



Our Vital Wetlands

Dear Parents, Educators and Concerned Citizens,

The first time you visit Lake County, it's easy to see its natural beauty. Nearly 200 square miles of our county are covered with shimmering, **sparkling lakes**. But there's much more to this area than our **lakes**. Here, an abundance of virtually unrecognized, but very important wetland communities exist.

This booklet was designed as an introduction to these wetlands. In it, **we** define for you what wetlands are, how to identify their different types, what their many values are and how you can help to protect them.

We encourage you to share this information with your children or with others who could benefit from **it**. Learn together about these living systems. Learn about the animals and plants which inhabit them. Learn why these special communities were destroyed in the past and what must now be done to save them.

Learn why your role is an important one and how you can **make** a difference. Once you do, we hope that you, too, **will** join in helping to save and protect these vital resources.

Sincerely,

The Lake County Water Authority
(August 1997)

Cover art and illustrations on pages 7,9,11,13,15,17, and 19 are under copyright of botanical illustrator Mary Ruth McCracken. For more than four decades, Ms. McCracken has directed attention to the plight of plant life in Florida's changing ecology. Educated in botany, bacteriology and illustration in the 1930's at the University of Pennsylvania, her biological training and her gift as an accomplished fine artist allow her to create illustrations which can be used as a learning tool. She currently lives in Niceville, Florida

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Wetlands ... An Introduction

“Wetlands” is a word used to describe a variety of **areas**, where plants and animals especially suited to wet environments can be found. Wetlands **come** in many forms including swamps, hammocks, deep and shallow marshes, and wet prairies. These **areas** are extensive, and make up about 6% of the earth’s land surface.

Many distinctive wetland **environments** can be found throughout Florida. In fact, Florida contains approximately 20% of the remaining wetlands in the United States, including a variety of wetlands here in Lake County.

Recently, we’ve learned that wetlands are valuable and functional resources which must be preserved. They serve **as** the natural habitat (native environment or home) for a variety of wildlife and plants. They clean pollution from our surface water supply (and are often called the “kidneys of the landscape” since like kidneys, **they** also cleanse out harmful materials). They **help** prevent **flood** damage and **protect** shorelines. **They serve as** sanctuaries for rare or endangered species and **are** also important recreational and educational areas.

Throughout most of our history, however, **scientists had little understanding** of why wetlands are important. Many people believed that wetlands were **places full of mosquitoes**, pests and possibly a scary

monster or two. Because **people** were frightened **of the wetlands**, or found them to be a **nuisance**, draining them seemed to be **the right thing to do**. **As** our society **grew**, the land was **used** for residential and commercial development, **as** a source of peat for fuel and soil improvement, and for agriculture.

Since New World **settlers** arrived in **this** country, they have been destroying wetlands. A little **more** than two **hundred years ago**, our country had **215 million acres** of wetlands.

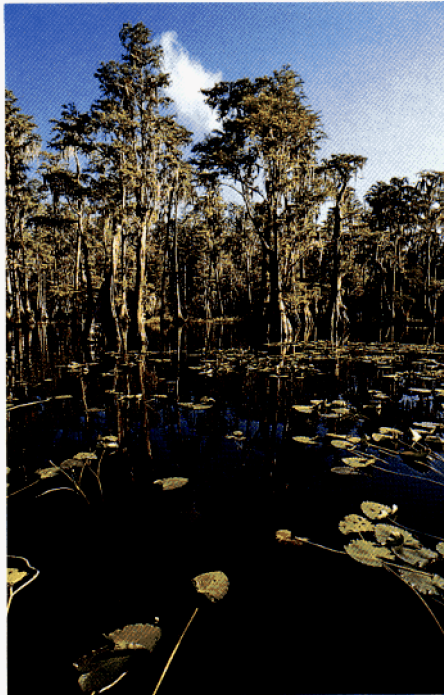
Today, we only have about 95 million acres.

Even **George Washington, Thomas Jefferson** and **Patrick Henry**, three of America’s founding fathers, destroyed important **wetlands**. They formed a company to drain the Great Dismal Swamp of Virginia and North Carolina. **The Virginia Assembly allowed 40,000 acres to be drained** so the timber growing **there** could be **cut** down and milled. Now that we can understand its greater value, a large part of the Great Dismal Swamp has

been turned into a wildlife refuge.

In the past 20 years, **people have come to understand** the need to **protect** and **preserve the** wetlands which remain, so they have **worked towards** adopting **federal, state** and local **laws** to save these vital resources.

This **publication discusses wetlands in general** and the types of wetlands most commonly found in Florida and Lake County. It will also suggest the reasons why **we must act now to protect and save them.**



