Marine Life Protection Act Initiative

Science Guidelines and Draft Options for MPA Arrays and Draft External MPA Proposals Evaluations North Central Coast Study Region

Presentation to the North Central Coast Regional Stakeholder Group

November 28, 2007 • San Rafael, CA

Presented by Dr. Mark Carr, Master Plan Science Advisory Team

Master Plan Science Advisory Team

MLPA goals
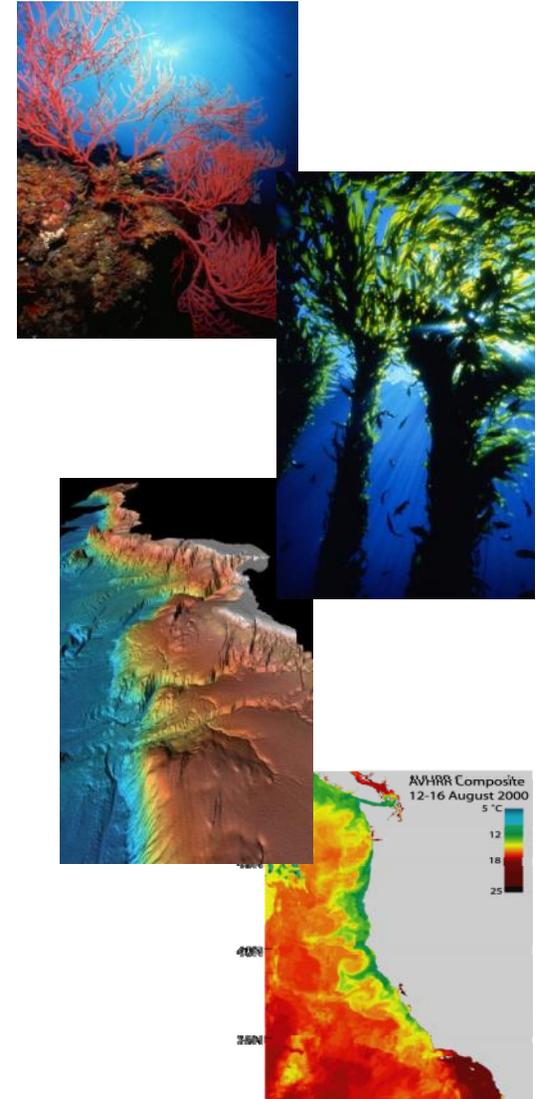
Science guidelines for MPA design

Evaluation of preliminary proposals
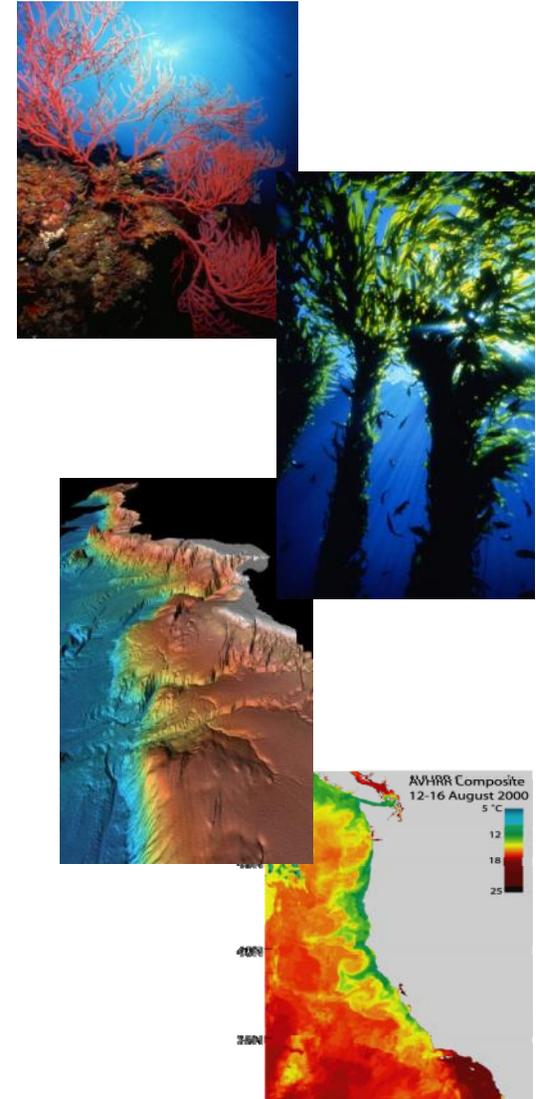
MLPA Goals - Habitats

