

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 Master Plan Science Advisory Team

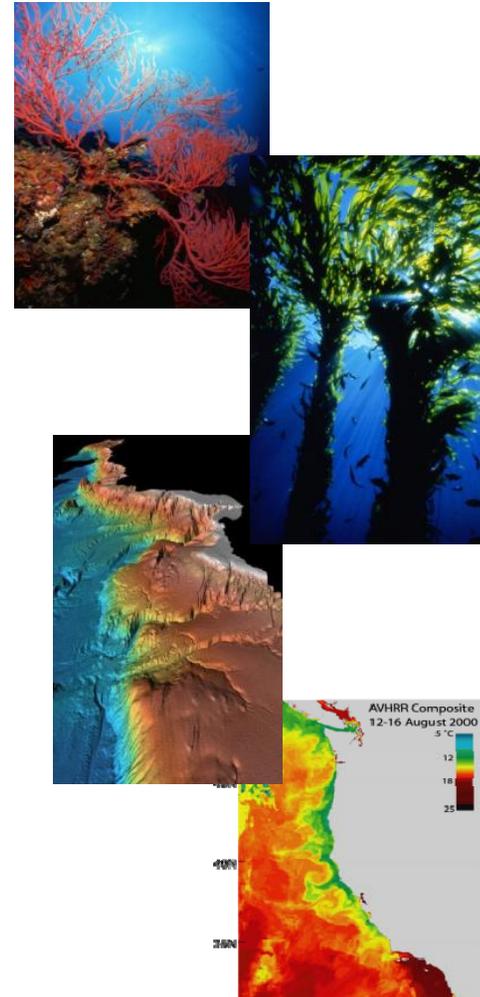
April 1, 2009 • Los Angeles, CA

Presented by Dr. Larry Allen



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**.

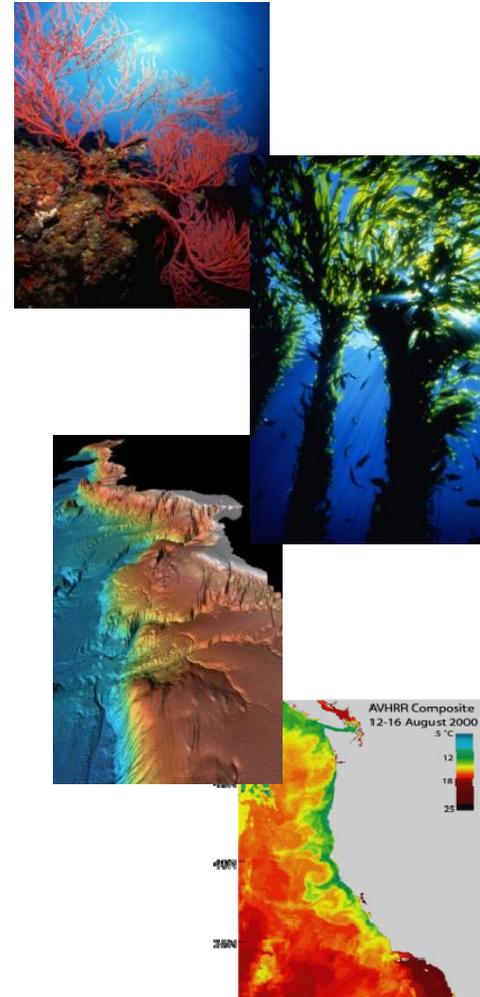


* Note that this language represents a summary of the MLPA goals



MLPA Goals*: Populations

1. To protect the natural diversity and function of **marine ecosystems**.
2. To help sustain and restore **marine life populations**.
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Protecting Populations (Goals 2 & 6)

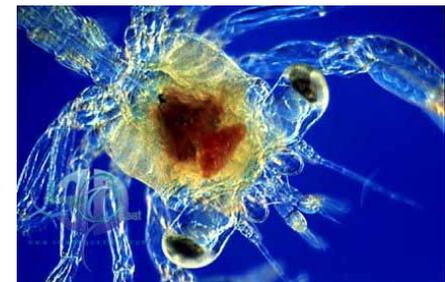
Size and Spacing



MPAs should be large enough that adults don't move out of them 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

