



**Alabama Marine Resources Division**  
**Department of Conservation and Natural Resources**

2 North Iberville Street  
P.O. Box 189  
Dauphin Island, Alabama 36528

Phone: 251-861-2882  
Fax: 251-861-8741  
Email: [amrddi@gulftel.com](mailto:amrddi@gulftel.com)

## **GULF & SOUTH ATLANTIC REGIONAL PANEL ON AQUATIC INVASIVE SPECIES**

### **Alabama Marine Invasive Report**

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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 imminent 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 and increased abundance warrants investigation.

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 has

received fewer validated reports in 2013 than previous years. Personnel communications between AMRD and commercial shrimpers indicate a significant abundance of *P. monodon* occur within Alabama waters despite the reduction in validated reports. Commercial shrimpers candidly indicate encounters with *P. monodon* throughout 2013, although they no longer record collection information, preserve the specimen, or report the encounters to AMRD in a timely manner. Regardless, 16 Asian tiger shrimp were validated by AMRD in 2012 and only 3 individuals in 2013. There have been no reports of Asian tiger shrimp in 2014.

Based upon the temporal and spatial abundance of *P. monodon* encounters and reported sightings (albeit reports more candid from 2012 through 2013), evidence suggests the Asian tiger shrimp has become established in Alabama's waters. Therefore, AMRD continues to focus on documenting occurrence, characterizing the population structure and processing samples for genetic investigation. Also, efforts are being made by local academic institutions to acquire live specimens and conduct research regarding behavior and interactions of Asian tiger shrimp with native fauna. Ideally this research will have the ability to identify negative interactions and qualitatively evaluate the impacts of the invasion.

Like 2012 and 2013 reports of the Asian Tiger Shrimp, encounters with lionfish typically are unknown unless AMRD representatives actively seek potential observers (i.e. dive shops, spearfishing tournament organizers, etc). 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 are now more abundant than previous years. 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 about where the observation was made. Similarly, unconfirmed reports are being made by SCUBA divers that indicate lionfish are widespread throughout Alabama's artificial reef permit zone. However, 26 lionfish were donated to AMRD after a lionfish rodeo in June and July 2012 by a local dive shop. Unfortunately the rodeo coordinator did not attempt to obtain collection information about the lionfish, and only retained specimens for AMRD if the participant volunteered to relinquish the lionfish for scientific studies.

Given the lack of quality lionfish reporting from the public and specimen acquisition, AMRD pursued financial support to fund outreach efforts and monitoring associated with the lionfish invasion. Alabama Marine Resources Division received a \$9,240 sub award agreement 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 from May 8, 2013 through July 31, 2013. Natural limestone rock outcroppings, barges/steel ships, reef pyramids, army tanks, and 1 bridge span were surveyed during the project. A total of 138 minutes and 10 seconds of actual survey time was conducted, and depths ranged from 37' to 129' on the various reefs. During the surveys, one SCUBA diver recorded survey data on a dive slate, and additional SCUBA divers were mobilized to increase effort to dispatch lionfish that were not in the field-of-view of the survey recorder. Twenty-eight lionfish were documented by the survey recorder while 34 lionfish were dispatched. All lionfish harvested by AMRD during MBLRU operations were delivered to National Marine Fisheries Service (NMFS) personnel. Lionfish delivered to NMFS were further processed to assess prey assemblage, determine age, and quantify spawning potential. Also, many of the lionfish captured during spearfishing tournaments and SCUBA enthusiasts are now being documented and reported due to increased coordination between local dive shops, NOAA, Gulf Coast Research Lab (GCRL), and AMRD. Approximately 200 red lionfish have been acquired (along with higher resolution collection information than previously acquired) and processed by AMRD, NOAA, and/or GCRL as a result of the increased coordination and dive surveys associated with the GSMFC grant.

