



The Lionfish Invasion



Florida Fish and Wildlife Conservation Commission
Division of Marine Fisheries Management

What is an Invasive Species?

- An organism brought to a new region by people
- Causes negative impacts like introducing diseases or preying on native species

Examples:

Burmese Python



Hydrilla



Kudzu

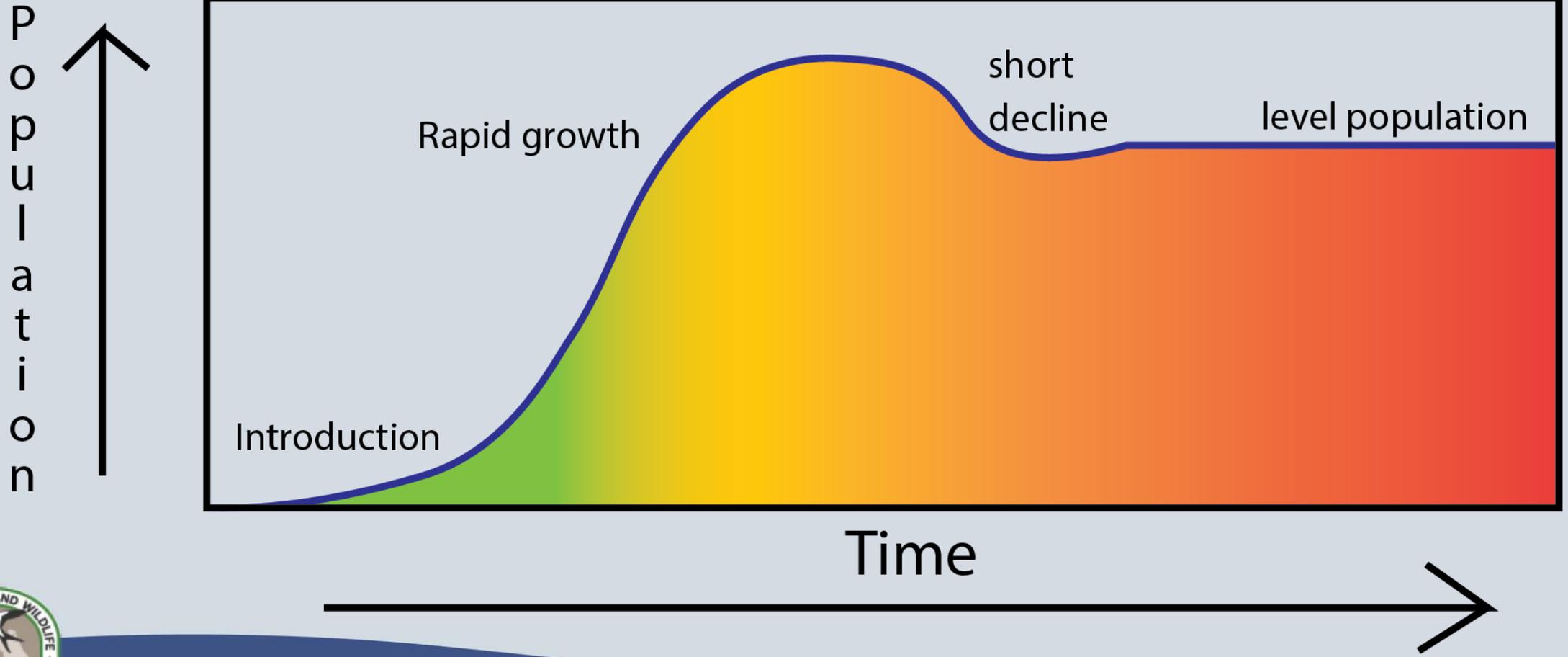


Invasive vs. Nonnative

- Both are organisms outside their native habitat
- **Nonnative**: not established or does not have negative impacts
- **Invasive**: established and has negative impacts



Invasion Trend



Marine Invasions

- 41 nonnative marine fishes in Florida, *only 5 have become established*
 - USGS non-indigenous aquatic species database 2019



- **Lionfish have become successfully established in nonnative range and are classified as the worst marine invasion to date**



Lionfish

(*Pterois volitans* & *P. miles*)

