



# Researching Forage Fish in the 'Fishing Capital of the World'

**F**orage fish are small, schooling, nutrient-rich fish, such as menhaden, mullet, anchovies, pilchards and pinfish. They are important food for marine predators such as snook, dolphins and pelicans. The Florida Fish and Wildlife Conservation Commission (FWC) and its scientific arm – the Fish and Wildlife Research Institute (FWRI) – have long been leaders in fisheries management and science. In 2015, the FWC adopted a resolution affirming its commitment to keeping Florida forage fish healthy and their many predators well fed. The **Forage Fish Research Program (FFRP)** was created to support that goal.

The FFRP is a public-private partnership among FWRI, leading academics and the Florida Forage Fish Coalition. The research program provides fellowships to graduate students at Florida universities who work hand in hand with FWRI to investigate links between forage species and their dependent predators, their relationships to essential fish habitat, and their responses to natural disturbances such as cold weather kills, harmful algal blooms, droughts and hurricanes. The program produces high-quality research on the value of forage fish to predators and marine habitats, builds collaborative partnerships between academia and FWRI and fosters the next generation of scientists.

## How it Works

The Forage Fish Research Program advisory committee holds an annual data workshop with academic partners to discuss forage fish-based research priorities that will complement work done by scientists at FWRI. The research program then reviews proposals from graduate students enrolled at Florida academic institutions and awards up to two \$15K fellowships annually. These paid fellowships provide the next generation of fisheries scientists the resources necessary to conduct this important work and pursue publication in a peer-reviewed journal. Additionally, the Florida Forage Fish Coalition, which is comprised of the International Game Fish Association, the Florida Wildlife Federation, Anglers Action Foundation, American Sportfishing Association, Wild Oceans, and The Pew Charitable Trusts, provides additional support in promoting and communicating this research to stakeholders and the general public at no cost to the program.

## The Fellowships

To date, the FFRP has funded eight graduate student-led research fellowships resulting in multiple peer-reviewed scientific publications.

*Faletti et al. (2019) Population dynamics of Pinfish in the Eastern Gulf of Mexico (1998-2016). PLOS ONE 14(8):e0221131*

*Camp et al. (2019) Identifying forage populations of concern: A new perspective based on predator recruitment considerations. Fisheries Research, Vol. 219, 105319*

## How You Can Help WIN-WIN-WIN for Florida Fisheries

Support the research program so we can increase our knowledge of these important little fish to help guide effective management for their benefit and the benefit of Florida's fisheries and ecosystems.

Visit [floridaforagefish.org](http://floridaforagefish.org) to join the campaign and donate at [www.igfa.org/fffrp](http://www.igfa.org/fffrp)

**Research Win:** The research is driven by FWRI priorities to help improve ecosystem based approaches to management of Florida's marine resources.

**Fellowship Win:** The fellows get experience in applied fisheries science and career networking by working with FWRI scientists.

**Public Win:** The public benefits from better understanding of the ecosystem roles of forage fish and better angling opportunities for themselves and future generations.



# Little Fish, Big Deal

## Forage Fish are Critical to Florida's Marine Fisheries and Food Webs

**F**orage fish feed on microscopic plants and animals and in turn serve as a critical food source for the saltwater fish, coastal birds, and marine mammals that draw tourists and support recreational activities and businesses. They also support commercial fishing that provides tens of millions of pounds of fresh seafood. Fishing and wildlife watching activities supported by forage fish contribute \$17.3 billion and 209,224 jobs to Florida's economy. Forage fish populations experience natural fluctuations due to environmental conditions and those variations can be intensified by overfishing. Scientific data is essential to ensure sufficient abundance, diversity and sizes of forage species to meet the food needs of predators and the businesses that depend on them.



Research on juvenile pinfish in estuaries along Florida's Gulf coast indicates that this species migrates from inshore seagrass habitats to distinct offshore regions to spawn, according to a 2019 University of South Florida study funded by the Forage Fish Research Program.

**FORAGE FISH FUEL FLORIDA'S FISHERIES**

Healthy forage fish populations and habitats support predators, fishing, and outdoor recreation.



Tiny bay anchovies make up >40% of the fish biomass in Florida's estuaries. In the Suwannee river estuary, their populations are sensitive to freshwater flow, which can vary as much as 30% between drought and flood cycles. This can impact the predators that depend on them like snook and seatrout, according to a study funded by the Forage Fish Research Program.



Examining two decades of data collected by the FWRI revealed that changing populations of forage fish are correlated with changes in abundance and diversity of large predatory fish in the Indian River Lagoon in east Central Florida, and in estuaries of the St. John's River near Jacksonville, according to a study funded by the Forage Fish Research Program.

Pinfish make up 45% of juvenile redfish diets in Florida's Gulf of Mexico estuaries, according to a 2019 University of Florida study funded by the Forage Fish Research Program.

Faletti M. et al. (2019) Population dynamics of Pinfish in the eastern Gulf of Mexico (1998-2016). PLOS ONE. (<https://doi.org/10.1371/journal.pone.0221131>)  
 Camp e. et al. (2019) Identifying forage populations of concern: A new perspective based on predator recruitment considerations. Fisheries Research: Vol (219); 105319. (<https://doi.org/10.1016/j.fishres.2019.105319>).  
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