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Comments on proposals for marine reserves in CINMS.
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Preface:

The following are my comments on materials sent me regarding the proposed reserve design in the CINMS. I am doing this because of an interest in seeing good science applied to marine reserve design, and have received no compensation for my work. My belief prior to undertaking this work is that marine reserves are an important tool in conservation and fisheries management, but are only one of many possible tools and need to be considered as part of an integrated management system. Further I will confine my comments solely to the impact of marine reserves as no-take areas, and not consider issues of habitat loss etc.

I have spent much of my career as a critic of the concept of salmon hatcheries as a way to enhance salmon production. While the technology seems attractive and indeed was for a time almost universally accepted as the panacea to salmon management, I believe that as scientists we must remain skeptical until the data show that the latest panacea actually works. In the case of salmon hatcheries the data has shown they have not delivered nearly the benefits promised.

I believe we must be equally skeptical of marine reserves. They are enormously popular at present, indeed about 5 years ago I chaired a session on marine reserves at the Society of Conservation Biology meetings in Victoria and it was clear that the room was full of people who believed they are a good idea, and were grasping for some data to show it.

I have been intensively involved in fisheries management for 30 years, working primarily in Canada, the west coast of the U.S. New Zealand, Australia and the western Pacific. I currently serve on working groups or scientific committees for salmon in several parts of Alaska, hoki, southern blue whiting, ling and orange roughy in New Zealand, sablefish in Canada, sablefish and short spine thornyheads in the west coast, and southern bluefin tuna. I have had experience with numerous other species including lobsters and abalone in New Zealand and Australia, crabs in Alaska, hake in Namibia, several other species in New Zealand, a range of groundfish in western Canada, monkfish and striped bass in the eastern U.S.

I have had only a few days to examine the material sent me so I cannot claim an exhaustive knowledge of it. The material includes a paper by Airame and 5 other authors (Applying ecological criteria ...) notes from the science advisory panel meeting of August 25, 2000, a paper by Warner, Swearer and Caselle in Bull Mar. Sci, Science Advisory panel recommendations, several papers by J. Roughgarden, notes from a science advisory panel presentation date 26 September 2000, questions for the science advisory panel dated 17 January 2001, notes from the Science advisory panel presentation dated 26, September 2000, and a document titled "locating potential reserves in the Channel Islands", dated 26, September 2000.

The need for objectives

There are two commonly touted benefits for marine reserves, (1) conservation and (2) management of exploitative fisheries. The conservation issue is essentially a no-brainer – it is almost universally excepted that exploitation reduces population sizes. A greater percentage of area set aside as no-take provides for a larger standing stock of populations. No-take areas, so long as their size is large relative to the movement of the species, will lead to increased abundance within the reserve. If our objective is to have more natural areas, as in national parks, then society should decide how much to set aside. This is a social choice, with little room for scientific input, and as a scientist I cannot say how much area should be set aside. This is unlike the traditional theory on terrestrial reserves where the key issue is how much habitat to set aside to allow for population viability. A good case can be made for setting aside some proportion of representative habitats as reserves for reasons of seeing natural populations. If you want these no-take areas to be effective then they have to be big enough to encompass movement of the species. Thus, society could decide to set aside the entire area of the Channel Islands as a reserve, but this decision would not be scientifically based.

However, the second objective, enhancing fisheries management is much trickier. Marine reserves are simply one of many possible methods of fisheries management. Before one can begin to determine what areas to set aside in marine reserves, you need a clear statement of the conservation and harvesting objectives.

Will marine reserves enhance yields

The sometimes explicit and more frequently implicit assumption is that the sustainable yields from the Channel Islands will be enhanced by marine reserves. It is on this ground that I think the science contained in the reports sent me is the most flawed. At the extreme, when marine reserves are large relative to the movement of species (both adult and larval movement), the reserve removes from sustainable harvesting the proportion of the stock in the reserve. At the other extreme, when the reserve is very small relative to species movement, the reserve has no impact on yield, it certainly does not enhance it. The literature is very clear on this point, reserves will decrease, rather than increase sustainable yields compared to the traditional tools of fisheries management such as size limits, effort and landing limitations (Polacheck 1990 and Hastings and Botsford 1999). At best they can provide the same yields as traditional management methods when properly applied. The cases these authors found where yields were enhanced by reserves were cases of overfishing outside the reserves.

So long as the fishery is well managed outside the reserve, there is no benefit from reserves to the sustainable harvesting and indeed the loss in yield for sedentary species will be roughly in proportion to the area set aside. The potential of marine reserves to enhance yields occur when the size of reserve is appropriate to protect spawning biomass yet let dispersal (usually of early stages) spill out of the reserve, if and only if the exploitation rate is excessive outside the reserve.

