



Marine Life Protection Act Initiative



SAT Evaluations of MPA Proposals and the Integrated Preferred Alternative for the North Central Coast Study Region

**Presentation to the California Fish and Game Commission and the
MLPA Blue Ribbon Task Force**

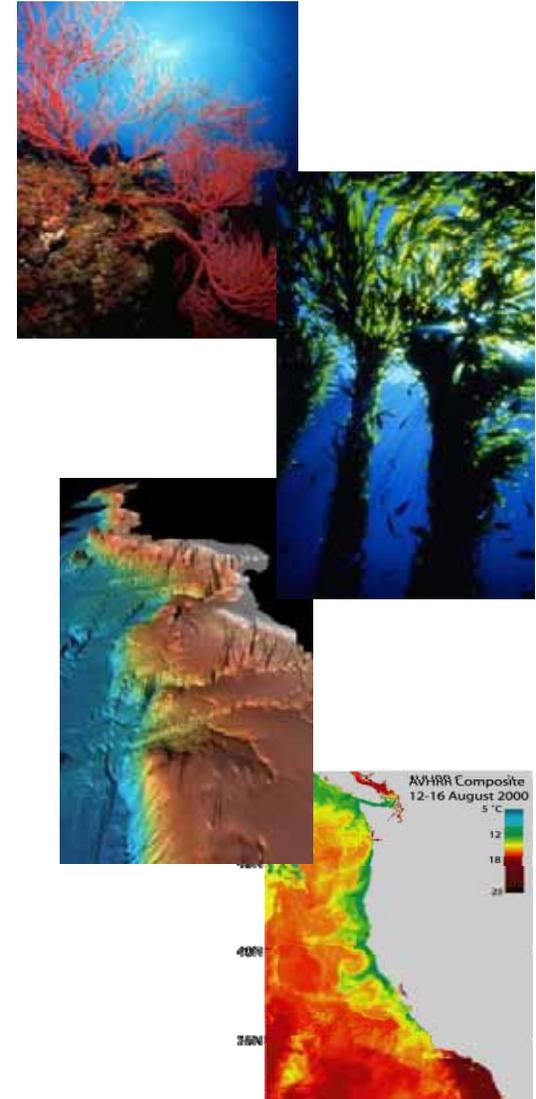
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MLPA Goals

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**.





Habitats and Ecosystems

Key Marine Habitats

Seafloor Habitats

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

Biogenic Habitats

- Kelp forests
- Seagrass beds

Depth Zones

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

Oceanographic Habitats

- Upwelling areas
- Freshwater plumes
- Retention zones



Habitats Evaluation (Goals 1 and 4)

Key Questions

1. How well are key habitat types represented in proposed MPA arrays?
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?



Habitat Representation

Similarities among proposals



Strong convergence among 4 proposals in area in very high (SMR) protection



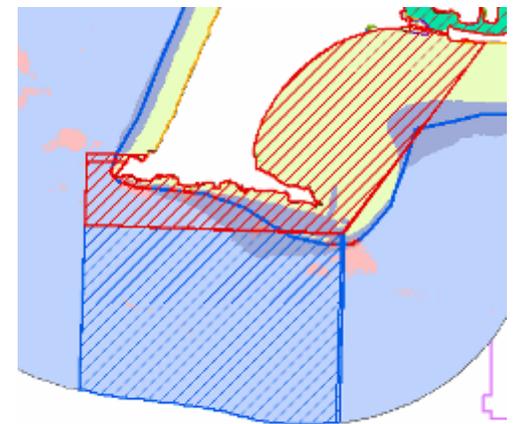
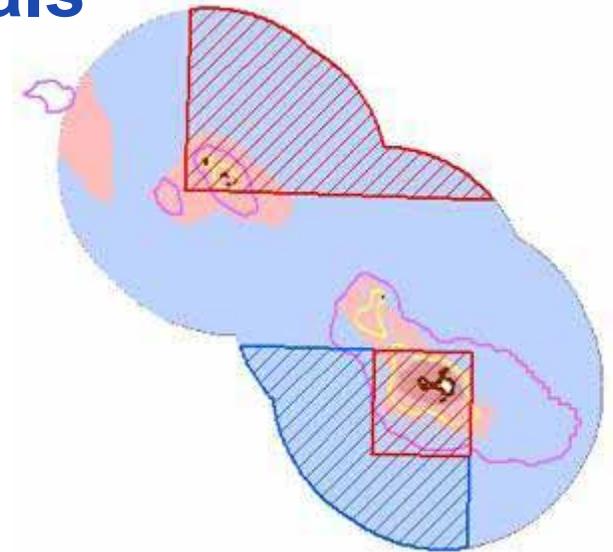
All 4 proposals have extremely similar MPA design at the Farallon Islands, Point Reyes, and Point Arena



All 4 proposals have similar area of rocky shore, sandy beach and surfgrass in very high (SMR) protection



All 4 proposals have similar protection of estuarine habitats





SAT Guidelines: Levels of Protection

	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, and other reef fish (H&L); surfperches (H&L)
	Low	SMCA SMP	bull kelp and mussels (any method); all trawling; giant kelp (mechanical harvest); mariculture (existing methods in NCCSR)

SMR = state marine reserve

SMCA = state marine conservation area

SMP = state marine park



Habitat Availability

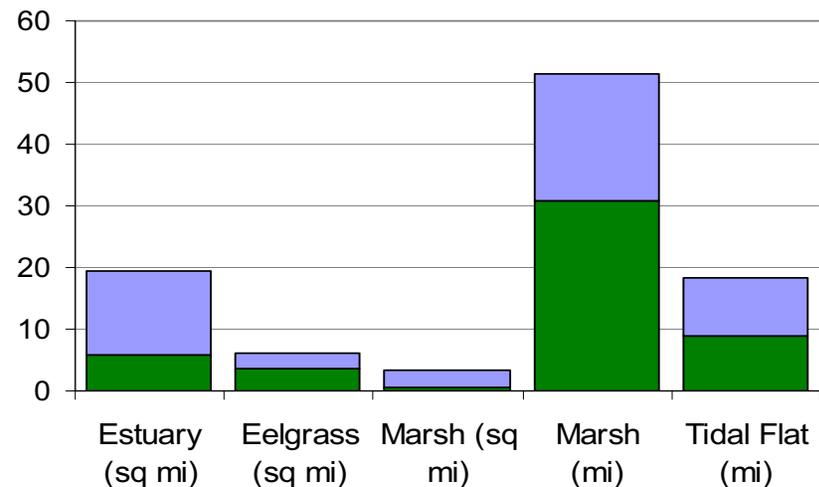
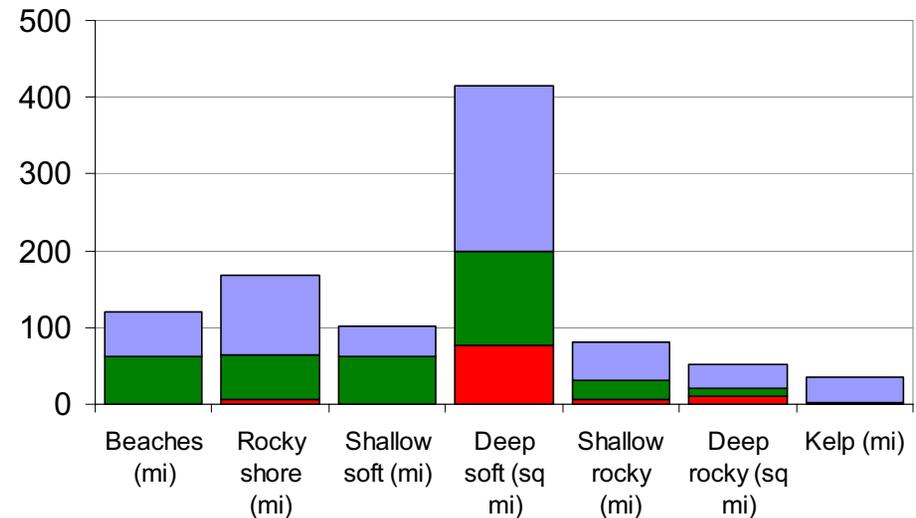
Deep soft bottom is the most abundant habitat in all subregions

