UF IFAS UNIVERSITY of FLORIDA

Florida LAKEWATCH

Dedicated to Sharing Information About Water Management and the Florida LAKEWATCH Program Volume 68 (2015)

A Special Thank You for the Financial Support!

A LAKEWATCH sampling kit (pictured above) costs about $300 per kit.

I want to thank everyone for the continuous support of the UF/IFAS Florida LAKEWATCH Program throughout the years. This statewide research, teaching and extension program exists to monitor and protect one of Florida's most precious resources – our water – through enhancing scientific knowledge and educating citizens and lake-users about Florida's water resources. Without the dedication of people like you, this program would not be possible.

Florida LAKEWATCH is truly the most cost-effective sampling approach for collecting this data, however there are still costs associated with maintaining the program. The Florida Legislature provides annual funding, however, due to legislative budget cuts and rising costs, this funding is no longer enough to properly maintain the program. More than ever we need the help of our friends to ensure the future of Florida LAKEWATCH. In November 2014 we sent out a request for financial support because of these budget shortfall and we received a tremendous response with over 50 individuals/groups sending checks for supporting the LAKEWATCH effort. These monies will be sufficient to purchase new sampling kits needed as we train new volunteers and replaced worn out parts from old kits already used around the state.

We sincerely appreciate everyone's support and at this time specifically for the financial support! It is only with the dedication of our volunteers, friends, faculty and staff that Florida LAKEWATCH continues to serve Florida. This program started as a dream 28 years ago, and thanks to you this dream is a real part of Florida's efforts to protect our water resources. We hope you will continue making a positive impact on Florida's future.

Mark Hoyer

Florida LAKEWATCH Director

LAKEWATCH office manager Mary Lettelier packages a replacement filter pump for the next mail run to an eager volunteer.

Molluscan Shellfish Aquaculture and Restoration Program at the University of Florida

By Huiping Yang

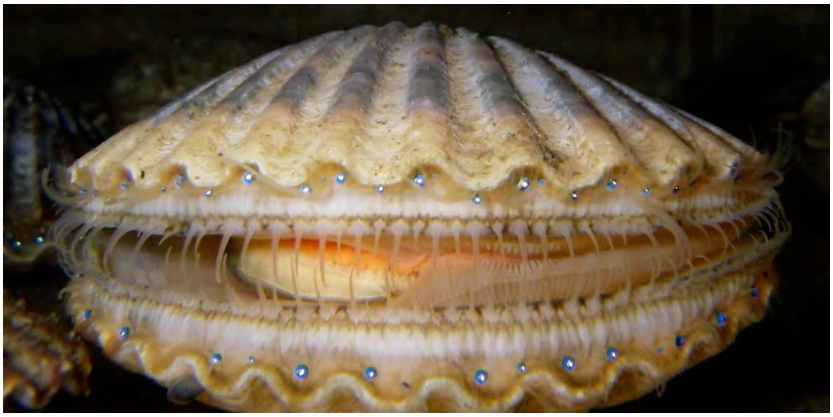
UF/IFAS Online Resource Guide for Florida Shellfish

The primary species for aquaculture is the hard clam *Mercenaria mercenaria* with an $11.9 million farm-gate sales value.

Huiping Yang is a new faculty member at the School of Forest Resources and Conservation of the University of Florida (UF). She obtained her PhD on Aquaculture at the Ocean University of China. She has worked at the Rutgers University, City University of Hongkong, and Louisiana State University Agricultural Center. Her expertise is on molluscan shellfish aquaculture focusing on genetics, reproduction, and biotechnology. Specifically, her working experiences include triploid-tetraploid induction, shellfish aquaculture, gametogenesis, germplasm preservation, and related genetic analysis. To date, the molluscan species she worked on includes oysters, clams, scallops, and abalones. At UF, her research program is Molluscan Shellfish Aquaculture and Restoration. The overall goals are to conduct research on molluscan shellfish aquaculture production, technologies, applications, ecology, and restoration, and to coordinate with the extension team and industry organizations to produce educational resources and demonstrations directly applicable to industry needs.

