

# Marine Life Protection Act Initiative



## Draft Size and Spacing Evaluations of the Round 1 Draft MPA Arrays/Proposals for the MLPA South Coast Study Region

Presentation to the MLPA South Coast Regional Stakeholder Group  
April 28, 2009 • Oxnard, CA

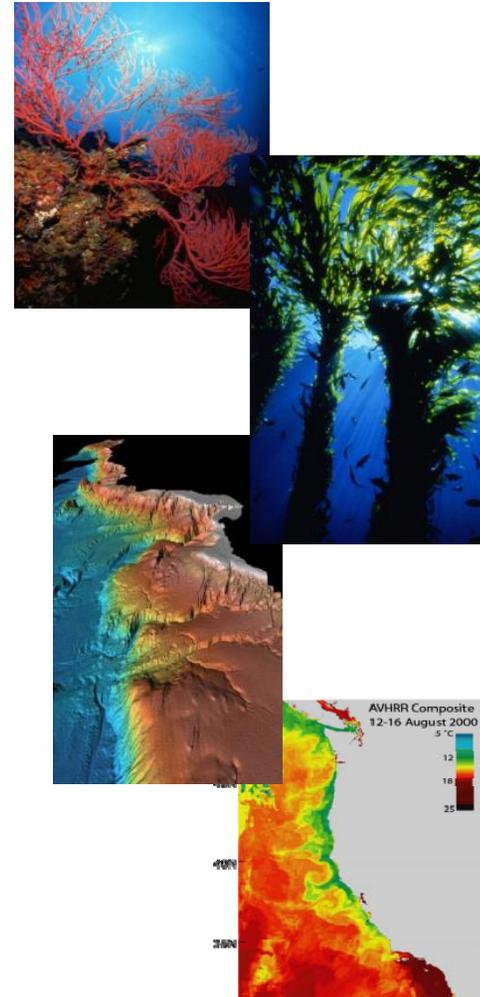
Presented by Dr. Larry Allen, MLPA Master Plan Science Advisory Team



# 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**.

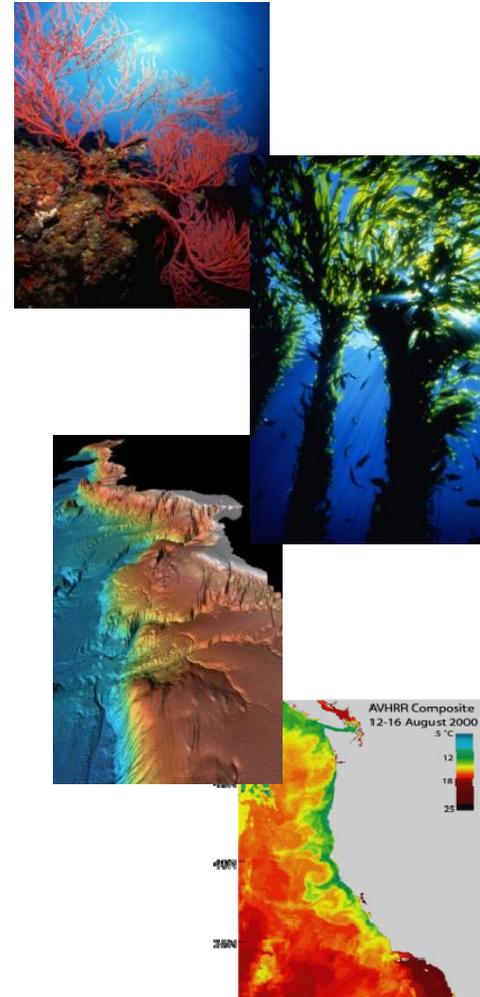
\* Note that this language is a paraphrasing of the MLPA goals





# MLPA Goals\*: Populations

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**.



\* Note that this language is a paraphrasing of the MLPA goals



# Protecting Populations (Goals 2 & 6)

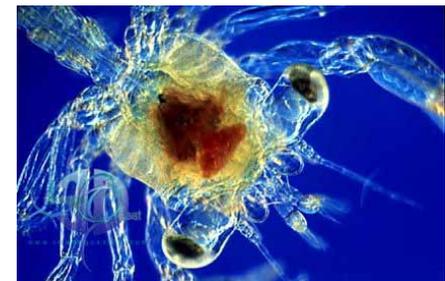
## Size and Spacing



Marine protected areas (MPAs) should be large enough that adults don't move out of them too frequently and become vulnerable to fishing



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





## Size Guidelines



**MPAs should have an alongshore span of 5-10 kilometers (3-6 miles) of coastline, and preferably 10-20 kilometers (6-12.5 miles)** to protect adult populations, based on adult neighborhood sizes and movement patterns. Larger MPAs should be required to fully protect marine birds, mammals, and migratory fish.



**MPAs should extend from the intertidal zone to deep waters offshore** to protect the diversity of species that live at different depths and to accommodate the ontogenetic movement of individuals to and from nursery or spawning grounds to adult habitats.



