

**Florida State of the Environment -- Wetlands:
A Guide to Living with Florida's Wetlands**

Introduction

Wetlands are one of our more important natural resources because of the many environmental and economic benefits that they provide. However, at one time, people thought of wetlands as being "useless wastelands." That antiquated perception led to the destruction of a large portion of our wetlands. This booklet explains why wetlands are important, how we affect our wetland environment, and how wetlands are protected. It also outlines the steps that must be followed by anyone who wishes to do any construction or other work in wetlands or other surface waters. Finally, it offers tips on how you can help us protect wetlands, and how you can obtain more information on wetlands.

What is a Wetland?

Generally speaking, a wetland is an area that is neither dry land nor open water. All wetlands are formed and sustained by the influence of water on land. However, the depth and duration of water in different types of wetlands can be extremely variable. In some wetlands the water is at ground level, where the saturated soils stay wet most of the time. While other wetlands are inundated, with normal water levels above ground. To make the situation even more confusing, the water levels in some wetlands can fluctuate dramatically. Many wetlands are dry for extended periods, but these same wetlands at other times may contain several feet of water. These are some of the reasons why it can be difficult to define and delineate a wetland. The State of Florida defines wetlands in Section 373.019 (17) of the Florida Statutes, and Section 62-340.200 (19) of the Florida Administrative Code, as follows:

"Wetlands' . . . means those areas that are inundated or saturated by surface water or ground water at a frequency and a duration sufficient to support, and [that] under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial, or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligate hydrophytic macrophytes that are typically adapted to areas having soil conditions described above. These species, due to morphological, physiological, or reproductive adaptations, have the ability to grow, reproduce or persist in aquatic environments or anaerobic soil conditions. Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps and marshes, hydric seepage slopes, tidal marshes, mangrove swamps and other similar areas. Florida wetlands generally do not include longleaf or slash pine flatwoods with an understory dominated by saw palmetto. . . ."

The method of determining the limits of a wetland is found in Section 62-340.300 of the Florida Administrative Code. This method is based on the concept that a wetland can be identified by looking for indicators that show the influence of water. Certain plants do better than others in an environment that is generally or occasionally wet. Similarly, soils develop certain characteristics in response to periodic and sustained saturation. Also, there are other physical traits such as water stains or special

plant adaptations that indicate wet situations. Using these traits, an experienced professional can draw a line between wetlands and uplands.

Florida's wetland definition and method of delineating wetlands are used by all state and local agencies in Florida. However, federal agencies (such as the U.S. Army Corps of Engineers) use a slightly different definition of a wetland and delineate wetlands a little differently.

Wetlands are Valuable

Although we cannot always set a price tag on the value of wetlands, they provide many important ecological, economic, and aesthetic functions.

Ecological value

Wetlands are vital to the health of our environment. They perform the same function for our ecosystem as kidneys do for our bodies, in that they filter and remove pollutants. As water passes through a wetland, much of the pollution that is dissolved or suspended in the water becomes trapped by the wetland plants and soils. Here, many of these pollutants, which would otherwise degrade surface waters, are actually converted into food material for aquatic organisms. This filtering capability of wetlands helps to keep surface water bodies suitable for swimming, fishing, and sometimes as a source of drinking water. Even in stormwater ponds, where highly polluted stormwater runoff is collected and held before it is allowed to reenter the natural system, water quality is improved by the filtering ability of wetland vegetation growing around the shoreline.

Regular inputs of water, sediments, and nutrients cause most wetlands to be highly productive. Vegetation grows very quickly in wetlands, producing a great deal of food for plant-eating animals and timber for our own use. Plant material that is not eaten directly is broken down into rich organic soil as well as a material called "detritus." Detritus is very important because it is the main item on the menu of many aquatic animals. It is estimated that as much as 90% of our commercial and sport fish depend on the food produced in wetlands. Because of the food and habitat provided by wetland plants, wetlands are also very productive for a diverse assortment of animals. Wetlands serve as nursery grounds for many of our commercially important fish, shellfish, and wildlife. Also, many of our endangered and threatened species, such as the wood stork and the Florida panther, are dependent upon wetlands for their survival.

Wetlands are also important because the amount of water that they can hold and the manner and rate that water passes through them. Most ground water supplies are recharged from the water that collects in wetlands and then infiltrates into the ground. During storm events, and shortly afterwards, we often face a surge of too much water. Fortunately, wetlands collect and store the excess stormwater that runs off uplands as well as the waters from flooding rivers. By providing temporary storage areas for this surplus water, wetlands slow down the rate at which the waters rise and reduce the maximum elevation of flood waters. This buffering capability helps to protect upland development from flood damage. The wetland vegetation and gradually sloping topography also absorb much of the energy from fast flowing waters and waves, thereby protecting our shorelines from erosion.

Economic value

Many of the ecological functions of wetlands have economic components. The economic importance of a wetland is equal **at least** to the gross revenue it produces for a given industry, such as

commercial fishing. However, there are other economic values that are more difficult to quantify, such as related businesses and property values.

Loss of wetlands leads to proportionately reduced populations of fish and wildlife. Floridians depend on healthy and diverse populations of fish and wildlife, not only because they provide us with recreational opportunities and food, but also because they support our commercial fishing, tourism, and recreation industries. As an example of the minimum economic value that wetlands provide to a particular industry, the commercial fishing industry brought in more than 5 million pounds of fish and shellfish worth almost \$13.5 million to Franklin County in 1994. Many of these commercially important fish, shrimp, and oysters grow to maturity in the wetland areas around Apalachicola Bay. Thus these wetlands were worth **at least** that much. But their economic value includes much more than just the **dockside** value of the wetland-dependent fish and shellfish. It also includes the income earned by seafood dealers and truckers who distribute it, of the markets that sell it to customers, and the restaurants that serve it to diners. Then we have to consider the suppliers of the fishing gear, harbor and marina operators, and others who provide services to the fishing industry.

