Marine Life Protection Act Initiative

MPA Size and Spacing Evaluations of the Round 2 Draft MPA Proposals for the MLPA South Coast Study Region

Presentation to the MLPA Master Plan Science Advisory Team
June 18, 2009 • Los Angeles, CA

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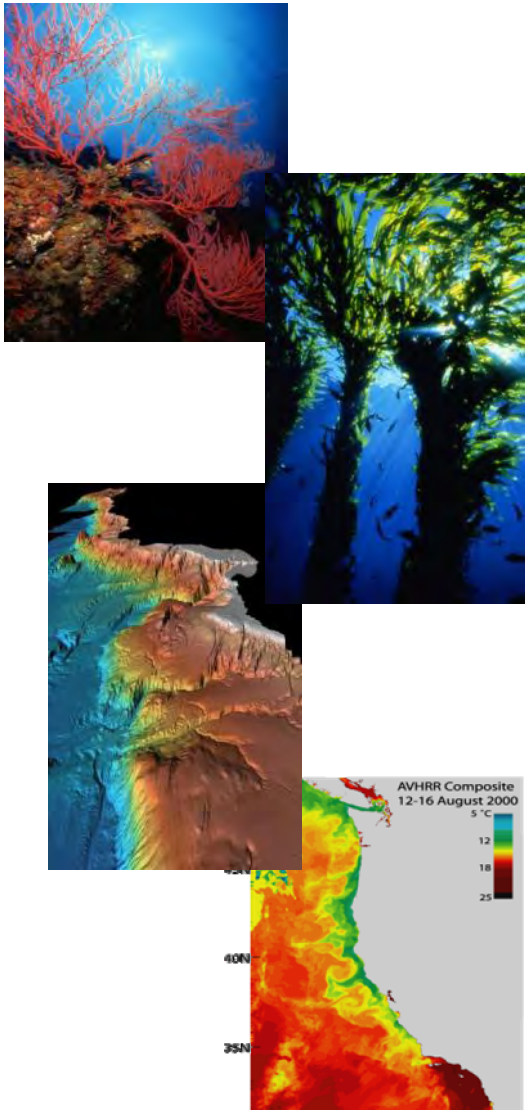
MLPA Goals*: Populations

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**.



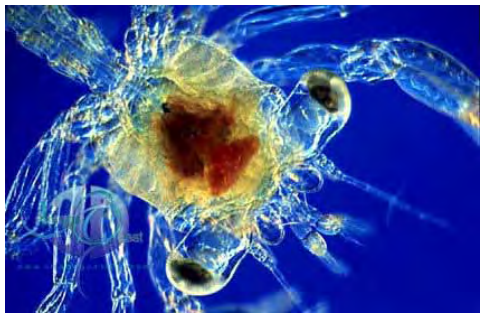
** Note that this language paraphrases the MLPA goals*

Protecting Populations (Goals 2 & 6)

Size and Spacing

- Marine protected areas (MPAs) should be large enough that adults don't move out 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.

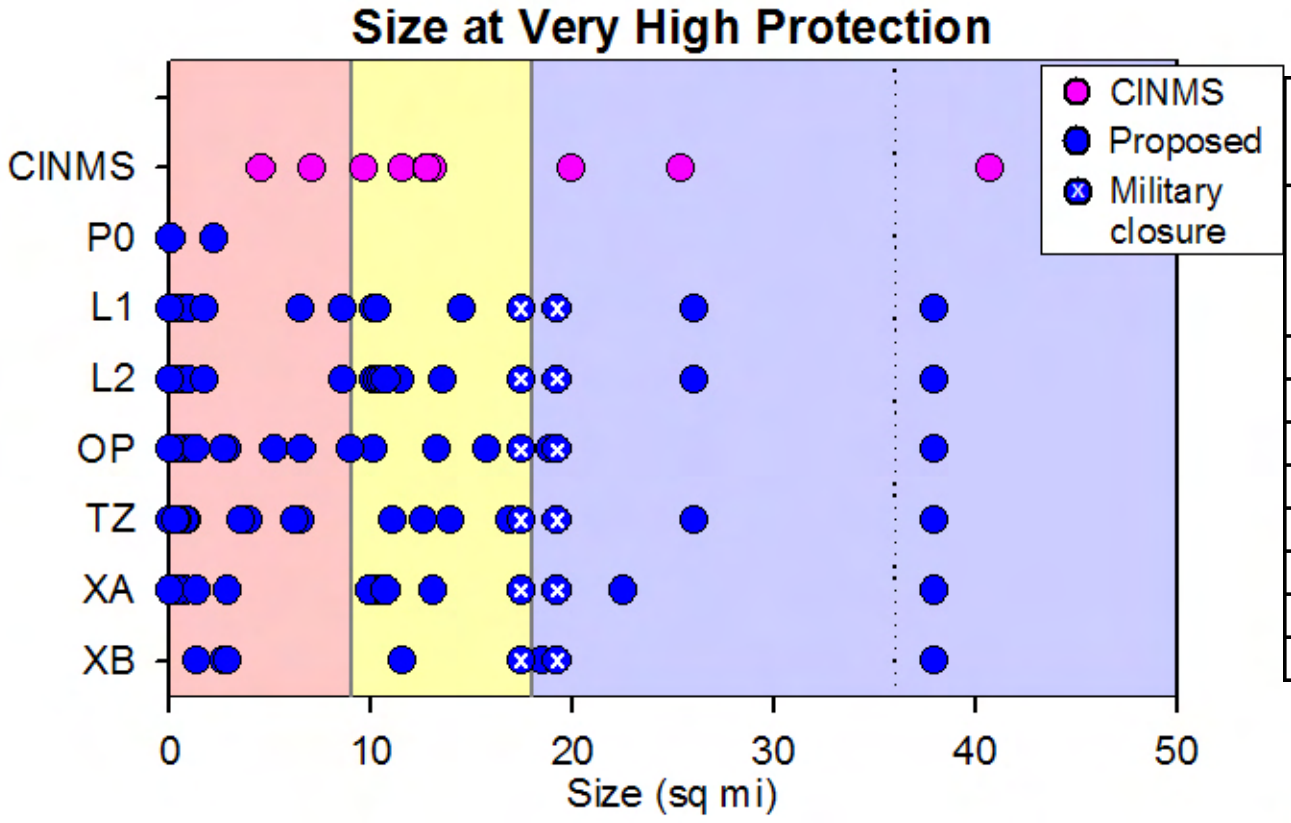
- **MPAs should extend from the intertidal zone to deep waters offshore** to protect the diversity of species that live at different depths and to accommodate the ontogenetic movement of individuals to and from nursery or spawning grounds to adult habitats.