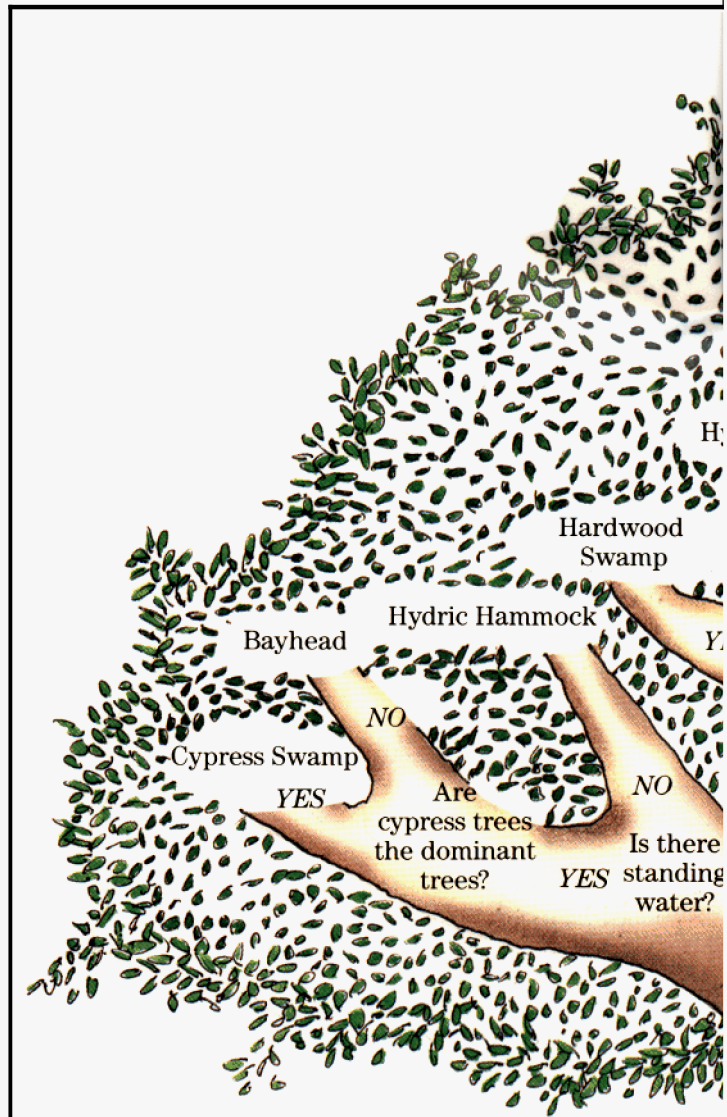
Defining Wetlands

The most common question about wetlands is “what are they?” Definitions vary with the needs of the people who establish and use them.

Formal definitions are used for scientific purposes such as classifying wetlands, or for research. Because the study of wetlands is a special field, different from the study of the water or soil conditions which surround the wetlands, some researchers have become specialists and are called wetland scientists.

Wetland scientists define wetlands in a way that allows them to be recognized more accurately.

In this book we will use the legal definition found in the regulations of the U.S. Army Corps of Engineers. In the box below is the corps’ definition as it was written at the time this booklet was printed. Words in brackets are not part of the original definition, but are used to make the definition more understandable.