- Tropical predatory fish from Indo-Pacific region
- Introduced by an aquarium release in 1980's
- Established in western Atlantic Ocean, Caribbean Sea, and Gulf of Mexico
- Density and biomass exceed that in their native range



1985



1990



1995



2000

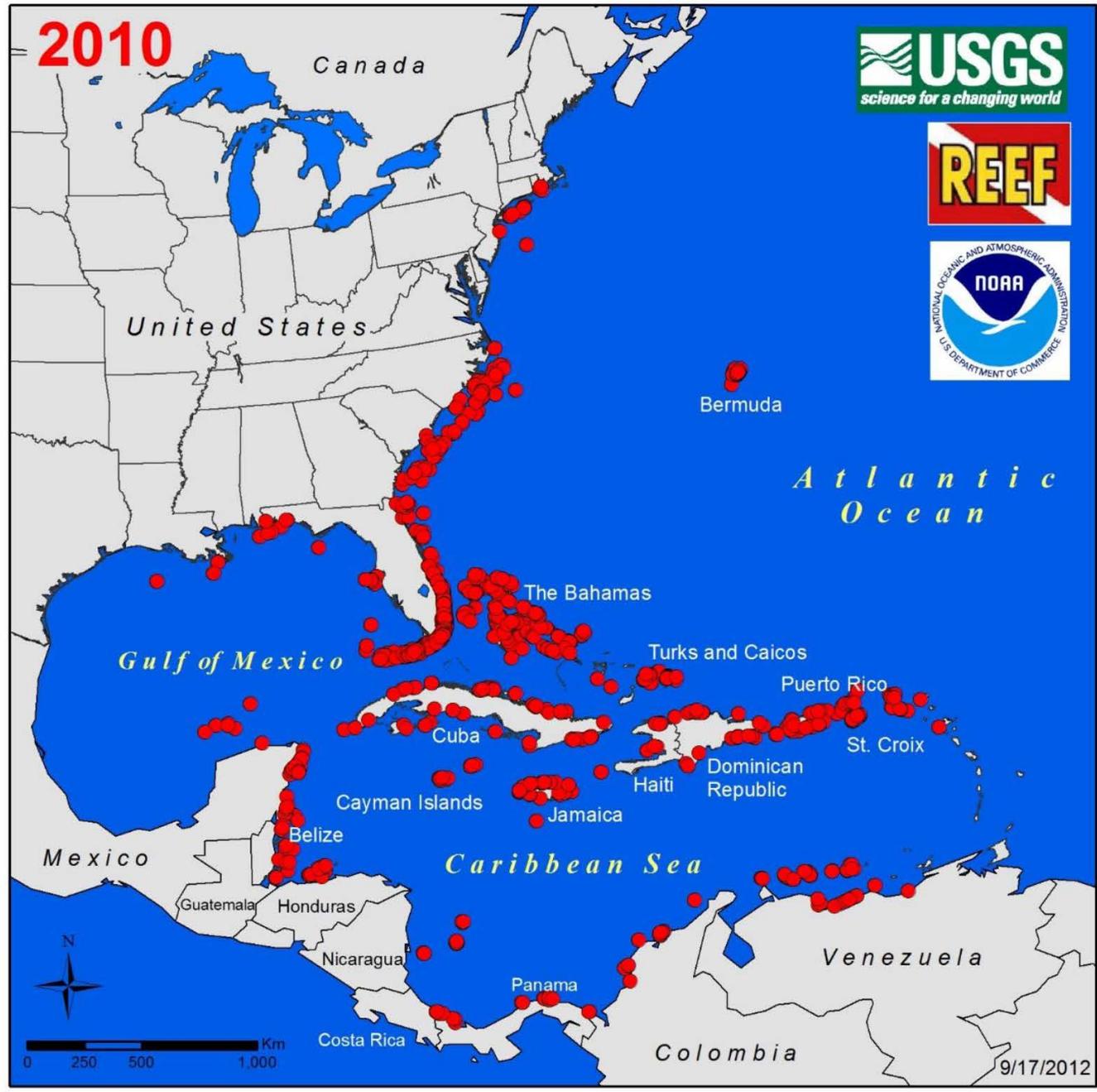


2005



9/17/2012

2010

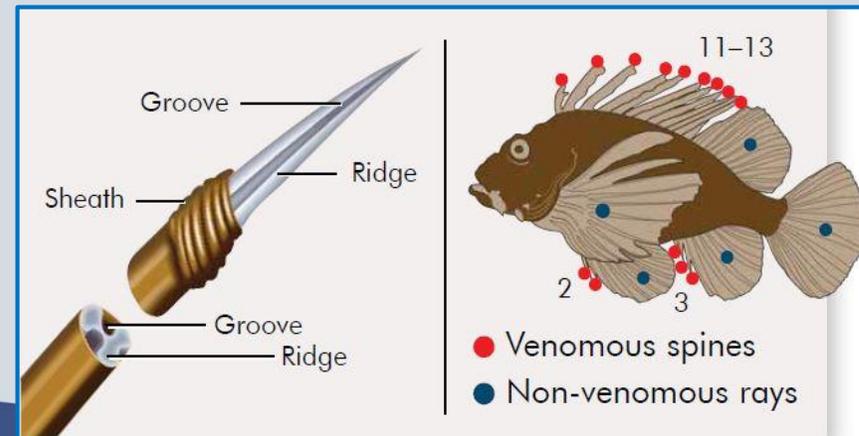


2018



Invasive Characteristics

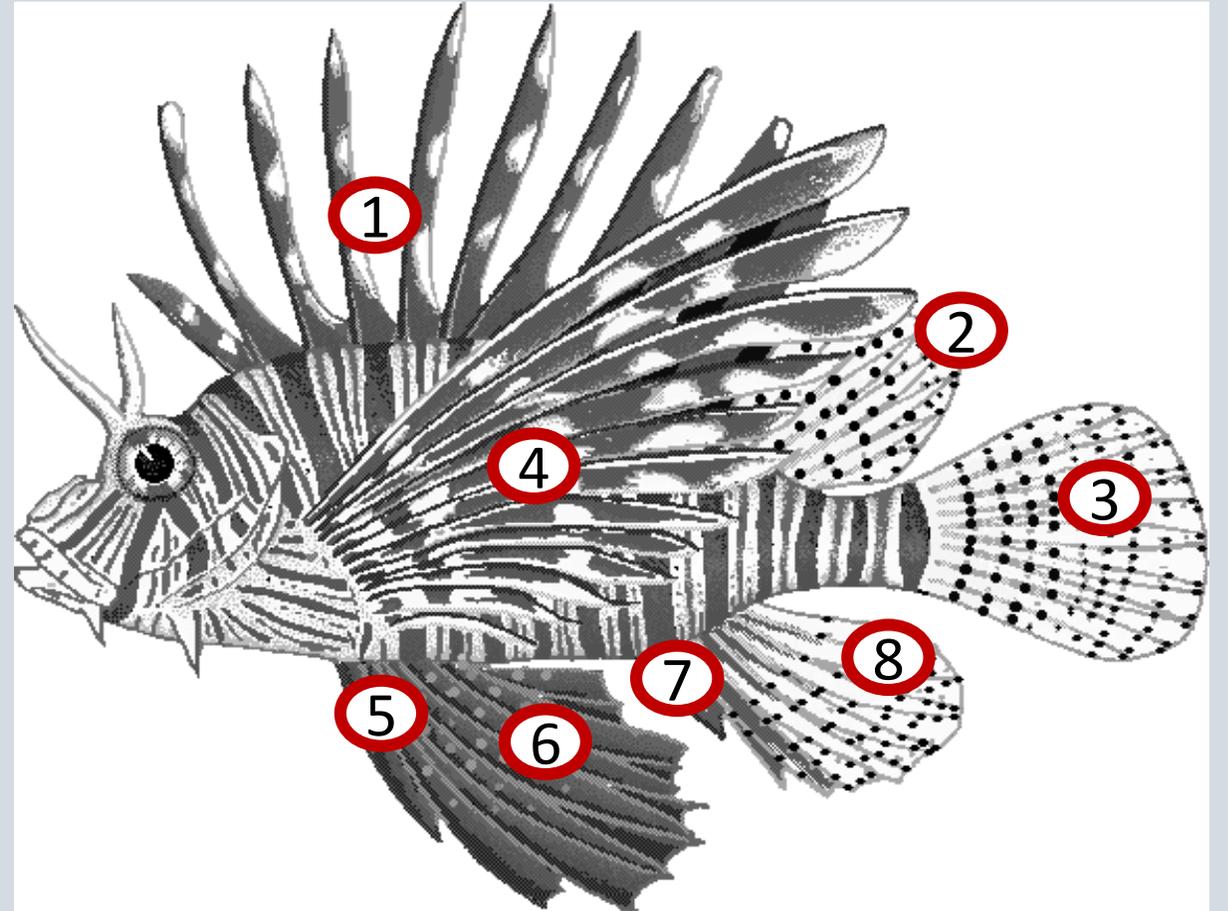
- Wide range of habitat use – natural and artificial, 1 – 1,000 ft. depths, tolerate temperatures as low as 50°F, salinities as low as 4 ppt (sea water is 35 ppt)
- Sexually mature at 1 year; spawn frequently (every 4 days); up to 30,000 eggs/spawn
- Consume economically & ecologically-important species; over 90 different species found in stomach; swallow prey over half body size
- 18 venomous spines; neuromuscular toxin; treatment: apply heat
- Unique coloration – native predators do not recognize as prey



