



cormorants, which nested by the millions on offshore islands and supported Peru's multi-million dollar guano industry. When the fish disappeared, so did the birds — and the guano.

Given that we have an overextended industry operating with a dearth of ecological information, why don't we just stop fishing endangered species until they return? Fish politics and current provisions for regulating the industry complicate the picture. At present, responsibility for fisheries management falls under the Department of Commerce. The Magnuson Act that set the two hundred mile limit also established eight regional councils around the coasts, which have complete authority for establishing the harvest limits for each fishery. They rely largely on fisheries information generated by the NMFS for their decisions: the NMFS is also under the Department of Commerce. Voting members of the council are chosen by the Secretary of Commerce and include a governor's appointee from each state represented. "Our mandate is to manage, not conserve," says the New England council's Guy Marchesseault. "You have to think of fish not as creatures but as a productive natural resource."

The problem, critics say, is that the councils are preoccupied with the short-term economic success of the fishermen. "The management councils are made up of people in the industry, so every decision is based on economics," says "Salt Water Sportsman's" Rip Cunningham. "It's like saying to Weyerhaeuser: 'All the national forests are open. Go in and take everything you want.' The NMFS then manages fisheries like the Forest Service might manage the national forest, by counting all the trees coming in off the trucks and then wondering what happened when they are all gone. It is simply a case where the kids are running the candy store."

Ken Hinman, executive director of the National Coalition for Marine Conservation, agrees: "It is hard to find a corner in fisheries management that politics cannot reach. Compare it to how we balance management of public lands in the Department of Interior: while some parts like the Bureau of Land Management are commerce-oriented, the Fish and Wildlife Service is resource-oriented." Like our national forests, the ocean is public, says Hinman. "There needs to be someone in fisheries management who thinks about future generations and not just those people making a profit."

The issue of gillnets is frequently raised as an example of how the present structure does not work. Anchored to the bottom and held up by floats, gillnets form a vertical wall which snare fish by their gills. As fish grow scarcer, gillnetters set more nets and move inshore in search of new areas. Nets are left unattended and are ripped loose in storms. Conservationists complain that the loose or forgotten nets trap sea life such as mammals, birds, and other non-targeted species.

"There are thousands of gillnets forming a whole wall from Cape Cod to the Gulf of Maine," says Ken Hinman. "They preempt fishing grounds from other users afraid of tangling their gear, and change the migration routes of fish so no one can find them. Anybody with a gillnet can go and set it anywhere and not be responsible, and it's very difficult to get the regional councils to do anything."

The New England Council did order a study that took three years and half a million dollars only to recommend biodegradable floats so the nets will eventually sink. Conservationists say that the nets need to be attended and their numbers restricted. The council is not convinced, however, that the problem is not simply a conflict between gillnetters and sport fishermen who want to fish where the nets have been set. Said one council member, "There's still a lot of controversy, and we're not ready to close certain areas to gillnetters."

This dispute is just one example of the conflicting demands on fishery management. Although council member Marchesseault admits that "the money species such as cod,

haddock and the flounders are overfished," he opposes strict regulation. "If we stopped the fishery completely," he explains, "the stocks would come back sooner, but the costs to society in terms of all those fishermen on welfare would be very high. And we have to prove to the Office of Management and Budget that the benefits of our regulation outweigh the costs. Or we can renew our fisheries over a period of fifteen years and use gear controls that fish selectively (i.e., equipment regulations such as the mesh size of nets), giving smaller fish a chance to spawn. This plan is the least costly and it works with fishermen."

But this attitude worries people outside the industry. Barry Gibson, editor of "Salt Water Sportsman" and a charter boat captain, says, "If things keep going like this, there will be no commercial fishery in five years. Some people say, 'Do nothing, let the fishermen dig their own grave.' But we've already made changes in the ocean. Sculpin are taking over old cod grounds, and sculpin eat juvenile cod. Fish like Pacific sardines and North Sea herring are dramatic examples of overfishing because they no longer have the density they need to reproduce. The NMFS thinks only in terms of underutilized resources. They don't seem to want to let any population of fish swim around undisturbed when money can be made by catching them. If the public really understood what was happening to that public resource, there would be a huge outcry."

