

**CALIFORNIA MARINE LIFE PROTECTION ACT INITIATIVE  
MASTER PLAN SCIENCE ADVISORY TEAM  
SEPTEMBER 19, 2005 MEETING SUMMARY  
National Marine Fisheries Service, Santa Cruz Lab  
110 Shaffer Road  
Santa Cruz, CA 95060**

**SAT members present:** Loo Botsford, Mark Carr, Steve Gaines, Doyle Hanan, Steven Murray, Jeff Paduan, Stephen Palumbi, Kenneth Schiff, Astrid Scholz, Rick Starr, William Sydeman, Mary Yoklavich

**SAT members not present:** Rikk Kvitek, Mark Ohman, Linwood Pendleton, Dave Schaub, Susan Schlosser, Dean Wendt, Richard Young

**Others present:** Steve Barrager (SAT Chair), Michael DeLapa (MLPA staff), Heather Galindo (note taker; SAT support staff), John J. Kirilin (MLPA staff), John Ugoretz (DFG staff), Paul Reilly (DFG staff), Paulo Serpa (DFG staff) and approximately 10 members of the public

**Acronyms used:** California Department of Fish and Game (DFG); geographic information system (GIS); lifetime egg production (LEP); marine protected area (MPA); MLPA Blue Ribbon Task Force (BRTF); MLPA Central Coast Regional Stakeholder Group (CCRSG); MLPA Central Coast Science Sub-Team (CCSST); MLPA Master Plan Framework (MPF), MLPA Master Plan Science Advisory Team (SAT)

### **Introductions, Welcome and Agenda Review**

SAT Chair Steve Barrager welcomed everyone to the meeting and gave a summary of the agenda. He announced that the Central Coast Regional Stakeholder Group (CCRSG) adopted a set of goals and objectives including revisions based on SAT input. John Kirilin agreed that adopting the goals and objectives is a major accomplishment and said the CCRSG is working as a group very effectively. The CCRSG will now turn their attention to developing packages of MPA alternatives that will, in turn, come to the SAT for evaluation. John Kirilin reminded the SAT about the upcoming BRTF meeting in San Luis Obispo on September 28-29, which will involve reporting on the goals and objectives and more presentations from the SAT. John Ugoretz finished the introduction by thanking the SAT for its work and recognizing the scope of work the SAT has before it and its importance to the work of the CCRSG. He added that at the end of the meeting he would like to work on scheduling SAT meetings for 2006.

### **Revised SAT Guidelines**

Steve Murray gave an update on the SAT guidelines document that was provisionally approved at the August 30, 2005 SAT meeting. Major revisions since the approval included:

- Changes in the language describing interactions between the SAT and regional stakeholder groups in hopes of streamlining the process
  - Science questions to be submitted during CCRSG meetings or via the MLPA website only

- SAT regional sub-team and MLPA Initiative staff to prioritize questions based on relevance to the process
- Refining the protocol for how the SAT makes decisions
  - SAT to make recommendations incorporating the full set of views of SAT members
- Addressing the potential conflict of interest when awarding contracts to SAT members
  - Important to emphasize that contract decisions are made by MLPA Initiative staff and not by the SAT.
  - A SAT member with a proposal for a contract will not evaluate that proposal or the direct work products resulting from the contract.
  - The following sentence will be added to the guidelines: “These award decisions are not within the purview of the SAT and do not imply SAT endorsement.”
- The word “spatial” in reference to MPAs deleted from the document
- The document made generic for interactions between the SAT and all regional stakeholder groups

The revised version of the SAT guidelines was approved later in the meeting after all above changes were made.

### **Species Likely to Benefit List**

Doyle Hanan gave an update on the species likely to benefit list and accompanying text. He thanked the SAT members for draft submissions and asked the SAT for feedback on the current draft version of the entire document. He also thanked Paul Reilly of DFG for feedback on the list. The discussion of the text portion of the document included:

- The draft introductory paragraph was good and provided an ecosystem, instead of just single species, perspective.
- Benefits are important, both as stated in the law and from a community perspective.
- The introduction should be followed by one or two sentences describing the effects of MPAs.
- There was concern about the terms “might” and “may” benefit.
- Repetition in the text should be minimized.
- It is important to acknowledge that benefits to a species might depend highly on the local conditions prior to MPA implementation, especially with regard to fishing pressure.
- Benefits to species will also depend on the goals, objectives, and designs of the MPAs.
- Benefits may vary across life stages.
- A suggestion was made that currently managed fish species not be included in the list, although fisheries management may not address issues with fish population size and age structure.
  - Clarification that the goal of the list is to identify species that will benefit from spatial management, not to identify species in need of spatial management

