

CALIFORNIA OCEAN PROTECTION COUNCIL

Staff Recommendation

May 15, 2008

**Central Coast MPA Baseline Monitoring – Year 2**

File No.: 08-063-01

Project Manager: Christine Blackburn

**RECOMMENDED ACTION:** Authorization to disburse up to \$1,621,750 to the University of California, Santa Cruz (UCSC) and to San Jose State University Research Foundation to conduct a second year of baseline monitoring for the Central California Coast marine protected areas designated under the Marine Life Protection Act.

**LOCATION:** Central coast, in state waters

**STRATEGIC PLAN OBJECTIVE:** Research and Monitoring and Ocean and Coastal Ecosystems

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**EXHIBITS**

Exhibit 1: [Monitoring sites and types of monitoring](#)

Exhibit 2: [Summaries of Central Coast Marine Protected Area  
Monitoring Activities Completed in 2007](#)

Exhibit 3: [Letters of Support](#)

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**RESOLUTION AND FINDINGS:**

Staff recommends that the Ocean Protection Council adopt the following resolution pursuant to Sections 35500 *et seq.* of the Public Resources Code:

“The Ocean Protection Council hereby approves the disbursement of an amount not to exceed \$1,621,750 (one million six hundred twenty one thousand seven hundred fifty dollars) to undertake a second year of biological fieldwork, data acquisition, and monitoring under the Central Coast MPA Baseline Monitoring Program at marine protected area sites along the central coast region of the Marine Life Protection Act. Disbursements may be made under this authorization to the University of California, Santa Cruz (UCSC) and to San Jose State University Research Foundation.

This authorization is subject to the condition that, prior to disbursement of funds, each grantee of funds under this authorization submit for the review and approval of the Secretary to the Council:

1. A detailed work plan, including schedule and budget.
2. The names and qualifications of any contractors the grantee intends to retain to carry out the project.
3. Documentation that the grantee has obtained all permits and approvals necessary to implement the project.”

Staff further recommends that the Council adopt the following findings:

“Based on the accompanying staff report and attached exhibits, the Council hereby finds that:

1. The proposed project is consistent with the purposes of Division 26.5 of the Public Resources Code, the Ocean Protection Act.
2. The proposed project is consistent with the Ocean Protection Council's project funding guidelines.”

#### **PROJECT SUMMARY:**

The proposed project would support a second year of baseline monitoring fieldwork for central coast marine protected areas (MPAs) that were designated under the Marine Life Protection Act (MLPA). Staff is recommending that the Ocean Protection Council (OPC) authorize the disbursement of \$1,621,750 to the University of California Santa Cruz (UCSC) and to San Jose State University Research Foundation, the nonprofit organization that receives and manages grants for the consortium of research institutions that comprise the Moss Landing Marine Lab (MLML), to continue the Central Coast MPA Baseline Monitoring Program (Monitoring Program). A second year of data, which will be collected during the summer of 2008, will create a more robust baseline dataset for these MPAs and better allow the Department of Fish and Game (DFG) to assess the effect of MPAs on marine ecosystems and adaptively manage these areas according to the goals and objectives of the MLPA.

In 2007, following a competitive process funded by OPC and supported by DFG, the California Sea Grant Program awarded a grant to five research organizations to implement the Monitoring Program, a coordinated program to collect baseline data in the central coast study region. The Monitoring Program was implemented by a team comprised of researchers from UCSC, MLML, Cal Poly San Luis Obispo, and NOAA Fisheries (the Baseline Monitoring Team). The key biological habitats that have been and will be monitored as part of this program include rocky intertidal habitats, kelp forests, deep rocky reefs, and rocky-reef fish assemblages.

In 2007, the Baseline Monitoring Team successfully collected baseline information on a variety of ecological variables associated with the new MPAs, including the distribution, composition, relative abundance, and size frequencies of key fishes and invertebrates identified as conservation priorities during the MPA planning process (Exhibits 1 and 2). Similar data will be collected during the second year of monitoring within the same MPA and reference sites established during year 1.

#### **PROJECT DESCRIPTION:**

### **Project Background:**

The Marine Life Protection Act was passed by the California legislature in 1999 (Chapter 10.5 of the California Fish and Game Code, Sections 2850-2863) and required DFG to develop a plan for establishing a network of MPAs in California waters to protect habitats and preserve ecosystem integrity, among other things. Following an extensive public process, the Fish and Game Commission (FGC) approved the central coast network on April 13, 2007 and the regulations went into effect on September 21, 2007. This approved network includes 29 marine protected areas representing approximately 204 square miles (or approximately 18 percent) of state waters in the Central Coast Study Region.

