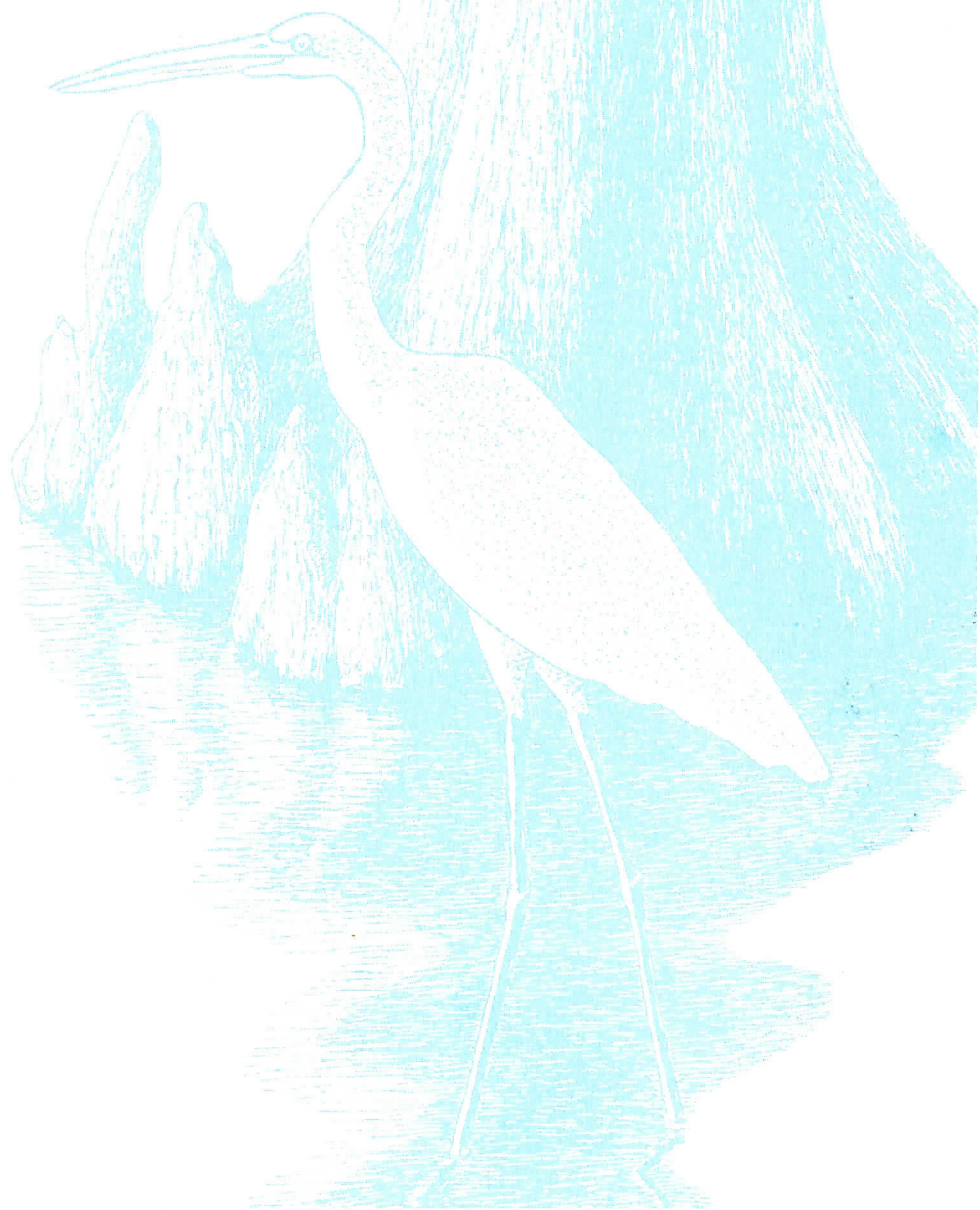


# Preserve FLORIDA WATERS



# Preserve FLORIDA WATERS

Second Edition

This popular guide on maintaining waterfront property was prepared by the League of Women Voters of Orange County. The League appreciates the input from the following consultants: Jim Hulbert - Dept. of Environmental Regulation, Dean Barber - Dept. of Natural Resources, Bill Partington - Environmental Information Center, Herbert Kale - Florida Audubon Society.

Funds for this second edition of *Preserve Florida Waters* were provided by the Florida Department of Environmental Regulation. This publication was produced at an annual cost of \$.50 per copy to promote public awareness on the causes, prevention and effects of water pollution on Florida's lakes, streams, rivers and bays.

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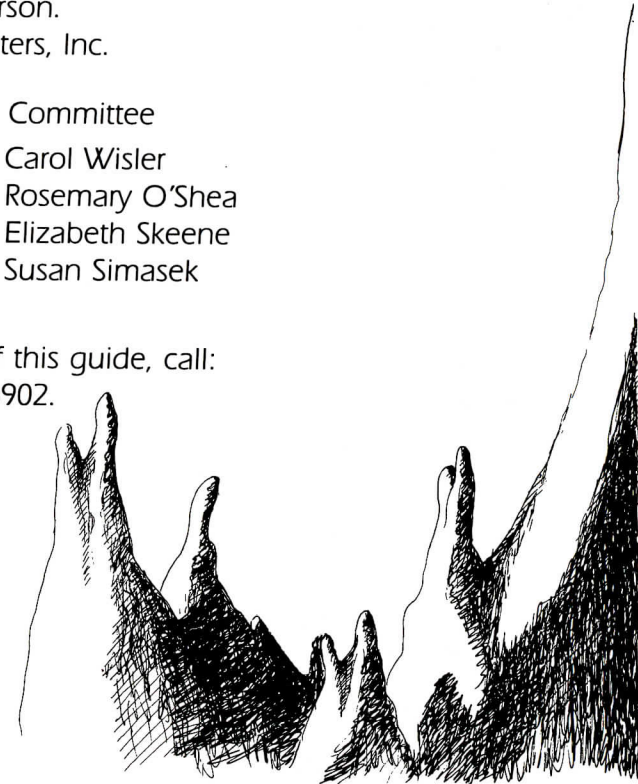
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For additional copies of this guide, call:  
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## Ten Commandments For A Healthy Lake

- **NEVER** rip out beneficial shoreline vegetation
- **NEVER** dump grass clippings or yard trash into the lake or sewer drains
- **NEVER** create (build) a sandy beach
- **NEVER** build a seawall or alter shoreline
- **NEVER** dump pesticides, herbicides, oil or paint into the lake or sewer drains
- **ALWAYS** reduce direct water runoff into lakes
- **ALWAYS** install septic systems as far away from the lake as possible
- **ALWAYS** use biodegradable, phosphate-free detergents
- **ALWAYS** landscape with native plants
- **ALWAYS** question construction near lakes

(For further explanation of these  
ten commandments . . . read on.)

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# INTRODUCTION

## CLEAN WATER IS ESSENTIAL TO ALL FORMS OF LIFE!

*"I had a real flash of nostalgia the other day. I saw a guy actually swimming in a local lake. I was so excited, I stopped to chat about the good old days. But I was disappointed. He was taking coliform counts."*

This quote from Dick Marlowe, Business Columnist for the *Orlando Sentinel*, is becoming true for more and more of our lakes.

