Invasive Lionfish

NOAA recognizes that invasive species have a profound effect on aquatic ecosystems and is working to protect our coasts from these invaders.

NOAA Invasive Species Efforts at a Glance:

- Co-chair of the Aquatic Nuisance Species Task Force and the National Invasive Species Council
- Coordinates prevention, early detection, rapid response, control, and monitoring programs nationwide
- Conducts and supports invasive species biological and ecological assessments and habitat restoration

Lionfish Life History:

Range: Invasive along the Southeast U.S., Gulf of Mexico, and Caribbean.

Maximum size: 47cm (19")

Life span: up to 30 years

Reproduction: Females may spawn every 3-4 days releasing over 2 million eggs per year

Prey: Generalist predators who primarily consume fish and some crustaceans

Predators: few to none.

Distinguishing characteristics: Both species look identical and have large flowing fins with venomous spines. They are unmistakable.

Status

The Indo-Pacific lionfish (*Pterois miles and P. volitans*) were first detected along Florida coasts in the mid-1980s and are now well established throughout most of the Caribbean to Cape Hatteras, North Carolina. Juvenile lionfish have also been found as far north as New York and Rhode Island, though establishment and invasion north of Cape Hatteras is unlikely because lionfish cannot tolerate the cold northern waters.

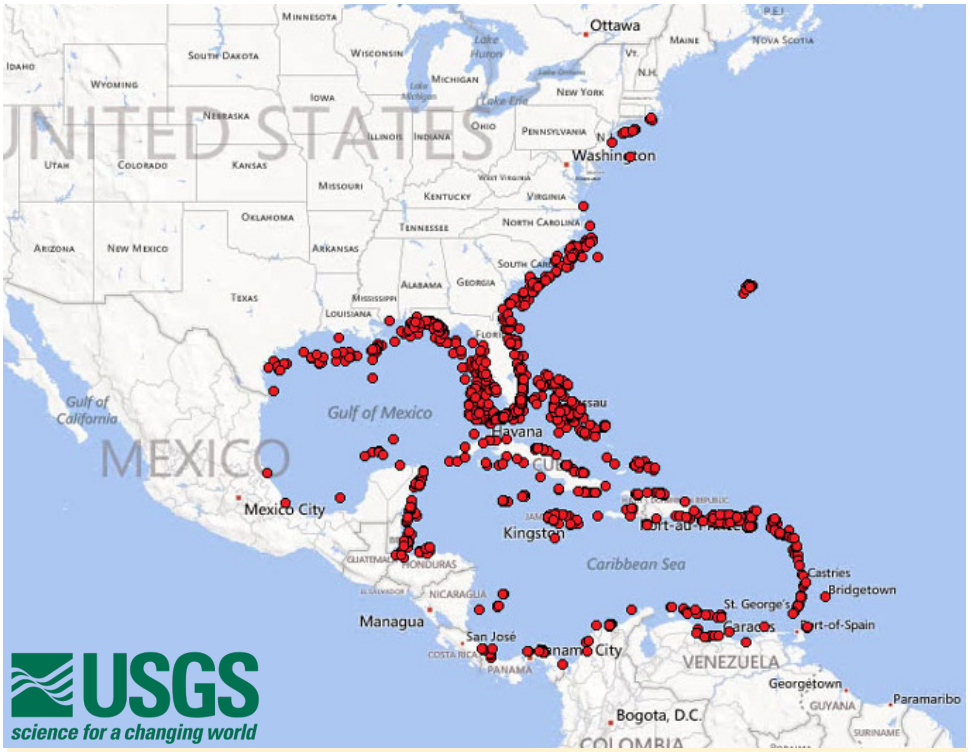
NOAA's National Center for Coastal Ocean Science first documented the establishment of Indo-Pacific lionfish in the Atlantic and is leading NOAA's efforts to study the lionfish invasion. NOAA is accomplishing its research missions on lionfish through strong collaborations with the Reef Environmental and Education Foundation (www.reef.org) and the United States Geological Survey (www.usgs.gov).

Why are we concerned?

