



# **LIONFISH CONTROL PLAN**

## **Action Items Summary 2019**



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Two species of Indo-Pacific lionfish have invaded the coastal and deep waters of the state of Florida. Lionfish possess a multitude of characteristics that have allowed them to establish as successful invaders. To address this invasive species, the Florida Fish and Wildlife Conservation Commission's (FWC) Lionfish Control Plan (LCP) team implemented several action items in 2019. This summary document highlights those successes.

# Theme 1: Policy and Regulations

## Goal 1.1: Prevent Introduction of Other Scorpionfish

### Risk assessment

**Scorpionfish Risk Assessments:** The FWC Division of Habitat and Species Conservation contracted with the University of Florida to assess risk of Scorpionfish species not established in Florida, but present in the aquarium trade. Risk assessments were conducted on 14 species of lionfish in the genera *Dendrochirus*, *Parapteris*, and *Pterois*. The two invasive species of lionfish (*Pterois miles* and *P. volitans*) had the highest scores followed by *P. russelii*, *Dendrochirus brachypterus*, and *P. lunulata*. This information will be used to inform management decisions.



Figure 1. Russell's Lionfish *Pterois russelii*. Photo: J.E. Randall from Froese and Pauly 2017.

<http://www.fishbase.org/photos/PicturesSummary.php?StartRow=3&ID=6404&what=species&TotRec=7>