More rocky shore and shallow rocky reef in the north subregion

More shallow soft bottom in the south subregion

Kelp is only mapped in the north subregion

More estuarine area in the north, but more eelgrass in the south



■ Farallones
 ■ South
 ■ North



Habitat Representation

Rocky Habitats

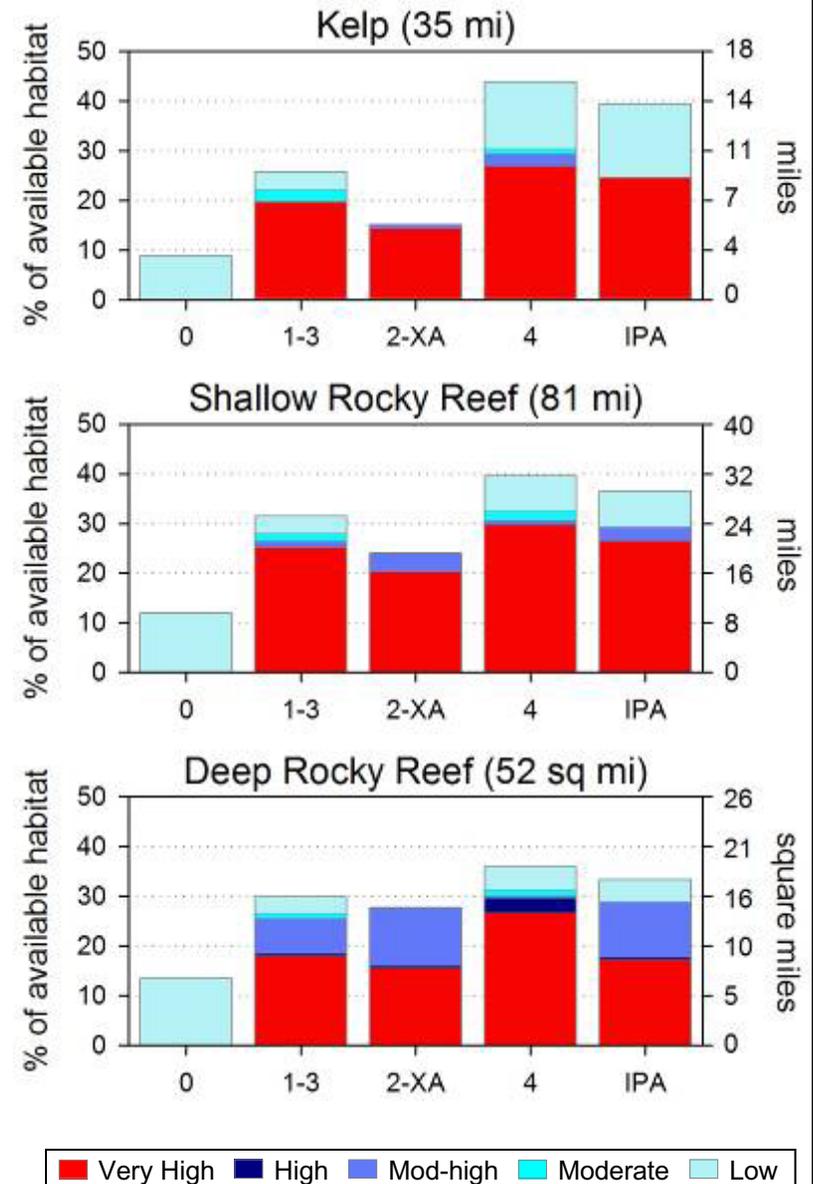
A high proportion of protected areas are in SMRs ■

Protection of kelp closely mirrors protection of shallow rock

Prop 4 protects the greatest proportion of all three rocky habitats at very high ■ protection

Large areas of deep rock in mod-high ■ protection due to salmon and crabbing

Some shallow rock and kelp areas in moderate ■ due to shorefishing and abalone and low ■ due to urchin harvest





Habitat Representation

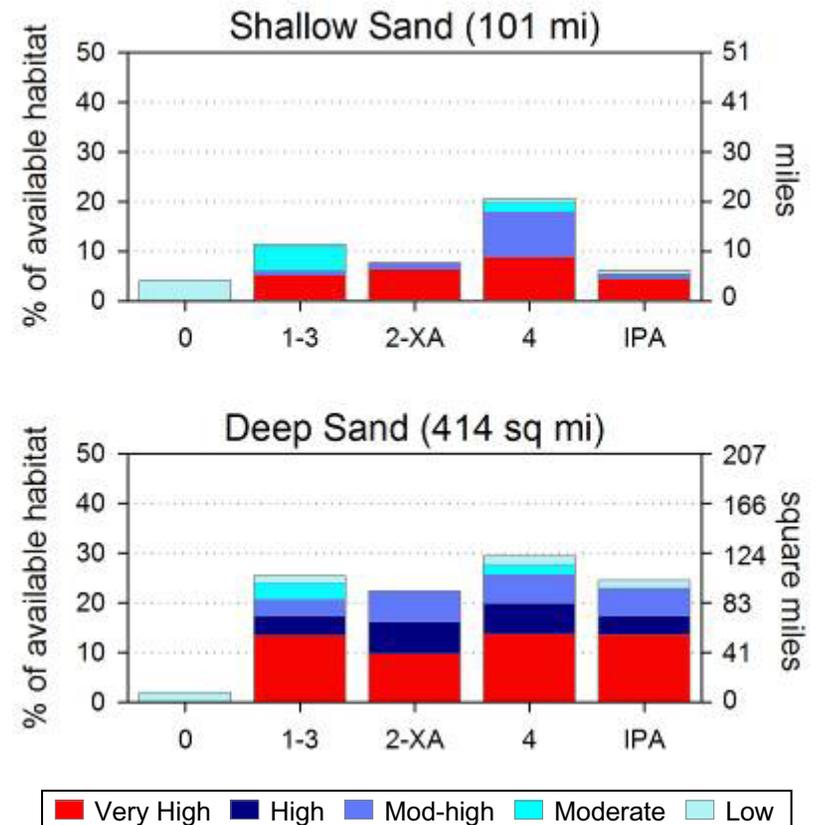
Sandy Habitats

Lower representation of soft bottom habitats relative to rocky habitats

Area of shallow sand in very high protection similar across proposals

Area of deep sand in very high, high and moderate-high protection similar across all 4 proposals

Large areas of deep sand in high protection due to deep water salmon trolling and mod-high protection due to crabbing





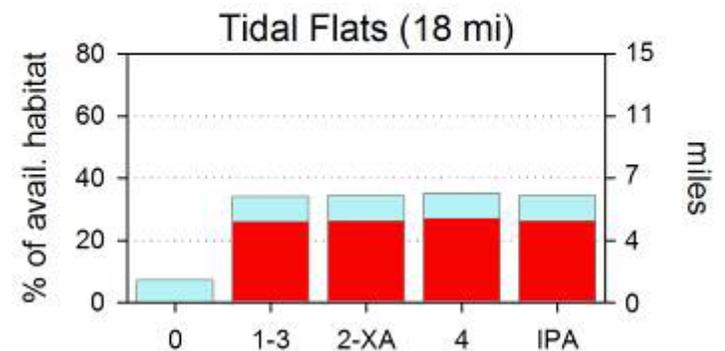
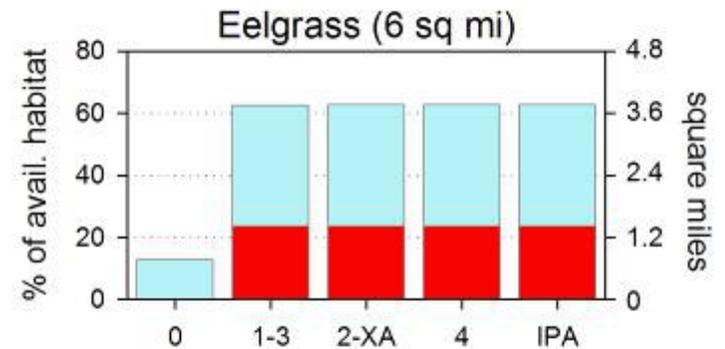
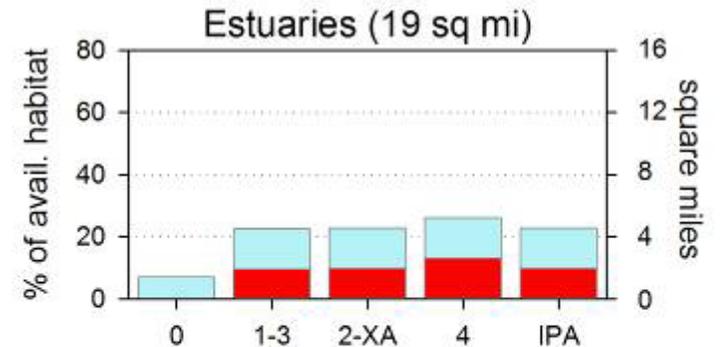
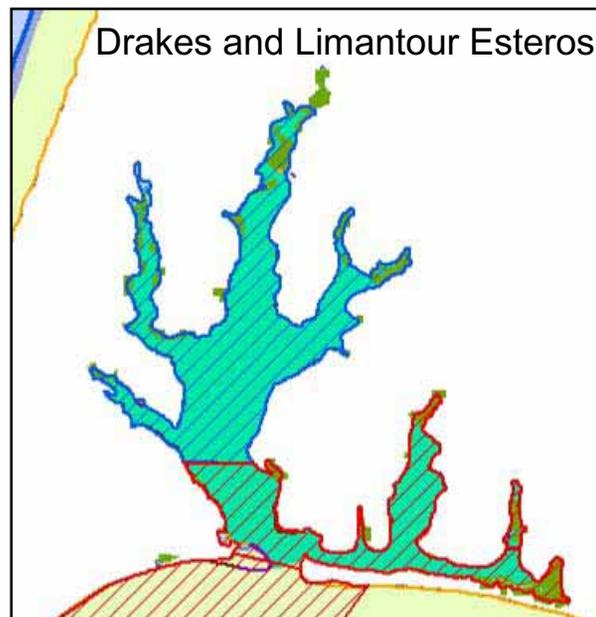
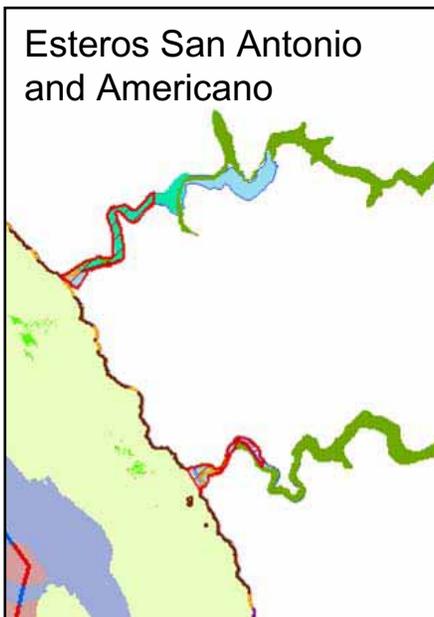
Habitat Representation

Estuarine Habitats

All four proposals have almost identical protection of estuarine habitats.

