

Science as a Central Tool in Planning Marine Reserves: Case Study of the Channel Islands

Note from the editor

This issue of MPA News focuses on the science of marine protected areas and how it translates into practice. Through the eyes of experts in the field, we examine some recent developments in MPA research, whether science is getting to practitioners who need it, and what stakeholders think of the role of science -- and scientists -- in planning. As always, we look forward to hearing from readers with comments and contributions.

Kind regards,
John B. Davis

A marine protected area based wholly upon ecological science may represent the ideal MPA for conservation biologists. Seldom, however, are MPAs designated on a purely ecological basis. More often, MPA designations represent the desire of decisionmakers to protect an area for aesthetic or political reasons. Or they incorporate a range of social and economic considerations -- like minimizing economic impacts on fishers -- that can compromise an MPA's "ideal" ecological design, often for the purpose of gaining support from stakeholders.

Frequently this results in disagreement about the role of science in stakeholder processes.

In the state of California (USA), a process is ongoing to designate a series of marine reserves around the Channel Islands archipelago. The process, designed by a multistakeholder group, has been advised by two panels: a science advisory panel, made up of natural scientists, and a socioeconomic advisory panel, consisting of economists and other social scientists. Set to conclude this month (May), the process has been intended to heed ecological and socioeconomic concerns in generating a consensus plan.

The process has been particularly noteworthy for the primary recommendation of the science panel -- that 30% or more of the waters around the islands be set aside as no-take areas. MPA News examines the roles that science and scientists have played in the Channel Islands process, and how stakeholders, particularly the fishing community, have responded.

Background

The marine ecosystems surrounding the Channel Islands are unique for their interactions among species. The islands form the boundary between two vast biogeographical regions: one of cold water, the other warm. Fish species found as far north as the Bering Sea interact in the Channel Islands with species found in Baja California (Mexico).

The US federal government designated the 4,294-sq. km Channel Islands National Marine Sanctuary (CINMS) in 1980 to protect the waters around the islands. At the time, such protection had little to do with protection from the effects of fishing; in fact, it was protection from the threat of increased oil drilling in the vicinity that initiated the designation. Nonetheless, in 1999, impelled in part by community calls to protect dwindling fish stocks, the sanctuary and the California Department of Fish and Game developed a joint process to consider no-take marine reserves in the sanctuary for the first time. (For the sanctuary, the reserve process has represented one element in a broader effort to update all aspects of the sanctuary management plan.)

The multistakeholder Sanctuary Advisory Council for CINMS, which serves to provide a range of advice to the sanctuary's management, was assigned oversight of the joint reserve-planning process. To study the possibility of reserves in greater detail, the council formed a marine reserves working group (MRWG) of managers, fishers, conservationists, and other stakeholders. Based on its study, the MRWG would recommend a plan to the council, which would evaluate and forward the plan to the sanctuary manager. Final implementation would rest on approval from state and federal fisheries management agencies.

To ensure that any decision it made on reserves weighed ecological and socioeconomic considerations, the MRWG set a number of goals. Among these were:

- protection of representative and unique habitats
- achievement of sustainable fisheries in the Channel Islands
- minimization of short-term socioeconomic losses to all resource users

The MRWG agreed to operate by consensus, and established the aforementioned two advisory panels -- on science and socioeconomics -- to inform its decisionmaking.

The science panel and its recommendation

One criterion for serving on the science panel was that members had no prior published views on marine reserves. Satie Airame, who has served as sanctuary liaison to the science panel, says such a restriction was necessary in order to represent the variety of interests involved in the reserve process, including commercial and recreational fishers.

"The Sanctuary Advisory Council required a neutral science advisory panel to review the existing literature on marine reserves and the status of resources in the Channel Islands," said Airame. The eventual science panel included oceanographers, biologists, fishery managers, statisticians, and others.

The panel adopted a habitat-based approach, particularly in its mapping of resources. Its GIS database -- used in analyzing proposed reserve sites -- identified habitat types accurate to fractions of 1 square nautical mile (3.43 sq. km). Based on this habitat information, the panel projected the distribution of area fish stocks and identified areas of high habitat heterogeneity with potential for meeting the MRWG goals.

Ideally, said Airame, the panel would like to have had more information on which to base its models. Available catch data, however, were judged by the panel as being insufficiently detailed in quantity and quality, and the state could offer little additional data. The state of California has only recently begun developing fishery management plans for stocks in its waters, and as a result, there were few stock studies for the panel to consult. The panel appealed to fishers to help by supplying proprietary stock information to the panel -- essentially telling the panel where the fish were -- but the fishing community was reluctant to do so. Fishers feared such sharing would draw more fishers or, worse, reserves to the best fishing sites. (The fishing community eventually supplied such data to the socioeconomic advisory panel under an agreement that strictly controlled how the data would be used and protected.)

In September 2000, the science panel released its recommendation to the MRWG. Given the status of marine resources in the sanctuary and the current levels of fishing, the science panel advised that at least 30% of each of the habitats of the sanctuary be set aside as no-take reserves. Furthermore, given environmental variability and the uncertainties associated with fisheries management, the science panel recommended setting aside as much as 50% of the sanctuary to minimize the risk of population collapse. The panel said such set-asides were necessary to protect the majority of the fish species of concern in the Channel Islands.