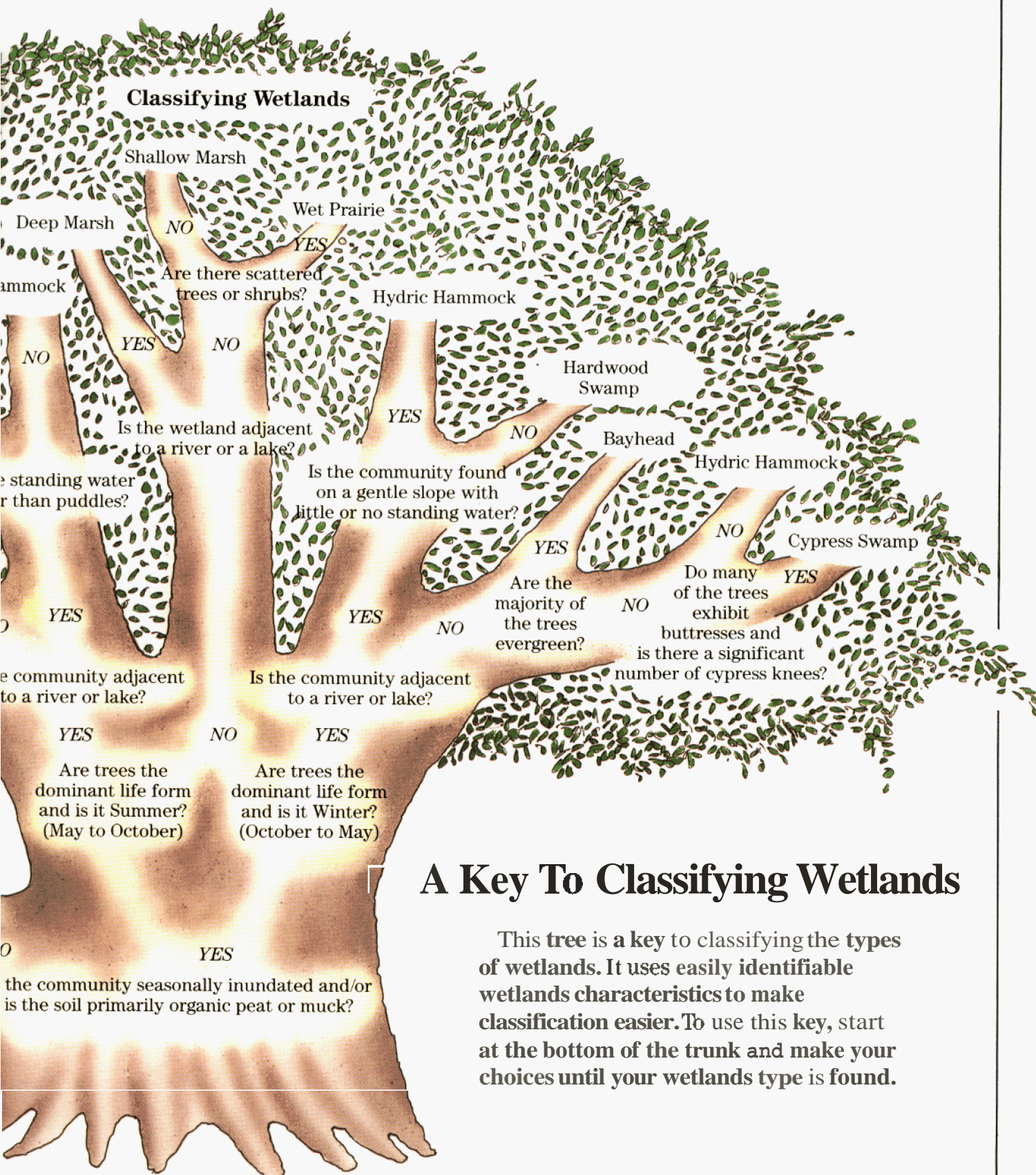


U.S. Army Corps Definition:

The term “wetlands” means those areas that are inundated [flooded] or saturated [soaked] by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence [majority] of vegetation typically adapted [adjusted] for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Not defined as a wet

Classifying Wetlands



A Key To Classifying Wetlands

This tree is a key to classifying the types of wetlands. It uses easily identifiable wetlands characteristics to make classification easier. To use this key, start at the bottom of the trunk and make your choices until your wetlands type is found.

Wetlands Characteristics

What makes a wetland a wetland? How **can** we identify a **wetland**? These **are** good questions, **with** complicated answers.

Because of the many different types of environments in which wetlands are found, and the fact that they **are** located **all over** the world, wetlands can vary greatly. It is difficult to say what is too wet to be a wetland or what is too dry to **be a wetland** without careful study **of** the particular system in which it is found. It is also **hard to** say how often land must be flooded, **or** the ground soaked with water before **it** is called a wetland.

Most experts do agree that wetlands usually have **at least three** main characteristics in common:

- a. Wetlands lie between terrestrial (upland) and **aquatic** (water) systems, and have unique traits and characteristics.
- b. Wetlands are flooded or **have** saturated soils for significant **periods of** time.
- c. Special vegetation (plants and trees) **has** grown because of the wet conditions of the soil.

Some other **factors** which influence the characteristics of wetlands include:

- a. how often water is present,
- b. whether the wetlands are located on a **coast** or inland, **and**
- c. how **much** they have been affected by people.

Types of Wetlands

There are many **different types of** wetlands, some **of which are only found in** the North, some in the South, some out West, some on the coasts near saltwater and some inland.

For this **booklet**, we will **limit** our description **to** the types of **Florida** wetlands located in **Lake County**. The following pages show some **of Lake County's** most common types **of** wetlands.

Because the presence of water is an important common characteristic of wetlands, the cover of this booklet and its full-page illustrations have a line drawn to show the average water level. In each case, the rest of the illustration is drawn in relation to the average water level line according to the wetlands type.

Deep Marsh

Cypress Dome

Wet Prairie

Uplands

110-
100-
90-
80-
70-
60-
50-
40-
30-
20-
10-
0
10

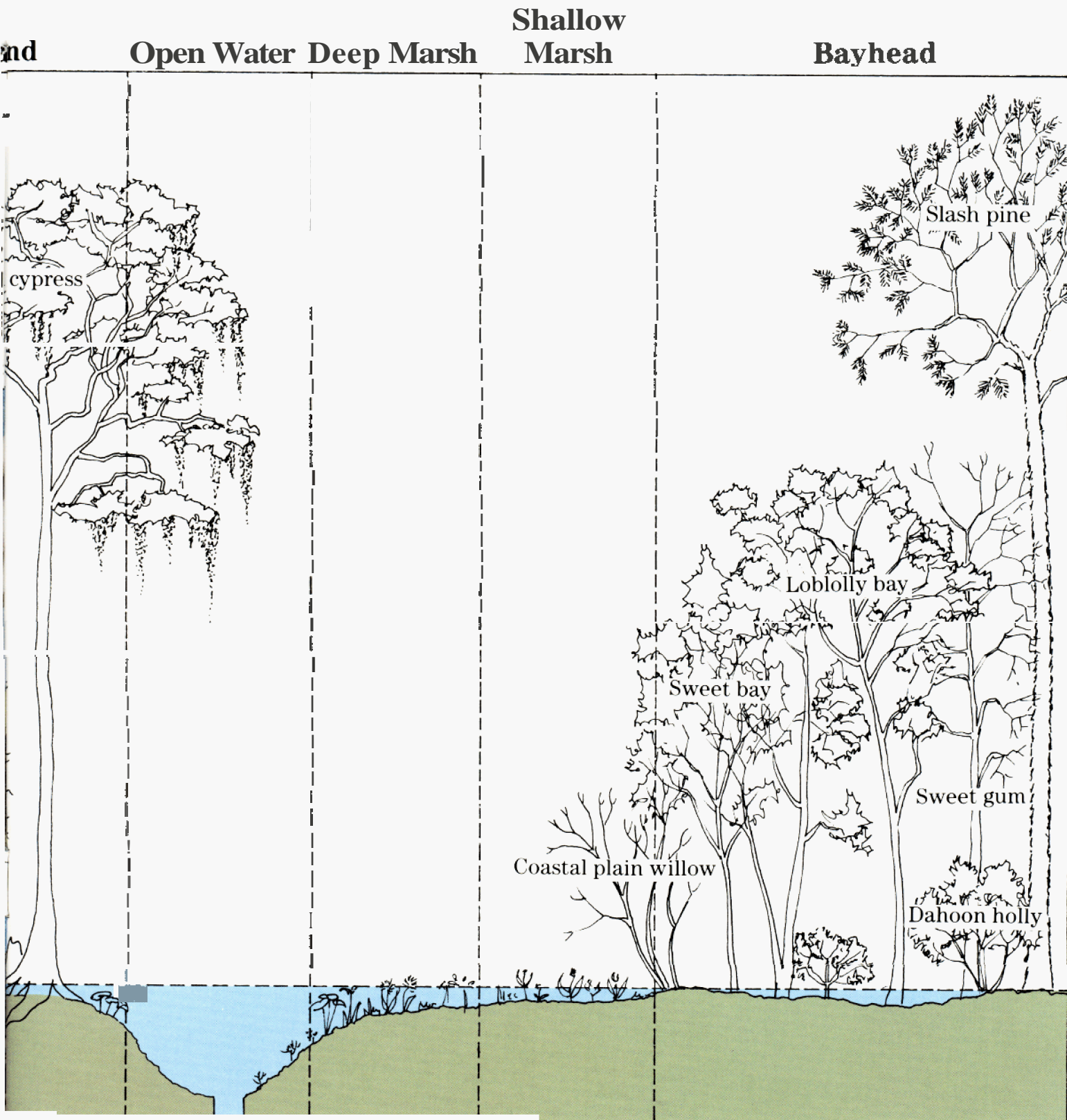
Height/Depth (in feet)