Central Coast MPAs include:

- 15 State Marine Conservation Areas (SMCA) that limit recreational and commercial fishing
- 13 "no-take" State Marine Reserves (SMR)
- One State Marine Recreational Managed Area (SMRMA) where recreational fishing is limited or restricted

### **The Need for MPA Monitoring:**

The MLPA requires adaptive management to ensure that a system of MPAs meets its stated goals [Section 2853(c)(3)]. The MLPA defines adaptive management as “a management policy that seeks to improve management of biological resources, particularly in areas of scientific uncertainty, by viewing program actions as tools for learning. Actions shall be designed so that, even if they fail, they will provide useful information for future actions, and monitoring and evaluation shall be emphasized so that the interaction of different elements within marine systems may be better understood” (Section 2852 (a)). According to the MLPA *Final Draft Adaptive Management and Monitoring and Evaluation Framework*, “adaptive management requires learning from current experience to improve the process of achieving the goals of the MLPA over time. Success requires: (a) appropriately scaled, sustained institutional capacity to make legitimate choices; (b) possession, broad communication, and use of relevant information; and, (c) use of (a) and (b) to effect desired changes in policies, programs, and human behaviors intended to achieve the goals of the MLPA.” The first step in implementing such an effort is to ensure proper acquisition of quality baseline data for the central coast study region, so that future monitoring efforts have reliable reference points for evaluating changes that may occur over time inside and outside of the MPAs.

The MLPA identifies a 5-year evaluation timeline, implying that some initial assessment of biological and socioeconomic changes may be required as early as 2012. This 5-year timeline is similar to the review that was recently conducted for the Channel Islands Marine Reserves during which scientists showed that having more data during the initial years of MPA implementation made it easier to detect changes during the short review timeline.

A review of whether the MPAs are accomplishing MLPA goals will likely require comparisons of marine ecosystem characteristic trends (e.g., population densities and community composition) between the time of implementation (the baseline) and the year of the review. Another likely approach to MPA evaluations will involve comparison of the difference in ecosystem characteristics trends inside and outside of MPAs (i.e., how are populations or communities inside MPAs changing over time relative to those outside MPAs?).

For either of these approaches multi-year baselines are scientifically superior to a one-year baseline. Most responses are unlikely to change quickly (within 1-2 years) such that a more rigorous baseline will be produced if annual samples can be repeated close to the time of MPA implementation. Data collected over several years at the outset will allow DFG and others to estimate inter-annual variability in MPAs—highlighting what changes are due to the MPA regulations and what changes happen as a function of a dynamic environment.

Ultimately, more data we collect during the baseline period, the greater the statistical power will be to distinguish future changes. This analytical argument for repeated sampling over a short, initial period can be relaxed over time as the evaluation mileposts are lengthened.

### **Project Details and Scope of Work:**

The second year of biological monitoring under the MPA Monitoring Program will be undertaken by four different teams of researchers who will focus on specific habitat types and depths, as follows.

#### ***Submersible surveys of deep water habitats***

Direct observations from a manned submersible will be used to continue baseline surveys of demersal fishes, structure-forming invertebrates (e.g., deep-sea coral communities), and associated habitats in and near eight of the new MPAs on the central coast. These surveys are designed to collect quantitative information about the distribution and abundance of species in deep-water rocky communities.

The same 8 MPA sites and 8 reference sites from 2007 will again be monitored in 2008, including areas in and near: Soquel Canyon SMCA, Portuguese Ledge SMCA, Pt. Lobos SMR, Point Lobos SMCA, Point Sur SMR, Point Sur SMCA, Big Creek SMR, and Big Creek SMCA. At each sample site, the primary investigators will conduct quantitative, visual strip transects using a manned submersible to characterize seafloor habitats and to identify, count, and measure species of demersal fishes and macro-invertebrates. They will also record video of the transects from a camera mounted on the exterior of the submersible. After the cruise, a trained video analyst will count all the fish identified by the observers and relate the fishes to habitat type discerned from the video. Additionally, an invertebrate expert will analyze the video to quantify macroinvertebrates encountered on each transect. In addition to the number and density of each species observed on the transects, the scientists will specifically highlight the fish and invertebrate species encountered over soft bottom habitats. Researchers will use this information to develop better protocols for identifying fishes and invertebrates observed at the interfaces between habitats.