Combined and simplified, these two guidelines yield:

**Minimum range of 9-18 square miles**

**Preferred range of 18-36 square miles**

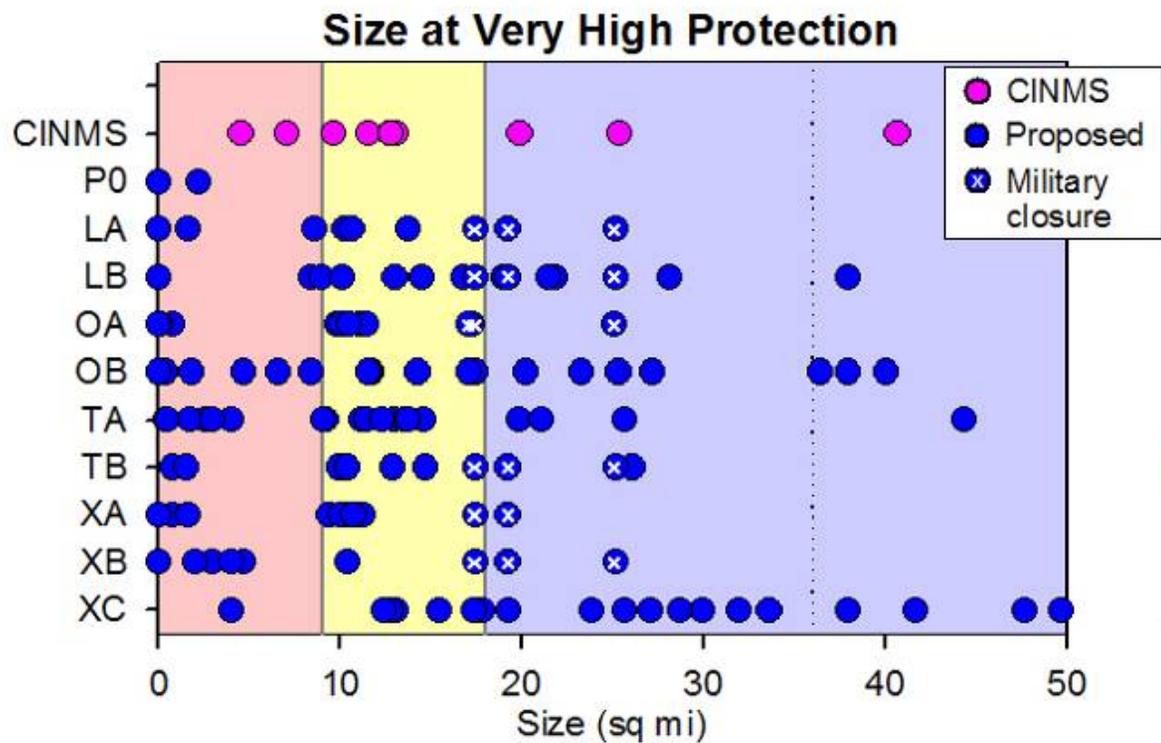


## Size Analysis Methods

-  Measure individual MPA areas
-  Combine contiguous MPAs into MPA clusters
-  Consider level of protection
-  Tabulate MPA cluster areas relative to minimum and preferred guidelines
-  Estuarine MPAs are not included in size evaluation



