

Marine Life Protection Act Initiative



Introduction to MPA Evaluation Methods: North Central Coast Example

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Presentation to the MLPA South Coast Regional Stakeholder Group
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Purpose of this Presentation

- Today
 - How guidelines are applied
 - Introduction to general evaluation methods/figures
 - Provide examples of evaluation methods used in the North Central Coast Study Region (NCCSR)
 - Update on status of south coast methods
- Next meeting (January 13-14, 2009)
 - More specifics on evaluation methods for the MLPA South Coast Study Region

Components of NCCSR Evaluation

- MLPA Initiative Staff
 - General statistics/maps
 - Goal 3 analysis
- MLPA Master Plan Science Advisory Team (SAT)
 - Habitat representation and replication
 - Size and spacing
 - Benefits to marine birds and mammals
 - Modeling
- California Department of Fish and Game (CDFG)
 - Feasibility analysis
- Ecotrust
 - Socioeconomic analysis

Goals of the MLPA

1. To **protect the natural diversity** and function of marine ecosystems.
2. To **help sustain and restore** marine life populations.
3. To **improve recreational, educational, and study opportunities** in areas with minimal human disturbance.
4. To **protect representative** and unique marine life **habitats**.
5. Based on **clear objectives, effective management, adequate enforcement, sound science**.
6. To ensure that MPAs are **designed and managed as a network**.



Habitat Representation and Replication

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Size, Spacing and Modeling

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Birds and Mammals

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MLPA Initiative Staff and CDFG

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Levels of Protection

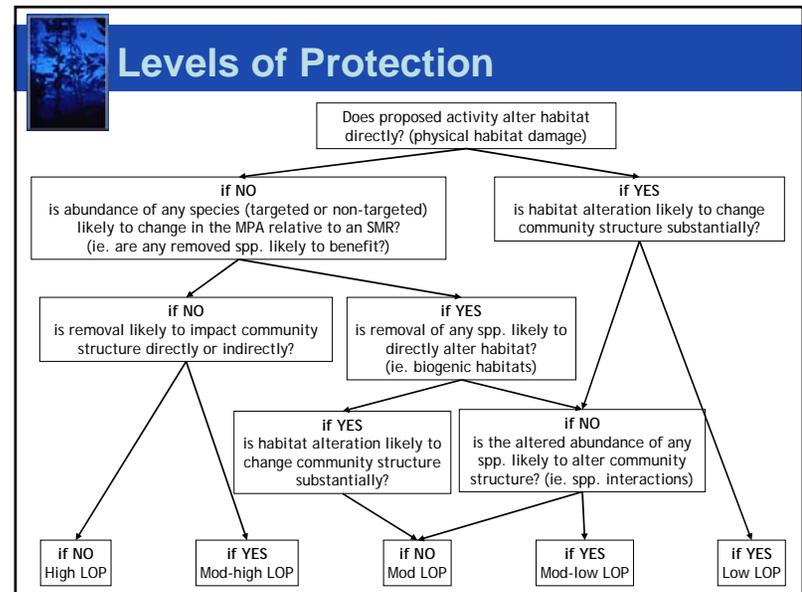
Levels of protections are assigned by the SAT, but are used to group MPAs in several evaluations

Levels of Protection

- Categorize relative ecosystem protection afforded by different types of proposed MPAs
- Based on proposed regulations (allowed take) within the proposed MPA
- An MPA received a lower level of protection if:
 - It allowed take of species that play a key ecological role in the local environment
 - It allowed activities that degrade habitats
 - It allowed activities that have significant incidental removal of non-target species