Average
water
level



Types of Wetlands: A Cross-section



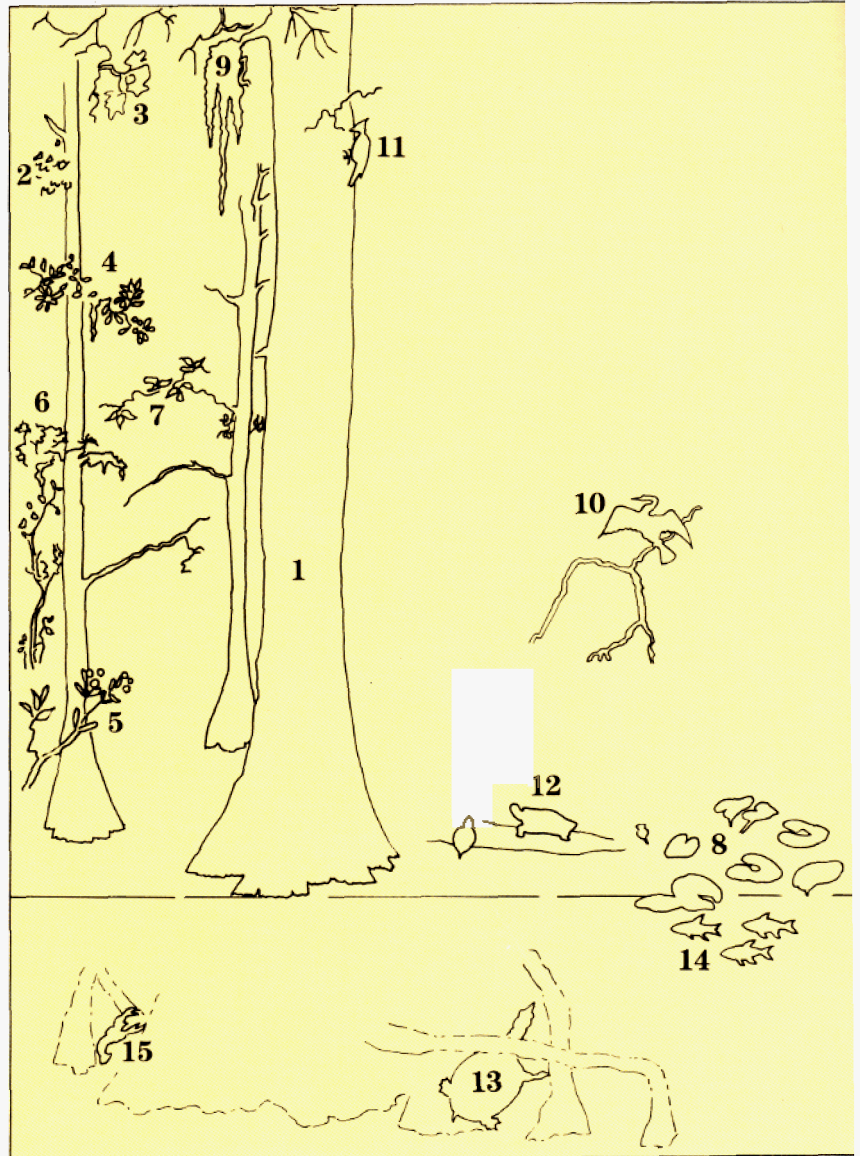


Cypress Wetlands

Cypress wetlands are made up mostly of bald cypress or pond cypress, and are usually flooded for long periods at a time (typically four to eight months in any given year).

Different types of cypress wetlands include cypress domes and cypress strands/swamps. Cypress domes usually occur in depressed areas surrounded by an upland community and cypress strands/swamps occur in long areas near rivers or lakes. These wetland types usually occur where slow-moving or still water is present most of the year.

Both have poorly drained soils, consisting of fine-textured soils or organic materials. Water is at or above the ground level a good portion of the year.