# Cluster Sizes: Very High Protection

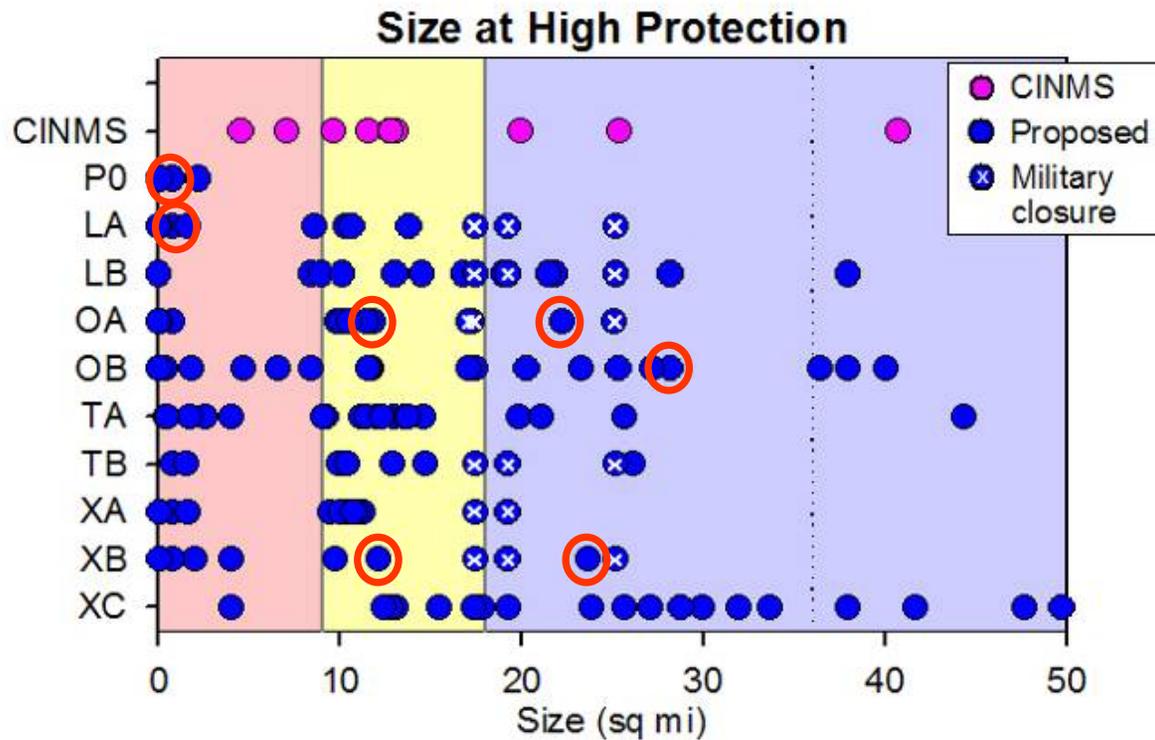


Number of MPA Clusters\* at Very High Protection

Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	3	0	0	3
Lapis A	5	4	3	12
Lapis B	5	5	8	18
Opal A	4	7	1	12
Opal B	7	7	7	21
Topaz A	6	9	6	21
Topaz B	2	5	3	10
External A	3	6	1	10
External B	5	2	2	9
External C	1	6	13	20

\* Clusters tabulated above do not include CINMS MPAs in proposals

# Cluster Sizes: High Protection\*



Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Lapis A	6	4	3	13
Lapis B	5	5	8	18
Opal A	4	7	2	13
Opal B	7	6	8	21
Topaz A	5	10	6	21
Topaz B	2	5	3	10
External A	3	7	1	11
External B	4	3	3	10
External C	1	6	13	20

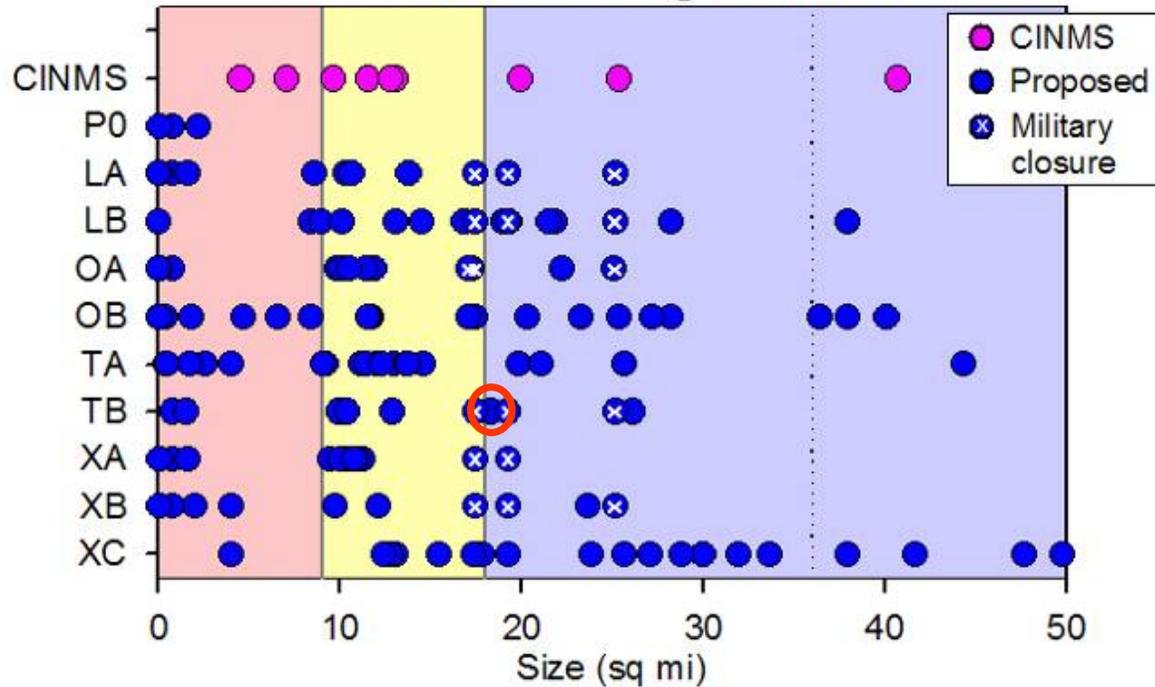
\* Clusters tabulated above do not include CINMS MPAs in proposals

\* Evaluated for all MPAs at or above high protection

# Cluster Sizes: Mod-high Protection\*



Size at Moderate-High Protection



Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Lapis A	6	4	3	13
Lapis B	5	5	8	18
Opal A	4	7	2	13
Opal B	7	6	8	21
Topaz A	5	10	6	21
Topaz B	2	4	4	10
External A	3	7	1	11
External B	4	3	3	10
External C	1	6	13	20

