Marine Life Protection Act Initiative

Size and Spacing Evaluations of the Round 3 SCRSG MPA Proposals for the MLPA South Coast Study Region

Presentation to the MLPA Master Plan Science Advisory Team
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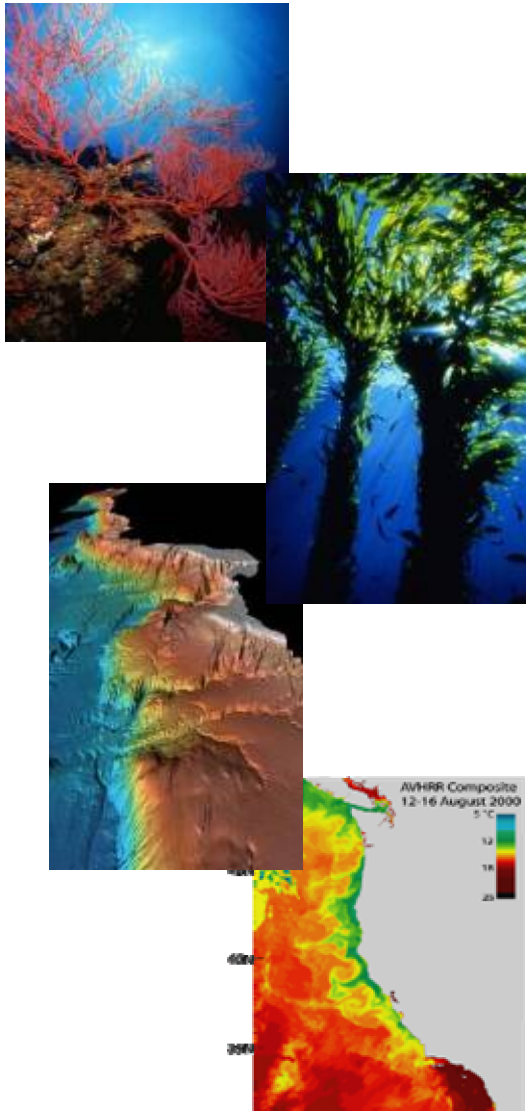
MLPA Goals*: Populations

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

- MPAs should be large enough that adults do not 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.

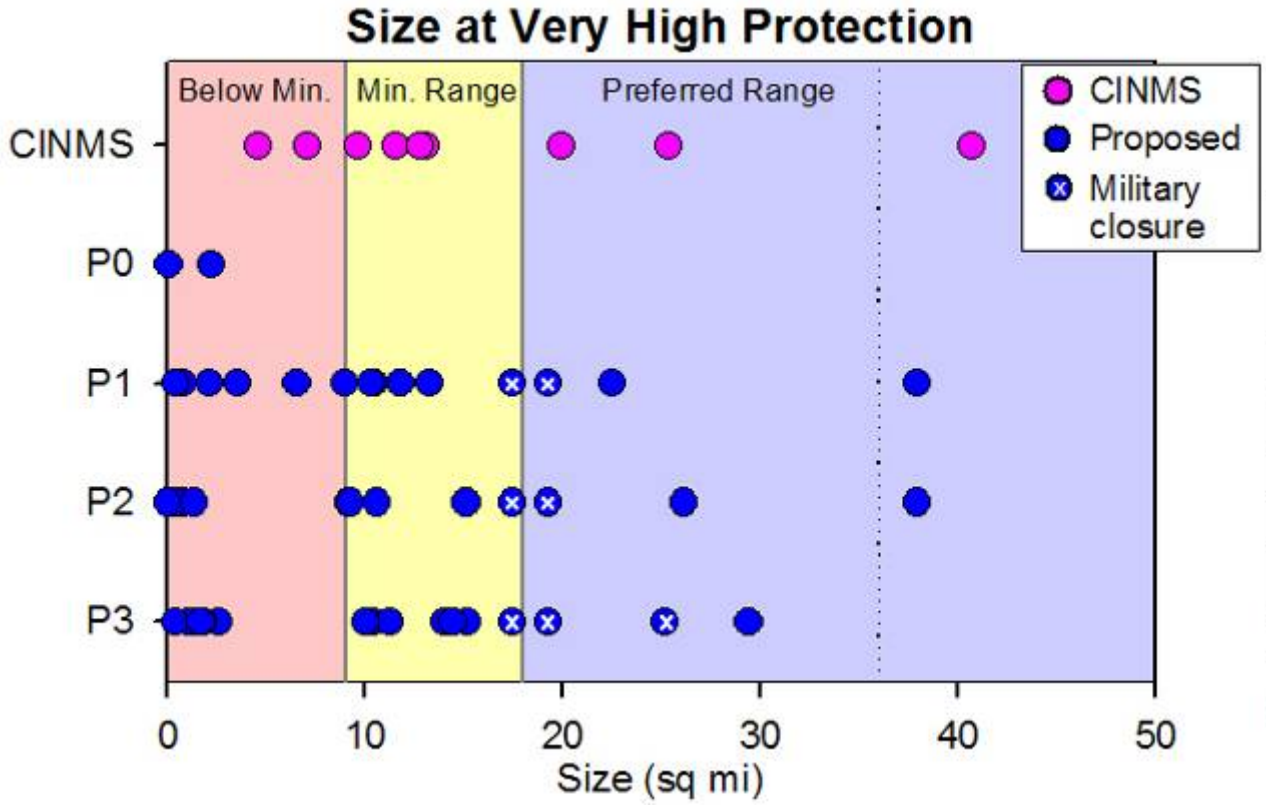
- Combined and simplified, these two guidelines yield:

  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

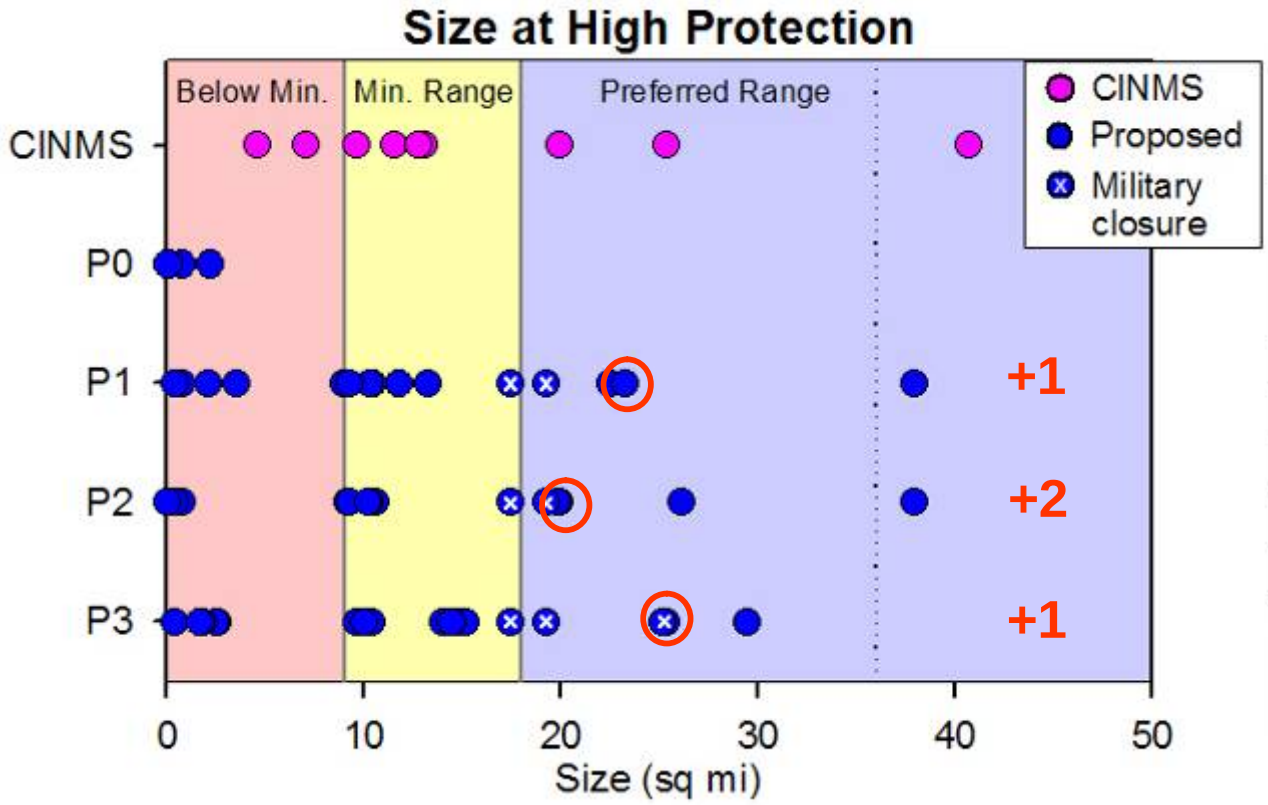


Number of MPA Clusters* at Very High Protection				
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	3	0	0	3
Proposal 1	5	6(1)	2(1)	13(2)
Proposal 2	4	5(1)	2(1)	11(2)
Proposal 3	5	7(1)	1(2)	13(3)

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

Proposals 1 and 3 have the same number of SMRs.