- 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 1	7	4(1)	2(1)	13(2)
Lapis 2	6	6(1)	2(1)	14(2)
Opal	9	5(1)	2(1)	16(2)
Topaz	9	4(1)	2(1)	15(2)
External A	5	6(1)	2(1)	13(2)
External B	5	1(1)	2(1)	8(2)

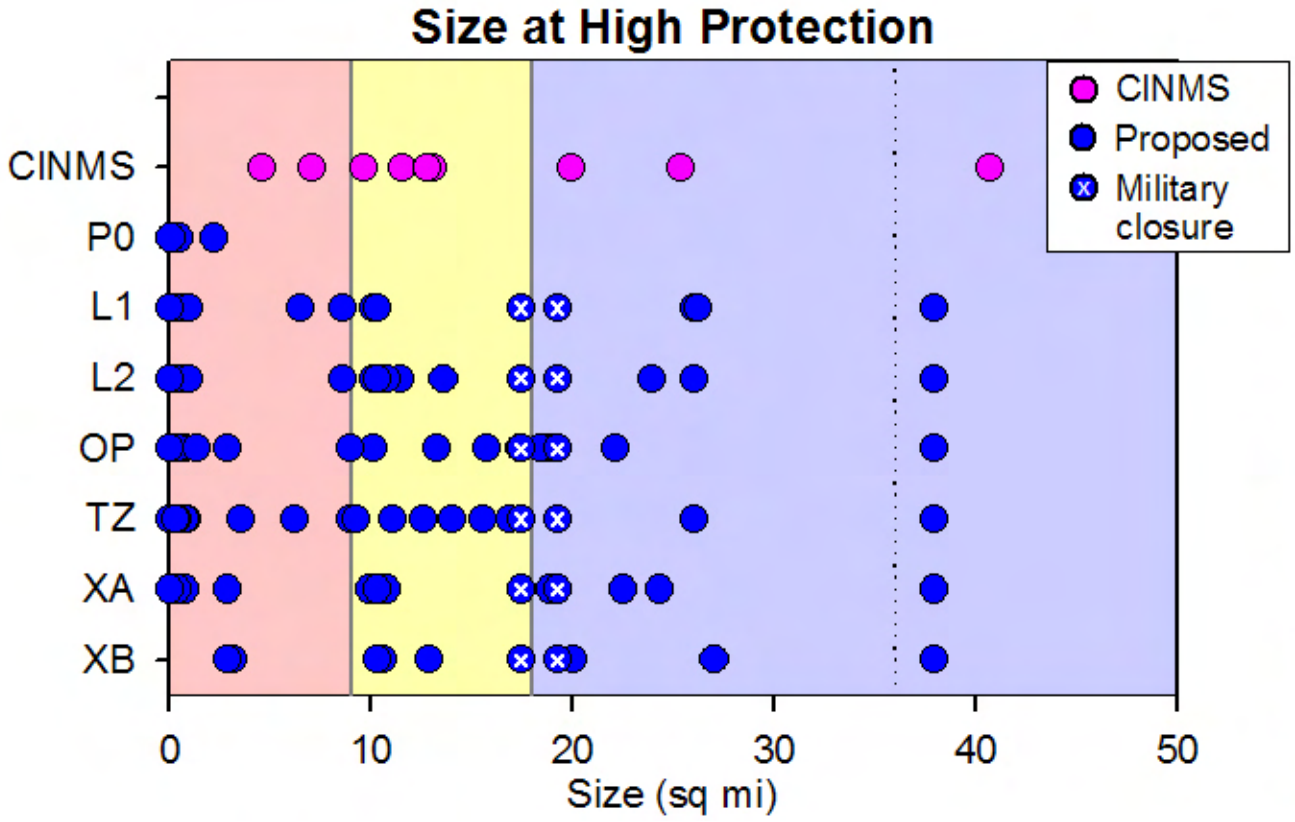
* Clusters tabulated above do not include CINMS MPAs in proposals, () indicates military closures

Most proposals (except XB) have similar numbers of SMRs
All proposals have 2 SMRs in preferred size range
Most SMRs below minimum size for all proposals

