Aquatic Nuisance Species Status Report
Nonnative Fish and Wildlife Program

Florida Fish and Wildlife Conservation Commission
November 2022 through March 2023
Prepared for Gulf & South Atlantic Regional Panel on Aquatic Invasive Species

MARINE NONNATIVE SPECIES STATUS REPORT

Lionfish

2023 Lionfish Removal and Awareness Day and Lionfish Challenge

Figure 1. Join in the 2023 Lionfish Removal and Awareness Day!

The 2023 Lionfish Awareness and Removal Day (LRAD) will be held May 15, 2023, in Destin, FL. Visitors will have the opportunity to taste lionfish, watch fillet demonstrations, participate in family-friendly games and much more (Figure 1). This event is held in conjunction with the state's largest lionfish removal event, the Emerald Coast Open Lionfish Derby on May 13 and 14, with a final weigh-in on the 15th, 2023. The six days leading up to LRAD is called Restaurant Week. Each day, one of six participating restaurants create and sell a lionfish dish that highlights the great taste and versatility of this unique seafood. It is hoped that the more people that taste lionfish, the higher the public demand for this unwanted but available resource will be. The 2022 LRAD event was very successful with 145 participants removing 13,835 lionfish. The First Place Team for Most Lionfish removed 1,623 fish. Prizes were also awarded for the largest lionfish (436 mm) and smallest lionfish (39 mm).

The Florida Fish and Wildlife Conservation Commission (FWC) is also planning to hold the 2023 Lionfish Challenge. The goal of the Challenge is to encourage and reward recreational and commercial divers for removing lionfish from Florida waters. The Lionfish Challenge is scheduled to begin May 20th and run through Labor Day, September 4th, 2023. The Challenge is a statewide event open to recreational and commercial divers. Checkpoints will be set up around

the state for recreational divers to submit their catch and commercial divers will provide copies of trip tickets to document the weight of lionfish they harvested. At the end of the Challenge the recreational diver with the most lionfish and the commercial diver with the most weight of lionfish will be crowned the Lionfish King or Queen for their category. To keep divers interested, there will be a tiered prize system based on the number or weight of lionfish submitted to encourage continued harvest. There will also be bi-weekly raffles for all participants that have submitted a qualified entry. Participants in the Challenge have historically removed a lot of lionfish as the 2022 Recreational Lionfish King brought in 1,194 fish and the Commercial Lionfish King won with over 3,000 pounds. This Challenge is a fun and potentially rewarding way to help reduce the number of lionfish on Florida's reefs. Additional information on the 2022 Lionfish Challenge can be found at http://fwcreefrangers.com/lionfish-challenge

Green Mussel (*Perna viridis*)

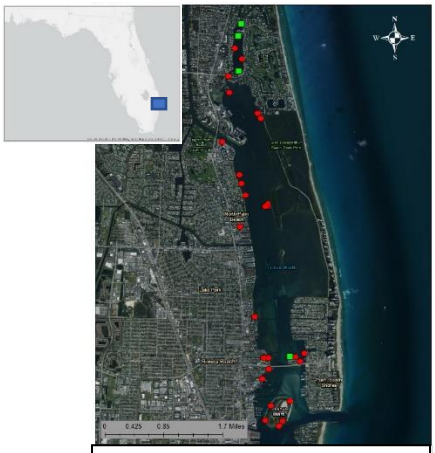

Figure 2. Lake Worth Lagoon survey locations with (green) and without (red) green mussels, 2022

Green Mussels *(Perna viridis*) were first discovered in Tampa Bay in the late 1990s and rapidly increased in abundance. They soon spread south along the Gulf coast, into the Keys and then up the Atlantic coast to several locations north of but not within Lake Worth Lagoon (LWL). However, in October 2020 Green Mussels were reported from Little Lake Worth Lagoon on the north end of LWL (Figure 2). FWC and other partners are currently undertaking major restoration projects in the LWL including creating nesting islands surrounded by rip rap intended for native oyster habitat. Green Mussels are a bio-fouling organism and there are concerns that they could displace native oysters and cause substantial economic fouling issues for ships and structures such as floating docks, channel markers, pilings, and intake pipes.

There have been no new Green Mussel reports from the LWL or other Intracoastal Waterway sites since February 2021. However, a flier (Figure 3) has been developed and disseminated to LWL stakeholders to aid in the identification and reporting of Green Mussels to the FWC.

