

Dedicated to Sharing Information About Water Management and the Florida LAKEWATCH Program Volume 65 (2014)

## Florida LAKEWATCH Honored with State and National Awards



Volunteers at the Florida LAKEWATCH 2014 Regional meeting in Lake County with their Distinguished Service and Vision Awards.

The LAKEWATCH staff has long recognized the contribution that each volunteer makes to the understanding and management of Florida's aquatic systems. This year, however, others are beginning to take notice as well.

Congratulations LAKEWATCHer,

this spring you have received two awards on both the state and national level. These awards recognize the volunteer's distinguished service and vision and were accepted on behalf of the LAKEWATCH volunteers by LAKEWATCH director Mark Hoyer at two separate events.

**Distinguished Service Award** - Florida LAKEWATCH Volunteers (Citizen Scientists) were awarded a Distinguished Service Award from the School of Forest Resources and Conservation, University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) at the school's spring



celebration. This award is given to those who provide services to the School and State of Florida that work to protect and manage Florida's precious natural resources.

**Vision Award** - LAKEWATCH volunteers received their second

award at the 9th National Monitoring Conference held the week of April 28 – May 2, 2014 in Cincinnati, Ohio at the Duke Energy Center. The conference was a showcase for new findings on the quality of the Nation's waters where professionals learned about the newest innovations and cutting-edge tools in water-quality monitoring, assessment, and reporting. The National Water Quality Monitoring Council's Vision Award recognizes a monitoring council or group that has demonstrated extraordinary vision and cooperation in the field of water quality monitoring on a local or regional level to enhance the management and protection of aquatic resources. "In recognition of extraordinary vision, collaboration, and leadership in water quality monitoring and environmental protection, the National Water Quality Monitoring

Council presented the 2014 Vision Award to Florida LAKEWATCH."

Since Florida LAKEWATCH's inception, thousands of volunteers have collected water quality data on more than 1,100 lakes, 175 coastal sites, 120 rivers, and 5 springs in 57 Florida counties. For long-term trend analyses, LAKEWATCH provides at least 20 years of monthly data on 27 lakes and 15 years of monthly data on 195 lakes. All the data collected by LAKEWATCH (currently about 45,000 samples per year) are publicly available in EPA's STORET as well as on the Florida LAKEWATCH website (<http://lakewatch.ifas.ufl.edu/LW/CIRC.HTML>), along with publications and other information generated by the program to promote the science-based management of Florida's aquatic resources.



Data collected by LAKEWATCH volunteers have been shown to be comparable to data collected and processed by Florida Department of Environmental Protection (FDEP) professionals. These comparison studies allow FDEP to use LAKEWATCH data for regulatory decisions including development of numeric nutrient criteria, assessment of impaired waters, development of Total Maximum Daily Loads, and development of Basin Management Action Plans.

Over the last 28 years, LAKEWATCH data have been used in over 35 peer-reviewed scientific publications and three books.



Volunteers at the Florida LAKEWATCH 2014 Regional meeting in Osceola County with their Distinguished Service Award.

Florida LAKEWATCH has also cooperated with scientists from around the globe by sharing data for comparative ecological studies. Over 35 graduate students, all of whom received degrees in the lake management field, were mentored through the program.

Undergraduate students are also mentored and supported in hands-on lake research and management activities.

The success of LAKEWATCH could not have been accomplished without contributions from many

funding sources, scientists, staff, and volunteers.

***However, “To The Volunteer Goes The Glory”, without your efforts there would be no LAKEWATCH.***



Volunteers at the Florida LAKEWATCH 2014 Regional meeting in Volusia County with their Distinguished Service and Vision awards.

**Bob Carling** writes about a smart way for all seafarers – sailors, fishermen, anglers, small boat owners and scientists – to track the effects of climate change

# A new way of measuring phytoplankton



Seafarers are being encouraged to take part in a unique global study, using a mobile phone app to record the effects of climate change. All they need is a smartphone that can obtain a GPS signal when at sea, the free Secchi app and a simple DIY piece of scientific equipment called a Secchi Disk.