\* Clusters tabulated above do not include CINMS MPAs in proposals

\* Evaluated for all MPAs at or above mod-high protection



## Size: Conclusions



The number & size of MPAs varies markedly across arrays



All proposals have 3-9 SMRs within minimum size range



All proposals except External A have SMRs within the preferred size range, but numbers vary greatly (from 1 in Opal A and External B, to 13 in External C)



All proposals have some MPAs that do not meet minimum size guidelines



Most MPAs in this analysis are SMRs; few SMCAs achieved high or mod-high protection across all arrays



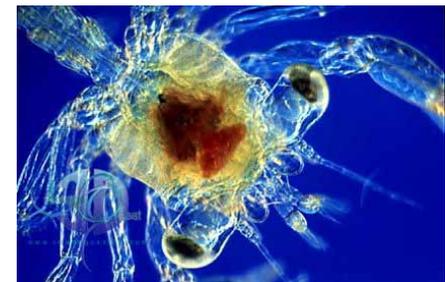
Only effect of updated habitat data has been to move one military MPA from minimum to preferred size range



# Protecting Populations

## Size and Spacing

-  MPAs should be large enough that adults don't move out of them too frequently and become vulnerable to fishing
-  MPAs should be close enough together that sufficient larvae can move from one to the next





## Design Guidelines: Goals 2 and 6



**MPAs should be placed within 50-100 kilometers (31-62 miles) of each other** to facilitate dispersal and connectedness of important bottom-dwelling fish and invertebrate groups among MPAs



Because many populations are habitat-specific, spacing is evaluated for each habitat



# Spacing Analysis Methods



MPAs or clusters must meet the minimum size guidelines (9 square miles) to be included in the spacing analysis



Identify the habitats included in sufficient amounts to count as a “replicate” within each MPA cluster



Measure gaps between adjacent MPA clusters that contain a given habitat



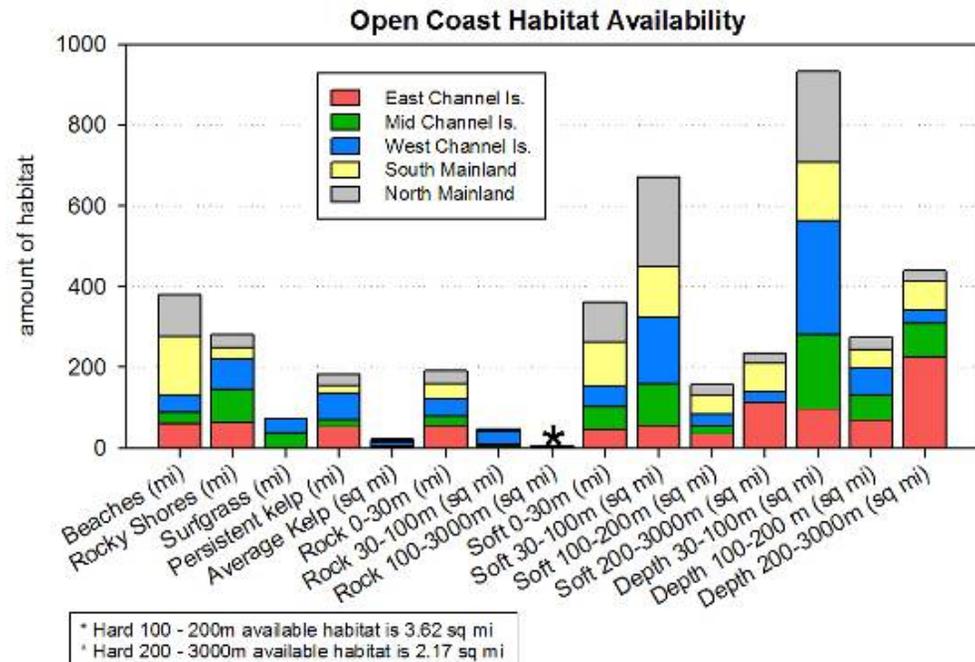
Spacing is calculated for mainland MPAs only



# Habitat Availability and Spacing

## Habitat availability and distribution limits spacing

- >30 meter rocky habitats are rare on the mainland
- >200 meter soft bottom on the mainland occurs mostly in canyons
- Surfgrass is not mapped on the mainland so not evaluated for spacing