Levels of Protection: NCC Example

Level of Protection	MPA Types	Activities Associated With this Protection Level
Very high	SMR	No take
High	SMCA	In water depth > 50m: pelagic finfish (H&L) salmon by troll only, coastal pelagic finfish (pelagic seine)
Mod-high	SMCA	Dungeness crab (traps/pots); squid (pelagic seine); In water depth <50m: pelagic finfish (H&L) salmon by troll only, coastal pelagic finfish (pelagic seine);
Moderate	SMCA SMP	salmon (non-troll H&L); abalone (diving); halibut, white seabass, striped bass, shore-based finfish, croaker, and flatfishes (H&L); smelt (H&L and hand/dip nets); clams (hand harvest); giant kelp (hand harvest)
Mod-low	SMCA SMP	Urchin (diving); lingcod, cabezon, greenling, rockfish, kelp bass, and other reef fish (H&L); surfperches (H&L); lobster (trap, hoop net, diving)
Low	SMCA SMP	bull kelp and mussels (any method); all trawling; giant kelp (mechanical harvest); mariculture (existing methods in NCCSR)



Staff Evaluations

- General statistics/maps
 - Total area by designation and level of protection for full MPA proposals
 - Statistics on individual MPAs
 - Habitat totals and percentages
- Goal 3 analysis
 - Evaluates recreational, educational, and study opportunities

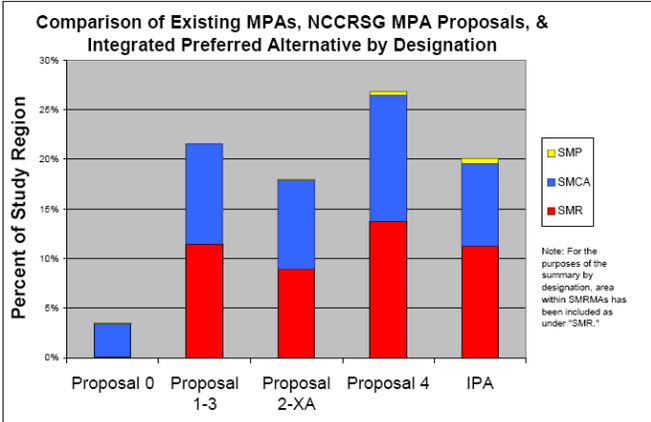
Staff Evaluations: Maps

- Proposed MPA boundaries
 - Designation (SMR, SMCA, SMP)
 - Allowed uses




Staff Evaluations: General Statistics

Comparison of Existing MPAs, NCCRSR MPA Proposals, & Integrated Preferred Alternative by Designation



Legend:
■ SMR
■ SMCA
■ SMP

Note: For the purposes of the summary by designation, area within SMRMs has been included as under "SMR."

Staff Evaluations: General Statistics

Staff Summary of Area and Habitats in the Integrated Preferred Alternative (IPA) MPA Proposal
Revised April 30, 2008

Overall Summary for the Integrated Preferred Alternative (IPA) (April 23, 2008 version)