Some startling statistics:

- There are three million acres of fresh water in Florida.
- It is estimated that 700,000 acres are seriously threatened or no longer able to sustain quality freshwater sport fishing.
- An additional one million acres are considered to be in jeopardy and will be lost if current trends are not reversed.
- Over 50% of Florida's fresh waters have been negatively altered or degraded into a less productive state. (1980)

This guide was prepared to educate waterfront owners on the causes, prevention and effects of water pollution to their lakes, streams, rivers or bays. Waterfront owners are the individuals who can do the most in solving these pollution problems.

Convincing your neighbors to follow the tips contained in this guide can make a pronounced improvement in the quality of your waterbody. This guide is also meant for the general public, who enjoy and have access to recreational waters and share in the responsibility of pollution-free Florida waters.

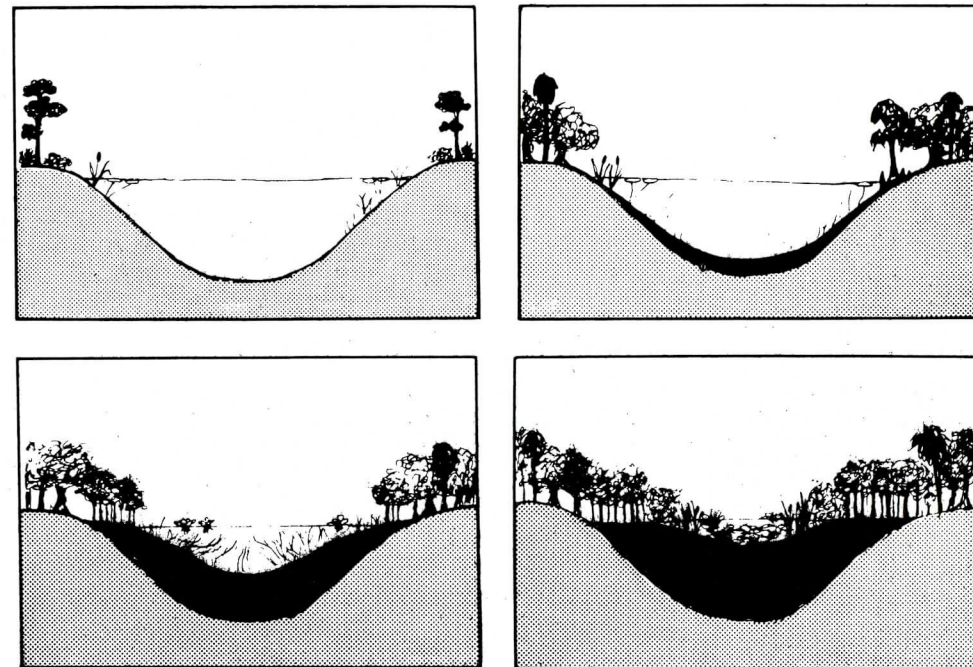


# WATER POLLUTION

Lakes, rivers, impoundments and estuaries go through a natural, healthy aging process called eutrophication where these waterbodies eventually become dry land. This natural process of filling in takes thousands of years. However, when you add humans and build their developments near waterbodies, this aging process is greatly accelerated. When the aging process becomes artificially accelerated by humans, it is called cultural eutrophication, a very unhealthy situation for your waterbody.

"Eutrophic" means well-nourished. When a waterbody is overfed with a higher nutrient input than its ecosystem can utilize or absorb, the ecosystem gets out of balance. These excess nutrients stimulate the plants and algae to over-produce, so that as they die the waterbody is filled with an excess accumulation of plants, dead plankton and sediments.

Some of these sources of nutrients are fertilizers, pet wastes, leaves, yard clippings, dust, debris and detergents.



## ALGAE BLOOMS AND FISH KILLS

A highly eutrophic or over-nourished waterbody will produce more algae (simple, rootless plants that grow in water in relative proportion to the amounts of nutrients available) than aquatic organisms can eat. As long as the algae is alive and there is sunlight, it is producing oxygen. But when the algae die or there is no sunlight, it uses up the oxygen. The swings from high oxygen content to low oxygen content are too extreme for the survival of many aquatic species.

Organisms which can survive in the oxygen-poor environment are usually those considered less desirable. Game fish are among the first species to disappear.

### LAKE APOPKA

Lake Apopka is well known for its history of problems. The following is an excerpt from Lake Apopka's Environmental Impact Statement. This document was prepared to explore the lake's past and present condition and possible methods for restoration.

*"... Throughout the first half of this century, Lake Apopka contained clear water and luxuriant vegetation and was noted for its excellent bass fishing. Today it is a highly eutrophic lake and experiences continual algae blooms. About 90 percent of the lake bottom is covered with organic deposits; in some places this muck is more than 15 m (50 ft.) deep ... Rough fish such as shad, gar and catfish are now the dominate species in Lake Apopka ..."*

The activities of man have reduced Lake Apopka from a fishing and recreational resource to a foul-smelling, unhealthy bog - all within less than 100 years. Nature's way would have taken thousands of years!

The rest of this booklet is devoted to explaining what we as informed, concerned individuals can do to help promote the best management practices for the health of our Florida waters.

### Example of a Healthy Lake

- Low level of plant nutrients
- Little sediment build-up on bottom
- Many different species of fish (bass, bream, bluegill, speckled perch)



### Example of an Unhealthy Lake

- High levels of plant nutrients
- Extensive plant growth and algae blooms
- Many individuals of a few species of fish (most likely gar, shad, catfish)





## SHORELINE VEGETATION

DO NOT REMOVE BENEFICIAL VEGETATION AND FORM SANDY BEACHES ALONG SHORELINES. The shoreline of a waterbody should remain completely natural; modification of the natural form or shape inhibits a waterbody's ability to effectively utilize or absorb nutrients and pollutants. A natural shoreline is to a lake what your kidneys are to you - the cleanser of impurities out of the system. High-level nutrient discharge from runoff from lawns and streets contributes to excessive growth of algae, rapid sediment buildup and production of undesirable types of vegetation. All these problems contribute to the accelerated death of your waterbody and directly cause short-term massive fish kills.

Shoreline vegetation, in addition to its erosion and pollution control benefits, also provides a habitat for numerous species of wildlife. Green-backed herons, least bitterns, common moorhens, purple gallinules, and red-winged blackbirds nest in emergent vegetation, such as cattails and sawgrass. Emergent vegetation also provides protective cover for the young of these birds and for several other species that may nest elsewhere but bring their young to be reared on your waterbody. Frogs and turtles that live in your waterbody use emergent shoreline vegetation for cover, perches and a place to forage for insects and other food sources. Some waterfront owners may even be lucky enough to have a family of otters living in their lake.



SUGGESTED LIST OF PLANTS TO PLANT ALONG YOUR SHORELINE TO HELP IMPROVE WATER QUALITY. Remember, plants aid your waterbody in removing pollutants and debris. However, you must research carefully so that you don't introduce obnoxious plants into your waterbody. The Florida Department of Natural Resources has an excellent book to help guide you. Their address is in the back of this booklet under the list of government agencies. This is a short list of some of the beneficial plants to use.

