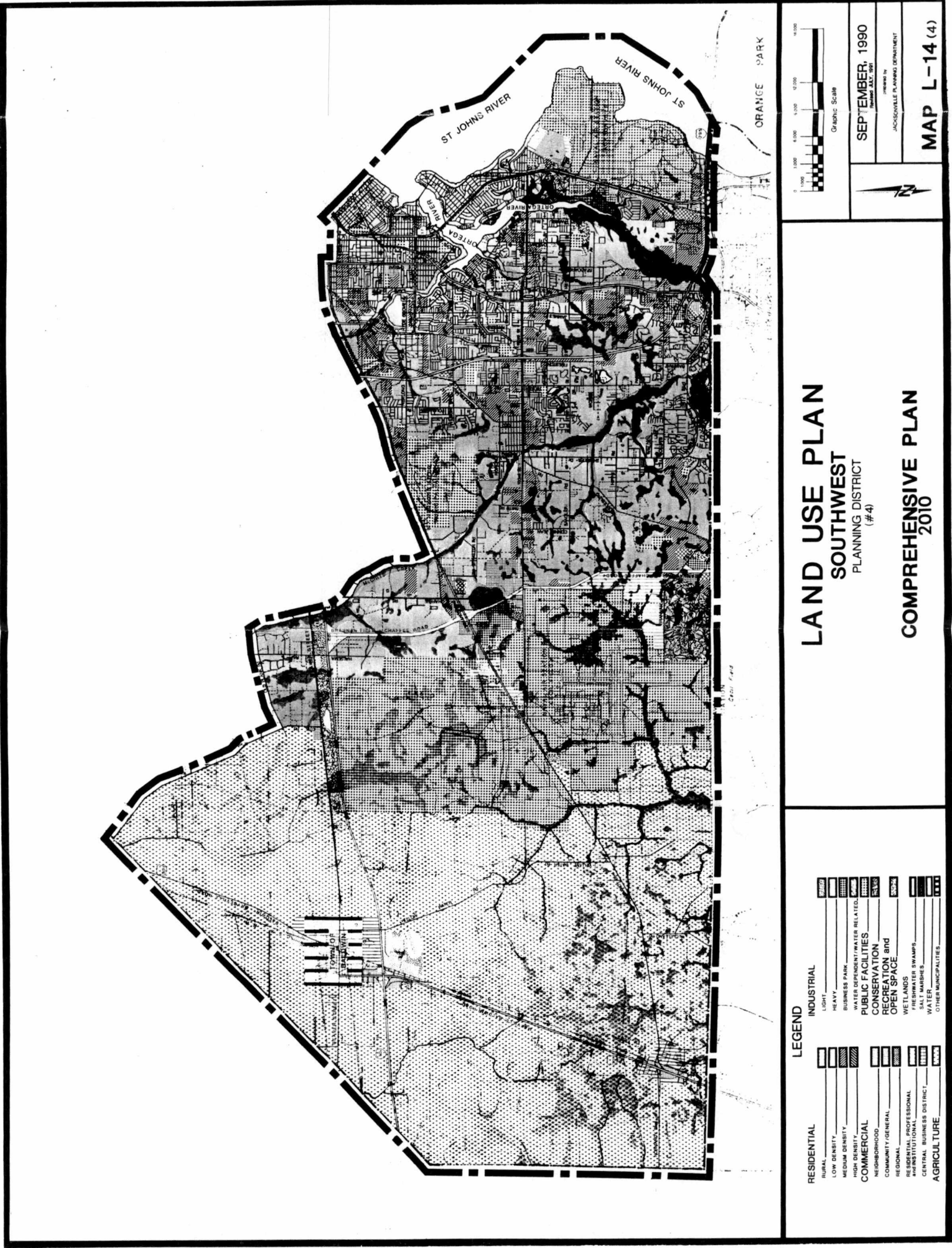
ADOPTED BY
ARLINGTON PLANNING DEPARTMENT

