STATE OF ALABAMA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
MARINE RESOURCES DIVISION
POST OFFICE BOX 189
DAUPHIN ISLAND, ALABAMA 36528
TEL (251) 861-2882
FAX (251) 861-8741
marine.resources@dcnr.alabama.gov

Our mission is to manage the State's marine fishery resources through research, enforcement, and education for the maximum benefit of the resources and the citizens of Alabama.

GULF & SOUTH ATLANTIC REGIONAL PANEL ON AQUATIC INVASIVE SPECIES

Alabama Marine Invasive Report

May 2022

Several invasive species have been documented in Alabama coastal waters. The Bocourt Swimming Crab (*Callinectes bocourti*), Tessellated Blenny (*Hypsoblennius invemar*), Australian Spotted Jellyfish (*Phyllorhiza punctata*), Asian Green Mussel (*Perna viridis*), Asian Tiger Shrimp (Penaeus monodon), and Red Lionfish (Pterois volitans/miles) have been documented although non-validated or undocumented reports of additional invasive species likely exist. Unfortunately, the ecological effects of these invasive species are poorly understood in Alabama's estuaries and Gulf of Mexico waters. However, interactions between indigenous species and invasive species typically results in negative impacts to the native species. Prey of Australian Spotted Jellyfish include early life history stages of many commercially and recreationally important finfish, and the temporal/spatial distribution of Australian Spotted Jellyfish could drastically increase finfish larvae/egg mortality rates if spawning events coincide with swarm activities. Similarly, the Bocourt Swimming Crab could compete for resources of the native Blue Crab. The current status of the Australian Spotted Jellyfish and the Bocourt Swimming Crab, however, does not indicate that these two invasive species pose an immanent concern. Similarly, *H. invemar* and *P. viridis* do not appear to pose an immediate threat, but their distribution and abundance should be monitored to ensure early detection of proliferation. However, the Asian Tiger Shrimp, *Penaeus monodon,* and Red Lionfish, *Pterois volitans/miles* continue to be invasives of heightened concern, and their broadened distribution, increased abundance, and/or documented negative effects on native species warrants concern.

The latest non-native observed in the marine waters of Alabama was a single Crescent Grunter, *Terapon jarbua*. The specimen was collected on February 28, 2020, but was not reported to the appropriate officials until March 29, 2021. The specimen was collected at the Dauphin Island Airport and was maintained in an aquarium at Five Rivers Delta Resource Center. The ADCRN/MRD was notified once the Fiver Rivers staff realized the fish was not native to Alabama. The fish is currently in quarantine at the Dauphin Island Estuarium and will be displayed for outreach purposes to educate the public on the problems associated with invasive species.

The Amazon Red Tail Catfish was observed in Alabama's marine waters in July 2016. The specimen was collected in a recreational crab trap at a private dock on the Bon Secour River.

Additionally, a single Bocourt Swimming Crab was collected in a commercial crab trap during a November 2016 ADCNR/MRD onboard fisheries observation trip. The exact location where the 101mm carapace width, male Bocourt Swimming Crab was caught is unknown, but the general location of capture is south of Lillian Bridge and north of Ross Point in Perdido Bay. No observations of the Bocourt Swimming Crab have been made since the first observation in 2007 until the 2016 observation.

The Asian Tiger Shrimp (*Penaeus monodon*) has been a species of concern since 2006 when it was first observed in Alabama's inshore waters (Mississippi Sound). After the first individual was documented, captures of *P. monodon* have incrementally increased. A confirmed report of a single specimen caught near Middle Bay Light occurred in 2008, followed by five confirmed reports in 2009. From 2006 to 2009, the distribution of *P. monodon* was primarily restricted to Alabama's southern inshore waters. However, its distribution extended to northern Mobile Bay and into Perdido and Wolf Bays in 2011. The forty-three confirmed reports during 2011 indicate the Asian Tiger Shrimp occurs within all of Alabama's primary estuary basins. However, the concern for *P. monodon* has decreased within the commercial shrimping community which has resulted in fewer validated reports. Alabama Marine Resources Division received fewer validated reports in recent years than in previous years, but personnel communications between AMRD and commercial shrimpers indicate a significant abundance of *P. monodon* occur within Alabama waters despite the reduction in validated reports. Based upon the temporal and spatial abundance of *P. monodon* encounters and reported sightings (despite lower perceived importance of Asian Tiger Shrimp since 2013), evidence suggests the Asian Tiger Shrimp has become established in Alabama's waters.