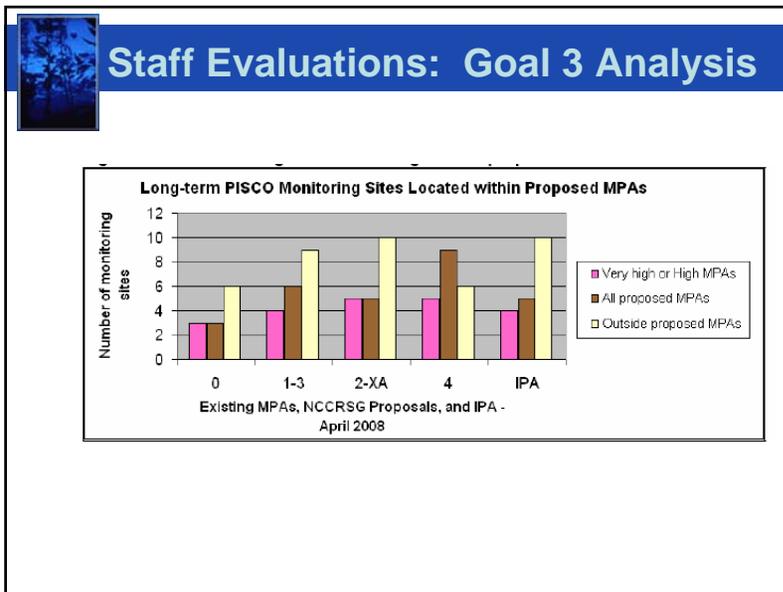
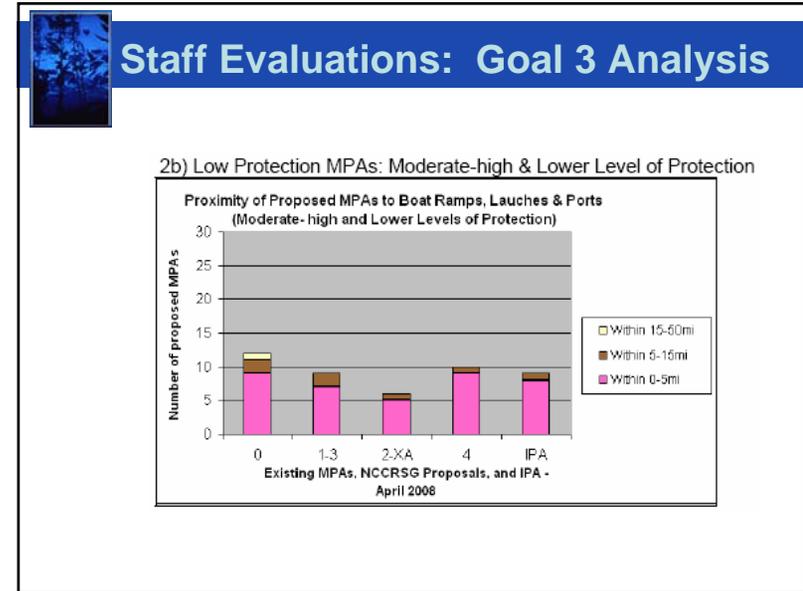
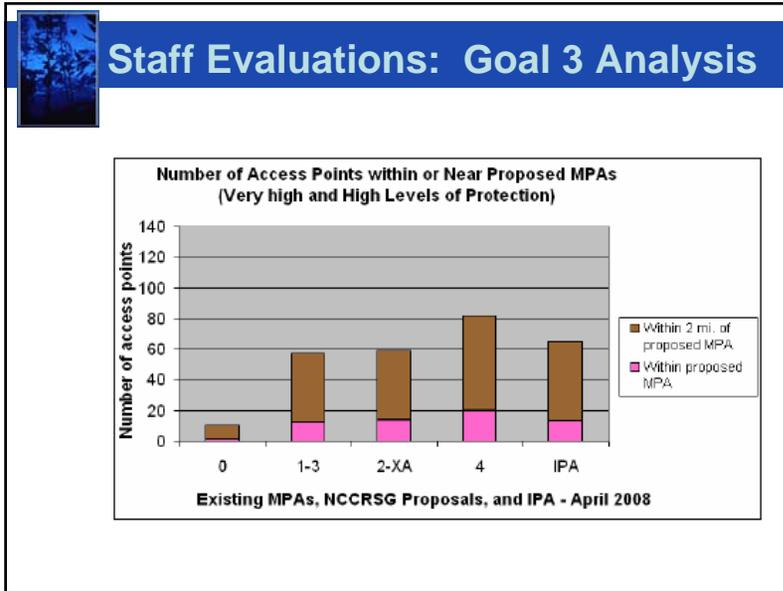
Type of MPA ^{1,2}	# Proposed	Area (mi ²)	% of Study Region
State Marine Reserve (SMR) ³	13	85.8	11.2%
State Marine Park (SMP)	2	3.8	0.5%
State Marine Conservation Area (SMCA)	9	63.8	8.4%
All MPAs combined	24	153.3	20.1%

Individual MPAs in IPA (April 23, 2008 version)