- Time frames of management plans and MPA implementation may differ
- Debate about importance of explicitly addressing the interaction of MPA implementation and fisheries management including issues such as optimum yield and stock assessment (suggestion to have a dialog between the SAT and fisheries management council groups on this issue)
- Emphasis that MPAs have effects beyond fisheries management
- Algae can be added to the list with a footnote indicating that the abundances of algae and sea grasses can be strongly impacted by indirect effects in MPAs.
- Text should be added about seabirds and mammals.
- Text should be limited to addressing the objectives of the document.

Doyle Hanan then directed the discussion towards the list itself. The list for species living in rocky habitats was organized by depth. The list was also color-coded to indicate proposed additions and deletions along with whether the species is currently depleted. Major points of discussion included:

- Depleted species in the central coast region should definitely be included.
- Inclusion in a commercial fishery should not be required for a species to be listed. Other factors such as sedentary life histories, incidental catch, and size-age population structure should also be considered.
- Prioritizing the list by indicating species more or less likely to benefit is in line with the accompanying text and objectives of the document. Categories should be created in an informational context.
- Prioritizing the list with respect to current status of the fishery might cause complications if the status of a fishery changes or is currently unknown.
- The list will evolve. For example, ongoing analysis of lifetime egg production for some species on the draft list may influence prioritization decisions.
- It is important to summarize how species were selected for the list.
- Documented evidence of benefits from existing MPAs should be considered for candidate species.
- Each species on the list should be assessed for each of the criteria listed in the text portion of the document.
- Species on this list are likely to be used in assessing the performance of the MPAs.

It was agreed that more work on the species likely to benefit list and accompanying text would continue outside the meeting. John Ugoretz emphasized that this document is a SAT product and will be important for the CCRSG as it assembles MPA proposals. The focus on particular species and some prioritization of species would be particularly helpful. The SAT should be in agreement about the final product.

## CCRSG Regional Goals and Objectives

Paul Reilly summarized the development of the goals and objectives to date. Over the course of one CCRSG meeting, two conference calls involving a working group and MLPA Initiative staff, and additional work by the staff, 130 potential objectives were reduced to 33. Developing the objectives was guided by the goals of the MLPA that were slightly modified to be specific to the central coast study region, but with a statewide network in mind. At the August and September 2005 CCRSG meetings, the stakeholders considered each of the 33 objectives carefully and incorporated feedback from the SAT discussion held on August 30, 2005. The final product includes 19 objectives, 10 design considerations, and 4 implementation considerations. John Ugoretz added that a few undecided issues would be presented to the BRTF and he would like to accompany them with additional feedback from the SAT. He also emphasized that the CCSST had been involved in every step of the goals and objectives development and that the CCRSG had unanimously adopted the document.

John Ugoretz presented the SAT with two versions of goal 4, objective 1 that had both been approved by the CCRSG:

Goal 4. To protect marine natural heritage, including protection of representative and unique marine life habitats in central California waters, for their intrinsic value.

1. Option a. Include within MPAs the following habitat types: estuaries, heads of submarine canyons, pinnacles, upwelling centers, and larval retention areas.
1. Option b. Include within MPAs the following habitat types: estuaries, heads of submarine canyons, pinnacles, upwelling centers.

Although the decision would ultimately be made by the BRTF, John Ugoretz asked the SAT to make a recommendation. He stated that DFG staff would endorse option 1b without explicitly naming larval retention areas since they do not appear to be mappable outside of Monterey Bay.

The SAT recommendation on goal 4, objectives 1 and 2:

Given that upwelling centers and larval retention areas are representative habitats and mappable in a gross sense (using headlands as a proxy for upcoast upwelling, downcoast retention) they are included in objective 2 and thus do not need additional note in objective 1. This would result in selecting objective 1b and eliminating “upwelling centers” from that objective.

The discussion leading to this recommendation included the following major issues:

- Larval retention areas are listed as a habitat type in the MPF. Is the intent to have them treated as all other habitats (e.g. criteria for replication, protection, etc.)? Or is the intent instead to recognize that larval retention areas and upwelling centers exist and there are consequences for including or not including them in MPA designs?
- Some larval retention areas are mappable, such as in northern Monterey Bay and south of Point Reyes.