Similar estimates can be determined for the recreational fishing industry, the hunting industry, and the tourism industry. All revenue generated by people who camp, hunt, fish, canoe, sail, photograph nature, watch birds, or hike in and near wetlands must be included when figuring the economic benefits of wetlands. This includes motels, meals at restaurants, and purchases of gasoline and outdoor gear. A 1992 Sea Grant study estimated that marine anglers (both tourists and residents) spent \$2.6 billion statewide in 1991. That represented more than 50,000 jobs--and wages totaling more than \$600 million.¹

Wetlands help protect the value of waterfront property in many different ways. For example, wetlands are very important for flood protection. Flood waters are temporarily held in the extra storage capacity of wetlands and are gradually released after the storm surge. Without wetlands to buffer the effects of floods, uplands along the shoreline would flood more frequently. This financially affects both the flooded property owners and the rest of us, who pay for the loss through increased insurance premiums.

The force of moving water can erode upland property. It is easily observed that the erosive effects of waves and flowing water are much more dramatic along shorelines not protected by wetlands than along shorelines with fringing wetlands. For example, in estuaries, the loss of mangroves can drastically destabilize high energy shorelines. Artificial shoreline stabilization can be very expensive and will increase the erosion on adjacent property. So, maintaining wetlands between moving water and uplands is an economical way to protect property from erosion.

Without wetlands to reduce water pollution, the safety of some of our drinking water supplies would be threatened, bodily contact with polluted waters could pose a health threat, and the smell of polluted waters would make waterfront property less attractive. These three factors can affect both property values and health care costs. Given the popularity of waterfront property in Florida and the ability of wetlands to maintain the security and desirability of this property, the economic value of wetlands to property owners, although difficult to quantify, must be quite high.

Aesthetic value

Finally (but far from least importantly) wetlands have aesthetic value. Wetlands offer people a sense of both beauty and well-being. It is comforting to spend time in these natural areas to enjoy the

¹ Saltwater Recreational Fishing in Florida: The Economics of Resident and Tourist Participation. Florida Sea Grant. SGEB 24, June 1993.

sounds, sights, and smells. But while a wetland may be beautiful, it is hard to assign a value to beauty. Each person has his or her own opinion about the natural beauty of wetlands and the relative worth of that beauty. However, we know that waterfront property commands a premium price over otherwise similar, landlocked property partly because of these aesthetic qualities. Income derived from the sale of wetland paintings, audio tapes, or photographs is yet another economic benefit derived from the aesthetic value of wetlands.

So, Florida wetlands do indeed have economic, ecological, and aesthetic value. Florida once had many more wetlands than it has today. In fact, more than half of our original wetlands have been lost as a result of drainage and development. Can we really afford to lose any more?

Threats to Wetlands

We now know that wetlands are more sensitive to alterations than we once believed. Small changes in water levels or the influx of pollutants can have significant effects on the functions of wetlands. These areas must be protected from abuse and destruction in order to maintain a healthy environment. Given all the benefits of wetlands, it is important that we recognize what kinds of activities threaten these important areas, and ultimately, all of us.

Paradox

Why, if wetlands are so valuable in their natural state, are they being eliminated at such a rapid rate? The answer to this paradox is that although wetlands serve society in multiple ways, the nature of wetland benefits are such that the owners of wetlands usually cannot capture the benefits for their own use or sale. The flood protection benefits accrue to others downstream. The fish and wildlife that breed and inhabit the wetlands migrate, and are captured or enjoyed by others. The ground water recharge and sediment trapping benefits cannot be commercially exploited. For the owner of a wetland to benefit from his resource, he often has to alter it, convert it, and develop it. That is why, despite their value, wetlands are being eliminated. Since the vast majority (74%) of the wetlands in the lower 48 States are privately owned, the system of wetlands is quite vulnerable.

Pollution

Although wetlands are good at filtering and attenuating pollutants, there are limits to these capabilities. If we overload these natural systems, not only will pollutants reach our open waterbodies, but the pollutants could damage the wetlands and reduce their filtering capacity. Some major sources of water pollution include sewage, industrial waste, and stormwater runoff. Stormwater runoff, for example, contains oils, greases, and heavy metals (from roads and parking lots), fertilizers and pesticides (from lawns and farm land), and nutrient-rich animal waste (from dairies and feedlots). Some of these discharges are toxic to wildlife and people, while others contain materials that rob wetlands and surface waters of essential dissolved oxygen. Nutrient laden discharges promote the growth of nuisance vegetation, such as hydrilla and blue green algae, which can choke open waters and remove dissolved oxygen from the water when these plants die and decay.

Construction in Wetlands

At one time, vast areas of Florida's sovereign submerged lands were all but given away in order to promote development in what was believed to be wastelands. As a result, large areas of productive estuary were lost to unregulated filling. In the past few decades, Florida has experienced a tremendous growth in population and has enjoyed an associated boom in the building industry. Now, as developing regions expand and land becomes more scarce, the price of uplands has increased dramatically, while the price of wetland acreage is still low. Therefore, wetlands are still being sought as building sites.

