The Bren School of Environmental Science and Management
MESM Group Project Proposal

Design of Marine Protected Areas in North Central California
in Accordance with the Marine Life Protection Act

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Background

In 1999 California enacted the Marine Life Protection Act (MLPA) aimed at protecting the state's ocean and coastal resources from threats by coastal development, water pollution, and other human activities. The legislation mandates that the California Department of Fish and Game (CDFG) develop a plan to establish a network of marine protected areas, to be designed, created, and managed according to sound science in order to protect the diversity and abundance of marine life and the integrity of marine ecosystems. In 2004, with support of both public and private funding, the MLPA Initiative was created to implement the Act. The Initiative team selected Central California for the first phase of implementation. The MLPA Initiative consisted of a body of respected decision makers to guide the process (known as the Blue Ribbon Task Force), a Regional Stakeholder Group and a Science Advisory Team.

To date, the Blue Ribbon Task Force and the Initiative staff developed a Master Plan, which outlines the process for implementation of the Act throughout California. The Task Force presided over the process by which stakeholders developed a network of MPAs for Central California, with guidance from the Science Advisory Team. In May 2006, the Task Force and the Department delivered an array of options to the California Fish and Game Commission, which modified and selected a preferred option to reflect a broad array of stakeholder perspectives. Bren School graduate students contributed to the MLPA Initiative process by providing data and recommendations for MPAs in Central California (Chan et al, 2006). Several "lessons learned" reports were generated from the pilot process in central California, allowing for greater understanding of gaps in knowledge and recommendations to be applied to future regions. Now, the Initiative is focusing its efforts to execute the MLPA in the North Central Coast (NCC) region of California from Pigeon Point to Alder Creek, just north of Point Arena. As the Initiative process is just beginning in the NCC, this is as a unique opportunity to play an active role in contributing scientific information to help the implementing agency, the California Department of Fish and Game (CDFG), realize a strategic and cohesive network of MPAs in this region.

Problem Statement

Designing and implementing MPAs is a challenging endeavor due to the myriad of stakeholders involved and the numerous scientific, economic and social questions, many of which are not definitively answered by the best available science. In order for the BRTF to adequately reach its goals, it will need to evaluate and commission the compilation of a large amount of data and information from a variety of scientific studies and stakeholders.

A notable deficit in the MPA design processes for both the Central California coast and the Channel Islands Marine Reserve process was lack of information on how additional MPA restrictions will impact local fishermen and interact with existing fishing regulations. Despite requests from fishermen, neither the time nor resources were available for this type of analysis. Through literature review, data analysis and map creation, our group will provide tools allowing the Task Force, stakeholders, Initiative staff and the Science Advisory Team, to evaluate the combined effects of MPAs and existing spatial and temporal restrictions on California fisheries.

The process of implementing the MLPA in the Central Coast region revealed several gaps in knowledge and highlighted the limitations of MARXAN, the decision-support software used to evaluate MPA locations. To overcome these limitations, Ecotrust—as part of a collaborative project with the University of California, Santa Barbara, and University of California, Davis—and the University of Queensland, are developing an improved tool known as MarZone. MarZone is capable of identifying and evaluating multiple levels of MPA protection and incorporates multiple costs and conservation features into a systematic design framework. Ecotrust has invited our group to use MarZone to identify potential options, and consider trade-offs, for MPAs in the North Central Coast region. We also will contribute to the MLPA process by providing near real-time economic evaluations of the potential impacts of proposed MPAs on commercial fisheries and non-consumptive uses. Our proposal represents a significant advance beyond the Central Coast planning process, for which only retrospective economic analyses were performed.

Project Objectives

This Group Project will address the issues identified above by accomplishing the following objectives:

- Provide a highly desirable spatial and temporal analysis of the interaction between proposed MPAs and existing fisheries regulation. We will evaluate the cumulative economic impact on local fishing regimes and identify areas of conflicting, excessive, redundant, or insufficient regulations.
- Assist in pilot testing the new decision support tool MarZone, by incorporating available socio-economic and biophysical data and identifying locations of high conservation value and low potential impact on consumptive and non-consumptive users.
- Provide the Initiative with economic analyses of the potential impacts of proposed MPAs, ensuring that the BRFT makes decisions based on the best available information.

Possible Approach and Available Data

We will provide a new perspective on the cumulative impacts of proposed MPAs and existing fishery restrictions in the North Central Coast so that stakeholders and Initiative staff, as well as members of the SAT and BRTF will have a clear understanding of fishery management and economic implications associated with additional MPA placement. We will compile the combined information about spatial, temporal and other aspects (e.g., trip limits) of state and federal fishing restrictions, available in public documents. By assembling the information in a geographic information system, we shall create maps to identify interactions between different fishery regulations and proposed MPAs, illustrating potential conflicts, redundancies and gaps in regulations to support the decision making process.

We will have an opportunity to use the new decision-support tool, MarZone, by working with Ecotrust. MarZone, unlike MARXAN, is able to systematically incorporate different types of management zones and allows more complex consideration of socio-economic costs and benefits. Our Group Project will be the one of the first to apply this tool to identify potential options for a MPA network and analyze their ecological and economic impacts.

To evaluate potential trade-offs, MarZone requires a broad array of biophysical and economic data. The biophysical data are being gathered by the MLPA Initative's Geodatabase Team and are available to our Group Project and the public at www.marinemap.org. The database manager, Will McClintock, is based at the Marine Science Institute at the University of California, Santa Barbara, and has expressed his support for our Group Project. Ecotrust will be involved in the collection of socioeconomic data on commercial fisheries in the North Central Coast region and has invited at least one Bren student to complete a summer internship facilitating this data collection and analysis. We will work with Ecotrust to process the data and incorporate it into our MarZone analyses.