In their native range, lionfish populations are controlled by predation, competition, and disease. In the Atlantic, Gulf of Mexico, and Caribbean they encounter few predators and are capable of reproduction year-round in warm waters. Lionfish are aggressive predators and have rapidly increased in number. Recent studies have documented significant impacts to native fish communities from lionfish predation. Lionfish occupy the same trophic position as economically important species (e.g., snapper and grouper) and may hamper native fish stock recovery efforts and coral reef conservation measures.

How is NOAA responding to the invasion?

NOAA is leading many research projects to assess the biology and ecology of this invasive species and to inform coastal managers of the threat and possible local control actions. Working with partners at the Aquatic Nuisance Species Task Force, NOAA is also developing a National Lionfish Management Plan. NOAA's Office of National Marine Sanctuaries has also developed a lionfish management plan to guide the prevention, early detection, control, management, and research at the Florida Keys, Flower Garden Banks, and Gray's Reef National Marine Sanctuaries. NOAA is also working with partners internationally to develop best management practices in the wider Caribbean region and is also organizing lionfish derbies to remove lionfish from Sanctuary waters.



Confirmed sightings of invasive lionfish throughout the Atlantic, Gulf, and Caribbean. Map courtesy of United States Geological Survey.

Ecological role:

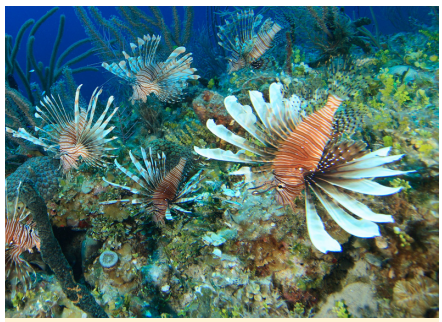
Because lionfish are slow-moving and conspicuous, they rely on their unusual coloration and fins to discourage would-be predators. Lionfish are now one of the top predators of coral and hard bottom reefs of the tropical Atlantic. Lionfish consume more than 70 species of native fish. They are active hunters who use their outstretched, fan-like pectoral fins to slowly pursue and corner their prey.

Behavior:

Lionfish feed using a variety of behaviors such as prey stalking, corralling prey in groups, ambushing, and cornering prey with their large pectoral fins. They move about by slowly undulating the soft rays of the dorsal and anal fins. During the day they can be found underneath ledges and crevices among coral, rocks, and artificial reefs.

Economic importance:

Lionfish are a food fish in their native range and are also being consumed in the Atlantic. Efforts to control lionfish by marketing them as foodfish are happening throughout their introduced range. Lionfish are also being harvested as juveniles for the aquarium trade. Their popularity as aquarium fish is likely the reason they are now established in the warm waters in the southeastern U.S. In August 2014, the state of Florida banned the import of lionfish to help avoid further introductions into state waters and to assist with lionfish control efforts in Florida.



Invasive lionfish feeding on a coral reef.

Common names:

Lionfish, zebrafish, firefish, turkeyfish, red lionfish, butterfly cod, ornate butterfly-cod, peacock lionfish, red firefish, scorpion volitans

How are lionfish identified?

Lionfish are white or cream colored with distinctive red/brown vertical stripes covering the head and body. The vertical stripes alternate from wide to thin and sometimes merge along the flank to form a "V." Lionfish have fan-like pectoral fins and long separated dorsal spines. An adult lionfish can grow as large as 18 inches, while juveniles may be 4 inches or less.

Where did they come from?

Lionfish are native throughout the South Pacific and Indian Oceans. The native distribution covers a very large area from western Australia and Malaysia east to French Polynesia and the Pitcairn Islands, north to Japan and southern Korea, and south to the coasts of eastern Australia and western New Zealand. They are also found throughout Micronesia. In their native habitat, lionfish reside near coral reefs and rocky outcrops from 10-175 meters deep.

Interesting Facts:

NOAA launched an "Eat Lionfish" campaign aimed at promoting consumption of lionfish. In partnership with the Reef Environmental Education Foundation (REEF) and others, NOAA is promoting lionfish as a sustainable seafood choice through multiple media outlets.

NOAA and REEF have been partnering since 2009 to remove lionfish from the Florida Keys National Marine Sanctuary. Lionfish derbies are an effective way to raise awareness of the lionfish invasion through public participation.