SMR = state marine reserve

CINMS MPAs = state MPAs within the Channel Islands National Marine Sanctuary

Cluster Sizes: High Protection*



Number of MPA Clusters* at High Protection

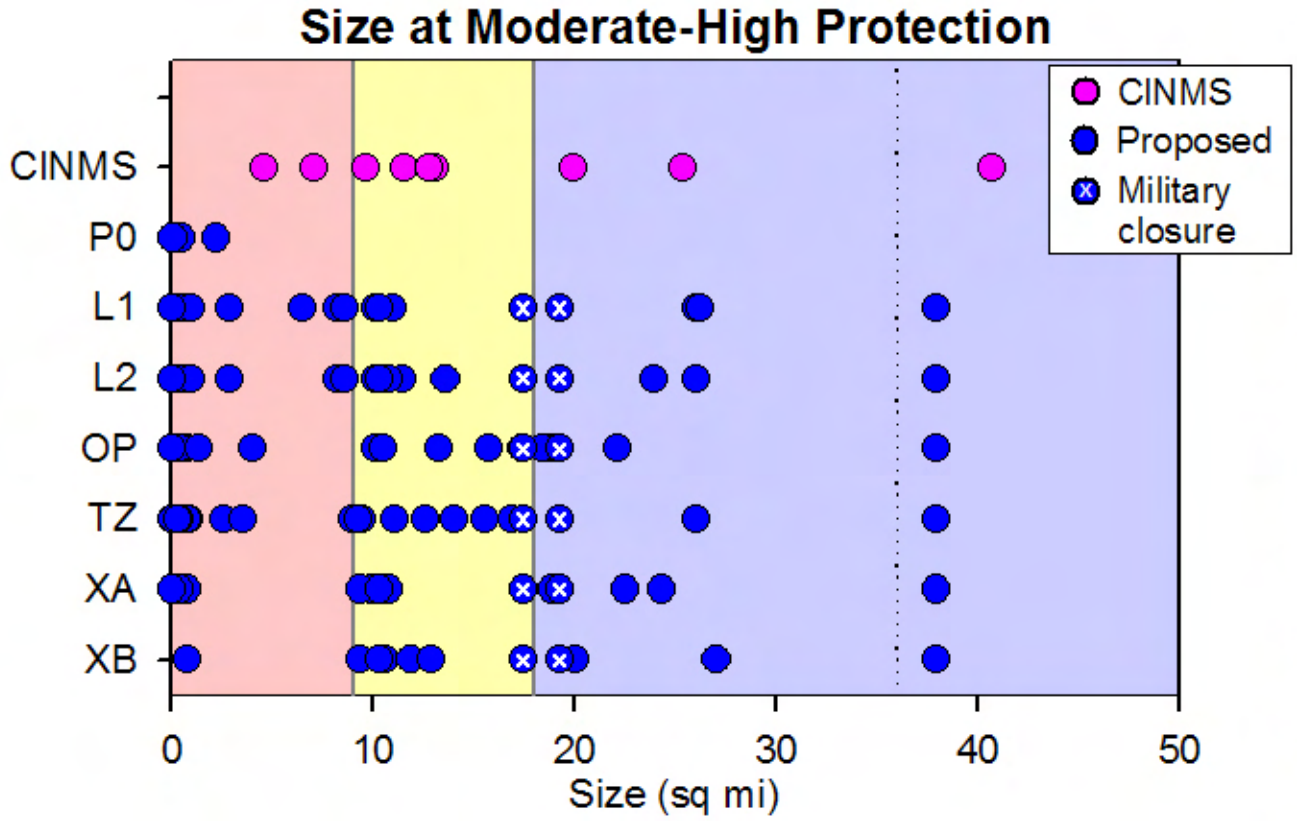
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Lapis 1	6	4(1)	3(1)	13(2)
Lapis 2	5	6(1)	3(1)	14(2)
Opal	6	6(1)	4(1)	16(2)
Topaz	8	6(1)	2(1)	16(2)
External A	4	5(1)	4(1)	13(2)
External B	3	3(1)	3(1)	9(2)

* Clusters tabulated above do not include CINMS MPAs in proposals, () indicates military closures

Clusters in all proposals moved into the preferred size range at high protection

** Evaluated for all open coast 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 1	8	5(1)	3(1)	16(2)
Lapis 2	7	6(1)	3(1)	16(2)
Opal	6	6(1)	4(1)	16(2)
Topaz	9	8(1)	2(1)	19(2)
External A	4	6(1)	4(1)	14(2)
External B	1	6(1)	3(1)	10(2)

* Clusters tabulated above do not include CINMS MPAs in proposals, () indicates military closures

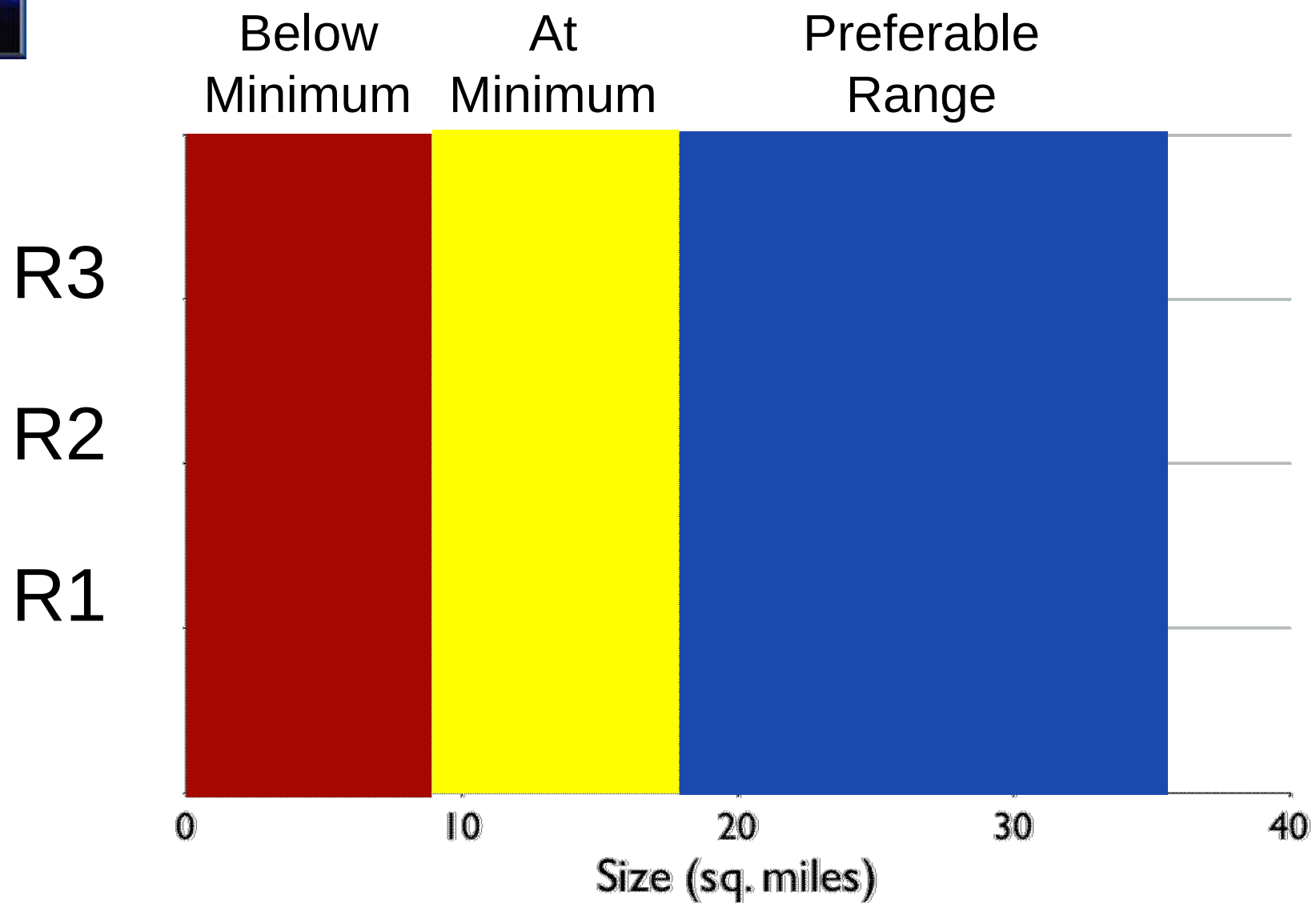
Some additional MPAs and clusters in the minimum size range at mod-high protection