Low ■ protection due to mariculture

Identical MPA shapes across all proposals



Very High High Mod-high Moderate Low



Habitat Representation

Summary

-  All habitats except shallow sand have at least 10% representation at very high protection in all 4 proposals
-  Consistent ranking of stakeholder proposals in percent of habitat protected (4 > 1-3 > 2-XA), with exception of shallow sand at very high and high protection
-  For most habitats, proposal IPA protects more area than 2-XA but less than 4 at very high protection.

IPA falls between 1-3 and 4 in area of **rocky shore**, **shallow rock**, **kelp**, and **deep sand** protected at very high protection

IPA falls between 2-XA and 1-3 in area of **surfgrass** and **deep rock** protected at very high protection

Exceptions – IPA protects less area of **sandy beach** and **shallow sand** than any stakeholder proposal.



Habitat Replication

Guidelines for replication:



3-5 replicates of habitat per biogeographic region (Point Conception to Oregon Border)



MPA or cluster must meet the minimum size guidelines (9 square miles)



Habitat must meet the threshold identified to encompass 90% of biodiversity in that habitat type



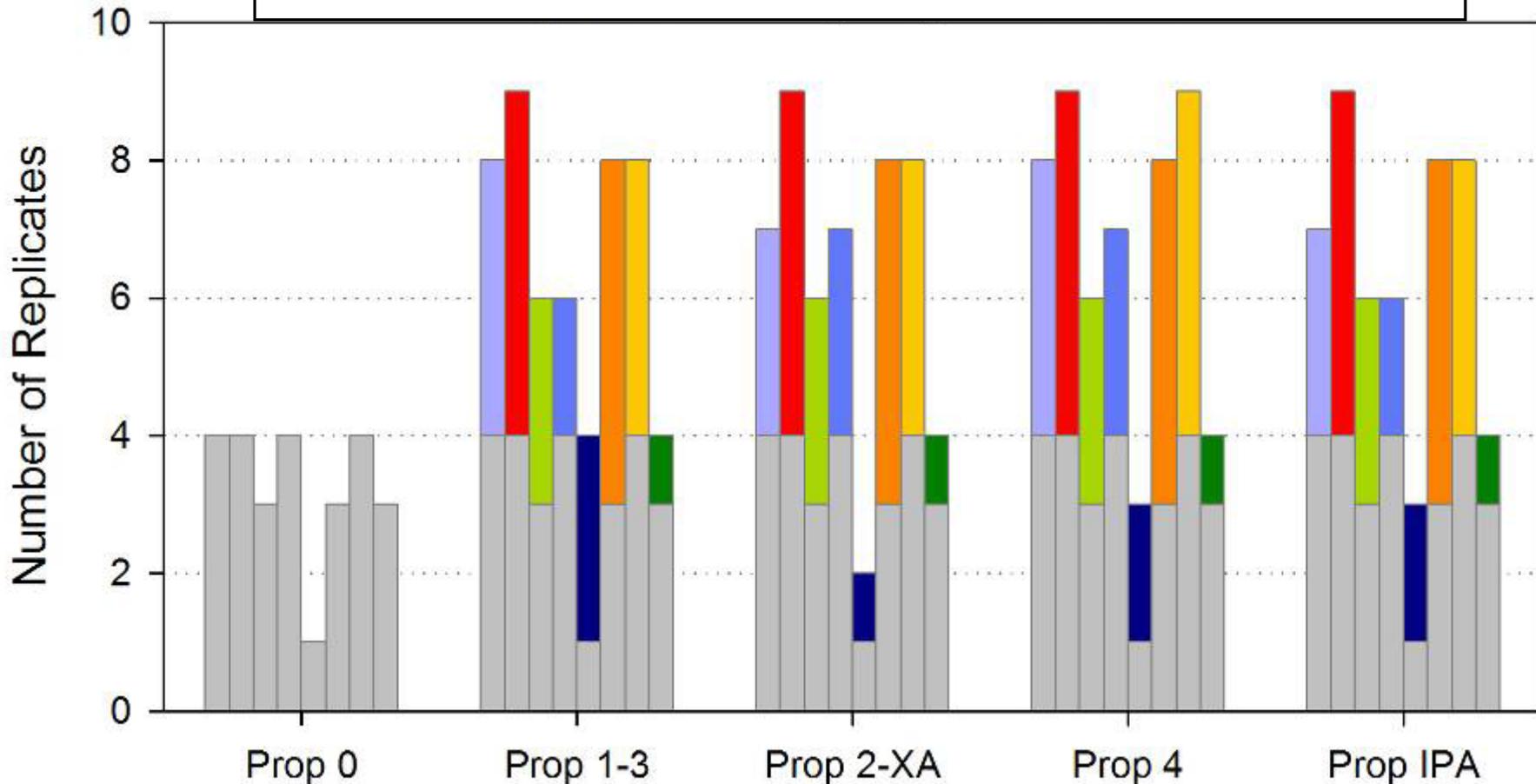
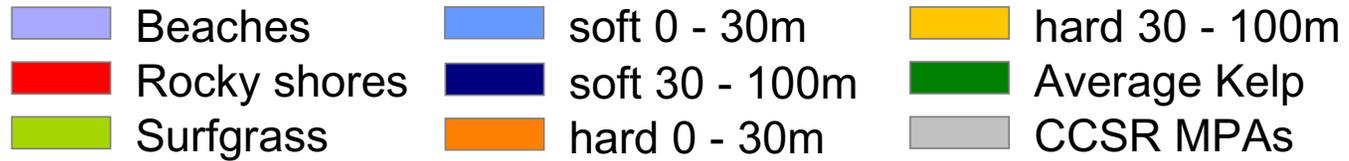
Estuarine MPAs do not have to meet size guidelines but must contain at least 0.12 mi² of estuarine habitat



Some small estuaries (Gualala and Garcia rivers, Pescadero Creek) contain less than the minimum 0.12 mi², but protection of these habitats still has conservation value