All proposals have 3 no-take clusters in the preferred size range .
Most SMRs are above the minimum size for all proposals.

Cluster Sizes: High Protection*



Number of MPA Clusters* at High Protection

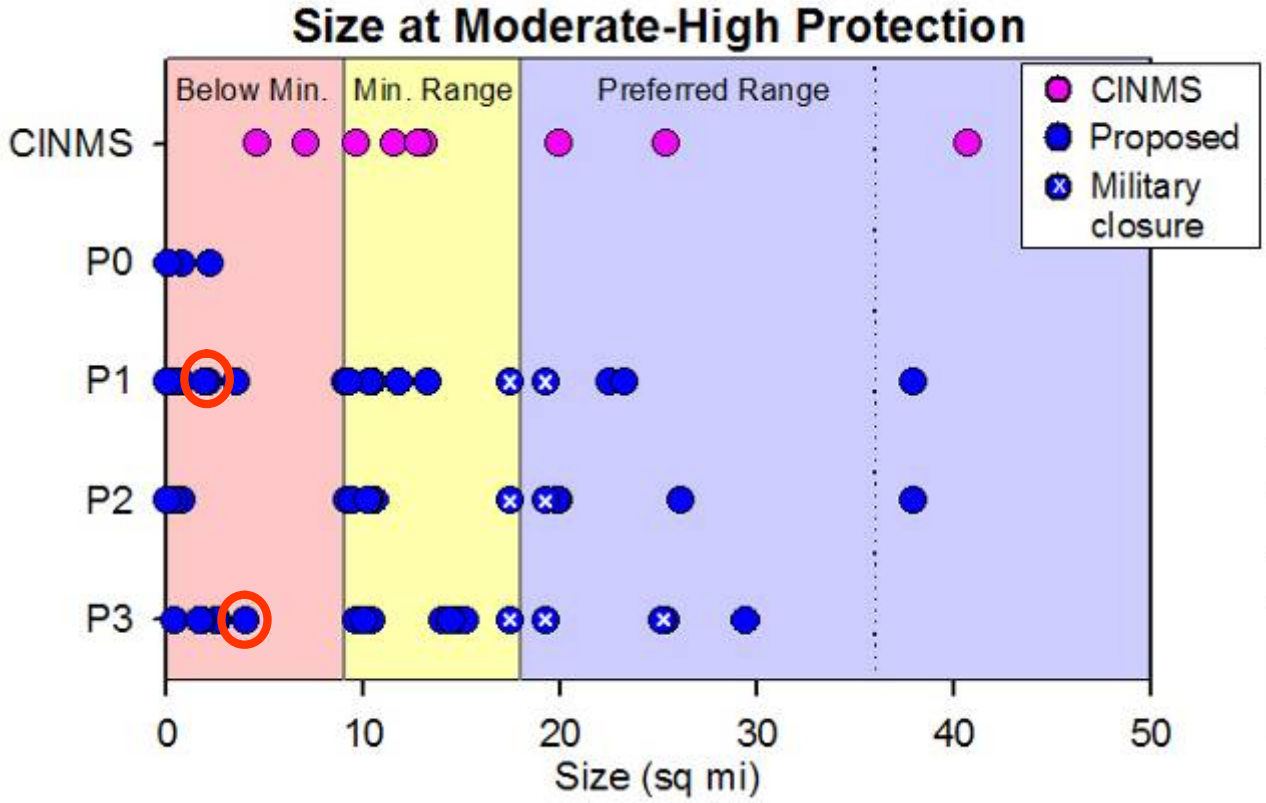
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
CINMS MPAs	3	5	3	11
Proposal 0	4	0	0	4
Proposal 1	4	7(1)	3(1)	14(2)
Proposal 2	3	6(1)	4(1)	13(2)
Proposal 3	5	8(1)	2(2)	15(3)