#### ***SCUBA surveys of kelp forests and rocky habitats***

Visual SCUBA surveys will be employed to survey fish, invertebrates, and algae associated with nearshore rocky reef and kelp forest habitat. Fish will be surveyed on benthic and mid-water transects at four depths between 5 and 20 meters. All fish except for small benthic cryptic species will be counted, length-estimated to the nearest centimeter, and identified to the lowest taxonomic level. Separate benthic community surveys will be conducted at three depths between 5 and 20 meters to record density and size of giant kelp (*Macrocystis*) and count understory kelps and large, mobile macro-invertebrates. Percent cover of sessile and colonial invertebrates and macroalgae will also be quantified using a point contact method which also provides data on

physical characteristics, substrate type, and relief at each site. In addition to density and percent cover data from transect surveys of fish, invertebrates, and algae, additional diver effort will be allocated to collect size-frequency data on commercially important invertebrate species (sea urchins and abalone) at all sites.

The same sites proposed for surveys as part of the 2007 baseline data collection will be visited again in year 2. These sites cover an area from north of Monterey Bay to Point Conception. A total of 102 sites covering 15 of the Central Coast MPAs include 36 sites within SMR, 20 within SMCA and 46 reference sites. These surveys will be conducted in cooperation with PISCO, Monterey Bay National Marine Sanctuary, DFG, and Reef Check California.

### ***Intertidal surveys***

Visual intertidal survey will be employed to measure biological and physical characteristics including biodiversity, relative abundance and size of key species, community structure and composition, topography, associations of species with particular habitats, and water temperature. The methods to be used include: photoplots, field sampling of biological communities and geospatial sampling. Over 80 reference and MPA sites that were surveyed in year 1 of the baseline study will be re-sampled in year 2. Particular attention will be paid to assessing parameters that are expected to change as a result of protection and redistribution of public take and access: these relate to poaching, legal take, and access impacts. In addition a photo-catalog will be created to aid in establishing a baseline.

### ***Surveys of Nearshore Fishes in Cooperation with Recreational Fishermen***

Quantitative hook and line surveys of rocky-reef fish assemblages will be continued using a collaborative fisheries model with the Commercial Passenger Fishing Vessel (CPFV) industry and volunteer anglers. Based on the work from last year, the program is expected to involve about 200 volunteer anglers from the recreational fishing community as part of the mark-and-recapture tagging program. The sampling design was developed with government resource managers (NOAA and DFG) and the recreational fishing industry and it will provide both useful information for monitoring the effectiveness of MPAs and data for fisheries management. Importantly, as outlined in the monitoring section of the MLPA Master Plan, the experimental design will gather indicator information on:

- Abundance and population structure of species of high ecological or human use value
- Composition and structure of a community (to some degree)
- Type and level of return on fishing effort
- Areas whose habitat or wildlife populations are showing signs of recovery

In 2008, the team will sample the same MPAs and reference sites that were sampled in 2007. Additionally one new MPA and reference site will be added (Piedras Blancas SMR). The 4 MPAs and 4 co-located reference sites (Año Nuevo SMR, Pt. Lobos SMR, Piedras Blancas SMR, and Pt. Buchon SMR) will be sampled twice a month for 3 months (likely August, September, and October). Cells for sampling (500m x 500m) have been stratified using fishermen knowledge and are selected at random on a given day. Hook and line gear and three standardized bait configurations (shrimp fly, baited shrimp-flies, and jigs) are used to capture fishes. All fishes captured are identified to species, measured, tagged, and released. Each fishing location is recorded using handheld GPS units and exact drift times are recorded for calculation

of standardized effort. Funds coming from additional sponsors are enabling the team to develop and execute a parallel collaboration with the commercial trap-fishing industry.

**PROJECT GRANTEEES:**

The researchers under the Monitoring Program were selected in 2007 through a competitive process managed by California Sea Grant. The second year of work under the Monitoring Program will be undertaken by the researchers who were responsible for the biological monitoring component of the Monitoring Program, a subset of the original team of researchers. (There is no need to continue the socioeconomic monitoring for a second year). The primary investigators involved in the first year and, under the proposed authorization, the second year of the Monitoring Program include:

- Peter Raimondi, UCSC – rocky intertidal surveys
- Mark Carr, UCSC – SCUBA kelp forest surveys
- Rick Starr, MLML and Mary Yoklavich, NOAA Fisheries – manned, deepwater submersible surveys
- Dean Wendt, Cal Poly San Luis Obispo and Rick Starr, MLML – cooperative recreational nearshore fishing surveys

A portion of the activities of the UCSC and MLML researchers will be funded under the proposed OPC authorization. The balance of their activities and the activities of the other researchers (affiliated with Cal Poly and NOAA Fisheries) will be funded by matching grant funds and in-kind contributions, as detailed in the Project Financing section, below.

