

Florida LAKEWATCH will continue to partner with the UF/IFAS Hydrilla IPM RAMP team



Figure 1. The invasive aquatic weed hydrilla. The plant is a submersed aquatic weed and is rooted in the sediment. The roots have characteristic tubers, which are visible in this photo. Photo by Lyle Buss, University of Florida.

If you attended an annual Florida LAKEWATCH volunteer appreciation meeting this year, you are likely to have met us, the UF/IFAS Hydrilla Integrated Pest Management Risk Avoidance and Mitigation Project (Hydrilla IPM RAMP) team! Along with Dan, David and Mary, the team has been touring the state to meet you and provide information about the management of the aquatic weed hydrilla (Figure 1).

Attendants of the meetings were informed that hydrilla is an invasive freshwater plant that can displace native plants and impede waterway navigation and recreational use (Figure 2). These issues can impact many interest groups and stakeholders from water body managers to businesses that support ecotourism to homeowners. Florida LAKEWATCH volunteers represent many of these groups includ-

ing lakefront property owners and recreational users (Figure 3).

During 2014, team members Jim Cuda, Raymond Hix (Florida A&M University), Verena Lietze and Emma Weeks provided training presentations to 117 Florida LAKEWATCH volunteers at 15 regional meetings covering 37 counties. Volunteers completed a pre- and post-test before and after the training. This enabled us

to determine what people know about hydrilla and how successful we were at increasing their knowledge. The test results showed that participants of the training sessions gained knowledge about hydrilla management tactics previously unknown to them (Figure 4). After the training, more participants than before the training could identify each of the management tactics available for hydrilla integrated pest management (IPM). Just as importantly, 93% of the attendees indicated that they will share the new information with other people.

The collaboration has been a fruitful one for both sides, and we are planning to continue working closely together over the coming years. Mark Hoyer of Florida LAKEWATCH and Emma Weeks, Jennifer Gillett-Kaufman and Jim Cuda of UF/IFAS recently received funding from the United States Department of Agriculture (USDA) to work together on a new project. This project, which also includes Mark Jackson of the National Center for Agricultural Utilization Research (USDA-ARS, Illinois), will build upon the Research and Extension efforts that were implemented by the UF/IFAS Hydrilla IPM RAMP team.

Research at UF/IFAS is ongoing to evaluate novel and sustainable management tactics and to help develop integrated pest management plans for hydrilla. The previous grant-funded project identified hydrilla management tools that were effective and demonstrated that tools could be combined to further improve hydrilla control. These tools included the hydrilla tip-mining midge, a plant-pathogenic fungus and the herbicide imazamox. The current project will build on these results through the completion of field-based experiments with the tools applied in different combinations as well as all three tools applied together.



Figure 2. A hydrilla infestation that has topped out. Very little light is penetrating this dense mat of invasive vegetation to plants and animals beneath. The use of the lake at this point is compromised. Lake Tohopekaliga in Kissimmee, FL. Photo by Tina Bond, University of Florida.

As part of the previous project, several educational materials were produced including brochures, booklets, books and promotional items such as bookmarks, boat rulers and web cards. Our newest release is the Hydrilla Integrated Management book (144 pages), which delivers up-to-date information on hydrilla management tactics. The book is available online at <http://edis.ifas.ufl.edu/in1044>. As new information becomes available, the UF/IFAS Extension team aims to distribute it to as many people as possible. The partnership with Florida LAKEWATCH has already helped us reach citizens who are directly involved in lake health monitoring. Through our new grant-funded project we will be able to evaluate our existing educational materials and design new materials that satisfy the needs of this involved group of