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. Clear objectives, effective management, adequate enforcement, sound science.

6. To ensure that MPAs are designed and managed as **a network**.

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SAT Guidelines - Goals 1 and 4

MLPA Goals:
1) Protect natural diversity and function of marine ecosystems
*4) Protect representative and unique marine life habitats*

SAT Approach

- Refined key habitats for NCCSR

- Defined biogeographic subregions

- Refined and described level of protection designations

- Evaluated habitat representation in MPAs

SAT Guidelines - Goals 1 and 4

Identified Key Habitats Using:

- Bottom Type and Depth Categories
- Biogenic Habitats
- Oceanographic Features
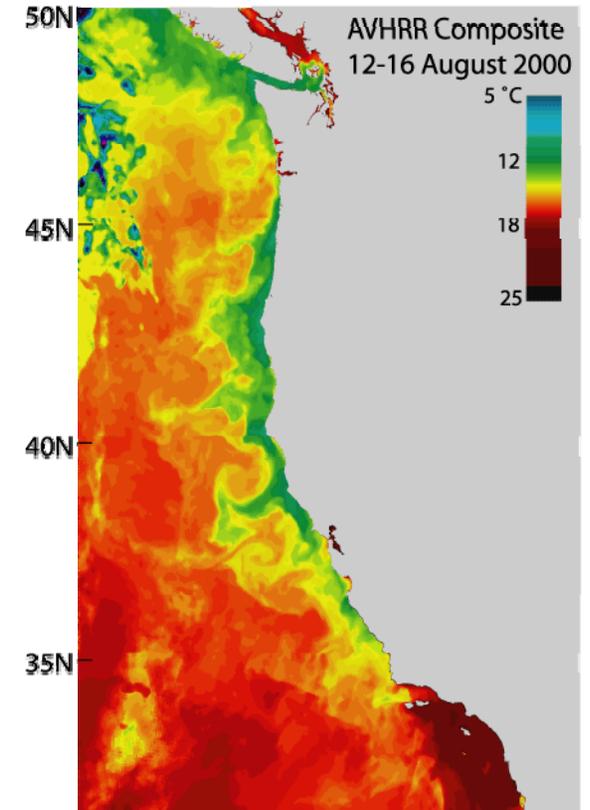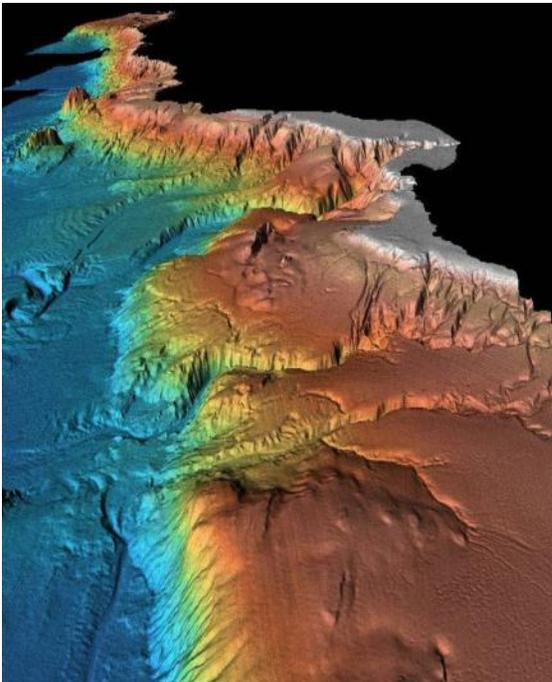
SAT Guidelines - Goals 1 and 4

