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Re-opening Closed Areas: A New Tool for Balancing Consumption, Conservation?

The consumptive use of wild species is an important aspect of the relationship between humans and the marine environment. For consumption to be sustainable, its conditions must be consistent with conservation.

As one way of fostering those conditions, the concept of rotating closed areas -- alternately closing and re-opening areas to fishing, allowing time for stocks to rebuild after each open season -- has gained the recent attention of some fisheries managers. In the northeastern US scallop fishery, for example, areas that have been closed for half a decade were re-opened this summer for huge catches; the fishery's managers are now considering re-opening the areas every 3-4 years. With managers and researchers elsewhere considering the idea, this could be an emerging trend in fisheries management.

A closed area of the ocean -- even one re-opened cyclically for fishing -- fits most definitions of "marine protected area," including that of the IUCN (MPA News 1:4). The idea of re-opening a closed area to fishing may be unacceptable to conservationists who favor permanently closed areas for the protection of biodiversity. But some managers suggest that such re-openings could be a way of securing buy-in from the fishing industry on the use of various kinds of MPAs.

"An astounding success"

The international dialogue on MPAs often rests on the balance between consumption and conservation, and the reasons given for designating MPAs generally reduce to: (1) to protect fisheries or (2) to protect fish. These reasons are not necessarily mutually exclusive. Nonetheless, the dialogue on MPAs is sometimes limited by fears among fishers -- justified or unjustified -- that advocates of closed areas care more about protecting fish than about protecting fishers' livelihoods.

In the northeastern US, however, the sea scallop industry is warming to the idea of closed areas. The reason: this summer, the federal council that oversees the fishery re-opened three areas off the New England coast that had been closed for five years, and the catches have been remarkable. In the re-opened areas, boats have been hauling 10,000 pounds (4545 kg) of meats in one hour of bottom-time with a single dredge; outside the closed areas, it takes well over 100 hours to haul that much with two dredges. In addition, the scallops caught inside the area have been larger on average (and thus more valuable) than those caught outside. "It's absolutely an astounding success," said Ron Smolowitz, a fisheries scientist for the Fisheries Survival Fund, an organization that represents the scallop industry.

The New England Fishery Management Council, which manages the scallop fishery and other federal fisheries in the area, uses days-at-sea as a tool to limit the scallop fleet's bottom time. To counteract the change in efficiency caused by the re-opened areas, the council's plan includes a provision to accumulate more days-at-sea in those areas than the number actually used: boats are charged 10 days-at-sea for each trip they make to the re-opened area, whether they are at sea for three days or ten days. The plan refers to this as the "days-at-sea tradeoff." In total, a full-time vessel in this fishery is allocated 120 days-at-sea per year, with a maximum of 60 days-at-sea accumulated in the re-opened areas. Trips to the re-opened areas are also limited to catching 10,000 lbs. per trip; outside the areas, larger catches are allowed.

It is up to fishers to decide whether the tradeoffs are worth it, and many factors come into consideration. Fuel prices are relatively high right now, and spending fewer days on the water saves fuel -- an argument in favor of fishing in the re-opened area. It also saves on food and crew pay, and earns more revenue per pound at market. On the other hand, one of the re-opened areas (Closed Area II) reportedly has fewer large scallops than the others, acc-ording to at least one fisherman: partly as a result, many fishers stayed away from that area during its re-opening period from June 15-August 14. In addition, scallop capture rates outside the closed areas have been higher than normal this year, owing to high levels of recruitment, and this has made scalloping easier everywhere.

"There's small scallops everywhere you go," said scalloper David Wiscott, noting that past years have found vast areas with no scallops at all. He attributed the relative abundance to four management strategies implemented by the council: the days-at-sea limits, limits on dredge-ring size, limits on crew size, and the closed areas. While he will continue to pick and choose when to fish in the re-opened areas and when to fish outside, he said of a recent trip to the Nantucket Lightship Closed Area (one of the three re-opened sites), "I've been fishing for 23 years and I've never seen scalloping as good as that."

Questions to be answered

Ironically, the three areas being re-opened this year were not closed to benefit scallops or the scallop industry. In 1994, the New England Fishery Management Council closed the areas to protect groundfish stocks, which were badly depleted; yellowtail flounder stocks in the area remain lower than hoped for. The scallop industry at that time was focusing its effort farther south on the coast, so it did not contest the designation.

When Smolowitz two years ago made the discovery that scallop populations had burgeoned in the closed areas, the industry urged the council to re-open the areas to scallopers. The council did so after crafting a plan that would limit bottom-time in the re-opened areas and provide automatic shut-offs to scalloping should bycatch rates of yellowtail flounder surpass set levels. Tests in 1999 demonstrated that scalloping in the closed areas could be done with low flounder bycatch, due in part to the great abundance of scallops and reduced bottom-time.

"We are witnessing a remarkable transformation of the scallop fishery in which the value of effort reduction is widely recognized and the advantages of closed areas as a management tool are gaining acceptance," said Paul Rago, a federal scientist on the council's scallop committee science team. "At present, the fisheries in the re-opened closure areas are known primarily for their large scallops, high catch rates, and short trips. It's equally important that they be known for their low finfish bycatch rates, reduced contact time on the bottom, and their strict controls on fishing mortality."

Rago acknowledged questions that still surround rotational closures. "The relevant question for environmental assessment is the acceptable magnitude of impact with respect to its area and temporal extent," he said. "For ecologists, the challenge is to contrast the effects of chronic disturbance in open-access fisheries with an alternative rotational strategy characterized by intermittent pulse fishing and recovery periods." He said experiments are needed to conclude the optimal frequency of disturbance and recovery times, although closure periods of three or four years could end up as typical for the scallops, based on the species' recruitment cycle.