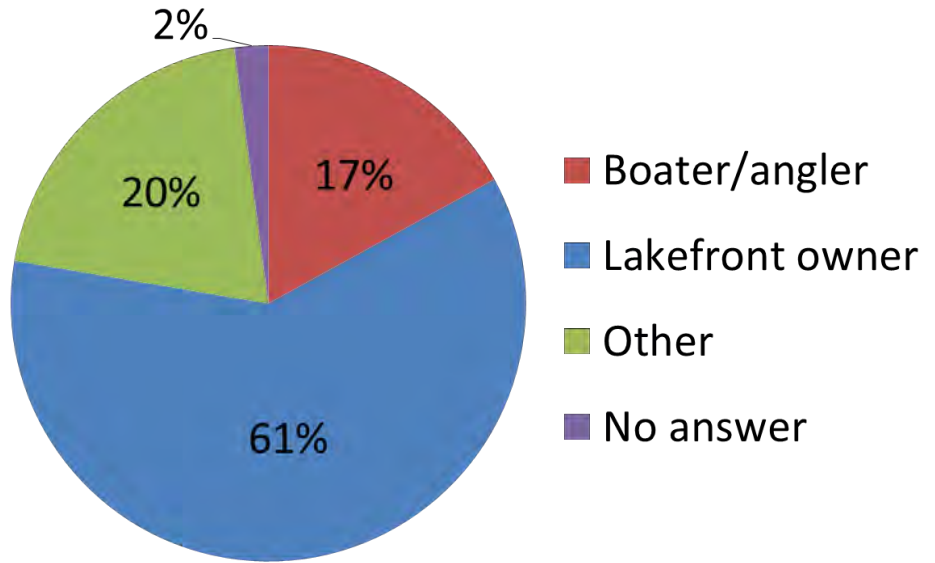


Figure 3. During pre- and post-testing, Florida LAKEWATCH volunteers were asked why they visited Florida's water bodies; the pie chart above details their responses.

stakeholders.

Emma Weeks and Jennifer Gillett-Kaufman

Thank you to all the volunteers we met this year for your dedication to Florida's water bodies and your interest and participation in the project so far. We are looking forward to working with you in the future!

UF/IFAS Hydrilla Integrated Pest Management Risk Avoidance and Mitigation Project (IPM RAMP, USDA NIFA RAMP Grant 2010-02825)

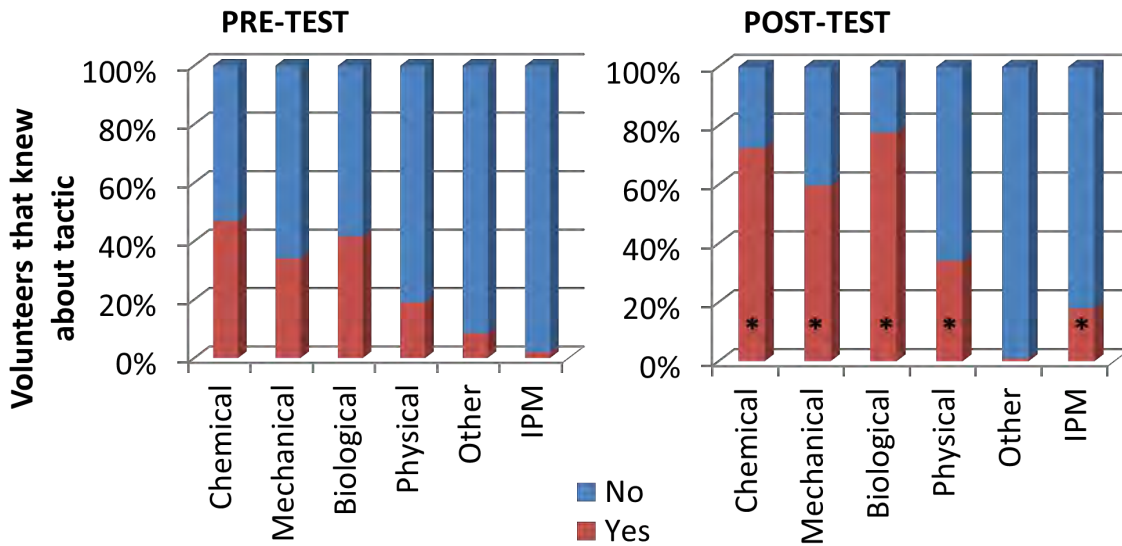


Figure 4. Volunteers were asked to list the hydrilla control tactics that they knew before and after the training was provided by the team. The figure shows that more tactics were known after the training than before and more people knew about integrated pest management (IPM); * indicates a significant increase in the number of volunteers who knew about the tactic.