Red Lionfish have successfully colonized the Gulf of Mexico waters offshore of Alabama. The first report, which was unvalidated, was from a 2009 observation made by a recreational SCUBA diver at an area of natural hard-bottom about 20 nautical miles south-southeast of Orange Beach named Trysler Grounds. The first confirmed report was documented in June 2011 by a spear fisherman who collected an individual from an oil/gas platform approximately 43 miles south of Dauphin Island. Numerous unconfirmed reports of lionfish have been made to various government agencies that indicate lionfish were rather abundant on the Trysler Grounds in 2011. SCUBA divers reported observing up to 30 individuals during single dives in this area during the 2011 dive season. However, unconfirmed reports from SCUBA divers from 2012-2013 indicate lionfish abundance had increased from previous levels. A recreational diver reported observing upwards of 60 individual lionfish during a dive at Trysler during the 2012 dive season, although the observer did not know when he made the observation or even an approximate location within the Trysler Grounds reef complex. Similarly, a SCUBA diver reported observing up to 100 individual lionfish during a dive at an artificial pyramid reef during June 2012. Unfortunately, the diver would not disclose any information indicating a more precise location the observation was made other than "offshore of Alabama". Additionally, 26 lionfish were donated to AMRD after a lionfish rodeo in June and July 2012 by a local dive shop, but the rodeo coordinator did not attempt to obtain collection information about the lionfish

Alabama Marine Resources Division received a grant from Gulf States Marine Fisheries Commission (GSMFC) in December 2012 to monitor reef communities in the Gulf of Mexico, dispatch Red Lionfish when encountered during SCUBA surveys, increase public awareness of the lionfish invasion, and streamline the general coordination between State agencies, Federal agencies, and the public. Eighteen dive surveys were completed by AMRD personnel during 2013 and t-shirts were distributed to members of the SCUBA community that were active in submitting reports, samples, and increasing public awareness.

Additional funding was secured from GSMFC to continue the monitoring in 2014 and continue increasing public awareness. AMRD personnel conducted SCUBA surveys at 18 reef

sites in 2014 and created an Adopt-a-Reef program that emphasized the reporting and capturing of lionfish. The Adopt-a-Reef program featured a web-based application that allows for the submission and viewing of reports collected by Adopt-a-Reef participants. However, the developer of the website removed the site from public access which effectively ended the Adopt-a-Reef program.

Fishery-independent monitoring of reefs offshore of Alabama report a similar pattern in the lionfish invasion. Remotely Operated Vehicle (ROV) surveys within the Alabama Offshore General Permit Reef Zone from 2011 through 2015 indicate a widespread distribution of lionfish between 10 nm and 50 nm offshore of Alabama. However, lionfish were more abundant on reef sites that were a greater distance from Mobile Bay. No Red Lionfish were observed during 2011 ROV surveys, but frequency of occurrence was 100% during 2015 ROV surveys. Between 2015 and 2020, the number of Red Lionfish per reef observed during ROV surveys decreased, as seen in Figure 1. Red Lionfish abundances observed in 2016 and 2017 were similar, but the number of lionfish counted per reef during ROV surveys conducted between 2017 and 2020 decreased each year. Using data from ROV surveys conducted between 2011 and 2020, Red Lionfish populations on Alabama's artificial and natural reefs were estimated, as shown in Figure 2.