The aim of the public science project is to measure the amount of phytoplankton, the minute organisms at the very start of the marine food chain, which reside in the world's oceans. The project is conducted using a Secchi Disk – a simple piece of equipment invented in 1865 by Father Pietro Angelo Secchi – the Pope's astronomer – to measure the turbidity of water. The data from this are then collected by free software – a mobile phone 'app' called Secchi – which stores the data along with GPS information and other optional information such as sea temperature, photographs, and any notes that the user might want to make.

Scientists fear the population of the

microscopic beings is in decline due to rising sea temperatures and, if true, that could have consequences for every aspect of marine life. The plankton that underpins the marine food chain are the sea's most important inhabitants and their distributions, abundance and seasonality are changing as their sea-surface habitat alters due to climate change.

The project is being spearheaded by Plymouth University's Marine Institute, which hopes to build a map of the oceans that charts the seasonal and annual changes of phytoplankton from now and into the future.

Plankton biologist Dr Richard Kirby, who is leading the study, said: "The idea for the project follows a report by three scientists – Boyce, Lewis and Worm – in *Nature* (2010) (Global phytoplankton decline over the past century: doi:10.1038/nature09268) that suggested the ocean's plankton population had declined by as much as 40% since 1950 as sea temperatures had warmed

due to climate change. The Canadian scientists suggested that a warming of the ocean surface may have reduced vertical mixing of the water column thereby reducing the supply of nutrients from deeper waters – in effect the input of fertiliser to the surface had lessened with effects upon phytoplankton growth. Their results provoked considerable debate among plankton biologists, however, some who thought they saw no change, or even an increase in phytoplankton in some places. Since the phytoplankton begin the marine food chain, we need to know more about if, how, and why they are changing in order to understand the effects on the ocean's biology." And so, the Citizen Science project came about with the idea to engage the sailing community wherever they are in the world.

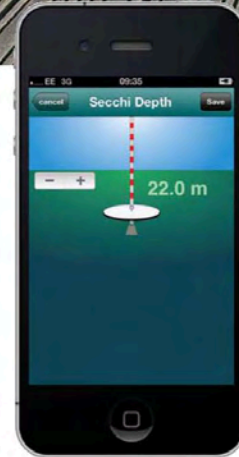
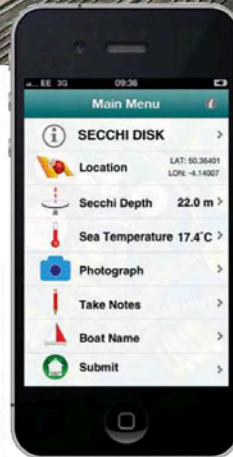
Because the phytoplankton – each thinner than a strand of human hair – exist at the sea's surface, mariners can help to study them using a 'Secchi Disk'. There are clear instructions on how to



make a Secchi Disk on the website [www.secchidisk.org](http://www.secchidisk.org) and in the Secchi App; the Secchi Disk can be plastic, metal or wood – the only restriction is that the disk is a standard 30cm in diameter and painted matte white.

Attached to a measuring tape, the Secchi disk is lowered over the side of a boat and the depth at which it disappears from sight estimates the amount of phytoplankton in the sea. The Secchi depth can be less than 1m in a plankton bloom and up to 80m in the clear waters of the Arctic or the Sargasso sea. This depth can then be uploaded to a database on the mobile using the Secchi app.

