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Finned INVADERS

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Finned INVADERS

*Established and Potential Exotics
Gulf of Mexico Region*

Beautiful, but **Venomous...**



Photo: Doug Kesling, National Undersea Research Center, UNCW

The Red Lionfish

Once restricted to reefs in the Indo-Pacific, *Pterois volitans*, the red lionfish, is now found in shallow coastal and offshore waters along the U.S. East Coast from New York to Florida.

Where are they coming from?

Aquaculture escapes, release of fish from aquaria and deliberate stocking of non-native species are responsible for a large percentage of introduced fish in the Southeast.

Did You Know?

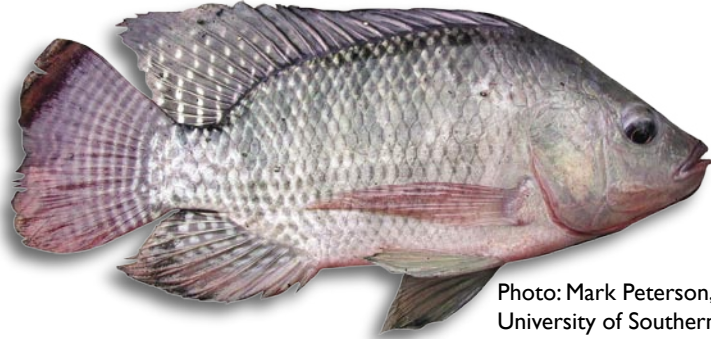


Photo: Mark Peterson, University of Southern Mississippi

Nile tilapia, *Oreochromis niloticus*

Vulnerable Locations: Northern Gulf of Mexico.

Native Range: Lakes and rivers of the Nile River basin, western Africa, Israel. **Status:** Established in Mississippi and possibly in a large reservoir bordering Florida and Georgia; also reported from other sites in Florida, Alabama and Arizona. Ability to expand range in the Gulf of Mexico enhanced by broad tolerance of salinity and temperature, maternal mouth-brooding reproductive strategy, large size and aggressive behavior.

Suspected Vector: Aquaculture escape. **Description:** Distinguished from other cichlids by presence of distinct broad vertical bars on body and narrow dark bars on caudal fin. Found in freshwater lakes and ponds, fresh running waters, and low-salinity waters associated with estuarine ecosystems. Typically reaches over two feet in total length throughout native range. **Negative Impacts:** Aggressive, may displace native nest-building species such as bass and sunfish.

Mayan cichlid, *Cichlasoma urophthalmus*

Vulnerable Locations: Florida and Texas. **Native Range:** Fresh and brackish waters in tropical America from the Rio Coatzacoalcos Basin southward through Mexico, including the Yucatan Peninsula and Isla Mujeres; also Belize, Guatemala, Honduras, and Nicaragua. **Status:** Established in South Florida; range

appears to be expanding northward. Broad tolerance of salinity and temperature greatly improves potential for expansion of range. **Suspected**

Vector: Aquaculture or aquarium release. **Description:**

Broken lateral line and turquoise ring on the tail diagnostic; body with six-eight bars that can be faint

or dark; body color varies greatly in intensity; sometimes with bright red on chin, throat and breast. Both spiny and soft dorsal fins present; rounded caudal fin. Typically reaches one foot total length throughout native range. **Negative Impacts:** Aggressive; voracious predator in south Florida systems; observed feeding on native centrarchid eggs in nests.



Photo: USGS, Florida Integrated Science Center

Rio Grande cichlid, *Cichlasoma cyanoguttatum*

Vulnerable Locations: Northern Gulf of Mexico.

Native Range: Fresh and low salinity waters in tropical and subtropical America from northeast Mexico and southern Texas; introduced widely into non-native



Photo: Martin O'Connell, University of New Orleans

Swamp eels are air breathers, live in moist soil for long periods and can survive for weeks without food.

Texas habitats; also in Louisiana and Florida. Potential to expand range and increase in numbers enhanced by ability to thrive in anthropogenically altered ecosystems. **Status:** Established in Lake Pontchartrain, La., and parts of Florida. **Suspected Vector:** Aquaculture and aquarium release. **Description:** Louisiana specimens green-blue to grayish, numerous small, light-blue to blue or green dots over most of the body and extending onto dorsal fin. During nesting, males and females turn black and white with the front half of bodies creamy white and rear half dark to completely black; coloration fades as they leave nests in cooler temperatures. Five or six anal spines. Typically reaches about one foot in total length. **Negative Impacts:** Impacts currently unknown.

Swamp eel, *Monopterus cf. albus*

Vulnerable Locations: Northern Gulf of Mexico. **Native Range:** Northern India and Burma to China, Japan and perhaps Russia. **Status:** Abundant in several southeast Florida box-cut canals; common in the Little Manatee River and Bullfrog Creek drainages near Tampa; expected to slowly spread into central and south Florida. **Suspected Vector:** Release from aquaculture site or live food market. **Description:** Body snakelike, tapering to a point; small eyes; tiny scales; finless. Color typically dark reddish-brown with light tan to orange abdomen; some are light



Photo: Leo G. Nico, USGS

orange, pink or white with dark calico-like markings. Heavy mucous coating facilitates burrowing; secretive and most active at night. Largest Florida specimen almost three feet in total length. **Negative Impacts:** Impacts currently unknown.