Beginning in 2016, spearfishing tournaments were held to specifically target Red Lionfish. A weekend long tournament, "Lions on the Line", was held at FloraBama during 2016 when 1,662 lionfish were harvested. A summer-long tournament, Alabama Lionfish Challenge, was held from May 26, 2018 through September 3, 2018 when the recreational division of the Alabama Lionfish Challenge harvested 540 lionfish and the commercial division harvested 278 lbs of lionfish. Tournaments were also held in April 2019 and September 2019 when a total 2,140.9 lbs and 1,296.4 lbs, respectively, were harvested during the tournaments.

The spatial distribution of Red Lionfish has not changed after becoming established. However, the rate of population growth has changed over time. During the first several years of the invasion, population growth of Red Lionfish increased substantially from year to year. However, the rate of population growth during the previous few years has reduced such that it seems the population has plateaued to a stable state.

In conclusion, a concern exists due to the COVID-19 pandemic that limited outreach activities to increase awareness of invasive species. In addition to limited outreach due to COVID-19, spearfishing tournaments that include Red Lionfish as categories were cancelled due to the pandemic. Therefore, limiting the control of population increase and distribution of lionfish. Future monitoring will be of higher importance if resource managers desire to evaluate control efforts on the lionfish invasion. On the other hand, Alabama resource managers made a significant stride in covering regulatory gaps observed in the Lacy Act.

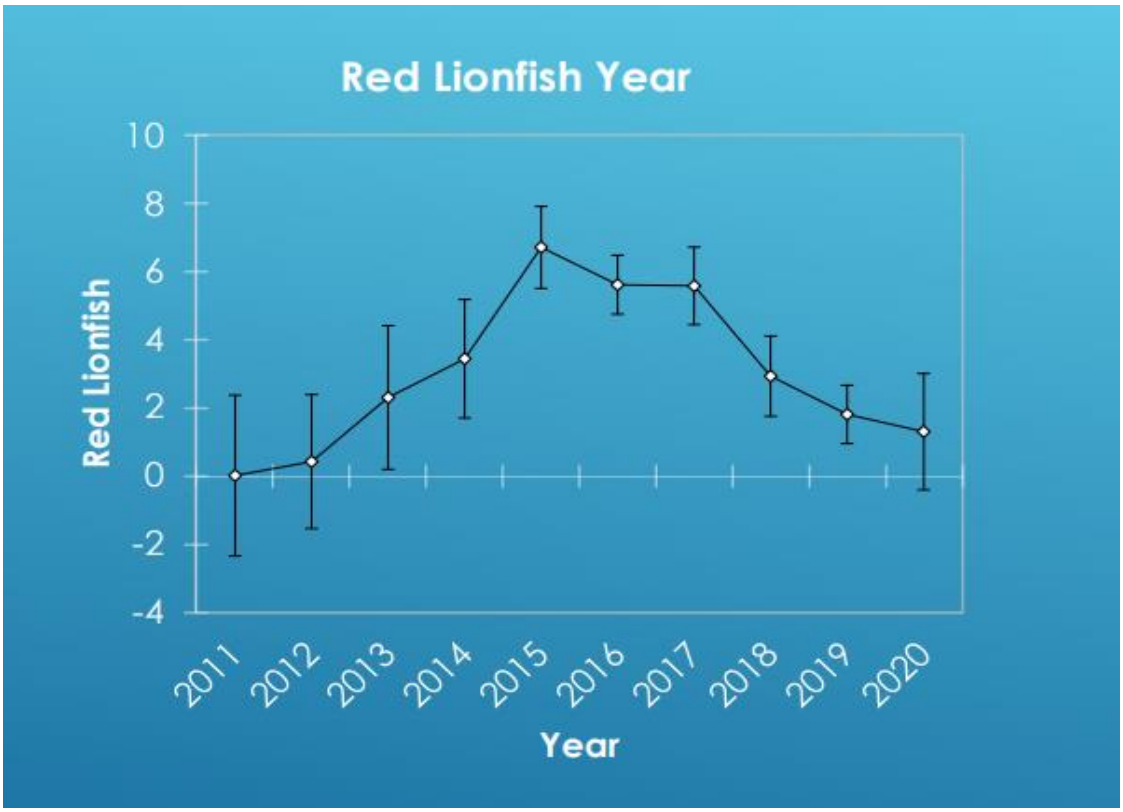

Figure 1. Number of Red Lionfish per reef derived from ROV surveys conducted at natural and artificial reef sites in the Gulf of Mexico offshore of Alabama . (Graph by Sean P. Powers, Ph.D. University of South Alabama, *ALABAMA REEF FISH ESTIMATION* presentation, April 8, 2022).