Key Marine Habitats

Seafloor Habitats

- Rocky reefs
- Intertidal zones
- Sandy or soft ocean bottoms
- Underwater pinnacles
- Submarine canyons

Depth Zones

- Intertidal
- Intertidal to 30 m
- 30 to 100 m
- 100 to 200 m
- 200 m and deeper

Biogenic Habitats

- Kelp forests
- Seagrass beds

Oceanographic Habitats

- Upwelling areas
- Freshwater plumes
- Retention zones
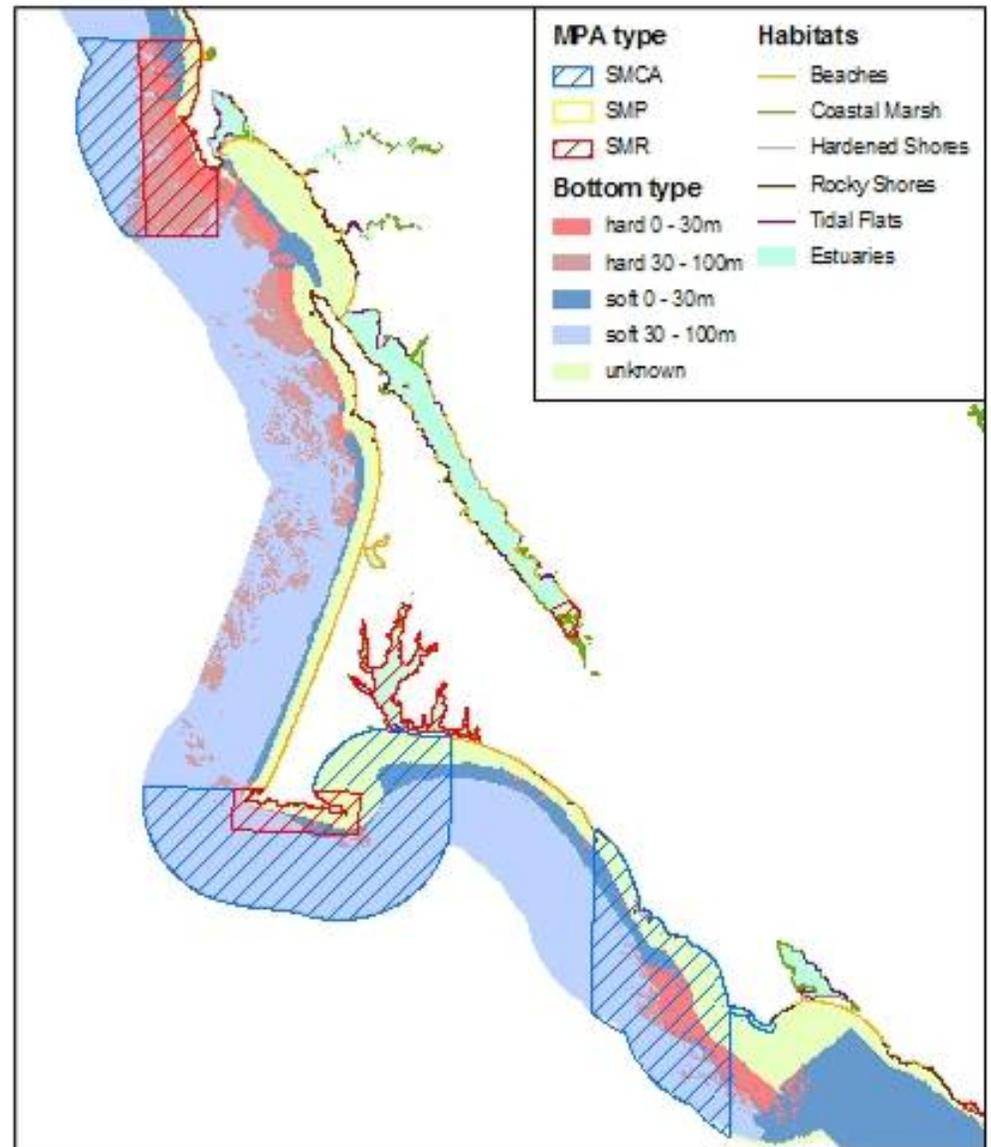
Used GIS to Locate Habitats