MPA Name	Size (mi ²)	Along-shore span ⁴ (mi)	Depth range (ft)
Point Arena SMR	4.38	3.0	0-173
Point Arena SMCA	6.73	3.0	153-324
Sea Lion Cove SMCA	0.22	0.7	0-39
Saunders Reef SMCA	9.35	3.0	0-276
Del Mar Landings SMR	0.22	0.6	0-57

Habitat Representation in IPA (April 23, 2008 version)

Habitat	Area ⁵ (mi ²) and percentage of mapped habitat in proposed MPA designations in the study region ⁷			
	SMR ⁶	SMP	SMCA	Total MPAs
Intertidal				
Sandy or gravel beach ⁸	12.08 (10%)	0.85 (1%)	1.90 (2%)	14.83 (12%)
Rocky intertidal ⁹	24.07 (17%)	8.01 (4%)	17.87 (26%)	49.95 (37%)



- ### SAT Evaluations
- Habitat representation and replication
 - Size and spacing
 - Benefits to marine birds and mammals
 - Modeling

Habitat Representation (Goals 1 and 4)

- How well are key habitat types represented in proposed MPA packages?
- What are the proposed levels of protection for these habitat types?
- How well are habitats and levels of protection distributed across the study region?

Habitat Representation (Goals 1 and 4)

Example Figures

- Percentage of **available** habitat
- Grouped by level of protection
- Conducted by subregion to show geographic representation

The figure consists of three stacked bar charts, each representing a different habitat type. The y-axis for all charts is '% of available habitat' (0 to 50). The x-axis categories are 0, 1-3, 2-XA, 4, and IPA. The legend indicates five protection levels: Very High (red), High (dark blue), Mod-high (medium blue), Moderate (light blue), and Low (white). The right y-axis of each chart shows the total area in square miles.

Habitat Type	Area (sq mi)	0	1-3	2-XA	4	IPA
Kelp	35	~10%	~25%	~15%	~35%	~15%
Shallow Rocky Reef	81	~10%	~25%	~20%	~30%	~15%
Deep Rocky Reef	52	~10%	~20%	~15%	~30%	~25%

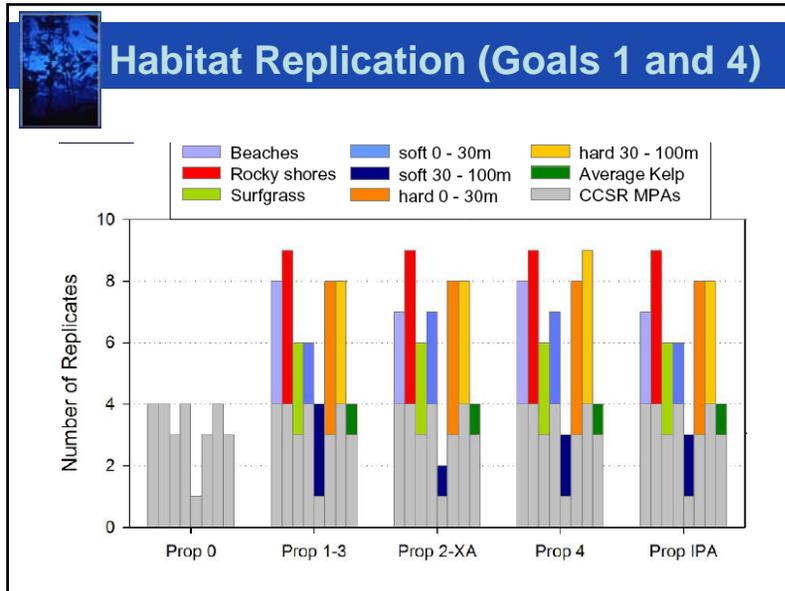
Habitat Replication (Goals 1 and 4)

- Counts the number of MPAs that contain each habitat
- Habitat must be “present” in sufficient size in an MPA to count
- MPA must meet minimum threshold size to count

Habitat Replication (Goals 1 and 4)

MPAs need to have enough habitat to “count”

