California Marine Life Protection Act Initiative
Methods Used to Evaluate Draft Marine Protected Area Proposals in the MLPA South Coast Study Region (Draft)
Section 5.0 – Habitat Representation
Draft revised January 2, 2009

5.0 HABITAT REPRESENTATION ANALYSES (GOALS 1 AND 4)

5.1 Identification of Key and Unique Habitats for the MLPA South Coast Study Region

[Insert the "Key and Unique Habitats of the South Coast Study Region" document here for description of habitats.]

5.2 Summary of Guidelines and Evaluation Methods: Habitat Representation

The *California Marine life Protection Act Master Plan for Marine Protected Areas* guidelines with respect to habitat protection are as follows:

1. "Key" marine habitats (defined below) should be replicated in multiple marine protected areas (MPAs) across large environmental and geographic gradients to protect the greater diversity of species and communities that occur across such gradients, and to protect species from local year-to-year fluctuations in larval production and recruitment.
2. For an objective of providing analytical power for management comparisons and to buffer against catastrophic loss of an MPA, at least three to five replicate MPAs should be designed for each habitat type within a biogeographical region (Point Conception to Oregon).

Considering guidance from the MLPA and master plan, the MLPA Master pLan Science Advisory Team (SAT) has identified the following "key" marine habitats in the MLPA South Coast Study Region for which habitat representation is assessed:

- rocky shore
- sandy beach
- surfgrass
- coastal marsh
- tidal flats
- estuarine waters
- eelgrass

- kelp
- rocky reef 0-30m
- rocky reef 30-100m
- rocky reef 100-200m
- rocky reef >200m
- soft bottom 0-30m
- soft bottom 30-100m

- soft bottom 100-200m
- soft bottom >200m
- submarine canyons
- pinnacles
- upwelling centers
- retention area

(m = meters)

In addition to the key habitats identified by the MLPA, the SAT has identified two unique habitats within the study region: oil seeps and shallow hydrothermal vents.

To assess how these key and unique habitats are represented across a range of environmental conditions, the SAT has identified five distinct bioregions within the MLPA South Coast Study Region (see Section 3.0). Because the key habitats within these bioregions

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support different marine life communities, the SAT recommends that MPA proposals represent key habitats across all five bioregions.

In evaluating habitat representation the SAT considers:
- The quality of habitat maps
- The availability of habitats across the entire study region
- The availability of habitats within the five bioregions defined by the SAT
- The percentage of available habitat protected in MPAs across all six levels of protection
- The distribution of habitat protection across the five bioregions in the MLPA South Coast Study Region

Several of the key and unique habitats named above have limited distribution in the study region or are poorly mapped (see section 5.3, below for more detailed discussion of habitat map quality). In consideration of data limitations, the SAT conducts a full evaluation of habitat representation (including area and percent of habitat protected) only for habitats that are adequately mapped. For habitats that are not comprehensively mapped, the SAT conducts one of the following simplified evaluations of habitat representation: 1) presence/absence of the habitat in an MPA proposal, or 2) the percent of known habitat point-locations protected.

[The SAT is currently discussing projects that affect habitat quality such as habitat restoration and artificial reefs and considering if or how these should be included in habitat representation analyses.]

5.3 Consideration of Habitat Map Quality

The quality of habitat mapping influences the way in which habitat representation can be assessed. For habitats that are comprehensively mapped, it is possible to accurately assess both the amount of habitat encompassed by a proposed MPA and the percent of available habitat protected. Unfortunately, many of the habitat maps are subject to one or more of the following limitations: 1) mapping is not of consistent quality across the entire study region, 2) mapped data does not allow assessment of the extent of habitat protected (aerial or linear extent), or 3) mapping does not accurately reflect presence or absence of habitats. Table 1 summarizes the limitations of habitat maps and recommendations for use of habitat data in habitat evaluations.

Table 1. Habitat Mapping Quality (note, table is incomplete)

Habitat	Source	Reviewed By	Review Summary	Recommended Use
Key Habitats				
rocky shore	NOAA Environmental Sensitivity Index (ESI) shoreline			

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Habitat	Source	Reviewed By	Review Summary	Recommended Use
sandy beach	NOAA ESI shoreline			
surfgrass	Minerals Management Service (MMS) 1980-1982			
coastal marsh	NOAA Coastal Change Assessment Program (CCAP)	Ambrose	1) may under-estimate the extent of marsh in some areas 2) no major gaps in coverage	appropriate for assessing area and percent protected
tidal flats	NOAA ESI shoreline			
estuaries	US Fish and Wildlife Service National Wetland Survey, NOAA ESI (2004)			
eelgrass	The Nature Conservancy, Humboldt Atlas, CDFG, and NOAA (2004)			
kelp – giant kelp	CDFG			
kelp – elk kelp				
rocky reef 0-30m	Kvitek			
rocky reef 30-100m	Kvitek			
rocky reef 100-200m	Kvitek			
rocky reef >200m	Kvitek			
soft bottom 0-30m	Kvitek			
soft bottom 30-100m	Kvitek			
soft bottom 100-200m	Kvitek			
soft bottom >200m	Kvitek			
submarine canyons				
pinnacles	unmapped			
upwelling centers	Largier			
retention areas	Largier			

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Habitat	Source	Reviewed By	Review Summary	Recommended Use
Unique Habitats				
oil seeps				
shallow hydrothermal vents				

Habitats with linear measurements include sandy or gravel beaches, rocky intertidal, coastal marsh, tidal flats, and surfgrass. Habitats with area measurements include estuaries, coastal marsh, eelgrass, kelp, and hard and soft bottom at depths of 0-30 m, 30-100 m, 100-200 m, and greater than 200 m. Due to a lack of nearshore substrate data, shallow hard and soft bottom habitats were also estimated as linear measurements by determining the habitat present along a 20 meter depth contour.

Although aerial measurements of kelp were available from CDFG surveys, a linear proxy of kelp extent was used for all habitat analyses. Because kelp forest communities vary markedly by depth, the SAT determined that the most important consideration in protection of a kelp forest community is that the MPA extends across depth range of the kelp forest. Simply stated, a narrow band of kelp along a steep shore, is likely to encompass as much biological richness as a broader kelp bed along a gently sloping shore, provided that the two extend along a similar length of shoreline. To ensure that both steep and gently sloping kelp beds are considered equally in habitat representation and replication analyses, the SAT used kelp bed length as the measure of kelp habitat. Kelp bed length was measured with a line drawn along the outside of the kelp bed, roughly parallel to the shore and derived from the composite aerial extent of kelp in the years 1989, 1999, and 2003-2006.