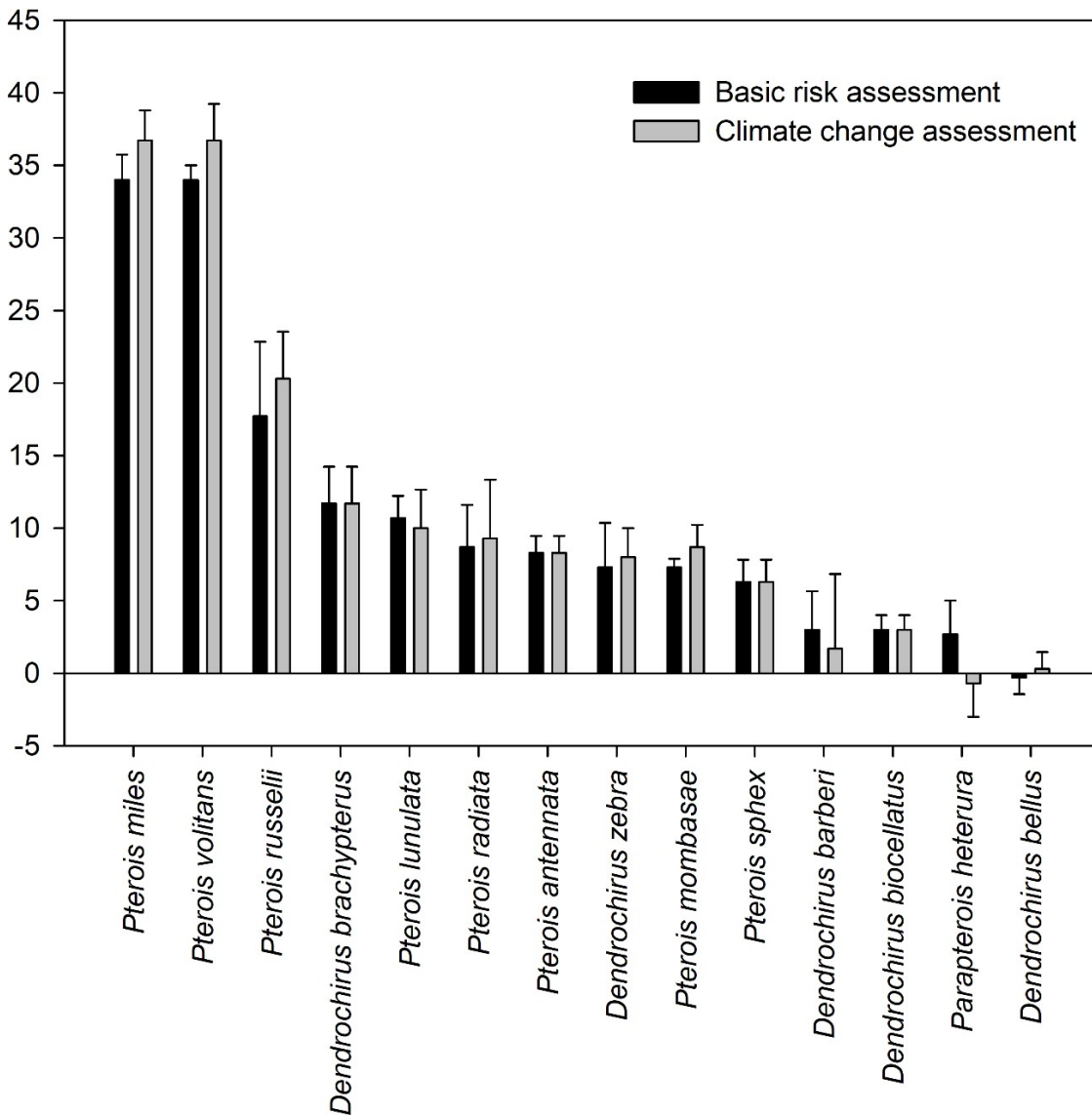


Figure 1. Mean ( $\pm$ SD) basic risk assessment and climate change assessment AS-ISK scores for 14 species of ornamental lionfishes.

## Theme 2: Removal and Control Incentives

### Goal 2.1: Encourage involvement in lionfish control

STATEWIDE EFFORTS REMOVED NEARLY 100,000 LIONFISH FROM FLORIDA WATERS IN 2019

#### Incentive programs



Lionfish Challenge Winners  
Josh Livingston (left)  
Ken Ayers, Jr. (right)

**Lionfish Challenge:** The goal of this ongoing statewide program is to reward recreational and commercial lionfish harvesters for their efforts with various prizes and incentives. To participate in the Lionfish Challenge, participants removed lionfish from Florida waters and submitted them to checkpoints located statewide. Qualified participants received a t-shirt and commemorative coin, which was valid for an additional spiny lobster per day during the two-day sport season in July. Additional submissions allowed participants to win additional prizes to encourage continuous removal efforts. During 2019, 158 participants harvested 23,451 lionfish.

### Commercial lionfish landings

**In 2019, commercial lionfish landings were over 49,000 pounds**

With increasing interest in lionfish throughout the invaded range, there has been a rise in demand for lionfish in the seafood market. The FWC encourages the public to get involved in the development of the commercial lionfish market by including a discussion on licensing requirements, safe handling practices and maintaining a database of Florida lionfish wholesale dealers' purchasing requirements. Furthermore, the FWC encourages commercial harvesters and wholesale dealers to follow all reporting requirements to ensure commercial lionfish landings data are accurate. In 2019, 1,233 lionfish were harvested in Florida waters and brought into live trade.

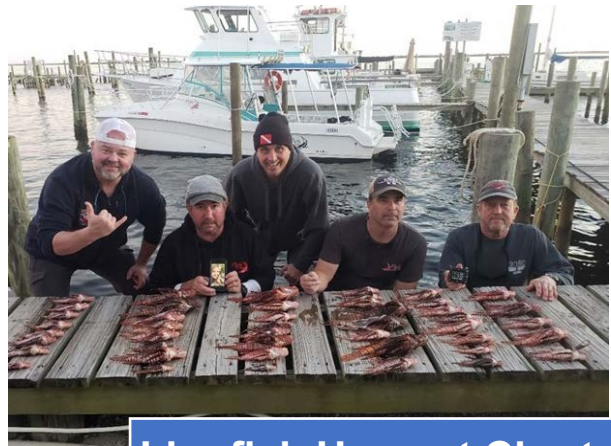
### Lionfish Tournaments

The FWC allocated assistance funds to encourage lionfish harvest through organized tournaments. The amount of funding provided was based primarily on the type of tournament being held (lionfish specific or tournament with a lionfish category) and then secondarily the number of participants. In 2019, 21 tournaments resulted in over 25,000 lionfish removed from Florida waters.



