

“Dr. Trevor Kenchington's review
of the Scoping Documents related to
Marine Protected Areas in the Gulf of Mexico.”

Steven,

Some time ago, way back before the Key West Council meeting, you asked me (by e-mail) for comments on the two Marine Reserve documents on your WWW site. I have been very slow in getting clear of other work so that I could take a look at them. However, since your public meetings on the topic have only just ended, I'll quickly make a few points now in the hope that they may still be of some benefit. Please make such use of this message as you see fit. (I am copying it to Bob Jones since my involvement in the Gulf of Mexico fisheries stems from working for his Association and I do not want to be providing gratuitous comments to third parties behind my clients' backs.)

Overall, the two documents seem too much influenced by the "MPA zealots" and too little by those with real experience with fisheries management. The "Questions and Answers" document (hereafter "Q&A") page 1 states that "Marine reserves are a new, additional tool". They are in no way "new" but are a long-established management tool. What may be "new" is the idea of _offshore_ "no take" reserves, which have not been used in the past, or at least not often, for good and obvious reasons. The documents do not explain why those reasons are no longer valid. [The "Scoping Document" (hereafter "Scoping") does draw a parallel between reserve-based management in terrestrial and marine systems, without showing any comprehension of the very different biological, ecological, regulatory and human-useage systems in the two environments.]

The two documents seem to present a case based on an assumption of its outcome. Q&A p.2, for example, starts out by declaring that "Protection of the marine habitat and ecosystem is essential". It is not. Maintenance of habitats and ecosystem functions are essential but whether protection measures are required (as distinct from allowing low-level impacts to continue without specific management action) is very much in doubt where offshore areas are concerned. (Inshore, of course, is a different matter where coastal-zone development is an issue.) As another: Q&A p.4. states that "By restricting a portion of the fishery resource, overall fishing mortality is reduced." That goes to the heart of the idea of using reserves as a fishery-management tool but it is a highly dubious contention. I doubt that there is any evidence of it being true, other than in extreme situations like the present New England scallop fishery (where so much of the resource is locked up in closed areas that even 100% mortality elsewhere is a low mortality rate on the total resource). For many fisheries, there is a persuasive case that closing parts of the range does nothing whatever to reduce mortality rates, simply shifting effort to open areas and increasing fishing costs. Yet again, Q&A p.10 suggests that the fishermen who lose most by their usual grounds being closed as a reserve may also benefit most from the "beneficial impacts" of that reserve. Aside from assuming that there is suitable bottom around the closed area and that those displaced can survive in the industry long enough to draw any benefit, that suggestion assumes that benefits will eventually appear -- which is still a questionable assertion.

The two documents rely on a lot of conditional statements to give a favourable impression of the effectiveness of marine reserves but they nevertheless make yet other claims that really need a "may" or "could" somewhere in the sentence. On Q&A p.4, for example, there is a bald claim that SPR "will" increase in reserves, leading to enhanced recruitment elsewhere, while some adults "will" migrate out of the reserve to supply other areas. Scoping p.2 similarly claims that fish populations inside reserves are larger, with a wider variety of age classes. These are things which _may_ happen with _some_ species in some reserves but will _not_ with others (such as highly-migratory species and those with no discernable

stock/recruitment relationship). [The documents should also point out that enhancing fisheries outside a reserve is not sufficient. It is also necessary for the benefits of that enhancement to exceed the losses involved in closing part of the grounds before a reserve can be said to have benefitted the fisheries, whatever it does for other interests.]

On the question of migratory habits, Scoping p.12 identifies groupers as an appropriate group for reserve management since they are "relatively sedentary". Compared to bluefin tuna, that may be true. However, at least some groupers undertake movements of hundreds of kilometres, suggesting that they may not benefit from reserve-based management systems.

Q&A p.6 continues by listing benefits of reserves that include: "certainty" that they would protect fish from fishing mortality, that they would prevent disruption of spawning aggregations (presumably meaning disruption by fishing -- other causes not being addressed), that age structures would be more natural and that biodiversity would be maintained. All of these are possible outcomes but only if a reserve is properly designed and only where suitable species are concerned. Highly-mobile species or reserves with the wrong boundaries would not produce these effects.