The majority of the evidence from existing marine reserves shows that if you reduce harvest you end up with more and large fish. This simply shows that the reserves are large enough relative to the movement of the fish to have an impact, but provides absolutely no evidence that these reserves enhance sustainable yield.

The theoretical papers have shown that the only time that marine reserves can enhance sustainable yields (rather than reduce them) is when the fisheries management system outside of reserves has failed. I find it interesting that this topic, and indeed the entire relationship between the proposed marine reserves and other fisheries management actions is hardly given any mention in the Airame et al. paper. This paper does mention that several species of rockfish have been listed as overexploited, but no analysis is presented as to how a marine reserve system would interact with the existing fisheries management system. I have seen no analysis of the effort levels or size limits. You cannot possibly determine how much yield will be lost to the existing commercial fishermen until you analyze the interaction between the marine reserves and the existing fisheries regulations – something I have not seen in any of the documentation. Further, to determine if the “spill over” effect will ameliorate the potential loss in yield we would need to know a lot more about the dispersal distances of juveniles.

I understand that someone from the CIMNS made a presentation to the Scientific and Statistics Committee of the PMFMC. The written response from the SSC suggested that insufficient documentation was presented on how the reserve size was determined, and how the proposed reserve design would (1) maintain fisheries benefits and (2) maintain long term socio-economic viability.

These are essentially my two points. Nothing in the documentation I have seen provides any evidence that the proposed marine reserves will benefit the fishermen. It would appear that the proposals are all based on the conservation objective with a general lack of analysis of the fisheries management objectives. If this is the case it should be clearly stated. Please don't try to convince the fishermen who make a living in this area that the reserve system will be good for them without providing a lot more substantial documentation.

I believe this is precisely the comment that was obtained from the scientists on the SSC of the PMFC.

Has the fishery management system failed?

It is clear from the documentation that I have seen that there is a general acceptance that the fisheries management system has failed, and marine reserves are needed because the existing system doesn't work. Yet I have seen absolutely nothing in the documentation to support this except the mention that several rockfish species are now listed as overfished. This topic was discussed in the meeting notes from 25 August, 2000, where clearly the nature of regulations outside the reserve were critical, but I have not been able to any documentation of integration of the reserve size with fisheries management activities. I do not know enough about the status of species found in the proposed area to comment in detail at this point but I would note that PMFC has established rebuilding plans for the species listed as overfished. I would also note that

according to NMFS statistics, nation wide we are losing only 14% of potential sustainable yield due to overfishing, this is a far cry from the perception that our fisheries are devastated and drastic measures are needed. While I agree that our fisheries have numerous economic and social problems associated with overcapitalization and open access, loss of yield due to overfishing is not the most pressing concern.

Need for a monitoring plan

Everyone recognizes that we know very little about the impact of planned reserves on populations and yields. Part of any plan should be monitoring to enable us to evaluate the costs and benefits of the reserve to potential yield. This should be further developed in the plan.

Some specific comments on the documents received:

The Science Advisory Panel Recommendations. This brief document appears to be a summary of science conclusions. It has numerous scientific errors and flaws. Specifically:

On page 1 the document asserts that “commercial fishermen benefit from larval export ...” Larval export merely reduces the loss to commercial fishermen from access to the whole population. So long as the stocks outside the reserve are well managed, larval export will simply make the losses less, not provide net benefits.

On page 2 Section entitled “For Fisheries Management”.

Here is where the science gets really dodgy. Mace and Sissenwine did **not** say that populations below 5-70% of carrying capacity are not sustainable, whoever interpreted this from their paper seriously mis-understands modern population dynamics. Many populations have been sustained at very low fractions of their unfished population sizes. For instance, many lobster populations have been fished at a small fraction (1-5%) of their unfished sizes for decades in a sustainable fashion. Many other fish populations have been sustainably harvested at 5-30% of virgin population size. Almost all of the text in this section seems to assume that the fishery is so poorly managed outside reserves that there is no remaining breeding stock. One of the figures from a Roughgarden paper shows probability of stock collapse at 100% below 50% of virgin biomass. Suffice it to say that this figure is counter to the experience of everyone I have shown it to familiar with real fisheries. No equations or documentation were provided. I suggest that the Science Panel report should be reviewed by a panel familiar with fisheries management.

