Reviewer Number 1
Tom Jagiolo's 16 September 2010 Report for the ACSF

"Consideration of Sanctuary Research Needs with Respect to Existing MPAs Situated in the Monterey Bay National Marine Sanctuary"

The questions are paraphrased from those provided to this reviewer to guide the review.

1. Is this a reasonable approach?

Yes, the approach that Jagielo takes to evaluate the potential for existing MPAs to meet the stated needs of the MBNMS is reasonable. I would argue that this is the most logical first step and likely the only one really necessary. One could quibble about the lack of any quantitative methods, but the objectives to be compared are similarly qualitative.

2. Is sound logic used in its application?

Yes, the logic is sound. Jagielo evaluates existing MPAs for their suitability with regard to the level of protection, habitat- and species-diversity, and, to a lesser extent, size (area covered). He reviewed existing marine reserves and considered the suitability of these for meeting the objectives provided by the Sanctuary behind their interest in establishing additional reserves.

3. Are the points made supported by the available information?

Yes. The amount of information regarding the State reserves is extensive and was carefully catalogued in some of the cited references. Data on deeper sites (e.g., RCAs) are less detailed, but Jagielo has included all of the readily available information. Likely additional details are available. For example, McClain et al. {, 2009 #4364} provide a faunal inventory for Davidson Seamount that is not referenced, but (1) these data support his contention that the existing reserves meet the needs of the MMBNMS and (2) this report (and, I expect, most other comparable research papers) does not include additional areas *within* the MBNMS that would allow for a comparison of potential control and experimental sites.

4. Are the conclusions applicable to conservation and research needs for all taxa, ecological processes and research disciplines.

No, of course not. The MBNMS goals, as I read them, preclude or ignore many research disciplines (e.g., geophysical research involving seismic surveys, ocean drilling), and focus on ecological research. Jagielo's report is therefore largely consistent with MBNMS interests with several important taxonomic exceptions: marine birds, marine mammals. Possibly these groups, like planktonic organisms, are not sufficiently site-specific to benefit directly from marine reserves, but there should have been some discussion of the importance of breeding and rearing sites

for these groups. Also, there are important indirect benefits from marine reserves such as the provision of foraging resources uncontested by human fisheries. These taxonomic groups were considered during the MLPA process, and breeding and rearing sites are largely if not exclusively found within State waters, however, so this is probably not a serious oversight. Benthic invertebrates arguably get short shrift too, though Jagielo points out that spatial restrictions on trawling, for example, provide ancillary protection for other, non-target species, and, given the broad scale of the questions, lumping deep-sea corals, decapod crustaceans and other myriad inverts together with "groundfish" is not unreasonable.

5. Did the author miss any important issues or points?

For the most part, no. See (4) above.

Reviewer Number 2

Review of analysis approach used in ACFS MBNMS Phase 2 Report by Tom Jagielo

Evaluating existing MPAs with respect to MBNMS MPA-related research objectives is an appropriate approach to determining potential needs for designation of additional MPAs . The analysis should, at a minimum, contain the following key components:

1) analysis of the research objectives to determine the relative importance of having fully vs. partially protected MPAs, the relative importance of permanent vs. temporary MPAs, and other key considerations that would enter into MPA design,
2) discussion and spatial characterization of the types of current and potential future human impacts that could occur in the various habitats in the MBNMS (beyond fishery impacts),
3) discussion of the types of protections in the existing MPAs, and how they eliminate or reduce potential impacts,
4) analysis of habitat/depth representation in the existing MPAs with respect to the entire MBNMS, and identification of gaps in that representation.

While the report partially addressed these components, significantly more work would be required for a complete analysis.

Component #1: An important missing link the analysis' logic flow is some sort of determination of the:
- level of protection
- level of permanence, and
- level of habitat/depth/species representation

needed to achieve the research objectives. A number of questions need to be answered, for example: Are fully protected MPA's needed, do they need to be permanent, are all habitats important, is replication of habitats needed in the experimental design, etc.? Answers to these questions need to be stated before one can determine which existing MPAs to include in the analysis, and where the gaps are.

Components #2 and #3: The analysis focused heavily on fisheries and did not address other anthropogenic influences, such as numerous types of potential ocean energy development, cables or pipelines, ocean aquaculture, possible future seabed mining, dredging or other navigation-related development, localized water quality concerns, etc. The state MLPA sites probably would do a good job addressing impacts from most of these uses. The RCA's wouldn't address the non-fishery anthropogenic influences, and it is unclear how effective the EFH designations would be to address these potential influences. The analysis needs to be significantly expanded to address the non-fishery uses with respect to existing MPAs. In addition, the maps of the MPAs in federal waters need to be improved and there needs to be clearer statements concerning precisely which fisheries are allowed in these areas, and when they are allowed. For example portions of the RCA area that open seasonally (e.g., 20-40 fm) would not meet the research objectives.

