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Florida LAKEWATCH

Dedicated to Sharing Information About Water Management and the Florida LAKEWATCH Program Volume 86 (2019)

Florida LAKEWATCH Staff Attend Florida Lake Management Society (FLMS) 30th Annual Technical Symposium

The purpose of FLMS is to promote understanding and comprehensive management of lake and watershed ecosystems by:

- Promoting and providing a forum for exchanging information and experiences on scientific, administrative, and financial aspects of lake and watershed management.
- Assisting in the development of local lake protection and restoration programs in accordance with appropriate management strategies and techniques.
- Encouraging the adoption of local, state, and national programs promoting lake and watershed management.
- Fostering a partnership for the mutual benefit of organizations, agencies, local and regional units of government, and individuals concerned with lake and watershed improvement and protection.
- Affiliating with the North American Lake Management Society (NALMS).

On August 27-30, 2019 six LAKEWATCH staff attended the 30th FLMS conference in Hawks Cay Resort, Duck Key, Florida. The theme of the conference was "Toxic Waters & Environmental Stewardship." Even though we had to keep an eye on Hurricane Dorian the meeting as always was full of excellent presentations on lake management science and application. These meetings also allow LAKEWATCH to network with management professionals from around

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the state keeping us informed on the latest science of lake management.

The following are the session titles that were used for the symposium and in each session there were three to four presentations on each session topic. All sessions were excellent and some of the following may be of interest to LAKEWATCH volunteers:

- Session A1: Indian River Lagoon-Identifying Problems
- Session A2: Indian River Lagoon-The Science Behind the Problems
- Session A3: Indian River Lagoon-Proposing Solutions
- Session A4: Programmatic Aquatic Plant Management
- Session A5: Water Chemistry Dynamics Management
- Session A6: Urban Lake Management
- Session A7: Fisheries Management
- Session A8: Resource and Data Management

- Session B1: Resource Management Planning
- Session B2: Algae and Bacteria Investigations
- Session B3: Lake Restoration
- Session B4: Importance of Aquatic Plants in Stormwater Ponds
- Session B5: Nutrient Sources and Reduction
- Session B6: Water Resources Innovation and Technology
- Session B7: Lake Management Tools

If any of the session titles interest you, the following is a link were you can find the final program listing the titles of individual presentations, the presenters name and an abstract summarizing the finding of the presentation:

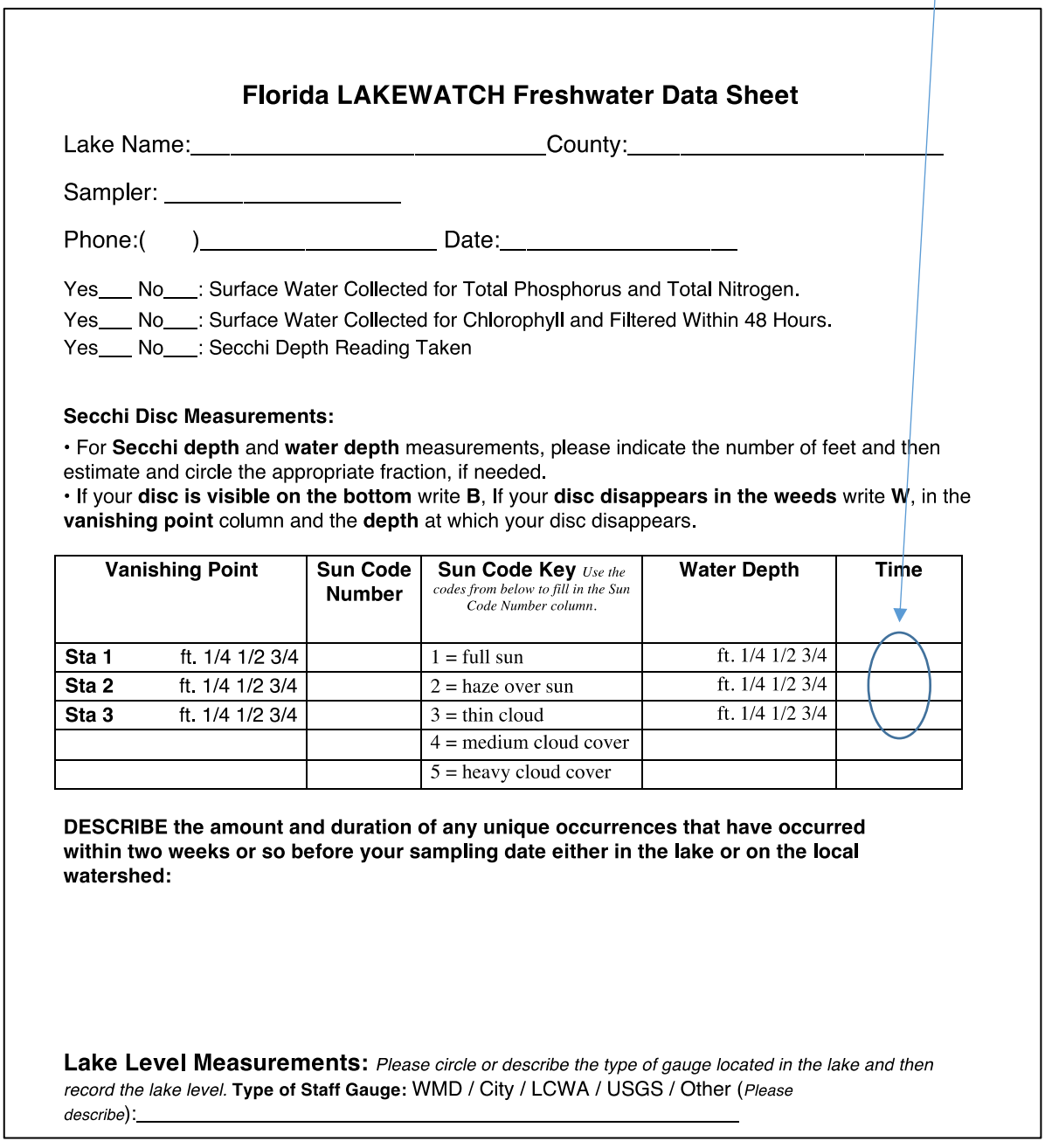
http://www.flms.net/images/stories/uploads/annual-conference/2019_conference/FLMS_SYMPOSIUM_2019_Program_Web.pdf

FLMS annual symposium is attend mostly by professionals but the society strongly encourages aquatic resources stakeholders to attend. LAKEWATCH also encourages our volunteers and anyone interested in their aquatic resources to attend next year's meeting at the Hyatt Regency Coconut Point in Bonita Springs, August 25-28, 2020 and learn how to better manage Florida's aquatic resources.

From the LAKEWATCH lab

We want to remind all volunteers it is important that you record sampling time on the field data sheet when individual samples are taken. We need a record of these times, usually three per lake, to meet requirements of our Standard Operating Procedures approved by the Florida Department of Environmental Protection. There are individual slots on the actual field sheet to record time sampled for each station. As always thank you for all your time and effort!

The LAKEWATCH lab



Florida LAKEWATCH Freshwater Data Sheet

Lake Name:_____County:_____

Sampler: _____

Phone:( )_____ Date:_____

Yes___ No___: Surface Water Collected for Total Phosphorus and Total Nitrogen.
Yes___ No___: Surface Water Collected for Chlorophyll and Filtered Within 48 Hours.
Yes___ No___: Secchi Depth Reading Taken

Secchi Disc Measurements:

• For **Secchi depth** and **water depth** measurements, please indicate the number of feet and then estimate and circle the appropriate fraction, if needed.
• If your **disc is visible on the bottom** write **B**, If your **disc disappears in the weeds** write **W**, in the **vanishing point** column and the **depth** at which your disc disappears.

