

**California MLPA Master Plan Science Advisory Team**  
**Draft Responses to Questions Received at the**  
**October 16-17, 2007 NCCRS Meeting**  
*Revised January 3, 2007*

The questions listed below were received at the NCCRS meeting on October 16-17, 2007. MLPA I-Team staff and the MLPA Master Plan Science Advisory Team (SAT) co-chairs have reviewed the questions and determined that some are policy/management based, others are science-based, and still others have both policy and science components.

This document contains responses to all of these questions. I-Team staff has provided responses to the policy/management questions, while the SAT has provided responses to the science questions. Some questions contain both policy and science responses.

**1. Would allowance of shore-based angling along a broad (100 yard) ribbon of the coast be acceptable and what impact would this have on the protection level of an MPA?**

**Staff response:** Each of these areas will, by definition, be classified as state marine conservation areas (SMCAs) or state marine parks (SMPs) and will be evaluated against the California Department of Fish and Game's (DFG's) feasibility criteria as well as be given a level of protection by the SAT. DFG's recommendation is to propose an SMCA or SMP that allows fishing from shore. A boundary distance offshore is not recommended since 100 yard fishing zones are not easily enforced and this could negate the intent to allow only shore-based fishing. DFG recommends against a separate narrow SMCA that allows fishing sited adjacent to and inshore of an SMR or other designation. This creates an abrupt change in regulations, multiple designations in a small area, is difficult to enforce, and creates difficulties for public understanding. DFG recommends that the SAT provide input on the ecological impacts of shore-based fishing on the overall level of protection of the area.

**Draft SAT response:** This question is being addressed in the evaluation of MPA proposals. Please see the document *Draft MLPA Evaluation Methods for MPA Proposals*.

**2. Where is the sewer outfall from San Francisco in relation to the Gulf of the Farallones National Marine Sanctuary?**

**Staff response:** The outfall for San Francisco's treated sanitary wastewater is outside of the Gulf of the Farallones and Monterey Bay National Marine sanctuaries. The outfall is approximately 5 nautical miles west of the San Francisco/San Mateo County boundary, near the 20 meter depth contour. The eastern boundary of the Monterey Bay National Marine Sanctuary is approximately 4 nautical miles west of the outfall. The eastern boundary of the Gulf of the Farallones National Marine Sanctuary is approximately 8 nautical miles west of the outfall.

Reference: Oceanside Biology Laboratory. August 2007. Southwest Ocean Outfall Regional Monitoring Program 2006 Data Report. Prepared for San Francisco Public Utilities Commission Natural Resources and Land Management Division.

Accessed online 1 November 2007 [http://www.mbnms-simon.org/docs/project/100212\\_2005\\_report.pdf](http://www.mbnms-simon.org/docs/project/100212_2005_report.pdf)

**3. How should the NCCRSB consider or deal with international telecommunication cables that are being installed and may cross MPAs or future wave farms that may not allow access?**

**Staff response:** A policy memo from the California Department of Fish and Game will be provided to the NCCRSB addressing the issue of other management measures, such as wave farms, which may impact the NCCRSB's deliberations.

**4. Have any wave farms been proposed for this study region?**

**Staff response:** Four wave energy proposals for California are currently under review by the Federal Energy Regulatory Commission (FERC). Additionally, one tidal energy proposal is under review. None of these proposals are within the MLPA North Central Coast Study Region, though at least two border the region closely. The proposals are:

1. Pacific Gas & Electric: "WaveConnect" pilot project off Humboldt Bay and Fort Bragg. The FERC application is for a 136 square mile study area off Humboldt Bay and 68 square mile area in Mendocino. The actual test sites could be about 1-4 square miles in area and would test multiple types of devices for a period of 3 years. They are not considering any on- or near-shore devices. The pilot project could be near 3 miles offshore.
2. Chevron: Two 40-megawatt wave farms off Fort Bragg are proposed.
3. Finavera: Planning to apply for a preliminary permit for the area north of Trinidad (Big Lagoon area). Finavera's plan is to install and test 4 buoy systems to generate 250 megawatts, on average. The four buoys would take up an area of ocean bottom approximately 950' by 200'.
4. Fairhaven Wave Energy: Proposal to place 40 to 80 wave energy converters (20 megawatts) in a site approximately 1/2 mile wide by 4 miles long northwest of Eureka.
5. Golden Gate Energy: Proposal is to develop a tidal current energy system. The system would be installed below the Golden Gate Bridge and use existing infrastructure for placement.

**5. Can the SAT analyze displacement effects?**

**Staff response:** This question was responded to at the NCCRSB meeting both by staff and SAT member Astrid Scholz; it is additionally addressed in the California Environmental Quality Act (CEQA) review of the central coast MPAs. It is extremely difficult to predict human behavior and response to fishery closed areas. At present, the spatial data necessary to effectively conduct this analysis is not available; such an analysis requires high precision small scale data on catch and fishing behavior. Monitoring efforts of the recently implemented central coast MPAs may in the future provide some insight into fishing behavioral shifts and displacement effects.

### **Reference**

Jones & Stokes. 2006. *Environmental Impact Report: California marine Life Protection Act Initiative Central Coast marine Protected Areas Project*. Draft. November. State Clearinghouse #2006072060. (J&S 06682.06) Oakland, CA. Prepared for California Department of Fish and Game, Marine Region, Monterey, CA.

### **6. Is an MPA that protects Farallon rockfish likely to increase the abundance of juvenile rockfish in the Farallon subregion?**

This response still requires review and further clarification by the full SAT before being adopted.

**Draft SAT response:** The interaction between adult and larval rockfish numbers within the Farallon subregion is a complex issue that depends on a number of physical and biological conditions. Though protecting adult rockfish in the Farallones should increase larval production through increased survival, growth, and age of adults, it is unclear if those larvae will be exported from the subregion or survive to adulthood if they are retained there. Complex current patterns around the Farallones could retain larvae near the islands or advect them inshore, where they could replenish populations along the coast, particularly those in the lee of Point Reyes due to the established current gyre in that area.

However, a growing number of studies indicate a surprising rate of local retention of larvae associated with islands (Hellberg et al. 2002, Kingsford et al. 2002, Sponaugle et al. 2002, Swearer et al. 2002, Thorrold et al. 2002, Warner & Cowen 2002). If larvae are retained at the Farallones, their contribution to adult rockfish populations depends on the size of the initial adult populations. Since adult rockfish prey on young rockfish (Hallacher & Roberts 1985), low initial adult populations (presumably due to fishing and marine mammal predation) would lead to higher juvenile survival. High numbers of adults (presumably due to protection from fishing) would decrease the survival rate of juvenile rockfish due to predation. However, predation might eventually increase larval production by providing increased growth and fecundity in adults. Due to natural variation in larval production and the uncertain role played by local currents, quantifying increases in larval production due to protection of adults in the Farallon subregion will be difficult.

### **References**

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recruitment in marine populations: biophysical correlates and mechanisms. Bull. Mar. Sci. 70: 341-375.

Swearer, S.E., J.S. Shima, M.E. Hellberg, S.R. Thorrold, G.P. Jones, D.R. Robertson, S.G. Morgan, K.A. Selkoe, G.M. Ruiz, and R.R. Warner. 2002. Evidence of self-recruitment in demersal marine populations. Bull. Mar. Sci. 70: 251-271.

Thorrold, S.R., G.P. Jones, M.E. Hellberg, R.S. Burton, S.E. Swearer, J.E. Neigel, S.G. Morgan, and R.R. Warner. 2002. Quantifying larval retention and connectivity in marine populations with artificial and natural markers. Bull. Mar. Sci. 70: 291-308.

Warner, R.R. and R.K. Cowen. 2002. Local retention of production in marine populations: evidence, mechanisms, and consequences. Bull. Mar. Sci. 70: 245-249.

Personal communication: Dr. Mark Carr and Dr. Pete Raimondi.

7. **The NCCRSG would like the SAT to (re)consider and comment on the following as possible additions to the list of species likely to benefit from MPAs.** (An NCCRSG workgroup was tasked to come up with a list and rationale for review of particular species – see additional discussion points in Appendix I)
- a. Flat abalone, *Haliotis walallensis*, and Northern abalone, *Haliotis kamtschatkana* (see Rogers-Bennett, 2007, Sloan, 2004, and Gladstone, 2002)
  - b. White sharks - SAT response to NCCRSG questions (revised Oct 12), "Since little is known about the breeding locations of white sharks, protecting forage species in areas where white sharks aggregate (e.g. the Farallones, Tomales Point) would likely benefit them."
  - c. Salmonids - SAT response to NCCRSG questions (revised Oct 12), "Placing a protected area in the coastal waters offshore of the river mouth will protect salmon during a crucial life stage."

**Draft SAT Response to Questions 7a and 7b:** Draft responses to these questions are still being formulated.

**Draft SAT Response to Question 7c:** Salmon are not likely to benefit from MPAs of the size generally under consideration in this process. This is due to their high mobility and pelagic nature in marine waters. Limited protections for local populations could be achieved by siting MPAs around the mouths of estuaries where some salmon stocks aggregate before making upstream movements. However, the pressure of ocean fisheries would largely outweigh protection afforded by an MPA. Despite the opportunity for limited protection through MPAs at the mouths of estuaries, these species would not likely achieve significant benefit from MPAs.

8. **Would the designation of a state marine reserve or other MPA around the mouth of a major estuary make a significant contribution to protection of anadromous fish that spawn upstream?**
- a. Does the SAT have comments on what size and setback is likely to be protective? Would a fairly narrow boundary accomplish resource protection?

- b. Is there a risk of boats "fishing the line" if the boundary is drawn tight to the mouth of a river?

**Draft SAT Response to question 8 and 8a:** An MPA around the mouth and including an estuary could provide limited protection for local anadromous populations staging for movement upstream. The exact size of an MPA needed to protect salmon during this period would depend on the size of an estuary and other factors that can change widely from year to year including: run size, oceanic conditions, the amount of freshwater input and the presence of obstructions, such as sandbars, that may close the estuary for periods of time.

Spatial salmon fishing closures currently exist in regulation (section 27.75) around the mouths of various rivers in Northern California including the Klamath, Smith and Eel Rivers. These regulations close salmon fishing around river mouths in areas that range in size from 8 mi<sup>2</sup> (4 x 2 miles) to 36 mi<sup>2</sup> (12 x 3 miles) seasonally, and 18 mi<sup>2</sup> year-round.

**Staff response to question 8b:** It is the California Department of Fish and Game's (DFG's) experience in the Channel Islands and elsewhere that fishing effort is often exerted near the boundaries of area-based fishery closures. DFG enforcement staff are, however, very familiar with enforcing boundary line regulations for both MPAs and other management. If the intent of a protected area is to protect fish returning to a specific spawning location, the area should be large enough to protect the congregation of animals around that location.

9. **What impact would the delineation of "vessel no traffic zones" of varying widths have on the level of protection assigned to an MPA?**
- a. What would be the specific benefit to seabirds and marine mammals?

**Draft SAT response to question 9:** This question is being addressed in the evaluation of MPA proposals. Please see the document *Draft MLPA Evaluation Methods for MPA Proposals*.

**Staff response to question 9:** The California Department of Fish and Game has issued a memo to the NCCRSG on the use of "special closures." This memo provides information to supplement the SAT response still being formulated.

**Staff response to question 9a:** This question was previously addressed. Please see the response to question 6 from the NCCRSG July 10-11, 2007 meeting.

**Appendix I. Additional rationale and discussion provided by the NCCRSB for considering the species listed in Question 7.**

- a. Flat abalone, *Haliotis walallensis*, and Northern abalone, *Haliotis kamtschatkana* (see Rogers-Bennett, 2007, Sloan, 2004, and Gladstone, 2002)

Rationale for this is based on the above scientific literature. Both species are under threat because of ocean warming contracting the southern portion of their ranges, the expansion of the sea otters range, and for the flat abalone, a commercial fishery in Oregon. They would also be a good candidate for "flagship" species that would highlight the need for kelp bed community conservation (Sloan, 2004). Gladstone (2002) included them with other mollusks as important indicator assemblages. In the mid- 90s, flat abalone were routinely observed at Saunder's Reef (*Lance Morgan, pers. comm., Oct. 2007*).

- b. White sharks - SAT response to NCCRSB questions (revised Oct 12), "Since little is known about the breeding locations of white sharks, protecting forage species in areas where white sharks aggregate (e.g. the Farallones, Tomales Point) would likely benefit them."

The following provides additional rationale and discussion for and against the inclusion of white sharks to the list of species likely to benefit from MPAs. These discussion points were summarized from email discussions among the NCCRSB about this topic.

Discussion and rationale against inclusion of white sharks to the list of species likely to benefit:

1. White sharks are already protected from fishing therefore would not benefit any further.
2. The forage base of white sharks is marine mammals, which are also fully protected.
3. Since little is known about the breeding locations of white sharks any considerations of MPA placement for benefiting white sharks would entail a 'shotgun' approach which is unacceptable for all other MPA requirements.
4. The feeding grounds for white sharks are very broad. "They eat whenever and where ever they want" therefore would not benefit from MPAs aimed at protecting forage.
5. There is no need to minimize human disturbance to foraging behavior. Seals have been known to board vessels to escape feeding white sharks. Therefore, white shark feeding behavior is not disturbed by vessel presence.

Discussion and rationale for inclusion of white sharks to the list of species likely to benefit:

1. Although white sharks are protected they would still gain benefit from additional protective designations such as MPAs since interactions with humans may still result in some level of take.

2. White sharks are internationally recognized as threatened and appear on the IUCN's red list and in CITES appendices.
  3. There are only four places where white sharks congregate in central and north central California. Three of those locations lie in the MLPA North Central Coast Study Region.
  4. It has been suggested that research is beginning to show there are limited numbers of white sharks and that some individuals may move between all four sites described above.
  5. As apex predators white sharks have small population sizes and are highly susceptible to human disturbance and impacts.
  6. White sharks mature late and have low fecundity.
  7. The Farallon Islands are an important white shark study area due to location and low human impact.
  8. Allowing take of other organisms increases risks to white sharks.
  9. White sharks frequent the same foraging grounds annually, therefore protecting forage grounds increases protection to white sharks.
  10. As an apex predator they promote ecosystem health and can be an indicator species.
- c. Salmonids - SAT response to NCCRSB questions (revised Oct 12), "Placing a protected area in the coastal waters offshore of the river mouth will protect salmon during a crucial life stage."

No additional rationale was provided.