## Lionfish Harvest Charter Program

FWC launched the Lionfish Harvest Charter Program in early 2018 to incentivize dive charters and dive shops to host lionfish-specific harvest trips. The program provides financial support to businesses within the diving and fishing industry to increase the number of divers confidently and safely removing lionfish from Florida waters. Registered vendors will conduct a lionfish harvest trip and be eligible for reimbursement (\$50 per diver) if the total lionfish harvest is equal to at least eight lionfish times the total number of divers. The qualifying total harvest is achievable for divers removing lionfish from areas of the state that vary in population density. It also allows for more-experienced harvesters to compensate for those that are less experienced. The program strengthens partnerships between FWC and dive businesses, increases awareness, and increases participation in lionfish removal efforts. In 2019 this program was funded over \$39,000 and over 8,800 lionfish were removed from Florida waters.



**Lionfish Harvest Charter Program**

## Theme 2: Education and Outreach

### Goal 2.1: Ensure accurate, consistent, effective information about lionfish is developed, updated, and disseminated

#### Outreach materials and communications

- Provided updated information and messaging reflecting newest advances in research, outreach programs, control, and commercial market.
- Established partnerships with a variety of marketing representatives to advertise Lionfish Removal and Awareness Day including: iHeart Media, Guy Harvey Magazine, Visit Pensacola, and Lamar Advertising. The FWC continues to work with the media on an as-request basis for current messaging, programs and ways to get involved, commercial market and development of innovative removal strategies.
- Continued to utilize the agency's Reef Rangers Facebook page to engage stakeholders, advertise current events and articles, and remain active in the industry. As of December, the Reef Rangers page had over 5,200 followers.

## Lionfish Education Exhibit Program

The Lionfish Educational Exhibit Program provides funding to public facilities who are committed to encourage public awareness of coastal issues in Florida. Funding awards are given to facilities with existing lionfish educational exhibits or an interest in creating one. FWC provides graphics and educational information to be displayed along with the exhibit.



## Outreach and partner events and meetings

- Hosted 5th annual Lionfish Removal and Awareness Day. Headquartered in Destin, at the Destin HarborWalk Village.
- Helped sponsor and attended the 5<sup>th</sup> annual Lionfish Invitational where trained volunteer divers and research partners from across the country, as well as internationally (Florida, Texas, Louisiana, Washington, Tennessee, Hawaii, California, and Bermuda), conducted fish surveys and removed 237 invasive lionfish at Flower Garden Banks National Marine Sanctuary from June 10-13, 2019.



Fifth Annual Lionfish Invitational  
Galveston, TX

Table 2: Outreach Events

Event Type	Number of Events Attended by FWC	Number of Attendees
Conference/ Convention	3	398
“Lionfish: Classroom Invasion” Dissection	3	1815
Festival	15	5,434
Presentation	7	160
Workshop	3	79
<b>Total:</b>	<b>31</b>	<b>8,486</b>