Dr Kirby added: “Even though they were invented over a hundred and fifty years ago, Secchi Disks are still used by marine scientists to study phytoplankton. However, there are too few scientists to survey the world’s oceans as well as we would wish. The Secchi app enables seafarers around the world to take part in a science project and, although our goals are huge, if we can just get a small percentage of the global



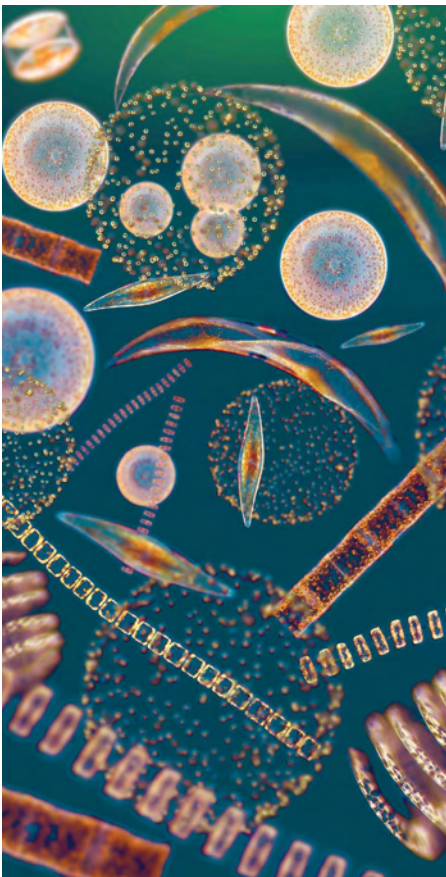
population of sailors involved, we can generate a database that will help us understand how life in the oceans is changing.”

The Secchi app has been developed by Dr Nicholas Out-ram and Dr Nigel Barlow, from Plymouth University’s School of Computing and Mathematics, and the database will be maintained by Pixalytics Ltd, a company founded by Dr Sam Lavender, an Honorary Reader at the University.

A major design consideration of the app was that it has to be able to operate

in places where the mobile phone has no Internet connection. Participants record as many Secchi readings as they like, and these are stored as ‘pending readings’ on the phone. Exactly how many pending readings can be stored depends on the capabilities of the phone, but the number is very large. These pending readings can be uploaded at a later date when an Internet connection is available.

In addition, the app has an easy to follow workflow to minimise errors. The participant’s location is taken from the phone’s GPS, eliminating transcription



errors. The user interface has been designed to be clean, intuitive and uncluttered, and in particular to be a user interface that works on a boat at sea. Small and fussy layouts are not used, and the 'depth disk' uses a logarithmic scale to enable shallow depths to be entered quickly and accurately.

The success of the project will depend entirely upon public awareness and so the scientists hope that many will help spread the word. There has been a great initial response to the app's release from sailors around the world. The first data was submitted from New Zealand within 2 days of the launch of the app. Since then, data has been received from the Pacific Ocean to the Mediterranean, including sailors from Turkey, the Philippines, Australia, Norway, Canada, and the USA.

The Secchi app has also generated discussions on sailing related internet fora and the developers have received several e-mails of encouragement:

"We have a 72ft expedition yacht, Sea Dragon. We're headed up the East Coast of US to the Great Lakes for Summer then Winter in the Caribbean. We'll

test it out."

"We set off in April heading from Croatia to Turkey so will start sending data from then."

"I am based in the Philippines. I am really interested in this project and I would like to be a part of this."

"I will be sailing from Madeira to the Azores and then to Exmouth in April and would like to take part."

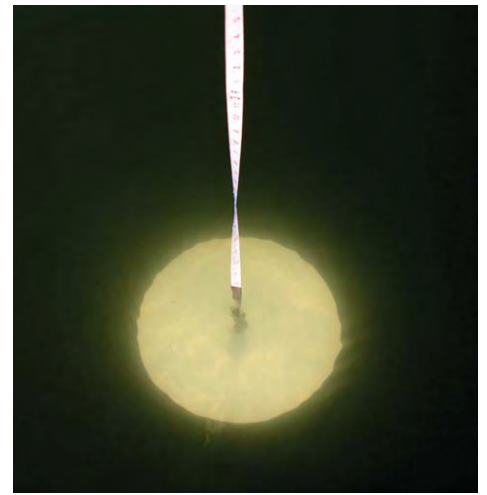
"I saw the Secchi app article on the BBC website and am considering trying to take some readings during a trip around Bahamas and Caribbean over the next few months."