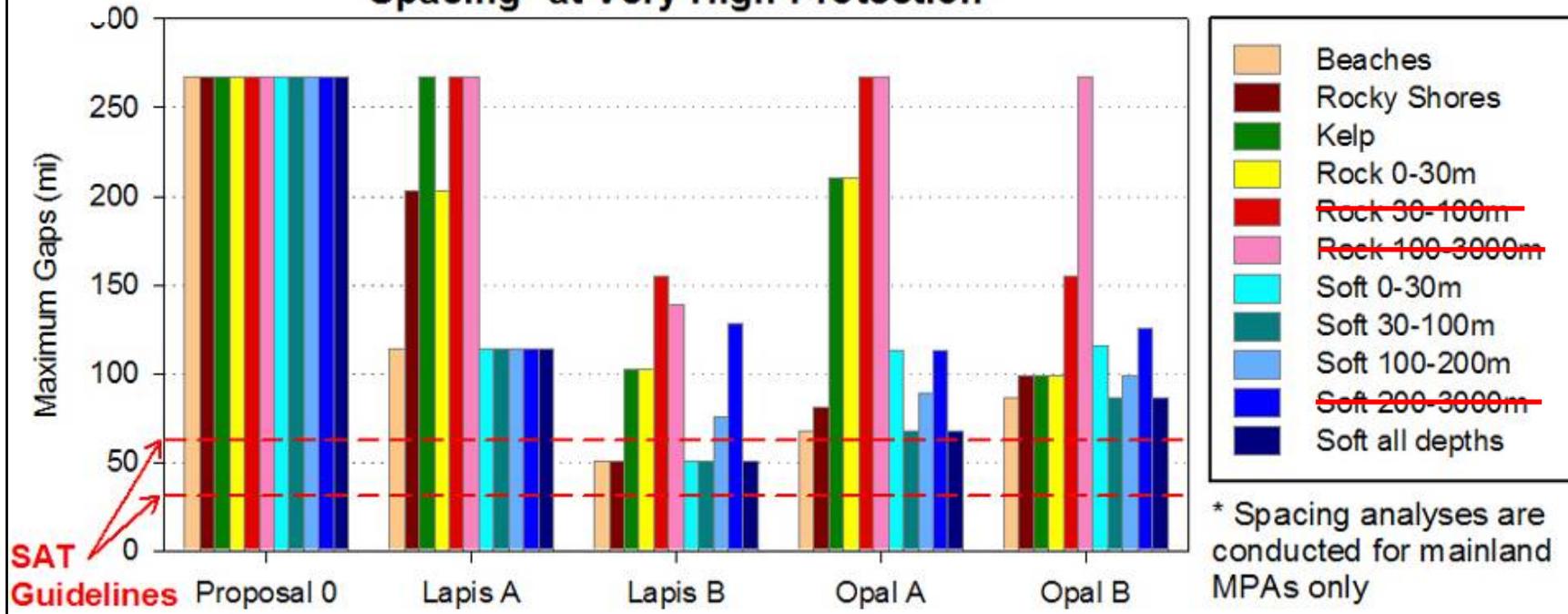




# Max Gaps: Very High Protection

First 4 of 9 arrays/proposals

### Spacing\* at Very High Protection



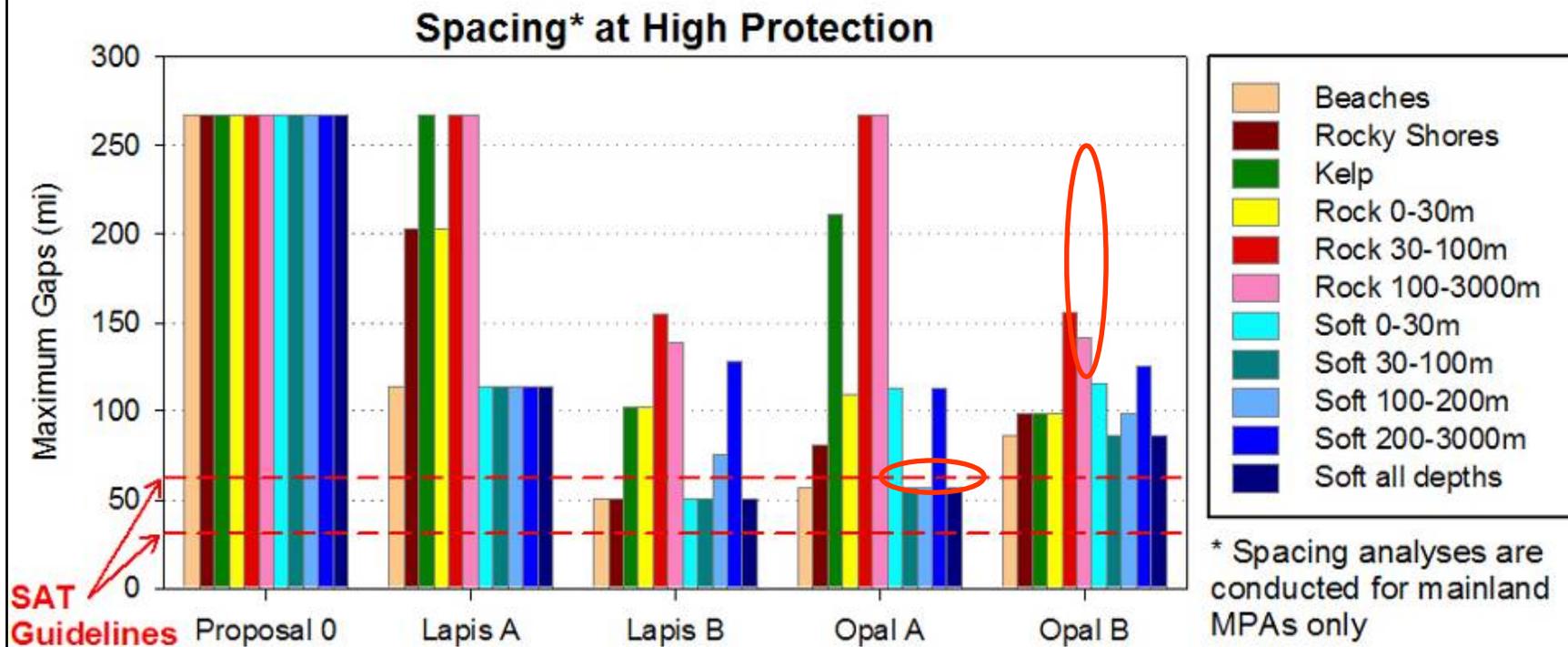
SAT Guidelines

\* Spacing analyses are conducted for mainland MPAs only