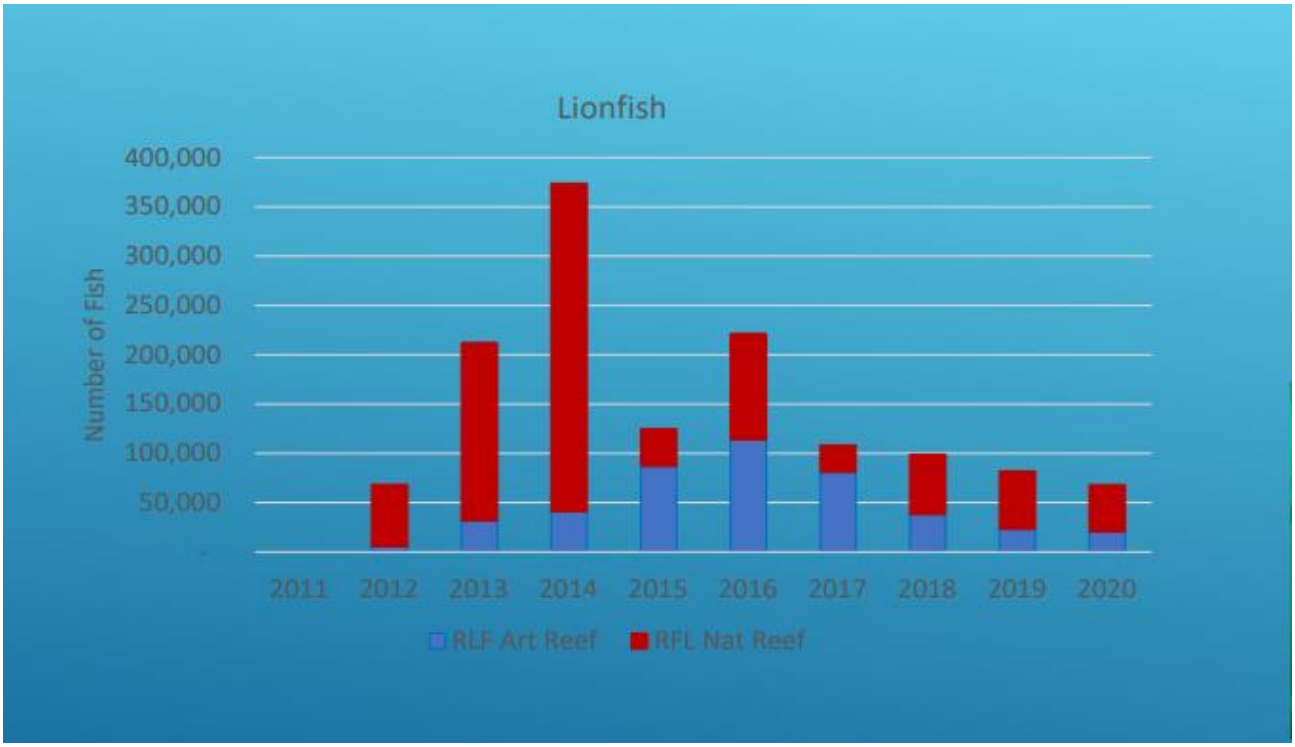

Figure 2. Red Lionfish population estimates computed from ROV surveys conducted at artificial and natural reef sites in the Gulf of Mexico offshore of Alabama. (Graph by Sean P. Powers, Ph.D. University of South Alabama, *ALABAMA REEF FISH ESTIMATION* presentation, April 8, 2022).