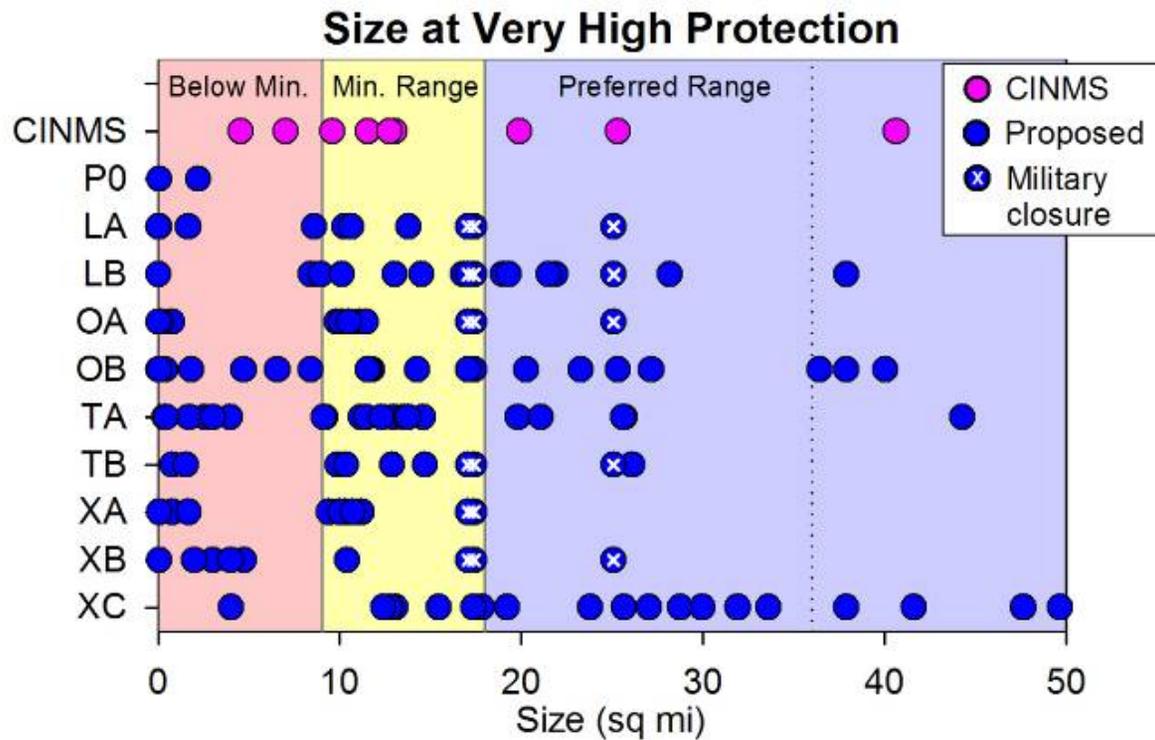


Tabulate MPA cluster areas relative to minimum and preferred guidelines



Estuarine MPAs are not included in size evaluation

Cluster Sizes: Very High Protection

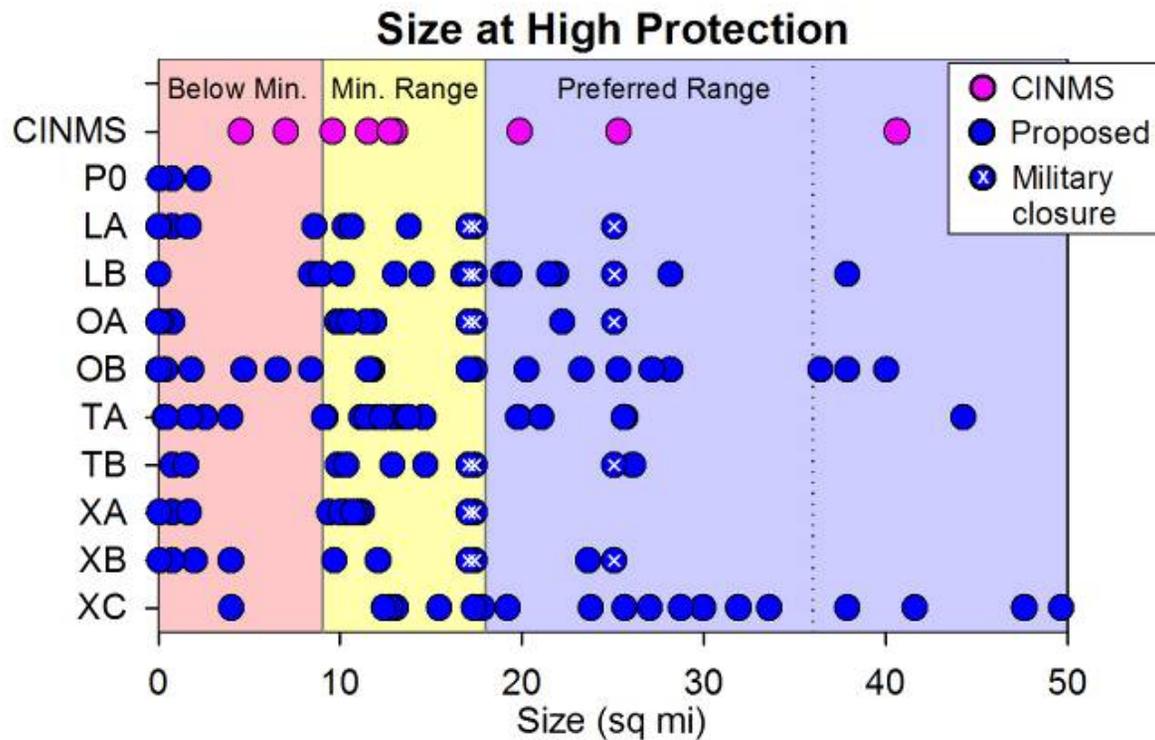


Number of MPA Clusters* at Very High Protection

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	5	2	12
Lapis B	5	6	7	18
Opal A	4	7	1	12
Opal B	7	7	7	21
Topaz A	6	9	6	21
Topaz B	2	6	2	10
External A	3	7	0	10
External B	5	3	1	9
External C	1	6	13	20

* Clusters tabulated above do not include CINMS MPAs in proposals

Cluster Sizes: High Protection*

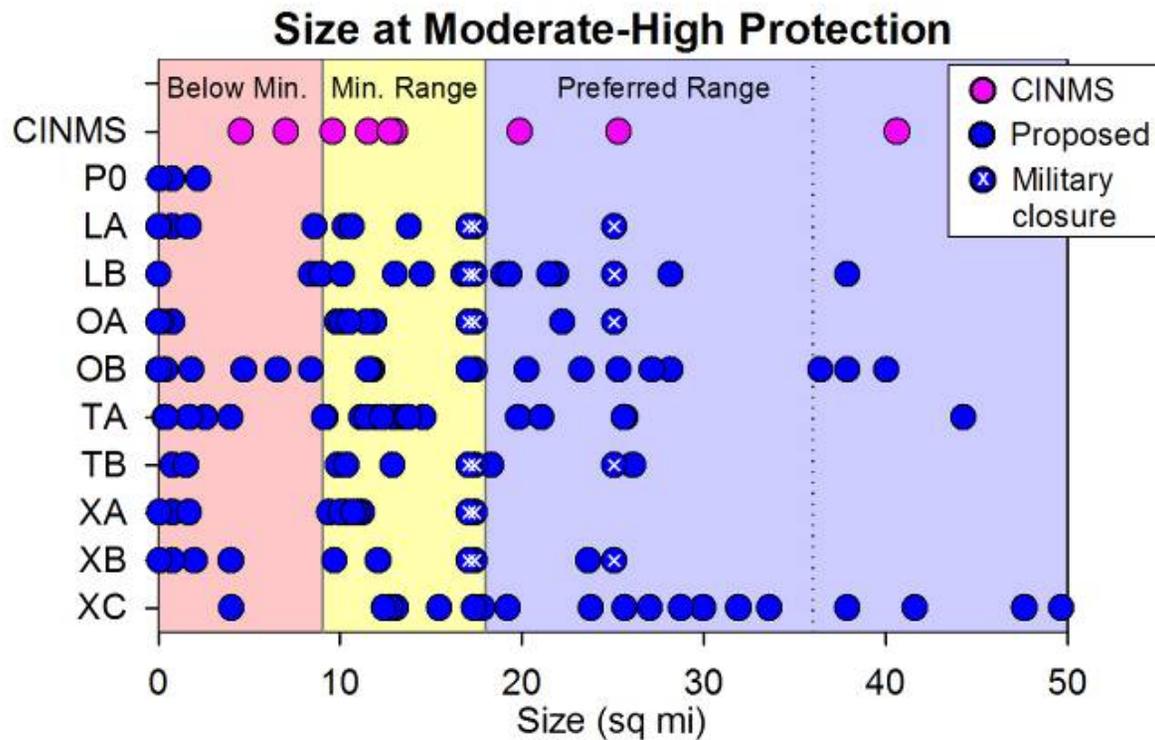


Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Lapis A	6	5	2	13
Lapis B	5	6	7	18
Opal A	4	7	2	13
Opal B	7	6	8	21
Topaz A	5	10	6	21
Topaz B	2	6	2	10
External A	3	8	0	11
External B	4	4	2	10
External C	1	6	13	20

* Clusters tabulated above do not include CINMS MPAs in proposals

* Evaluated for all MPAs at or above high protection

Cluster Sizes: Mod-high Protection*



Number of MPA Clusters* 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	5	2	13
Lapis B	5	6	7	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	8	0	11
External B	4	4	2	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



