

THE LIONFISH: THREATENING NATIVE FISH AND FLORIDA'S FISHING INDUSTRIES

Florida is blessed with a world-renowned natural environment, which helps drive a colossal tourism industry, and makes the state a great place to work and play. With this dependence on nature, invasive species can have a significant (and often expensive) impact on Florida's economy and desirability. Invasive species are plants or animals that are not native to a given area, typically introduced by people; and because they are not native to the area, natural predators are typically absent, allowing invasive species to thrive, consuming native species and reproducing quickly.



Photo by Jens Petersen, Edited by Wikipedia User:Olegiwit

The lionfish, native to the Indo-Pacific region, is an invasive species in the Atlantic Ocean and Caribbean that devours native fish and competes for food with native predators, and represents a threat to several important industries in Florida, including sport and commercial fishing, and to the health of coral reefs and the biodiversity in our waters. In addition to killing native species, the lionfish also reproduces at a much faster rate than other fish in the region, and is able to adapt to almost any environment, from a 1-foot deep mangrove stand to a more than 1,000-foot deep reef.¹ Two particular species affect Florida and nearby waters: the red lionfish (photo above, *Pterois volitans*) and common lionfish (*Pterois miles*).

First caught in 1985 in Dania Beach, Florida, the precise reason for its arrival to the Atlantic coast is unknown; however, the National Oceanic and Atmospheric Administration (NOAA) and other conservation groups² have stated that the most likely cause is individuals dumping these fish and/or their eggs into the wild from their aquariums.³ The species exponentially grew along the Florida Keys and the Bahamas from 2004 to 2010.⁴

1 Portland Press Herald. "Invasive lionfish imperiling ecosystem." Available at: <http://www.pressherald.com/2014/06/08/invasive-lionfish-imperiling-ecosystem/>

2 The Nature Conservancy. "Stopping the Lionfish." Available at: <http://www.nature.org/ourinitiatives/regions/caribbean/bahamas/howwework/stopping-the-lionfish.xml>

3 Science Insider. "Mystery of the Lionfish: Don't Blame Hurricane Andrew." <http://news.sciencemag.org/2010/04/mystery-lionfish-dont-blame-hurricane-andrew>

4 See footnote 1.

Lionfish can truly be devastating to the waters they invade. A 2012 Oregon State University study shows that the lionfish caused a 65 percent average decrease in native prey fish population along nine reefs in the Bahamas in only two years.⁵ The fish are now more common in these waters than in their home waters in the Indo-Pacific region. They have been observed in several states along the Atlantic coast, the Gulf coast, and the Caribbean Sea, and they have no known predators.

Their sting can also cause severe pain, allergic reactions, nausea, and convulsions in humans, and in very rare cases, death. Due to their disruptive effects, several state organizations and nationwide organizations including the NOAA, Reef Environmental Education Foundation (REEF), and the U.S. Geological Survey (USGS) have been working to help control the lionfish population. In Florida, the Florida Fish and Wildlife Conservation Commission (FWC) has been actively working on controlling these fish.

EFFECTS ON FLORIDA'S FISHING INDUSTRY

The diversity of fish in Florida is being significantly altered by the lionfish, putting a strong economic engine at risk. Lionfish feed on snapper, grouper, and other popular Florida fish, which can have a significant impact on the fishing industry. In 2012, Florida led the nation in total angler expenditures,⁶ and the saltwater recreational fishing industry supported more than 109,341 jobs.⁷

Our state is also the nation's second largest saltwater commercial fishery, ranks 11th in commercial fishing landings (with over 84 million pounds in 2013),⁸ and the industry supports about 64,744 jobs in the state.⁹ One of the top species harvested in Florida is the red grouper (with a 2010-11 dockside value harvest of \$15.1 million),¹⁰ which competes with the lionfish for prey, and is often prey itself.

