A report from The Pew Charitable Trusts and Audubon Florida | Nov 2013

Audubon FLORIDA

THE PEW CHARITABLE TRUSTS

Fins and Feathers:

Why Little Fish Are A Big Deal To Florida's Coastal Waterbirds

Forage Fish:

Small fish that serve as food for coastal birds, marine animals, and valuable fish species.

Introduction and summary

Florida's birdlife is some of the most captivating and well-recognized in the country, from impossibly pink Roseate Spoonbills to the raucous gulls and terns of our sandy beaches. Coastal waterbirds are as emblematic of our state as orange juice, yet they also serve as a sensitive bellwether for the health of the ecosystem that supports our coastal communities and economy.

At the start of the 20th century, many Florida bird species were in steep decline because of exploitation for the millinery trade. Their bright, ornate feathers were highly prized as decoration for women's hats. Most of these bird populations rebounded after the federal government banned this practice , yet today many of these birds are again threatened and decreasing. They face pressures on where they live and competition for the food they eat. Habitat loss is often the emphasis of bird conservation efforts, but comprehensive conservation of any species must consider all its vulnerabilities.

Forage fish—sometimes known as baitfish or prey fish—play a vital role in the marine ecosystem as a food source for coastal birds and other marine wildlife. These small, nutrient-rich fish are the crucial link between plankton and predators in the ocean food webs. The schooling behavior and relative abundance of forage fish make them ideal prey for much larger coastal predators such as Terns, Pelicans, and Ospreys, as well as their ocean counterparts such as tarpon, snook, and dolphins.

In this report, we investigate an area of growing concern for these birds: how declines in populations of forage fish in Florida's coastal waters could exacerbate declines of seabirds, wading birds, and other fish-eating birds, particularly species of conservation concern such as Least Terns and Black Skimmers.

Three recent peer-reviewed studies highlight the importance of conserving forage fish for seabirds and other marine wildlife:

- **"Global Seabird Response to Forage Fish Depletion: One-third for the Birds":** A 2011 paper published in the journal Science by an international team of 14 researchers found that when forage fish biomass fell below one-third of the maximum historical level, seabird populations produced fewer chicks. Particularly notable was the finding that declines in seabird nesting success were consistent across seven marine ecosystems and 14 seabird species. This study provides guidance on the threshold of minimum forage species biomass needed to sustain seabird populations and productivity over the long term.

- **"Impacts of Fishing Low-trophic Level Species on the Marine Ecosystems":** In a paper also published in 2011 in Science, researchers used three ecosystem models in five well-studied areas to examine systemwide effects of fishing on forage species. In all the areas and across models, researchers found that fishing at the conventional goal of maximum sustainable yield (the largest average catch that can be taken continuously from a fish stock without depletion under existing environmental conditions) affects the ecosystem significantly. The researchers found that as catch rates of forage fish decreased, the harm to the ecosystem was reduced. Specifically, they found that when fishing was reduced by half, there were much smaller effects on the ecosystem, including predatory birds, and this still allowed catch of forage fish at 80 percent of maximum sustainable yield.
- **"Little Fish, Big Impact: Managing a Crucial Link in the Ocean Food Webs":** The Lenfest Forage Fish Task Force, a panel of 13 fisheries and marine scientists, spent three years conducting a comprehensive global analysis of forage fisheries. The task force surveyed the literature, held workshops, made site visits, and undertook new quantitative modeling of marine food webs. In April 2012, the scientists issued their findings, which included recommendations to fisheries managers for improving the sustainability of forage fisheries. They found that conventional fisheries management can be risky, in part because it does not capture the critical role forage fish play as prey for seabirds, marine mammals, and many species of fish targeted by fishermen. They recommended cutting catch rates by half in many ecosystems, as well as doubling the minimum biomass of forage fish left in the water, compared with conventional management targets.

> Fewer forage fish could exacerbate declines of seabirds, wading birds, and other fish-eating birds.

The needs of predator populations such as seabirds are not considered explicitly in managing forage fish such as herring, mullet, and sardines in Florida's coastal waters. Also, prey that the state's coastal waterbirds depend upon is not well-described or considered in bird conservation efforts.

Issues in Focus:

In this report, Audubon Florida brings its bird expertise together with The Pew Charitable Trusts' marine conservation focus to:

- Explore the ecosystem connections between Florida's coastal waterbirds and forage fish.
- Assemble the best available science on the diets of coastal waterbirds found along Florida's coast and offshore waters.
- Examine the vulnerabilities of these coastal waterbirds to decreases in prey availability.

This report is especially timely given Florida's current effort to revise its Threatened Species list. The Florida Fish and Wildlife Conservation Commission has drafted management plans and supporting regulations for 60 species of conservation concern, 10 of which are birds that rely on forage fish as part of their diet. That is why our joint report concludes with four recommendations for managing forage fish in the state's coastal waters. The recommendations could help ensure that sufficient numbers of forage fish remain in coastal waters as prey for coastal waterbirds.

> Few rules directly limit the amount of forage fish taken out of Florida's coastal waters.

Recommendations:

- Explicitly account for the dietary needs of coastal waterbirds before expanding current forage fisheries or allowing the development of new fisheries.
- Ensure sufficient abundance, variety, and sizes of forage fish species to meet the needs of coastal waterbirds and other marine wildlife when setting management limits on forage fishing.
- Identify and map foraging areas for nesting coastal waterbirds and areas subject to forage fisheries, analyze potential overlap of these areas and activities, and consider conservation and management options to avoid or minimize potential conflicts.
- Protect forage fish habitat such as mangrove forests and sea grasses, as well as water quantity and quality in the estuaries.

As this analysis of the literature demonstrates, Florida's coastal waterbirds may be affected by changes in the size, seasonality, distribution, abundance, and duration of prey fish availability. Our recommendations could help ensure sufficient prey for these vulnerable species. The focus is on strategies to address fishing for forage species because this is in line with recommendations in recent peer-reviewed scientific literature, and it is an element that can be controlled directly. Reducing fishing pressure can also add resilience to forage fish populations so they are better able to avoid collapse in the face of other stressors such as red tides.