

California Marine Life Protection Act Initiative
Science Questions Received at the January 13-14, 2009 Meeting of the
MLPA South Coast Regional Stakeholder Group
Revised February 17, 2009

The science questions in this document were received at the January 13-14, 2009 meeting of the MLPA South Coast Regional Stakeholder Group (SCRSG). MLPA staff and the MLPA Master Plan Science Advisory Team (SAT) co-chairs will review the questions to determine which questions are policy or management based, and which questions are science based. MLPA staff will be assigned to respond to the policy/management questions, while the SAT will form work groups tasked with responding to science questions.

1. What are important [*marine*] ecological features of San Clemente and San Nicholas Islands and how do these relate to the bioregion?

Status: A SAT work group has been formed to address a similar question raised by the MLPA Blue Ribbon Task Force (BRTF). An analysis of habitat inside of military use areas will be part of the response given to the BRTF. When this is complete the response will be made available to the SCRSG along with any guidance given by the BRTF.

2. What are [*larval*] retention zones? Can you provide the SCRSG with maps and/or location information for retention zones?

Draft SAT Response: Larval retention zones are places that exhibit symptoms of retention, either in terms of phytoplankton or meroplankton/larvae. Retention zones are areas where waters spend more time than elsewhere and they are characterized by weaker or recirculating currents. These regions often are stratified. These areas are important as they may exhibit higher phytoplankton concentration or may retain larvae for a significant portion of their time while planktonic. These retention zones can either retain larvae long enough so the larvae can settle near to where they were spawned (local recruitment) or, if retained for shorter periods, retention zones tend to reduce the net distance that larvae travel from their origin. In this latter case, the retention zone can affect larvae that originate from either within or upstream of the retention zone. Relatively short retention times are specifically important if the larvae are retained near favorable habitat just before or during metamorphosis and settlement. Locations where retention has been reported (formally or informally) are indicated on the map*. Typically, larger retention zones will retain larvae for longer periods. In contrast to upwelling zones, retention zones are less well-defined and very challenging to identify through observations.

* A map of retention zones is being developed.

3. Do the established marine protected areas(MPAs) on the north shore of San Miguel, Santa Rosa, and Santa Cruz Islands network with the coastal MPAs of Santa Barbara and Ventura Counties and count toward the size and spacing criteria?

Status: A response to this question is being developed.

4. Can you identify which threats from water quality are most likely to cause harm to species identified as most likely to benefit from MPAs?

Draft SAT Response: The SAT has identified three principal water quality concerns, in its guidance document to the SCRSG titled *California MLPA Master Plan Science Advisory Team Recommendations for Considering Water Quality and Marine Protected Areas in the MLPA South Coast Study Region*. These three threats are 1) entrainment, and to a lesser extent impingement, from power plant once-through cooling water intakes, 2) stormwater discharge sites, and 3) municipal wastewater and industrial discharge sites. More details about these threats can be found in the referenced document.

5. What are the level of pollutants from the first flush rain events to subsequent rain events?

Draft SAT Response: The question correctly indicates that there is a first flush effect, with the concentrations of contaminants in stormwater runoff correlated with the period of antecedent rainfall. There is also a first flush effect within individual storms, with the highest concentrations typically associated with the early parts of a storm. The magnitude of the antecedent rainfall effect varies considerably depending on characteristics of the watershed, the amount of rainfall received, and the contaminants of concern^{1, 2}. While antecedent rainfall does affect the magnitude of contamination associated with storm events, effluent from most large drain systems in most storms is still toxic and the SAT recommendations regarding stormwater discharge locations remain as one of the factors that should be considered in siting MPAs.

¹ Stein ED, Tiefenthaler LL, Schiff K. 2006. Watershed-based sources of polycyclic aromatic hydrocarbons in urban stormwater. *Environ Toxicol Chem* 25:373–385.

² Tiefenthaler LL., Stein ED, Schiff K. 2008. Watershed and land use-based sources of trace metals in urban storm water. *Environ Toxicol Chem* 27:277–287.