Dredging, filling, and other construction activities in, on, or over wetlands and other surface waters can degrade or destroy wetlands. Examples of such activities include the construction of piers, docks, retaining walls, jetties, fill pads (for houses or roads), channels, and canals. These activities may eliminate habitat used by fish and wildlife, reduce the capacity of the wetlands to remove pollutants, and reduce flood storage capacity. Docks and piers can eliminate submerged vegetation by reducing light penetration. Wood preservatives in the pilings contain toxic materials that can leach into the water. Erosion control structures can stabilize the targeted shoreline, but may increase erosion off-shore and on adjacent shorelines. Construction activities in the water also may cause the suspension of sediments, which can use up dissolved oxygen (causing fish kills), reduce light penetration through the water column (stifling plant growth and the production of dissolved oxygen), and cover living organisms when it settles out (killing plants, fish eggs, and coral).

Hydrologic alterations, such as damming or channelizing streams, can also do a great deal of damage to wetlands. These alterations can destroy wetlands by adding too much water, removing too much water, altering the pattern of materials imported into or exported from the wetland, or altering the frequency and duration of fluctuating water levels that are needed by certain types of wetlands. The altered flow patterns can also concentrate pollutants, cause erosion, cause sedimentation, and reduce valuable shallow water habitats.

Activities in Uplands

Activities that occur in uplands also can adversely affect wetlands and other surface waters. For example, land clearing may cause stormwater to run off the cleared land more quickly, causing erosion in the uplands, sedimentation in the wetlands, and turbidity in the open waters. This may also cause floodwaters to rise higher and more quickly than normal. The water level in wetlands and other surface waters can be lowered by wells, wellfields, drainage canals, and ditches. Such activities can eliminate or reduce the acreage of wetlands, move the shoreline of lakes, and make wetlands susceptible to invasion by nuisance or exotic plants. Drainage ditches and canals also divert water from wetlands, thereby drying them out. In bypassing the wetlands, the accelerated stormwater runoff can cause increased flooding and erosion. Without the benefit of wetland treatment, more pollution will be transported downstream.

Secondary Impacts

As noted above, there are many direct impacts to wetland habitat and water quality that occur as a result of various construction or alteration projects. However, there also may be additional impacts that are caused by these projects but are not directly proposed by the applicants. These secondary impacts can be just as harmful. A dock could be situated and constructed in such a way as to avoid any significant direct impacts, but the boats using the dock can cause prop dredging in nearby seagrass beds, leach toxic materials from the anti-fouling hull paint, and collide with manatees. The effects of new roadways through wetlands are apparent beyond the right-of-way. The cleared alignment allows light to

penetrate into the adjacent forested wetlands. This degrades wetlands by causing these areas to become hotter and dryer than normal. It also provides a vector for exotic and nuisance plants and animals to penetrate into the previously undisturbed interior of the wetlands. The possibility of vehicular collisions with animals crossing the road is a constant threat to many of our threatened or endangered species, including bears, panthers, and key deer. For some species a filled roadway becomes an insurmountable barrier. In those cases, the new structure divides the wetland into smaller habitats, which may not be large enough to support the existing populations.

Protecting Wetlands

Good planning and design are the best approaches to reduce or eliminate many of these adverse effects on wetlands. Of course, the best approach is to avoid wetlands in the first place. However, if that is not possible, regulatory programs at the federal, state, and local levels have been established to review these kinds of activities and to prevent or minimize damage to wetlands or water quality.

Minimizing Impacts

There are many ways to minimize the damaging effects of construction or other activities on wetlands and other surface waters. The key to preventing damage from sewage and industrial waste is proper treatment and disposal. Better yet, conservation and pollution prevention may reduce the need for the discharge in the first place. Stormwater runoff is now the largest source of water pollution in Florida. Retaining and detaining stormwater runoff helps to reduce the pollutants discharged from this source. The adverse effects of docks may be reduced by selecting alignments that avoid submerged or shoreline vegetation, by extending docks to depths where dredging is not needed to allow boat access and mooring, and by using alternative building materials that don't give off toxic materials or allow more light penetration. The impacts from road construction can be reduced by selecting the least damaging alignment and by building a bridge rather than a filled causeway to cross wetlands or other surface waters.

Why Activities In Wetlands Are Regulated

As mentioned previously, wetland owners do not always take advantage of all the benefits that their wetlands provide. Just as the benefits of wetlands are utilized by people other than the property owner, likewise, the adverse impacts of wetland degradation or destruction are felt by people other than the property owner. Placing fill in a floodplain will cause higher flood waters and degraded water quality to be transmitted downstream with the flowing waters. Eliminating the vegetation in a coastal marsh will reduce the number of larval shrimp that will survive and thereby reduce the take for commercial shrimpers. In such cases it is clear that what happens on an individual's property will affect the public as a whole. That is why the people of Florida have authorized regulatory agencies to oversee wetland activities and prevent the wholesale destruction of these valuable areas, as has occurred in a bygone era.

Florida's Wetland Protection Programs

The Florida Department of Environmental Protection, the five water management districts, many local governments, and the U.S. Army Corps of Engineers share the responsibility for protecting wetlands in Florida. This is done both through regulatory (permitting) and land stewardship programs. At

the state level, the Wetland Resource (WR) permit program is in effect in the Florida panhandle, the Environmental Resource Permit (ERP) program is in effect in the rest of the state, and the Sovereign Submerged Lands program is in effect throughout the state.

History of Wetland Protection in Florida

In the past, Florida's wetland protection programs consisted of the WR permit program (also known as Dredge and Fill), the Management and Storage of Surface Waters (MSSW) permit program, and the Sovereign Submerged Lands program.

The WR permit program, which was administered by the Department of Environmental Regulation (DER), covered dredging, filling, and construction in, on, or over Waters of the State. These Waters of the State included most natural and artificial water bodies as well as the wetlands that were contiguous to the waters, but excluded isolated wetlands. Impacts to isolated wetlands or adjacent uplands could not be considered by the WR program except for those impacts to threatened or endangered species that were closely related and causally tied to the regulated wetland impacts. The WR program considered impacts to water quality, fish and wildlife habitats, and other public interest factors but not water quantity.