"I think we could help a lot with this project. We [OceansWatch] have members sailing all over the world and a large network so could bring in a lot of data for you."

"Beautiful stuff. I'll spread the word."

"Awesome, simply awesome."

Dr Kirby added: "Many of the datasets that scientists rely upon today to tell us about long-term changes are 'citizen science' studies that were begun a few decades ago. How often do we now look back and wish we had already started monitoring something about the



natural world - 'if only we had started measuring 'x' ten years ago'. Well there is no time like the present to start something for the future. This project will help us learn much more about the phytoplankton at a crucial time when their habitat is altering due to climate change. We hope people will take part for many years to come."

**You can find out more about the project at [www.secchidisk.org](http://www.secchidisk.org). Contact Dr Richard Kirby, Marine Institute Fellow, Plymouth University Tel: +44(0)1752 633231 [richard.kirby@plymouth.ac.uk](mailto:richard.kirby@plymouth.ac.uk)**



# Florida Sea Grant takes an international approach to maintaining fish stocks

Written May 14, 2014 by Becca Burton



Local fishermen in Dominica bring in their catch for the day. Photo by Florida Sea Grant.

Think about it. Ocean-going fish can travel anywhere in Caribbean waters without needing passports.

It's why fisheries managers from across borders must often collaborate on conservation efforts.

Florida Sea Grant researchers are taking

the same international approach, partnering with the fisheries division of Dominica to explore whether traditional fishing practices can be improved to increase local seafood availability while reducing pressure on overfished stocks.

The aim of one new project is to test whether the local fishermen can adopt

the use of artificial lures instead of relying on wild-caught bait to bring in the catch of the day.

"Catching up large amounts of live bait eliminates the source of food for larger fish that the fishermen are hoping to catch, which can be somewhat counter-productive," said Florida Sea Grant's associate director of research, Charles Sidman.

"The schools of small fish harvested for bait are what attract the mackerel, dolphin fish, grouper and other species that fishermen target," he said. "It negatively affects the overall health and productivity of the fishery."

Florida shares valuable marine fisheries stocks with many island nations in the Caribbean. For some, like Dominica, fish and fisheries are an integral part of the island's economy. Fishermen rely on healthy fish stocks to eat, make a living and preserve their cultural heritage, Sidman said.



Charles Sidman presents the various artificial lure options to the fishermen in Dominica. Photo by Florida Sea Grant.

“Floridians depend on many of the same fisheries to support the state’s recreational and commercial fishing industries,” he added.

Under a cooperative agreement with the Caribbean Regional Fisheries Mechanism, a fisheries management accord among a number of Caribbean nations, Florida Sea Grant has been building professional development exchanges and collaborative research opportunities that promote sustainable fisheries.

Kai Lorenzen, a University of Florida fisheries professor and a co-leader on the project, said the team hopes Floridians recognize the potential of their project.

“We are working directly with the local fishermen to address their immediate concerns,” Lorenzen said.

“By getting feedback on the local level, we are providing information that can be useful in supporting national and regional fisheries management efforts.”

This latest project is funded by a \$50,000 award from the Royal Caribbean Cruises Ltd. Ocean Fund. Additional project partners include the Caribbean Regional Fisheries Mechanism and the Japan International Cooperation Agency.

Two bait and lure manufacturers, Bait-Masters, and L&S Bait Company – manufacturer of the popular MirrOlure saltwater fishing plug, have stepped up to the plate and are donating the lures to be used in the field trials.

“These sponsors have provided funding, expertise and equipment that will ensure the success of this project,” Sidman said.

Starting next month, the research team will begin experimenting with the lures to determine their potential. Much of the trials will be conducted in the proximity of fish aggregating devices, or FADS, which are broad, floating structures placed in coastal waters to attract

schools of small fish seeking shelter.

The structures are often palm fronds, bamboo poles and buoys lashed together and anchored in place with heavy cement weights. The small fish attracted to FADs in turn attract larger, predatory fish, according to Sidman.