* 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
Proposal 1	6	7(1)	3(1)	16(2)
Proposal 2	3	6(1)	4(1)	13(2)
Proposal 3	6	8(1)	2(2)	16(3)

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

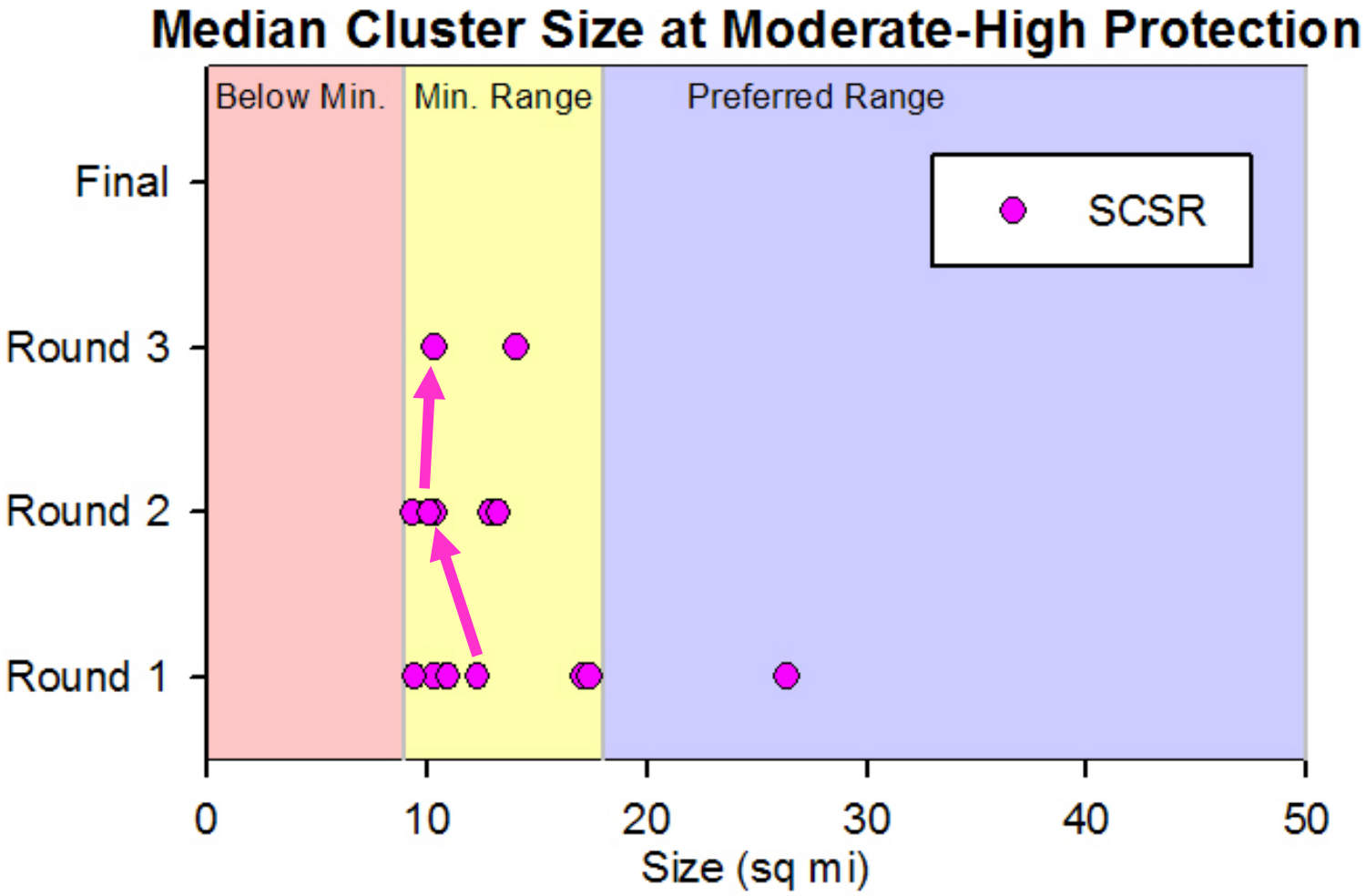
Some additional smaller MPAs at mod-high protection