Habitat	Representation needed to encompass 90% of biodiversity	Data Source
Rocky Intertidal	~0.6 linear miles	PISCO Biodiversity
Shallow Rocky Reefs/Kelp Forests (0-30 M)	~1.1 linear miles	PISCO Subtidal
Deep Rocky Reefs (30-100 M)	~0.2 square miles	Starr surveys
Sandy Habitat (30-100 M)	~10 square miles	NMFS triennial trawl surveys 1977-2007
Sandy Habitat (0-30 M)	~1.1 linear miles	Based on shallow rocky reefs
Sandy Beaches	~ 1 linear mile	



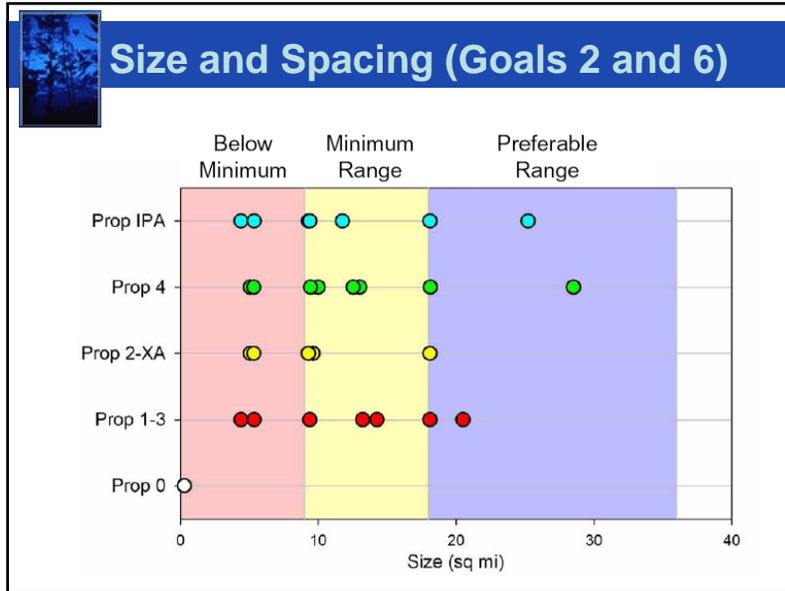
- ### Size and Spacing (Goals 2 and 6)
- Are the MPAs big enough to encompass the adult movements of a range of species?
 - Are the MPAs close enough together so that larvae can move from one MPA to another?

- ### Size and Spacing Guidelines (Goals 2 & 6)
- Size
 - 3-6 mile minimum alongshore span (6-12 mile preferred)
 - Extend offshore to deep waters (state waters extend to 3 miles offshore)
 - Size guidelines combined by SAT to be 9-18 square mile minimum (18-36 square mile preferred)
 - Spacing
 - 30-60 miles between MPAs

Size and Spacing (Goals 2 and 6)

Size Analysis

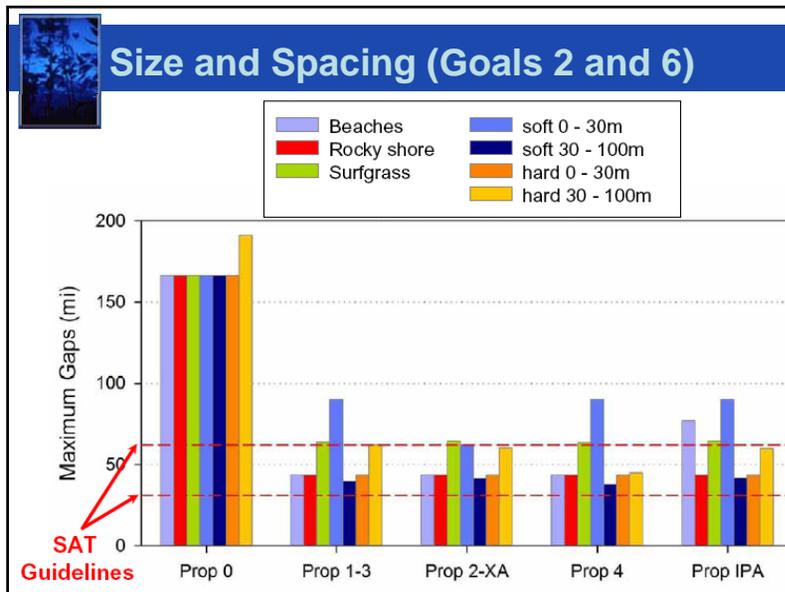
- MPA areas calculated
- Adjacent MPAs grouped into “clusters”
- Analysis conducted at each level of protection
- Compare to guidelines