GENUS / SPECIES	COMMON NAME
<i>Sagittaria graminea</i> .....	coastal arrowhead
<i>Sagittaria latifolia</i> .....	common arrowhead
<i>Eleocharis baldwinii</i> .....	slender spikerush
<i>Brasenia schreberi</i> .....	water-shield
<i>Bacopa caroliniana</i> .....	lemon bacopa
<i>Scirpus cyperinus</i> .....	woolgrass bulrush
<i>Zizania aquatica</i> .....	wild rice
<i>Juncus effusus</i> .....	soft rush

TROUBLESOME PLANTS THAT SHOULDED NEVER BE INTRODUCED INTO YOUR WATERBODY. If they are already present, use mechanical means of disposal first - use chemical means only as a last alternative.

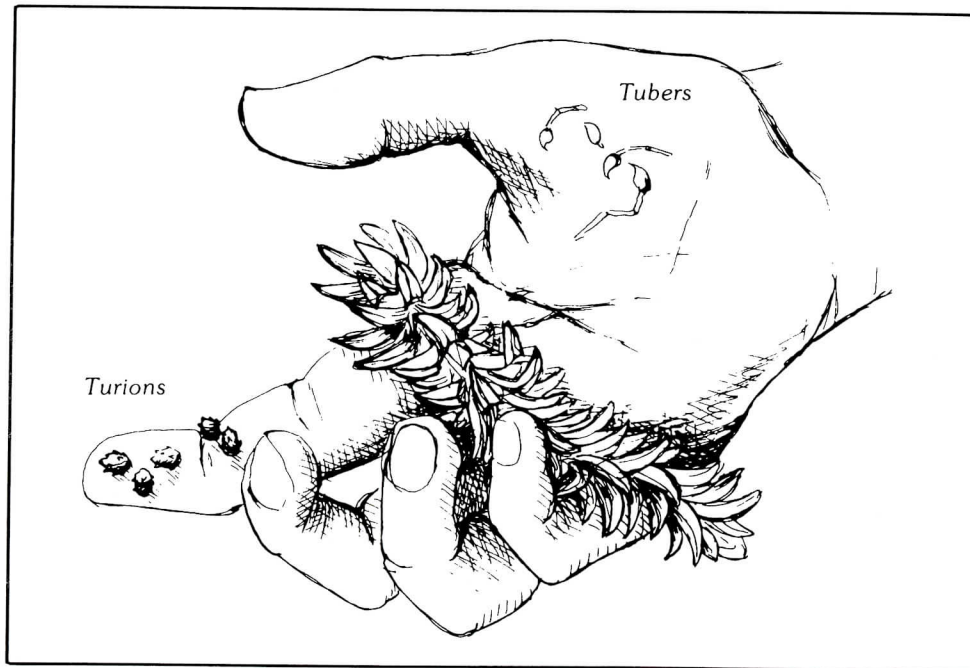
GENUS / SPECIES	COMMON NAME
<i>Eichhornia crassipes</i> .....	floating water-hyacinth
<i>Alternanthera philoxeroides</i> .....	alligator-weed
<i>Myriophyllum spicatum</i> .....	Eurasian watermilfoil
<i>Hydrilla verticillata</i> .....	hydrilla
<i>Utricularia gibba</i> .....	cone-spur bladderwort
<i>Schinus terebinthifolius</i> .....	Brazilian pepper



# HYDRILLA

One big problem for waterbodies and the people that use them is a submersed aquatic plant called hydrilla. This plant was introduced into this country by the aquarium industry.

To identify this plant, look for long, branching stems that can grow in depths of water as great as 15 meters with leaves 4 mm wide, 8-18 mm long, in whorls of three to five. It reproduces by turions and tubers, both of which allow the plant to survive cold winters and periods of drought. Its spread has been facilitated by fragments of the plant attached to boat motors and trailers. Water fowl and other animals may also be carriers. It is a hardy plant that can survive a variety of water conditions, even moderate amounts of salinity. It requires a lower level of sunlight than native aquatic plants; therefore, it can grow in deeper and darker water and can start growing earlier in the morning. This characteristic allows it to outgrow native plants and eventually take over a waterbody.



At present, hydrilla is controlled by the use of herbicides. Herbicides are expensive to use, and because not all the facts are known about these chemicals, they could be dangerous. After application of the herbicide, the plant dies and falls to the bottom of the waterbody, contributing to the sediment buildup and excess nutrients that can cause algae blooms.

There have been experiments conducted on several lakes using the grass carp (white amur) to feed on hydrilla. If a correct balance between hydrilla and the carp is obtained, the carp will control the hydrilla without destroying the native plants.

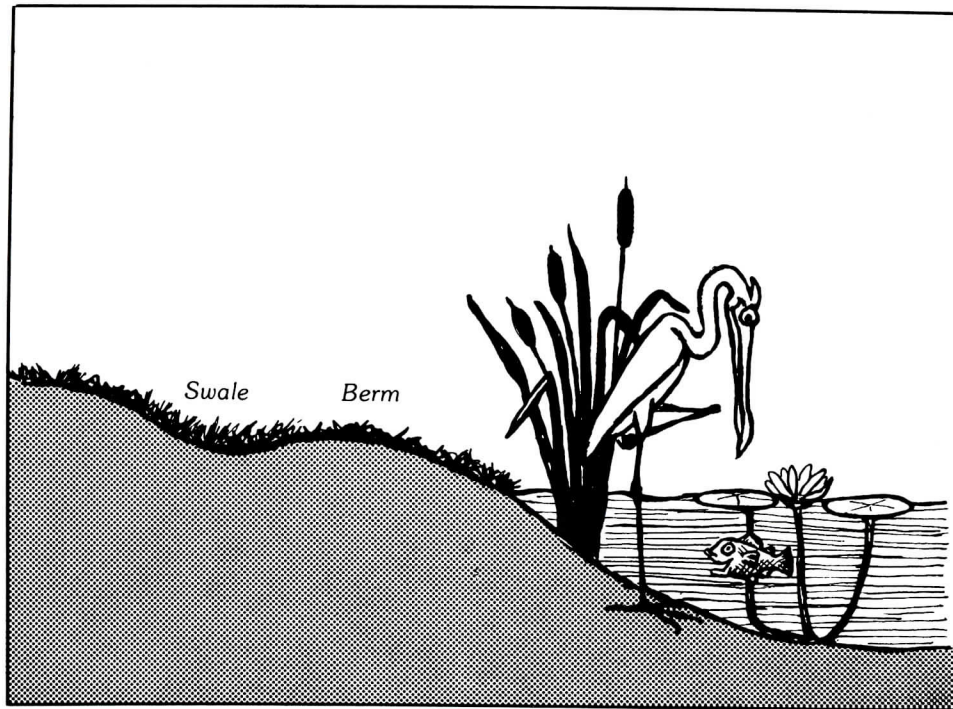
Since there is a possibility the grass carp could breed in our waters, the Florida Game and Freshwater Fish Commission has decided to discontinue its use in favor of the sterile triploid grass carp. Research dealing with the triploid grass carp is presently being conducted in hydrilla-infested lakes in Florida by the Florida Game and Freshwater Fish Commission. The triploid grass carp is available to lakefront property owners only from the Commission. For further information, contact Dr. Clayton Phillip, Florida Game and Freshwater Fish Commission, 620 S. Meridian St., Tallahassee, FL 32304.

## SHORELINE CONTOUR

Under original natural conditions, lakes are typically clean and healthy. The water is "swimmable" and birds, fish and other wildlife are healthy.

One reason for this is that, under natural conditions, stormwater runoff flowing into the lake usually runs through native plants that absorb any chemicals being washed into the lake.