CONTROLLING THE LIONFISH POPULATION

Florida has begun a campaign against the lionfish. The FWC encourages people to remove the lionfish from Florida waters using hand-held nets or spears, with no recreational or commercial bag limit; however, the FWC cautions about the use of spears, as they can damage the reefs if not used carefully.¹¹

In addition, several organizations in the state carry out lionfish derbies (see table on the next page) and lionfish educational events throughout the year. These events have been found to be effective in the deterrence of lionfish in a 2014 study by Green, et al.¹²

The FWC has implemented other programs to control the lionfish, including the development of the "Report Florida Lionfish" mobile app, which helps collect data and raise awareness about the lionfish. This new data collection tool will complement the lionfish data that is already collected by the USGS.

5 Portland Press Herald. "Invasive lionfish imperiling ecosystem." Available at: <http://www.pressherald.com/2014/06/08/invasive-lionfish-imperiling-ecosystem/>

6 Florida TaxWatch. "Florida: The Fishing Capital of the World."

7 Florida Fish and Wildlife Conservation Commission. "The Economic Impact of Saltwater Fishing in Florida."

8 National Oceanic and Atmospheric Administration. "Annual Commercial Landing Statistics."

9 Ibid.

10 Ibid.

11 Florida Fish and Wildlife Conservation Commission. Lionfish (*Pterois volitans*, *Pterois miles*) Frequently Asked Questions. <http://myfwc.com/wildlifehabitats/nonnatives/marine-species/lionfish/faqs/#2>

12 Green, et al. "Linking Removal Targets to the Ecological Effects of Invaders: A Predictive Model and Field Test." 2014

2015 DERBY EVENT LIST

EVENT	DATE	LOCATION
MCAC Lionfish Clinic and Hunt	4/24-4/25	Jupiter
Naples Spearfishing League Third Annual Shootout	4/24-4/25	Naples
Northeast Florida Lionfish Blast	5/1-5/31	Jacksonville
Lionfish Removal and Awareness Day Festival and Tournament	5/16-5/17	Pensacola
Treasure Coast Lionfish Safari	5/16-5/17	Ft. Pierce
MCAC Lionfish Round-Up	5/29-5/30	Jupiter
Teeples Memorial REEF Lionfish Derby	7/17-7/18	Ft. Lauderdale
Palm Beach County REEF Lionfish Derby	8/15	Palm Beach
Naples Spearfishing League Lionfish Tournament	8/22	Naples
Key Largo REEF Lionfish Derby	9/11-9/12	Key Largo-John Pennekamp Coral Reef State Park

Source: FWC. Lionfish Derby and Event Calendar

With the app, users are now able to report fish sightings so that they can be removed from the water. Since its release in late May 2014, more than 200 users have already used the app to report lionfish sightings, according to Amanda Nalley, from the Marine Fisheries Management office at FWC. Additionally, the app was developed by an Orlando-headquartered software company, Solodev.

FWC has also started carrying out several initiatives to control lionfish, including prohibiting imports of lionfish for aquarium trade, and allowing the use of rebreathers for divers to target lionfish (but not any other fish). Aside from the FWC control initiatives, other suggested means of lionfish control include training sharks, which prey on lionfish in the Pacific, to devour the invasive species.¹³ All of the aforementioned efforts are carried out with the hope of reducing the population, as eradication is no longer an option given their abundance.

CONCLUSION

The highly adaptable lionfish is an invasive species with no known predator that threatens state and local economies in Florida, as it affects both the sports fishing and commercial fishing industries, which support thousands of jobs in the Sunshine State. Several programs have been put in place to reduce the lionfish population, including 10 derbies, a lionfish awareness program, and several laws to control inhibit the further reproduction of these species. Ultimately, complete eradication is unlikely, because the lionfish has reproduced to the point of being widespread, but strong control and management of the species can help reduce its impact and help the natural environment adapt to the presence of this invasive species.

¹³ Time Magazine. "Taming the Lionfish: Can Predators be Trained to Control an Invasive Species?"

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