California MLPA Master Plan Science Advisory Team

Proceedings of the MLPA Master Plan Science Advisory Team for the MLPA South Coast Study Region

October 27, 2009

The Marine Life Protection Act (MLPA) requires the use of the best readily available scientific information to achieve the goal of redesigning California's system of marine protected areas (MPAs) to, among other things, increase the coherence and effectiveness of protecting the state's marine life and habitats, marine ecosystems, and marine natural heritage, as well as to improve recreational, educational and study opportunities in marine ecosystems that are subject to minimal human disturbance, while functioning as a network. A science advisory team (SAT), appointed in each study region, works to ensure that the best readily available science is used to inform and guide implementation of the MLPA.

The SAT for the MLPA South Coast Study Region (SCSR SAT) consisted of 21 scientists with diverse expertise (Appendix 1). Each member was selected based on her/his scientific knowledge and reputation. SCSR SAT members included natural and social scientists who together provided a vast and high level of scientific knowledge and experience with coastal marine ecosystems and the SCSR. The purpose of this document is to summarize and review the work of the SCSR SAT in providing the scientific information required to inform and support the marine protected area planning in the SCSR.

The SCSR SAT supported the MLPA Blue Ribbon Task Force (BRTF) and MLPA South Coast Regional Stakeholder Group (SCRSG) in designing their proposals for a network of MPAs in the SCSR. The SCSR SAT reviewed science guidance in the *California Marine Life Protection Act Master Plan for Marine Protected Areas* (Master Plan) and provided recommendations for how to apply science guidance in the SCSR. The science guidance in the Master Plan originally was developed by the SAT in the MLPA Central Coast Study Region (CCSR) and then refined as new and relevant information emerged in the MLPA North Central Coast Study Region (NCCSR) and the SCSR. The science guidance in the Master Plan was peer-reviewed by a group of external scientists and ultimately adopted by the California Fish and Game Commission.

In performing its work, the SCSR SAT relied strongly on principles and concepts appearing in the peer-reviewed scientific literature. The SCSR SAT drew from a broad range of expertise among its members and, when the need arose, sought outside expertise to fill information gaps. The SCSR SAT advanced the informative value of the guidance and evaluation tools used in the CCSR and the NCCSR and developed new science-based approaches to better inform SCSR stakeholders and MLPA decision-makers. All SCSR SAT scientific decisions were discussed openly in public meetings, and made only after receiving public comment. With few exceptions, SCSR SAT decisions on guidelines and evaluation tools were approved by a unanimous vote, indicating strong consensus among the 21 SCSR SAT members.

The SCSR SAT met in person or participated in teleconferences/webinars during 11 meetings held over 13 days from September 2008 through October 2009. A list of meetings and meeting objectives and accomplishments is included in Appendix 2. During these meetings the SCSR SAT discussed scientific data and concepts related to the MLPA process. With an eye toward unique features affecting the MLPA process in the SCSR, the SCSR SAT: 1) developed

criteria for accepting robust scientific data inputs, 2) reviewed and revised, where necessary, existing science guidelines for designing MPA networks, 3) produced answers to SCRSG and BRTF questions, and 4) developed and reviewed evaluations of MPA proposals developed by the SCRSG and external proponents.

Data Inputs

The SCSR SAT approved robust criteria for accepting data inputs, e.g., for habitat availability, to ensure a consistent standard of resolution and information quality for informing the MLPA process. Additionally, the SCSR SAT developed new approaches for filling in missing but essential data gaps (e.g., availability of shallow rock habitat) and addressing the dynamic nature of important habitat-forming populations of living organisms (e.g., kelp bed coverage). The MLPA Initiative contracted with independent scientists to map fine-scale habitats and areas of importance to commercial and recreational fishers in the SCSR. Fine-scale habitat data were included in MarineMap and made available for design and evaluation of proposed MPAs. The SCSR SAT used the spatial information on fisheries to estimate the maximum potential economic impact of individual MPAs and entire MPA networks on commercial and recreational fishing.

Design Guidelines

The SAT provided several refinements to the design guidelines used in the CCSR and NCCSR and generated information and new approaches specific to the unique characteristics of the SCSR. Related to the science guidelines for MPA design, the SCSR SAT determined:

- key marine habitats in the SCSR to be incorporated within MPA networks,
- the minimum size of each key marine habitat needed to protect 90% of the associated biodiversity,
- unique marine habitats in the SCSR that may be considered for protection in MPAs,
- five bioregions in the SCSR, based on available data on species associated with rocky reef and soft bottom communities,
- the need for at least one replicate MPA for each habitat type in each of the five bioregions, and
- species likely to benefit from MPAs in the SCSR.