Replication: Very High Protection

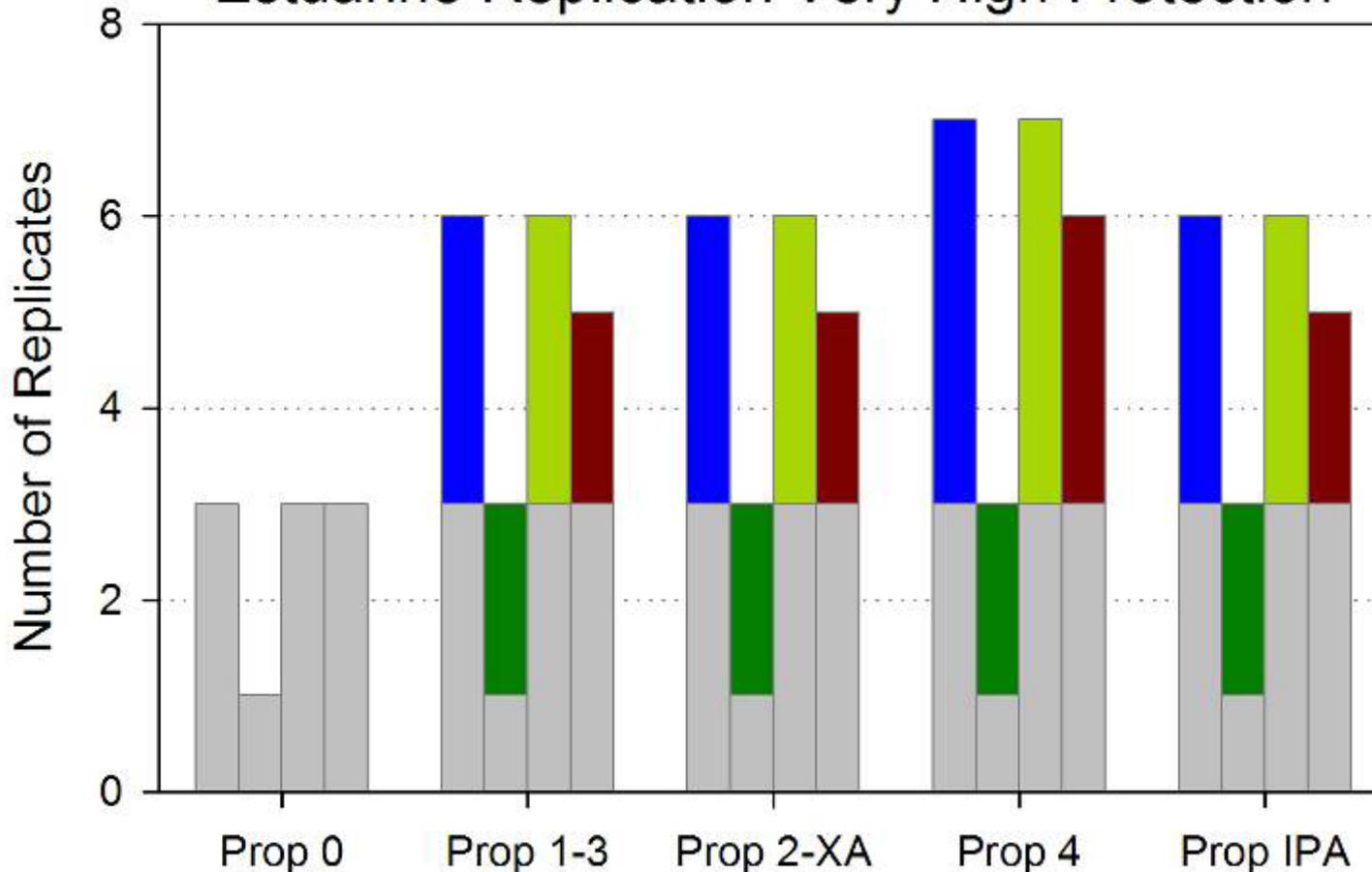




Replication: Estuarine Habitats



Estuarine Replication Very High Protection



Most habitats with 2-4 new replicates

Greater replication of eelgrass than central coast study region

No estuarine habitats in mod-high or high LOP



Habitat Replication

Summary



No marked differences among proposals

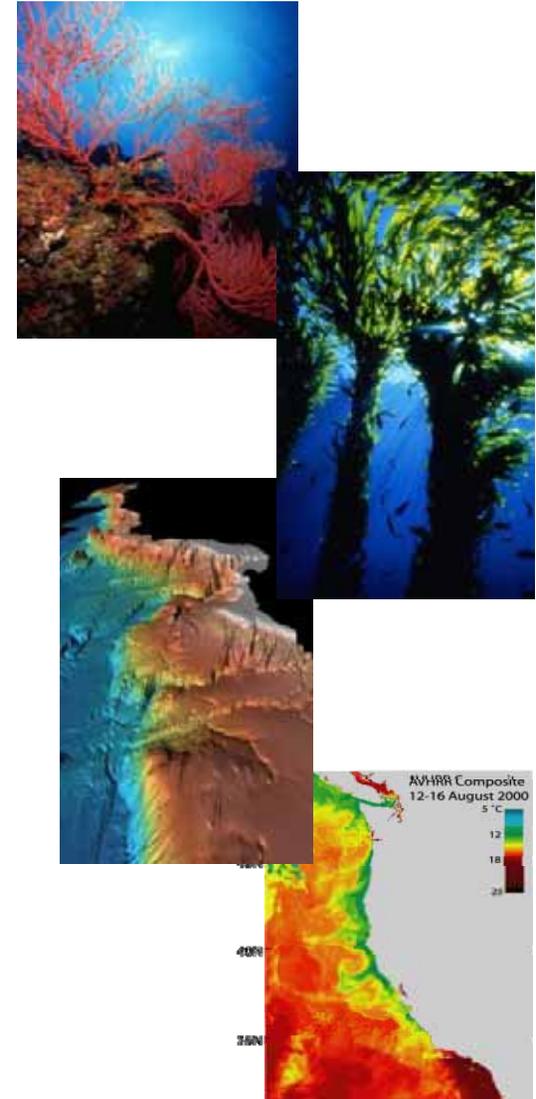


Levels of replication similar to MLPA Central Coast Study Region for most habitats at very high protection



MLPA Goals: Populations

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Protecting Populations (Goals 2 & 6)

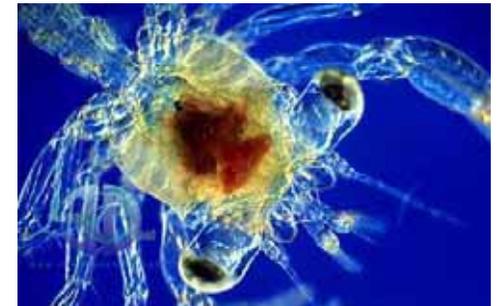
Size and Spacing



MPAs should be large enough that adults don't move out of them and become vulnerable to fishing