In addition to the increase in lionfish specimens submitted to AMRD by the public, the outreach efforts of AMRD has increased the local SCUBA community's awareness of the lionfish invasion. AMRD partnered with REEF to hold a workshop on October 24 to educate the public about the lionfish invasion and demonstrate safe harvesting and handling techniques. As a result of the outreach efforts, numerous SCUBA divers have become more active at targeting lionfish and restaurants are beginning to include lionfish on their menus. Also, AMRD has also developed an Adopt-a-Reef program that allows SCUBA enthusiasts the ability to submit their lionfish observations more efficiently and fosters enthusiasm of Adopt-a-Reef participants to generate and submit data regarding lionfish.

In conclusion, the validity of a portion of lionfish reports are questionable, and the ratio of giant tiger prawn that are rumored to have been caught to the amount of reports received by State agencies is relatively high. For example, native finfish with an intriguing appearance often seem to be confused with lionfish. Similarly, unsubstantiated rumors of shrimpers routinely catching giant tiger prawn throughout Mobile and Baldwin County exist yet relatively few are reported. Therefore, educating the public is paramount to obtaining quality information. The DCNR/MRD continues their efforts to enhance public awareness of these two invasives. Participation in additional workshops and the promotion of the Adopt-a-Reef program is expected to produce significantly more lionfish reports and harvest. A notification that describes the giant tiger prawn and provides information concerning proper reporting continues to be distributed to the shrimping community (Figure 1). Also, a page within the Alabama Marine Information Calendar dedicated to educating the public about the lionfish and the Adopt-a-Reef program has been distributed (Figure 2). The calendar has been distributed to a variety of establishments where it becomes readily available to DCNR/MRD constituents.

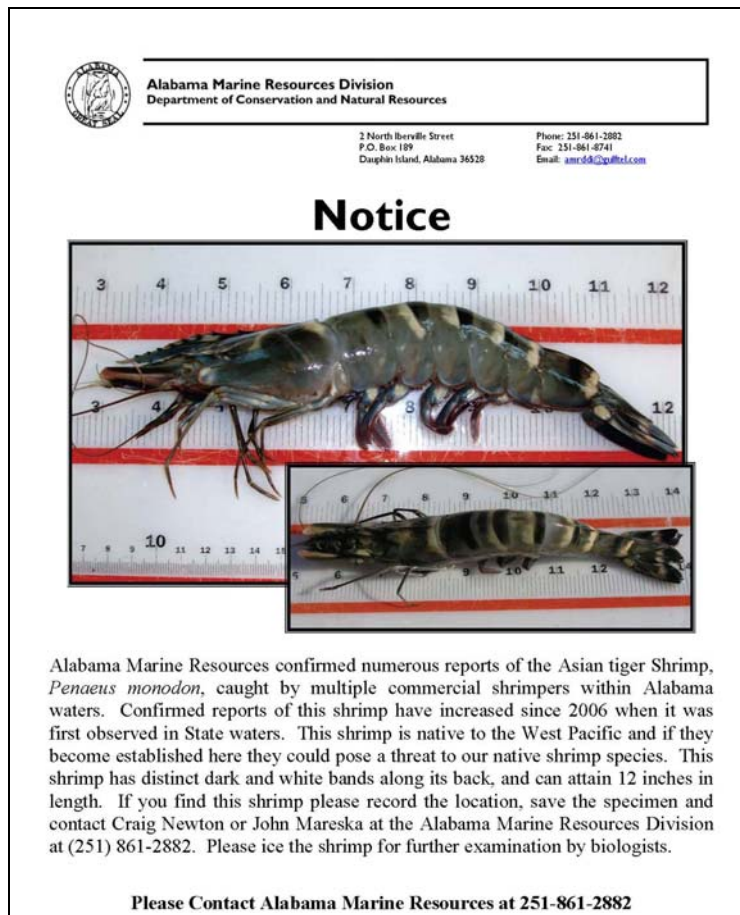


Figure 1. Notification distributed by Alabama Marine Resources Division to the shrimping community in order to increase awareness and promote reporting.



Figure 2. Page from the 2014 Alabama Marine Information Calendar distributed to a wide range of user groups in order to educate, increase awareness, and promote reporting of invasive species.