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Marine Life Protection Act Initiative




Methods Used to Evaluate MPA Proposals in the MLPA North Coast Study Region

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Purpose of the SAT Evaluation



- Provide evaluation of marine protected area (MPA) proposals generated by the public and regional stakeholder group in an iterative process of design, evaluation and refinement
- How well do MPA proposals meet the scientific goals of the Marine Life Protection Act (MLPA)?



SAT Evaluation Steps

- SAT members develop evaluation methods based on guidance in the MLPA and master plan for MPAs
- Evaluation methods are approved by the MLPA Master Plan Science Advisory Team (SAT)
- MLPA Initiative staff work with a work group of the SAT to generate statistics, figures, etc.
- SAT members present results to the SAT, MLPA North Coast Regional Stakeholder Group (NCRSG) and MLPA Blue Ribbon Task Force (BRTF)



Evaluation Methods Document

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Executive Summary

1. Overview
2. Bioregions
3. Protection Levels (Goals 1, 2, 4 and 6)
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6. MPA Size
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11. Commercial and Recreational Fishery Impacts

Appendix A. Bioeconomic Modeling

Appendix B. Impact Assessment Methods

Appendix C. Levels of Protection for Potential Allowed Uses



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Bioregions for North Coast

- **Executive Summary** – *Needs SAT review*
- **Chapter 1. Overview** – *Provides background information, needs SAT review*
- **Chapter 2. Bioregions** – *Approved in December two bioregions, with split at mouth of Mattole River*



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- **Chapter 3. Protection Levels** (Goals 1, 2, 4 and 6) – *Approved February 11 meeting; continual revisions*
- MLPA Blue Ribbon Task Force directed the SAT to present evaluations of MPAs at the three highest levels of protection:
 - Very High (SMRs)
 - High (SMCAs and SMPs)
 - Moderate-high (SMCAs and SMPs)

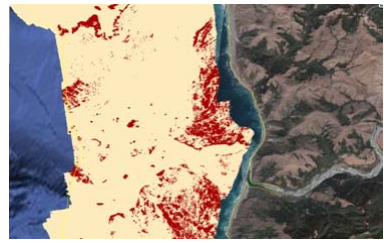
	Level of Protection	MPA Type
	Very high	SMR
	High	SMCA SMP
	Moderate-high	SMCA SMP
	Moderate	SMCA SMP
	Moderate-low	SMCA SMP
	Low	SMCA SMP

SMR = state marine reserve SMP = state marine park
 SMCA = state marine conservation area



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- **Chapter 4. Habitat Representation and Analyses** (Goals 1 and 4) – *Approved February 11 meeting*

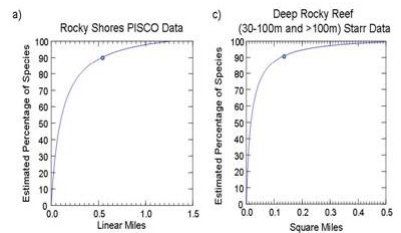


- Includes identification of key habitats in north coast
- The SAT considers:
 - the quality of habitat maps,
 - the availability of habitats,
 - the percentage of habitat protected in MPAs, and
 - the distribution of habitat protection across the two bioregions in the MLPA North Coast Study Region



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- **Chapter 5. Habitat Replication Analyses** (Goals 1, 2, 3, 4 and 6)– *Approach approved, specific criteria needs approval*
- *Amount of habitat to encompass 90% of biodiversity based on species area curves*



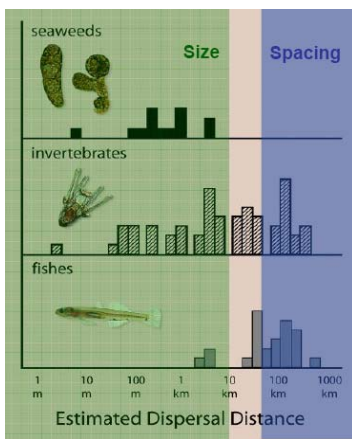
Example

Habitat	Amount of habitat needed to encompass 90% of biodiversity
Rocky shores	0.55 linear miles
Nearshore rocky reefs and kelp forest (0-30 m)	linear miles including the full 0-30m depth zone
Rocky reef 30-100 m	0.13 square miles
Rocky reef 100-3000 m	0.13 square miles
Beaches	1.1 linear miles
Soft bottom 0-3000 m ^a <i>(includes replicates of 0-30m, 30-100m and >100m soft bottom)</i>	10 square miles total mapped soft bottom. Distributed across depth zones including at least: <ul style="list-style-type: none"> • 1.1 mi 0-30m • 5 sq mi 30-100m • 1 sq mi >100m