Protecting Populations

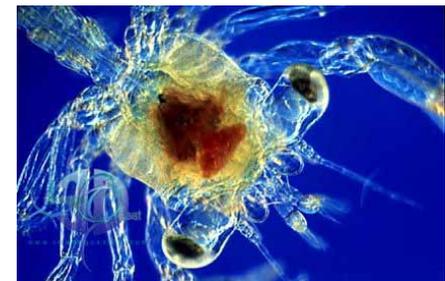
Size and Spacing



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



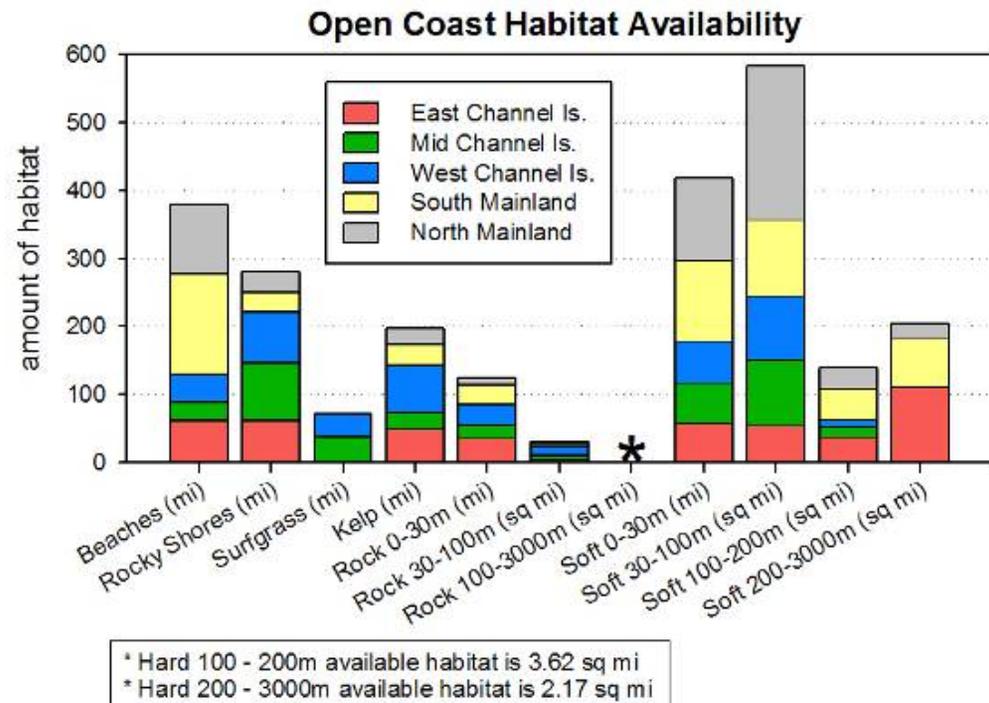
Spacing is calculated for mainland MPAs only