Florida Department of Environmental Protection – Impaired Waters Rule Lake Nutrient Assessments and Restoration –

Kevin O'Donnell - Environmental Administrator
Division of Environmental Assessment and Restoration
Watershed Assessment Section



Ocean Pond. Photo credit; Florida Department of Environmental Protection.

The Florida Department of Environmental Protection (Department) has made significant changes to lake assessments based on recent revisions to the Impaired Waters Rule (IWR), 62-303, F.A.C. and Surface Water Quality Standards, 62-302, F.A.C. In an effort to collaborate with data providers and ensure lakes are properly assessed under the recently adopted Numeric Nutrient Criteria (NNC), the Department provides the following information about some of the changes to the way the Watershed Assessment Section, who is charged with assessing Florida's waterbodies, assesses nutrients (total nitrogen and total phosphorus) and nutrient response variables (chlorophyll-a) in Florida lakes.

Water quality data collected around the state that is submitted to Florida STORET is extracted periodically to produce the Impaired Waters Rule database or "IWR Runs." These IWR Runs are ultimately used to produce updates to Florida's list of impaired waters. The Department uses the impaired waters list to [develop Total Maximum Daily Loads \(TMDL\) and Basin Management Action Plans \(BMAP\)](#). **For more information about the IWR assessment process, please follow the link: <http://www.dep.state.fl.us/water/watersheds/assessment/index.htm>.**

IWR Lake Nutrient Assessments

For the purpose of assessing impairment status using the IWR, 62-

303.200(8), F.A.C. lakes are defined as:

"Lake shall mean a lentic fresh waterbody with a relatively long water residence time and an open water area that is free from emergent vegetation under typical hydrologic and climatic conditions. Aquatic plants, as defined in subsection 62-340.200(1), F.A.C., may be present in the open water. Lakes do not include springs, wetlands, or streams (except portions of streams that exhibit lake-like characteristics, such as long water residence time, increased width, or predominance of biological taxa typically found in non-flowing conditions)."

The first part of a lake assessment is

to determine if the data sufficiency requirements have been met for the lake classification. The lake classification is based on the long-term (meaning from the available period of record dataset) geometric mean of color and alkalinity results. These values are calculated based on the available period of record data and a minimum of ten data points over at least three years with at least one data point in each year is required. If insufficient alkalinity data are available, long-term specific conductance results can be used. Once these geometric means have been calculated, the lake can now be classified as colored, clear-alkaline, or clear-acidic depending on color and alkalinity results.

The Department would especially like to stress the importance of collecting true color, instead of apparent color, and alkalinity or specific conductance when sampling lakes. Apparent color is a measurement derived by visually matching the color of an unfiltered sample to a color standard. Apparent color is more likely to fluctuate as a result of heavy rainfall events due to mixing of the water column and increased turbidity. Conversely, true color is a measurement taken after the suspended substances have been removed through filtration. True color is not as susceptible to fluctuation as apparent color, because turbidity is controlled. Both measurements can be useful, but true color is required to determine the lake classification for lake assessments and is therefore the preferred type when submitting color data to Florida STORET.

The second part of a lake assessment is to determine if the data sufficiency requirements are met to calculate the annual geometric

means (AGM) for total nitrogen (TN), total phosphorus (TP), and chlorophyll-a. To calculate an AGM at least four temporally independent samples (minimum of one week apart) with at least one sample collected between May 1st – September 30th and at least one sample taken in a month outside of that range are required. The AGM is then compared to the numeric interpretations in the table shown below for the specific “Nutrient Watershed Region” that are defined in Rule 62-302.200(25) as a “drainage area over which nutrient thresholds in paragraph 62-302.531(2)(c), F.A.C. apply.” A lake is considered impaired for nutrients if a nutrient or nutrient response parameter exceeds its numeric interpretation more than once in any consecutive three year period. If a lake is verified to be impaired, it is then placed on the draft Verified List of Impaired Waters and is presented to the public for review and comment. The final version of the Verified List is then presented to the Secretary of the Department for adoption by Secretarial Order.