Size and Spacing (Goals 2 and 6)

Spacing Analysis

- Conducted separately for each habitat
- Distance measured between clusters of at least minimum size
- Conducted at each level of protection
- Compare largest gaps to guidelines



Marine Birds and Mammals (Goal 2)

- What percentage of marine mammal haulouts and rookeries are included within MPAs?
- What percentage of seabird breeding colonies and roosts are included within MPAs?
- How much foraging area for marine birds and mammals is included within MPAs that protect forage species?

Marine Birds and Mammals (Goal 2)

Bird/Mammal Analysis

- Haulouts, rookeries, and colonies mapped
- Percentage of sites inside and outside of MPAs calculated
- Foraging areas near colonies identified
- Overlap between MPAs and forage areas calculated

Marine Birds and Mammals (Goal 2)

- Analysis conducted by species
- Divided by subregion and by entire study region

Modeling (Goals 2 and 6)

- Supplemented the size/spacing analyses
- Two different, but complementary, modeling approaches used
- Report on conservation value and economic return
- Calculations assuming different fisheries management scenarios in future

Modeling (Goals 2 and 6)

CDFG Analysis

- Feasibility analysis (NCC example)

General Area	Proposal and MPA with Feasibility Concern	Type of Feasibility Concern			
		Boundaries	Allowed Take	MPA Type	MPA Name
Saunders Reef	(1-3) Saunders Reef SMCA	-	X	-	-
Del Mar Landing Black Point/Stewart's Point/Rocky Point to Horseshoe Point	(1-3) Del Mar Landing SMP	X	X	-	-
	(2-XA) Black Point SMCA & SMR	X	-	-	-

Socioeconomic Analysis

- Conducted for commercial and recreational fisheries
- Maximum potential economic impact of marine protected areas on selected fisheries
- Based on survey data collected by Ecotrust

Socioeconomic Analysis

Fisheries	1-3	2-XA	4	IPA
California Halibut	—	—	—	—
Coastal Pelagics	—	—	—	—
Market Squid	—	—	—	—
Deeper Nearshore Rockfish	32.0%	16.8%	33.9%	30.0%
Nearshore Rockfish	16.9%	10.5%	18.1%	16.1%
Urchin	6.8%	5.7%	9.4%	8.4%
Dungeness Crab	7.7%	6.4%	11.0%	8.0%
Salmon	1.7%	1.3%	1.9%	1.8%

Point Arena

Figure 2: Annual Net Economic Impact of MPA Proposals for the NCCSR

Proposal	% reduction in profit
1-3	5.6%
2-XA	4.8%
4	8.3%
IPA	6.3%

Update on Staff / CDFG Analyses

- Maps and basic statistics
 - Similar format
- Goal 3 analysis
 - Similar format, currently gathering additional data
- CDFG feasibility
 - Revised analysis (see memo and presentation)
- Socioeconomic analysis
 - Similar format (see presentation)

Update on SAT Analyses

- SAT meeting on November 12
 - Progress on methods discussed
- SAT meeting on December 17
 - Updated evaluation methods for south coast study region to be discussed
- Revised methods to be presented to the MLPA South Coast Regional Stakeholder Group at its January 13-14, 2009 meeting

Recap

- Today
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Three rounds of evaluations

Iterative process:

