Marine Life Protection Act Initiative

Overview of Science Team Methods for Evaluating Alternative MPA Proposals

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Evaluating MPA Proposals

Alternative MPA proposals are evaluated using:

- Marine Life Protection Act (MLPA) goals
- Scientific guidelines described in the California MLPA Master Plan for Marine Protected Areas
- California Department of Fish and Game feasibility criteria
- California Department of Parks and Recreation guidelines

Science Advisory Team Evaluations

Alternative MPA proposals are evaluated for:

- Levels of protection
- Habitat representation
- Habitat replication
- MPA size
- MPA spacing

Science Advisory Team Evaluations

Alternative MPA proposals also are evaluated for:

- Bioeconomic models
- Birds and mammals
- Water quality (*evaluation methods pending*)
- Recreational, educational and study opportunities (Goal 3)
- Potential commercial and recreational fishery impacts (Ecotrust)

Bioregions

- **Five bioregions in the MLPA South Coast Study Region (SCSR):**
  - North Mainland (Point Conception to Marina Del Rey)
  - South Mainland (Marina del Rey to California/Mexico border
  - West Channel Islands (San Miguel, Santa Rosa, San Nicolas islands)
  - Mid-Channel Islands (Santa Cruz, Anacapa, Santa Barbara islands)
  - East Channel Islands (Santa Catalina, and San Clemente islands)

Levels of Protection

- **Based on likely impacts of proposed activities to ecosystems within MPAs**
  - "How much will an ecosystem differ from an unfished ecosystem if one or more of the proposed activities are allowed?"
- **Overall level of protection assigned to a MPA with multiple uses is the lowest level of protection designated for any of the uses**
- **Only three highest levels of protection contribute toward habitat representation and replication and MPA size and spacing**

Levels of Protection

*Note: Levels of protection for activities listed in **blue** were approved at the February 24, 2009 SAT meeting*

	Level of Protection	MPA Type	Activities Associated with Protection Level
	Very high	SMR	No take
	High	SMCA	pelagic finfish, white seabass and bonito (spear, H&L >50m)
	Moderate-high	SMCA	pelagic finfish, white seabass and bonito (H&L surface gear on mainland, 50m>30m)
	Moderate	SMCA SMP	spot prawn (trap); sea cucumber (scuba/hookah); grunion (hand harvest)
	Moderate-low	SMCA SMP	kelp bass, barred sand bass (H&L, spear), sheephead (H&L, spear, trap); spotted sand bass (H&L); lobster (trap, hoop net, scuba); pelagic finfish, white seabass and bonito (H&L <30m on mainland, <50m on islands); urchin (hand take)
	Low	SMCA SMP	rock scallop (scuba)

Habitat Representation

- **Guideline: Every "key habitat" represented in each bioregion in the MPA network**
- **22 key habitat types**
  - *Pelagic habitats* defined on 2/24/09
- **Evaluation Methods:**
  - Availability of habitats in SCSR
  - Availability of habitats within 5 bioregions of SCSR
  - Percentage of available habitat protected in MPAs at three highest levels of protection
  - Distribution of habitat protection across 5 bioregions
  - Unique habitats noted, but no minimum size threshold or replication required

Habitat Replication

- **Master Plan requires habitat replication within two *biogeographic* regions**
  - Point Conception north to California-Oregon border
  - Point Conception south to California-Mexico border (entire MLPA South Coast Study Region)
- **Evaluation Methods:**
  - 3-5 replicates of each key habitat type in each biogeographic region
  - 1 replicate of each key habitat in each of 5 bioregions
  - Science advisory team sums the number of replicates for each habitat within each biogeographic region and bioregion

Habitat Replication

- **Replicates must contain enough habitat to encompass 90% of associated biodiversity**
  - Minimum area varies by habitat and is determined by biological surveys
- **Each patch must be contiguous, not broken into two or more protected areas (*SAT 2/24/09*)**

Habitat Replication

Table ES-2. Amount of habitat in an MPA necessary to encompass 90% of local biodiversity given in linear statute miles and square statute miles.

Habitat	Representation needed to encompass 90% of biodiversity	Data Source
Rocky Intertidal	~0.48 linear miles	PISCO Biodiversity
Shallow Rocky Reefs/Kelp Forests (0-30 m)	~1.14 linear miles	CRANE Subtidal Surveys
Deep Rocky Reefs (30-100 m)	~0.20 square miles	Love Surveys
Deep Rocky Reefs (100-3000 m)	~0.22 square miles	Love Surveys
Sandy Beaches[1]	~1.14 linear miles	See below
Soft Bottom Habitat (0-30 m)	~1.14 linear miles	See below
Soft Bottom Habitat (30-100 m)	~2.24 square miles	SCCWRP (BIGHT '98 & '03)
Soft Bottom Habitat (100-200 m)	~1.10 square miles	SCCWRP (BIGHT '98 & '03)
Soft Bottom Habitat (>200 m)	~0.46 square miles	SCCWRP (BIGHT '98 & '03)
All Soft Bottom Habitat (>0 meters)	***~8 square miles***	***Preferred option - see below***
Estuarine Habitats	0.12 square miles (77 acres)	SONGS sampling

[1] Sandy beaches are often linked to shallow soft bottom areas, therefore linear extent for sandy beaches is tied to linear extent of soft bottom habitat, see below for further explanation.

MPA Size

- **Guidelines for MPA Size**
  - Alongshore span is a minimum of 3-6 miles of coastline, preferably 6-12.5 miles
  - Offshore span of 3.45 miles from mean high tide line to state waters boundary
  - Overall minimum area 9-18 statute square miles, preferably 18-36 square miles
- **Evaluation Methods**
  - Contiguous MPAs at or above three highest levels of protection grouped into “MPA clusters”
  - Size of each “MPA cluster” noted

MPA Spacing

- **Guidelines for MPA Spacing**
  - MPAs should be placed within 31-62 miles (50-100 km) of each other to facilitate larval dispersal
  - MPAs placed more closely together also will meet the guideline
  - At the Channel Islands, other criteria besides spacing should be used for MPA design
- **Evaluation Methods**
  - Determine distance between replicates of key habitats within MPAs relative to minimum spacing guideline
  - Estimate distance between protected patches of same key habitat
  - Analyze distances between neighboring MPAs (or MPA clusters) for each key habitat

Bioeconomic Models

- Models use data on habitat, life history characteristics of model species, fishery effort, and proposed MPA locations and regulations
- Models provide information about biomass and larval supply and fishery yield and for one model, fishery profits
- Each of these variables will be estimated for a suite of about 10 representative species
- Modeling is an additional and complimentary tool to other SAT evaluations; it does not replace the other evaluations

Birds and Mammals

- **Evaluation Methods**
  - Identify seabird breeding colonies and pinniped rookeries in proposed MPAs
  - Estimate proportion of resting and foraging locations in proposed MPAs
  - Calculate area protected in estuaries that support resident and migrant shorebirds and waterfowl
  - Consider adding evaluation of sea otters at San Nicolas, pending available data

Water Quality

- ***Water quality should be a secondary criterion for MPA design after the other guidelines have been incorporated***

Water Quality Guidelines:

- **Avoid locations of poor or threatened water quality, such as:**
  - major cooling water intake sites for power plants
  - municipal sewage or industrial outfalls
  - areas that are significantly impacted by a variety of pollutants from large industrial or developed watersheds.
- **MPAs may be placed in areas of impaired water quality if there are other reasons to place MPAs in such areas**