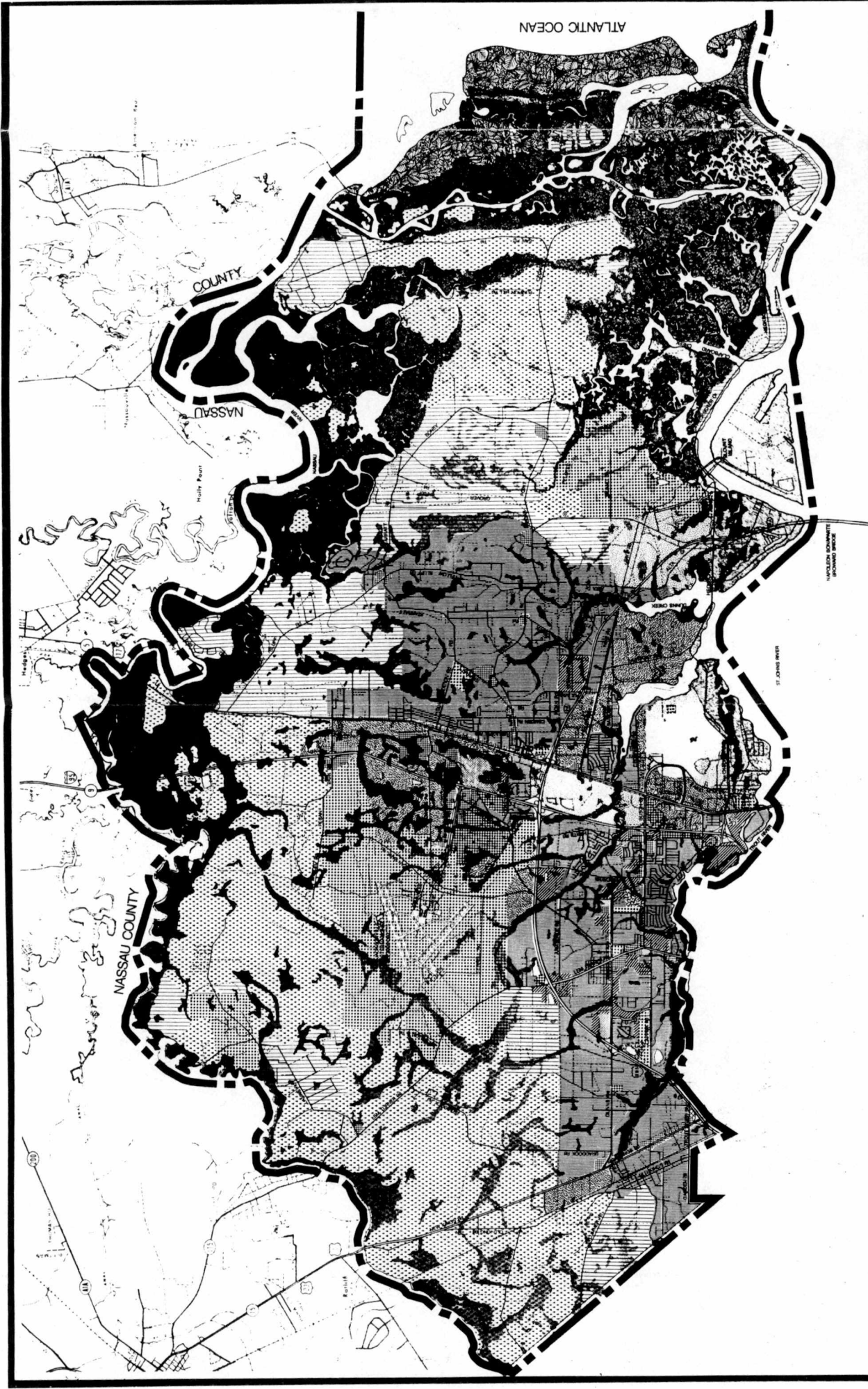
MAP L-14(2)



Graphic Scale







LAND USE PLAN

NORTH PLANNING DISTRICT (#6)

COMPREHENSIVE PLAN

2010

MAP L-14 (6)

SEPTEMBER, 1990

DESIGNED BY
JACQUETTE PLANNING DEPARTMENT

DATE
SEPTEMBER, 1990

LEGEND

RESIDENTIAL RURAL _____ LOW DENSITY _____ MEDIUM DENSITY _____ HIGH DENSITY _____ COMMERCIAL NEIGHBORHOOD _____ COMMUNITY/GENERAL _____ REGIONAL _____ RESIDENTIAL PROFESSIONAL _____ CENTRAL BUSINESS DISTRICT _____ AGRICULTURE _____	INDUSTRIAL LIGHT _____ HEAVY _____ BUSINESS PARK _____ WATER OR SEWAGE TREATMENT PLANT _____ PUBLIC FACILITIES CONSERVATION _____ RECREATION AND OPEN SPACE _____ WETLANDS _____ FRESHWATER SWAMPS _____ SALT MARSHES _____ WATER _____ OTHER MUNICIPALITIES _____
--	---

GRAPHIC SCALE

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000

North Arrow

APPENDIX B

LIST OF ACRONYMS

BESD	Bio-Environmental Services Division
CBD	Central Business District
COE	U.S. Corps of Engineers
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EWRA	Emergency Wetlands Resources Act
F. A. C.	Florida Administrative Code
F. S.	Florida Statutes
FCMA	Florida Coastal Management Act
FDCA	Florida Department of Community Affairs
FDER	Florida Department of Environmental Regulation
FIC	Federal Interagency Committee for Wetland Delineation
FSA	Food Security Act
FWPCA	Federal Water Pollution Control Act
FWS	U.S. Fish and Wildlife Service
GNP	Gross National Product
J. M. C.	Jacksonville Municipal Code
JPD	Jacksonville Planning Department
NEPA	National Environmental Policy Act
NFRPC	North Florida Regional Planning Council
OTA	Office of Technology Assessment
SCS	U.S. Soil Conservation Service
SJRWMD	St. John's River Water Management District
TCF	The Conservation Foundation

USGS	United States Geographic Survey
WMD	Water Management District
WRI	World Resources Institute

VITA

Teresa Salazar-Catron was born March 23, 1964, in Kankakee, Illinois, and raised in Louisville, Kentucky. In Louisville she received her primary and secondary education at St. Margaret Mary Elementary School and Sacred Heart Academy, from which she graduated in May, 1982. Teresa entered Purdue University the following August and graduated in December, 1987, with a Bachelor of Science degree in Landscape Architecture. Following successful completion of the Unified National Examination for professional certification as a Landscape Architect in 1989, she entered the Graduate School of the University of Tennessee in September, 1990. Her Master of Science in Planning degree, with a specialization in Environmental Planning, was awarded in August, 1992.

Teresa is presently employed by Barge, Waggoner, Sumner, and Cannon in Oak Ridge, Tennessee, where she practices the professions of Landscape Architecture and Planning in both the private and public arena.