“Fishermen concentrate their efforts near FADs because they can catch more fish in shorter amounts of time, plus save fuel costs,” he said.

But though FADs are gaining popularity across the Caribbean, they can also be problematic, creating use and access conflicts among fishermen. They can also disrupt migratory patterns of wild, open ocean fish stocks, and increase overexploitation of small fish species harvested for bait. “Using artificial lures will help ease some of the strain on the fishery,” Sidman says.

Once the experiments are done, he added, the team will create a guidance document explaining the success of various lure fishing techniques.

The harvesting of live bait is not the only challenge to using FADs, which is why the research team is taking a more holistic approach to managing the fish-

ery.

During initial visits to Dominica, the team met with local fisherman to identify their main concerns. The fisherman said that heavy competition was reducing their success. When three or more fishers competed on the same FAD, their catches suffered. Part of the problem cited was a lack of recordkeeping and communication.

As one remedy, the team proposed a planning chart that fishermen could use to keep track of what FADs were being fished and when.

“With the help of fishermen and government stakeholders we are developing and testing practical tools for these fishermen that can help reduce conflict and increase the profitability and long-term use of the Caribbean FAD fishery,” Sidman said.

In addition to testing the effectiveness of lures as an alternative to live bait options, future efforts of the group will include working with the locals to develop a code of ethics to facilitate greater cooperation and information sharing among government and fishermen in the management of the FAD fishery.



Local fishermen read about and test out artificial lures that will be used in place of live bait. The feedback from fishermen will give insights as to which lures are most effective. Photo by Florida Sea Grant



# Volunteer Bulletin Board

Recently we received a letter written by long time but recently retired volunteers Al and Audrey Umbach who sampled Lake Ribbon in Flagler County. Al and Audrey Umbach have lived on Flamingo Drive adjacent to Ribbon Lake North for over 25 years, and through their efforts and hard work have made sure the lake was well maintained. They formed the Ribbon Lake Homeowners Association to collect voluntary contributions from the property owners around the lake who contract with a professional herbicide applicator to have the lakes maintained for aquatic weeds at a higher level of service than what the City provides. The Umbachs have spearheaded this endeavor for the length of time Ribbon Lake has been their home.

They wrote this letter to John Moden,

Palm Coast City Engineer who along with Judi McCullar, Sr. Staff Assistant, help coordinate and recruit volunteers and maintain the LAKEWATCH collection center in Flagler County. They asked us to share this letter with all of our LAKEWATCH family.

Attention John Moden

Since Audrey and I turned in all the equipment that Lake Watch provided us I have been looking at the two collection units that we made to collect the samples on our lake. I began to

wonder if perhaps they could be used on other lakes. I sat down and with pictures, diagrams and general fabrication instructions put together the enclosed package. I am sending it to you and if you think it might be helpful to the program you could forward it to the proper person at Lake Watch.

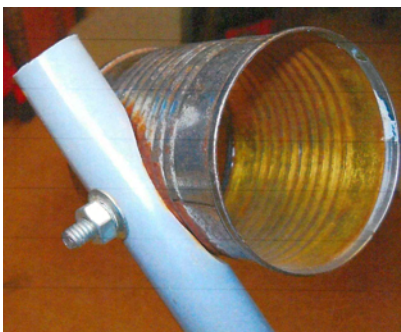
Audrey and I really miss working with the program but are smart enough to heed the warnings of an age of 88 and are content of looking back at the memories we have gath-

ered over 20 years, also the fine friendships we have been blessed to have developed with you and Judy.