Scoping at least lists some of the disadvantages of reserves. However, notably lacking from its p.11, where the costs for fishermen having to travel to other grounds are mentioned, is any comment on the implications for safety in sending fishermen further from shore or into otherwise sub-optimal areas. Nor is there any indication of the limited amounts of fishable bottom in the sea. The implication seems to be that certain areas have to be closed because they are essential to fish but that fishermen can go anywhere to catch those fish.

What both documents lack (and indeed seems lacking world-wide) is much solid evidence that reserves have ever had the benefits (to the fisheries) claimed for them. Scoping p.6 (see also pp.13, 18) suggests a benefit to the scallop fisheries from the groundfish-directed closures off New England. That has most certainly not yet occurred. There may have been some benefit to the scallop populations (in areas from which the fishery is largely excluded) but it would be difficult to separate that from the effects of (i) naturally-strong year classes and (ii) reduced fishing effort, which could have been achieved by less draconian restrictions. Otherwise, examples are offered from the Philippines, Saba, New Zealand and elsewhere. Without reading the original reports, I cannot say whether they proved what is claimed for them in the two documents. Suffice to say that there is plenty of scope for increases in fish resources to occur coincident with reserve closures without the closures being responsible. It is also interesting that none of the studies which have shown the failure of fish to disperse beyond the boundaries of densely-populated reserves are cited. Nor is there any mention of the many reserves world-wide for which no evidence of enhanced fishing opportunities outside has yet been gathered.

There are two claims in the documents which I think are simply false. Q&A p.5 suggests that estimates of age, growth, natural mortality and the effects of fishing can be more-precisely determined in reserves than outside. that is wrong. Firstly, determining such things needs large samples which (almost inevitably) require extensive fishing and usually the use of a fishery as a sampling device. Secondly, for fisheries-management purposes, the numbers needed are the growth and death rates (including "M", the "natural" mortality rate) in exploited populations. Measurements in closed areas are of dubious relevance. [I am not disputing the value of no-take reserves as sites for research into marine ecology. I am disputing their use in studies designed to directly support fisheries management.]

That is followed (Q&A p.6, also Scoping p.3) by the suggestion that "reserves also preserve genetic diversity by protecting fish across a range of sizes and growth rates". There is some reason to think that fast-growing fish are genetically different to slow-growing ones (with the fast-growers more vulnerable to typical size-selective fisheries). However, by far the greater genetic diversity is between different areas

within the same broad "stock". Since reserve-based management will tend to protect some areas while allowing increased fishing pressure elsewhere, its net genetic effect (in most cases) will be to reduce genetic diversity, not to preserve it -- assuming that the reserves actually have any effect at all. To me, this is a dangerous error in the documents and strongly suggests that they have been informed more by a pro-reserve agenda than by careful consideration of the management issues.

The "precautionary approach" has been defined a number of ways in different documents. To the best of my knowledge, none of them are consistent with the statement (Scoping p.6) that "reserves may be the best approach" to the implementation of the precautionary approach. [PA is more a way of applying every step in the decision-making and management process than something to be implemented by one measure or another.] Page 9 of the same document declares that the precautionary approach requires some areas to be maintained in undisturbed states pending "complete understanding of ecosystems". While some environmentalists may wish that the PA had been stated in those terms, it has not in any of its official versions, so far as I am aware (and I argued this through in front of a bunch of lawyers a couple of years ago when we were trying to get a stronger version of the PA used in the regulation of offshore petroleum activity).

The legality of the Council establishing marine reserves I should really leave to the lawyers. However, I would just note that the parts of the Act quoted on Q&A p.3 seem to only authorize the Council to restrict fishing. To be effective, many reserves would need controls on other human activities and thus the Council may not be the body to (alone) institute a reserve program.

Scoping p.8 stresses that reserves "improve fairness and equity" and that "no group is favored at the expense of another". Yet the same document on its next page notes that reserves allow scientists and the public to study, appreciate and understand ecosystems free of fishing -- implying that scientists and those seeking non-consumptive uses are favoured over those whose interest is in consumptive use. On p.10, Scoping singles out tourist divers and those who provide them with services as particularly deserving of such advantages. While I personally share that bias, it does seem odd to describe it as equitable, unless this is a form of equity in which some interest groups are considered more equal than others. [These benefits are, in any case, almost exclusively applicable to inshore reserves with bottom depths little more than 100 feet. Very few members of the public have shown any interest in non-consumptive exploitation of areas tens of miles from shore and deeper than SCUBA-diving depths (other than for vicarious experiences through TV shows and the like).]

On the suggested framework procedure for establishing reserves (Scoping pp.30ff), I would only note that the criteria set in item 1 are very vague and broad. Without firmer criteria, I would anticipate a large number of requests to establish reserves, each of which would trigger endless debates over means and ends. With clear guidelines, all concerned would know what the Council planned to do with reserves and so which areas would be worth requesting (and which requests would be worth contesting).

The discussion of reserves and "biodiversity" (Q&A p.8) is dubious. It begins with a daring definition of "biodiversity" -- something that most advocates shy away from defining and indeed which may not be definable (except in the sense of a quantitative measure, such as the old and long discredited Shannon-Weaver Index). It continues with a bald claim that loss of bio-diversity decreases resiliency. I do not follow the debates of theoretical ecologists but my understanding is that the diversity/resiliency link is far from universally accepted. Then it suggests [see also Scoping p.9] that the concentration of fisheries on top predators (which is not true of such things as the shrimp fishery) has major impacts on biodiversity (another ecologically-dubious contention), without noting that such impacts (if they occur) can be adequately addressed by any of the management tools used to prevent excessive depletion of the target species. [Reserves are obviously a useful tool for the protection of biodiversity, whatever that is taken to

mean. My doubt is over the presentation of the idea, with its implication that fishing is a major threat to biodiversity and one that can only be met by closing areas.]

Scoping p.17 includes the false claim that "the evidence from the northeast and elsewhere in the world is compelling that trawled gear can have significant effects on benthic habitats and productivity", supporting that with four citations: one of an environmentalist tract, one of a policy discussion, one of a pseudoreplicated study that yielded only conclusions of dubious validity and the last a review of some European studies. I have recently completed an extensive review of the literature on seabed impacts of fishing gear (locating some 500 items in all). Once the invalid experimental designs and unsupported conclusions were eliminated, there was no "compelling" evidence of significant effects on the more widespread seabed habitats, let alone on the productivity of those areas (though seagrass beds, coral patches etc. are another story). There may well be justification to close some areas to trawling but it would need much more thought that the Scoping document indicates has yet been applied in the Gulf context.

To conclude:

It seems to me that many people (mostly outside the small community of "conventional" fisheries management) are looking for a "magic bullet" that will fix the problems of the global fisheries that have become evident in the 1990s. (Scoping p.3 goes so far as to state that managers are looking for a strategy that can protect many species in the face of uncertainty while reducing the number of regulations.) One group sees MPAs or reserves as a possible solution. The hard truth is that there are no magic bullets. Area-based management is certainly part of the manager's toolbox. It has always been used but could probably be applied more than it has been in the past. Nevertheless, it is only one tool amongst many and suggesting, as the two documents seem to do, that it is in some way more than that is, in my view, dangerously misleading.

Their whole presentation also reads, to me, as though their authors have concluded that "no take" areas are needed for reasons that have little to do with benefits to the fisheries but that they have thought it necessary to present their conclusions in terms of what such reserves could do for the fisheries. If so, the documents are simply dishonest.

This above should not be read as some polemic against reserves. I think they very much have a place amidst the tools used by fisheries managers -- as they have long been used. However, if their use is to be expanded in the Gulf of Mexico, as it very well could be, it is important that the decisions be made on the basis of a firm grounding in the objectives, benefits, costs and design-techniques involved. To me, the two documents you have circulated present too unbalanced a perspective to be relied on (alone and unaided) for that foundation.

I hope this hasty and disordered note is of some use to you.

All the best,

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