Plants

Trees

1. Bald cypress
2. Black gum
3. Red maple
4. Dahoon holly

Shrubs

5. Buttonbush
6. Wax-myrtle
- Swamp rose

Vines

7. Poison ivy
- Virginia creeper

Herbaceous Plants

- Climbing aster
- Pickerelweed
8. Bonnets (Spatterdock)
9. Spanish moss
- Stiff-leaved wild pine
- Royal fern

Grasses and Grasslike

Maidencane

Animals

Mammals

- Raccoon
- River otter

Birds

10. Anhinga
- Osprey
- Parula warbler
11. Pileated woodpecker
- Hooded merganser
- Limpkin

Reptiles

- American alligator

Turtles

12. Peninsula cooter
- Florida snapping turtle
13. Florida softshell

Snakes

- Brown water snake
- Black swamp snake

Amphibians

- Bullfrog
- Leopard frog
- Little grass frog
- Salamanders

Fish

- Largemouth bass
14. Golden shiner
- Mosquito fish
- Chain pickerel
- Yellow bullhead
- Long-nosed gar

Insects and Other

15. Crayfish
- Dragonflies
- Spiders
- Apple snail



The Values of Wetlands

Historically, wetlands were thought to be valuable only as producers of peat and fossil fuels and as sites for agricultural development. Energy developers took a huge toll on wetlands, as acre after acre was destroyed in efforts to mine peat, coal and crude oil. In Florida, the value has been predominantly agricultural. The forested wetlands are also good sources of timber.

Since wetland scientists and managers began studying these vital areas, they have discovered the economic importance of wetlands, and many other values which could never have a price placed on them. Indeed, who can truly measure the value of:

- clean water?
- preserving entire species of plants and animals?
- enjoying the natural beauty of a wetland?

Some of those wetlands values include:
Habitats for Wildlife and Waterfowl -

A habitat is a place for wildlife and waterfowl to live, providing them with the food and shelter needed for survival. Wetlands are a habitat for many animals and birds which could not nest, breed or live anywhere else. For example, nearly two-thirds of all nesting and breeding ducks use the wetlands of the United States and Canada for habitat.

Likewise, nearly two-thirds of our marine fish and shellfish, including shrimp, depend on wetlands for habitat.

Additionally, a wide variety of plants thrive in wetland conditions. Wetlands, especially certain deeper water types including Hardwood Swamps, Cypress Swamps, Deep Marshes and Shallow Marshes play an essential role as wildlife refuge areas well-suited for waterfowl, wading birds and aquatic animals.



Lakeshore grasses provide an excellent habitat for wildlife and waterfowl.

Improved Water Quality –

Of all of our resources, water is the most **valuable**, and the least valued. Two-thirds of the earth's **surface** is covered by water, 97% of which forms **our** oceans. A majority of the remaining three percent is found in ice caps, glaciers, precipitation, and fresh ground and surface water supplies. Only a fraction **of** one percent is actually fresh water.

We must not view clean, fresh water as an infinitely **abundant** resource. Including personal, agricultural **and** industrial uses, the average person in the **U.S. uses** 1,356 gallons of fresh water per day. With more than 250 million people in this country, we are approaching a use of **339 billion** gallons of water daily. In some places, the lack of water, not energy, **has** created a resource crisis.

The value of wetlands as natural water purifiers is great. Wetlands have been shown to filter or absorb toxic pollutants as well as organic and inorganic nutrients. They also remove silt and sediment from surface waters. The use of man-made wetlands to treat **sewage** wastewater and stormwater has been successful in restoring water quality.

Flood Control and Prevention –

Wetlands are very useful in decreasing the devastating effects of floods, and the resulting losses that flood waters cause. It is believed that floods may cause as much as \$4 billion worth of damage **per** year. Wetlands slow the **peak** surges of storm waters by storing water from those surges. These waters are then released slowly, over a longer period of time, reducing **the risk** of flood **damage**.

Shoreline Protection –

Wetlands which are located in coastal areas **and** inland shorelines **serve** as “absorbers” of wave energy - buffering and protecting the shoreline against



Luke County school children being educated and guided regarding our important wetlands.

erosion, **and** inland areas against damage caused by the fury of waves **and** storms.

The cost of preserving shoreline wetlands **makes** economic sense when compared to the cost of **repairing** the damage which storms could cause to both shoreline and inland property, without the presence of **these** wetlands.

Recreational And Educational Opportunities –

The beauty of our wetlands is a value beyond measure. Their unspoiled, natural open spaces offer opportunities for fishing, hunting, hiking, bird watching and as subjects for photographers and artists.

Wetlands also serve as educational sites for learning about the cycle of water, the food chain, identification and classification **of** plants, **waterfowl** and wildlife, and in many cases **as a link to our cultural past**. Indian village and mound remains have been found in and near wetlands areas, indicating how wetlands were used by **man** many years ago.



A nesting Florida Sandhill Crane.

Endangered Plant and Animal Habitat —

Wetlands serve as the habitat for 90 percent of the plants, 30 percent of the birds, 15 percent of the mammals and 50 percent of the fish on the U.S. endangered species list. Following are some examples of endangered species and some of the types of Lake County wetland areas they might occupy:

Cypress Wetlands: Provide nesting habitat for wood storks, southern bald eagles, ospreys and little blue herons. They also provide habitat for Florida black bear. A variety of epiphytic orchids grow on cypress trees, as well. Epiphytic plants are ones which grow on other plants, but don't get their nourishment from those plants, instead getting nourishment from the rain, dew or dust in the air. They are sometimes called "air plants".