Habitat Availability and Spacing

Habitat availability and distribution limits spacing

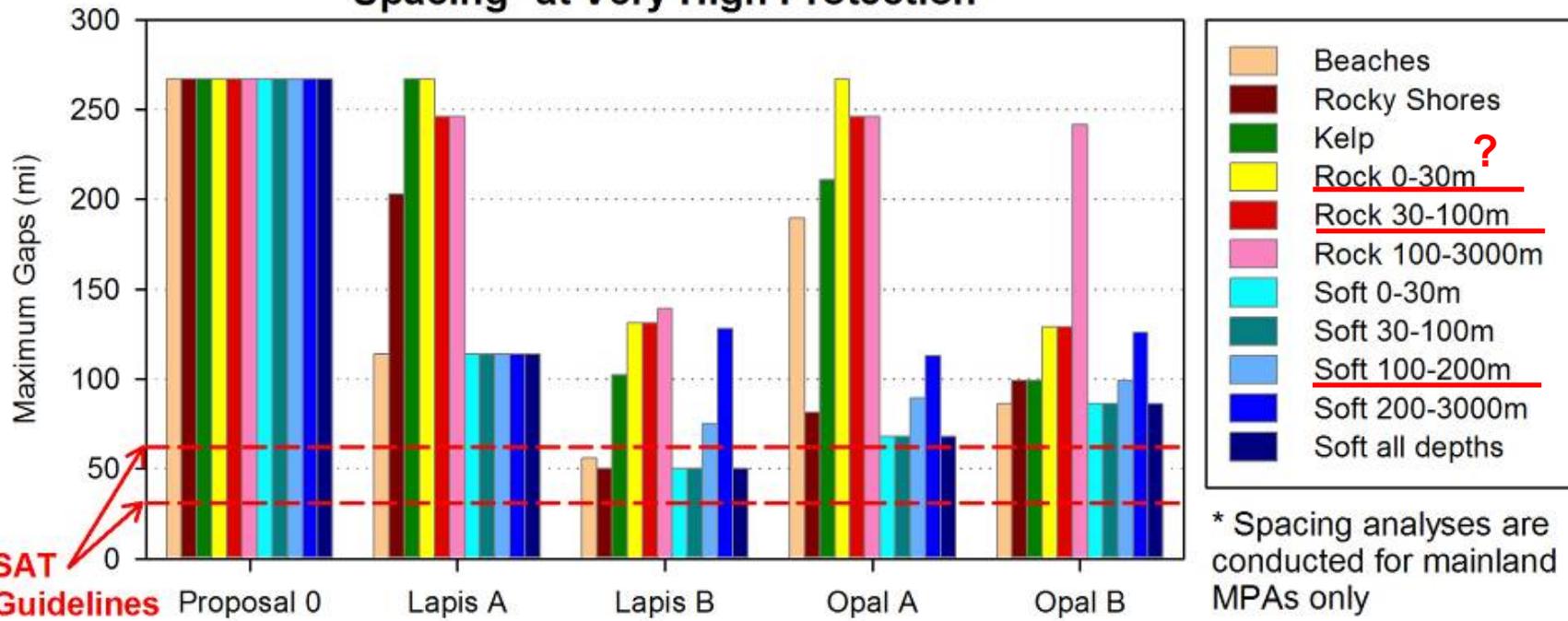
- >30 meter rocky habitats are rare on the mainland
- 0-30 meter habitat is poorly mapped by the current proxy line
- >200 meter soft bottom on the mainland occurs mostly in canyons
- Surfgrass is not mapped on the mainland so not evaluated for spacing





Max Gaps: Very High Protection

Spacing* at Very High Protection



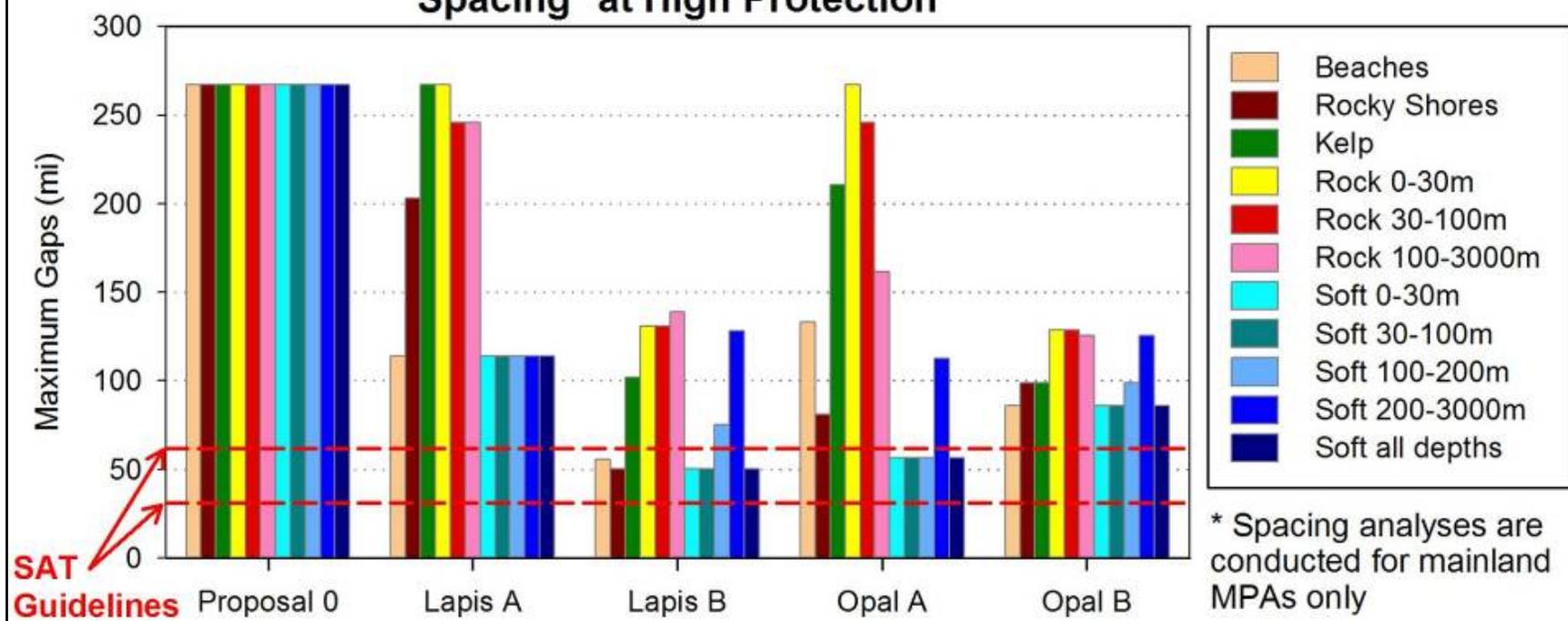
Likely not possible to meet spacing guidelines for >30 meter rock or >20 meter soft habitats