Collectively these researchers have been conducting biological monitoring in the central coast for many years through the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) and other monitoring efforts.

**SITE DESCRIPTION:**

The MLPA central coast study region extends from Pigeon Point to Point Conception and encompasses 29 different MPAs. The locations of monitoring and reference sites for baseline monitoring and the types of habitat monitored at each site are detailed in exhibit 1.

**PROJECT HISTORY:**

The OPC funded the first year of central coast MPA baseline monitoring (\$2,275,000) in 2007 using a special one-time appropriation from the legislature. At the same meeting in November 2006, the OPC also approved a grant of \$2,000,000 to the California Ocean Science Trust to create the MPA Monitoring Enterprise (Monitoring Enterprise). The purpose of the enterprise is to ensure that MPA monitoring science is properly collected, managed, analyzed and disseminated. The primary functions of the Monitoring Enterprise are: (1) science, including developing monitoring strategies and analyzing data; (2) IT and data management; and (3) communication and dissemination of information.

In cooperation with DFG staff, the science component of the program includes developing plans and measures for monitoring managed ecosystems, developing externally reviewed protocols and

QA/QC approaches, collecting and managing data, and completing periodic analyses, syntheses, and interpretations of data to service resources managers, policymakers, and the public. The Ocean Science Trust and Monitoring Enterprise have been working to ensure that all monitoring data from the year 1 project onward are reported using the same metadata standards so that comparisons across the individual project can be made. Using these standards, data from the year 1 project will be reported shortly to the Monitoring Enterprise and DFG. Staff at the Monitoring Enterprise has also been working with interested stakeholders to ensure that a comprehensive monitoring plan will be in place before baseline data is collected in the other regions. The Monitoring Enterprise is drawing from lessons learned during the year 1 project to help formulate the statewide plan.

**PROJECT FINANCING:**

Ocean Protection Council	\$1,621,750
Matching and in-kind funds	<u>\$1,133,288</u>
<b>Total Project Cost</b>	<b>\$2,758,038</b>

The anticipated source of OPC funds will be the fiscal year 07/08 appropriation from the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84). Proposition 84 generally authorizes the use of these funds for the protection of coastal waters. The specific appropriation, pursuant to Public Resources Code Section 75060(g), allows for the expenditure of funds for purposes consistent with Section 35650 of Division 26.5 of the Public Resources Code, establishing the California Ocean Protection Trust Fund. Under Section 35650, Ocean Protection Trust Fund monies may be expended for projects authorized by the OPC that are consistent with the Ocean Protection Act (Public Resources Code Sections 35500 et seq.). As discussed in the section below, the project is consistent with the Ocean Protection Act. In addition, under section 35650, Ocean Protection Trust Fund monies may be expended for grants or direct expenditures on “projects or activities that provide monitoring and scientific data to improve state efforts to protect and conserve ocean resources”. That is the exact objective of the proposed project.

Finally, this project is appropriate for prioritization under the selection criteria set forth in Section 75060(g). Section 75060(g) provides that the Council will give priority to projects which help develop scientific data needed to adaptively manage the state’s marine resources and reserves.

The total amount of the authorization will be allocated to the different types of monitoring as follows:

SCUBA surveys	\$325,870
Rocky intertidal surveys	\$197,690
Submersible surveys	\$805,710
Cooperative nearshore surveys	\$292,480

Funds provided for the submersible and cooperative nearshore surveys will be granted to the San Jose State University Research Foundation, the organization that receives and manages grants for the consortium of research institutions that comprise the Moss Landing Marine Lab. The funds

for the SCUBA and intertidal surveys will be granted to UCSC.

The investigators for these projects will be combining OPC funds with matching and in-kind funds from other sources to complete the full scope of the project. These additional funds total \$1,133,288. The allocation of non-OPC funds for the different projects is:

SCUBA surveys	\$ 403,087
Rocky intertidal surveys	\$ 172,705
Submersible surveys	\$ 307,196
Cooperative nearshore surveys	\$ 250,300

**CONSISTENCY WITH CALIFORNIA OCEAN PROTECTION ACT:**

Under the Ocean Protection Act (Public Resources Code Sections 35500 *et seq.*), the OPC is charged with coordination of activities of state agencies related to the protection and conservation of coastal waters and ocean ecosystems, to improve the effectiveness of state efforts to protect ocean resources within existing fiscal limitations, consistent with Sections 35510 and 35515 and, in particular, to coordinate the collection and sharing of scientific data related to coast and ocean resources (Public Resources Codes section 35615(a)). Section 35510 identifies one of the major objective of these activities: to improve monitoring and data gathering and advance scientific understanding, to continually improve efforts to protect, conserve, restore, and manage coastal waters and ocean ecosystems.

The proposed project will squarely satisfy these objectives. It will provide data about changes in ocean resources as a result of the implementation of MPAs, and these data will be use to inform future actions by DFG regarding the appropriate management of the MPAs so as to meet the objectives of the MLPA. The information developed under the project concerning key species and habitats will also prove useful to other state agencies charged with coastal management, including the California Coastal Commission and the State Lands Commission.

**CONSISTENCY WITH OPC'S STRATEGIC PLAN GOAL(S) & OBJECTIVE(S):**

The proposed project is consistent with the Council’s 2006 Five-year Strategic Plan by furthering goals and objectives related to ocean and coastal ecosystems and research and monitoring. Specifically, the proposed project is consistent with goal E, objective 1b which guides the OPC to make “resources available to design and implement a comprehensive MPA monitoring program that can be implemented statewide, and that will measure changes in these ecosystems and inform future management decisions” and goal B, objective 2b to “support the establishment of a comprehensive monitoring program focused on MPAs established under the MLPA...and insure that this monitoring effort is integrated with other state and federal monitoring programs.”

This project will continue to provide data needed to assess the success of MPAs in the central coast. In addition, state personnel and academic researchers are continuing to learn what data are required to adequately monitoring changes in individual MPAs as well as the MPA network as a whole. Lessons learned in this region will be incorporated into the statewide MPA monitoring plan that is currently being prepared by the MPA Monitoring Enterprise and will be implemented in new regions as they are established.



## **CONSISTENCY WITH OPC'S PROJECT FUNDING GUIDELINES:**

The proposed project is consistent with the OPC's Project Funding Guidelines adopted June 14, 2007, in the following respects:

### **Required Criteria**

1. **Directly relate to the ocean and coast:** The monitoring will be conducted in coastal and ocean waters of the state.
2. **Support of the Public:** Funding for the first year of monitoring enjoyed broad support from organizations such as the County of Santa Cruz, the MLPA Initiative, NRDC, Ocean Conservancy, and the University of California Office of the President. Letters are provided from the Department of Fish and Game and the MPA Monitoring Enterprise to express their support for continuing funding for a second year (see exhibit 4).
3. **Greater-than-local interest:** The results will inform the adaptive management of the central coast region from Pigeon Point to Point Conception. In addition, lessons learned in this region about the type of scope of monitoring needed to adequately manage these areas will be applied to new MLPA regions as they are implemented.

### **Additional Criteria**

4. **Leverage:** A significant portion of the overall project will be undertaken through of matching funds or in-kind services. See the “Project Financing” section above for details.
5. **Timeliness or Urgency:** Monitoring for the second year must being in May or June to allow researchers to conduct surveys during the summer months when the weather and ocean conditions are most favorable.
6. **Coordination:** The project is a partnership between the OPC, DFG, Monitoring Enterprise, NOAA, and three research institutions within the central coast study region.

## **CONSISTENCY WITH OPC'S 2007/2008 FUNDING PRIORITIES**

This project is consistent with the strategic opportunities grants section of the 2007/2008 funding priorities. In particular, this project will provide essential data that will “improve management approaches and techniques for coastal and ocean resources” and it will continued partnerships with the Monitoring Enterprise, NOAA, research institutions, and DFG that will continue to “improve coordination or data sharing among local, state or regional entities.”

## **COMPLIANCE WITH CEQA**

The proposed project is categorically exempt from review under the California Environmental Quality Act (“CEQA”) pursuant to 14 Cal. Code of Regulations Section 15306 because the project involves only data collection, research and resource evaluation activities that will not result in a serious or major disturbance to an environmental resource. Staff will file a Notice of Exemption upon approval by the Council.