Significance

California's identity, vitality, heritage, and economy are interwoven with its coastal and ocean resources. The creation of the MLPA Initiative is a clear acknowledgement of their value and the need to ensure their future viability. The Initiative will have a profound economic, biological, and social effect on the future of these resources and offers an exceptional opportunity to develop effective MPAs based on sound scientific analyses.

This Bren Group Project will be able to significantly contribute to the understanding and effective management of California's marine ecosystems. Our efforts will be used by the science and policy advisory teams to develop a robust network of MPAs in North Central California. Maps and support tools generated throughout this project will contribute

valuable information to advance the critical policies that govern our coastal ocean. Moreover, a well-designed MPA network, based on sound science, will set a national example for the management of ocean and coastal resources.

In contrast to this project, the previous Bren Group Thesis Project associated with the MLPA Initiative was a retrospective analysis of the value of differing MPA location options. We are able to take advantage of the nascent status of implementing the MLPA in the North Central Coast region, a unique opportunity to actively influence the creation of policy, identify and fill gaps in knowledge, and apply lessons learned from the Central Coast region.

By addressing gaps in knowledge we will fill the need, requested by state officials, for a more formal analysis of economic impacts of potential MPA locations. In addition, fishermen and other stakeholders have been calling for a review of the cumulative impacts of existing fisheries regulations and MPAs. Our synthesis of this previously unconsidered information will result in a more robust and informed selection of MPAs. Proper analysis of MPA impacts on fishermen is a pervasive problem that has yet to be formally addressed. Our timely work will provide unprecedented information for the North Central Coast and other MPA processes in the future. The anticipated timeline for the North Central Coast Initiative process is March 2007 through March 2008, perfectly coinciding with the Bren Group Project cycle.

This project proposal has garnered interest and enthusiasm from many people involved with the Initiative process. We have strong local support and access to needed information resources because UCSB's Marine Science Institute hosts the MLPA geo-database (www.marinemap.org) and faculty at the Marine Science Institute serve on the MLPA Science Advisory Team and the Geodatabase Team. Our group aspires to provide an additional layer of data synthesis to the Initiative, improving the information available to decision-making bodies and resulting in the best possible suite of MPA options.

Stakeholders

The CDFG, The California Resources Agency, PISCO, commercial and recreational fisherman, MLPA Blue Ribbon Task Force, Science Advisory Team, North Central Coast Regional Stakeholder Group, and public users of ocean and coastal resources.

Project Deliverables

- GIS maps will be created to evaluate the combined (or cumulative) impacts of MPAs and existing fisheries restrictions. Data will be uploaded to marinemap.org, a web-based interactive database for analysis and evaluation of potential MPA locations, where it will be available for public and planning use.

- Using the MarZone decision support tool, our group, in conjunction with Ecotrust, will identify an array of options for potential networks of MPAs that satisfy the goals of the MLPA. We will:
  - Create reports describing the relative biological and socioeconomic benefits and costs of each option.
  - Submit our recommendations to the BRTF, SAT, and RSG for their review and consideration.
  - Disseminate our findings through Mary Gleason, a contractor responsible for gathering geospatial data for the working groups associated with the MLPA Initiative.

- Attend meetings with the Blue Ribbon Task Force, Science Advisory Team, and Regional Stakeholder Group to observe and interface with the Initiative process.

Anticipated Financial Needs and Sources of Support

Sources of support will come from collaborations with constituencies working on the Initiative. Confirmed collaborators include: Satie Airme (PISCO), Mary Gleason (MLPAI), Carrisa Klein and Charles Stenback (technical support for MarZone model), Astrid Schultz (Ecotrust- socio-economic data), Will McClintock (data management and dissemination). We have identified one summer internship with the PISCO policy program at UC Santa Barbara, and one or two summer internships with Ecotrust (to coincide with the Coastal Zone Conference in July 2007), as well as possible financial support from the MLPA Initiative, Ecotrust, and PISCO for travel to the project site. Anticipated financial needs include funds for group members to travel and attend key meetings at the project site.

References

California Department of Fish and Game (CDFG), Marine Region. 2006. *Maine Life Protection Act Initiative – A Conceptual Overview.* Retrieved December 18, 2006 from http://www.dfg.ca.gov/mrd/mlpa/overview.html.

California Department of Fish and Game. 2004. *Marine Life Protection Act Initiative.* Retrieved December 18, 2006 from www.drg.ca.gov/mrd/mlpa.html

California Resources Agency and California Environmental Protection Agency. 2004. *Protecting Our Ocean, California's Action Strategy.* Retrieved December 18, 2006 from http://resources.ca.gov/ocean/Cal_Ocean_Action_Strategy.pdf.

Chan, Allison, A. Cundiff, N. Gardner, Y. Hrovat, L. Kirsher, C. Klein. *Marine Protected Areas along California's Central Coast: A Multicriteria Analysis of Network Design.* The Donald Bren School of Environmental Science and Management Group Project Thesis, June 2006.

Donald Bren School of Environmental Science and Management (Bren). 2006. Group Project Guidelines Class of 2008. Retrieved December 2006. http://www.bren.ucsb.edu/services/student/documents/200607GPGuidelines_000.pdf

Harty, Michael. *Report on Lessons Learned From the Marine Life Protection Act Initiative.* August, 17 2006. Harty Conflict Consulting and Mediation. Davis, CA

McCreary, Scott. *California Marine Life Protection Act Initiative Central Coast Project: Facilitators Report.* CONCUR, Inc. August 10, 2006. Berkeley, CA

Raab, Jonathan. *California Marine Life Protection Act: Evaluation of the Central Coast Stakeholder Group Process* August 14, 2006. Raab Associates Ltd. Boston, CA