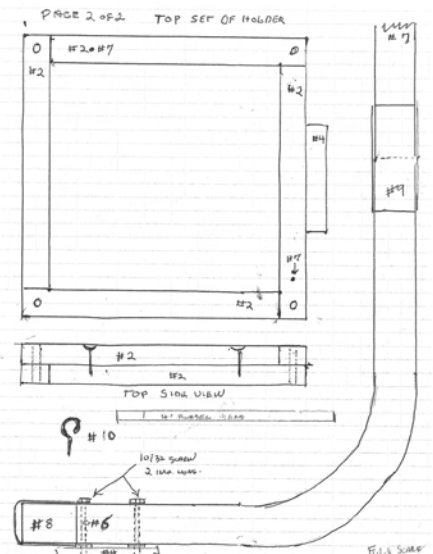
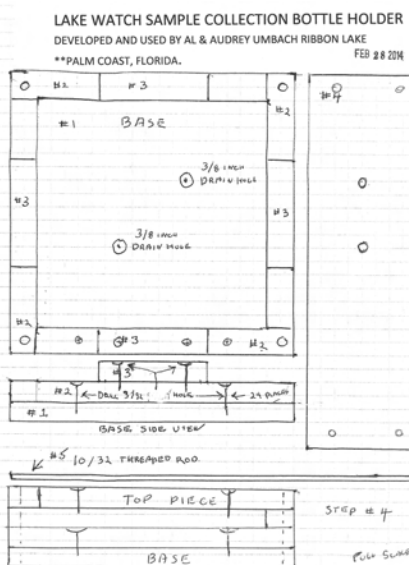
Sincerely  
Al & Audrey Umbach

If you are interested in the plans for this sampling device call us at:  
1-800-525-3928  
or e-mail us at:

Fl-lakewatch@ufl.edu



Al and Audrey Umbach with John Moden, City Engineer at the Palm Coast Council Meeting receiving their certificate of appreciation for 20 years of service.



# Florida Waters: Ours to Protect

Of the nearly 4,000 plant species growing in the wild in Florida, about 1,000 are non-native or “exotic.” Most of them are not a problem. However, about 130 plant species are considered invasive. An invasive plant is a non-native plant that causes harm to the environment, economy, or public health. In Florida, approximately 24 aquatic plant species are currently considered invasive.\* Many of them have been introduced largely from global commerce and trade (imported aquarium and water garden plants and ballast water from ships) and also from recreational boat travel. Once introduced into a waterbody, plants are easily spread by boats and other recreational equipment.



Scenes from “Florida Waters: Ours to Protect” video

## To protect native species and their habitat

Florida is home to over 2.5 million acres of fresh water, which includes lakes, rivers, springs and wetlands. Aquatic invasive plants threaten native species and habitats, flood control structures, natural areas and resources, and recreation. Without management of invasive aquatic plants, boats would not be able to navigate, people could not

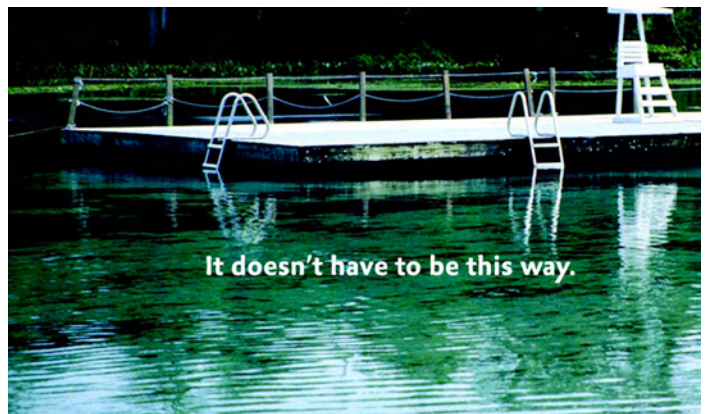
safely swim, fish populations would be stunted or move elsewhere, bird populations would be threatened, tourists might go elsewhere, and agriculture crops and neighborhoods could be flooded during storm events.

Native aquatic plants provide food and shelter to native fish and wildlife, lend stability to shorelines, produce oxygen in the water, improve water clarity, and provide aesthetic beauty. Be-

cause native plants usually do not take over their home range, there is biodiversity—a number of species growing in balance within the aquatic ecosystem.