Further, the SAT determined that the previous guideline for spacing between MPAs should be applied only to the mainland coast because the complex geography and ocean circulation associated with California's Channel Islands, which affects the potential for movement of larvae and juveniles around and between islands and the mainland.

SCSRG Questions

The SCSR SAT formed workgroups to develop scientific responses to questions from the SCRSG and BRTF. These responses were provided through written documents and presentations; all responses were posted on the MLPA website. The SCRSG posed questions about a variety of topics, e.g., minimum MPA size guidelines, spacing of MPAs at the Channel Islands, connectivity between the northern Channel Islands and the mainland coast, movement

of California halibut, larval retention zones, survivorship of larvae in MPAs, bycatch for catch and release fisheries, water quality threats and pollutants, and use of persistent and maximum kelp in MPA design and evaluation, among others. Due to the high level of military activity in the SCSR, the BRTF asked the SCSR SAT to describe and analyze ecological characteristics of areas used by the military and potential impacts of military activities. Further, the BRTF requested that the SCSR SAT evaluate available habitat in three pending military closures and MPAs proposed by the SCRSG on San Nicolas Island, Begg Rock and San Clemente Island, and evaluate potential impacts of military activities in those areas.

Evaluation

Building on the work of the CCSR and NCCSR SATs, the SCSR SAT expanded, approved and applied the *Draft Methods Used to Evaluate Marine Protected Area Proposals in the MLPA South Coast Study Region*. Science evaluations include habitat representation and replication, MPA size and spacing, bioeconomic modeling, marine birds and marine mammals, potential economic impacts to commercial and recreational fisheries, and water and sediment quality. To evaluate proposed MPAs, the SCSR SAT developed a conceptual model for determining the level of protection to an ecosystem based on the impacts of the types of human activities allowed in individual MPAs. These levels of protection ranged from *very high* in a fully protected marine reserve where no extractive activity is allowed, to *low* in MPAs where allowed activities may alter habitat or negatively affect resident species. The SCSR SAT responded to the strong interest in improving understanding of the socio-economic impacts of SCSR MPAs by creating and refining a unique bioeconomic model for estimating the effects of protection from individual MPAs and MPA networks on biomass production and fishery yield under different levels of external fishing pressure. The SAT also incorporated analyses of maximum economic impact to commercial and recreational fisheries to further inform the development of MPA networks in the SCSR. Lastly, the SCSR SAT created a new evaluation approach for water and sediment quality in proposed MPAs. In doing so, the SCSR SAT identified areas of greatest water quality impact to be avoided in the design of MPAs and areas of water quality opportunity (e.g., Areas of Special Biological Significance) that would complement the goals for proposed MPAs.

The SCSR SAT evaluated proposed MPAs in external proposals developed by external proponents and draft MPA arrays and proposals developed by the SCRSG during three iterative rounds of design. For each evaluation, members of the SAT evaluation workgroup presented preliminary results to the SCSR SAT, incorporated suggestions from SAT members following public comment, and presented revised and approved evaluation results to the BRTF and SCRSG. For each evaluation, the SAT evaluation workgroup members created, distributed and delivered PowerPoint presentations and written summaries, and posted supplemental information to the MLPA website.

In summary, the SCSR SAT served a critical role in the application of the MLPA to the SCSR. The SCSR SAT responded to issues and questions raised by the BRTF and members of the SCRSG and used its collective scientific expertise to ensure that the best available science was used in the SCSR MLPA process.

Appendix 1

California Marine Life Protection Act Initiative
Members of the MLPA Master Plan Science Advisory Team for the
MLPA South Coast Study Region

Dr. Larry Allen *(co-chair)*, Department of Biology, California State University, Northridge

Dr. Richard Ambrose, UCLA, Department of Environmental Health Sciences, University of California, Los Angeles

Dr. Eric Bjorkstedt, Fisheries Biology Department, Humboldt State University and Southwest Fisheries Science Center, National Marine Fisheries Service

Dr. Mark H. Carr *(co-chair)****,*** Department of Ecology and Evolutionary Biology, University of California, Santa Cruz

Dr. Susan J. Chivers, Southwest Fisheries Science Center, National Marine Fisheries Service

Dr. Christopher Costello, Bren School of Environmental Science & Management, University of California, Santa Barbara

Dr. Paul Dayton, Scripps Institution of Oceanography, University of California, San Diego

Kevin Fleming, California Department of Parks and Recreation

Dr. Steven D. Gaines, Marine Science Institute, University of California, Santa Barbara

Dominic Gregorio, Ocean Standards Unit, State Water Resources Control Board

Dr. Ray Hilborn, School of Aquatic and Fishery Sciences, University of Washington