Difficult to meet spacing for 0-30 meter rock due to data that will soon be corrected



Max Gaps: High Protection

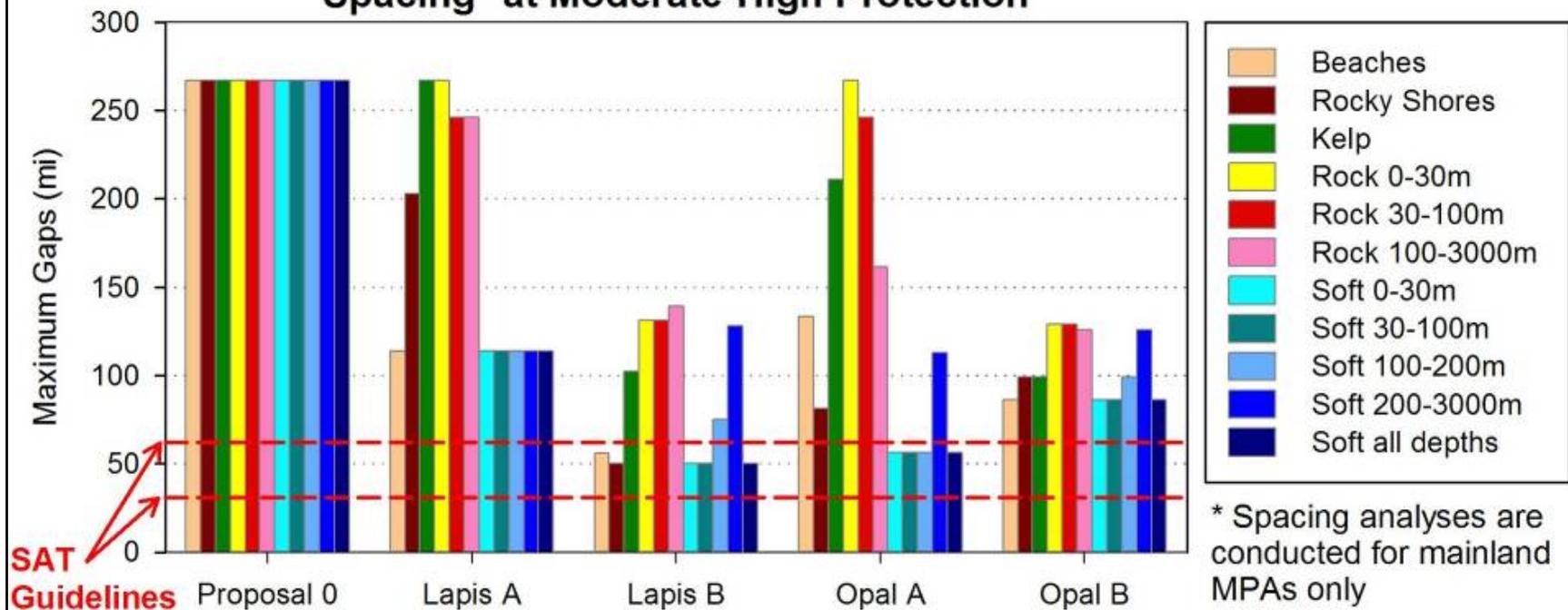
Spacing* at High Protection





Max Gaps: Mod-high Protection

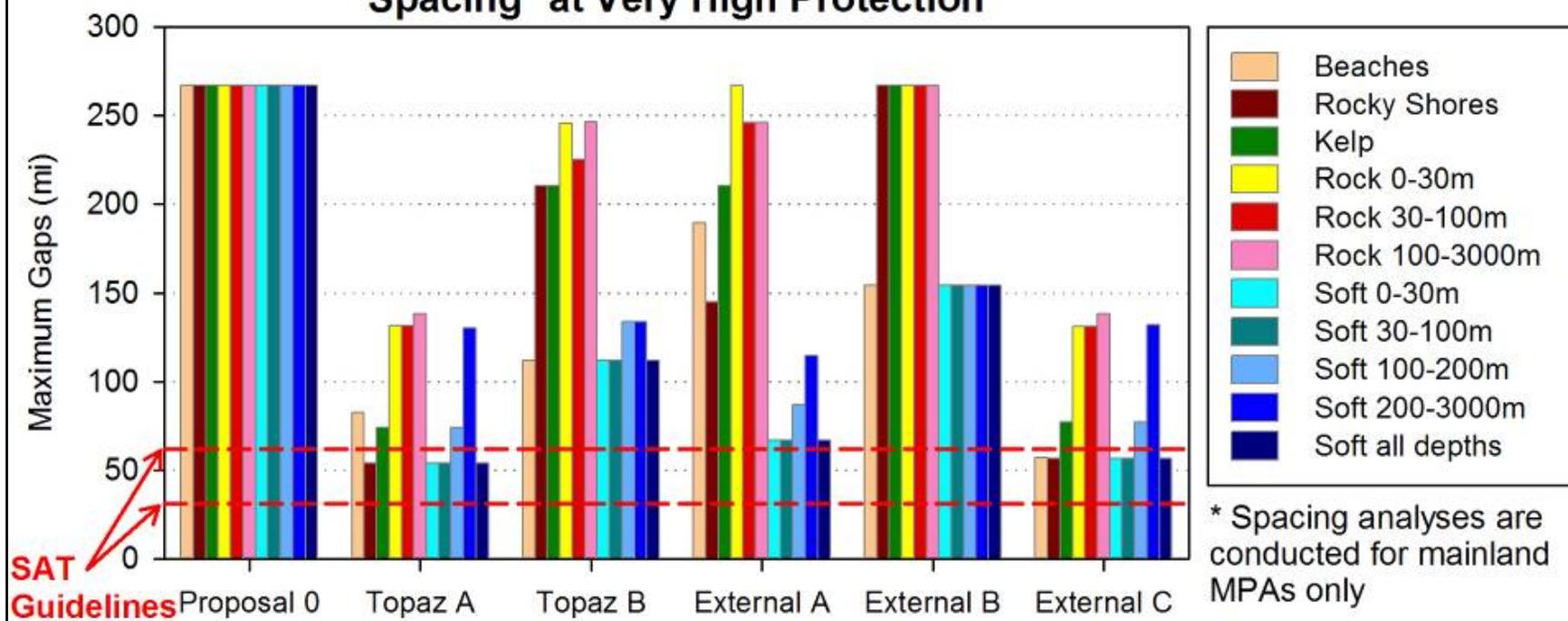
Spacing* at Moderate-High Protection