Hardwood Swamps: Provide a nesting habitat for southern bald eagles, ospreys, and little blue herons. The hardwood swamps also provide habitat for Florida black bears.

Bayheads: Provide nesting habitat for southern bald eagles. Bayheads also provide habitat for Florida black bears.

Hydric Hammocks: Provide nesting habitat for southern bald eagles, ospreys and little blue herons. They also provide habitat for Florida black bear and plants such as fall-flowering pleat-leaf.

Deep Marshes: Provide feeding habitat for wood storks, southern bald eagles, and ospreys. Deep Marshes also provide habitat for limpkins.

Shallow Marshes: Provide nesting habitat for Florida sandhill cranes. They also provide habitat for blackbanded sunfish, wood storks, little blue herons, limpkins and fall-flowering pleat-leaf.

Florida's Famous Wetlands

Outside of **Lake** County, but **still** within Florida, **is** one of the world's most interesting regional wetlands made up of **areas known as** the Everglades, the coastal mangroves and the Big Cypress Swamp.

The Everglades **were** formed on eroded limestone bedrock **and** are fed mainly by water from **Lake Okeechohee**. Though this area looks **like** a river of grass, in many places it is very shallow. The most common plant found there **is** Jamaican saw grass **which** isn't really a grass at all **but** a **sedge**. Its sharp edges make **walking** through the Everglades dangerous - the tooth-like leaves can cut through clothing and boots.

The coastal mangroves occupy a **zone** **between** the open waters of the coast and the uplands and freshwater wetlands of the interior. Mangrove trees have roots which tangle together, trapping sediment and organic material which have been washed in **by** the tides. This process forms **new** hammocks, islands or **keys**.

Mangrove *trees* are hearty, and have adapted well to the harsh conditions of the coastal portions of the Everglades. Their **presence** is a large and important addition to the natural food chain. Mangrove leaves which fall **into** the water are eventually broken down by microorganisms. Those microorganisms become food for **shrimp** and small fish, which in turn become food for **blue** crab, spiny lobster and for larger fish including **snapper**, tarpon and mullet. Mangroves and other trees within the Everglades also provide roosting and nesting space for many types of birds.

Man's tampering with **the** Everglades almost proved disastrous. Wildlife and birds **were** killed for their skins or feathers. **Developers** attempted to **drain much** of **the** Everglades to provide land for cities and

agriculture. **What** resulted **was** a loss of the natural flood control provided by this important area. During several hurricanes, **areas** surrounding the Everglades were flooded. Because of drainage, much of the organic soil of the Everglades became parched and fires burned out of control.

Drainage and **excessive** withdrawal **of** groundwater have caused salt water to enter the local drinking water aquifer, and thus entered wells in South Florida. The destruction of wildlife, the floods, the fires, and the threat to drinking water sources eventually **led** the government to step in **with** protective measures, which ultimately were responsible for preserving the remaining portions of this important resource.

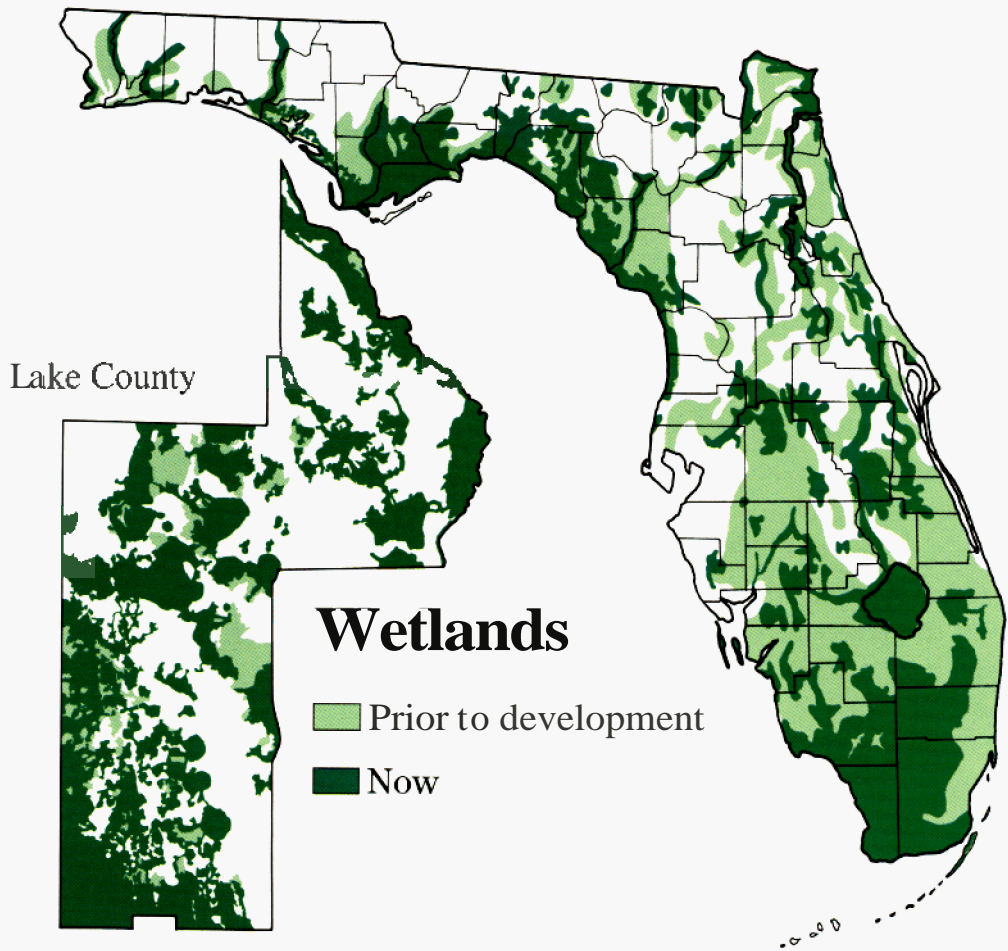
The Big Cypress Swamp, adjacent to the Everglades, **is** made up mainly of **cypress**, **but** also has piney areas and **wet** prairies. Beautiful royal **palms** (native to Florida) **are** found here and in the Everglades. Bobcats **and** the endangered Florida Panther can sometimes be found here.