The MSSW program, which was administered by the water management districts, involved work on stormwater treatment systems, water attenuation systems, dams, impoundments, reservoirs, and other works, including agricultural and forestry-related activities. This program covered water quantity, water quality, and environmental criteria for activities in uplands or wetlands, including isolated wetlands.

The current Environmental Resource Permit (ERP) program went into effect on October 3, 1995. It combined the WR and MSSW programs into a single program, using a single permit application. The ERP program is administered by the Department and four of the state's five water management districts (SJRWMD, SWFWMD, SFWMD, and the Suwannee River Water Management District).

The ERP program is not currently implemented in the Northwest Florida Water Management District (NFWWMD) due to fiscal constraints. The Wetland Resource (WR) Permit program and a stormwater program are still implemented by the Department in the NFWWMD, which covers the Florida panhandle, from Escambia County to the middle of Jefferson County. MSSW permits are required from the NFWWMD only for agricultural, silvicultural, and dam safety activities. In addition, the WR and MSSW programs remain in effect throughout the rest of Florida for some "grandfathered" activities.

Environmental Resource Permit Program

The ERP program addresses everything covered by the WR program as well as water quantity, stormwater, and isolated wetlands. Under this program, uplands also are regulated to control stormwater and drainage (quality and quantity), and to protect the habitat value that uplands provide to wetland-dependent animals. Most turtles, for example, live in the water but must lay their eggs in dry ground.

Since five agencies administer the ERP program, it is important to identify which agency will process any given permit application. This is done using an activity-based split of responsibilities, which is spelled out in Operating Agreements between the Department and the water management districts. Under these agreements, the Department generally reviews and takes action on applications involving the following:

- solid waste, hazardous waste, domestic waste, and industrial waste activities;
- mining activities;
- power plants and electrical distribution and transmission lines;
- communication cables and lines;

- natural gas or petroleum exploration, production activities, and distribution lines;
- docking facilities of 10 or more boat slips and adjacent docking related development; [docking facilities that are proposed as part of a larger residential or commercial development are reviewed by the water management districts]
- systems located seaward of the coastal construction control line;
- seaports;
- private single-family residences on land of 5 or fewer acres;
- navigational dredging by governmental agencies; and
- water-related projects (such as boat ramps, ski jumps, mooring buoys, and artificial reefs) that are not part of a larger plan of development.

The water management districts are responsible for reviewing and taking action on all other applications under the ERP program. Staff of the Department and the water management districts can answer questions about this activity based split, and will be happy to help applicants determine the appropriate agency for any given application. All wetland permitting is now done in the district offices of the Department and the water management districts (see maps).

The ERP program is designed to ensure that activities in uplands, wetlands, and other surface waters do not degrade water quality (such as through loss of wetlands, improper construction techniques in waters, or discharges of improperly treated stormwater runoff), cause flooding (such as by changing off-site runoff characteristics), or degrade habitat for aquatic or wetland dependent wildlife. These measures will help to preserve our health, safety, and quality of life in Florida.

Sovereign Submerged Land Approvals and the ERP/WR Programs

If any of the above WR or ERP activities are located on sovereign (state-owned) submerged lands, the applicant will also need permission from the land owner (the State) to use these lands. This permission is known as proprietary authorization. Since the State of Florida owns these areas, people who want to conduct activities in these areas need permission from the actual owner (the State) to use them.

Fortunately, the WR or ERP application now also serves as the application for proprietary authorization. The information needed to begin this review is contained in the joint application booklet for the ERP program. Regardless of which agency (the Department or the water management district) conducts the review, both the regulatory and proprietary reviews for the project are conducted concurrently, by the same reviewers, under the same time clocks, and a final decision is conveyed by a single document at the same time. Under this process, all the information needed to complete both the regulatory and proprietary aspects of the application are asked at the same time, the file does not become complete until the information for both programs is received, and the decision to grant or deny both aspects of the application will be the same. This process is referred to as the “linkage” of the the regulatory and proprietary programs. Unfortunately, however, activities that are eligible for a noticed general permit or an exemption are not linked in this way. This is due to a substantial difference in regulatory and proprietary review times for projects of these types of authorizations.

For most activities, the final authorization to use sovereign submerged lands has been delegated by the Board of Trustees of the Internal Improvement Trust Fund (the Board) to staff of the Department and the water management districts. However, for the following activities, the final decision on the use of sovereign submerged lands must be reviewed by the Board:

- docking facilities with more than 50 slips and modifications consisting of the addition of more than 10% of the number of existing slips, where the total of the existing and proposed number of slips is more than 50;
- docking facilities having a preempted area of more than 50,000 sq. ft. and modifications consisting of the addition of more than 10% of the existing preempted area where the total of the existing and preempted area is more than 50,000 sq. ft.;
- private easements of more than 5 acres;
- the establishment of a mitigation bank; or
- any project found to be of concern to one or more members of the Board.

These thresholds capture a relatively small number of projects. By delegating most of the smaller projects to the Department and the water management districts, the time and complexity of the review process is reduced for the applicant. However, these delegations do not reduce the protection afforded to public lands or environmental protection in general.

Other Authorizations

In addition to the above ERP, WR, and MSSW permit programs, which are implemented by the state of Florida, permits may also be required from the U.S. Army Corps of Engineers (Corps) and local governments (at the county and city level). The joint application booklets used by the Department and the water management districts in the WR and ERP programs are also used by the Corps. Applications are submitted to the Department or the appropriate water management district, and a copy of the application is immediately forwarded to the Corps. This prevents the applicant from having to submit separate applications to the DEP and the Corps.