Likely not possible to meet spacing guidelines for >30 meter rock or >200 meter soft habitats



# Max Gaps: High Protection

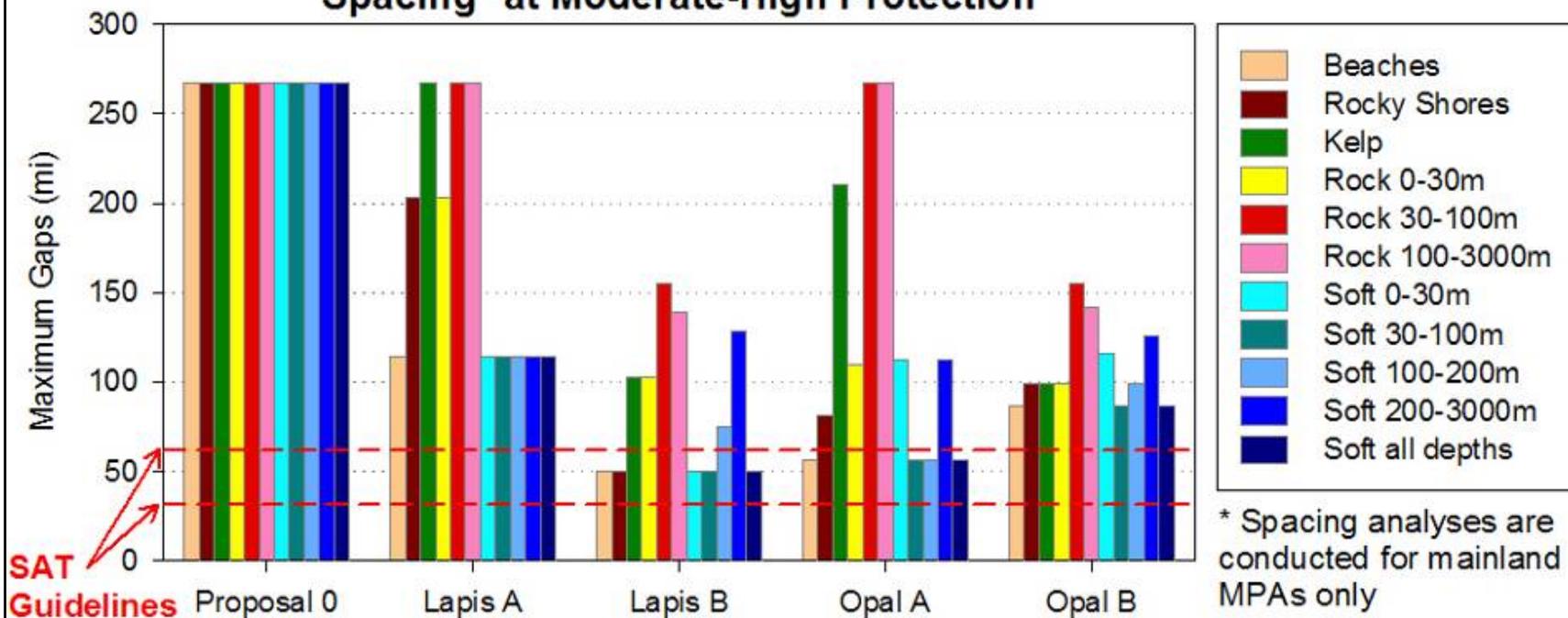


High protection MPAs contribute to spacing in Opal A and Opal B.