MPAs should be close enough together that larvae can move from one to the next





Size Analysis Methods



Measure individual MPA lengths and area



Combine contiguous MPAs into MPA clusters



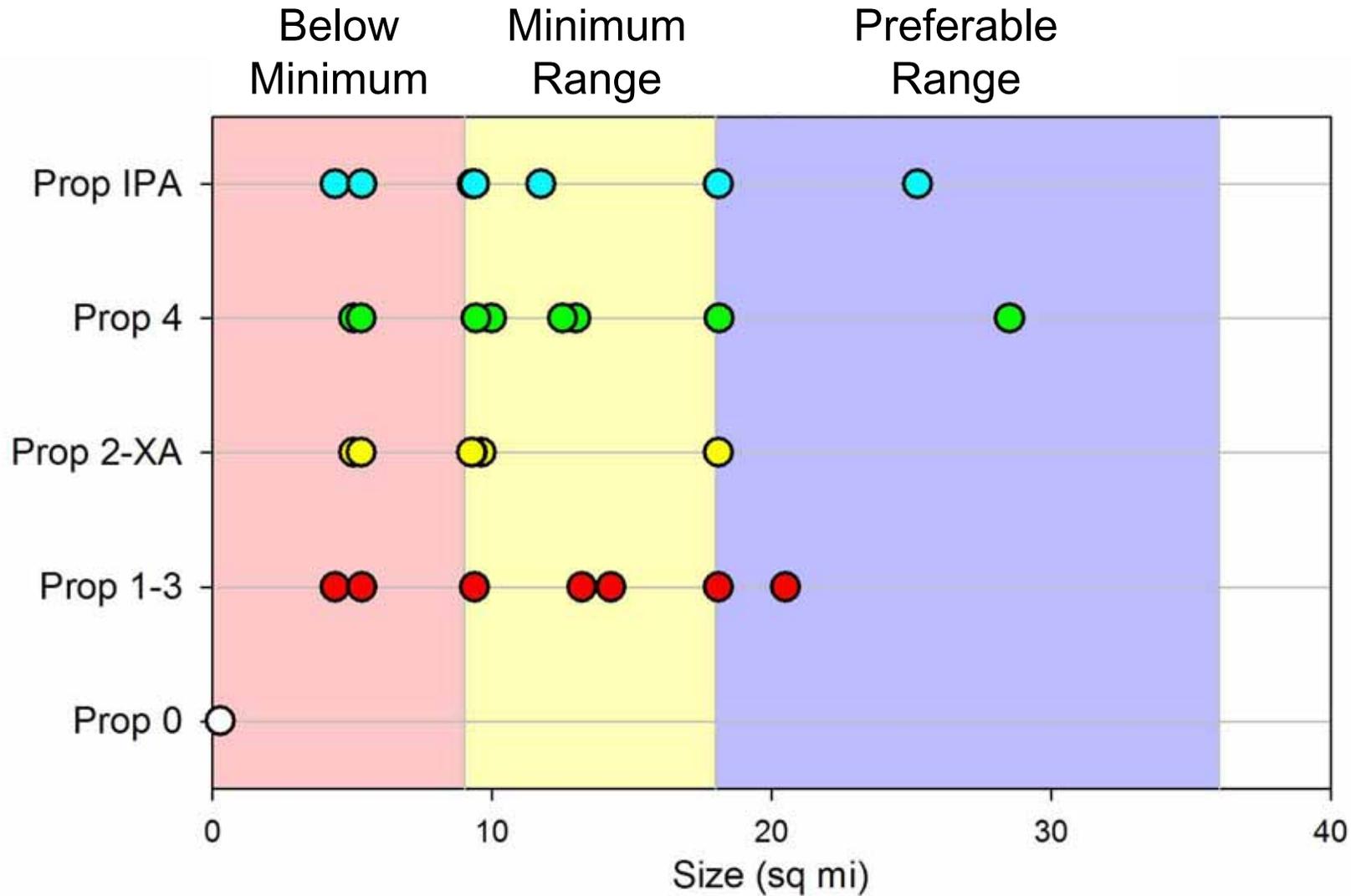
Consider level of protection



Tabulate MPA lengths and areas relative to minimum & preferred guidelines

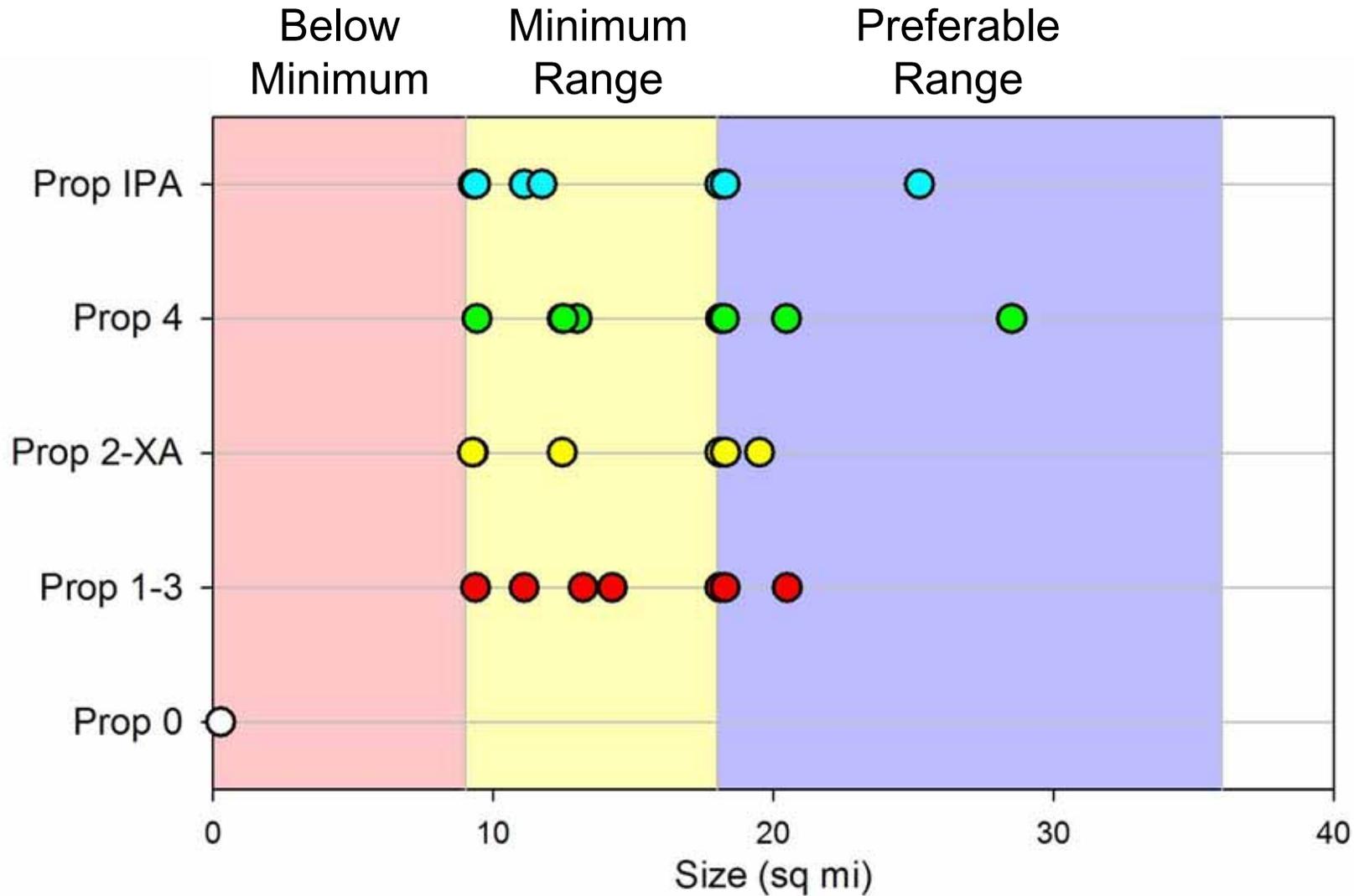


Size: Very High Protection



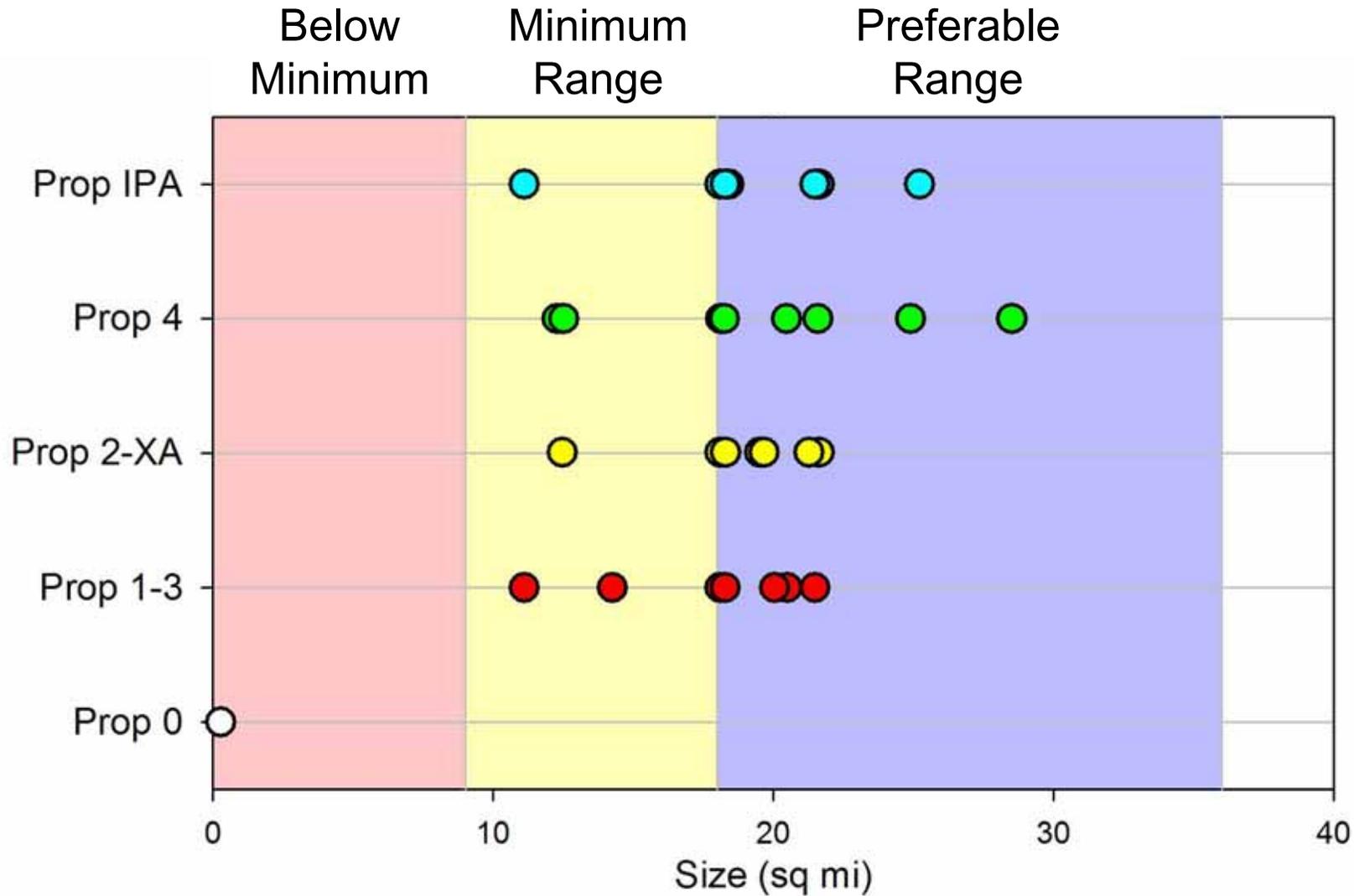


Size: High Protection





Size: Mod-high Protection





MPA Size Conclusions



Most MPAs meet minimum size guidelines



All MPAs meet minimum size for High/Mod-High protection in all proposals

Avg. MPA Size	Very High Protection	High Protection	Mod-High Protection
Prop 1-3	12.2	14.0	17.7
Prop 2-XA	9.4	13.8	18.8
Prop 4	12.7	16.6	18.8*
Prop IPA	11.9	14.7	19.2

* Proposal 4 has two more MPA clusters than other proposals



Protecting Populations

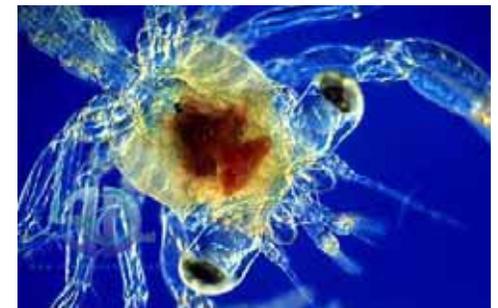
Size and Spacing



MPAs should be large enough that adults don't move out of them and become vulnerable to fishing



MPAs should be close enough together that larvae can move from one to the next





Spacing Analysis Methods



MPAs or clusters must meet the minimum size guidelines (9 square miles) to count for spacing



