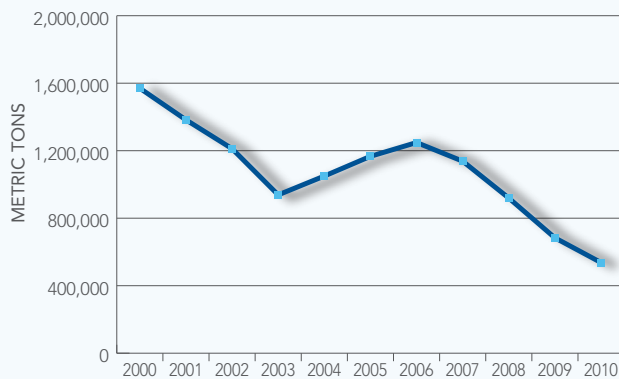


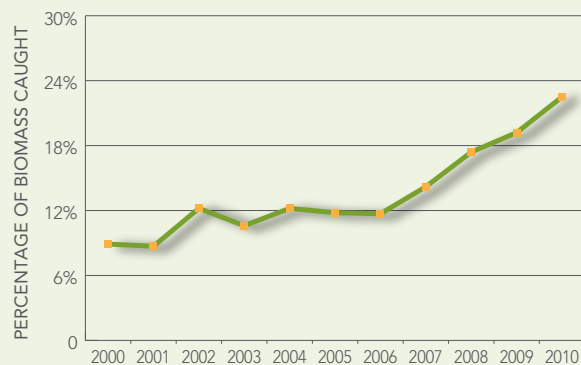
## THE MOST IMPORTANT LITTLE FISH IN THE SEA

Ocean fish populations are managed species by species, often with little regard for how fishing of one population affects the ecosystem as a whole. This is a particular problem for forage fish, the small schooling fish that many other species depend on for survival. The Pacific Fishery Management Council has an opportunity to change course, however. A new proposal would enable decision-makers to address ecosystem-wide issues and ensure that there are enough fish to sustain marine life as well as people.

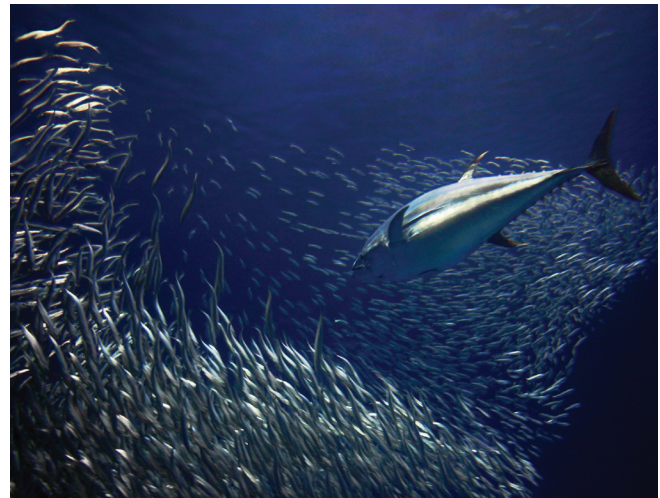
### PACIFIC COAST SARDINE BIOMASS



### PACIFIC COAST SARDINE EXPLOITATION



SOURCE: NMFS PACIFIC SARDINE RESOURCE ASSESSMENT, 2010



A Pacific bluefin tuna pursues a school of sardines, a type of forage fish.

PHOTO: INGO ARNDT/MINDEN PICTURES

### A CRUCIAL LINK

Forage fish provide a critical link between plankton at the bottom of the food web and predators at the top. Their schooling behavior and superabundance make them ideal food sources for much larger predators such as salmon, seabirds and marine mammals. In the Pacific Ocean, important forage stocks include herring, northern anchovy and sardine.

### THE PROBLEM

On the marine food web, forage fish make up an essential yet precarious segment linking the vast supplies of plankton with a wide array of predators. These small schooling fish are abundant in the number of individuals but relatively few in the number of species. The perilous nature of this prey base can affect predators when they are most vulnerable. Many species of seabirds, for example, may be able to survive on a variety of invertebrates during nonbreeding months, but they can raise their nestlings only on the small schooling fish. Unfortunately, many

West Coast species of these fish experience dramatic population swings. The number of Pacific sardine—by weight, the region’s biggest commercial forage fishery—is falling precipitously while the catch rate rises (see chart). At the same time, market demand is growing for secondary uses of forage fish, which can be found in fish meal, vitamin tablets and pet food. Fishery regulations, however, do not explicitly take into account the value of leaving these fish in the ocean.

## A NEW SOLUTION

A group of fishing and conservation organizations is encouraging the Pacific Fishery Management Council to manage populations by looking at the big picture. An ecosystem-based approach would account for the role of forage fish as a critical food source for seabirds, marine mammals and fish such as salmon, tuna and groundfish that are important to commerce and recreation. Under the proposal, the council would identify key forage species and determine how much ought to be left in the ocean to support marine life and then would set catch limits for fishermen. A strong plan would forestall development or expansion of fishing for forage species until it could be shown that there will be enough prey to sustain ocean life.

## ABOUT ECOSYSTEM-BASED MANAGEMENT

Ecosystem-based management is not a new concept. It was one of the cornerstone recommendations of two national ocean commissions in the past decade, as well as several scientific panels supported by fishing industry representatives. Scientists and fisheries managers have increasingly recognized the central role that abundant forage species play in the ecosystem. In 1998, Washington state adopted a forage fish management plan whose top priority is an

abundant prey base for salmon, other fish, seabirds and marine mammals. In Alaska, the North Pacific Fishery Management Council prohibited the direct removal of forage species. And along the West Coast, the Pacific Fishery Management Council has already taken steps in this direction, having preemptively banned commercial krill fishing in 2006.

## LOOKING AHEAD

Commercial catch of forage fish such as sardine has followed a boom-bust cycle over the past century. Such an approach not only hurts fishermen but also diminishes a critical nutrition source for predators high on the food web. A strong ecosystem-based management plan would help to ensure plenty of forage for marine life and for people who rely on a healthy ocean environment.

## THE SCHEDULE

The Pacific Fishery Management Council is expected to vote June 11 on whether to begin developing an ecosystem-based management plan and whether to include a mechanism to manage forage stocks that are currently unmanaged. The plan would account for a wide range of ecological considerations in management of ocean fisheries off the West Coast, including conservation of the forage base.

## THE CAMPAIGN

The Pew Environment Group’s Pacific Fish Conservation Campaign works to bring scientific expertise to bear on fishery management plans and seeks common ground with fishermen to find solutions that balance human and environmental needs and raise awareness about overfishing and potential remedies.

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For additional resources, visit us at [www.PewEnvironment.org](http://www.PewEnvironment.org).