Max Gaps: Very High Protection

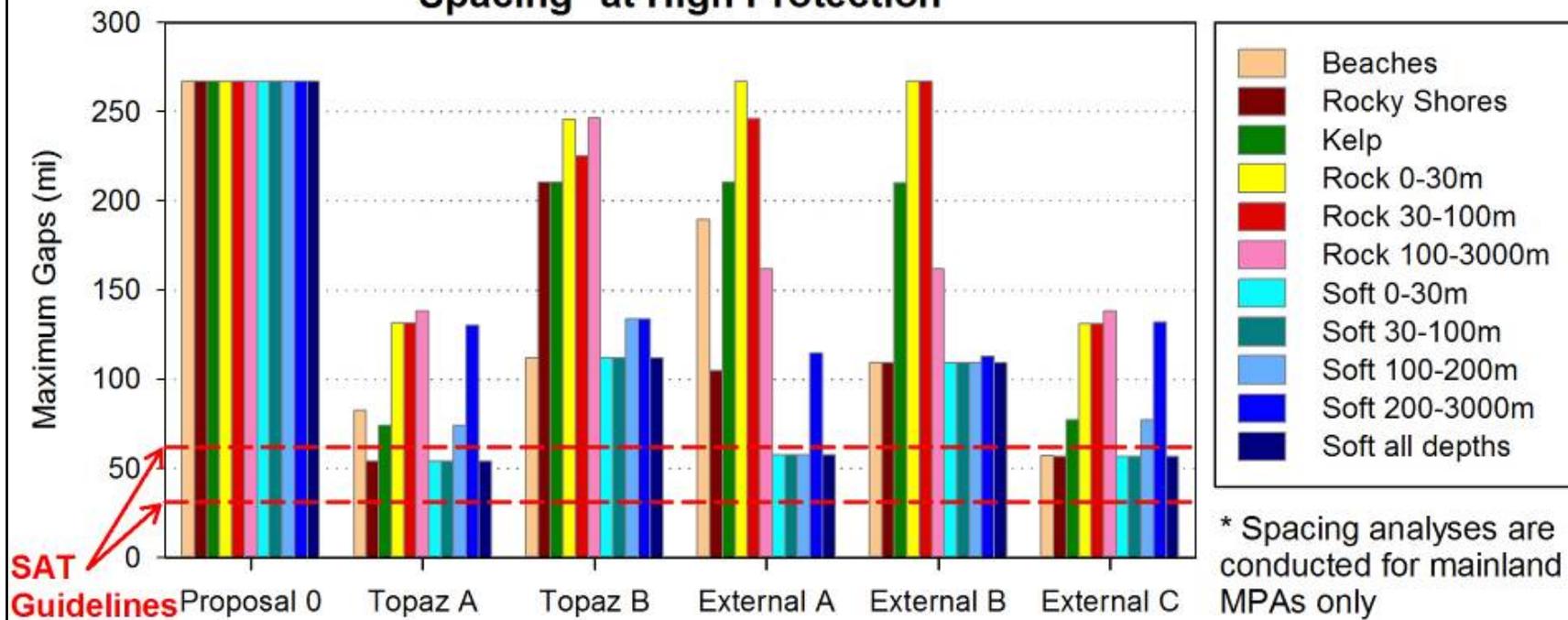
Spacing* at Very High Protection





Max Gaps: High Protection

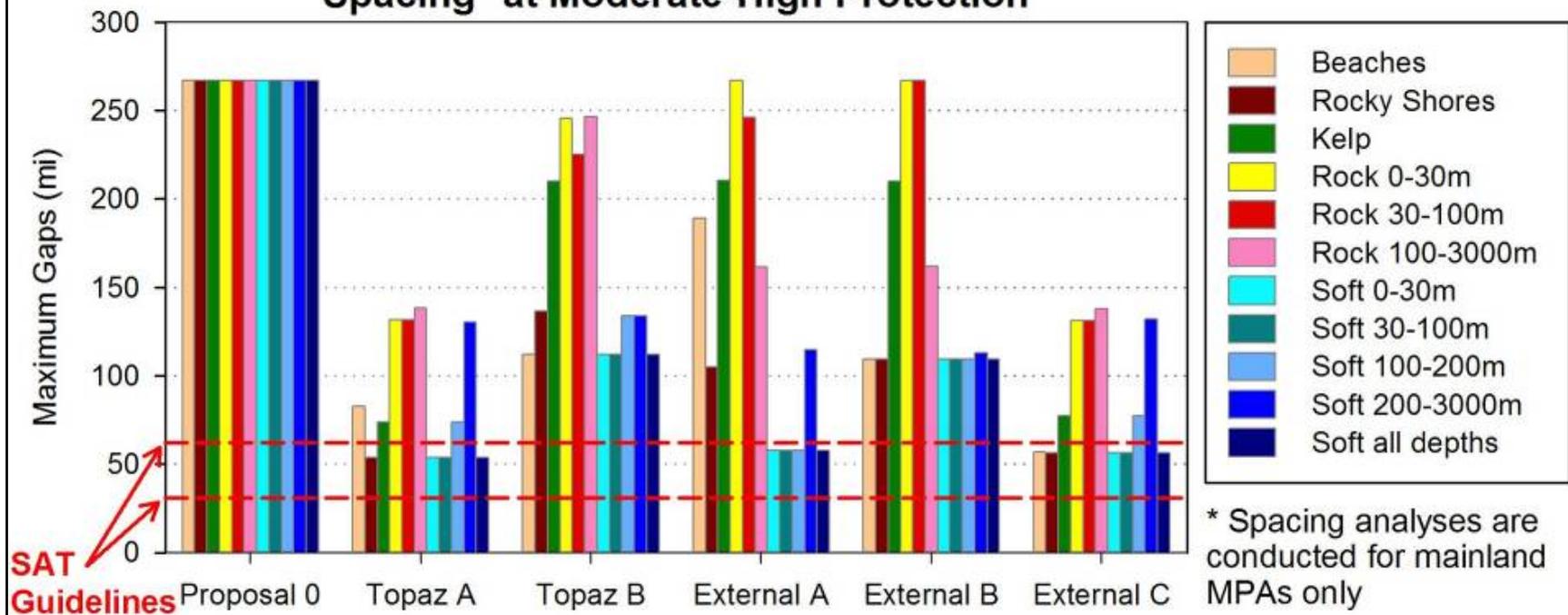
Spacing* at High Protection





Max Gaps: Mod-high Protection

Spacing* at Moderate-High Protection





Spacing: Conclusions



Spacing guidelines may be impossible to meet for some habitats—in other cases habitat data limitations have an impact on spacing analyses (0-30 meter rock)



No proposals meet spacing guidelines for all possible habitats



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



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