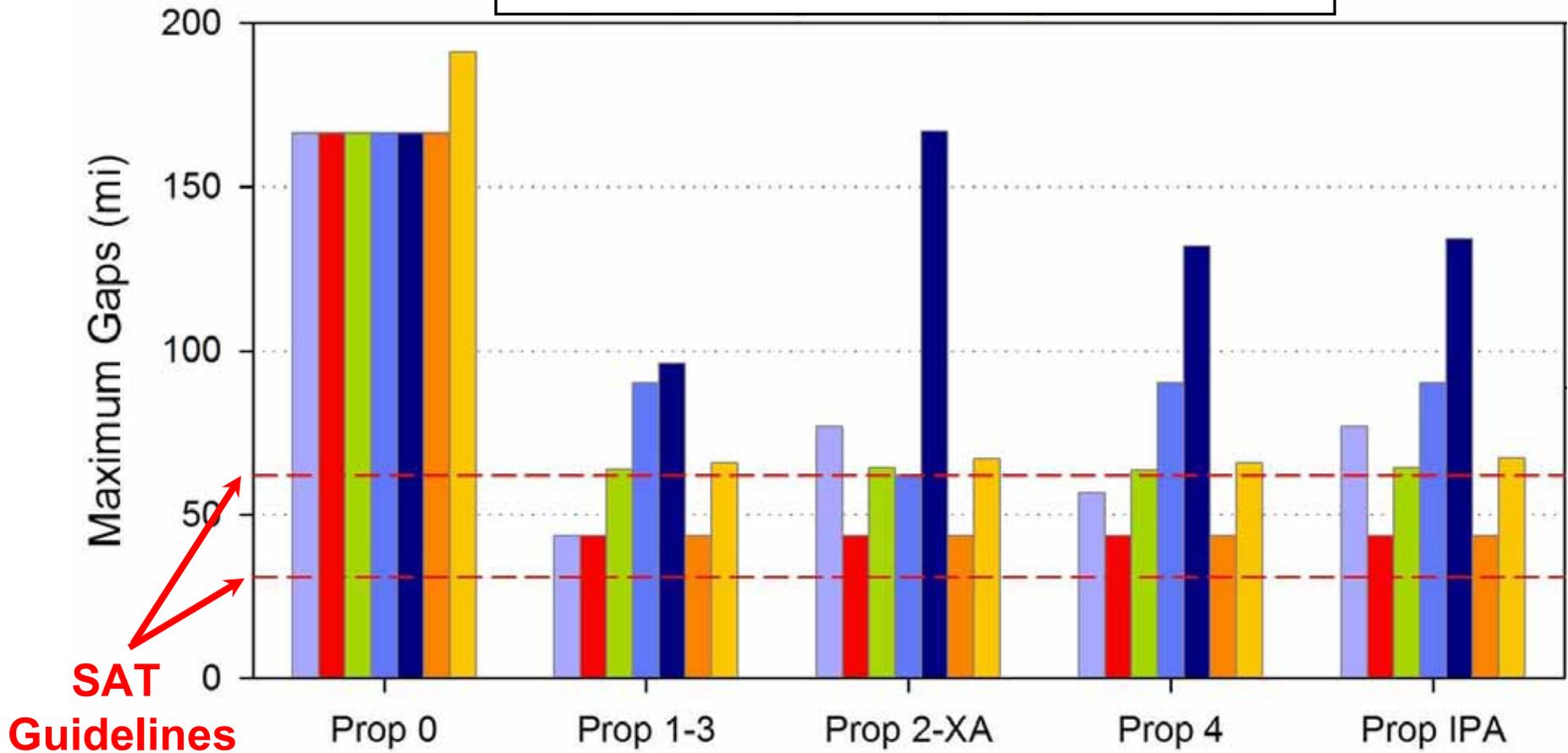
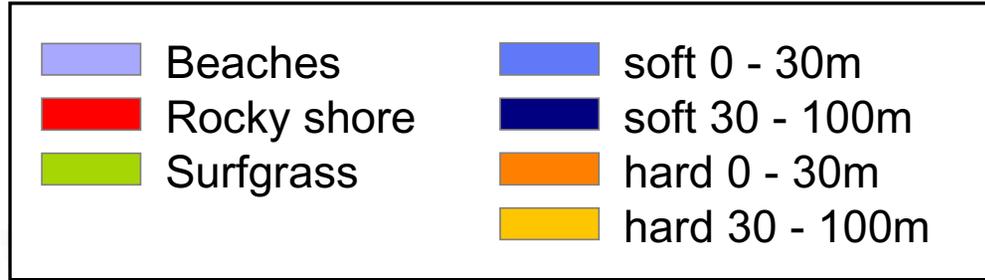
- Identify the habitats included within each MPA cluster



- Measure gaps between adjacent MPA clusters that contain a given habitat

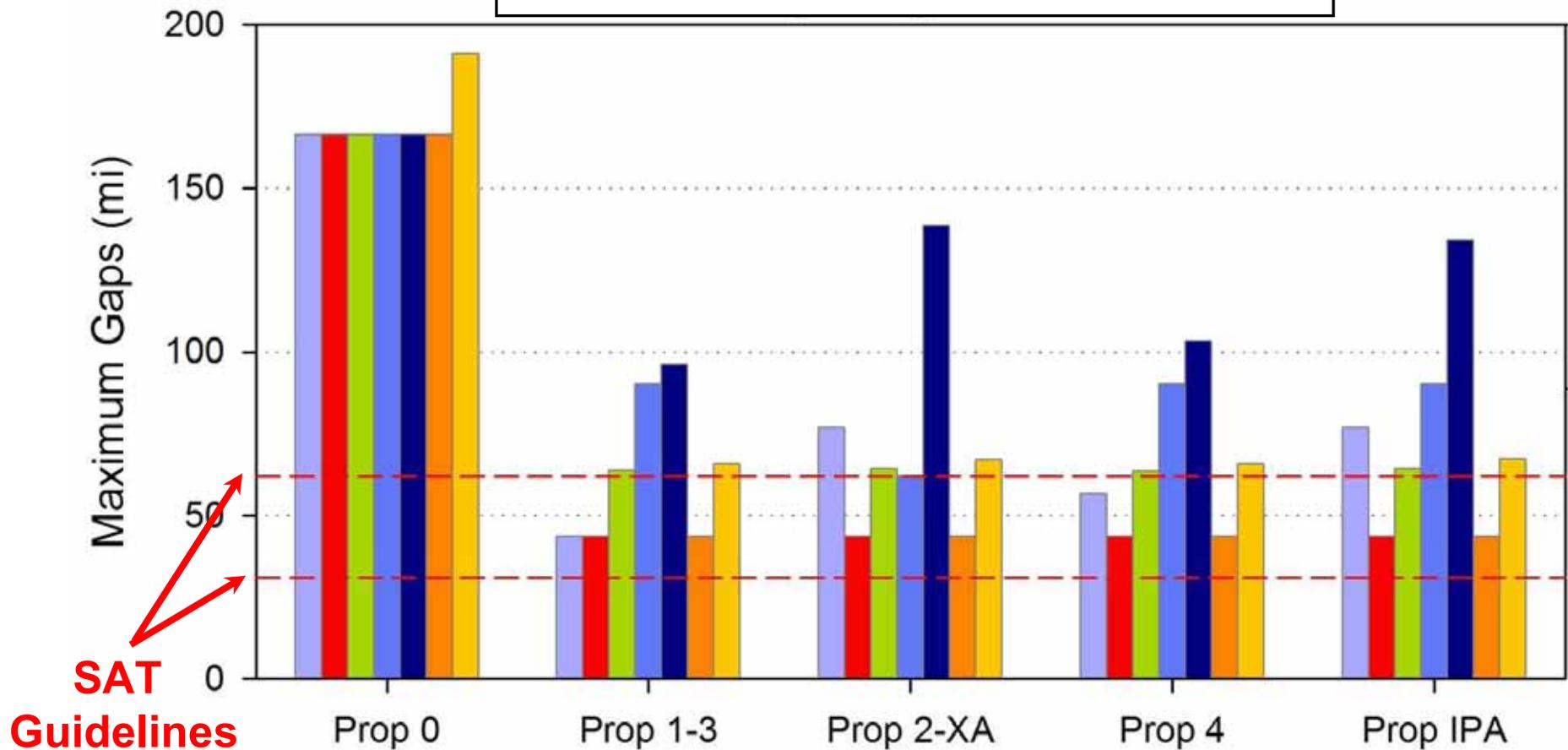
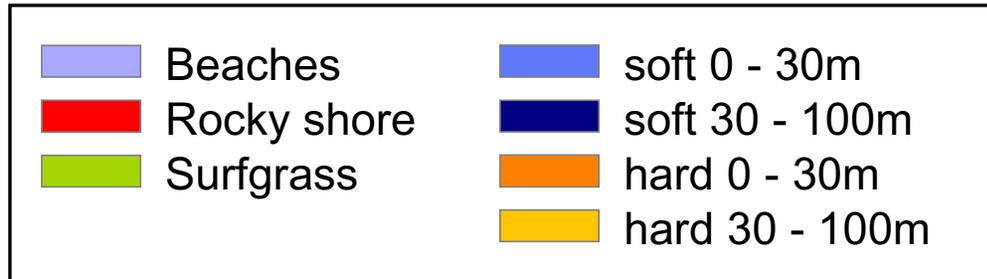