NOTE: All the state and local agencies in Florida delineate the boundaries of wetlands using the same methodology. However, the methodology used by the Corps is different, and may produce a wetland line that is different from that used by the State.

Streamlining Initiatives

The Department is working with the Corps to streamline issuance of both the state and federal permits for work in wetlands and other surface waters in Florida. This type of authorization is called a State Programmatic General Permit. Currently, the process is being implemented on a limited set of project types (docks, piers, marinas, shoreline stabilization (seawalls and rip rap), boat ramps and boat launch areas and structures, and maintenance dredging of canals and channels). This process allows the Department to grant both the ERP and the federal permit, instead of requiring both agencies to process the application. This agreement with the Corps to use the State Programmatic General Permit has not yet been extended to the water management districts. Also, it is not available within the geologic limits of the NFWMD (Florida panhandle).

To further streamline the state permitting programs, the Department and the water management districts are considering possible delegations of the ERP, WR, and stormwater (within the panhandle) programs to local governments. This would allow the local government to review and approve or deny the state permits at the same time the local authorizations are granted or denied.

Mitigation and Mitigation Banking

Mitigation allows those who must work in wetlands to make up for any unpermittable damage caused by their work. For example, the applicant who can not build on their property without encroaching into the edge of a cypress dome, may be facing an unacceptable loss of wetlands.

Mitigation allows the applicant to compensate for this loss by restoring a filled wetland or enhancing a degraded wetland in an adjacent cypress dome. This makes it possible to get a permit for work in wetlands without causing any net environmental degradation. However, before mitigation may be accepted, the applicant must first attempt to eliminate or reduce their impacts.

To facilitate a developer's ability to mitigate damages to wetlands, the Legislature authorized the Department and water management districts to develop rules governing mitigation banks. A mitigation bank is a parcel of land on which the banker has conducted mitigation activities (such as environmental restoration, enhancement, and preservation) in anticipation of future impacts from unrelated projects. These banks are developed and managed by entities that specialize in mitigation. The plans for mitigation banks are reviewed and authorized by the Department or water management district, at which time "credits" are assigned for the various types of mitigation activities. Applicants who may not have other lands available for necessary mitigation, may purchase credits from a mitigation bank.

The rules on mitigation banking were developed jointly by the department and water management districts, and took effect in early 1994. The South Florida Water Management District is developing mitigation banks for lands in their district. The Department and the other districts have no immediate plans to establish mitigation banks.

Private interests have applied for or received permits for about twenty mitigation banks in the St. Johns, Southwest Florida and South Florida Water Management Districts. They range in size from 345 to 4,700 acres. Most are for fresh water wetlands.

Groups that want to use credits from a mitigation bank must meet criteria set out by rule:

- The type of mitigation must be appropriate to offset the impacts (restoring a cypress swamp for impact to a cypress swamp, etc.);
- The construction to be mitigated must be within the service area for the bank; and
- On-site mitigation would not be hydrologically or ecologically viable in the long term.

Ecosystem Management and Wetlands--Stewardship

Since the 1909 acquisition of the OluStee Battlefield Site, Florida has pursued the preservation of its unique natural and cultural resources. Through purchases, long-term leases, donations and other means, the state has acquired lands to protect endangered species, natural communities, archaeological and historical sites, geological features and water resources. Protection of these lands enhances the quality of the environment, as well as the quality of life of the state's residents. Conservation lands provide habitat for wildlife, beneficial services such as water storage and flood protection, and outdoor recreation opportunities for millions of residents and tourists. In addition to other benefits, these public lands also serve to protect the state's water quality and drinking water supply.

Florida's first organized land acquisition program began in 1963. The largest state funded acquisition programs, the **Conservation and Recreation Lands** (CARL) and **Save Our Rivers** (SOR) programs, began in 1979 and 1981, respectively. In 1990, the Florida Legislature approved the **Preservation 2000** (P2000) Act, an initiative to increase funding for land acquisition programs by providing an additional \$300 million annually for a ten-year period. As of 1996, the State has spent over two billion dollars to acquire nearly two million acres of land.

The Conservation and Recreation Lands program, administered by the Department of Environmental Protection, is funded from a portion of the state's Documentary Stamp Tax: seventy cents on each \$100 in value of property sold in the state and thirty-five cents on each \$100 of financial notes, stocks, bonds, etc. CARL also receives the first ten million dollars generated by the Phosphate

Severance Tax. Since fiscal year 1989-90, CARL accrued funds have exceeded \$40 million annually. Presently, however, much of these funds go to land management and other services besides land acquisition. The CARL program also receives 50% of the additional funds provided by Preservation 2000, giving the program another \$135 million each year. CARL and its predecessor, the Environmentally Endangered Lands program, have acquired over 900,000 acres of important natural areas.

The state's five water management districts acquire land under the Save Our Rivers program through the Water Management Lands Trust Fund. Money for this program also comes from a portion of the Documentary Stamp Tax. In addition, SOR receives 30% of the P2000 moneys, representing about \$80 million in added funds each year. Each District uses these funds to acquire fee or other interest in lands "necessary for water management, water supply and the conservation and protection of water resources." The Districts have acquired over 725,000 acres of mostly wetland areas that border on major Florida waterways.

Acquisitions under the CARL program include several purchases within the Wekiva River Basin, including Rock Springs Run State Preserve's 8,500 acres; all within easy driving distance of the urban Orlando area and Disney World. Topsail Hill, at \$100 million (the most expensive CARL purchase to date), protects the last stretch of pristine beach and dunes in the Florida Panhandle. Other purchases include Wakulla Springs, the largest underwater cave system in the world; the Lake Wales Ridge, home to more endangered species of plants and animals than any other in Florida; and historic Fort George Island. CARL is acquiring lands in Fakahatchee Strand and Big Cypress Swamp that are vital to protecting the Everglades ecosystem. Purchases have been made around the Apalachicola River and Bay, the source for over 90% of the state's oysters, and additional lands have been identified for future acquisition. In addition, much of the remaining natural area of the Florida Keys has been identified for acquisition by the CARL program.

Summary of Land Acquisitions in Florida			
<u>Source</u>	<u>Year</u>	<u>Dollars</u>	<u>Acres</u>
LATF(1)	1963 -	182,493,891 ⁽²⁾	101,976
EEL bonds	1974 - 1983	200,000,000	370,000
CARL ⁽¹⁾	1979 -	821,961,171 ⁽³⁾	551,236
SOC bonds	1980 - 1993	252,300,000	77,700
SOR ⁽¹⁾	1981 -	780,383,768 ⁽⁴⁾	738,485 ⁽⁵⁾
P2000 other	1990 -	109,515,785 ⁽⁶⁾	54,500
TOTAL ⁽⁷⁾		=====	=====
		\$2,346,654,615	1,893,897

(1) P2000 moneys are included in program totals.
(2) Includes 1968 and 1972 bond issues.
(3) Includes acquisitions with 1987 CARL bond issue of \$35,000,000.
(4) Includes numerous District bond issues.
(5) Does not include land transferred from the federal Central and Southern Flood Control District, land acquired with federal funds, or land acquired with local ad valorem tax revenues. When these lands are added to SOR lands, the total District conservation land holdings equal over 1,860,000 acres.
(6) Includes GFC, DOF and DCA(FCT); but not DRP, which is included under LATF.
(7) Prior to 1963, the state acquired 584,000 acres for \$2,000,000.

In the Save Our Rivers program, the Northwest Florida Water Management District has purchased land along the Apalachicola, Choctawhatchee and Escambia Rivers. The Suwannee River Water Management District, in an innovative partnership with industry and private conservation organizations, has acquired many acres of the Suwannee River floodplain. The St. Johns River Water Management District is purchasing floodplain along the upper St. Johns River as part of its Upper Basin Restoration program and has purchased the eastern shore of Lake George, helping to protect the state's second-largest lake. The South Florida Water Management District is using SOR moneys to purchase lands in the Kissimmee River floodplain as a part of the restoration program for the Kissimmee River and Lake Okeechobee. In the Southwest Florida Water Management District, purchase of lands in the Green Swamp will protect the recharge area for urbanized Tampa Bay's water supply.

The 1991 Legislature amended Preservation 2000 to expand the scope of District acquisitions to include "lands necessary to implement surface water improvement and management plans" that have been approved for priority water bodies. Lands that are listed in SWIM plans as priority acquisition areas are added to the Districts' SOR Five-Year Plans. Two areas where Districts have acquired land for the SWIM program are Lake Apopka and the Everglades/Florida Bay Ecosystem.

The DEP and water management districts are managing these lands to protect water resources, wildlife, and valuable native habitat, as well as to offer increased recreational opportunities for residents and visitors.

A statewide system of greenways, which eventually will connect natural areas throughout Florida, also is being developed. Greenways are corridors of protected open space that are managed for conservation and recreation. Greenways follow natural land and water features, such as ridges or streams, or human landscape features such as abandoned railroad corridors or canals. They link natural reserves, parks, cultural and historical sites.

Land stewardship isn't only a government responsibility. The bulk of Florida's land area is controlled and managed by large private landowners, many of whom are excellent stewards of the land. The DEP is encouraging good stewardship by all landowners. Small landowners, such as family farmers and suburban and urban homeowners, can help too. The next section tells how.

Being a Good Environmental Citizen -- How You Can Help Protect Wetlands

Few of us would destroy a wetland on purpose, but many of the routine, every-day things we do can (and do) damage wetlands. A little thought before we wash our car, dispose of waste auto fluids, fertilize our lawns, or perform any number of other common chores can go a long way toward protecting local wetlands. And even when we are on holiday, we can avoid inadvertent damage to Florida's waterways and wetlands with a little extra thought and care.

What is Environmental Citizenship?

The term Environmental Citizenship is a convenient way to describe the responsibility we have to the natural world around us. Environmental Citizenship means knowing our place in Florida's environment and then taking appropriate action based on that knowledge. Environmental Citizenship is the idea that we are an integral part of our environment. What follows are a few tips on how you can practice Environmental Citizenship in your home and neighborhood and protect wetlands and water quality.

Reduce Runoff and Erosion

Erosion not only removes your top soil, but it also transports suspended sediment into water bodies. You can reduce erosion by mulching, or planting ground cover over exposed soil in heavily trafficked areas, flower beds, and shaded areas. Mulch helps to reduce the amount of water that runs off your lawn or garden. Water that *does* run off from mulched or planted areas will be cleaner. If you have any steep slopes, try terracing the area with bricks, rocks, or landscaping timbers to reduce erosion. Bare patches of lawn should be re-vegetated.

Recycle the vegetation. Rather than piling, raking, or blowing leaves or grass clippings into the streets where they will wash into streams or lakes, then decay and become a source of pollution, make a compost pile and return these materials to your soil.

Let rain water soak into the ground rather than letting it run off your property on impervious surfaces. Direct runoff from your roof through gutters and drain spouts to the lawn or garden, and not to

the paved driveway or parking lot. Limit paved areas around your home. For driveways and walks, consider flagstones or pavements that allow water to soak into the ground. Or, use gravel or crushed shell.