TMDL Development

Once a waterbody has been placed on the Verified List of Impaired Waters, the next step in the Department’s Watershed Management approach is the development of a Total Maximum Daily Load (TMDL). The TMDL serves as the restoration goal or target(s) that needs to be achieved for the waterbody to meet its designated uses and applicable water quality criteria. Over the last 2 years, the Watershed Evaluation and TMDL Section have been working on a TMDL Development Prioritization strategy to help develop their TMDL work plan.

When developing nutrient TMDLs, the Department is currently using results from multiple lines of evidences to set the TMDL targets. Depending on the data availability and the specific waterbody the primary current lines of evidences that are being used include, but are not limited to:

Long Term Geometric Mean Lake Color and Alkalinity	Annual Geometric Mean Chlorophyll <i>a</i>	Minimum calculated numeric interpretation		Maximum calculated numeric interpretation	
		Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen	Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen
> 40 Platinum Cobalt Units	20 µg/L	0.05 mg/L	1.27 mg/L	0.16 mg/L ¹	2.23 mg/L
≤ 40 Platinum Cobalt Units and > 20 mg/L CaCO ₃	20 µg/L	0.03 mg/L	1.05 mg/L	0.09 mg/L	1.91 mg/L
≤ 40 Platinum Cobalt Units and ≤ 20 mg/L CaCO ₃	6 µg/L	0.01 mg/L	0.51 mg/L	0.03 mg/L	0.93 mg/L

¹ For lakes with color > 40 PCU in the West Central Nutrient Watershed Region, the maximum TP limit shall be the 0.49 mg/L TP streams threshold for the region.

1. Use of the NNC for lakes to evaluate future impairment status, so TMDLs are not developed for lakes that will likely meet the new NNC;
2. Lake region specific targets;
3. Targets associated with a set of lakes with similar water residence time, mean depth, and watershed area to lake surface area ratio;
4. Targets derived from paleolimnological studies;
5. Targets derived based on lake specific correlation between chlorophyll and nutrient concentrations;
6. Historic minimum when a long period of record of nutrient data is available; and
7. Model simulated background conditions.

As the Department works with data providers and stakeholders to prioritize TMDL development, new data will be incorporated into the IWR assessment process and waterbod-

ies will be re-evaluated applying the new criteria and assessment methodology. If a TMDL is developed by the Department, the verified impaired parameter is then placed into assessment category 4a – TMDL Complete and removed from the list of impaired waterbodies. The TMDL also becomes the water quality criterion for that specific waterbody. Following the TMDL rule adoption by the FDEP Secretary, the Department may develop a Basin Management Action Plan, which is the next phase in the restoration process.

For more information on TMDL development and the two year work plan, please follow the link:
<http://www.dep.state.fl.us/water/tmdl/index.htm>

BMAP Development

The Department coordinates the creation and implementation of restoration action plans, known as Basin Management Action Plans or

BMAPs, with local stakeholders in a watershed. Restoration activities include stormwater and wastewater treatment, nonpoint source management, agricultural best management practices, education, and other site-specific activities. As BMAPs are completed, the Department’s watershed assessment and restoration process repeats itself in a cyclical process — monitoring of water quality gauges the progress and effectiveness of restoration activities; assessment of water quality data leads to confirmation of restoration or impairments; new and revised TMDLs expand and update restoration goals; and restoration plans bring stakeholders together to implement new activities to meet the restoration goals.

The Department is continuously looking for innovative restoration alternatives through stakeholder involvement to restore and improve water quality in Florida’s waters. **BMAPs are a stakeholder driven process facilitated by Department staff; however, if local stakeholders are interested in developing their own nutrient reduction plans, or restoration targets/goals, they are encouraged to do so and they may contact the Department, who is eager to work them.**

For additional information on the BMAP process and implementation, please follow the link:

<http://www.dep.state.fl.us/water/watersheds/bmap.htm>.