- Plankton species compositions differ north and south of headlands indicating larval retention areas are likely to be associated with headlands. Birds are also likely found south of headlands in retention areas.
- Two major headlands exist in the central coast study region.
- There was much agreement that both upwelling centers and larval retention areas are important and should be considered, but not necessarily treated exactly like other habitat types listed. Both features are associated with biological indicators such as species composition.
- Goal 4, objective 2 covers the importance of representing all habitat types listed in the MPF in MPAs and therefore includes upwelling centers and larval retention areas.
  - Goal 4, objective 2: Protect, and replicate to the extent possible, representatives of all marine habitats identified in the MLPA or the MPF across a range of depths.
- Habitats with both high and low biological diversity should be considered and included in MPA design.

Other important details of revisions by the CCRSG to the goals and objectives included:

- The CCRSG adhered to the SAT suggestion to change the word “maintain” to “protect” in the objectives, but chose to retain the word “disturbance” rather than the SAT suggestion of “perturbations”.
- SAT input and language was included in the revision of goal 3, objective 2 concerning replication of MPAs.
- SAT recommendation to include water quality was added as a design consideration, although in a somewhat vague way.
- SAT advice about forming separate objectives to deal with consumptive and non-consumptive recreational uses was considered.
- Design consideration 1 was written by non-socioeconomic scientists and is not intended to be read technically. A SAT member explained that a technical reading of this design consideration would commit the process to measuring impacts in a very specific way.

## **Evaluation of Existing and Proposed MPAs**

John Kirlin opened the discussion by emphasizing the importance of SAT input on the monitoring and evaluation of MPAs. On the subject of networks, he explained that none of the existing contracts included information about networks, but that networks would be the topic of one of the upcoming SAT presentations to the BRTF and possibly CCRSG.

John Kirlin went on to explain that the monitoring and evaluation matrix document created by MLPA Initiative staff was based on the design considerations in the MPF and the goals and objectives of the CCRSG. The purpose of further SAT input is to fill in gaps in the matrix, but not to add new evaluation criteria. The October CCRSG meeting will be focused on devising a

process by which MPA proposals are created and organized. The matrix will be valuable both in creating proposals and in evaluating them.

In addition to the matrix, various SAT members have proposed the development of tools to aid in SAT evaluation of MPA proposals. All proposals must be submitted to the appropriate budget authority and will be handled as directed in the newly revised and adopted SAT Guidelines.

John Kirlin finished his introduction by asking the SAT to consider whether different monitoring and evaluation criteria are needed to evaluate existing MPAs, MPA proposals, and long-term MPA effects in light of the MLPA goals concerning ecosystem-based management. In addition, is there other information from MPAs that might be useful in answering scientific questions about the marine environment in general? A conference call organized by MLPA Initiative staff will be held on these topics tomorrow.

John Ugoretz then gave a description of the monitoring and evaluation matrix document. The goals and objectives were updated to reflect the most recent version from the CCRSG. The best data available was used which included coarse scale data everywhere and fine scale data where available. In the matrix itself, representative habitats are divided by type and depth where applicable. The amount of each habitat in existing MPAs is quantified. The following color codes were used to indicate data sources:

- Yellow: Coarse scale habitat mapping (200m resolution)
- Green: Fine scale habitat mapping (1-5m resolution, sources: CSUMB and USGS)
- Pink: Anecdotal data

Anecdotal data collection was limited to CCRSG members, MLPA Initiative staff, and SAT members. In particular, CCRSG members were given a form and asked to list the habitat types in each MPA. They were also asked about the presence or absence of 13 species from the draft species likely to benefit list. Some stakeholders were asked about the levels and types of usage in certain areas. John Ugoretz then invited socio-economic expertise on appropriate uses of the data collected and heeded advice about careful documentation of the data collection method.

Size and spacing guidelines from the MPF have been included in the matrix. However, freshwater plumes, larval retention areas, and upwelling centers have not. Versions of the matrix in various units (e.g. fathoms, feet, meters) are available. Protection status of species in MPAs was considered. Discussion by the SAT included:

- Data should be given in the same units regardless of source.
- The matrix should accurately reflect the true dimensions of the existing MPAs (e.g. maximum depth).
- Available studies or other sources of information for each MPA should be referenced.
- It is important to recognize the presence of more than the 13 listed species.