Criticism of the science process

The reaction from fishers, including those on the MRWG, was shock and outrage. The idea of giving away one-third to one-half of their fishing grounds threatened economic disaster to the regional fishing industry. Analysis by the socioeconomic advisory panel indicated that a closure of 50% of the sanctuary would result in a maximum potential loss of about 50% in fishing industry revenue (commercial and recreational), according to Bob Leeworthy, lead economist on the socioeconomic panel. "If you're a user group, you're scared that size of closure will put you out of business," said Leeworthy.

MRWG member Bob Fletcher, president of the Sportfishing Association of California, says the science panel was skewed in favor of reserves from the beginning. "I think many of the panel members believe that traditional fisheries management has been a failure, and that marine reserves are going to be the savior of fisheries management," said Fletcher.

Aniello Guglielmo, a squid fisherman and MRWG member, suggests that other management tools could be just as effective as reserves in protecting stocks, while allowing fishing to continue. The California squid industry, for example, has voluntarily stopped fishing for two days each week; incidentally, 75% of its catch comes from the Channel Islands. Such temporal closures could be instituted for other industry segments, said Guglielmo. "A one-day closure for sportfishers seems like it would be reasonable," he said.

"A lot of fishermen here feel the scientists have acted as stakeholders, trying to set policy," said Chris Miller, a lobster fisherman and MRWG member. To simply argue against the panel's recommendation, however, is reactionary, he said. "What we need to ask is how it would be applied to, and integrated with, existing fisheries management," he said. "Fishermen are always portrayed as malcontents for attacking scientific data. It's a trap that's easy to fall into. We have to stay constructive."

Deadline for consensus

The MRWG must now weigh the ecological and socioeconomic advice of the panels in forming a consensus plan for reserve

placement in the sanctuary. The deadline for such a plan is this month -- 16 May. In recent weeks, public meetings of the MRWG have drawn hundreds of vocal fishers and conservationists. Many conservationists have adopted the 30-50% closure range of the science panel as their preferred target.

Fishers are doubtful that a MRWG consensus on the science panel's recommendation will be possible soon. "A 30% closure will not be reached by consensus by the [16 May] meeting," said Guglielmo.

However, say some fishers, consensus on a smaller closure figure -- perhaps 20% -- appears possible. In fact, fishers, managers, and conservationists have been meeting privately to devise alternative reserve sites, analyzing them with a GIS-based model created by the science and socioeconomic panels. Running the model for 10 minutes generates output to analyze the economic impact of a proposed reserve on particular segments of the fishing industry.

"If everyone believes that marine reserves are as valuable as they think, then they should be willing to accept a smaller closure now with the understanding that we'll reconvene in five years or so to evaluate," said Fletcher. "If the supporters can show that a smaller closure has increased stock abundance and catch per unit effort around the reserves, then it would be a lot easier to get support for the bigger closure."

The willingness of fishers to support any closure in the Channel Islands has been the result of recognizing political realities, said Fletcher. California is starting its own review of the need for resource protection throughout the state's marine waters; presumably, the state could implement its own reserve network in the Channel Islands if it saw fit. "My fishermen know this," said Fletcher. "If they're willing to give up a little now, maybe the future processes will take less."

Lobster fisherman Miller added that although the science panel's percentage approach has been controversial, it shouldn't overshadow the other elements of reserve theory and design that the panel has contributed to the process. These elements -- including considerations for connectivity, edge effects, representative habitat, and habitat quality -- have been essential to the reserve-siting negotiations among fishers, conservationists, and managers, he said.

"We've utilized all the ecological process information that the science panel gave us," he said. "In spite of the problems we have encountered, we will come up with a good reserve design."

For more information:

Satie Airame, Channel Islands National Marine Sanctuary, 113 Harbor Way, Suite 150, Santa Barbara, CA 93109-2315, USA. Tel: +1 805 884 1468; E-mail: satie.airame@noaa.gov.

Bob Leeworthy, Special Projects Office, NOAA, 1305 East West Highway, Silver Spring, MD 20910-3282, USA. Tel: +1 301 713 3000 x138; E-mail: bob.leeworthy@noaa.gov.

Bob Fletcher, SAC, 1084 Bangor St., San Diego, CA 92106, USA. Tel: +1 619 226 6455; E-mail: dart@sacemup.org.

Chris Miller, 252 E. Mountain Dr., Santa Barbara, CA 93108, USA. Tel: +1 805 969 3594; E-mail: cmlobster@earthlink.net.

Aniello Guglielmo. Tel: +1 805 966 3559; E-mail: fvtrionfo@aol.com.

BOX: Channel Islands reserve documents online

The website below serves as a repository for all official documents of the Channel Islands reserve process:

<http://www.cinms.nos.noaa.gov/nmpreserves.html>

Source URL: <https://www.openchannels.org/news/mpa-news/science-central-tool-planning-marine-reserves-case-study-channel-islands>