# Max Gaps: Mod-high Protection

Spacing\* at Moderate-High Protection



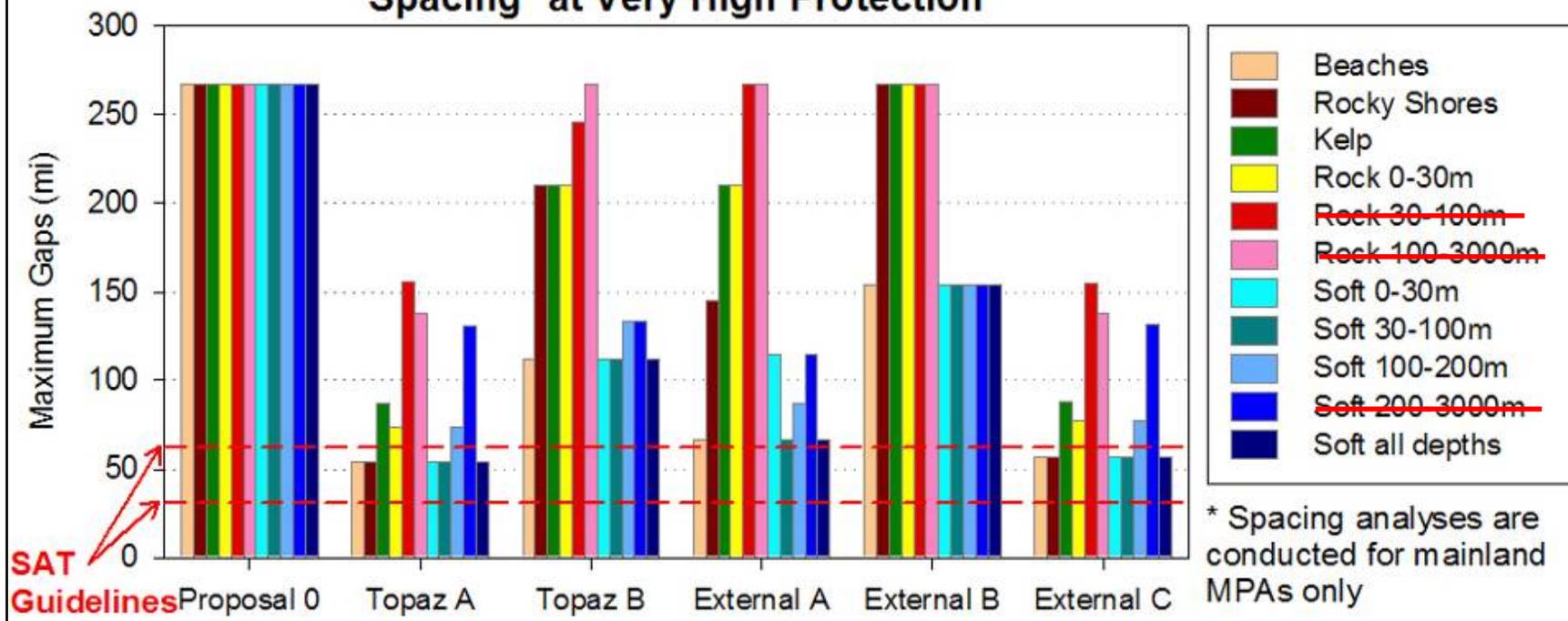
Mod-high protection MPAs do not contribute to spacing for any of these arrays.