Identified geographic distribution

Estimated area of each habitat type for study area and subregions

Estimated area or linear extent of habitat in each MPA
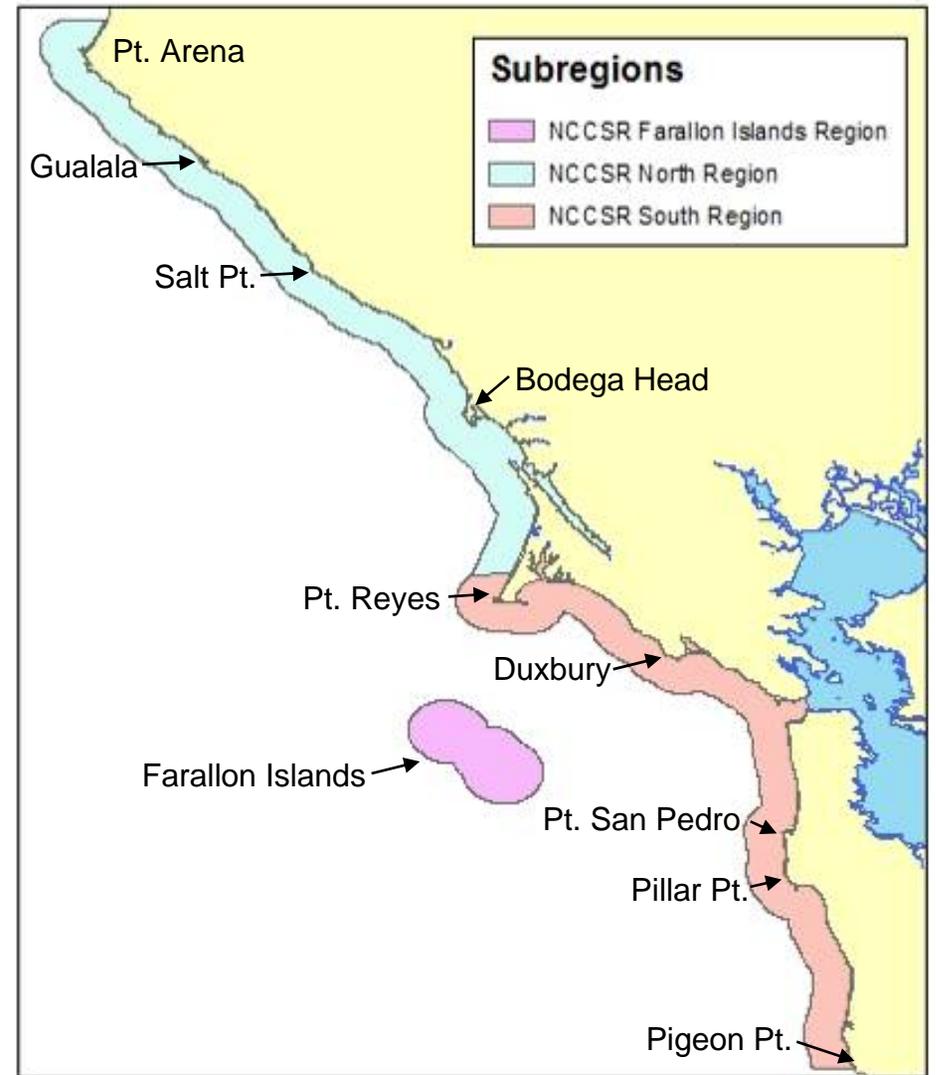
Three subregions

- North (Pt. Reyes to Pt Arena)

- South (Pigeon Pt. to Pt. Reyes)

- Farallon Islands

Based upon

- Species and community distributions
- Geomorphology
- Oceanography

SAT Guidelines – Levels of Protection

Designated levels of protection based on potential impacts of proposed activities

- direct impacts
    - habitat damage
    - incidental removal or mortality of non-target species

- indirect impacts
    - potential ecosystem effects caused by removing target or associated catch species

SAT Guidelines – Levels of Protection

The Question:

"Would there be a difference between ecosystems within an MPA that prohibits take of this species versus an area outside of the MPA where take is allowed?"

Yes if:

- habitat is damaged

- many species are removed

- removed species play an important role in the resident ecosystem (predator, prey, competitor etc.)

No if:

- no habitat damage

- little associated catch

- species removed are highly mobile so MPAs won't change local abundance

SAT Guidelines - Goals 1 and 4

	Level of Protection	MPA Types	Activities associated with this protection level
	Very high	**SMR**	**No take**
	High	**SMCA**	**salmon** (troll H&L in water greater than 50m depth), **sardine, anchovy, and herring** (pelagic seine)
	Mod-high	**SMCA**	**salmon** (troll H&L in water less than 50m depth), **Dungeness crab** (traps/pots), **squid** (pelagic seine)
	Moderate	**SMCA SMP**	**salmon** (non-troll H&L), **abalone** (diving), **halibut, white seabass, shore-based finfish and flatfishes** (H&L), **clams** (hand harvest), **giant kelp** (hand harvest)
	Low-mod	**SMCA SMP**	**Urchin** (diving), **lingcod, cabezon, greenling, rockfish, and other reef fish** (H&L), **surfperches** (H&L)
	Low	**SMCA SMP**	**bull kelp and mussels** (any method), **all trawling, giant kelp** (mechanical harvest)

SAT Guidelines - Goals 1 and 4

NCCSR Protection

	CCSR Level of Protect.	MPA Type	Activities associated with this protection level
	High	SMR, SMCA	**No take**, **salmon** (in water greater than 50m depth),* **coastal pelagics** (sardine, anchovy, herring)
	Moderate	SMCA	**salmon** (in water less than 50m depth), **crab** (traps/pots), **squid** (pelagic seine), **spot prawn** (traps/pots), **giant kelp** (hand harvest)
	Low	SMCA	**all others**, **giant kelp** (mechanical harvest)

Very High

High

Mod-high

Moderate

Low-mod

Low

Evaluation – Goals 1 and 4
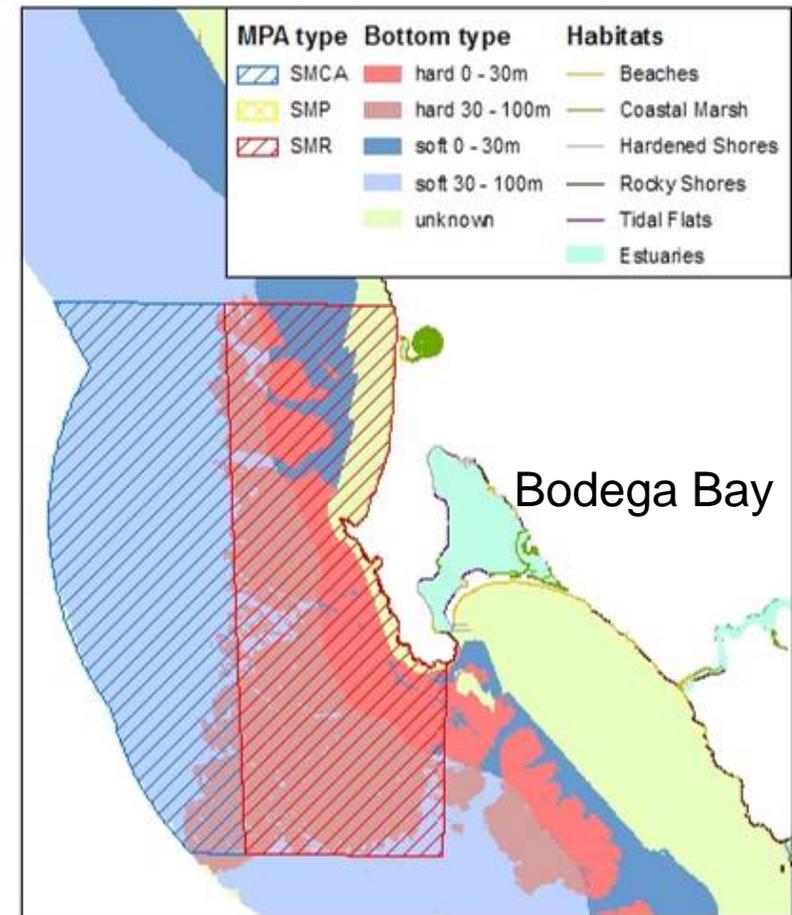
Key Questions for Each Proposed Package

1. How Well are Key Habitat Types Represented in Proposed MPA Packages?

2. What are the Proposed Levels of Protection for these Habitat Types?

3. How Well are Habitats and Levels of Protection Distributed Across the Study Region?

Similarities between proposals

- similarities in number, size and location of MPAs as well as the habitats they include

- clusters of MPAs with an inshore SMR and offshore SMCA that allows various fishing activities

- shoreline and shallow habitats are generally well represented in very high protection MPAs

- many MPAs located in rocky reef habitat

MPA type: SMCA, SMP, SMR
Bottom type: hard 0 - 30m, hard 30 - 100m, soft 0 - 30m, soft 30 - 100m, unknown
Habitats: Beaches, Coastal Marsh, Hardened Shores, Rocky Shores, Tidal Flats, Estuaries
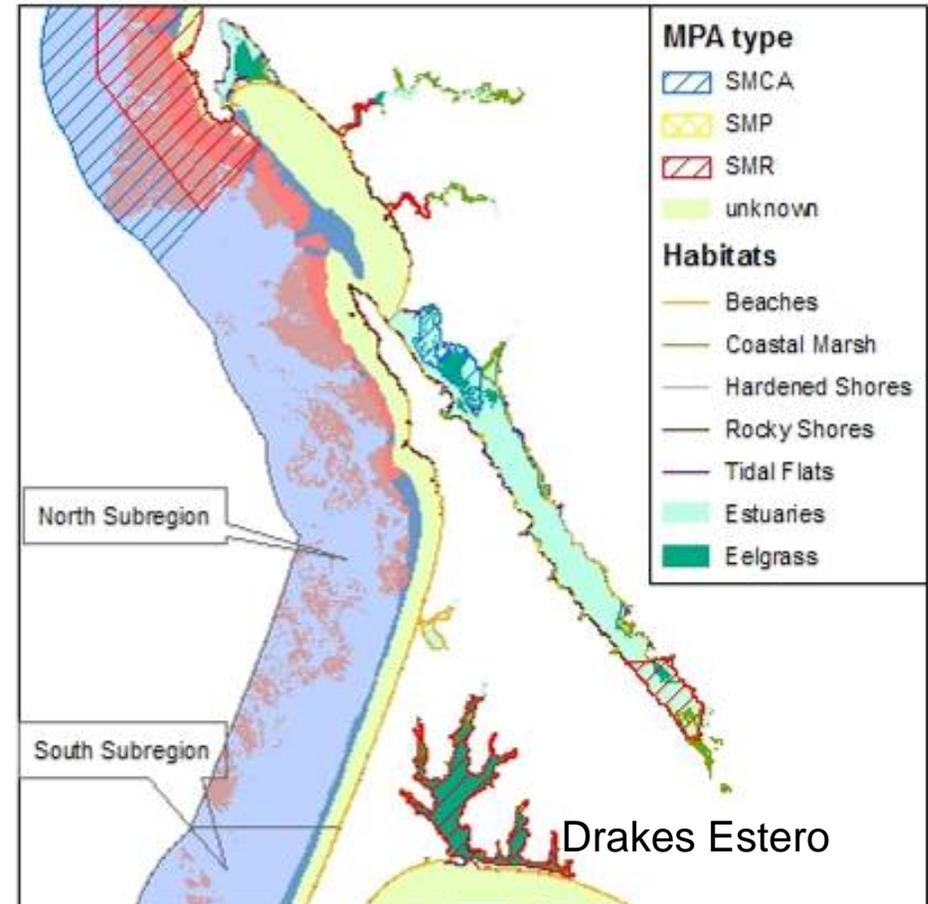
Bodega Bay