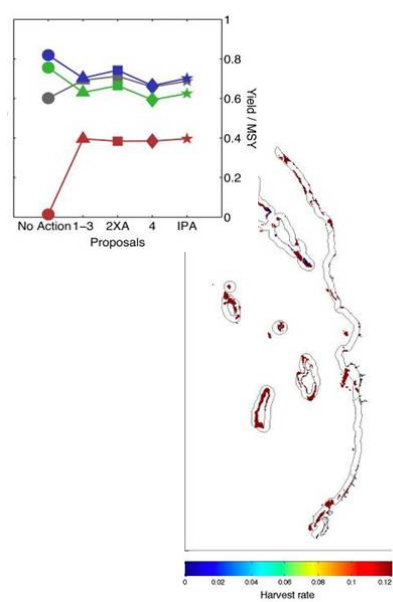
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- **Chapter 6. MPA Size – *Approved***
February 11 meeting
 - Preferred **18-36** square statute miles;
 minimum **9-18** square statute miles;
 extend offshore
 - Measured at various levels of protection
 (LOPs)
- **Chapter 7. MPA Spacing –**
Approved February 11 meeting
 - Maximum spacing **31-62** statute miles
 - Evaluated for key habitats; MPA clusters
 that meet minimum size; very high, high,
 moderate-high LOPs



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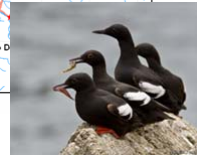
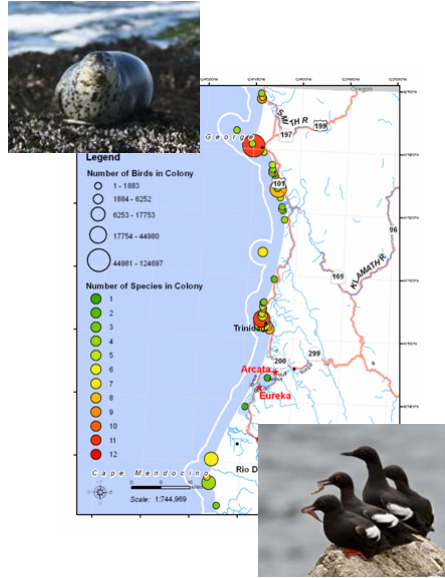
- **Chapter 8. Bioeconomic Modeling – *Approved***
February 11 meeting
 - conservation value and economic
 return among proposals
 - Complements spacing evaluation
 - Outputs inform revisions





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- **Chapter 9. Protection of Marine Birds and Mammals** – *Approved approach February 11 meeting; chapter needs approval*
- Protection of breeding colonies and rookeries
- Population hot spots
- Marine bird and mammal resting (roost/haulout/raft) locations
- Near-colony/rookery foraging concentrations
- Neritic foraging
- Estuarine and coastal beach protection for resident and migrant shorebirds and waterfowl



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- **Chapter 10. Water and Sediment Quality** – *Approved approach February 11 meeting; chapter needs approval*



Water Quality Concern Area	Scores: Co-located with Water Quality Concern Area	Scores: Not Co-located with Water Quality Concern Area
Stormwater/Nonpoint Source Discharge	-1.0	1.0
Wastewater Discharge	-0.5	1.0
• Water Quality Protection Area	Co-located with SWQPA	Not Co-located with SWQPA
• SWQPA/ASBS	Between 0 and 1, based on the % of shoreline coverage	0
Final score for each MPA	Average of scores for each category, weighted by multiplying by ratio of MPA shoreline to regional proposal total shoreline for coastal MPAs	
Final score for regional MPA proposal (coastal MPAs only)	Sum of the final score for each MPA within the proposal	



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- **Chapter 11. Commercial and Recreational Fishery Impacts** – *Approved approach February 11 meeting*
- Commercial Fisheries
 - Maximum potential impacts on fishing grounds (area and value)
 - Maximum potential negative socioeconomic impacts (gross and net)
 - Disproportionate impacts to fisheries and individuals
 - Consideration for existing fishing closures
- Recreational Fisheries
 - Maximum potential impacts on fishing grounds (area and value)
 - Consideration for existing fishing closures



Chapter 3: Protection Levels

Changes since the SAT's last meeting:

- No new LOPs assigned
- Text added to support the LOP assignment for bull kelp
- Additional information about redbtail surfperch movement analyzed – supports existing LOP assignment, but not yet incorporated in text