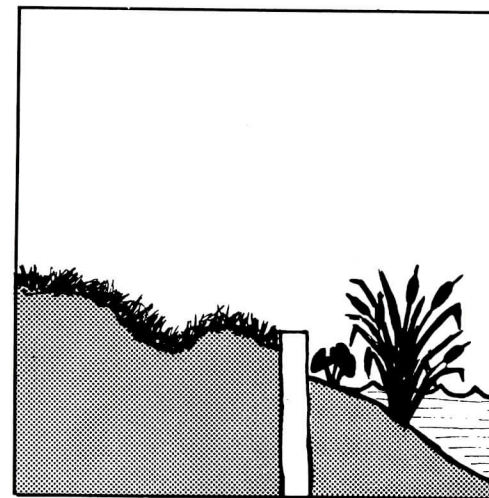
Another reason is that uphill shoreline slopes are usually naturally very gentle, almost flat in many parts of Florida. The drop in elevation may be measured in inches every ten feet or so. Thus, the stormwater flows slowly through beds of native vegetation of various species and has time to be absorbed.



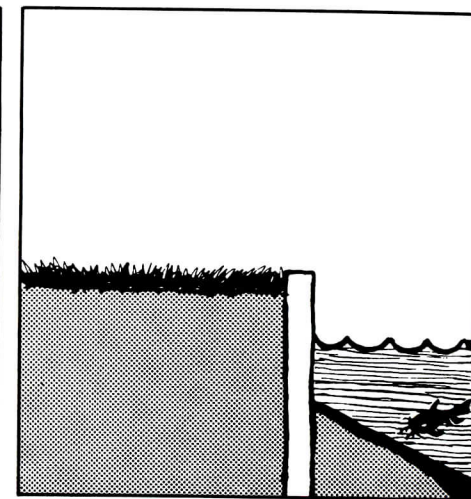
Unfortunately, waterfront homebuilders usually build up house lots by adding dirt in order to keep the house high and dry, and to grow a lawn. Stormwater under the changed conditions then runs off more rapidly. Waterfront homeowners generally leave few or no native shoreline plants to absorb nutrients, and most lawns have been treated with artificial fertilizers and pesticides. Rooftops and pavement replace absorbant land. Thus, natural controls, gentle slope, native plants, and sandy soils are replaced by conditions that "over-enrich" the waterbody and pollution occurs.

To repair this condition, the waterfront owner should try to slow the rate of runoff and reduce the nutrients. Creating berms and swales will help retard the first flush of rainwater. Allow natural vegetation to regrow in the swale and along the shore to absorb some of the nutrients.

In most cases, sea wall construction goes hand in hand with removal of shoreline vegetation which proves harmful to the lake's ecosystem. If a sea wall has already been constructed on your property, the best solution would be to place a swale and berm system a foot or two back from the wall. This will prevent the direct discharge of impure stormwater runoff by allowing it to percolate through the soil.



Correct



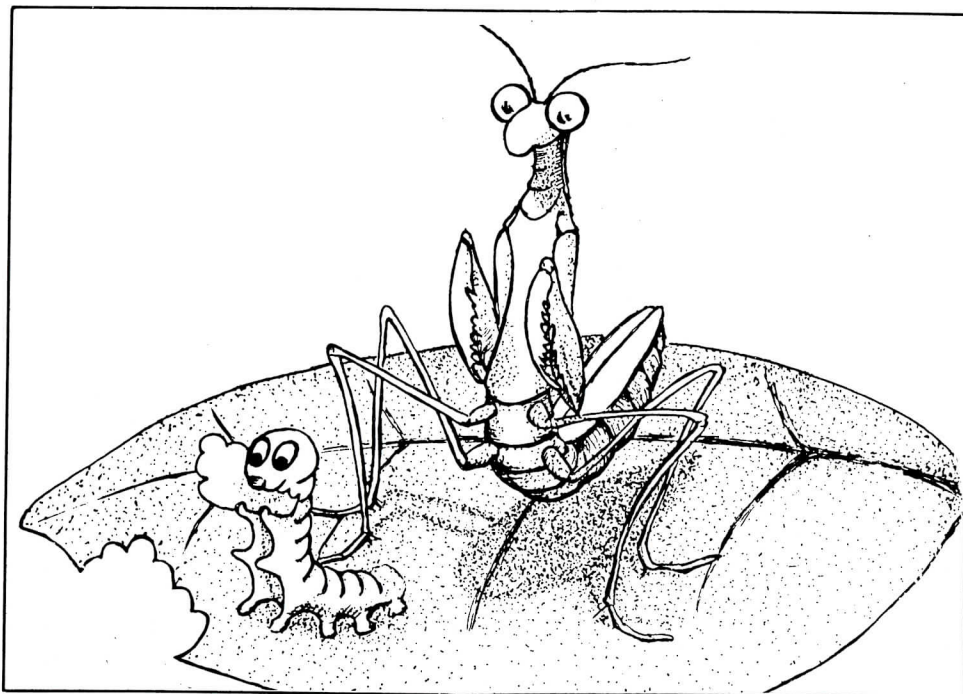
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## PESTICIDES

One of the purposes of *Preserve Florida Waters* is to emphasize that clean water is essential to all forms of life. Chemical pesticides (which include insecticides, herbicides, fungicides, rodenticides, and many other classes) used on the lawn or in the garden will eventually be carried into the water ecosystem. However, insects and other pests can also be controlled by cultural, mechanical and biological methods.

Cultural methods include spading and plowing the soil to kill weeds and expose insects to the weather and predators; rotating crops; fertilizing and watering to increase plant growth and insect tolerance; and, after the growing season, converting crop remains into compost by spading them into the soil.



Mechanical methods include hand removal of diseased plants, weeds, and insects; placement of plant guards such as sticky barriers on trunks of trees and shrubs to prevent infestation by crawling insects; mesh covers for small fruit trees and berry bushes; and aluminum foil on the soil beneath the plants to repel certain insects (aphids and leafhoppers, in particular). Spraying with water loosens insects from plants, and the addition of a small amount of soap to the water will repel insects. Various traps can be set to catch insects: boards laid on the ground will catch slugs and pill bugs; rolled up newspapers will trap earwigs; a 9:1 dilution of water to molasses in a 2-quart container will trap grasshoppers, moths, and some beetles; and beer in a pan placed flush with the soil will catch slugs and snails.

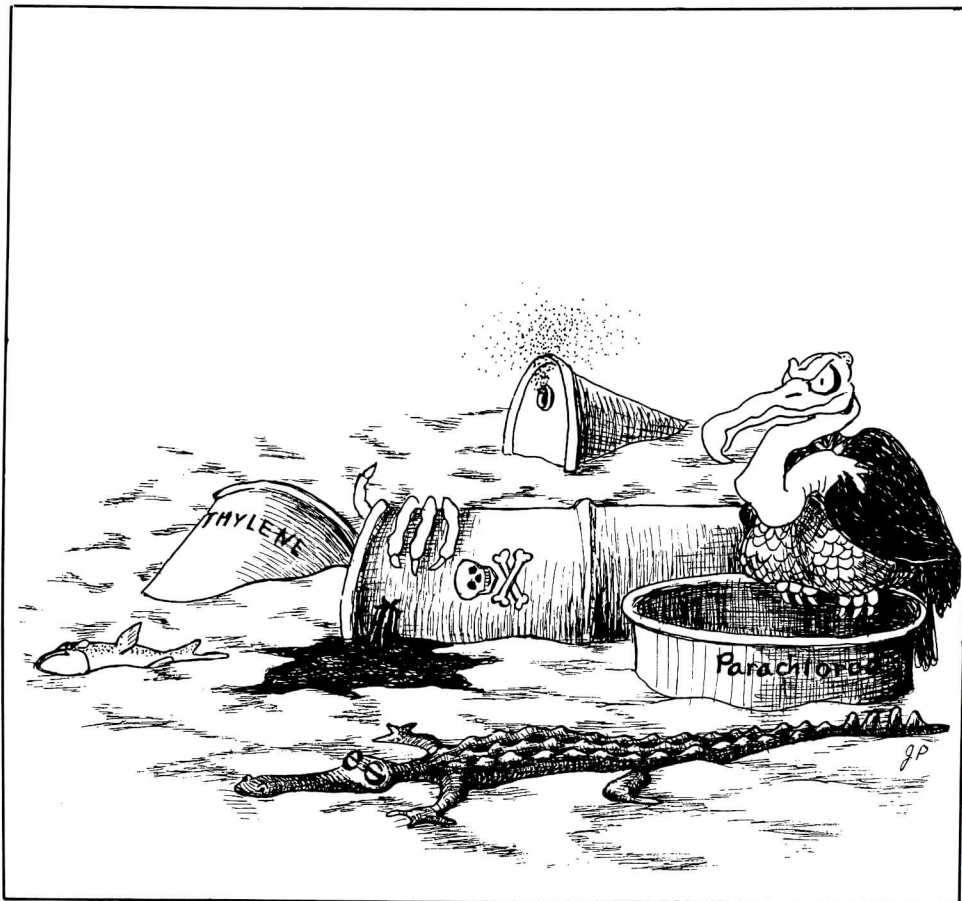
Biological methods include using beneficial insects and birds as predators. Praying mantises, ladybugs, wasps, ground beetles, dragonflies, lightning bugs and spiders feed on various harmful plant insects and are therefore beneficial to gardeners. Encourage insect-feeding birds to your yard and garden by providing cover, other food, and safety from cats.

If these methods and other nonchemical treatments fail, it may be necessary to use a commercial chemical pesticide, which can be either a synthetic or naturally occurring chemical compound. However, chemical insecticides will kill both the harmful and the useful insects. Remember, too, if they enter your nearby waterbody, they can be harmful to the life within that water.

There are pesticides that can be made at home, including insecticides, herbicides and fungicides, and there are also various insect repellents for plants, humans, animals and the home which can be manufactured at home. An excellent source for pest control information is your local county agent, who is part of the cooperative extension service of the local county government. To find the nearest agent to you, look in the phone book or contact the Institute of Food and Agricultural Services, University of Florida, Gainesville, FL 32611.



Two very comprehensive books on pest control, which you should be able to find in your public library, are *The Complete Guide To Pest Control With And Without Chemicals* by George W. Ware (1980, Thomson Publications, P.O. Box 9335, Fresno, CA 93791) and *The Natural Way To Pest-Free Gardening* by Jack Kramer (1972, Charles Scribner's Sons, New York).



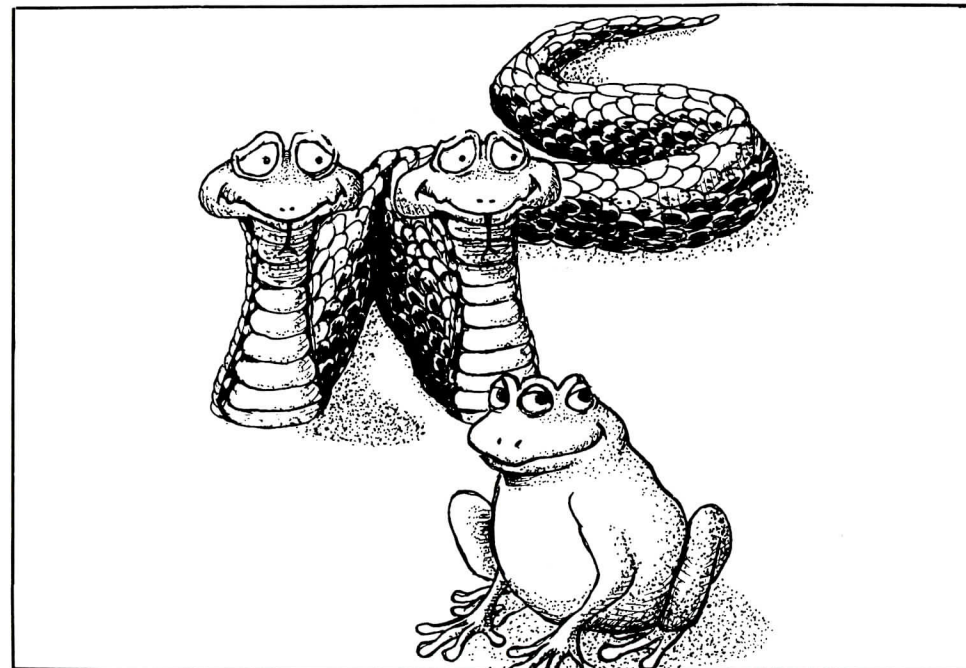
Pesticides used on the lawn or garden will eventually find their way into the lake's ecosystem.

## HERBICIDES

Lake and river systems require vegetation to remain "alive." They should not be approached with the idea of converting their shoreline vegetation to a beachfront. Attempting to mold inland waterbodies into synthetic beaches may destroy the very beauty that originally convinced you to buy your waterfront property.

Herbicides are chemicals used to kill plants. But they also exhibit toxicity to man and animals. New evidence has come to light on the possible carcinogenic, teratogenic and mutagenic effects of herbicides.

Herbicides used to clear your waterfront property for boating and swimming activities destroy emergent aquatic plants that provide waterfowl habitats and protect young wildlife from predators. Shoreline vegetation is necessary to prevent erosion, provide forage and food for wildlife, and maintain fish populations.



Herbicides cannot be considered as harmless compounds.

Not only should you seriously consider the damage that is done to a waterbody's ecosystem by altering the shoreline, you should also know that by law it is required to be permitted prior to undertaking the control of aquatic plants with herbicides. Specific laws governing the use of herbicides in emergent aquatic plants can be obtained from the Florida Department of Natural Resources and county environmental protection departments. Besides chemical control of aquatic plants, there are also mechanical and biological (introduction of the grass carp in the waterbody is an example of a biological method) methods. It is legal to clear a 24-foot-wide access to your waterbody provided it is accomplished by mechanical means. Cutting the tops of plants prevents them from being able to photosynthesize, and they will eventually die. Use this method to clear the area for access - it will not damage the water environment. Still, consult your local and state government agencies - they are willing to work with you while also working to preserve all of Florida's waterbodies, which every day need more protection because of the rapid growth and development Florida is experiencing. Also, these agencies may have other specific regulations that anyone who plans to alter a water ecosystem must follow. For instance, in Orange County, Article V of the Water Conservation Code regulates pumping and dredging and Article IX defines lakeshore protection regulations. Be safe and consult these agencies prior to any shoreline alterations.

## NATURAL FERTILIZERS

Landscaping with native plants will reduce your dependence on fertilizers. You want to reduce your need to fertilize because inorganic fertilizers can be an important contributor to the phosphate contamination of waterbodies. Therefore, you should only fertilize according to need. It is wasteful and expensive to fertilize needlessly and automatically at certain seasons. Give nature a chance!

If you must fertilize, try natural fertilizers (phosphate-free) which are available from farmers and nurseries.

There is little in the way of fertilizers that is better than compost heaps. The principle behind a compost heap is simple. It takes place in every forest where leaves, fallen wood and other organic matter are converted to rich soil by action of bacteria, organisms and oxygen. A compost heap is simply a means of carrying out this process in one spot. Your compost heap can either be contained in a shallow hole in the ground, a cement block or wooden enclosure, or simply placed in a corner of your property. **MAKE CERTAIN THAT YOU PUT THE COMPOST HEAP IN A PLACE WHICH WILL NOT AFFECT YOUR WATERBODY.**

Essential things for a compost heap are:

1. The organic matter (yard clippings, vegetable parings, leaves, etc.) must be kept damp.
2. Oxygen must reach most of the material for the decaying process to work. This can be accomplished by turning the pile every week or two.
3. Seed the pile by mixing in garden soil which contains essential decaying organisms.

Remember - this compost is free and there's little in the way of mulch or fertilizer at any price that is better.



## YARD CLIPPINGS

Yard clippings must not be allowed to reach the waterbody.

In terms of waterfront property, removal of grass clippings and other yard clippings is beneficial. For the lake to decompose these organic wastes requires the use of oxygen. In turn, this imposes a strain to the waterbody's ecosystem by lowering oxygen levels. An adequate oxygen supply is vital to the survival of plants, fish and other aquatic organisms.

As mentioned in the Natural Fertilizer section, organic substances can be disposed of in compost heaps, with the resulting material being an excellent soil conditioner.

Another means of disposal of yard clippings would be as a mulch for your landscape plants. Mulch keeps weeds to a minimum as well as conserving water by preventing evaporation and lowering soil temperature.

Burning is a poor alternative because it releases solid particles and smoke into the air. Other than being a source of air pollution, these air-borne pollutants return to the earth through rainfall. Also, in many areas of Florida, it is against the law to do burning of any kind without a permit from your local fire department.

## STORMWATER RUNOFF

When rainwater collects in the streets, it is routed to a storm drain. In many existing developments, stormwater is transported by storm drains for discharge into the nearest waterbody without treatment. STORMWATER RUNOFF IS ONE OF THE PRIMARY CONTRIBUTORS TO CULTURAL EUTROPHICATION OF WATERBODIES.

Many persons improperly use storm drains as an alternative to proper garbage disposal. Car oil and rinse water used to clean pesticide applicators and paint brushes are just a few of the pollutants people improperly put down storm drains. Compounding these problems is the litter on the roadsides, including leaves and grass clippings, which is pushed into the drains by the velocity of stormwater runoff.

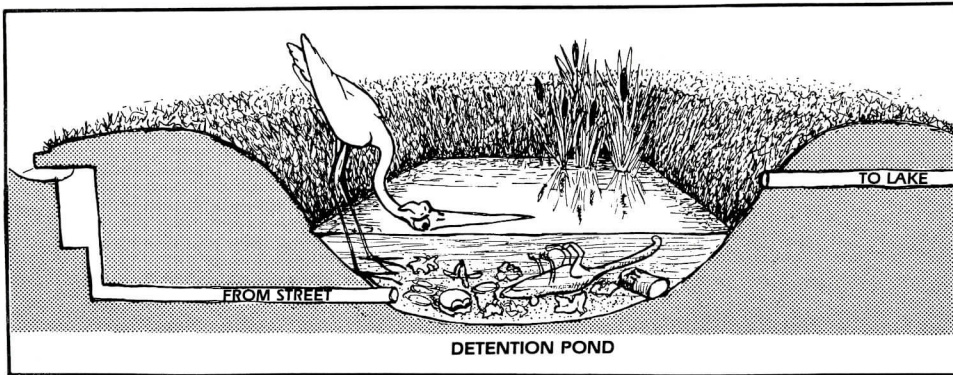
Stormwater runoff is a difficult problem to solve because of its volume, polluting effects and diverse nature. Even if all other pollution sources are removed, inputs of stormwater runoff can pollute a waterbody to the extent that it becomes unfit for recreational use.

In Florida, stormwater discharges introduce 450 times more suspended solids and possess a biochemical oxygen demand nine times greater than secondarily treated wastewater. Stormwater is also responsible for 80-95% of heavy metals found in our waterbodies. (From the East Central Florida Comprehensive Regional Policy Plan.)

While it is impossible to prevent all stormwater runoff from entering our waterbodies, a portion of the initial runoff or "first flush" should be treated.



Diverting stormwater runoff to retention or detention ponds is one solution. These should not be confused with sewage holding ponds. They are strictly for stormwater runoff. Review the illustration to better understand how retention or detention ponds work.



Incorporation of stormwater abatement techniques in previously developed areas is a more difficult proposition, since until recently, property was not reserved for stormwater management. Donations of small portions of land by concerned owners may be one solution to this problem. Research is currently underway for other methods of stormwater runoff treatment, and new state legislation is addressing this serious problem.

## SEPTIC TANKS

Serious water quality problems occur when septic tank and drainfield systems are located too near a waterbody. Untreated or improperly treated sewage may reach the water, causing pollution and degradation problems. Unfiltered sewage that reaches surface water causes odor problems, attracts flies and other insects, and is a source of disease.

Construction of a septic tank system near waterbodies on steep slopes should be avoided. Slopes of less than 15% usually do not create serious problems in either construction or maintenance of an absorption field provided the soils are satisfactory. Septic tank systems may also contaminate groundwater if located near wells in high water table areas.

Proper soil conditions are probably the most important aspect in septic tank feasibility. Soil permeability is that trait which allows water and air to move through it. It is influenced by the amount of gravel, silt and clay in the soil. Water moves faster through sand and gravel soils than through clay soils.

Homeowners should become familiar with health regulations, permits and inspection requirements associated with septic tank construction. Various agencies and local officials may be able to furnish information concerning septic tank systems and installations. You may call:

Health Departments

Soil Conservation Services

Agricultural Extension Departments

City and County Planning Departments

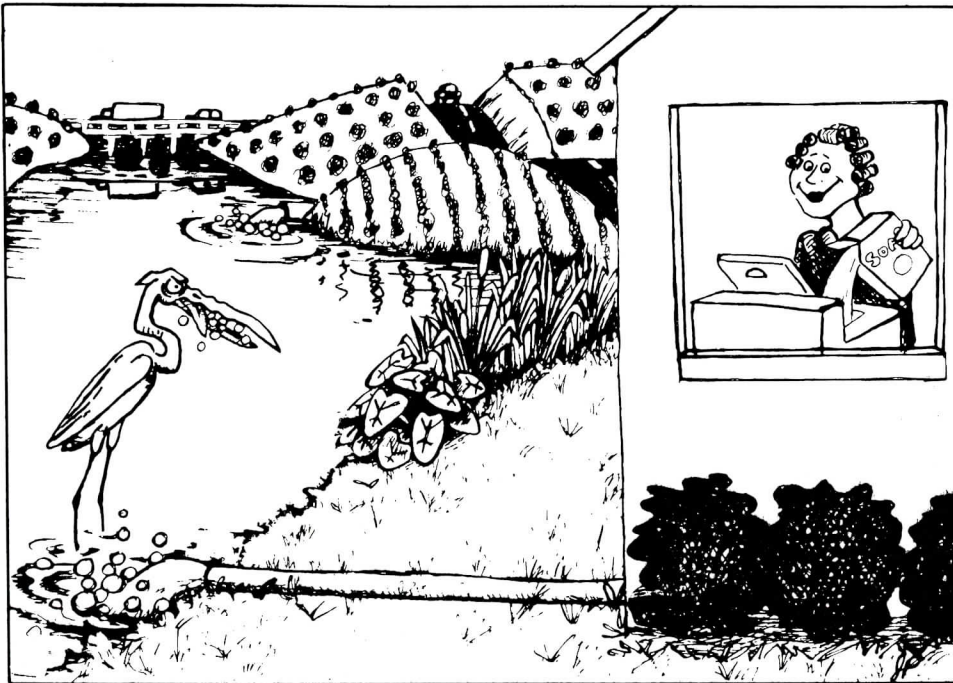
City and County Pollution Control Departments

If possible, waterfront homeowners should connect to the public wastewater treatment system.

## DETERGENTS

Use detergent products which are phosphate-free and biodegradable. Phosphorus is a nutrient that seriously contributes to the eutrophication of waterbodies. Biodegradable means materials which decompose. If materials are not biodegradable, solid particles remain in the waterbody indefinitely and can be harmful to aquatic plants and animals.

Check your washing machine and sink drainage outfall location. These discharges should be hooked into your sewer or septic tank system instead of being discharged onto your property. This is an important point because stormwater runoff will pick up these impurities and transport them into the water.



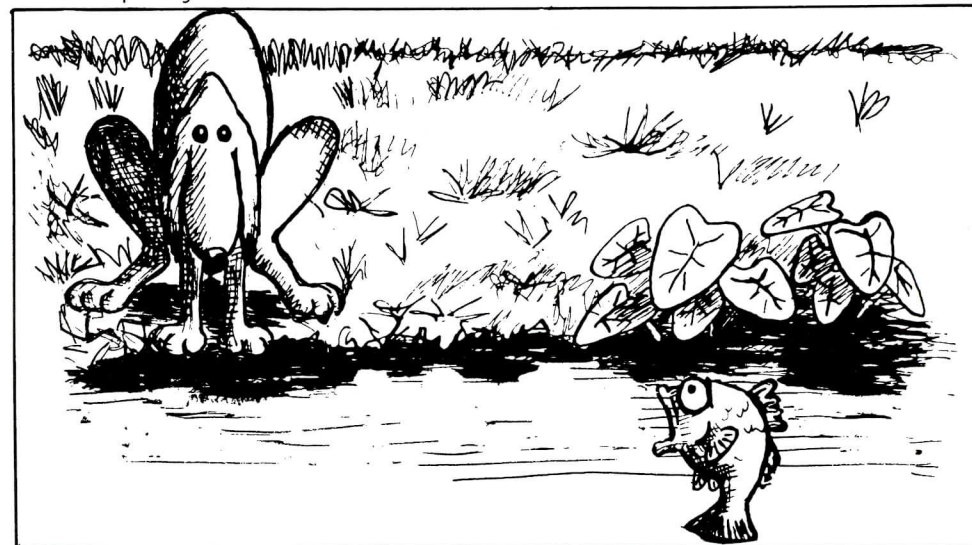
## ANIMAL LIFE

Removal of pet wastes by waterfront owners can be extremely beneficial. Pet wastes are washed into the water by stormwater runoff. The higher the incidence of fecal wastes entering a waterbody, the more chances increase that a virus or disease-causing organisms will become present. The most common ailments resulting from human and pet wastes are stomach viruses, ear infections and skin rashes.

Bodily wastes from ducks usually occur near the water's edge. Sampling tests show that ducks produce more potentially harmful wastes than do humans. At least two species of exotic ducks now breed in Florida - the Muscovy duck and the semi-domesticated Mallard. Because these species are not native, no special efforts should be undertaken to encourage their increase. Natural predators, such as turtles, alligators, or birds of prey which may take an occasional duckling, should not be persecuted for this instinctive behavior.

Another pet-related problem is people who wash their animals in a lake or stream. This action adds more nutrients and chemicals to the waterbody's ecosystem.

Other than the problems associated with health, excrement entering waterbodies requires oxygen for decomposition. This oxygen is vital to the survival of fish populations, beneficial organisms and vegetation. An ample oxygen supply is necessary for a healthy ecosystem. Thus, removal of excrement inputs is an important method of improving water quality.



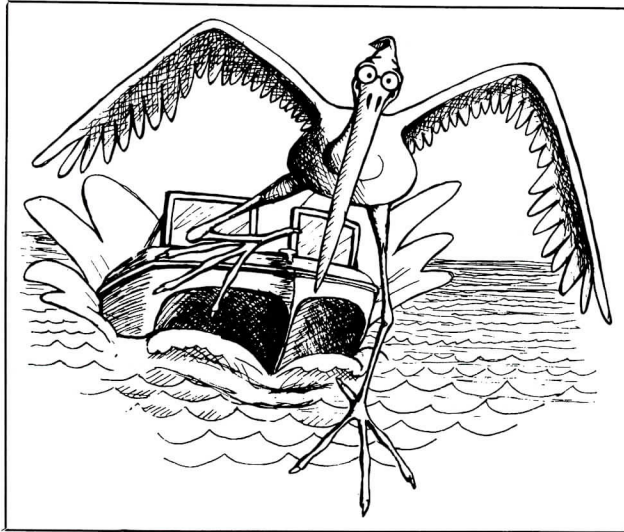


## MOTORBOATS

Proper maintenance of motorboats is an important factor in maintaining good water quality. Motorboats are prone to oil and gas leaking problems; both of these substances have a disastrous effect on water quality and aquatic organisms. Oil and gas from this source, together with that from automobiles (picked up by stormwater runoff) can have a significant impact. Fish kills are one probable result of heavy concentrations of oil and gas.

When cruising the shoreline, your speed limit should not exceed 5 mph. Driving your motorboat at excessive speeds has two detrimental effects. One, the erosion process is accelerated because of the enlarged wake. Secondly, if your lake is shallow, the nutrients and sediments which have settled to the bottom become resuspended or overturned by the churning action of a high-speed motor. This returns settled bottom nutrients to the waterbody's ecosystem for utilization and also results in increased turbidity. In fact, motorboats should be completely banned from very shallow lakes.

Boat trailers/motors should be checked after each use to remove aquatic plants. This prevents the introduction of foreign plants should you launch your boat into different waters.



## IRRIGATION WITH LAKE WATER

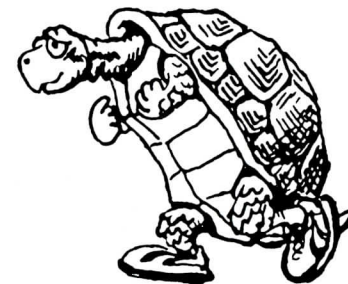
The use of lake water for irrigation has some benefits - economics, for one, in not having to pay for water from a utility company. Conservation of drinking water is another. Another benefit is that the nutrient-enriched water from your waterbody helps to fertilize your lawn and plants.

Water level fluctuation can be another advantage in the widespread use of lake water for irrigation.