Component #4: The report presents detailed tables of habitat areas, but it is difficult to conclude how well habitats are represented in the various categories of MPAs. For example, in combination, the SMRs and SMCAs appear to do a good job at representing habitat generally inside of 100m. However, in most cases these areas are set up with the SMR in inside waters and the SMCA in outside waters. For the most part, the SMR's only thoroughly represent 50m and shallower. If the analysis of research objectives (see component #1) concludes that at least some fully protected MPAs are needed within the overall system, it is necessary to know specifically how well habitats are represented in this types of MPA. A summary of MPAs categorized by protection level is needed to fully identify the potential gaps the representation/protection level. The simple table structured like the one below would be extremely helpful in determining if existing MPAs are adequate, or if there are gaps:

		SMRs		SMCAs		EFH areas		RCA areas	
Habitat/Depth Type	MBNMS total area	total area	% repre-sentation	total area	% repre-sentation	total area	% repre-sentation	total area	% repre-sentation
soft 0-30									
soft 30-100									
etc									
etc									

Reviewer Number 3

Review of "Consideration of Sanctuary Research Needs with Respect to Existing MPAs Situated in the Monterey National Marine Sanctuary"

1) Is this a reasonable approach to answering the question: To what extent do the existing MPAs in the MBNMS already meet projected MBNMS-MPA research needs?

2) Is sound logic used in the application of the approach used?

I don't think this is a reasonable approach to evaluating whether the research questions proposed by the MBNMS can be answered by the existing MPAs. To be clear, I am not suggesting that the existing MPAs are insufficient in addressing the research needs of the MBNMS, they may be. I am only suggesting that the analysis used doesn't determine whether or not the scientific questions of interest to the MBNMS can be addressed. How does showing that specific research questions are consistent with overarching goals for MPAs say anything about whether or not those specific research questions can be properly addressed (Table 4)? The logic here is that because research questions are consistent with the stated goals for existing MPAs, the research questions can be answered by existing MPAs. This isn't necessarily true; the appropriate comparison to make is not the broad goals for the existing MPAs to the specific research questions posed by the MBNMS. Instead, the correct question to evaluate is: Are the research questions that can be addressed by the existing MPAs within the Sanctuary sufficient to answer the research questions posed by the MBNMS? This approach is simply not addressed by current analysis. I expect that for many of the nearshore areas within the MBNMS this may be the case given the inclusion of appropriate reference areas where human activity occurs.

3) Are the points made supported by appropriate data and references?

See above.

4) Are the conclusions applicable to conservation and research needs for all taxa, ecological processes, and research disciplines?

I expect the deep-water habitats within the Sanctuary would not be covered. In fact, it would seem to me that if the MBNMS is really interested in knowing the impact of human activity they may need to re-open some of the EFH and RCA zones to fishing in order to answer some of their research questions (1-5). In the same way that one needs closed areas to address these questions, one also needs areas open to human activity.

5) Did the author miss any important issues or points?

In the introduction the author states that there are three principle management objectives. This analysis only addresses one of those three objectives. What about the remaining two objectives, which are not mentioned?

Reviewer Number 4

Jagielo Review (Jagielo ACSF MBNMS Phase 2 Report 9-16-2010)

10/19/2010

1) Is this a reasonable approach to answering the question: To what extent do the existing MPAs in the MBNMS already meet projected MBNMS-MPA research needs?

As the author states, the goal of his review is to evaluate whether the existing MPAs could, **in principle**, address the types of research questions posed by the MBNMS. The MBNMS encompasses a large geographic area, and numerous state and federal MPAs exist within its boundaries. Thus, Jagielo's approach is a reasonable exercise with which to begin to evaluate whether the existing MPAs meet MBNMS-MPA research needs. The key is that this approach is a theoretical, rather than a quantitative assessment. In this review, the author bases his conclusions largely upon a comparison of the verbiage in the MBNMS goals to the verbiage in the MLPA goals. This is useful in determining if the existing state and federal MPAS in the Monterey Bay have the potential to meet the projected MBNMS-MPA research needs, based on the similarities in the language describing the MLPA and MBNMS goals and objectives.

Jagielo's review illustrates that there is a high degree of overlap between MLPA goals and MBNMS research needs, but he does not provide sufficient evidence to demonstrate to what extent, if any, that the existing MPAs are actually meeting these goals.

2) Is sound logic used in the application of the approach used?

In this review, the author concludes that existing MPAs in the MBNMS meet the MBNMS research needs based on an evaluation of the wording of MLPA and MBNMS goals. The author's approach is logical in theory, but the author does not always explain how he arrived at the conclusions in the matrices and tables. For example, in Table 1, Jagielo provides a list of habitat types and the area of each habitat present in each MPA, as evidence of the diversity of habitats that exist under current MPA protection. Table 1 is useful in demonstrating the number of habitats represented in the existing MPAs, but it would be helpful if the author discussed why these habitat types are necessary and if these total habitat areas are sufficient in meeting the MBNMS research needs.

In Tables 2 and 3, Jagielo records a "Y" for each of the MPAs that are consistent with the MLPA goals, and "N" if the MPA is not consistent with MLPA goals. In Table 4, the language in the MBNMS research goals is compared to the language in the MLPA research goals and objectives, with the goal of mapping the scientific and conservation goals common to both. Jagielo hypothesizes that if the state MPAs embody MLPA goals, and the MLPA goals are the same as the MBNMS research needs, then the state MPAs therefore meet the MBNMS research needs. Using this logic, the author presents a matrix of the state and federal MPAs and whether they meet MBNMS research needs in Table 5. While this is a useful exercise, this argument would be strengthened if the author provided a better explanation of the criteria that he used to determine how a particular MPA met the MLPA goals, and thus MBNMS research needs.

3) Are the points made supported by appropriate data and references?

The appropriate data sources are referenced within the document, but the explanation of how those data were used to arrive at the results described in the table matrices could be improved. I would like to see a description of the criteria used to determine how a particular MPA is meeting (or not meeting) MLPA or MBNMS goals. For example, in Table 4, there is clear comparison of language of the MLPA goals and MBNMS goals, and the author does a good job of describing the similarities between the written goals. However, in Table 2 and 3, it is not clear what criteria were used to assign a "Y" or and "N" for each MPA in being consistent in meeting the Central Coast MPA goals and objectives, or in Table 5, the MBNMS research needs. Is the author just matching the word description of each MPA to see if it fits within the MBNMS/MLPA goals? If so, he could have explained this more clearly. Finally, this review should include an evaluation of the scientific data collected to date in MPA monitoring studies in the MBNMS (See comment under question 5).

4) Are the conclusions applicable to conservation and research needs for all taxa, ecological processes, and research disciplines?

A diverse number of taxa are represented within the existing MBNMS-MPA boundaries (Jagielo 2010). Jagielo presents conclusions that could be relevant to some, or all of these species, but without an assessment of the status of these species prior to the implementation of the existing MPAs, it is difficult to determine the level of progress that has been made towards meeting individual MBNMS research goals. The author's conclusions are likely not applicable to taxa that are found in deep water habitats based on the author's assessment that deep water habitats are not well represented in the existing MPAs in the MBNMS.

This document does not adequately address whether MBNMS research needs are being met with respect to ecological processes, nor does he address whether they are met with respect to different research disciplines. Although there is some discussion regarding climate changes and how these may confound researchers ability to detect changes in MPA versus control sites, more information is necessary to understand how certain ecological processes may affect MBNMS research needs.

5) Did the author miss any important issues or points?

This author presents an evaluation of the potential for existing MPAs in the MBNMS to meet MBNMS research needs, not whether they actually are meeting these research needs. Overlap of MBNMS research needs with MLPA goals does not necessarily indicate that the existing state MPAs are effectively meeting MLPA and/or MBNMS research goals.

The most important point that the author missed is an evaluation of preliminary results from the scientific data that have been collected inside and outside the existing MPAs. The Ocean Protection Council provided funding to scientists to collect data before and after the state MPAs were implemented. An evaluation of the results from these studies (and other historical data sets collected in the MBNMS, if applicable) would be instrumental in determining the level of progress has been made toward meeting the original Central Coast MPA goals to date.

Jagielo's approach is a good first step in determining if the existing MPAs are meeting MBNMS research goals, but ideally, progress towards meeting the MBNMS research goals would be quantifiable. For example, one of the MBNMS research needs (RN-4) asks, "What are the recovery trajectories in disturbed habitats? This question could be evaluated by measure changes over time in species biomass, species diversity, etc. in areas inside and outside the MPAs. These data may be available from existing scientific research in the MBNMS.

Finally, the author also does not address the fact that it may be premature to evaluate if the existing MPAs are meeting MLPA or MBNMS research goals. The state MPAs in the MBNMS were implemented in September 2007. I am not convinced that three years is sufficient time to evaluate MPA effects. Although the federal MPAs have been in place for longer, these MPAs were implemented as emergency fishery rebuilding measures. These large area-based fishery closures were set aside without specific research goals in mind, thus making it hard to evaluate the effects of these MPAs with respect to MBNMS research needs.