North Lake Munson. Photo credit; Florida Department of Environmental Protection.

Many holiday goodies available – some under the fish attractor ‘tree’

by Bob Wattendorf with Brandon Thompson, Florida Fish and Wildlife Conservation Commission

So this holiday season, how would it be if the Florida Fish and Wildlife Conservation Commission (FWC) put some more fish under the tree? Well, that is exactly what we have done for you all around the state.

The typical fish attractor in Florida is a cluster of hardwood trees, anchored by cinder blocks. State constructed structures are marked with a bright yellow or white bouy so boaters and anglers know where they are. These attractors are strategically placed to congregate fish, making them more accessible to anglers.

Fishery managers have experimented with alternate materials such as evergreen trees, wooden pallets, stake beds, rock piles, gravel, concrete blocks, car tires and plastic fish-attracting devices. Studies comparing material types revealed variable results. Early data showed ev-



Photo courtesy of FWC.

State constructed structures are marked with a bright yellow or white bouy so boaters and anglers know where they are.



Photo courtesy of FWC.

FWC biologist deploying a brush fish attractor.

ergreen trees did not last as long as hardwood, and environmental and navigational concerns eliminated the use of car tires and concrete in most freshwater systems.

These attractors work by providing areas that algae can grow, which attracts insects that in turn bring small fish around to feed on the bugs. The small fish attract larger fish. The fact attractors also provide shelter for concealment, making the areas havens for a variety of fishes.

More recently, fisheries managers in Florida focused on comparing the productivity, longevity and cost of brush and plastic fish attractors. New models of plastic fish attractors look and act somewhat like natural trees.

Preliminary results, from the first year of a three-year study, indicate plastic attractors are typically yield-

ing more bass than brush attractors. So despite additional material cost, they may be the wave of the future, especially if they prove as durable as hoped, because brush attractors need to be frequently refurbished.

Results show anglers caught more fish around plastic attractors than either brush treatment in 68 percent of weeks sampled. In four of six sample areas, anglers caught more bass near plastic, and the four attractors with the highest catch rates were all plastic. Of 197 total bass caught, 78 percent were caught on crankbaits and 99 lures were lost but only 10 percent of those were on plastic attractors. Moreover, in the last 10 weeks, no lures were lost on plastic attractors, as anglers learned to recover them.

Fishery biologists also conducted electrofishing surveys, where an electric current temporarily stuns



Photo courtesy of FWC.

New models of plastic fish attractors look and act somewhat like natural trees.

fish and allows them to be collected, counted and live released. The number of bass was similar near brush and plastic attractors. Therefore, plastic and natural trees may concentrate similar numbers of bass, but bass near plastic attractors may be more vulnerable to angling. Plastic and brush also concentrated similar numbers of black crappie.

The FWC operates under a permit from the Department of Environmental Protection when placing attractors in public waters. A permit is also needed by individuals or organizations to place natural or artificial attractors in public waters or lakes owned by two or more parties. Apply for permits from DEP and/or the local water management district. Litter laws also apply to depositing materials in public waters.

The FWC still constructs gravel or shell attractors that create excellent spawning substrate for sunfish, including bass, bream and crappie. These effectively concentrate fish during spring in areas that otherwise have mostly muddy bottoms.

For [coordinates](#) to more than 150 attractors in public waters around the state, go to [MyFWC.com/Fishing](#) and under “Freshwater Fishing” select “Fishing Sites/Forecasts” then “Fish Attractors.” Click the map for an interactive tool. A video of hardwood fish-attractor construction is also available, along with more information about freshwater attractors.

Fish attractors aren’t the only way the FWC is putting more fish under the “tree” for you! Stocking programs, habitat enhancement and special regulations contribute to fishing success. These efforts are funded in part by fishing license sales. Other funds come from a fee on the sale of fishing tackle and motor boat fuels, which is collected at the national level and returned to the states for Federal Aid in Sport Fish Restoration projects.