Results: Habitat Representation

Similarities between proposals

- estuarine habitats are generally well represented in very high protection MPAs

- most proposals protected more of these habitats in the south subregion (Drakes Estero)

- only two proposals specifically targeted large proportions of estuarine habitats in the north subregion (EA & EB)

MPA type
- SMCA
- SMP
- SMR
- unknown

Habitats
- Beaches
- Coastal Marsh
- Hardened Shores
- Rocky Shores
- Tidal Flats
- Estuaries
- Eelgrass
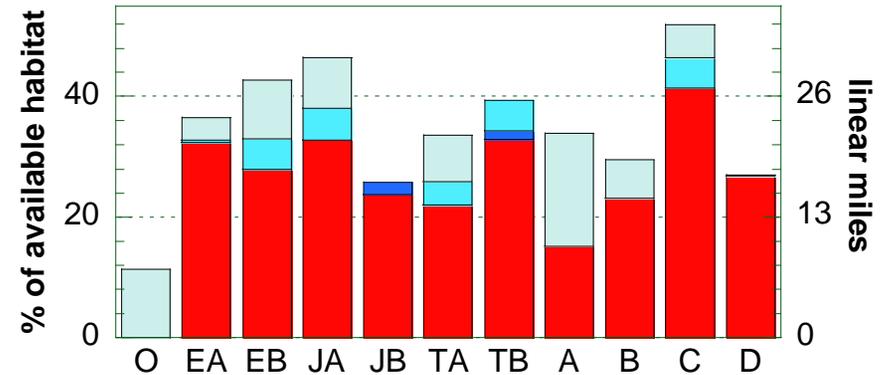
North Subregion

South Subregion

Drakes Estero

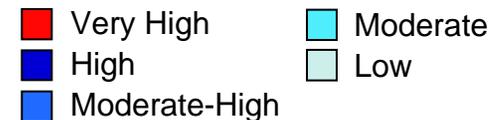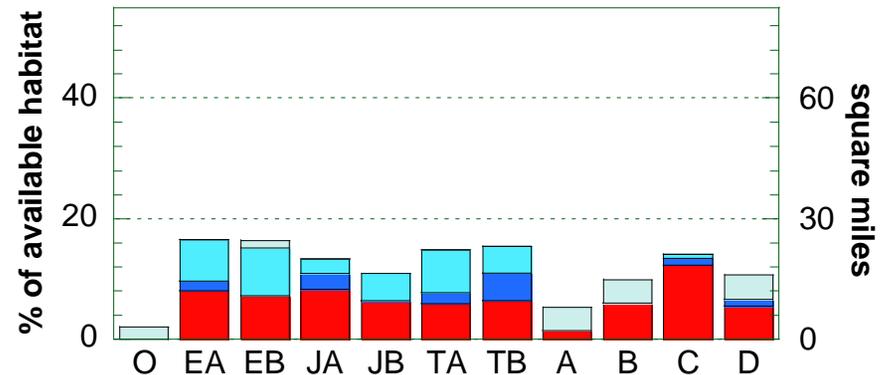# Results: Habitat Representation

Shallow Bottom Habitats

Proposals target shallow rocky reef, especially in north subregion

The lower proportion of shallow soft bottom included in MPAs reflects, in part, the large available area of this habitat