Section page 2 “entitled population dynamics models”

Data from hundreds of populations of harvested fish have now been analyzed and it is clear that MSY is achieved most commonly at 15-40% of virgin population size. The 50% figure quoted in this section is 50 year old science and based on no data at all. This section repeats the error that populations need to be 60% or 75% of their virgin size to be sustained. Next the text in the section suggests that setting aside 30%-50% of the area as reserves will result in an equivalent reduction in fishing effort. This is totally wrong, in general fishermen will simply move somewhere else (outside the reserve and indeed often on the edge) and there will be little if any

reduction in effort, merely increased cost for the fishermen. Alternatively the fishermen may have to cease fishing completely because the fishery is no longer economic.

Page 3 "What do other scientists recommend"

This paper contains a list of "recommendations" from published papers. Of the papers in this list I am familiar with, this table is a serious distortion of the results because of the assumption about other fisheries management activities. The usual assumption is that there is no effective fisheries management system outside the reserves.

Subject: Fwd: Channel Isles proposed closure

Date: Mon, 09 Apr 2001 13:44:21 -0700

From: "PFMC Comments" <pfmc.comments@noaa.gov>

To: james.seger@noaa.gov

Subject: Channel Isles proposed closure

Date: Sun, 1 Apr 2001 20:09:20 -0700

From: "Glenn Thacher" <hookupiron@home.com>

To: <pfmc.comments@noaa.gov>

Enough is enough. If we as a society give so much, why do you need to take so much.

If you as an organization are supposed to be caregivers of our environment, why must you be takers of our resources. Please don't take away by closure the areas you propose at the Channel Isles.(that would include now and later)

All the environmentalist want is to deny access to fishermen so they can have an exclusive right to the area for what ever they want.

Sometime in the rest of my lifetime I hope to see some form of cooperation that isn't mean spirited and denies people the pursuit of their form of enjoyment.

Hoping you will see the middle in this propose taking process.

Thank you,

Glenn Thacher

Five other persons submitted the same comments.

Subject: Fwd: (no subject)

Date: Wed, 09 May 2001 09:32:27 -0700

From: "PFMC Comments" <pfmc.comments@noaa.gov>

To: james.seger@noaa.gov

Subject: (no subject)

Date: Tue, 8 May 2001 22:59:45 EDT

From: <MCSFSH@aol.com>

To: dan.basta@noaa.gov, matt.pickett@noaa.gov, scott.b.gudes@noaa.gov, nmscomments@noaa.gov, svalenzuela@dfg.ca.gov, jugoretz@dfg2.ca.gov, gale_norton@ios.doi.gov, mpainfo@ios.doi.gov, mpainfo@noaa.gov, senator@feinstein.senate.gov, senator@boxer.senate.gov, president@whitehouse.gov, Assemblymember.Wayne@assembly.ca.gov, susan.davis@mail.house.gov, michael.murray@noaa.gov, anne.walton@noaa.gov, rtreanor@dfg.ca.gov, jduffy@dfg.ca.gov, rhight@dfg.ca.gov, pwolf@dfg.ca.gov, graydavis@governor.ca.gov, sean.hastings@noaa.gov, pfmc.comments@noaa.gov, Rebecca.Lent@noaa.gov, devans@doc.gov

Dear Sir or Madam:

I have recently become aware that the Channel Islands National Marine Sanctuary is currently in the process of determining which 30% to 50% of our local islands to designate as NO-TAKE ZONES.

I OPPOSE THE IMPLEMENTATION OF NO-TAKE ZONES FOR RECREATIONAL PURPOSES.

- 1) No-Take Zones should be utilized as a last resort in conservation, not as a first resort.
- 2) Recreational fishing has minimal impact when compared to commercial fishing.
- 3) The decision to implement No-Take Zones are based on recommendation from one study, performed by non-partial "scientists". Our Channel Islands should be controlled by science, not politics.
- 4) I believe that recreational fishing impact can better be controlled on a per-species basis, as needed.

Open access for recreational purposes is a concept embraced on virtually all federal lands and waters including wildlife refuges, national parks, wilderness areas, and the exclusive economic zone. This extensive record clearly demonstrates that access can be maintained for recreational purposes under appropriate science-based regulatory schemes that include seasons, size limits, bag limits and other regulations. Such management practices have proven themselves to be highly effective in maintaining healthy fisheries.

Only in those cases where recreational fishing has demonstrable adverse effects should a specific, well-defined area be closed. Restricting public admission to our coastal waters should not be our first course of action, but rather our last.

I ask that you help in maintaining our Channel Islands as an area of open recreation for generations to come.

Sincerely,

Marty Steelman
mcsfsh@aol.com