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

Size: Conclusions

- Proposals have a larger proportion of MPAs above the minimum size as compared to Round 2.
- All proposals have 3 very high protection clusters within the preferred size range (includes SMRs and military closures).
- Proposals 1 and 3 have the same number of MPAs above mod-high protection; Proposal 2 has fewer.
- All proposals have some MPAs that do not meet minimum size guidelines.

Median Cluster Size Through Time



Protecting Populations

Size and Spacing

- MPAs should be large enough that adults do not 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.

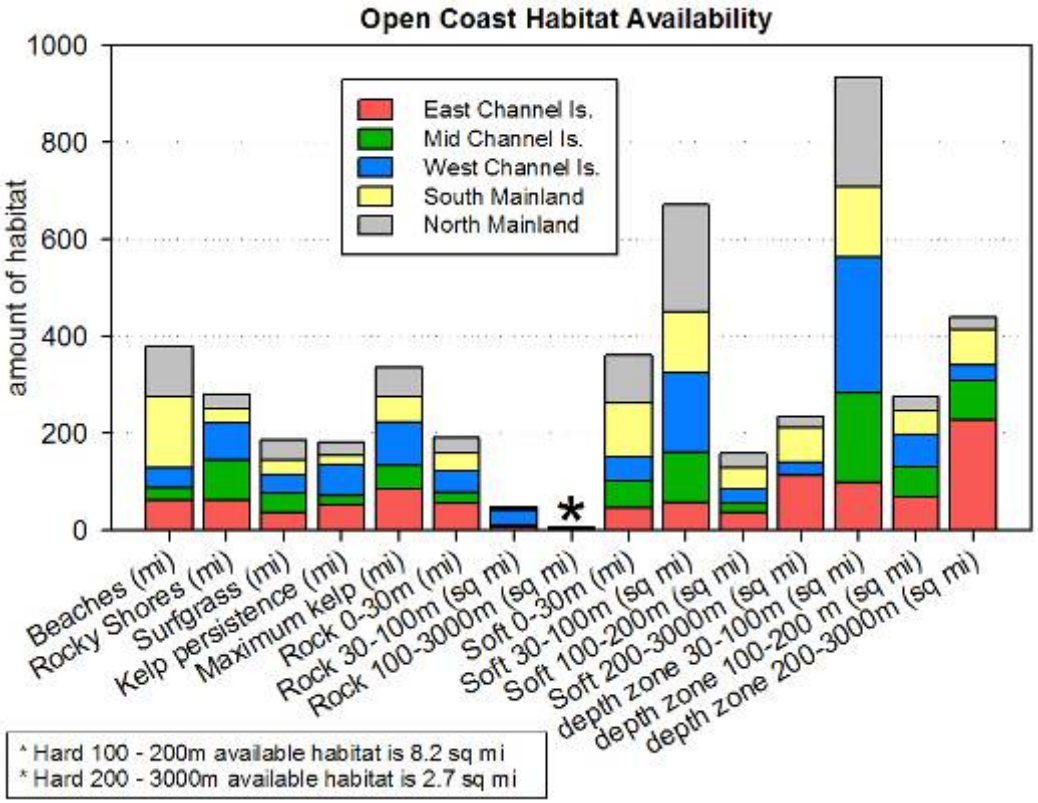
Spacing Analysis Methods

- 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