Vanishing Point		Sun Code Number	Sun Code Key *Use the codes from below to fill in the Sun Code Number column.*	Water Depth	Time
Sta 1	ft. 1/4 1/2 3/4		1 = full sun	ft. 1/4 1/2 3/4	
Sta 2	ft. 1/4 1/2 3/4		2 = haze over sun	ft. 1/4 1/2 3/4	
Sta 3	ft. 1/4 1/2 3/4		3 = thin cloud	ft. 1/4 1/2 3/4	
			4 = medium cloud cover		
			5 = heavy cloud cover		

DESCRIBE the amount and duration of any unique occurrences that have occurred within two weeks or so before your sampling date either in the lake or on the local watershed:

Lake Level Measurements: *Please circle or describe the type of gauge located in the lake and then record the lake level.* **Type of Staff Gauge:** WMD / City / LCWA / USGS / Other (*Please describe*):_____

Living Shoreline Project Installed on the Indian River Lagoon

BY FLORIDA TECH MARKETING AND COMMUNICATIONS

The Indian River Lagoon, which spans 156 miles on Florida's east coast from Ponce de León Inlet in Volusia County to Jupiter Inlet in Palm Beach County, is often regarded as one of the world's most ecologically diverse estuaries.

But the lagoon is struggling.

Over the years, pollution and coastal construction have wiped out huge numbers of oyster beds, which act as natural reefs that help block wave energy and prevent shoreline erosion. Oysters themselves act as living filters, removing impurities from the water naturally efficiently and constantly.

Last year, Florida Tech, Brevard County and the Brevard Zoo partnered to create the Living Shoreline project in an e□ort to restore oyster beds to the Indian River Lagoon. This spring, the first Living Shoreline project was established along a section of the lagoon in Indialantic, which will serve as the model for future oyster reef build outs in other parts of the estuary.

Robert Weaver, associate professor of Ocean Engineering and his students performed physical model simulations of

oyster reef breakwaters and revetments at Florida Tech's Coastal Engineering Lab to establish the design and performance of the structures. The reefs are made from long, mesh bags containing real oyster shells that attract oyster larva to attach and make a home there.

In May, Brevard Zoo volunteers recently placed the engineered breakwaters and revetments into the lagoon near the shoreline where they should collect enough living oysters and other creatures to help prevent further erosion along the banks. The oyster reefs work by dissipating incoming waves and diminishing the waves' power to pull sediment from the shore.

"The installation was a great opportunity to see coastal engineering and community engagement in action," said Weaver.

Prepping the foundation for the oyster reef.

Florida LAKEWATCH Assisting in the Development of a Habitat Management Plan for Lake Istokpoga, Highlands County, FL

Lake Istokpoga, Florida's fifth largest lake at 27,700 acres, is highly productive in terms of both plant and animal life. Many different stakeholders use and rely on Lake Istokpoga, including anglers, hunters, recreational boaters, birdwatchers and general wildlife observers, fishing, hunting and wildlife watching-related businesses, the local hospitality industry, local residents, and a variety of civil society organizations. Many of the uses of the lake and the conservation of its biological resources rely on active management of its habitats, particularly with respect to aquatic vegetation. This task, however, is complex due to the dynamic, ever-changing ecology of the lake, the diversity of stakeholders, and their often conflicting preferences for lake habitat characteristics and management actions.

In order to promote effective, strategic habitat management for Lake Istokpoga and reduce stakeholder conflict, the Florida Fish and Wildlife Conservation Commission (FWC) has contracted the University of Florida (UF) to engage stakeholders in the development of a Lake Istokpoga Habitat Management Plan. This article outlines the preliminary outcomes of that planning process.

Stakeholder engagement in habitat management was strategic, adaptive and included a variety of methods to ensure the highest level of participation possible. Initially a broad-based situation analysis was conducted to assess baseline stakeholder knowledge, attitudes and perspectives regarding the management of Lake Istokpoga as well as their general value orientations. A permanent committee of representatives from key stakeholder groups was formed in order to identify objectives, develop habitat management options, assess trade-offs between objectives, and plans for continued monitoring, review and adaptive management. A wider array of stakeholders and the general public was engaged through public meetings and a stakeholder survey to obtain input from stakeholders at large who have not personally engaged with the committee or public meetings. A web-based information portal was maintained to document plan development and stakeholder input.