# Max Gaps: Very High Protection

Next 5 of 9 arrays/proposals

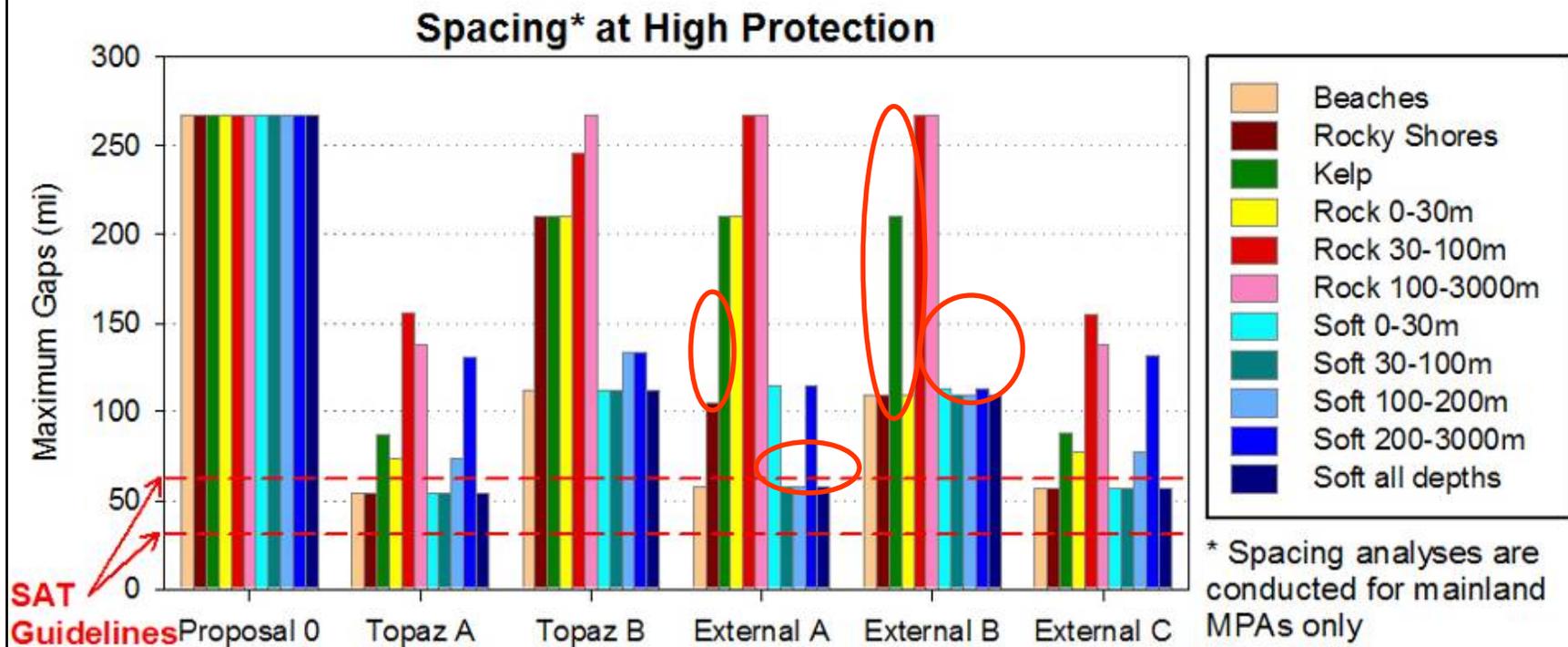
Spacing\* at Very High Protection



Likely not possible to meet spacing guidelines for >30 meter rock or >200 meter soft habitats



# Max Gaps: High Protection

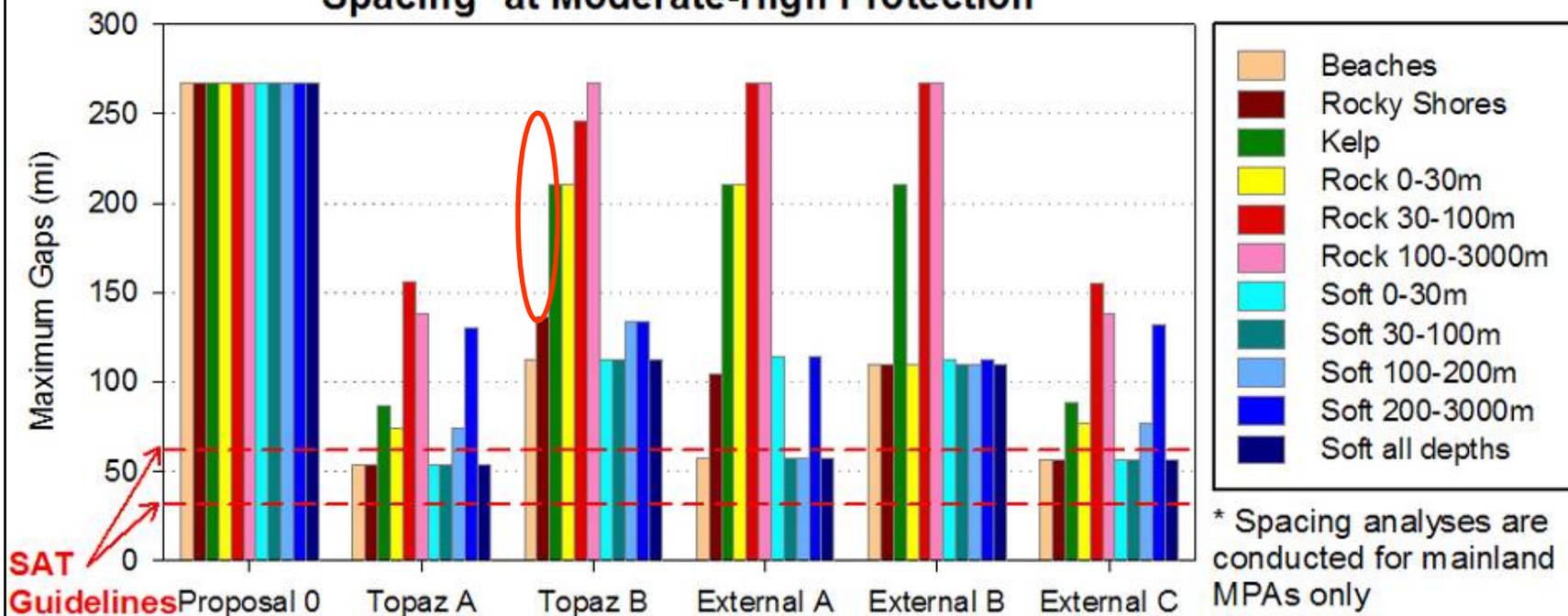


High protection MPAs contribute to spacing in External A and External B.



# Max Gaps: Mod-high Protection

Spacing\* at Moderate-High Protection



Mod-high protection MPAs contribute to spacing in Topaz B.



# Spacing: Conclusions



Spacing guidelines may be impossible to meet for some habitats



No proposal meets spacing guidelines for all possible habitats



Gaps between rocky habitats are generally larger than between soft habitats even where guidelines are achievable



Lapis B, Topaz A, and External C come closest to meeting spacing guidelines



Updated habitat maps/layers had marginal effect on spacing evaluations