The Okefenokee Swamp in northeast Florida and southeast Georgia is also a regional wetland. It has a number of floating islands and **wet** prairies, but actually is made **up** of at **least six** major types of wetlands.

Wetlands Management

Even **with** the increase in regulations protecting wetlands over the **past 20** years or so, about 458,000 acres of wetlands are still lost each **year** in the United States alone.

Wetlands managers face enormous **pressure** to allow the *use* of wetlands **areas**



for agriculture and development.

Wetlands are unique areas whose real values are often much less obvious than their real estate values. Those who would encourage the destruction of our vital wetlands **fail** to understand these real values.

Protecting the existence of wetlands is no longer enough...steps must also **be** taken to ensure that our remaining wetlands are properly managed so they may **keep** or even improve their natural values.

The responsibility for the management of wetlands falls to all **of** us. Landowners, sportsmen, scientists, engineers, environmentalists, and government agencies all have special and important reasons to join to protect wetlands, **but the most important wetlands manager is you!** Public opinion, from citizens who understand the value of wetlands, can help educate and influence the behavior of

those **people** who don't.

How many wetlands exist, where they are, which are being threatened or disappearing, are questions for which answers must be supplied. **A** number of **agencies** including the U.S. Fish and Wildlife Service have launched identification, trend and mapping projects on a nationwide level.

Locally, the Lake County Water Authority **is** updating the Lake County Wetlands Mapping Project to classify wetlands by vegetation and soil types, map those wetlands areas, and assign relative importance to them as they **relate** to **Lake** County's environment. Upon completion of this project, wetlands managers should have an improved tool with which to enforce existing wetlands regulations and to adopt new ones.

Laws exist today which establish

wetlands **policy** and regulatory functions throughout the United States. Policy is set on federal, state and local levels.

Currently, federal regulations control about 60% of the country's wetlands. However, states, counties and cities are now beginning to take more and more responsibility for the protection of their **own** environments.

The responsibility **for** protection and management of our wetlands **falls** to many **various** agencies.

To encourage **landowners** to maintain their wetlands without losing the economic benefit of their land, several forms of management are considered. These special management practices include: waterfowl production, commercial shellfish and marine fish production and cattle-feed production. Some states also have **land** acquisition or tax relief programs.

Conclusion

The steps **taken** in the past 20 years to preserve our vital wetlands have been enormous, yet **we** still have a long **way** to **go**.

Until all states and their **local** governmental units adopt wetlands protection and management policies, and until **we** all understand the importance of wetlands, the job will not be complete.

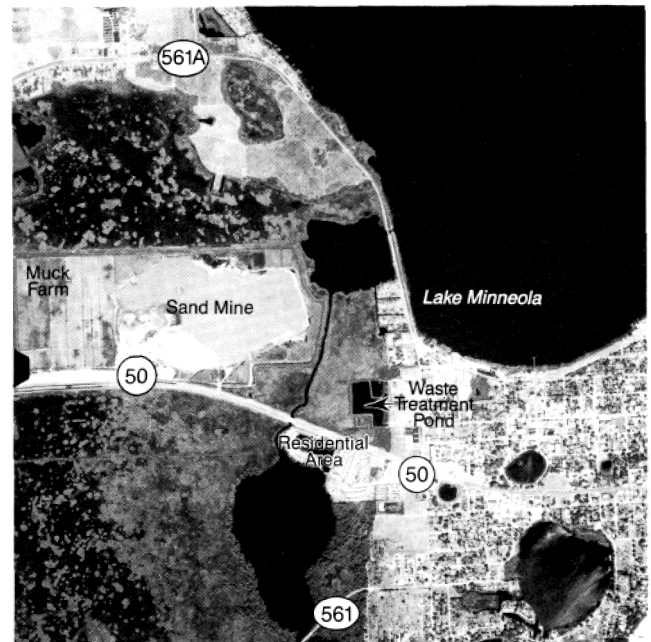
We must **work** together, get involved, insist that laws be written and enforced to save and protect our vital wetlands.

This booklet is **a** starting **point**. We have tried to introduce you briefly to the benefits of wetlands. Many private organizations **as** well **as** governmental agencies also have a strong interest in these resources.

The **Lake** County Water Authority would be happy to answer your questions **or** help you obtain additional information about our vital wetlands.



An aerial photo taken in the early 1940's shows an area of untouched wetlands around Lake Minneola and Lake Minnehaha near Clermont.