Chapter 3: Protection Levels

Level of Protection	MPA Types	Activities Associated with this Protection Level
Very high	SMR	No take
High	SMCA SMP	Salmon (H&L or troll in waters >50m depth); coastal pelagic finfish ¹ (H&L, round-haul net, dip net);
Mod-high	SMCA SMP	Dungeness crab (trap, hoop-net, diving); salmon (troll in water <50m depth); surf and night smelts (dip net, a-frame net, cast net)
Moderate	SMCA SMP	redtail surfperch (H&L from shore); surfperch (H&L from shore) California halibut (H&L); coonstripe shrimp and spot prawn (trap); clams (intertidal hand harvest); turf-forming and foliose algae ² (intertidal hand harvest); salmon (H&L in waters <50m depth)
Mod-low	SMCA SMP	Pacific halibut (H&L); lingcod, cabezon, and rockfishes, and greenlings (H&L, spearfishing, trap); red abalone (free-diving); urchin (diving); surfperch (H&L)
Low	SMCA SMP	Rock scallop (diving); mussels (hand harvest); bull kelp (hand harvest); ghost shrimp (hand harvest); sea palm (intertidal hand harvest); canopy-forming algae ³ (intertidal hand harvest)

1 The grouping "coastal pelagic finfish" includes: Northern anchovy (*Engraulis mordax*), Pacific herring (*Clupea pallasii*), jack mackerel (*Trachurus symmetricus*), Pacific mackerel (*Scomber japonicus*), and Pacific sardine (*Sardinops sagax*).

2 The grouping "turf-forming and foliose algae" includes the following harvested groups: *Porphyra* spp. (Nori, Laver), *Ulva* spp. (Sea Lettuce), *Chondrocanthus/Gigartina exasperata* (Turkish Towel), and *Mastocarpus* spp. (Mendocino Grapestone).

3 The grouping "canopy-forming algae" includes the following harvested groups: *Alaria* spp. (Wakame), *Lessoniopsis littoralis* (Ocean Ribbons), *Laminaria* spp. (Kombu), *Saccharina/Hedophyllum sessile* ('Sweet' Kombu), *Egregia menziesii* (Feather Boa), and *Fucus* spp. (Bladder wrack or Rockweed).

Chapter 4: Habitat Representation

Changes since the SAT's last meeting:

- Changed "drowned river *canyons*" to "drowned river *valleys*"
- Text added describing Humboldt Bay
- Information added about habitat mapping quality

Example:

Habitat	Source	Review Summary	Recommended Method of Habitat Assessment
rocky shore	NOAA Environmental Sensitivity Index (ESI) shoreline - 1994	<u>Shoreline types are comprehensively and consistently mapped across the state. resolution may be insufficient to resolve intermixed habitats (e.g. beaches interspersed with rocky outcrops) in some areas.</u>	<u>Appropriate for assessing both the length and proportion of habitat included in MPA proposals.</u>



Chapter 5: Habitat Replication

Newly drafted text describing methods:

- Recommendation that habitats are replicated in both bioregions, where possible
- Fleshed out application of the habitat size guidelines based on the area needed to encompass 90% of local biodiversity
 - Evaluated replication for rocky shores and offshore rocks separately
 - Identified thresholds for replication of soft bottom habitats across multiple depth zones
 - In absence of information from large estuaries, like Humboldt Bay, used estuarine species accumulation curves from small estuaries elsewhere in California



Chapter 5: Habitat Replication

Example of habitat size guidelines for replication:

Habitat	Amount of Habitat Needed to Encompass 90% of Biodiversity	Data Source
Nearshore rocky reefs and kelp forest (0-30 m)	1.1 linear miles <i>including the full 0-30m depth zone</i>	PISCO Subtidal
Soft bottom 0-3000 m ^a <i>(includes replicates of 0-30m, 30-100m and >100m soft bottom)</i>	10 square miles total mapped soft bottom Distributed across depth zones including at least: 1.1 mi 0-30m 5 sq mi 30-100m 1 sq mi >100m	NMFS trawl surveys, 1977-2007
Soft bottom 0-100 m ^a <i>(includes replicates of 0-30m and 30-100m soft bottom)</i>	7 square miles total mapped soft bottom Distributed across depth zones including at least: 1.1 mi 0-30m 5 sq mi 30-100m	NMFS trawl surveys 1997-2007
Estuarine Habitats ^b	0.12 square miles (77 acres) total estuarine area Distributed across estuarine habitats including at least: 0.04 sq mi coastal marsh (25 acres) 0.04 sq mi eelgrass (25 acres)	SONGs sampling



Chapter 7: MPA Spacing

Changes since the SAT's last meeting:

- MPA spacing between MPAs that contain like habitats now measured as a straight-line distance from edge-to-edge, rather than center-to-center