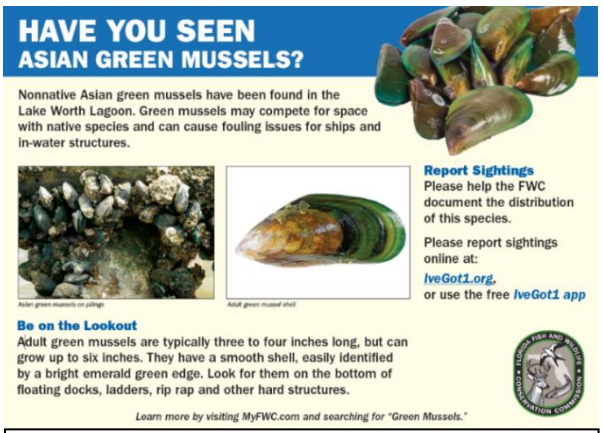

Figure 3. Green Mussel (*Perna viridis*) identification and reporting flier.

Asian Tiger Prawns (Penaeus monodon)

During this report period, the FWC received one report of Asian Tiger Prawn (*Penaeus monodon*) from Martin County.

FRESHWATER NONNATIVE AQUATIC SPECIES STATUS REPORT

Zebra Mussels (*Dreissena polymorpha*)

No confirmed reports of Zebra Mussels were received during this report period.

Arapaima (*Arapaima gigas*)

Figure 4. .Arapaima (*Arapaima gigas*) Photo by: Citron. Licensed under Creative Commons BY-SA 3.0 Unported. Available: https:// commons.wikimedia.org/wiki/File:

In February 2023 a new unconfirmed report of an Arapaima (*Arapaima gigas*, Figure 4) in a brackish water canal in Cape Coral, FL was received by the FWC. The location is less than two miles from a previous but unverified arapaima report. Due to a lack of credible information, FWC did not investigate this latest report. This site is near the Caloosahatchee River. It is likely the fish was a large Snook or Tarpon; species that frequent these canals.

Figure 5. Juvenile Arapaima seized by FWC Law Enforcement

In March 2023, FWC Law Enforcement investigators seized an illegal shipment of juvenile (approx. four inches long) Arapaima (Figure 5). Arapaima are regulated by the FWC as a Conditional species. Permits to possess live Arapaima are only issued to qualifying entities for research, commercial import/export, and public exhibition. Aquaculture facilities with a valid Aquaculture Certificate with Restricted Species Authorization issued by the Florida Department of Agriculture and Consumer Services are allowed to raise Arapaima only for food. FWC has developed outreach materials to inform the public on the potential environmental consequences of releasing this fish and to encourage anglers to report observations or catches to FWC's IveGot1 hotline. For more information, visit FWC's Arapaima website at:

https://myfwc.com/wildlifehabitats/profiles/freshwater/arapaima/

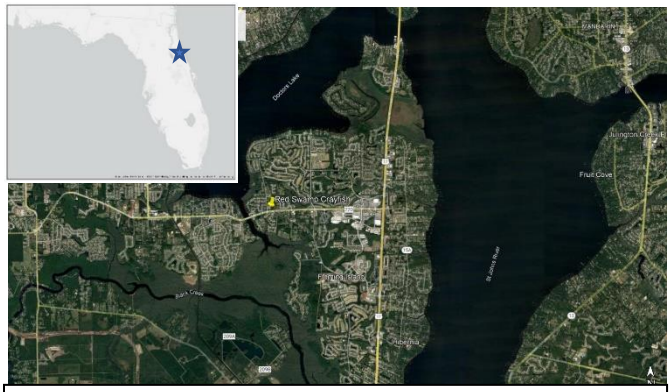

Figure 6. Confirmed Red Swamp Crayfish location in Fleming Island, FL. Site is near the State Threatened Black Creek Crayfish (bottom left).

Red Swamp Crayfish (*Procambarus clarkii*) Update

In August 2022, an EDDMapS report of Red Swamp Crayfish (RSC, *Procambarus clarkii*) was received from a location in northeast Florida near Jacksonville, Figure 6). FWC staff positively identified them as RSC. RSC are native to the Escambia River basin in western peninsular Florida, but this site is more than three hundred miles from their native range. RSC are considered highly invasive, and the site is near habitats occupied by the State Threatened Black Creek crayfish, a species already under stress from a native crayfish species that has been transplanted into the Black Creek drainage basin. The site has a series of drain lines connected to a retention pond. The RSC were first spotted in one of the access wells of the drainage system (Figure 7) and were also trapped from the retention pond. Small numbers of RSC were also trapped from a shallow pothole in an almost completely dry drainage ditch just north of the site. The source of these RSC at this site is unclear at this time. Trapping and surveying of waterbodies near the site were rapidly initiated to define the geographic range of the RSC and a team was developed to formulate an Early Detection Rapid Response plan to address this novel Florida invasion. Two applications of copper sulfate were applied to the retention pond, drain lines, and pothole. The treatments were unsuccessful in eradicating the RSC from any of the sites.