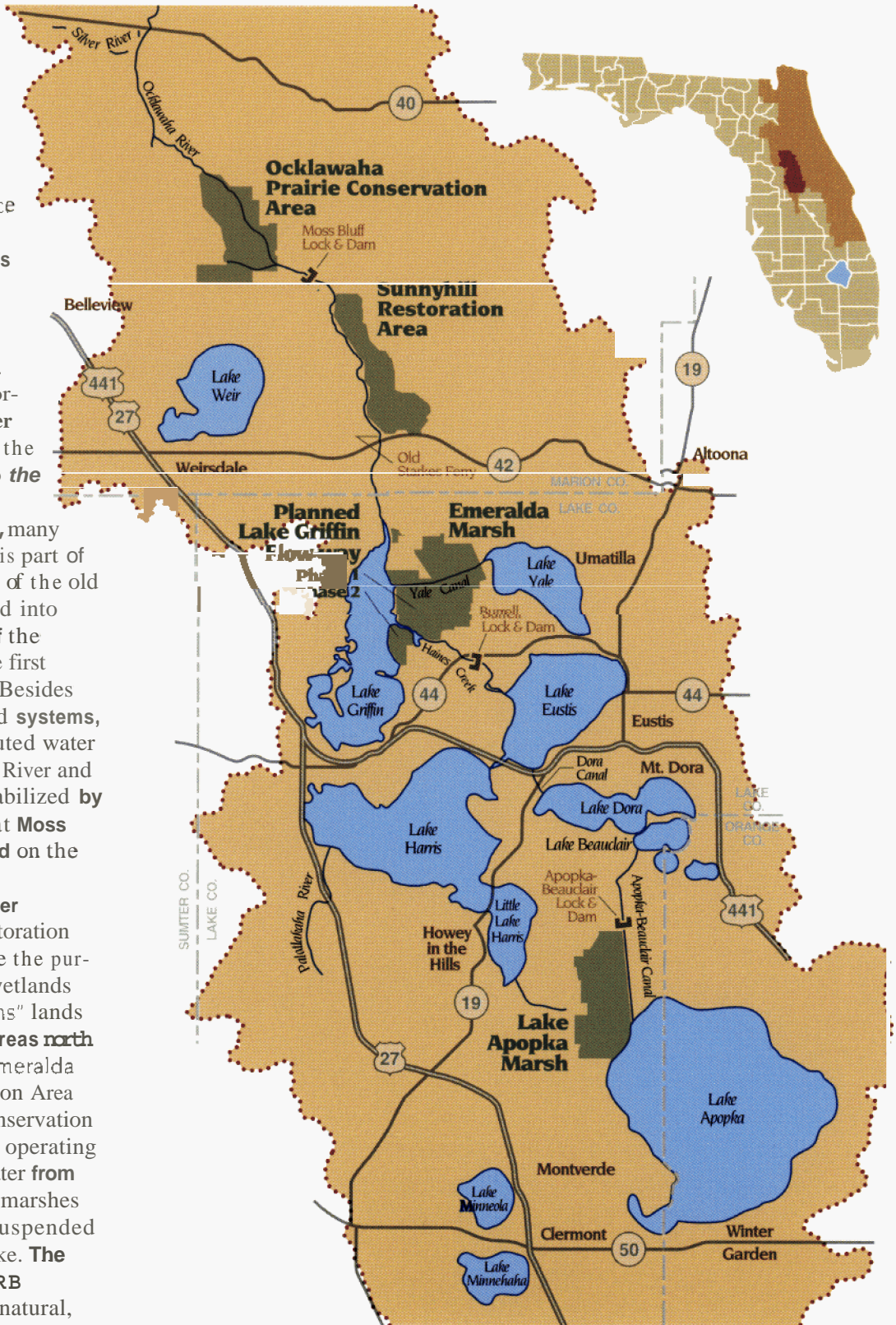
A current aerial photograph shows the destruction of these wetlands which were developed for use as a sand mine, muck farm, waste treatment plant and residential area.

The Upper Ocklawaha River Basin

The publication of this booklet was supported in part by the St. Johns River Water Management District through the Upper Ocklawaha River Basin (UORB) SWIM program. SWIM stands for the Surface Water Improvement and Management Act which was passed by the Florida Legislature to protect and restore the state's surface waters and natural habitat. The UORB includes the portion of the Ocklawaha River basin that runs north from the Apopka-Beauclair Canal to the Silver River near Ocala.

Over the last 100 years, many changes occurred along this part of the Ocklawaha River. Parts of the old river channel were diverted into canals to allow drainage of the floodplain to establish the first muck farms in the region. Besides draining important wetland systems, these farms pumped polluted water into the upper Ocklawaha River and lakes. Lake levels were stabilized by the construction of dams at Moss Bluff, on Haines Creek, and on the Apopka-Beauclair Canal.

The St. Johns River Water Management District's restoration efforts in the basin include the purchase and restoration of wetlands on many of the "muck farms" lands in the basin. The largest areas north of Lake Apopka include Emeralda Marsh, Sunnyside Restoration Area and Ocklawaha Prairie Conservation area. A flow-way project is operating on Lake Griffin to filter water from the lake through restored marshes to remove nutrients and suspended solids directly from the lake. The other major project in UORB involves restoring a more natural, rainfall driven, method of regulating water levels and flows in the Ocklawaha Chain of Lakes. For more information on the UORB, please contact the SJRWMD at (904) 329-4323 or (352) 821-1489.





"Caring for the beauty and
safety of our waterways."

LCWA

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