- The symbol “N/A” should be used to indicate when a cell is empty because the category is not applicable.
- The symbol “0\*” should be used to indicate when fine scale data is not available but there is anecdotal data.
- Tables with both raw data and scaled estimates would be very useful. Using only raw data can be problematic if not all of the habitat in an MPA has been sampled.
- Habitat quality is important, but would be difficult to include in the matrix.
- Separating data by MPA type would be useful (e.g. three columns for the three types of MPAs listed in the MPF)
- If possible, it would be nice to have the data broken into 50 or 100-mile swaths.
- There was concern about a disconnect between the matrix, CCRSG goals and objectives, and evaluation criteria developed by the SAT Monitoring and Evaluation Sub-Team.

John Ugoretz announced that a revised version of the matrix would be sent to the SAT in a few days. He asked the SAT to focus their review on benchmarks used to evaluate existing MPAs, how benchmarks might respond in other areas after MPA implementation, and an appropriate measure for the diversity of habitat types. He also reminded them that evaluation of proposed MPAs included aspects not represented in the matrix (e.g. socio-economic goals and objectives).

John Ugoretz thanked the SAT members for their input and then introduced Paulo Serpa to talk about the mapping of pinnacles. Paulo Serpa explained that the pinnacle GIS layer is a preliminary count-point layer based on a mean change in relief of 10m or more in a 5m x 5m cell based on the bathymetric position index. The bathymetric position index is adopted from the well-referenced topographic position index. The data are a mosaic of data from California State University Monterey Bay (CSUMB) and United States Geological Survey (USGS) models converted to a 5m x 5m grid. There are some data artifacts where the datasets overlap, but staff is working with experts at CSUMB to resolve this issue.

A brief discussion highlighted that the data layer may be modified as it is more carefully reviewed. A SAT member suggested that other data sources on pinnacle location in the peer-reviewed literature be considered. The response from DFG staff indicated that in order to keep the data collection methods in the current pinnacle GIS layer unambiguous, such literature review additions or deletions would likely be included in a separate data layer.

### **Tools for the Evaluation of Existing and Proposed MPAs**

John Kirilin led a discussion on a variety of tools that might be helpful in MPA evaluation for both the central coast study region and the rest of California. These tools would be in addition to the IMMSG tool already developed by MLPA Initiative contractors. A summary of preliminary proposals for two tools is:

- Calculating lifetime egg production (Loo Botsford): LEP is calculated for a variety of rockfish species based on stock assessments and other existing data sets. Given a spatial arrangement and a variety of dispersal distances, LEP analysis can show how MPA networks affect population persistence. This analysis has been done with a stakeholder group in Point Reyes. LEP analysis has been done on five species already with datasets available for another six species. In addition, state and federal data sources are available for another 17 species. In total, there is potential for LEP analysis to be done on a total of 28 species. Some of this could be completed in the next few months.
- Updated version of MARXAN (Astrid Scholz, Steve Gaines, and Hugh Possingham): Tools like MARXAN have been useful in a variety of planning processes to help optimize MPA designs to meet specific goals and identify critical components of successful designs. However, in its current state MARXAN cannot consider biological and socioeconomic information at the same time. The current version also allows for only one type of MPA – marine reserves. Reviews on this subject were referenced in the document distributed at the August 30, 2005 SAT meeting. This proposal would support work to update MARXAN so that several types of data and MPAs could be considered simultaneously. This work could be done in a time frame of three to six months.

After outlining the proposals, Loo Botsford, Astrid Scholz, and Steve Gaines all left the meeting room pursuant to the SAT guidelines during the subsequent SAT discussion. In general, the SAT showed support for both proposals. An updated version of MARXAN would be a useful tool for the MLPA Initiative and other processes. Calculation of LEP could provide a means of evaluation in cases where stock assessments are not available (particularly for nearshore species). Both proposals offer additional sources of information and will help to reduce uncertainty in the process. However, it will be important to think about how value judgments should be considered along with the more quantitative measures from these tools.

John Kirilin closed the discussion by saying he would give the contracts further consideration and may contact SAT members for future discussion. He also agreed to post the titles and personnel (including bios) for existing contracts with the MLPA Initiative on the MLPA Initiative website.

