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CALIFORNIA SEAFOOD COUNCIL

Harvest Refugia: Fact and Fantasy

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The concept of "harvest refugia," closing areas as a quick fix to protect marine resources, is gaining popularity worldwide. More than 100 marine protected areas now exist in California. Legislation introduced in 1997 in California, proposing sweeping reforms in management of California's ocean resources, also included the concept of "marine replenishment zones," where fishing would be prohibited. In addition, various advocacy groups have proposed closing approximately 20 percent of fishing grounds, not only in California but around the world.

What is known about harvest refugia and - equally important - what isn't? Here's food for thought from independent scientists on the potential for marine reserves in fishery management.

For heavily fished **resident** species (as opposed to wide ranging species), marine reserves tend to support denser populations of larger individuals than are found outside reserves.

But dense populations within reserves do not necessarily lead to increased catches in surrounding waters.

To have a strong effect on local fishing, there must be net spillover of fishes across reserve boundaries. Many species are habitat specific, reluctant to disperse across foreign habitats. While it is reasonable to expect some amount of spillover, accurate prediction of the amount is, at present, impossible. And spillover from a reserve will probably not demonstrably increase catches other than very near the reserve boundaries.

Export of larvae from reserves has the potential to increase the sustainability of heavily impacted fisheries. But the significance of this effect depends on the species involved, the fishing pressure received, the size of the reserve, and local and regional current patterns.

The export of larvae from reserves to augment regional fisheries has theoretical potential but is almost entirely unproven. Its only great benefit will be to fisheries that are limited by the number of larvae that settle, and its success will depend on many difficult-to-predict factors.

To design effective marine reserves, studies are needed of the movement patterns and habitat requirements of all life stages (larval, settlement, juvenile, adult, feeding and breeding) of all targeted species.

The lack of detailed and scientifically defensible knowledge regarding the effects of reserves makes the establishment of new reserves very difficult. Existing reserves have been established without baseline studies.

Because improperly designed refuges may endanger a fishery by providing a false sense of protection (or by placing unwarranted limits and restrictions on harvesting of renewable seafood resources), determining the effectiveness of a refuge is of utmost importance.

There is a perception that marine reserves will provide effective protection to all resident species with little need for detailed knowledge of the species and without direct management of populations within the reserve. This is ... wishful thinking.

Management may need to include a variety of options - including allowing selective fishing.

Sources:

- R.J. Rowley, Case Studies and Review, Marine reserves in fishery management, in Aquatic Conservation: Marine ad Freshwater Ecosystems, Vol. 4 233-254 (1994)

- Mark Carr & Daniel Reed, Conceptual Issues Relevant to Marine Harvest Refuges, in Can.J. Fish.Aquat.Sci., Vol. 50, (1993)