Consider purchasing a “Go Fishing” largemouth bass tag for fishing enthusiasts’ vehicle or boat trailer (see [BuyAPlate.com](#)). The Department of Highway Safety and Motor Vehicles issues specialty license plate gift cer-

tificates that allow anyone to purchase a specialty license plate as a gift for a motor vehicle registrant. The bass tag directly supports FWC efforts to improve fishing in Florida.

Another useful gift idea is to help bass anglers register at [Trophy-CatchFlorida.com](#) and buy them a fishing scale. Just registering enters them in a drawing for a \$40,000 Phoenix bass boat. Everytime they take a photo of an eight-pound or heavier bass on the scale, submit it according to the rules and release it, they’ll earn at least \$100 in gift cards, club shirts, decals and certificates – all year long.

A Florida fishing license also makes a great gift. Visit [License.MyFWC.com](#), where you will find licenses for residents and visitors, and a youth fishing license that is good until they turn 17, locking in the price and bragging rights as a card-carrying sportsman.

A Lifetime Sportsman License for Florida children and young adults covers hunting, and freshwater and saltwater fishing! The license is available through Dec. 31 for about half its usual price. So for a limited time you can buy it for \$500 plus processing fees. It can be purchased for Florida residents ages 5 to 21 online, by calling 888-347-4356 or at local tax collectors’ offices. For [details](#), go to:

[License.MyFWC.com](#).

All of us at the FWC wish you a happy holiday season and hope you enjoy the great outdoor experiences the new year has to offer here in the “Fishing Capital of the World.”

Volunteer Bulletin Board

LAKEWATCH remembers dedicated volunteer Paul Hutzelman



Hi Dan. Just wanted to let you know that Paul passed away peacefully at home on Oct. 25th. We were Lake-watch partners for 12 years before he had to stop because of his health. Paul leaves behind his wife Kay to whom he was married for 59 years. He was a graduate of Ohio State with a B.S. degree, bio-physics major. Paul was also an Eagle Scout, Silver Beaver recipient, a member of Jefferson Lodge, F & A.M., member of the Scottish Rite and a Shriner. We are going to miss Paul.

Jim Decker, Lake Reedy, Polk Co.

FLMS Love Your Lake grant deadline extended

FLMS has created a cost-share program that funds lake, pond and shoreline projects demonstrating management techniques that help protect, preserve and restore Florida's aquatic resources. Each year FLMS solicits grant proposals describing successful management projects. FLMS will provide matching funds

for expenses incurred by the selected applicant. Expenditures may be in the form of labor or monetary contributions utilized in the program. Proposals are reviewed by a selection committee based on the following criteria:

- Monetary or labor match — programs encouraging community involvement are strongly recommended.
- Location — project must be accessible to the public (may include large communities or neighborhoods - dependent on accessibility).
- Signage — educational component explaining project.
- Water quality enhancements — examples include Florida-friendly landscaping, environmental berm and swale, and other innovative erosion control techniques.

The deadline for submitting a Love Your Lake grant request has been extended to February 15, 2015. Information and forms are available on our website at www.flms.net.

Maryann Krisovitch
Florida Lake Management Society
(352) 434-5025

[Visit us on the web at flms.net!](http://www.flms.net)

The Florida Lake Management Society "Managing Florida's Water Resources"

No longer sampling?

If you are no longer able to monitor your lake, please let us know as soon as possible so that we can find a new volunteer to train and continue the work that you have started! It will also enable us to maintain consis-

tent data if we can train someone before the next sampling date arrives.

Kit Roundup

If you are no longer able to sample and you have sampling materials that are in your way, collecting dust, let us help! Please give us a call and we'll make arrangements to pick up the materials so that we can revamp them and re-use them. Like everything else these days, the kits have become more expensive, so we need to be more diligent in collecting and re-circulating the unused materials.

Thanks for your help!

Finally but not least of all, we want to wish all of our volunteers and supporters a very Merry Christmas and a Happy Holiday Season!