Spacing: Very High Protection



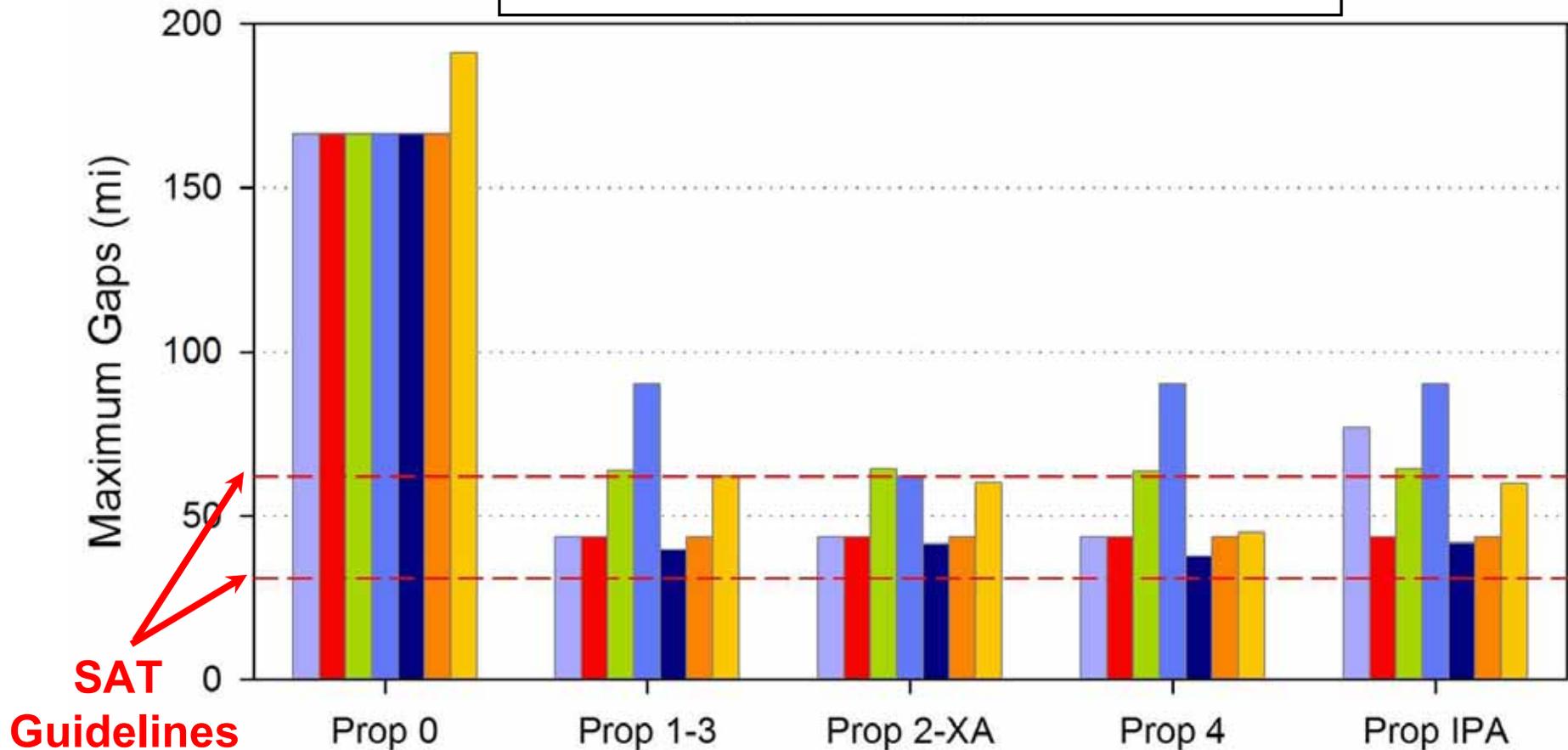


Spacing: High Protection





Spacing: Mod-high Protection





MPA Spacing Conclusions



All proposals have gaps that exceed guidelines at Very High and High levels of protection (1-3, 2-XA, and 4 each have two gaps, IPA has three)



Large gaps are all in sandy habitats



Proposal 2-XA meets guidelines at Mod-high protection



Proposals 1-3 and 4 have a single gap (shallow sand) that exceeds guidelines at Mod-high protection



Proposal IPA has two gaps (shallow sand and sandy beach) that exceed guidelines at Mod-high protection



Protection of Birds and Mammals (Goal 2)



Basis for Evaluation:

Special closures reduce disturbance

MPAs may reduce disturbance and protect forage base



Identify breeding and roosting/haul out sites inside MPAs and special closures (# of species and individuals)



Analyze the proportion of foraging areas protected by MPAs (within a distance of breeding sites or where non-breeding birds concentrate to forage)



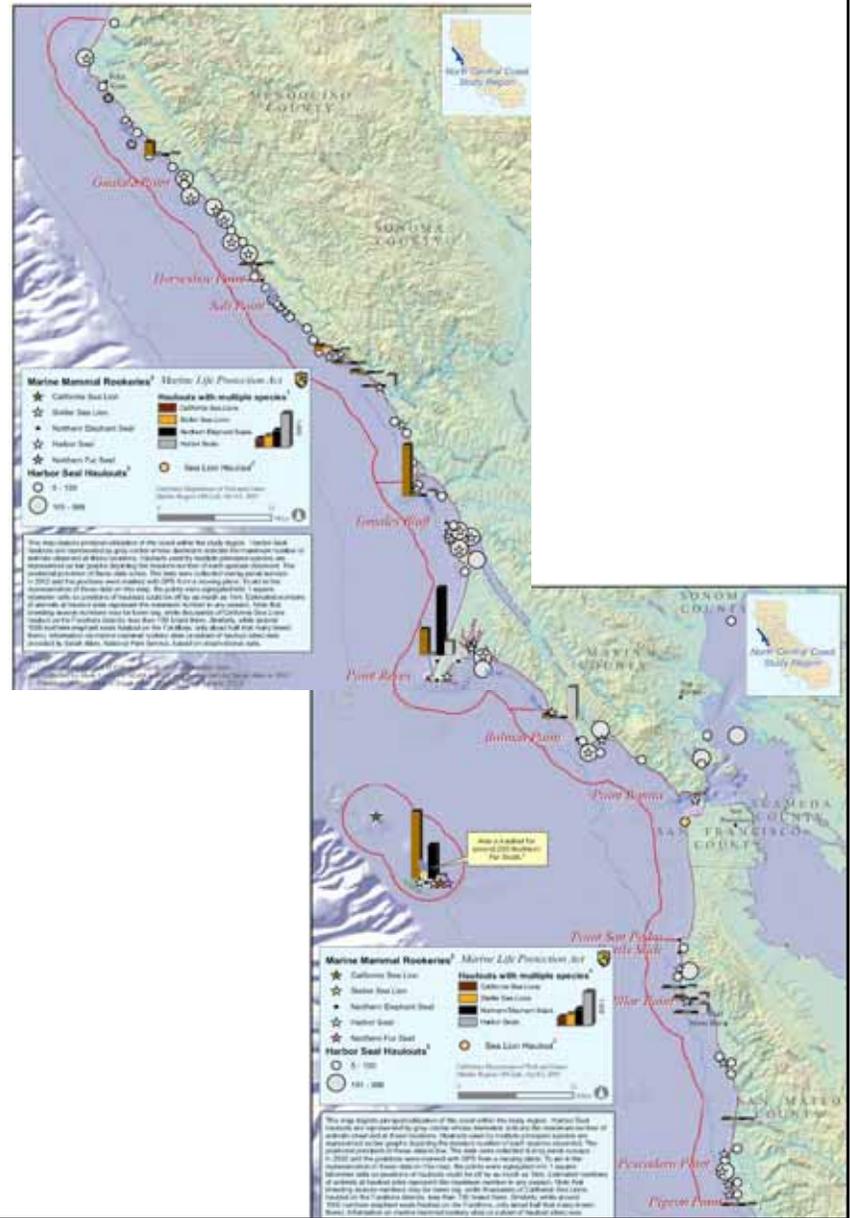
Consider species of special interest (endangered brown pelicans)

Marine Mammal Haul Outs and Rookeries



Five species of pinnipeds in Study region

- 42 colonies
- 76 haul out sites
- 9,300 breeding mammals
- 17,900 resting/ molting