Molluscan shellfish farming in Florida occurs in 12 counties along both the east and west coasts with a value of about $20 million (http://www.agcensus.usda.gov/Publications/2012/). The primary species for aquaculture is the hard clam *Mercenaria mercenaria* with an $11.9 million farm-gate sales value. Diversification is occurring with culture efforts being developed for the eastern oyster *Crassostrea virginica* and sunray venus clam *Macrocallista nimbosa*. In addition, some species, such as the eastern oyster, bay scallops *Argopecten irradians*, and calico scallop *Argopecten gibbus* have been cultured for restoration purposes. For marine fishery landings in Florida, the molluscan species historically include the eastern oyster, hard clam, sunray venues clam, calico scallop, bay scallop, conches, octopus, and squids.

Freshwater molluscan species are also widely distributed in Florida considering the large number of lakes, streams, and rivers. Most species are mussels from family Unionidae (58 native and 2 introduced species), and several others from four additional families (Corbiculidae, Dreissenidae, Mactridae, and Sphaeriide). For application, freshwater mussels have been



The bay scallp (pictured above) has been cultured for restoration purposes. Photo by Rachael Norris and Marina Freudzon

historically harvested in large quantities as food for Native Americans, and large shells have been used as ornamental pearls and buttons. Today some freshwater molluscan species are threatened because their numbers are declining. Therefore, most attention has been focused on protection of those valuable freshwater natural resources especially after the federal Endangered Species Act was passed in 1973.

Considering the current situation and future trends in molluscan shellfish interest, the scope of work for this program includes, but is not limited to the following aspects: 1) marine molluscan shellfish aquaculture and restoration, the research topics will cover breeding program, creation of specific lines for genome research, triploid-tetraploid technology, germplasm cryopreservation, and aquaculture techniques for new native species to diversify the industry; 2) freshwater mollusks, conservation of the endangered species and related genetic analysis will benefit the natural resources protection; 3) for extension and outreach work, the goal will be to build up strong communications with stakeholders to exchange ideas, identify problems, propose solutions, provide updated education and policy materials. In addition, extension efforts through workshops, step-to-step manuals, videos, and scientific meetings will be made to enhance the communication; and 4) for education, both graduate (PhD and Master) and undergraduate students will be trained in this program through research activities, classes, seminars, group discussion, presentation, and hand-on experiences.

Overall, the long-term aim of this program is to develop a genetic stock resource center for molluscan shellfish, with wild populations, aquaculture-selected populations, specific lines, tetraploids, inbred lines, and mutant lines. These repositories can be used for aquaculture breeding programs to benefit industry production, provide unique research materials to benefit scientific research, and serve for conservation of the endangered species.

I hope this short essay can serve as an introduction of the Molluscan Shellfish Aquaculture and Restoration Program at the University of Florida to the Florida LAKEWATCH readers, and I look forward to building connections and trust for future communications and collaborations.

Huiping Yang, *School of Forest Resources and Conservation, Institute of Food and Agricultural Sciences University of Florida, 7922 NW 71st Street, Gainesville, FL 32653. Phone: 352-294-0671 Email: huipingyang@ufl.edu.* Photo by Mark Hoyer.

TrophyCatch helps demonstrate success of Lake Trafford restoration

By The Florida Fish and Wildlife Conservation Commission

Restoration efforts included the dredging of over 6 million cubic yards of muck from the lake. FWC photo by John Cimbaro.

During a recent fishing tournament, John Stewart, 54, of Alva caught, documented and released an 8-pound, 2-ounce Florida largemouth bass on Lake Trafford.

This bass, caught Feb. 7, showcases the remarkable recovery of fishing at Lake Trafford after years of restoration efforts led by citizens of Collier County, the South Florida Water Management District and the Florida Fish and Wildlife Conservation Commission (FWC). Biologists with the FWC verified this impressive fish for the agency's TrophyCatch conservation program.

Over the past several years, Lake Trafford has been the focus of a major multi-agency restoration project. Restoration efforts included the dredging of over 6 million cubic yards of muck from the lake and re-establishing native vegetation. In the past, the muck triggered algal blooms and fish kills.

"I am so very proud of the partnership built between our local community, Collier County, the FWC and partner agencies," said FWC Commissioner Liesa Priddy, "The grass-roots efforts by the local community, businesses and the people of Collier County set in motion the process that brought us to this successful conclusion -- this celebrated catch."