Anatomical Terms

Dorsal

1. Dorsal Spines
2. Dorsal Fin
3. Caudal Fin
4. Pectoral Fin
5. Pelvic Spines
6. Pelvic Fin
7. Anal Spines
8. Anal Fin



Ventral



Venomous vs. Poisonous

- Poisonous – a toxin ingested, inhaled, or absorbed through skin
- Venomous – a venom injected through a bite or sting
- Lionfish are venomous NOT poisonous



Lionfish Diet

- **Economically important species**

- Fish: groupers, snappers, baitfish



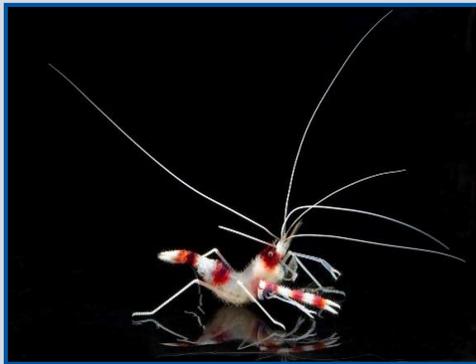
- Invertebrates: shrimp, crabs, lobster



Lionfish Diet

- **Ecologically important species**

- Cleaners: maintain health of reef fish by consuming parasites



- Grazers: maintain health of coral reefs by consuming algae



Effects on Native Ecosystems



- Opportunistic generalists
 - Consume over 90 different species of native fish and invertebrate species
- Reduce recruitment and prey biomass:
 - More than 2 times the reduction in juvenile recruitment than native predators
 - 65% reduction in prey biomass (Green et al. 2012)