Florida is famous for its biodiversity. Biodiversity exists when species are constrained in their growth by natural factors, so they can’t overrun their neighboring species. Because non-native invasive plants are usually here without the natural conditions that kept them in

\* Florida Administrative Code 62C-52.011 Prohibited Aquatic Plants





check in their native ranges, they can outgrow and replace native plants.

Florida's native wildlife evolved with native plants and often cannot use non-native plants. Some aquatic invasive plants can completely fill the water or cover the surface of our lakes and rivers, resulting in degraded conditions and loss of native plant communities. The destruction and replacement of native plants has several significant consequences:

- Natural biodiversity is reduced or destroyed;
- Rare and endangered species can be eliminated;
- Wildlife does not thrive;
- Native fish may be driven out or fish kills may occur from low oxygen problems caused by the degraded conditions.

**To protect infrastructure**

Dense stands of invasive plants can block or damage infrastructure such as bridges, dams, and flood control faci-

ties, resulting in threats to public safety and millions of dollars in damage.

**To protect natural resources**

The nearly 8,000 lakes in Florida are some of the most biologically rich systems in the world. Florida's climate and nutrient-rich soils provide year-round growing seasons for aquatic plants and animals. This means Florida lakes are even more susceptible to invasive plants and algae blooms. Proper plant management in freshwater lakes is an important element in maintaining healthy lake ecosystems and ensuring their intended functions.

**To protect our playgrounds**

Florida is also home to more than 600 springs, and nearly 1,700 rivers and streams that stretch across the state; many are vulnerable to invasive plant species and their associated ecological impacts. Known as the "fishing capital of the world," Florida benefits from a

world-renowned fishery. Freshwater fishing alone contributes over \$2.5 billion annually and nearly 25,000 jobs to the Florida economy. Aquatic plant management is essential to the future of such an important recreational and economic resource.

**To enjoy, protect, and manage Florida waters**

Goals for managing invasive aquatic plants include:

- Preserving healthy habitats for native fish, wildlife, and plants;
- Maintaining lake and canal functions for flood control;
- Ensuring a healthy water supply for drinking and irrigation;
- Facilitating navigation for fishing and other recreation.

Most of the time, it is not possible to completely remove an in-



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This newsletter is generated by the Florida LAKEWATCH program, within UF/IFAS. Support for the LAKEWATCH program is provided by the Florida Legislature, grants and donations. For more information about LAKEWATCH, to inquire about volunteer training sessions, or to submit materials for inclusion in this publication, write to:

Florida LAKEWATCH  
Fisheries and Aquatic Sciences  
School of Forest Resources and Conservation  
PO Box 110600  
Gainesville FL 32611-0600

or call  
1-800-LAKEWATCH (800-525-3928),  
(352) 392-4817,

E-mail: [flakewatch@ufl.edu](mailto:flakewatch@ufl.edu),

Website: <http://lakewatch.ifas.ufl.edu/>

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.

vasive plant infestation. Once the plants are established, it is more realistic to control them at low levels and prevent them from spreading.

Since it is extremely difficult to predict which plants can become inva-

sive, prevention is another crucial strategy for protecting our waters. Help us spread the message about aquatic invasive plants and protect the unique and treasured natural resources of Florida.

**View the video "Florida Waters: Ours to Protect"**  
[plants.ifas.ufl.edu/manage/why-manage-plants/introduction](http://plants.ifas.ufl.edu/manage/why-manage-plants/introduction)

**For information on plant management in Florida:**  
[plants.ifas.ufl.edu/manage](http://plants.ifas.ufl.edu/manage)  
[myfwc.com/wildlifehabitats/habitat/invasive-plants](http://myfwc.com/wildlifehabitats/habitat/invasive-plants)

This article and all photos and images were provided by the Center for Aquatic and Invasive Plants ([plants.ifas.ufl.edu](http://plants.ifas.ufl.edu)).



Center for Aquatic and Invasive  
Plants



A collaboration of the UF/IFAS Center for Aquatic and Invasive Plants and the Florida Fish and Wildlife Conservation Commission / Invasive Plant Management Section