### **Draft Presentations**

John Ugoretz reminded SAT members that the following set of SAT presentations would be given in the morning of the BRTF meeting on September 29, 2005 in San Luis Obispo and again in the evening of the October 5, 2005 CCRSG meeting in Monterey:

- Population persistence (or the importance of big, old rockfish) - Dr. Louis Botsford, University of California, Davis
- Larval dispersal and recruitment - Dr. Mark Carr, University of California, Santa Cruz
- Adult movement and neighborhoods - Dr. Richard M. Starr, California State University, Monterey Bay

Draft versions of all three presentations were originally given at the SAT meeting on August 2, 2005. Please refer to the meeting summary from that day for more details on the presentations. Feedback regarding the updated versions:

- Population persistence (or the importance of big, old rockfish) - Dr. Louis Botsford, University of California, Davis
  - Initial slide about a fish life cycle can be used to introduce the concepts of how fishing young vs. old adults can affect population sustainability. This slide might be good to bring back when talking about lifetime egg production.
  - Important to use the terms “reserve” and “MPA” appropriately.
- Larval dispersal and recruitment - Dr. Mark Carr, University of California, Santa Cruz
  - Statement that 50% of invertebrates are in the plankton for under a day should be corrected.
  - Although slides explicitly addressing MPA networks have been removed since the last draft, talking about MPA size, location, and spacing with regard to the MPA design guidelines in the MPF is important.
  - It is not clear how the BRTF will define a network.
  - Purpose of talk is to provide the BRTF with basic knowledge on this topic.
- Adult movement and neighborhoods - Dr. Richard M. Starr, California State University, Monterey Bay
  - Most of the changes to this presentation since the last draft were to graphics and organization of topics.

Steve Gaines announced that the presentation on MPA network design was being designed in collaboration with Ray Hilborn and Loo Botsford.

Kenneth Schiff gave a presentation on water quality with the following major points:

- Aimed level of presentation for advanced high school/first year of college
- Sources of potential pollutants (examples below)
  - Point sources: treatment works, industrial facilities, power generating stations
  - Nonpoint sources: urban and agricultural runoff, dredged materials, atmospheric deposition, boating and shipping
- Types of pollutants (examples below)
  - Nutrients: nitrogen, phosphorous
    - Potential effects: eutrophication
    - Showed graph indicating nutrient concentrations from central coast rivers.
  - Toxics: metals, pesticides, herbicides
    - Potential effects: acute or chronic toxicity, bioaccumulation
    - Showed data relating fertilization success in sea urchins with level of toxic pollutants in the water

- Showed data indicating the levels of DDT in some central and southern California fish and crabs
- Pathogens: fecal indicator bacteria, virus, protozoa
  - Potential effects: gastrointestinal illnesses, other illnesses/infections, non-target diseases
  - Showed data for microbial levels at various beach sites
- Emerging chemicals: endocrine disruptors, PBDE
  - Potential effects: hormone mimicry
  - Discussed increased estrogen levels found in male fish
- Nontraditional pollutants: sediments
  - Potential effects: habitat alteration, light attenuation
  - Discussed satellite imagery of increased turbidity due to sediments
- Ken emphasized that not all pollutants are anthropogenic and not all anthropogenic discharges result in impacts
- The following aspects of water quality are important to consider in siting MPAs:
  - Proximity to historical, current, and future discharges
  - Areas of swimming advisories and closures
  - Areas of seafood advisories and closures

SAT discussion on the water quality presentation included:

- Slide with take home messages should be up front in the presentation
- Some data layers mentioned in the talk are available
- Brief mention of thermal impacts of power plants should be included, although thermal impacts are highly localized and entrainment is a far bigger impact (this can go in the section for non-traditional impacts)
- Potential for a separate presentation on the Diablo report
- Difficult to think how many of these impacts affect the open ocean
- Focusing on particular issues that are important to consider when siting MPAs would be helpful to BRTF and CCRSG. For example:
  - Impacts of outfalls
  - Quantifying impacts in space and time (these can sometimes be chemical specific)
  - Relative impacts of point versus non-point sources of pollution
  - How the geography of marine pollution relates to the geography of MPAs

### **Update on Central Coast Regional Stakeholder Group**

This item was removed from this meeting's agenda due to time constraints.

### **Public Comment and Wrap Up**

There was no public comment.

Steve Barrager closed the meeting by congratulating the SAT members on a great meeting and reminded them that a SAT representative was still needed for the BRTF meeting on September 29 2005.

### **Upcoming Meetings**

The next SAT meeting will be held October 18, 2005 in San Luis Obispo, CA.