If you live along the waterfront, protect the natural slope of the shoreline. Regrade a damaged shoreline to its original slope and revegetate with native plants. If a shoreline must be hardened, use rip rap (a retaining wall made with large rocks or clean concrete rubble that breaks the force of the waves) instead of a seawall. Vertical seawalls reflect the wave energy, which accelerates erosion on neighboring property and causes off-shore erosion. **(Warning: Be sure to obtain any necessary permits or approvals from state and local governments for regrading or shoreline stabilization.)**

If your property is located next to a wetland or waterbody, you could leave a strip of upland in its natural state between the wetland and your lawn or garden. This “buffer” would provide the upland habitat that is occasionally needed by many aquatic or wetland animals. The undisturbed soil and vegetation in these areas also helps to stabilize the wetland habitat and filter the runoff from your yard. If you must mow or trim the vegetation, cut as little as possible, and don't place the clippings in or near the water.

If you live along an estuary, protect any mangroves that may be growing on your shoreline. These trees are very important, not only for shoreline stabilization, but also as a food source for many fish and shellfish, and as breeding sites for fish and birds. If you must prune them, be certain you observe the laws written to protect mangroves. Check with your county's environmental office, or with the nearest DEP District Office.

Remove exotic plants. These include water hyacinth, hydrilla, Australian pine, Brazilian pepper, Chinese tallow, melaleuca (pump trees), Japanese climbing fern, and many others. Ask for assistance from the Department's Bureau of Aquatic Plant Management or the water management districts, and work with your neighbors and your county agricultural extension agent.

Use Fertilizers and Pesticides Wisely

We often put too much fertilizer, or use too many pesticides on our lawns and gardens. Then we water too much and too often. Nationally, lawns guzzle water, and use up to 10 times as much chemical pesticide per acre than an equal area of cropland. U.S. lawns absorb more synthetic fertilizer each year than India applies to *all* of its food crops.² You can reduce the amount of chemicals you use by not cutting the grass too short (less stress on the grass), by leaving grass clippings on the lawn (a natural fertilizer), and by keeping your mower blades sharp (dull blades damage and weaken the grass).

Test your soil, then use fertilizers and pesticides sparingly, and only where and when they are needed. Read labels carefully and follow directions. Your county agricultural extension agent can help.

Use compost and mulch (such as those grass clippings or leaves) to reduce your need for fertilizers and pesticides. Information about composting is available from your county extension agent, from the Department of Environmental Protection's Office of Environmental Education, or from the public library.

Never apply fertilizers or pesticides on bare ground or eroded areas. Try not to apply them just before a rainstorm, or near a well, waterbody, or wetland. If they run off into the water, they will kill fish and other aquatic organisms.

When you do apply pesticides, do it in the late afternoon or evening to reduce the danger to bees and other pollinators. Better yet, instead of using pesticides, buy disease and pest-resistant plants.

F. Herbert Borman, Professor of Forest Ecology, Yale University. In Scientific American, February 1994.

Native plants are better adapted to survive with the insects and other pests that live in Florida. Learn which plants repel insects. Some herbs and flowers (including basil, chives, chrysanthemums, garlic, horseradish, marigolds, mint, onions, savory and thyme) mixed in with other plants help keep pests away.

Use pesticides only as a last resort. *Read the labels.* Pesticides labeled “**CAUTION**” are less toxic than those labeled “**WARNING**”, which are less toxic than those labeled “**DANGER**”. When you are through, dispose of pesticides and fertilizer containers properly. Follow label instruction on rinsing empty containers of garden chemicals. Apply the rinse water to the same plants that received the pesticide. Then, dispose of the empty, clean containers as solid waste. If you are unsure about disposal, check with your county agricultural extension agent.

Care for Your Septic Tank

There still are 1.6 million septic tanks in use in Florida. Septic tanks are an acceptable means of sewage treatment in some locations, but when they are crowded together in subdivisions, if the soils aren't appropriate, and when the septic tanks are not kept up properly, they can become a major source of pollution.

If a city, county, or private sewer system is available, hook up to it! Septic tanks should be used only where there is no alternative.

Know your septic system. Have the tank checked annually, and pump out surface scum and sludge about every three years.

Finally, never dispose of household or other chemicals (such as photographic or garden chemicals) down the drain. (This applies if you are on city sewage treatment or on septic tanks. The chemicals can upset the ability of either system to treat the sewage.) Septic tanks and the pipes leading to these tanks can be overloaded and clogged by fats, greases, and other solids that are sent through garbage disposals. Because of this, you should be selective of the foods that are ground up and washed through disposals, and many communities actually require the effluent from sinks with disposals to be discharged into separate, dedicated septic tanks. Do not use the sink or toilet as a trash can; it can and will clog or overload the system. Items which should not enter sewer or septic systems include: facial tissue, paper towels, hygiene products, disposable diapers, condoms, dental floss, coffee grounds, grease, cat litter.

Keep the septic tank system clear of trees and large shrubbery. Roots will clog the drainfield. Do not pave over the drainfield or drive vehicles or heavy equipment over it.

Signs of a failing septic tank

- _ Poor flushing or sluggish drains.
 - _ Drains backing up.
- _ "Greener pastures" -- an indication that the drainfield is clogged and effluent is too near the surface.
 - _ Soft, spongy ground.
 - _ Odors.

WARNING -- effluent puddling at the surface is dangerous. Children can be exposed to dangerous, disease-carrying organisms.

If any of these conditions exist, contact your county health department.

Car Care

Our cars are indispensable to us these days, but they are also a significant source of pollution. Oils and greases, leaking antifreeze, and other auto fluids drip onto our roads and highways, then wash off into our wetlands and waterways during the next rain.