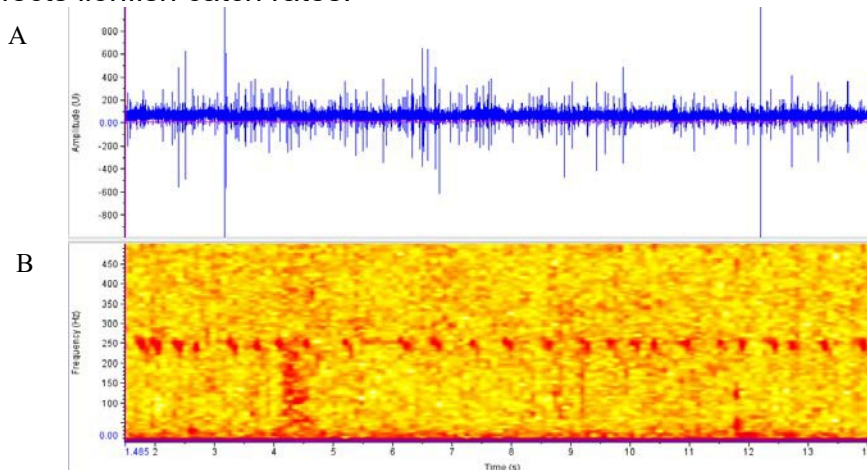
# Theme 4: Research and Monitoring

## Goal 4.1: Improve removal and detection capabilities for lionfish Research

### Lionfish vocalization research

Prepared by: Jessica Keller, Alejandro Acosta, and Jack Olson

Many species of fish communicate using sounds often associated with spawning or courtship, aggressive behavior, hunting, or territorial behavior. Lionfish vocalization calls were recorded by FWC staff both in tanks and on coral reefs using hydrophone (underwater microphones). Calls recorded on the reef appear to be associated with conspecific interactions, possibly related to courtship. Calls so far have only occurred during afternoon and evening hours and the amplitude is low, meaning that it is not a very loud vocalization. Video from a camera paired with the hydrophone have shown at least two lionfish in frame during the time of this call. Recordings of the conspecific call are currently being used by other FWC staff to determine if playback of the calls in traps affects lionfish catch rates.

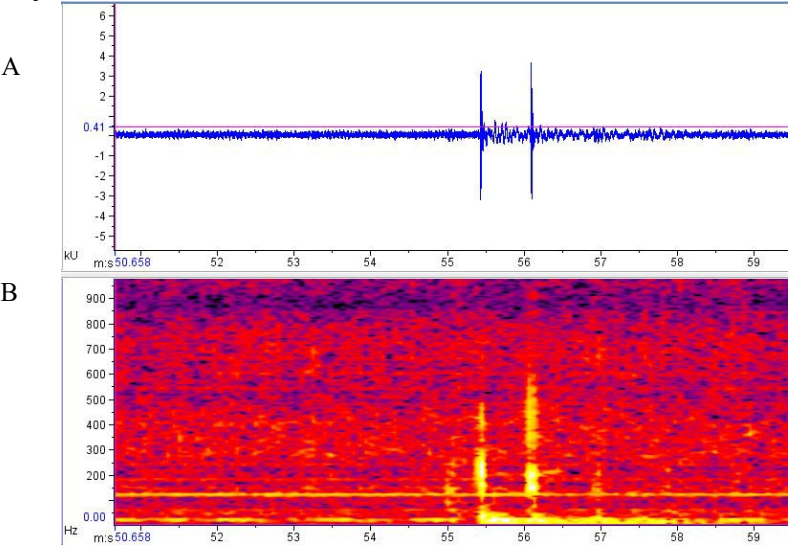


**Figure 1. Waveform (A) and spectrogram (B) of the lionfish conspecific call.**



**Figure 2. Image from the hydrophone's camera during the time of one call proposed to be a lionfish conspecific call.**

The calls recorded in a tank are believed to be a distress call as lionfish only made these calls while being agitated. Interestingly, the only distress calls recorded were when a single lionfish was in the tank. When a lionfish was agitated in a tank with other lionfish, the distress call recorded previously was not heard. Sounds were also recorded when not agitating the lionfish, but the conspecific call heard on the reef was not heard in the tank set up, regardless of the number of lionfish in the tank. While the distress call was fairly loud, the wet lab environment the tank was located in was quite noisy, and it is possible that the conspecific call would be too faint to detect underneath the other ambient sounds. It is also possible that the lionfish would not display the same behaviors that they would in the natural environment.



**Figure 3. Waveform (A) and spectrogram (B) of the distress call made by an agitated lionfish in a tank.**