The positive side to this story is in growing public awareness. Concern about saving whales and other marine mammals and cleaning up polluted estuaries like Chesapeake Bay are signs of a changing attitude. The passage of the eighteen billion dollar Clean Water Act is significant progress: ninety percent of commercially targeted fish spend some part of their lives in estuaries. People are beginning to see the ocean as part of the earth's ecological web rather than as a bottomless mystery.

The threat of economic disaster has industry officials thinking about changing their approach as well. The National Oceanographic and Atmospheric Association, under the direction of the Secretary of Commerce, recently proposed a restructuring of fisheries management. Whereas decisions are currently biased toward immediate use for profit at the expense

of the longterm health of the resource, the secretary would grant the NMFS authority to establish "acceptable biological catches" for each fishery and then let the councils allocate the amounts, thus removing NMFS scientists from the political arena. Estimates of fish population would then be made independently of who gets what fish.

While commercial fishermen have not responded favorably to this proposal, the Secretary of Commerce's office indicates the plan will go through. Fishermen may initially endure hardships when faced with catch restrictions, but in the long run there will be healthier fish populations and a better balance between hunters and hunted.

Ironically, it is not conservation groups but sport fishermen who are most aware of resource management problems. "It's hard to get lay people excited about cod," says Ken Hinman. But fishing ranked second with biking after swimming in a recent Gallup poll of America's favorite participant sports. The disappearance of striped bass provoked a lot of attention from fishermen and the publicity aided efforts to clean up Chesapeake Bay.

As wild fish become scarcer, mariculture is blossoming. The great salmon runs in Alaska are increasingly populated by hatchery fish, particularly chum and pink salmon, which can be set loose after only a few months. Salmon farming, where fish are raised in pens until marketable, is also growing internationally at a tremendous rate. Norwegian farmers grew almost sixty million pounds of Atlantic salmon in 1985 and predict they will produce almost two hundred million pounds per year by 1990.

Clams, oysters, mussels, crabs and lobsters are also cultivated for consumption. Striped bass are now reared in numerous southern U.S. hatcheries. Walter Adey, the Smithsonian's Marine Systems Laboratory director, successfully tested a scheme to grow algae on artificial substrates in the open sea. The algae in turn supports marketable populations of the Caribbean king crab and possibly whelk, parrotfish and sea urchin.

Indonesians have farmed milkfish, a marine finfish for six hundred years. In 1973 nearly a million acres of milkfish ponds in Indonesia, the Philippines and Taiwan yielded approximately two hundred thousand tons of the fish for market.

The solution to our endangered ocean fish stocks is certainly not to stop eating fish. But we must ease our exploitation of heavily targeted fish and concentrate on gathering information about ocean ecosystems. Richard Langton and other scientists at Maine's Fisheries Research Laboratory are surveying clam, herring and groundfish nurseries in the Gulf of Maine this summer to create a computer model of the Gulf's marine resources. The impact of tidal power development in the Bay of Fundy is being studied to determine the bay's role in the lives of migrating fish like striped bass, as well as shorebirds, scallops, plants and other marine life.

Encouraging as these steps are, we cannot ignore the changes we have wrought in the ocean's balance. Like any other wildlife targeted for human use, fish require nurturing as well as exploiting. The remnants of our redwoods and buffalo attest to our squandering above sea level. The future of the ocean depends on all of us realizing that the myth of the inexhaustible ocean is just that: a myth.

"Fish don't live in isolation," says Ken Hinman. "People are starting to make connections between the land, the shores and the ocean. Our idea is to promote an abundance of life at all levels."

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