After years of poor habitat conditions and a series of devastating fish kills, this catch highlights the remarkable recovery of fishing at Lake Trafford. Largemouth bass had been the sport fish species most impacted by the degraded habitat conditions over the past 20 years. Excessive amounts of muck lead to low oxygen levels that nearly eliminated the largemouth bass population from the lake. The lake's poor condition also impacted bluegill, crappie and redear sunfish, but to a less-

er extent. After dredging, the FWC stocked about 500,000 largemouth bass fingerlings to supplement the native Lake Trafford community and jump-start the recovery of the fishery.

"A number of dedicated people, past and present, put in a lot of effort and energy to help bring this fishery back," said Jon Fury, deputy director of the FWC Division of Freshwater Fisheries. "Seeing a largemouth bass entered into TrophyCatch from this lake is very gratifying."

The FWC hosted free kids fishing activity at the public event celebrating the Lake Trafford restoration. Photo credit: FWC media.

"Almost four years ago to the day, I had the privilege of participating in the honorary 'first cast' into the freshly dredged Lake Trafford at the celebration of our collective restoration efforts," said FWC Commissioner Ron Bergeron. "This is exactly the kind of success I envision for all the fish and wildlife of south Florida, including the Everglades, when I speak about our need to work together for the benefit of the environment."

The FWC continues to contribute to restoration and habitat enhancement at Lake Trafford, and across Florida, through its Aquatic Habitat and Conservation Section.

How are other anglers doing on Lake Trafford?

"A week after the tournament where John Stewart caught his fish, Gary Stenic caught an 8-and-3-quarter pounder," said Lake Trafford Marina owner Ski Olesky, "We're seeing real improvement in the size and quality of bass being caught."

Planting vegetation on the south east side of Lake Trafford in 2012. Photo credit: FWC media.

For making the first approved TrophyCatch submission from Lake Trafford, Stewart qualifies for a special set of prizes including a U.S. Reel casting reel, a Glen Lau DVD and a gift certificate from Alligators and Airboats at Lake Trafford Marina, as well as the standard TrophyCatch incentives.

TrophyCatch is an incentive-based conservation program designed for anglers who catch and release largemouth bass heavier than 8 pounds in Florida. For more information visit TrophyCatchFlorida.com. For more information on Lake Trafford and similar FWC freshwater restoration efforts go to MyFWC.com/Conservation and click on Freshwater programs.

Attention Volunteers!

Many of you have attended LAKEWATCH Regional meetings and learned of the July 2014 memo from Florida Department of Environmental Protection granting site –specific and limited use methods approval for Florida LAKEWATCH samples collected by volunteers and analyzed at the LAKEWATCH laboratory in Gainesville.

This approval came after data collected by LAKEWATCH volunteers was 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.

While this approval was a big step for the LAKEWATCH program in gaining recognition as a reliable water quality data source for professionals across the state it did come with some restrictions that we need to make the volunteers aware of.

The most important one is that in order for the data to be considered totally reliable without a "qualifier", it must be analyzed within 5 months of the date collected.

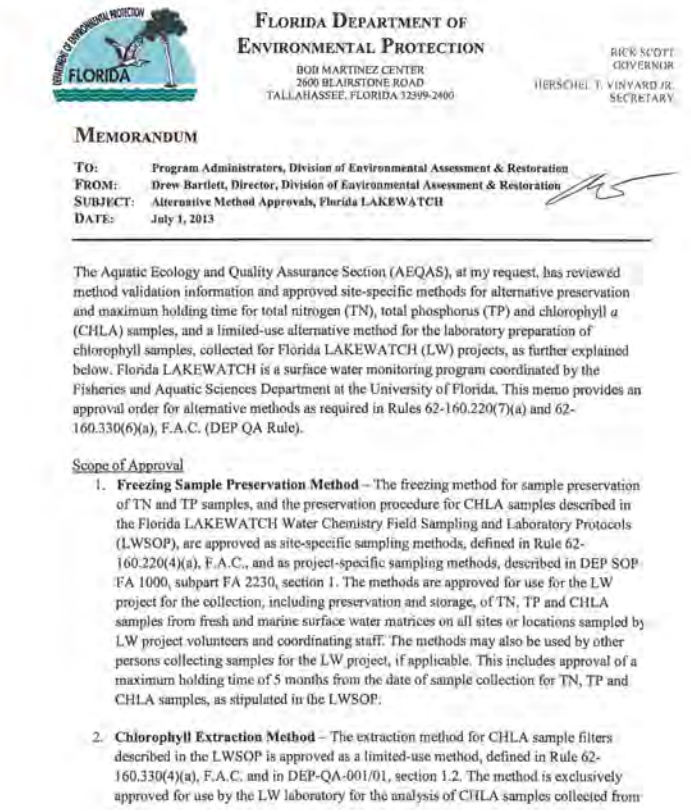
What does having a "qualifier" attached to your data mean? It means that the data may not be used by DEP for regulatory decisions. This will also hold true for other state and local agencies. You should still feel confident enough in the data to use it to make non-regulatory management decisions.

Because of the large number of samples analyzed by the LAKEWATCH program it is very important that the volunteers keep their samplings flowing to their collection centers in a timely manner. This is especially important for those volunteers in areas where samples are picked up from the collection centers on a quarterly basis.

Another new criteria that the LAKEWATCH lab follows is that we will no longer analyze samples that are more than one year old from the date collected.

So whenever possible, get those samples to the collection centers before the next scheduled pickup date so that your data can be used to it's fullest extent.

If you need to know the next pickup date for your collection center you can call the toll free LAKEWATCH number or check the Florida LAKEWATCH website.



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
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RICK SCOTT
GOVERNOR
HERSCHEL T. VINYARD JR.
SECRETARY

MEMORANDUM

TO: Program Administrators, Division of Environmental Assessment & Restoration
FROM: Drew Bartlett, Director, Division of Environmental Assessment & Restoration
SUBJECT: Alternative Method Approvals, Florida LAKEWATCH
DATE: July 1, 2013

The Aquatic Ecology and Quality Assurance Section (AEQAS), at my request, has reviewed method validation information and approved site-specific methods for alternative preservation and maximum holding time for total nitrogen (TN), total phosphorus (TP) and chlorophyll *a* (CHLA) samples, and a limited-use alternative method for the laboratory preparation of chlorophyll samples, collected for Florida LAKEWATCH (LW) projects, as further explained below. Florida LAKEWATCH is a surface water monitoring program coordinated by the Fisheries and Aquatic Sciences Department at the University of Florida. This memo provides an approval order for alternative methods as required in Rules 62-160.220(7)(a) and 62-160.330(6)(a), F.A.C. (DEP QA Rule).

Scope of Approval

1. **Freezing Sample Preservation Method** – The freezing method for sample preservation of TN and TP samples, and the preservation procedure for CHLA samples described in the Florida LAKEWATCH Water Chemistry Field Sampling and Laboratory Protocols (LWSOP), are approved as site-specific sampling methods, defined in Rule 62-160.220(4)(a), F.A.C., and as project-specific sampling methods, described in DEP SOP FA 1000, subpart FA 2230, section 1. The methods are approved for use for the LW project for the collection, including preservation and storage, of TN, TP and CHLA samples from fresh and marine surface water matrices on all sites or locations sampled by LW project volunteers and coordinating staff. The methods may also be used by other persons collecting samples for the LW project, if applicable. This includes approval of a maximum holding time of 5 months from the date of sample collection for TN, TP and CHLA samples, as stipulated in the LWSOP.

2. **Chlorophyll Extraction Method** – The extraction method for CHLA sample filters described in the LWSOP is approved as a limited-use method, defined in Rule 62-160.330(4)(a), F.A.C. and in DEP-QA-001/01, section 1.2. The method is exclusively approved for use by the LW laboratory for the analysis of CHLA samples collected from

The Florida Department of Environmental Protection's memorandum approving alternative methods for Florida LAKEWATCH.

The Peppermint shrimp, a premier ecosystem provider for the aquarium-keeper hobbiest.

by Michael D Dickson

Michael Dickson

A premier ecosystem provider is the peppermint shrimp, *Lysmata boggessi,* which is heavily targeted along the west coast of Florida.

The marine life trade involves the wild harvest of fish, invertebrates, and aquatic plants to supply the aquarium industry. In the United States aquarium-keeping has risen to the second most popular hobby, and as this popularity continues to increase so inevitably does the demand for wild-caught organisms. The diversity of organisms inhabiting the coastal environments of Florida has resulted in this peninsular state becoming the North American epicenter for marine life collection, where some of the most sought after species include those that provide natural ecosystem services. These species, coined "ecosystem providers", refer to invertebrate scavengers and grazers whom are introduced into home aquaria to help regulate natural processes, such as the accumulation of algae and debris. Unfortunately, these harvested ecosystem providers are largely understudied, and baseline information regarding their population biology and ecology does not exist. One consequence of this knowledge void is the unknown effect of harvest on populations; however, the additional ecological threat entails the uncertain impact of removing these organisms, and their services, from the environment. Even though easing harvest pressures with aquaculture may seem to be a plausible mitigation strategy, the complex life histories of marine life organisms currently create challenges for culturing, which is rarely successful at a commercial scale. The reliance of the marine life trade upon wild-caught individuals emphasizes the need to determine baseline information for these organisms, which is critical to aid management plans that ensure ecosystem conservation and promote sustainable fisheries.

A premier ecosystem provider is the peppermint shrimp, *Lysmata boggessi,* which is heavily targeted along the west coast of Florida. This shrimp is desired among home aquarists for its biological control of pest anemones, and is popular for its striking red colorations. They are also renowned by scientific community for living in social groups, and

for their unusual form of hermaphroditism. However, no previous studies have looked at the role of their hermaphroditism, their habitat requirements, and the adaptive value of their social behavior for harvested Florida populations. Therefore, the goal of my thesis research was to develop baseline knowledge for this species and generate information in these three areas by assessing a population offshore of Homosassa, Florida.

My first objective was to describe changes in seasonal population structure and reproductive characteristics by sampling this population monthly for an entire year. The majority of individuals harvested from Homosassa are landed as bycatch via roller-frame shrimp trawlers, and so sampling involved spending long nights, with colorful captains and crews, aboard these vessels. The peppermint shrimp caught during each trawl were counted, and then subsampled to be brought back to the laboratory to determine sex phase, a carapace length measurement, and the fecundity of gravid hermaphrodites. The results showed that the population consisted predominantly of male phase shrimp during cooler fall and winter months, and vice-versa hermaphroditic phase shrimp during the spring and summer. Furthermore, a greater proportion of male individuals during the spring transitioned into hermaphrodites, and at smaller sizes, than compared to other seasons. It was hypothesized that this shift is indicative of spring being the primary reproductive season, a notion which was also supported by a greater number of spawning hermaphrodites during this period. The second objective was to gain *L. boggessi* ecological knowledge by testing for habitat preference and trophic relationships. The dominant substrates encountered by these shrimp are limestone hard-bottom, seagrass, and sand; therefore, these substrates were re-constructed in mesocosms using artificial materials, and the selection choices of released shrimp were observed during day and night to infer habitat preference. These trials showed that at night *L. boggessi* are capable of using all three substrates, however, during the day rely upon physical refuges, and preferably those found in hard-bottom. To determine trophic relationships, the dominant primary producers and consumers were collected from the Homosassa area and analyzed using stable isotopes. These results suggested that peppermint shrimp are at least secondary consumers that forage on prey organisms living in a variety of habitats. The last objective was to test *ex situ* the influence of one potential factor, predator presence, on group-living behavior. This was accomplished by placing two shelters, one empty and one housing peppermint shrimp, at opposite corners of an aquaria, and allowing one released shrimp to decide whether to reside with others or alone. To introduce a predator effect, a blue crab was tethered between the shelters during half of the trials. Surprisingly, the inclination to group declined in the predator trials, as more shrimp chose to shelter alone after confronting the blue crab.

For these peppermint shrimp, although these experiments neither show the direct effect of harvest on the population nor conclude on the ecological impact of losing their services, I still believe that they were successful as an initial step in gathering baseline information on this important marine life species. I am hopeful that this work will contribute as a foundation that fosters within the scientific community continued research on peppermint shrimp, but above all, will raise awareness to everyone about the marine life trade, ecosystem providers, and the need for establishing proper management strategies for this fishery and the environment.

Volunteer Bulletin Board

YOUR HELP IS NEEDED!

Did you attend a Florida LAKEWATCH regional meeting last year (2014) and receive educational materials on hydrilla management? The UF/IFAS Hydrilla IPM Team in partnership with Florida LAKEWATCH would like your input on the materials so we can improve them and produce new materials that would be useful to you!

Soon you will be receiving a web link to a survey either by email or mail (depending upon your LAKEWATCH contact preferences). Please complete the survey if possible using the web link, if this is not possible we will provide a number for you to call so that a person can record your survey answers.

If you did not receive the educational materials but would still like to receive them so that you can provide input or would like more materials please contact us by email eniweeks@ufl.edu or by telephone 352-273-3957. Or you can review the material online by visiting our Resources and Extension pages on our website: http://entomology.ifas.ufl.edu/hydrilla/

Thank you!
The UF/IFAS Hydrilla IPM Team & Florida LAKEWATCH

FWC raises awareness on lionfish issue with creation of 'Removal' day

The Florida Fish and Wildlife Conservation Commission (FWC) adopted a resolution to help raise awareness about the invasive-lionfish issue. At its meeting Feb. 5 in Jacksonville, the FWC designated the first Saturday after Mother's Day each year to be Lionfish Removal and Awareness Day.

On this day, through education and outreach, the FWC will encourage extra effort from the public to remove lionfish from Florida waters.

Lionfish are a nonnative, invasive species that have a negative impact on Florida's native wildlife and habitat. Consistent lionfish removal can reduce the negative impacts lionfish have on the reef community.

The FWC has several activities planned for the weekend of the first annual Lionfish Removal and Awareness Day, which is May 16. On the 16th and 17th, divers across the state will be encouraged to see how many lionfish can be removed from Florida waters in one weekend.

Divers are asked to report their catches via the Report Florida Lionfish app or online at MyFWC.com/Lionfish.

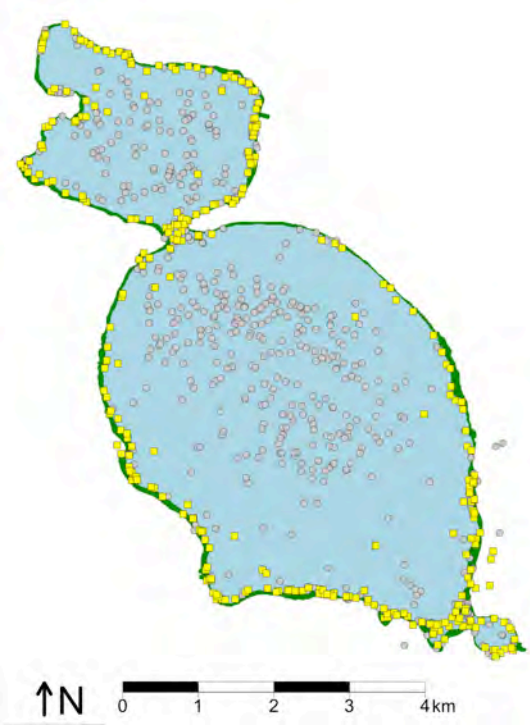
To supplement this effort, several local sponsors across the state are scheduling lionfish derbies in conjunction with the weekend. A festival and derby will be hosted by the FWC, Guy Harvey Ocean Foundation and the Gulf Coast Lionfish Coalition in Pensacola.

The FWC is also excited to roll out its new Reef Rangers Lionfish Control Program the weekend of May 16 and 17, asking members of the public to select a reef and pledge to remove lionfish from that area several times a year.

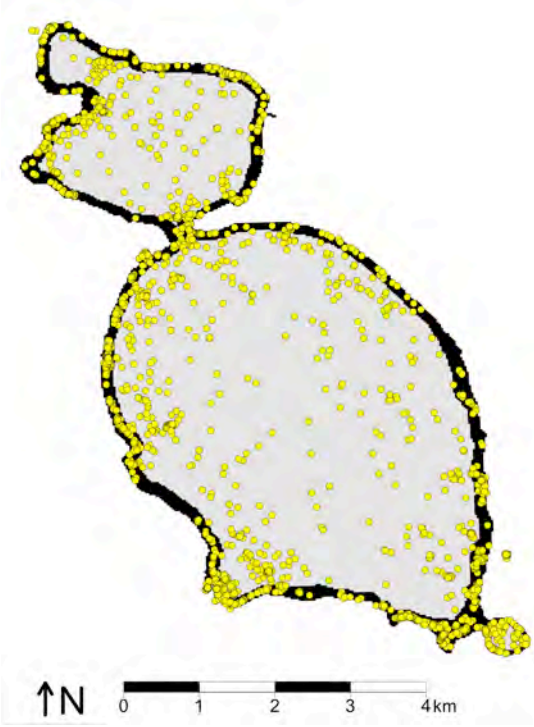
To learn more about lionfish, including upcoming events and how to fillet your catch so you can enjoy it for dinner, visit MyFWC.com/Lionfish.

Hide and Seek

Lake Santa Fe is the site of recent University of Florida Fisheries Study



The distribution of Largemouth Bass anglers (yellow squares) and non-bass anglers (light grey dots) on Lake Santa Fe from November 2010 through October 2011. Green dots around the perimeter of the lake represent the vegetated areas and blue represents open water. Angler locations outside of the lake are in canals.



All Largemouth Bass locations from October 2010 through October 2011 (yellow dots). Areas where largemouth bass anglers had a high likelihood of targeting (black) and where they were not likely to target (light grey) based on logistic generalized linear model incorporating distance from shore and rugosity (rough or wrinkled) of the shoreline habitat. Fish locations outside of the lake were found in canals.

Lake Santa Fe located in Alachua County was the first Lake in the Florida LAKEWATCH program and was the site of a recent study by University of Florida Researchers, Bryan Matthias, Mike Allen, Rob Ahrens and Janice Kerns. Along with United States Geological Survey researcher, T. Douglas Beard, Jr., these researchers studied the interplay of fish and anglers and how that relationship can influence Fisheries Management.

Lake Santa Fe began in the LAKEWATCH program on August 16, 1986 and has faithfully sampled for over 28 years. The lake is composed of two basins, a main basin of 1873 ha and a northern basin (also known as Lake Little Santa Fe) of 577 ha. Lake Santa Fe's greatest depth is about 8.1 m and the lake has a thin band of emergent aquatic plants (plants that grow up above the surface of the water) around it perimeter. These plants include maidencain, bald cypress and giant bulrush.

The researchers began their study in November of 2010 and ended it 12 months later in October 2011. They went out every two weeks (twice during the week and once on the weekend) on the lake and surveyed the location of anglers to determine how the fishing effort was distributed across the lake. They did their surveys from a boat by driving the perimeter of the lake to locate shoreline anglers and they ran transects across the open water to count the offshore anglers.

On the same days they were surveying anglers, they also determined where the fish were located in the lake using radio telemetry. They initially collected largemouth bass using boat electrofishing and angling to sample fish

Bryan Matthais

Tracking bass in the lake with radio telemetry.

both near the shore and out in the open water. Fish were then implanted them with radio transmitters, allowed to recover from the procedure, and were finally released back into the lake near the location where they were captured. Then every two weeks, the fish were tracked to determine their location in the lake.

In addition to the telemetry implants the researchers also implanted an external reward tag of $200 to obtain catch data on the fish.

So what did they find? First, they found that on Lake Santa Fe over 90% of the anglers were fishing within 50 meters (164 feet) of the shoreline but only about 66% of the fish were congregating in those same areas. They reasoned that the remaining 33% would be less likely to be caught because only 10% of the anglers were fishing in their vicinity. But, when they examined the data from the external tags that were returned, they found that catch trends were the same for anglers in the open water as they were for near the shoreline.

So what is going on? The researchers theorize that two things are coming into play here. First, largemouth bass were moving between the two habitats at such a rate to negate the affects of the angler distribution (more anglers near the shore than in open water). Secondly, the behavior of fish and anglers in open water may be different from those near the shore making the open water fish more "catchable."

What is the take home message? The researchers suggested that when fishery managers are considering management techniques for fishery conservation, like closing certain areas to fishing as "conservation areas", they need to consider the behavior of both fish and anglers i.e. some anglers are better fishers than others and some fish may be more "catchable" than others. A failure to evaluate all of these factors could cause regulations to be ineffective.

Getsomebass.com

Largemouth Bass was the target species in this study.

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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:

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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.

Bryan Matthais

Tracking bass in the lake with radio telemetry.