Figure 7. Drain line partially plugged and filled with pyrethrin-treated water.

Figure 8. Application of pyrethrin to retention pond containing RSC.

Researchers in Michigan are using pyrethrin, a commonly used insecticide, as an effective means of removing RSC. However, it is not currently labeled for use in aquatic systems. Exemptions were obtained from the EPA and NPDES and a treatment was conducted in December 2022. At the time of this treatment, juvenile RSC were observed in the pond and in the pothole. Sections of the drain lines were partially plugged and pyrethrin was applied to the pond, pipe

Figure 9. Pothole containing RSC treated with pyrethrin.

sections, and pothole at a concentration of 2 ppm (Figures 7,8, 9). The pond, pipe sections, and pothole were monitored for three days by visual inspection and trapping. No live RSC were recovered. Additional trapping was conducted in waterbodies outside the treated areas and no additional RSC were recovered.

Trapping continued in early 2023 to monitor the pyrethrin treatment water collected in a second low spot in the ditch, a spot that had been dry in December 2022. Dip netting yielded an adult and several juvenile RSC in this location. This pothole was treated with pyrethrin and no live RSC were recovered. Due to the burrowing ability of RSC and the high-water table in the area, it appears that RSC were able to survive and even reproduce during the dry season and occupy a shallow pothole after a rain event. FWC plans to return to the area at the beginning of the rainy season to monitor all the sites and treat any remaining RSC.

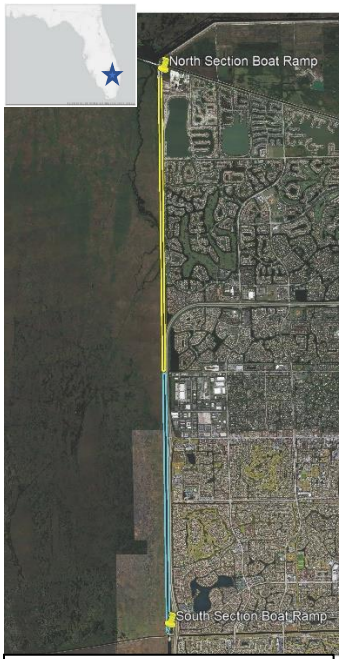

Figure 10. The north and south sections of the L-36 Canal in west Broward County.

Bullseye Snakehead (*Channa marulius*) Removal Project

A canal in western Broward County that is divided into two similarly sized sections by water control structures was identified as a site to examine potential impacts of Bullseye Snakehead (*Channa marulius*) on native fish species with emphasis on Largemouth Bass (*Micropterus salmoides floridanus,* Figure 10). The sections are divided into transects and quarterly fish community electrofishing was initiated in November 2022. In the south section, all Bullseye Snakehead collected have been removed. Monthly removals from the south section are being conducted to expedite any potential changes in the native fish communities. We will primarily be looking for changes in relative abundance of native and nonnative species based on electrofishing catch rates and changes in size structure of native sportfish. This is a 2-year research project that will provide insights on Bullseye Snakehead impacts in a relatively closed system. As a side project, FWC will monitor the canal sections annually to determine how long Bullseye Snakehead in the removal section repopulate the area.

Upcoming Events

GSARP Spring Meeting: The spring meeting of GSARP will be held April 28 and 29, 2023 in Jekyll Island, Georgia.

Fish Slam: A multi-agency fish Slam is tentatively scheduled for May 2023 in the Tampa Bay-Sarasota area.

Southwest CISMA Invasive Fish RoundUp: The Southwest Cooperative Invasive Species Management Area is hosting a nonnative fish removal contest May 5-7, 2023. Anglers of all ages will target nonnative fish in hopes of winning a prize for the most species, most fish, and heaviest aggregate weight.

2023 Lionfish Challenge: The 2023 Lionfish Challenge is scheduled to run from May 20 through Labor Day. The goal of the Challenge is to encourage and reward recreational and commercial divers for removing lionfish from Florida waters. For more information visit FWC's lionfish website at: https://fwcreefrangers.com/lionfish-challenge/