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

Size: Conclusions

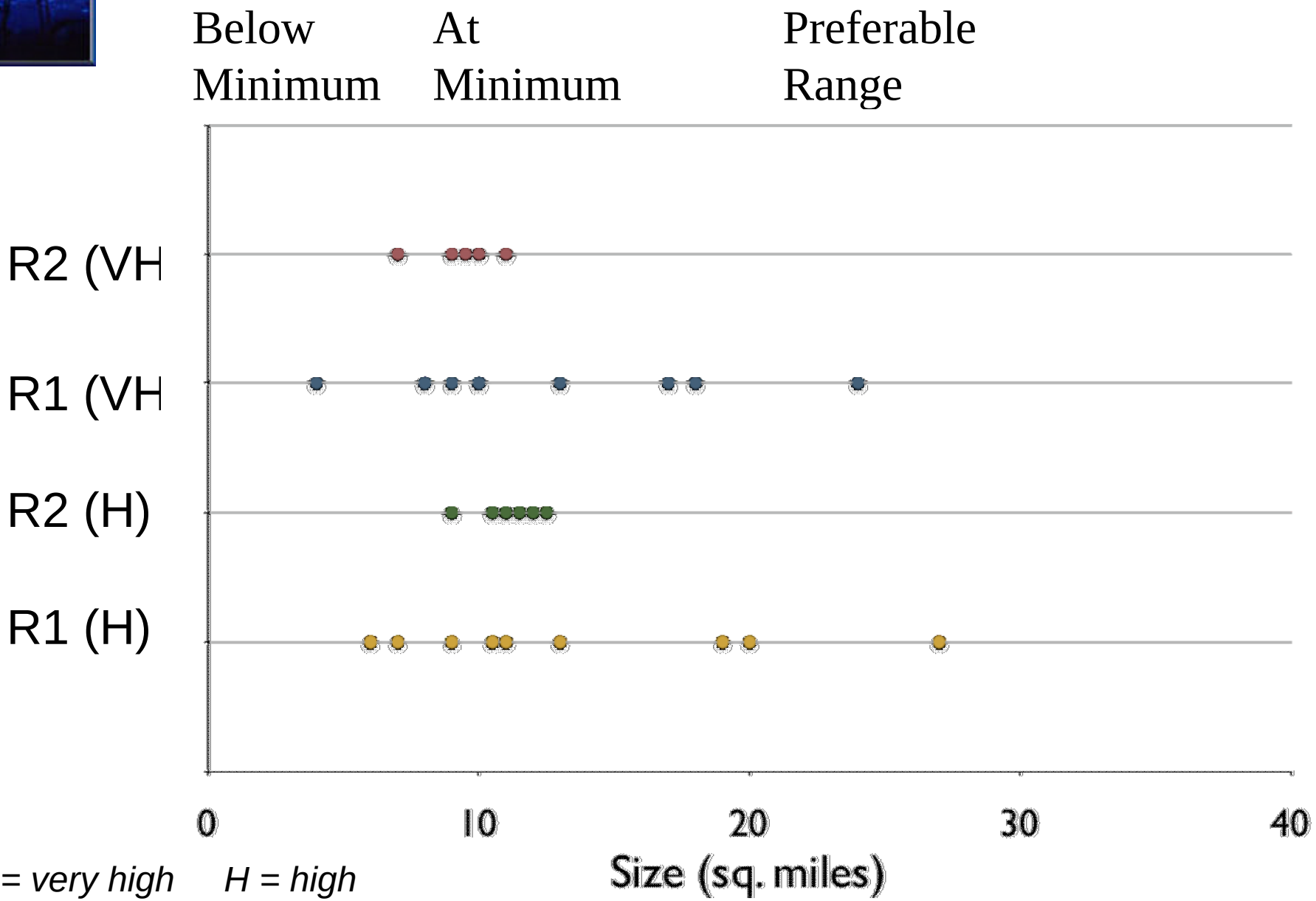
- Most proposals similar in the number and size range of MPAs (External B is the exception)
- All proposals have 2 SMRs within the preferred size range
- All proposals have many MPAs that do not meet minimum size guidelines
- Trends in MPA size differ from previous coastal sections

North Central Coast Average MPA Cluster Sizes (High Protection)



R1 = Round 1 Arrays *R2 = Round 2 Draft Proposals* *R3 = Round 3 SCRSG Proposals*