Photo: Doug Kesling, National Undersea Research Center, UNCW

Red lionfish, *Pterois volitans*

Vulnerable Locations: Coastal and offshore waters of the Gulf of Mexico. **Native Range:** Western Pacific Ocean from southern Japan to Micronesia, Australia and the Philippines; Oceania (including the Marshall Islands, New Caledonia and Fiji) east to French Polynesia. **Status:** Established off the Atlantic Coast of the United States from south Florida to North Carolina; reports from Florida to New York. **Suspected Vector:** Aquarium release. **Description:** Red lionfish have greatly elongated dorsal fin spines; membranes of all fins often with spots. Body white or cream colored with red to reddish-brown vertical stripes that alternate from wide to very thin. Can reach over one foot in total length. **Negative Impacts:** Impacts currently unknown. The dorsal and anal fin spines of the lionfish contain a potent venom. There are no documented natural predators of the lionfish.

Finned Invaders

Mozambique tilapia, *Oreochromis mossambicus*

Vulnerable Locations: Northern Gulf of Mexico.

Native Range:

Southern Africa
in lower river
and coastal
regions,
from just
north of
the Zambezi



Photo: Windsor Aguirre,
State University of New York

delta southwards to Bushman's River (eastern Cape).

Status: Species stocked in ponds in Alabama in 1950s and 60s; established in Texas. **Suspected Vector:**

Aquaculture release and deliberate stocking. **Description:** Females nearly identical to but not as large as blue tilapia; males easily distinguished by large mouth and black coloration when breeding; possible hybridization between blue and Mozambique tilapias further complicates identification. Maximum size a little over one foot in total length. **Negative Impacts:** May impact native fish assemblages by aggressive behavior during nest building and reproduction and competing use of nesting areas. Opportunistic feeder with potential to compete with a broad array of native species. May lower local biodiversity through competition for food resources and direct predation.

Sailfin catfish, *Pterygoplichthys*

Vulnerable Locations: Northern Gulf of Mexico, particularly Florida and Texas. **Native Range:**

South America. **Status:** Abundant in lakes and rivers of central and south Florida; established in Texas. **Suspected Vector:** Aquarium release.

Description: Rows of bony plates cover all but belly area; wormlike, reticulated patterns of dark markings on body over a dark golden background. Pectoral fins stout with rough surfaces resembling coarse sandpaper; at least 10 dorsal fin rays. Disklike, protrusible mouth under head used like a suction cup to attach and graze on algae. Maximum size about 1.5 feet in total length. **Negative Impacts:** May compete with native grazers in fresh water habitats. Burrows may lead to erosion along banks of lakes and rivers where it has invaded.

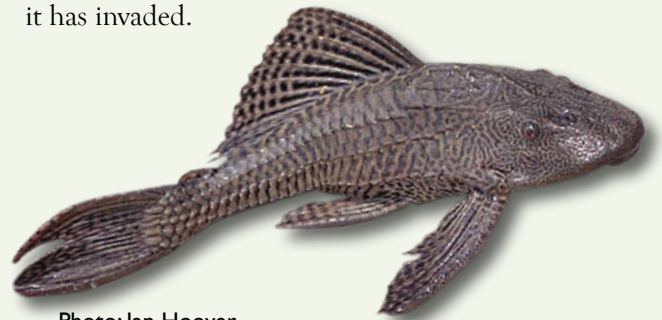
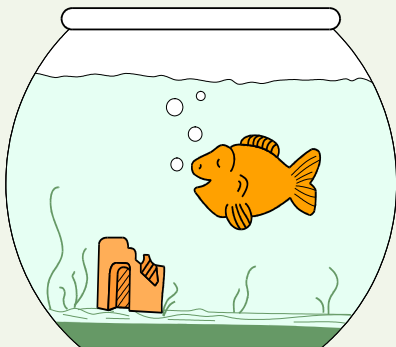


Photo: Jan Hoover,
U.S. Army Corps of Engineers



Did you know...

According to U.S. Geological Survey Scientists, **goldfish** were the first foreign fish species introduced to North America and the first recorded releases in the United States came a few years after the Pilgrims landed at Plymouth Rock.

Expansion of global travel and shipping has led to dramatic increases in the number of introduced species.

Sailfin catfish pose significant threats to native fish species and aquatic ecosystems. They build nesting burrows that compromise shoreline stability, increase erosion and add to sediment loading, often leading to bank failure and high turbidity. In Florida, USGS scientists estimate bank erosion rates of 4m/year in lakes with catfish-infested shorelines.