The resulting Lake Istokpoga Habitat Management Plan will be structured as follows.

Chapter 1 is a introduction.

Chapter 2 will provide background and a historical perspective on the lake's ecology and habitat management. This material helps to define the broad envelope within which future habitat management actions and their outcomes should be considered.

In Chapter 3, an overall management vision and guiding principles for habitat management will be outlined.

Chapter 4 will detail the identification, development, and prioritization of management issues, strategies, goals, objectives, and recommendations. It will provided a framework for FWC's management activities on Lake Istokpoga that reflects and incorporates stakeholder input. The chapter will set out broad goals and specific objectives for habitat management within the purview of the FWC's jurisdiction, and includes a suite of management actions that can be implemented when actual habitat conditions are outside the preferred or acceptable ranges specified in the objectives.

Chapter 5 will identify and develop monitoring and adaptive management strategies for the continued evaluation and when necessary, modification of habitat management strategies and practices.

Chapter 6 will outline potential actions for agencies other than the FWC to consider. For instance, water level management, water quality, and watershed development provide context for FWC management actions but cannot be directly

addressed by FWC since these issues are outside the agency's jurisdiction. Nonetheless, such issues might be included in a listing of potential future actions by other agencies or discussion of the history of other agencies' efforts to address these issues.

Chapter 7 will provide a summary and conclusions.

Finally an Appendix provides documentation of all meeting/event/engagement opportunity feedback from participants and leader(s)/facilitators on meeting success, meeting organization and facilitators' performance.\

This process is fast coming to a close and the final plan will be finished this December. For more information on the development of the Lake Istokpoga Management Plane use the following link to the web site:

https://lakeistokpoga.wordpress.com/

“Red Sore Disease” in Game Fish[1]

Peggy Reed and Ruth Francis-Floyd

One of the most common disease problems encountered in freshwater game fish is generically referred to as “red sore disease.” This problem usually occurs in the spring and fall, and fishermen and pond owners are often concerned by the appearance of red ulcers and sores on their fish. Typically, “red sore disease” is caused by two organisms, Aeromonas hydrophila , a bacterium, and Heteropolaria sp. (formerly Epistylis sp.), a protozoan.

Both of these organisms are found in aquatic environments and are capable of causing disease. Red sore disease will often run its course, and fish may recover without treatment. The primary concern is often not mortality of fish, but rejection of the affected fish by anglers because of the diseased appearance. Occasionally red sore disease can reach epidemic proportions, contributing to significant mortality (more than 10 percent) of game fish. When this is the case, treatment is warranted.

Identification of Red Sore Disease

Red sore disease is a generic term that describes a physical condition of fish rather than referring to a specific disease agent. Fish most frequently affected are game fish, particularly bluegill (bream), largemouth bass, and striped bass and its hybrids. The condition is observed in fish from natural waters, recreational fishing ponds, and commercial aquaculture facilities. Sores caused by Heteropolaria sp. can be characterized by white-grey, cotton-like patches on the body surface or the fins. Due to the irritation, the fish will “flash,” or rub, to rid itself of the parasite, causing scale loss and ulceration of the already damaged area. This allows the bacterium Aeromonas hydrophila to enter.

In its mildest form, the condition is seen as red, raised “sores,” or lesions, on the tips of fins, particularly the dorsal fin of bluegill (Figure 1). As the disease progresses, fish may be afflicted with fin erosion, and ulcers on the side of their body (Figure 1). Because red sore disease is a general condition rather than a specific disease, affected fish must be sent to a fish disease diagnostic laboratory in order to correctly identify the pathogens contributing to each outbreak of disease.

Figure 1.

Pathogens Contributing to Red Sore Disease

Red sore disease usually involves several aquatic organisms, most of which are considered to be “opportunists.” That is, these organisms are present in the environment in which fish live, but are only

1. This document is VM85, one of a series of the Veterinary Medicine-Large Animal Clinical Sciences Department, Florida Cooperative Extension Service,
Institute of Food and Agricultural Sciences, University of Florida. Original publication date December 01, 1993. Reviewed September 2011. Visit the
EDIS website at http://edis.ifas.ufl.edu.