South Coast Median MPA Cluster Sizes



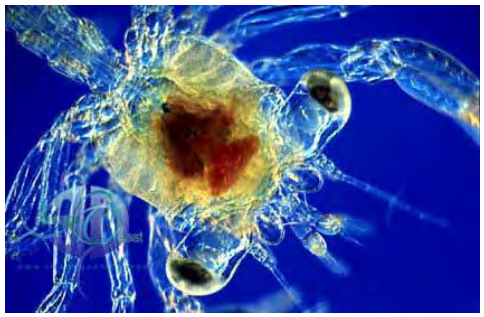
VH = very high *H = high*

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

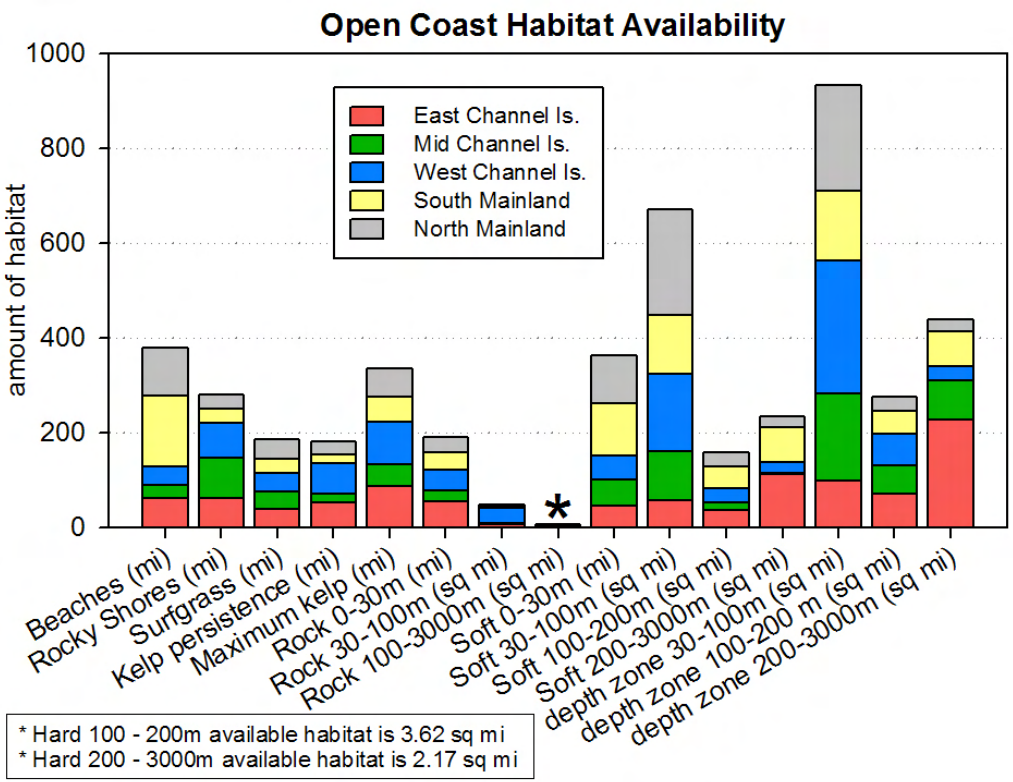
Spacing Analysis Methods

- 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

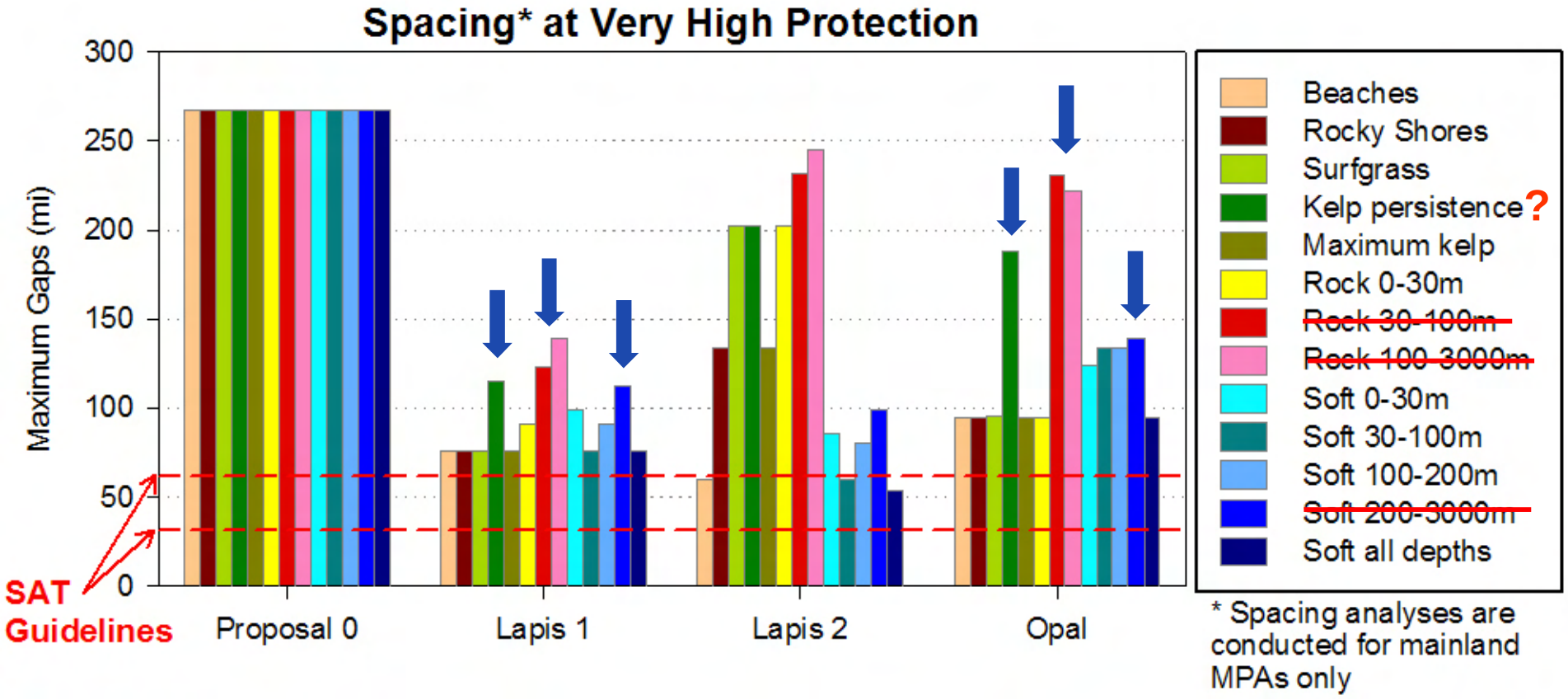
Habitat availability and distribution limits spacing

- >30 meter rocky habitats are rare on the mainland
- 0-30 meter habitat is mapped by aproxy line
- >200 meter soft bottom on the mainland occurs mostly in canyons