Studies indicate that water stabilization efforts are a contributing factor to the increasing degradation of Florida lakes. The importance of periodic natural lowering of lake levels is multifaceted.

As a lake's water level lowers, unconsolidated bottom sediments are exposed to air and direct sunlight; this allows them to dry and compact. Compacted sediments provide a more healthy atmosphere for aquatic plants. In turn, these plants are important for game fish spawning along with the reproductive cycles of other aquatic organisms.

However, during a severe drought, common sense should be used concerning the use of a lake for irrigation.





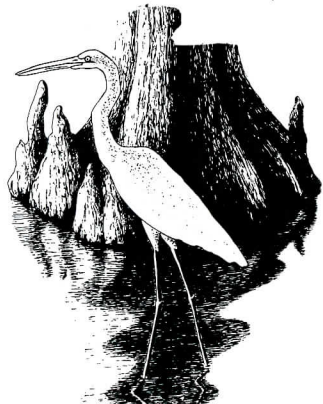
## CONCLUSION

Florida's urban waterbodies are a magnificent asset but they have been greatly abused ever since development began. This is entirely due to ignorance on everyone's part. The waterbodies were so large and numerous that it seemed reasonable to stabilize them, build up their shorelines, cut down trees, fill in marshy areas, and pour storm-water from streets and lawns into the waterbodies in order to make Florida livable.

Many polluted waterbodies in this area have now been studied and restorative techniques are underway. The purpose of this booklet is to educate people so their waterbodies won't reach the condition that would warrant the use of extensive, experimental restorative projects that may not work.

In the preceding pages you read about the causes of water pollution and suggestions of how individuals on their own can prevent a part of the degradation of their waterbodies. The League of Women Voters hopes, by producing this booklet, to build a better informed constituency for proper waterbody management. This booklet is your first tool towards this action. Contact the agencies and organizations listed to further your education and to make your voice heard.

An informed, insistent citizenry is essential to bringing about these changes.



THE FOLLOWING LIST OF GOVERNMENT AGENCIES & PRIVATE ORGANIZATIONS MAY BE CONTACTED FOR FURTHER INFORMATION:

### LOCAL, STATE AND REGIONAL GOVERNMENT AGENCIES

#### Orange County Environmental Protection Department

2002 E. Michigan St., Orlando 32806 (407) 244-7400  
Responsible for protecting the waters of Orange County, respond to citizen complaints, enforce pollution laws, cooperate with fire districts in supervising open burning and land clearing, provide aquatic weed treatment for special tax districts by biological and chemical means, permit shoreline alterations. This agency enforces the Orange County lakeshore protection ordinance.

#### Orange County Cooperative Extension Service

Agricultural Center, Urban Horticulture Division,  
2350 E. Michigan St., Orlando 32806 (407) 244-7573  
For information relative to plants, soils, pesticides, herbicides, etc.

#### Seminole County Environmental Control

3000 A Southgate Dr., Sanford 32773 (407) 322-5904  
Responsible for issuing dredge and fill permits, permits for docks and sea walls, regulates development of wetlands.

#### Seminole County Cooperative Extension Service

Agricultural Center, Urban Horticulture Division,  
4300 Orlando Dr., Sanford 32773 (407) 323-2500  
For information relative to plants, soils, pesticides, herbicides, etc.

#### Osceola County Cooperative Extension Service

East U.S. Hwy. 441, Kissimmee (407) 846-4141  
For information relative to plants, soils, pesticides, herbicides, etc.

#### Clerk To The Orange County Board Of Commissioners

(407) 236-7300  
This is where you make first application for a permit to construct a dock, sea wall, or alteration (of any kind) to a shoreline.

#### St. Johns River Water Management District

P.O. Box 1429, Palatka 32078 (904) 328-8321  
Local Office: 618 E. South St., Orlando (407) 894-5423

#### South Florida Water Management District

P.O. Box V, West Palm Beach 32423 (305) 686-8800  
Local Office: 80 S. Hoagland Blvd., Kissimmee (407) 933-5688  
These regional water management districts are the regulatory agencies responsible for their respective areas' water quantity and quality.

#### Florida Marine Patrol

P.O. Box 2564, Titusville 32780 (407) 267-4021  
They are under the Dept. of Natural Resources and provide a uniformed police force charged with enforcement of the Florida motorboat laws and the saltwater fisheries conservation laws. Also have available a free booklet entitled, *Florida Boating Safety*. For law enforcement on lakes, you contact local county sheriff, city police department or Florida Game & Fresh Water Fish Commission, depending on what is available in your area. There is also a toll-free number for Natural Resources Dept. of Law Enforcement, Div. of Florida Marine Patrol: 1-800-432-3355.

### **Department of Environmental Regulation**

Central Florida Division,  
3319 Maguire Blvd., Suite 232, Orlando 32803 (407) 894-7555  
Responsible for the protection of natural resources of Florida. Questions concerning water quality, domestic waste, solid waste, industrial and hazardous waste, air monitoring, potable water, and dredging and filling should be directed to this organization. They also have informational and educational materials.

### **Department of Natural Resources**

Bureau of Aquatic Plant Management in the Division of Resource Management,  
3900 Commonwealth Blvd., Tallahassee 32303 (904) 488-5631  
You may obtain a copy of the *Aquatic and Wetland Plant Identification Manual* by writing the above address. For questions about local permitting (dredging and filling) in Central Florida, contact a biologist at the Regional Office for the Bureau of Aquatic Plant Management: 4378 L.B. McLeod Road, Orlando (407) 423-6037.

### **Florida Game and Freshwater Fish Commission,**

Central Fla. Regional Office, 1239 SW 10th St., Ocala 32674 Toll-free 1-800-342-9620  
Responsible for law enforcement for boating and fishing violations. There is a fisheries division, a game management division, and an information service. Educational materials are available. There is a field office at 5950 Colonial Dr., Orlando (407) 295-9123 and Fisheries Research Office at 207 W. Carrol St., Kissimmee (407) 847-7293.

### **East Central Florida Regional Planning Council**

1011 Wymore Road, Suite 105, Winter Park 32789 (407) 645-3339  
Responsible for developing regional comprehensive policy plan (including water quality and quantity in lakes, streams and wetlands) for the six counties: Orange, Seminole, Lake, Brevard, Osceola and Volusia. Also available are educational materials, research studies, library, mailing list and public hearings.

## **OTHER HELPFUL ORGANIZATIONS**

### **Environmental Information Center**

1191 Orange Ave., Winter Park 32789 (407) 644-5377  
The Center is a non-profit, tax-exempt organization whose purpose is to research and disseminate information on Florida's environmental matters (water resources, energy, growth) through tours, newsletters, reports, conferences and other means.

### **Central Florida Chapter Native Plant Society**

P.O. Box 680008, Orlando 32868 (407) 299-1472  
The Society is dedicated to educating people on the benefits of using plants native to Florida in the landscape.

### **Florida Audubon Society**

1101 Audubon Way, Maitland 32751 (407) 647-2615  
Known as "the Voice of Conservation," they are dedicated to preserving natural wilderness, lobbying for environmental concerns, providing information and tours.

### **Wekiva Resources Council**

University of Central Florida, Orlando 32816-0150 (407) 275-2942  
Established to collect and disseminate data on the changing Wekiva River Basin and the associated influence on the status of the river.

**Don't forget your local public library!** They have information available on the study of water quality in this area.