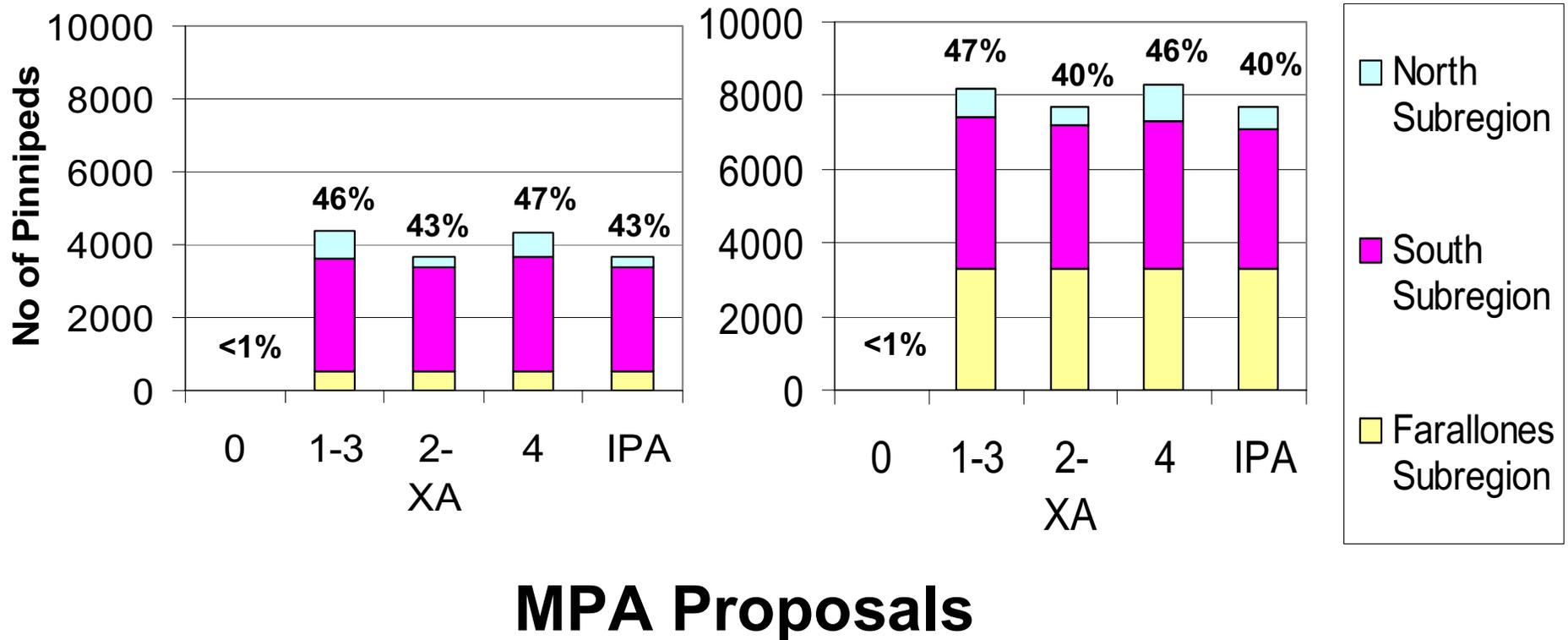


No. of Mammals at Rookeries and Haul Outs

% = % of mammals in study region included within MPA proposals

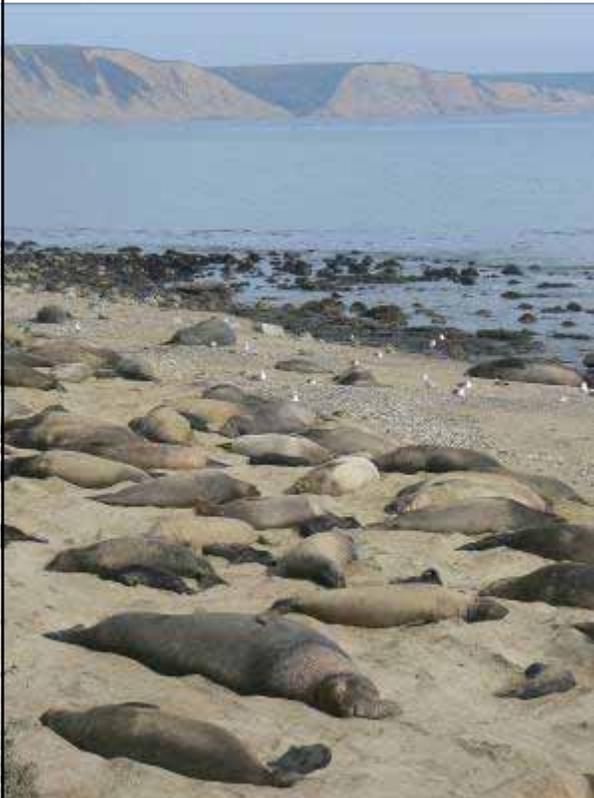
Rookeries

Haul outs





Marine Mammals in Special Closures



Special Closure Location	Prop 0	Prop 1-3	Prop 2-XA	Prop 4	Prop IPA
No special closures north of Point Reyes					
Point Reyes		1000 ft 4 species		1000 ft 4 species	1000 ft 4 species
Pescadero		300 ft 1 species			
North Farallon Islands		300 & 1000 ft 2 species	300 ft 2 species	300 & 1000 ft 2 species	300 & 1000 ft 2 species
South Farallon Islands	300 ft 5 species	300 ft 5 species	300 ft 5 species	300 ft 5 species	300 ft 5 species

All Seabird Colonies in NCCSR

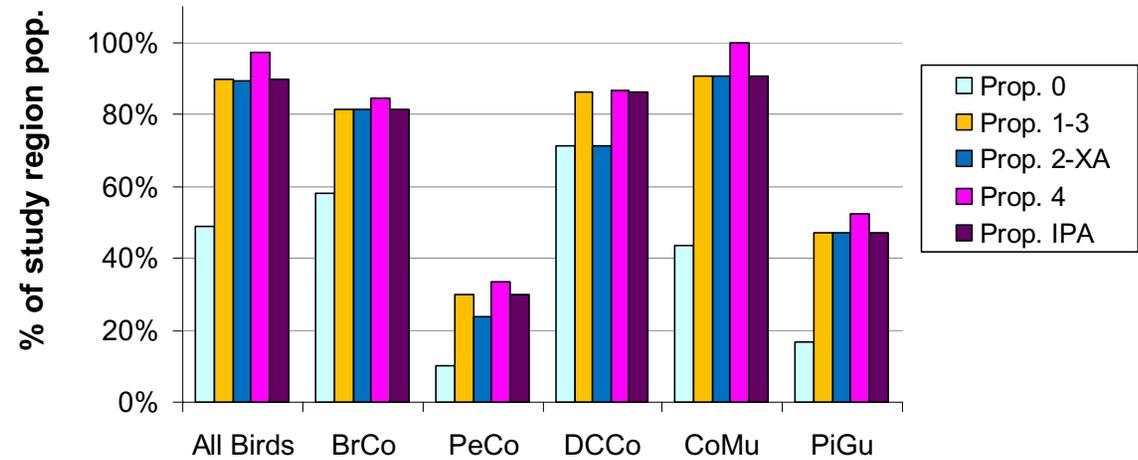
- 66 colonies
- 12 species
- > 335,000 birds



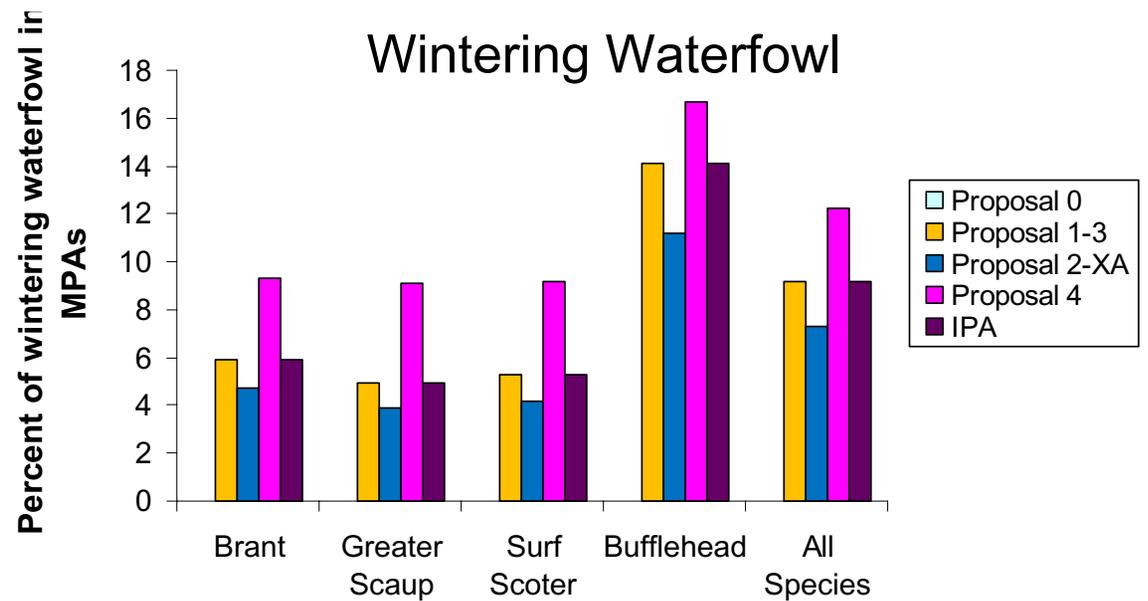
Seabirds and Waterfowl in Proposed MPAs



Breeding Seabirds



Wintering Waterfowl





Proposed Special Closures

Proposal	0	1-3	2-XA	4	IPA
Arched Rock				300 feet	
Gull Rock				300 feet	
Point Reyes		1,000 feet		1,000 feet	1,000 feet
Point Resistance		500 feet	300 feet		300 feet
Stormy Stack		300 feet	300 feet	300 feet	300 feet
Devil's Slide Rock		1,000 feet	300 feet	1,000 feet	300-1000 feet
Pescadero *		300 feet			
North Farallon Islands	300 feet	1,000 feet 300 feet	300 feet	1,000 feet 300 feet	1,000 feet 300 feet
South Farallon Islands	300 feet	300 feet	300 feet	300 feet	300 feet

* Little benefit to seabirds



Bird and Mammal Conclusions



-  All proposals protect bird and mammal rookeries at the Farallons
-  Protection of birds and mammals across all proposals: Farallons > south subregion > north subregion
-  All proposals protect the largest seabird colonies with special closures but few roosts
-  Across all proposals, about half of marine mammal hotspots fall inside MPAs, but special closures only target mammals at Point Reyes and Farallons
-  Proposal IPA falls within the range of stakeholder proposals



SAT Evaluations of NCCSR Proposals