Dr. John L. Largier, Bodega Marine Laboratory, University of California, Davis

Dr. Steven G. Morgan, Bodega Marine Laboratory, University of California, Davis

Dr. Steven N. Murray (co-chair), College of Natural Sciences and Mathematics, California State University, Fullerton

Dr. Daniel J. Pondella II, Department of Biology, Occidental College

Dr. Peter T. Raimondi, Long Marine Laboratory, University of California, Santa Cruz

Dan Robinette, Vandenberg Field Station, Point Reyes Bird Observatory Conservation Science

Dr. Astrid J. Scholz, Ecotrust

Dr. Stephen Stohs, Southwest Fisheries Science Center, National Marine Fisheries Service

Dr. Stephen Weisberg, Southern California Coastal Water Research Project

Stephen P. Wertz, Marine Region, California Department of Fish and Game

Appendix 2

California Marine Life Protection Act Initiative
Meetings of the MLPA Master Plan Science Advisory Team for the MLPA South Coast Study Region

1. September 10, 2008, 11 a.m., Teleconference/webinar
    a. Objectives:
        i. Welcome new MLPA Master Plan Science Advisory Team (SAT) members
        ii. Receive an introduction to the MLPA Initiative process and players
        iii. Receive an introduction to open meeting requirements and how they apply to the SAT
        iv. Review SAT charter, operating guidelines and meeting timeline
        v. Receive briefing on the science guidance adopted in the California MLPA Master Plan for Marine Protected Areas (MPAs)
        vi. Receive briefing on the MPA evaluation methods developed in the central coast and north central coast processes of the MLPA Initiative

2. September 15, 2008, 9:30 a.m., Embassy Suites Los Angeles - International Airport/South, El Segundo, California
    a. Objectives:
        i. Welcome MLPA Master Plan SAT members for the MLPA South Coast Study Region (SCSR)
        ii. Potentially adopt list of species likely to benefit for the MLPA North Central Coast Study Region (NCCSR)
        iii. Potentially adopt the Methods Used to Evaluate MPA Proposals in the NCSR
        iv. Potentially adopt SAT operating principles and select SAT chair(s)
        v. Discuss biogeography in the SCSR
        vi. Receive report from modeling work group and discuss ideas for future study regions
        vii. Discuss recommendations for considering water quality for MPA planning
        viii. Discuss initial SCSR science questions and issues
        ix. Identify SAT work groups to begin addressing science questions
        x. Discuss and potentially adopt criteria for handling external data and information
        xi. Thank you and farewell to NCCSR SAT members
    b. Accomplishments:
        i. The NCCSR SAT voted to adopt a final version of the list of species likely to benefit from MPAs in the MLPA NCCSR.
        ii. The NCCSR SAT voted to adopt the Methods Used to Evaluate MPA Proposals in the NCCSR.
        iii. Members of the SCSR SAT formed work groups to draft answers to preliminary science questions and elected a chair and two co-chairs.

3. November 12, 2008, 9:30 a.m., Sheraton Gateway Los Angeles Hotel, Los Angeles, California
    a. Objectives:
        i. Discuss the California Fish and Game Commission (FGC) request regarding the northern Channel Islands
        ii. Discuss application of size and spacing guidelines to the MLPA SCSR
        iii. Discuss and potentially adopt bioregions for the MLPA SCSR
        iv. Discuss and potentially adopt the list of key and unique habitats in the MLPA SCSR
        v. Discuss restored habitats, habitat alterations, and artificial structures
        vi. Review and begin developing the criteria and methods used in determining levels of protection for the MLPA SCSR
        vii. Review, discuss and potentially adopt criteria used to develop the species likely to benefit list for the MLPA SCSR
        viii. Review and provide feedback on proposed presentations to the MLPA South Coast Regional Stakeholder Group (SCRSG)
    b. Accomplishments:
        i. Approved presentations on the existing Northern Channel Islands MPAs to be delivered to the California Fish and Game Commission
        ii. Approved presentations on fish movement and habitats in the SCSR to be presented to the MLPA Blue Ribbon Task Force (BRTF) and MLPA SCRSG
        iii. Approved the five proposed bioregions for the MLPA SCSR.
        iv. Approved the proposed key and unique habitats.
        v. Work groups for levels of protection, species likely to benefit, and restored habitats will continue to refine their guidance documents and the criteria used to create the science guidelines for design of MPAs.