Shallow Rocky Reef (67 mi)

Shallow Soft Bottom (149 mi²)

Very High
High
Moderate-High
Moderate
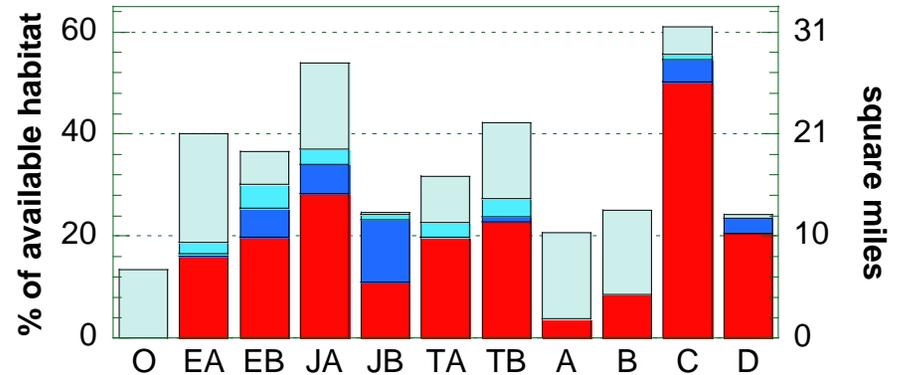Low

Results: Habitat Representation

Deep Bottom Habitats

Proportion of deep hard bottom in very high protection varies markedly between proposals
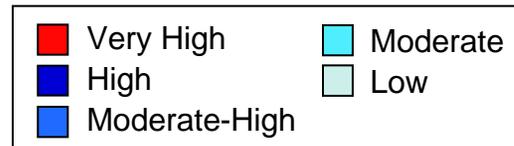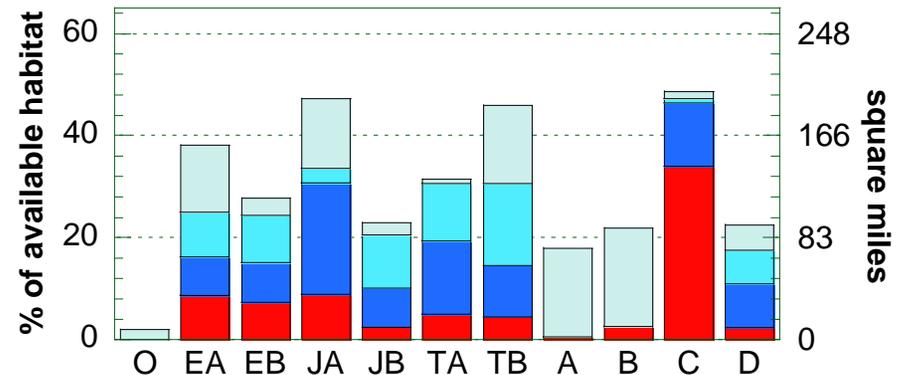
Areas of deep rocky reef protected at mod-high and moderate levels of protection (m-h = crabbing/ unspecified salmon, mod = halibut)

Large areas of deep soft bottom protected at mod-high and moderate levels of protection
(m-h = crabbing/ unspecified salmon, mod = halibut)

Deep Rocky Reef (52 mi²)

Deep Soft Bottom (414 mi²)

Legend:
- Very High (red)
- High (dark blue)
- Moderate-High (blue)
- Moderate (cyan)
- Low (light blue)

Results: Habitat Representation

Summary

- soft bottom habitats less represented in high protection MPAs, but assessment of shallow soft bottom habitat availability needs to be revisited (much unknown)

- several MPAs received lower protection level designations because of insufficient information (e.g., salmon gear, fate of existing mariculture activities)

- representation of some habitats varied across subregions:
    - better represented in south: tidal flats, eelgrass, estuaries, shallow soft bottom
    - better represented in north: deep and shallow rocky reef

- kelp habitat is not well mapped – need to know relationship between shallow rock and kelp

SAT Preliminary Evaluations

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