2. Peggy Reed, biological scientist; Ruth Francis-Floyd, DVM, associate professor; College of Veterinary Medicine; Cooperative Extension Service, Institute
of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

able to cause disease under certain circumstances. For this reason, the condition is most prevalent in the spring and fall, when the natural disease resistance of fish is low.

One of the most important organisms that contributes to red sore disease is the stalked protozoan, Heteropolaria sp. (Figure 2). This protozoan attaches to the fins, skins, or gills of fish, and forms colonies. It is capable of secreting an enzyme that begins to break down tissue at the attachment site. This damaged tissue is suitable for infestation by bacteria and/or fungi, which ultimately results in formation of a "red sore" or ulcer.

The bacteria most commonly associated with red sore disease is Aeromonas hydrophila , the most common bacterial infection in aquatic organisms. Other organisms that may be associated with ulcerative lesions on fish include a number of protozoans (eg. Icthyobodo sp. [formerly Costia sp.] and Trichodina sp.), the bacterium Flexibacter columnaris and fungi in the genus Saprolegnia . The presence of a red sore does not necessarily mean that the fish has Heteropolaria sp. or Aeromonas sp.

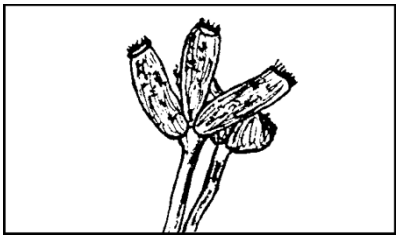


Figure 2.

Wet mounts of affected areas should be examined by microscope (100x and 400x) to confirm the presence of Heteropolaria sp. The colony is made up of numerous cylindrical, elongated bodies attached to the end of a branched stalk. The base of the stalk attaches itself to the skin of the fish, which it uses only as a place for attachment. There is a spiral of oral cilia, or hairs, at the end of each body, and the cilia collect bacteria and organic debris from the surrounding water.

Bacterial cultures of external lesions, as well as posterior kidney, are needed to confirm the presence of A. hydrophila or other bacteria. Primary isolation should be done using 5 percent blood agar as well as Ordal's Media for F. columnaris. Sensitivity testing should be done using Mueller-Hinton agar.

Transmission

Heteropolaria is almost everywhere in fresh water and sediments. It has a direct life cycle, requiring only the fish host. It reproduces by binary fission (dividing), and the resulting young forms are free swimming. The mature stage attaches to fish or other structures in its environment, including spawning containers and submerged logs. Heteropolaria thrives if there are high levels of organic matter in the water to provide nutrients. Stress, caused by poor water quality, crowding, water temperature variations, reduction in body condition, or spawning can increase the susceptibility of fish to red sore disease.

Treatment of "Red Sore Disease"

In many instances fish afflicted with red sore disease will recover without treatment. If lesions on most fish are mild (restricted to the tips of dorsal fins), and if few mortalities are observed, it may be advisable to observe the fish daily and elect to treat the pond only if the situation seems to worsen rather than improve.

If treatment is warranted, potassium permanganate is often effective when administered one time as a bath at 2 mg/l (see IFAS Fact Sheet #FA-23) because of its broad spectrum activity against external

protozoa, bacteria, and fungi. If fish do not improve following treatment with potassium permanganate, they should be submitted to a fish disease diagnostic laboratory (see IFAS Circular #921) for a complete diagnosis.

In some instances, the disease may be far enough along that fish are dying of systemic bacterial infection secondary to external damage. Antibiotic treatments should be provided in a medicated feed based on results of bacterial isolation and sensitivity testing (see IFAS Fact Sheet #VM-70). In the event medicated feed is warranted, this medication should be administered in addition to the potassium permanganate bath. Anytime fish do not respond to treatment as expected, they should be re-evaluated by a fish diagnostic laboratory.

If fish affected with red sore disease can be handled, a 3 percent salt dip is extremely effective in eliminating external Heteropolaria sp. infections. Salt reatments are discussed in IFAS Fact Sheet #VM-86.

Wholesomeness of Fish with Red Sore Disease

Fishermen often ask whether it is safe to eat game fish that have sores on them. In most cases the sores are external only, and when the fish is cleaned, the damaged area is easily removed from edible tissue. thorough cooking will eliminate any pathogens that might remain in tissue, resulting in a safe and wholesome product. Although the appearance of a fish with sores on it may be unappetizing, there is no reason to discard the fillets as long as they are thoroughly cleaned and cooked.

Summary

Red sore disease in game fish is common in the spring and fall, and often due to the effects of two opportunistic aquatic pathogens, Heteropolaria sp. and Aeromonas hydrophila . Heteropolaria sp. is a ciliated protozoan, found almost everywhere in fresh water. It causes problematic infestations on game fish. These protozoans flourish and attach to the skin, where they cause unsightly, bloody, ulcerated areas.

In lakes or rivers, treatment is not feasible. In recreational farm ponds or aquaculture facilities, Heteropolaria sp. may be controlled with potassium permanganate at 2 mg/l administered as a prolonged bath. A salt dip (3 percent) is also effective if it is feasible.

Aeromonas hydrophila is an aquatic bacterium capable of infecting skin or fins damaged by Heteropolaria sp. The bacterium adds to the damage caused by the protozoan, which results in formation of large red ulcers and occasionally systemic infection. If the bacterial infection becomes systemic, mortality rates will increase, and antibiotic therapy, administered in medicated feed, is warranted. Antibiotic therapy should be based on the results of sensitivity tests. Any time fish do not respond to treatment as expected, a sample should be submitted to a fish disease diagnostic laboratory for reevaluation.

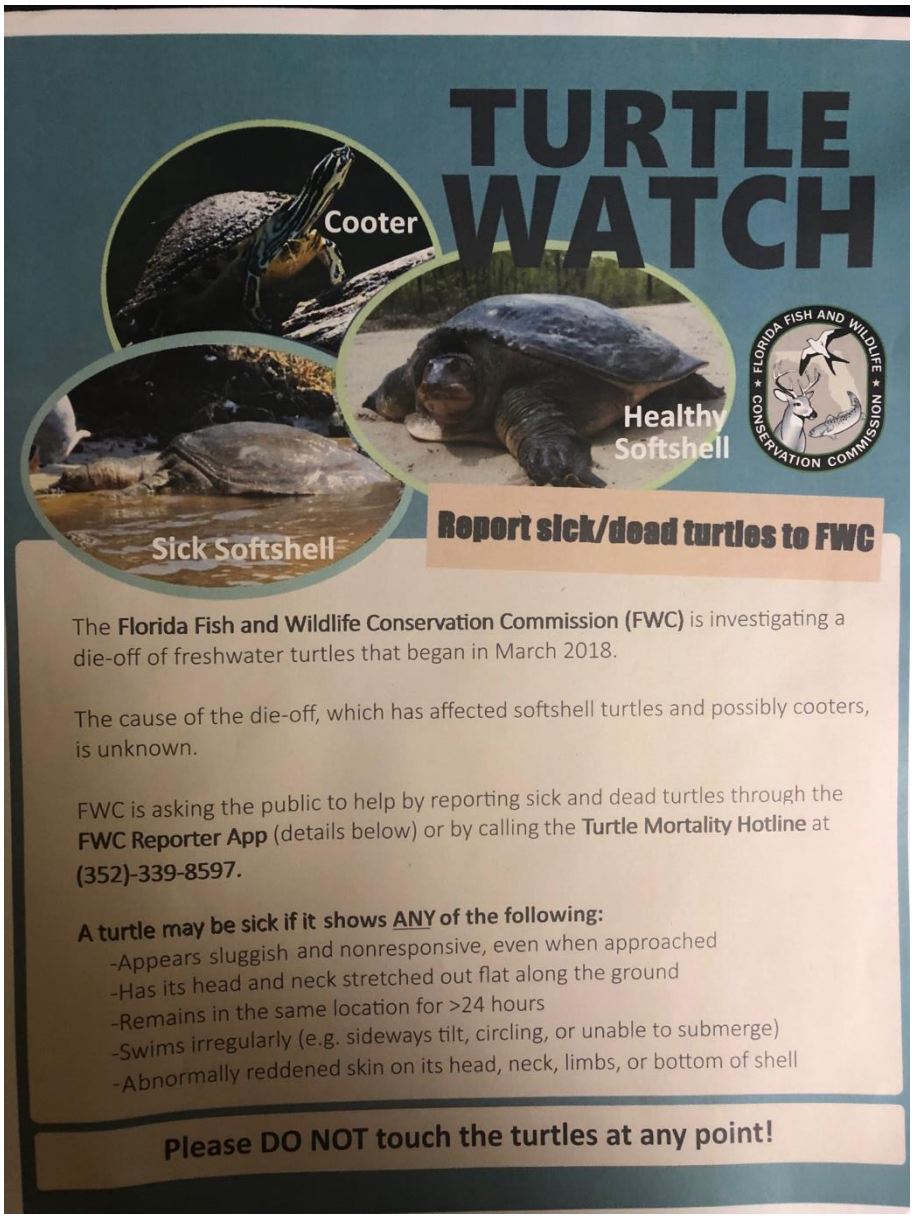
Many game fish affected with red sore disease will recover without treatment. Fish heal very quickly, and sores will disappear rapidly once the recovery process has begun. Fish that have sores are still acceptable for human consumption as long as the damaged area is removed when the fish is cleaned and the meat is thoroughly cooked.

FWC and partners continue investigation of freshwater turtle die-off

FWC press release 3-19-2019

The Florida Fish and Wildlife Conservation Commission (FWC) and collaborators continue to investigate a die-off of freshwater turtles, and the FWC is asking the public to assist by providing information.

In March 2018, the FWC began to receive reports of sick and dead Florida softshells and cooters in the St. Johns River. Approximately 300 sick or dead turtles have been reported that may be related to this ongoing mortality event. Sick and dead turtles have been found along the St. Johns



River (SJR) watershed from the headwaters near Palm Bay in the south, to Crescent Lake and Palatka in the north. Additional reports of dead turtles have been received from Lake Apopka, Eustis, Windermere and Cocoa Beach.

To determine the cause of the turtle mortalities, the FWC began a collaborative investigation with the University of Florida College of Veterinary Medicine (UF-CVM) Wildlife Aquatic Veterinary Disease Laboratory (WAVDL), UF-CVM Aquatic Amphibian and Reptile Pathology Program, Office of Protected Resources (National Oceanic and Atmospheric Administration Fisheries), and the Florida Department of Agriculture and Consumer Services Bronson Animal Disease Diagnostic Laboratory (BADDL). To date, 18 turtles collected by the FWC from the SJR watershed have been examined by wildlife veterinarians at FWC and UF laboratories in Gainesville. Initial findings suggested a viral infection contributed to the mortalities. Virologists at BADDL and WAVDL discovered a novel virus associated with diseased Florida softshell turtles (*Apalone ferox*), peninsula cooters (*Pseudemys peninsularis*), and Florida red-bellied cooters (*P. nelsoni*). Toxins, including those produced by harmful algal blooms, were not detected in any turtles tested. There have been no reports of dead fish or other wildlife in conjunction with the turtle die-offs.

Investigators are planning additional studies to better understand this viral disease, the extent of its distribution in Florida, and its effect on turtle populations. As part of the ongoing investigation, the FWC is asking the public for help by taking the following actions:

- Report sightings of sick or dead turtles to the FWC by calling: 352-339-8597 or through the FWC Reporter App. Photos can be uploaded via the Reporter App and will aid researchers in turtle species identification and condition.
- Do not touch or attempt to move sick turtles.
- To avoid spreading the virus, do not capture, transport or release freshwater turtles, even those that appear healthy, to new locations.
- Do not eat turtles that appear sick or unhealthy.

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