Thank you,

The LAKEWATCH Crew

Hillsborough County Lake Management Program in Action on Lake Carroll in Hillsborough County



Satellite imagery of Lake Carroll with locations of the five projects completed.

The following is an article about lake management in action on Lake Carroll in Hillsborough County. This article was reprinted with permission from *On Our Pond* volume 20 No. 3. *On Our Pond* is a quarterly newsletter published by the Hillsborough County Public Works Environmental Services. Lake Carroll is a 210 acre lake in the metropolitan Tampa area.

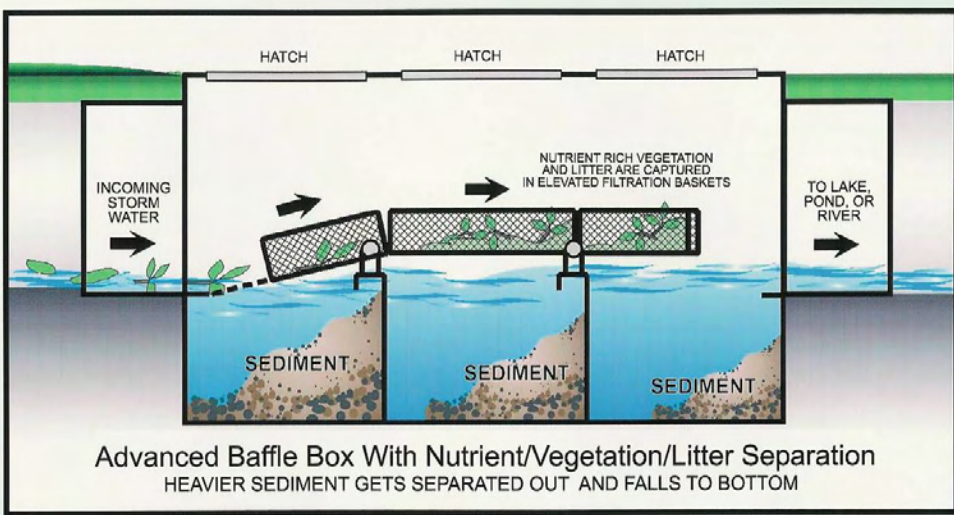
How can the Lake Management Program help a big lake?

Residents around Lake Carroll can answer that question. The County has recently completed a series of projects to help clean the water in the area that drains to the lake.

Several years ago, residents asked the County for help. Because they were well-organized and the project fell within County goals, the Lake Management Program was able to

help. First, we found funding by partnering with the Southwest Florida Water Management District. Then, we did a study to find out how to best keep the water clean. The study identified several projects and we presented those to the community at various public meetings. The list was narrowed down to five projects, and we started construction.

In the end, we built two treatment boxes to capture dirt and other



Schematic of the underground treatment boxes.

pollutants before they flow into the lake. We also altered three stormwater ponds to help them treat the water better by trapping pollutants. It has been a long road, but we finally completed the projects in October. Now, we'll continue to sample the water to see how much it improves.

If you live on a lake, and would like to help keep the water clean like the

residents of Lake Carroll, the Lake Management Program may be able to help. But you'll have to do your part too. The first step is to organize your neighbors. You need some type of association to formally represent your community of lake residents. Then you need to have a Lakewatch volunteer for the lake to take samples. The samples tell us what's really going on in the water. Then you need to work with the

Lake Management Program to determine a course of action. Be prepared for a long process. These things take time. But if you focus on the end result and carefully take each step in the process, you'll be surprised at how much you can accomplish and at how much the Lake Management Program can help.



Hillsborough County Lake Management Program.

After the Carroll Cove plantings.



Hillsborough County Lake Management Program.

The Carroll Place pond cleanout.

For more information, visit

www.Hillsborough.WaterAtlas.usf.edu/LAMP.

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All unsolicited articles, photographs, artwork or other written material must include contributor's name, address and phone number. Opinions expressed are solely those of the individual contributor and do not necessarily reflect the opinion or policy of the Florida LAKEWATCH program.



After the Fore Drive pond plantings.

Hillsborough County Lake Management Program