There is some question as to whether the closed areas in New England are serving as important spawning areas, triggering the overall resurgence of scallops along the coast. If such were the case, the re-openings could threaten the recovery. The effect of the closed areas in the resurgence is unknown, however, as are so many other factors in the fishery, including the long-term effect of renewed scalloping on groundfish stocks.

"We muddle forward. Actually, we muddle, and we hope it's forward," said Trevor Kenchington, a fisheries scientist who has worked for the Fisheries Survival Fund. "I'd hope to see an organized re-opening system set up so that it won't be ad hoc, but that's difficult to do."

On the research that still needs to be done, the council's Rago said, "The re-openings that have occurred thus far might be viewed as evolutionary rather than revolutionary steps toward rotational area management."

Buy-in from fishers in Hong Kong

Tony Pitcher, an economist at the Fisheries Centre of the University of British Columbia, suggests that opening some closed areas to fishing can be useful if it brings greater compliance and support for the overall conservation scheme. In July at the "Economics of Marine Protected Areas" conference in Vancouver, British Columbia (Canada), sponsored by the Fisheries Centre, Pitcher described models for the establishment of artificial reefs inside Marine Special Areas in heavily fished Hong Kong. His results showed that a trade-off policy that opened some reefs to fishing might be worth the increased risk to resources.

"Sacrificing some artificial reefs to fishing by the numerous small-scale [fishing] sector may be worth it if biomass recovery is not prejudiced too much," he said. Compliance is a major problem in Hong

Kong, he said: there is almost no enforcement of the very few regulations that exist. "The hope for the artificial reef scheme is that the local communities will help with compliance," he said.

Notably, Pitcher's model did not assume a cyclical re-opening of reefs to fishing; it was assumed that one reef was open to constant fishing year after year, while other reefs were permanently closed. Nonetheless, according to the model, having one reef always open would still result in increased overall catches to fishers over a 10-year span as compared to having no closed areas, due to larval and adult export from the MPAs.

Re-opening closed areas in the Galápagos?

If a manager's goal is to maximize long-term catches, rotational management of closed areas makes sense for some species, according to Graham Edgar, a zoologist formerly at the University of Tasmania (Australia) and now the new head of research and conservation for the Charles Darwin Research Station in the Galápagos Islands (Ecuador).

In a paper published last year in the*Journal of Experimental Marine Biology and Ecology*(242 [1999] 107-144), Edgar wrote that re-opening the small Maria Island reserve off the Tasmanian coast in Australia every five years could provide a significant boost to rock lobster catches in the area. According to his calculations, a re-opening of the reserve after five years would allow a catch of 400 kg per hectare; this is compared to a catch of 40 kg/hectare/year taken without the reserve. Edgar suggested that rotational re-opening could result in increased catches of other species, too -- but not all, depending on recruitment behavior, migration, and other factors.

In his paper, Edgar did not suggest that managers actually re-open the Maria Island reserve to fishing. The reserve was primarily declared to conserve marine habitats representative of the Tasmanian east coast, not to serve as a fishery recovery area. Said Edgar, "Re-opening MPAs does little for biodiversity, but is simply a fisheries management tool for possible use in currently exploited areas to maximize harvest rates." He added that Tasmanian fishers have shown little interest in the concept of re-opening reserves to this point.

In the Galápagos, however, Edgar is not opposed to researching the possibility of cyclically re-opening some of the islands' new no-take areas(MPA News 1:7) in the interest of maximizing catches for artisanal fishers. "Not in the near future -- there are other priorities for limited funds and there is a need first for information on what happens in the closures," he said. But research into re-opening the closed areas could occur in five years or so, he said.

Closed one year, open the next

In Hawaii, managers of the Waikiki-Diamond Head Shoreline Fisheries Management Area (FMA) re-open the area to fishing on even-numbered years (1996, 1998, etc.) beginning 1 January. Most nets and traps are not allowed, nor is the use of a spear between 6 p.m. and 6 a.m. Nonetheless, say several witnesses, the resource is generally fished out after the first two months.

This was not the original intent of state resource managers in the 1970s, who wanted to establish a rotational management system for the entire coast of the island of Oahu, according to Brian Kanenaka, an aquatic biologist with Hawaii's Division of Aquatic Resources. In negotiations with public stakeholders, however, the rotational scheme was reduced to involve just the Waikiki-Diamond Head FMA.

In an initial two-year test closure in 1981, the FMA's reef fish returned to pristine levels, said Kanenaka. Demands from recreational fishermen led managers to set a policy of closing the FMA for just one year at a time, though. "After one year, the fish numbers are back up to levels that can support fishing, but not close to pristine levels," said Kanenaka. He said that for the future, the Division of Aquatic Resources is considering stocking the FMA just before fishing season begins, to enhance the recreational fishing experience.

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Box: Website for the scallop plan

The plan for re-opening three closed areas in New England to scalloping (titled "Framework Adjustment 13 to the Atlantic Sea Scallop Fishery Management Plan") is available on the website of the New England Fishery Management Council, at http://www.nefmc.org/.

Box: Ranching the sea

One advocate of rotationally re-opening closed areas to fishing described the concept as ranching the sea -- similar in many ways to managing cattle. The idea of viewing stocks in MPAs as "herds" for cyclical culling may seem counterintuitive to conservationists used to thinking of MPAs as sanctuaries from fishing.

What do you think? Does the re-opening of closed areas to fishing represent a promising method for balancing conservation and consumption? Is it sacrilege? MPA News wants to hear from readers on this subject. Please send your ideas to mpanews@u.washington.edu; we look forward to printing replies.