4. December 17, 2008, 9:30 a.m., Sheraton Gateway Hotel, Los Angeles, California
    a. Objectives:
        i. Review and potentially adopt MPA evaluation methods for the MLPA SCSR
        ii. Review and discuss habitat quality guidance
        iii. Review and potentially adopt revisions to criteria for the list of species likely to benefit from MPAs for the MLPA SCSR
        iv. Assign work groups to address science questions from the MLPA SCRSG
        v. Review and provide feedback on proposed science presentations to the SCRSG and MLPA BRTF
    b. Accomplishments:
        i. Approved methods for evaluating habitat representation
        ii. Approved delineation of five bioregions in the SCSR
        iii. Approved current approach to identifying unique habitats
        iv. Approved criteria for populating the species likely to benefit list
        v. Approved three science presentations to be given to the SCRSG

5. January 23 and January 27, 2009: January 23, 1:00 p.m., Conference call; January 27, 9:30 a.m., Sheraton Gateway Los Angeles Hotel, Los Angeles, California
    a. Objectives:
        i. Review and potentially adopt MPA evaluation methods for the MLPA SCSR
        ii. Review preliminary responses to science questions from the MLPA SCRSG
        iii. Review list of species likely to benefit from MPAs
        iv. Designate SAT MPA Proposal Evaluation Work Group members

6. February 24, 2009, 9:30 a.m., Teleconference/webinar
    a. Objectives:
        i. Discuss and potentially approve the MLPA Master Plan SAT response to the MLPA BRTF request regarding U.S. Department of Defense "military use areas"
        ii. Review, discuss and potentially approve MPA design guidelines and evaluation methods for the MLPA SCSR
        iii. Review, discuss and potentially approve the list of species likely to benefit from MPAs
        iv. Review and potentially approve SAT responses to questions from the MLPA SCRSG

7. April 1 and April 6, 2009: April 1, 9:30 a.m., Embassy Suites LAX North, Los Angeles, California; April 6, 1:30 p.m., Teleconference/webinar
    a. Objectives:
        i. Discuss and potentially approve the MLPA Master Plan SAT response to the MLPA BRTF request regarding U.S. Department of Defense "military use areas"
        ii. Review, discuss and potentially approve level of protection designations
        iii. Review, discuss and potentially approve the SAT evaluations of MLPA SCRSG draft MPA arrays and draft external MPA proposals
        iv. Review, discuss and potentially approve the water quality evaluation methods for MPA proposals in the MLPA SCSR
        v. Review and discuss draft document regarding beach manipulation activities in the MLPA SCSR
        vi. Review and potentially approve SAT responses to questions from the MLPA SCRSG
        vii. Review and potentially approve commercial and recreational fishing chapter of the SCSR evaluation methods document

8. May 5, 2009, 9:30 a.m. , Teleconference/webinar, with four public locations (San Diego, Los Alamitos, Santa Barbara and Sacramento)
    a. Objectives:
        i. Receive briefing on requests made at the April 15-16, 2009 BRTF meeting
        ii. Discuss and potentially approve the revised marine birds evaluation methods
        iii. Discuss and potentially approve the revised water quality evaluation methods and guidance

iv. Discuss and potentially approve the approach for addressing habitat data gaps
v. Discuss and potentially approve the wetlands restoration activities and artificial reef background information documents
vi. Discuss and potentially approve the MLPA Master Plan SAT analysis of military activities
vii. Discuss and potentially approve the draft response to the MLPA BRTF's request for a description of the SAT's use of fisheries information
viii. Discuss and potentially approve the proposed concepts for designing MPA networks for adaptive management document

9. May 15, 2009, 2:30 p.m., Teleconference/webinar
    a. Objectives:
        i. Discuss and potentially approve the draft evaluation of ecological contributions of pending military closures and proposed MPAs at San Nicolas Island, Begg Rock and San Clemente Island
        ii. Discuss and potentially approve the draft MLPA Master Plan SAT analysis of military activities

10. June 18, 2009, 9:30 am , Embassy Suites LAX North, Los Angeles, California
    a. Objectives:
        i. Review, discuss and potentially approve text associated with the levels of protection approved at the April 1, 2009 SAT meeting and newly proposed levels of protection
        ii. Review, discuss and potentially approve SAT evaluations of MLPA SCRSG draft MPA proposals and revised external MPA proposals
        iii. Review and potentially approve additions to the water quality guidance document

11. October 6, 2009, 9:30 am, Radisson Hotel at Los Angeles Airport, Los Angeles, California
    a. Objectives:
        i. Review and potentially adopt MPA evaluation methods for the MLPA SCSR
        ii. Review, discuss and potentially approve newly proposed levels of protection
        iii. Review and potentially adopt SAT evaluations of the MLPA SCRSG final MPA proposals
        iv. Thank members of the MLPA Master Plan SAT for the SCSR for their service to the people of California