Max Gaps: Very High Protection

First 3 of 6 proposals

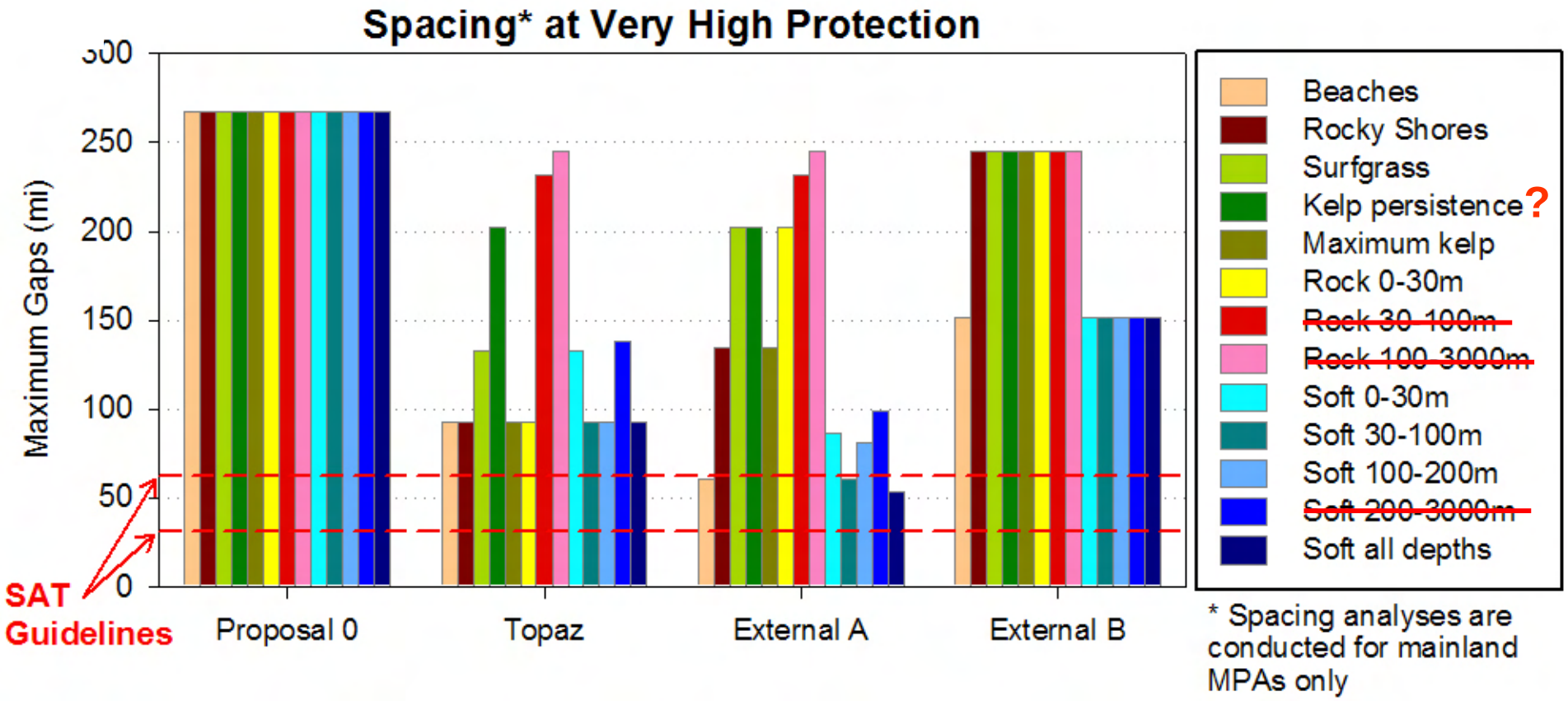


Not possible to meet spacing guidelines for >30 meter rock or >200 meter soft

Best possible spacing for persistent kelp (at least 3 of 7 years) is ~ 75 miles due to gap between Palos Verdes and San Elijo area

Max Gaps: Very High Protection

Next 3 of 6 proposals



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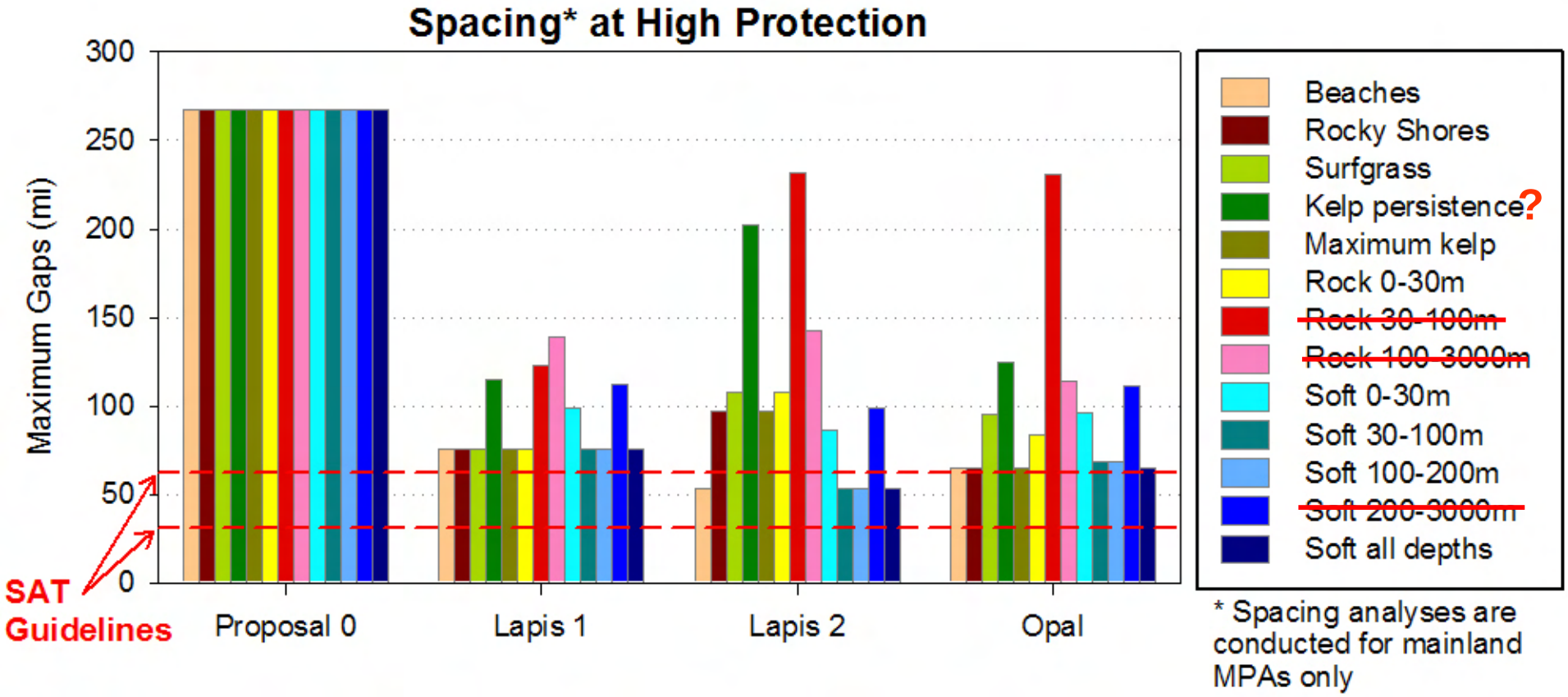