If you change your own oil (or other auto fluid) take the used material to a recycler. Many service stations and garages will accept used oil or antifreeze. For a location near you, call 1-800-741-4337. Before disposing of an oil filter, puncture it, drain it, and recycle the waste oil.

Each time we wash our cars in our driveways, the dirty, soapy water we use runs down the drive and into the street and along a gutter. Eventually, it vanishes into a curbside storm drain, out of sight and out of mind. But everything goes somewhere. Chances are, that our soapy wastewater ends up in a drainage ditch that flows into a nearby wetland and then to a stream, pond or estuary.

When you wash your car, do it on the lawn and put the wash water to good use. Use a bucket and a hose with a cut-off nozzle to avoid wasting water which will runoff into the gutter. Use non-phosphate, biodegradable detergents.

Boating Tips

The time we spend out on our boats is an opportunity to get close to and enjoy Florida's environment. Even boating, though, can be damaging to the environment, especially to the wetlands and the animals that live in and around them.

Home docking facilities should be designed to avoid submerged or emergent vegetation that hold the sediment and provides shelter for aquatic animals. If these areas must be crossed to reach deep water, the structures should be designed to allow light to reach the water and penetrate to the vegetation.

The toxic effects of anti-fouling boat paint can be minimized by keeping boats in dry storage.

Boaters should avoid shallow water where their propellers can stir up the bottom sediments and chew up the aquatic plants. Suspending the sediment will pollute the water, and destroying the plants will eliminate food and habitat of many different kinds of aquatic life.

Manatees are hard to see and avoid unless you are going slowly. If you do hit one, their chance of sustaining a serious injury is increased when hit by a fast moving boat. The number one killer of this endearing and endangered species is boat collisions. So go slowly in areas where manatees may be found.

Boat wakes can and do erode shorelines and damage wetlands. Boaters should keep their wake down when traveling near the shore and obey NO WAKE signs.

Repair fuel and oil leaks immediately. Be careful when refueling, and do not overfill or "top off the tank." Remember that spills inside the boat will be discharge to open water when you pump your bilge. A gallon of oil or gasoline can create a large oil slick.

Use pump out stations for sewage wastes.

Carry food wrappings, scraps, and other litter back to shore, then dispose of it properly. Plastic packaging and monofilament fishing line can be very dangerous to aquatic animals if they try to eat it or get entangled in it.

Recreation

Wetlands are favorite areas for hunters, anglers, and more passive outdoor recreation such as bird watching and photography. But merely by being there we can damage the wetland ecosystem.

Leave only your footprints. Pick up and properly dispose of litter and trash you find, even if it's not yours. If your fishing line gets snarled up (it does happen), save the tangle and throw it away in a trash can. Fishing piers and bait houses sometimes will accept fishing line for recycling.

Collect animals and plants only with permission of the landowner, and then be reasonable. The plants and animals that live in wetlands all have important roles to play in the ecosystem. If left in their natural state, we can all enjoy these plants and animals.

If you follow even a few of these suggestions, you will be well on your way toward being a good environmental citizen of Florida.

Appendices

Appendix 1: Florida Laws and Rules Affecting Work in Wetlands

Rules:

- 18-20, F.A.C. Aquatic preserves
- 18-21, F.A.C. Sovereign submerged lands
- 62-4, F.A.C. Application fees & Antidegradation (of water quality)
- 62-302, F.A.C. Water quality standards
- 62-312, F.A.C. Wetland resource permit procedures & Florida Keys rule
- 62-330, F.A.C. Adoption by DEP of WMDs' ERP rules
- 62-340, F.A.C. Wetland Delineation
- 62-341, F.A.C. Noticed general permits
- 62-342, F.A.C. Mitigation banking
- 62-343, F.A.C. ERP procedures & application forms

Statutes

- Ch. 253, F.S. State Lands
 - s. 373.414, F.S. ERP authorizing legislation
 - s. 403.813, F.S. Exemptions

In addition, the St. Johns River, Suwanee River, South Florida, and Southwest Florida Water Management Districts have rules relating to Environmental Resource Permitting.

Where to get copies of the laws and application forms.

Paper copies are available from:

- Any of the DEP District Offices <http://www.dep.state.fl.us/org/district.html>
- Any of the water management districts <http://www.dep.state.fl.us/org/water.html>
- DEP Library in Tallahassee - 904-488-0890

Electronic copies are available from:

Florida Department of Environmental Protection Environmental Resource Permitting Web Site at <http://www.dep.state.fl.us/water/Slerp/pds/erp.htm>

For those with a computer and modem but no internet access, the Department's Ecosystem Management & Environmental Education BBS also carries all of the DEP's rules and statutes. Access to the BBS is via a toll free number - 1-800-217-2934 (Communication settings for your modem: com settings-8-N-1 (the standard setting), terminal emulation-ANSI)

Appendix 2: More Information

Further Reading

Florida's Estuaries: A Citizen's guide to Coastal Living Florida Sea Grant (SGEB-23) University of Florida, Gainesville, FL 32611-0409

Ecosystem Management Around the Home. Florida Department of Environmental Protection, 1996.

Toward Environmental Citizenship. Florida Department of Environmental Protection, 1995.

Wetlands on the Internet

There are several good wetlands sites on the Internet's World Wide Web. Three very good sites that contain links to other wetlands sites are:

The U.S. Fish and Wildlife Services' National Wetlands Inventory page at <http://www.nwi.fws.gov>

The U.S. Environmental Protection Agency's Wetlands page at <http://www.epa.gov/owow/wetlands/>

The society of Wetland Scientists' list of wetland-related internet sites at <http://www.sws.org/wetlandsweblinks.html>