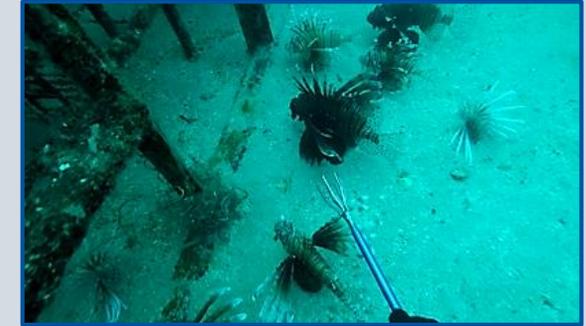
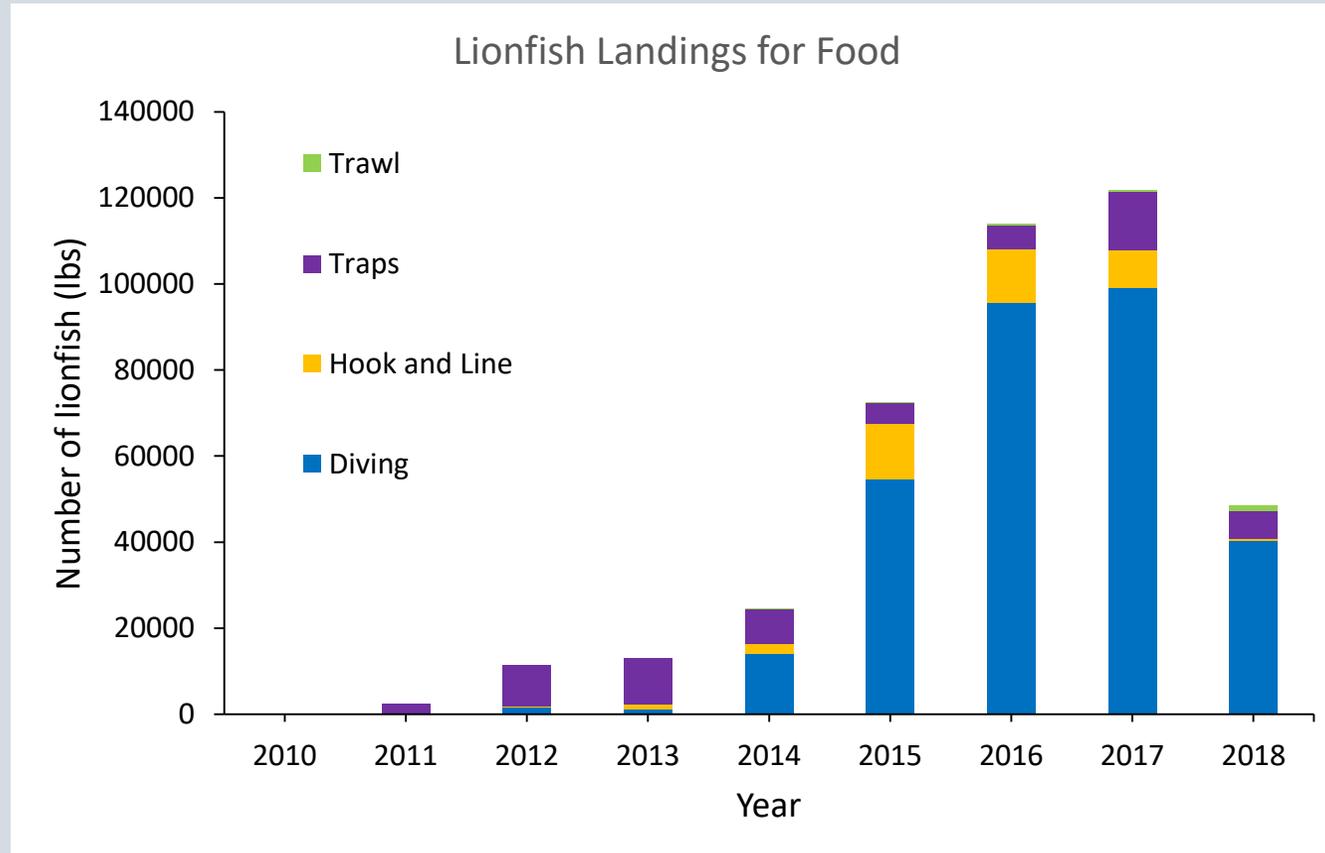
Effects on Native Ecosystems



- Absence of natural control mechanism
- Non-consumptive effects:
 - Competition with larger predators for habitat and prey
 - Habitat degradation
- **Humans are only known predator**



Lionfish Landings by Gear Type



Programs about Lionfish

- **Agency goals:** Minimize negative impacts to human health and safety, the environment, and the economy
 - Diver programs:
 - Rules that make it easy to harvest lionfish
 - Support lionfish tournaments
 - Encourage divers to harvest lionfish
 - Research new ways to catch lionfish
 - Education programs:
 - Workshops and school dissections
 - Traveling “Be the Predator” outreach booth
 - Lionfish Removal and Awareness Day
 - Promote consumption and commercial market



From 2014-2019 FWC has tracked the removal of over 593,486 lionfish from Florida waters!





Questions?

Video and Diver: Meaghan Faletti