Photo: Jan Hoover, U.S. Army Corps of Engineers



Suckermouth Catfish

Related to *Pterygoplichthys* is a large group of popular imported aquarium catfishes commonly known as “plecos.” *Hypostomus plecostomus*, the common pleco, has now established wild populations in Florida and Texas. Sailfin and suckermouth catfish, also known as armored catfish, are sold in the aquarium trade as “algae eaters.”



Photo: www.schillmania.com

NO DUMPING

Red-bellied Pacu, *Piaractus brachyomus*

Vulnerable Locations: Warmer areas along the Gulf of Mexico. **Native Range:** Tropical America; Amazon and Orinoco river basins of South America. **Status:** Occasionally caught in ponds, lakes and rivers; often confused with piranhas. Reported from many states



Photo: Pam Fuller, USGS

including Florida, Alabama, Mississippi and Texas. **Suspected Vector:** Aquarium release. **Description:** Rounded body with flat sides; broad head; bones of cheek smooth. Greenish in color on back; black coloration on underside. Fleshy fin present with rays. Specimens have been found measuring up to four feet in total length. **Negative Impacts:** Impacts currently unknown; found in ponds and warm water discharges in the northern Gulf of Mexico.

Northern snakehead, *Channa argus*

Vulnerable Locations: Northern Gulf of Mexico, mainly Florida and Texas. **Native Range:** Southeast Asia, with most species found from Myanmar eastward and southeastward through Malaysia, Sumatra,



Photo: USGS, Florida Integrated Science Center

Java and Borneo. **Status:** Occasionally caught in fresh water rivers and ponds in California, Florida, Hawaii, Massachusetts, Maryland, Maine, North Carolina, Rhode Island and Wisconsin. **Suspected Vector:** Release from aquaria or live food markets. **Description:** Elongate and cylindrical body; distinct large scales on head reminiscent of large scales on the heads of snakes; head generally flattened; eyes located dorso-laterally on the anterior part of head. Maximum size collected about a foot in total length. Air breathing species, can travel overland. **Negative Impacts:** Voracious predators as adults; typically consume all fishes in ponds; considered a major threat to native fauna where established.

Silver carp, *Hypophthalmichthys molitrix*

Vulnerable Locations: Coastal rivers and watersheds, lakes, ponds and impoundments. **Native Range:** Large, lowland rivers in eastern China. **Status:**



Photo: USGS, Florida Integrated Science Center

Widespread throughout the Gulf states with records from Louisiana, Mississippi and Alabama. Populations

established in the middle and lower Mississippi River Basin and possibly the Tallapoosa drainage in Alabama. **Suspected Vector:** Release from aquaculture and municipal facilities. Introduced in the early

Aquarium releases are the single most important source of introduced species in Florida.

1970s to control plankton blooms in catfish production ponds and sewage lagoons; also raised in aquaculture facilities. **Description:** Deep-bodied, laterally compressed; a ventral ridge extends from in front of the anus to near the junction of the gill membranes; large eyes and head; terminal mouth; dorsal surface olive to grayish black, sides silver. Large fish can reach over four feet in total length. **Negative Impacts:** Potential effects of silver carp introductions are difficult to assess; ecological impacts of introductions are not always predictable. If stable breeding populations develop and population levels increase, shifts in food web structure could be expected.

Blue tilapia, *Oreochromis aureus*

Vulnerable Locations: Northern Gulf of Mexico.

Native Range: Northern Africa and Middle East.

Status: In Alabama this species has been stocked by

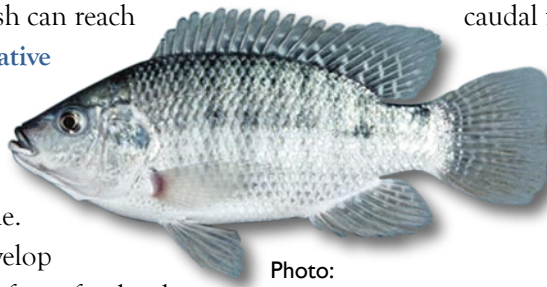


Photo:
Noel M. Burkhead,
USGS

state fisheries agencies in Crenshaw County Public Lake. It is established in many reservoirs in Florida and Texas. **Suspected Vector:** Deliberately stocked.

Description: Young are nondescript gray with a black spot at rear of dorsal fin; adults generally with blue-gray that shades to white on belly; borders of dorsal and caudal fins with red to pink borders. Broken lateral line; spiny dorsal fin joined to soft dorsal fin. Largest fish collected in Florida were almost two feet in total length. **Negative Impacts:** Native fish assemblages appear unable to control blue tilapia numbers either by competition or direct predation. Diet of juvenile blue tilapia overlaps that of juvenile shad (*Dorosoma* spp.), suggesting competition for limited food resources in Florida. Blue tilapia and native centrarchids appear to compete for breeding areas. Aggressive behavior may alter community structure where blue tilapia are abundant.

Heads Up!

Just when you thought it was safe to go fishing...

The introduced silver carp grows to a large size and has injured anglers by leaping into anglers' boats when the fish are frightened. This species has established populations in the middle and lower Mississippi River basin.



Photo: www.yankton.net