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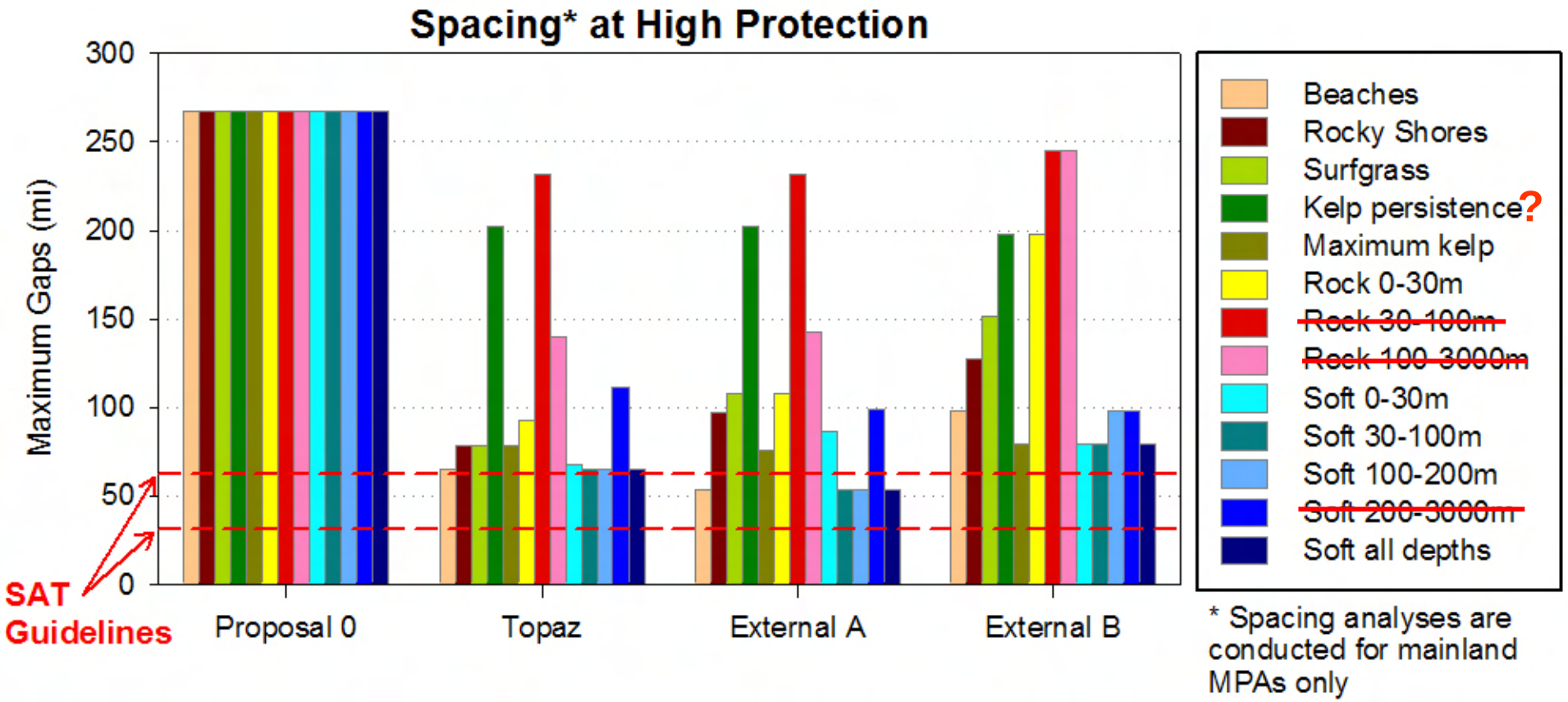
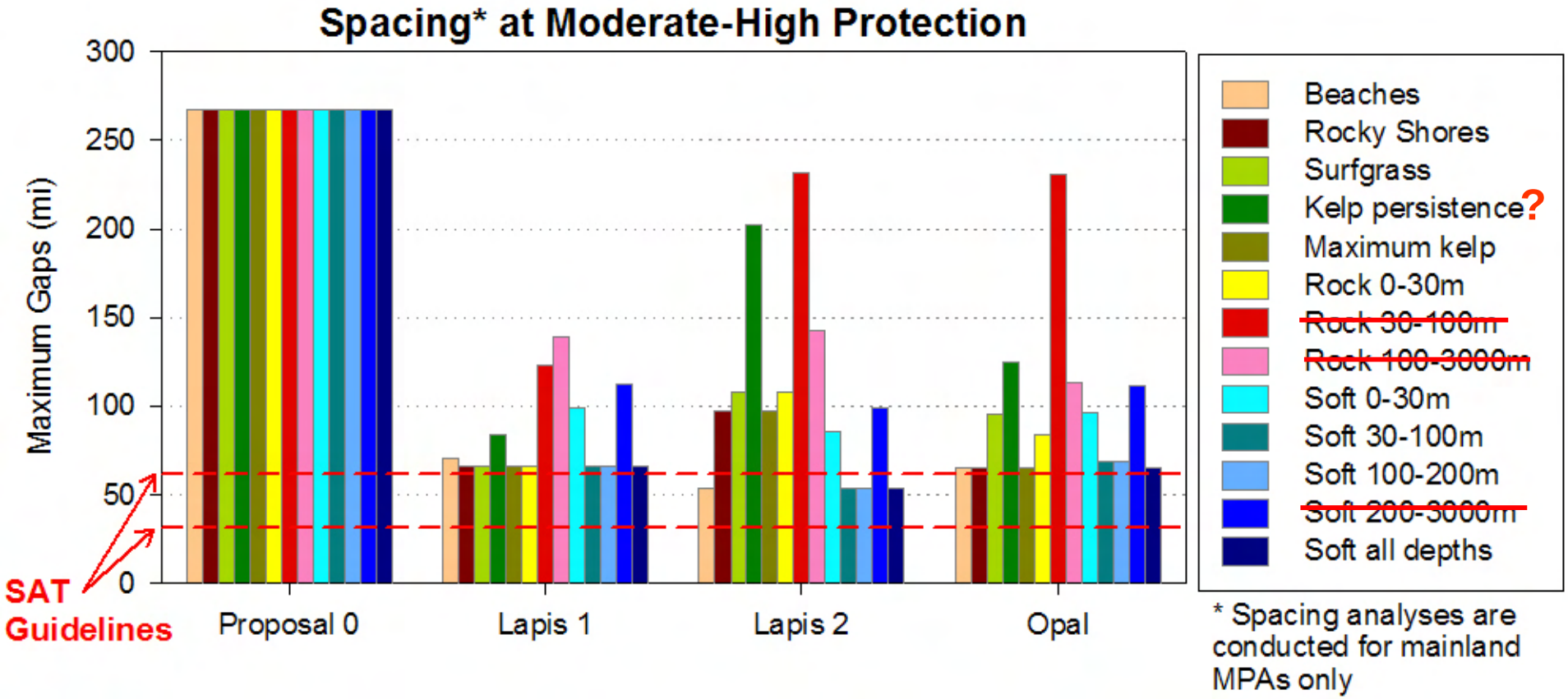
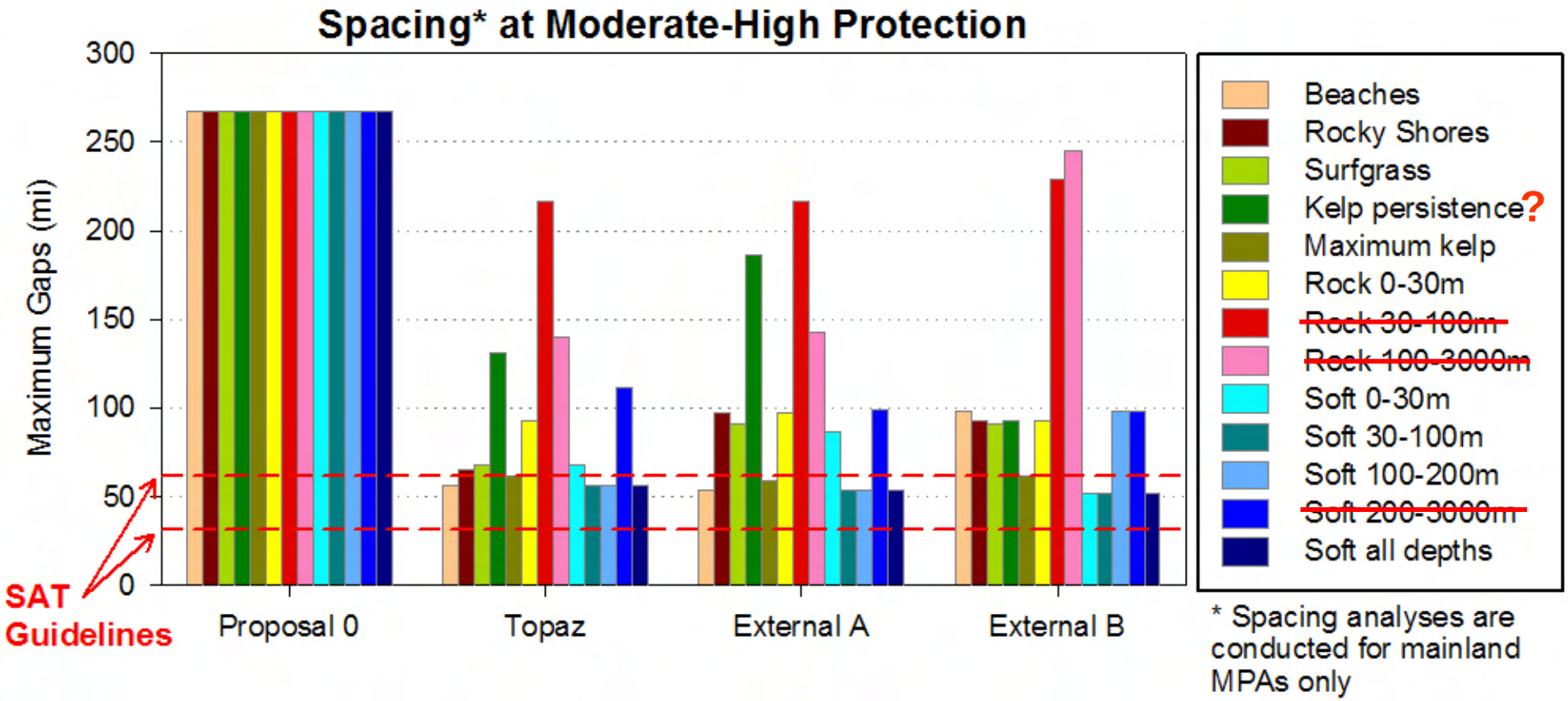


Max Gaps: Mod-high Protection

First 3 of 6 proposals



Max Gaps: Mod-high Protection



Spacing: Conclusions

- Spacing guidelines may be impossible to meet for some habitats
- No proposals meet spacing guidelines for all possible habitats
- Lapis 1 comes closest to meeting spacing guidelines for all possible habitats, followed by Topaz/Opal