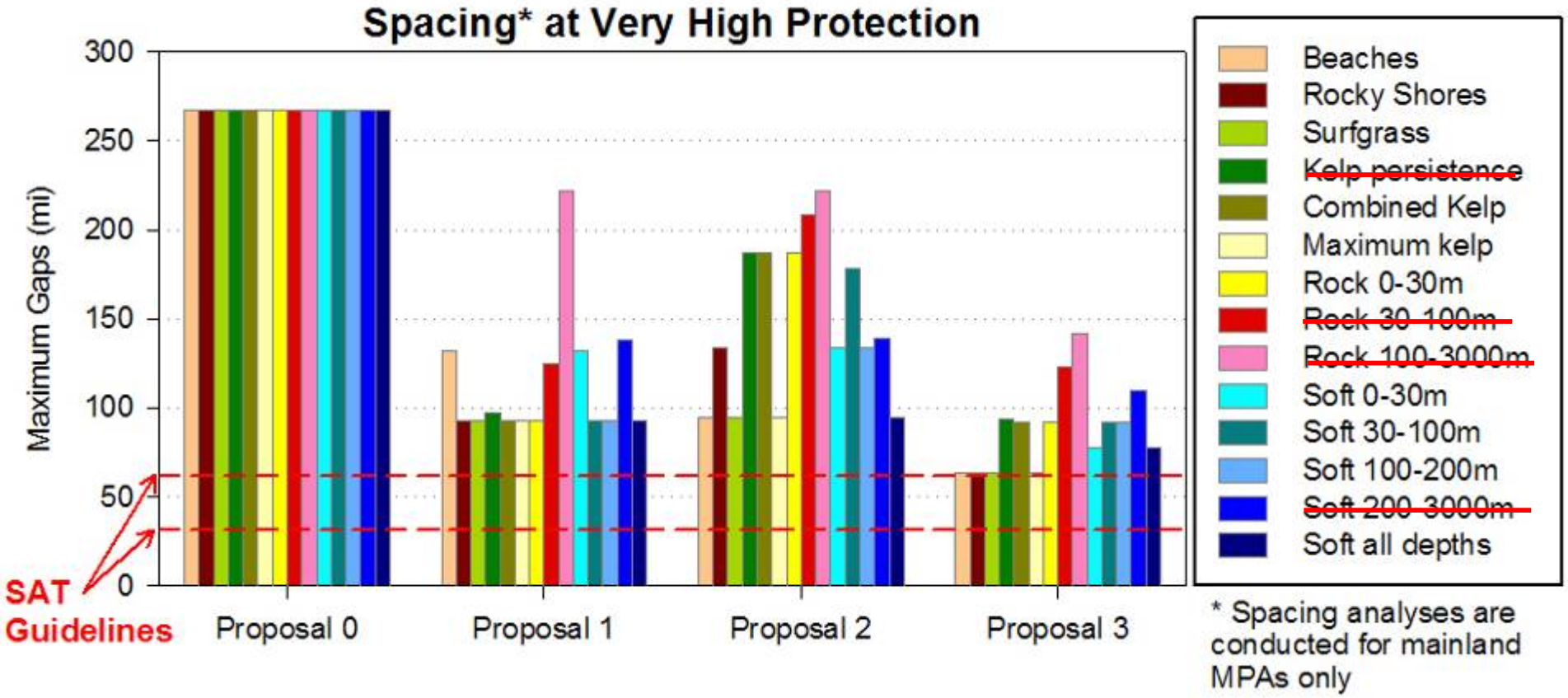
Habitat Availability and Spacing

Habitat availability and distribution limits spacing

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



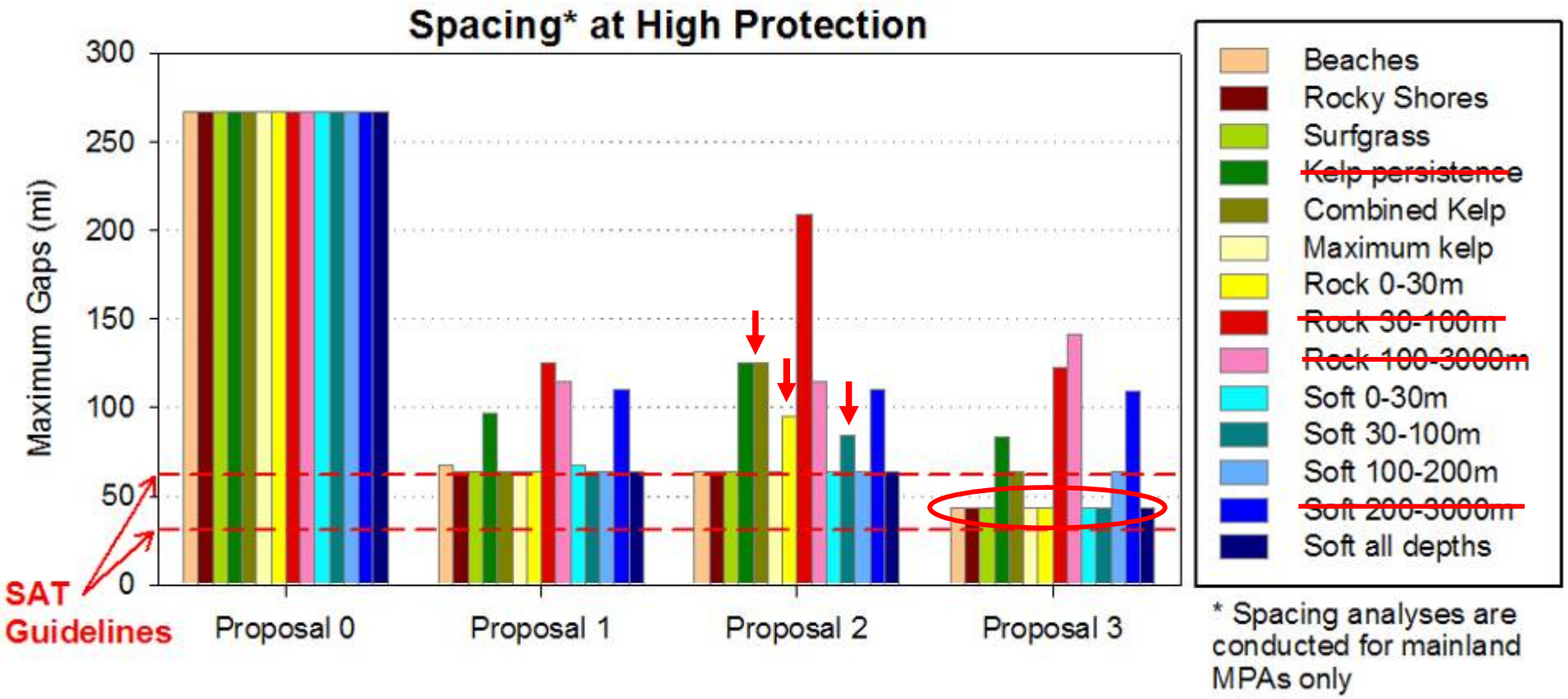
Max Gaps: Very High Protection



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 ~ 75-85 miles due to gap between Palos Verdes and San Elijo area.

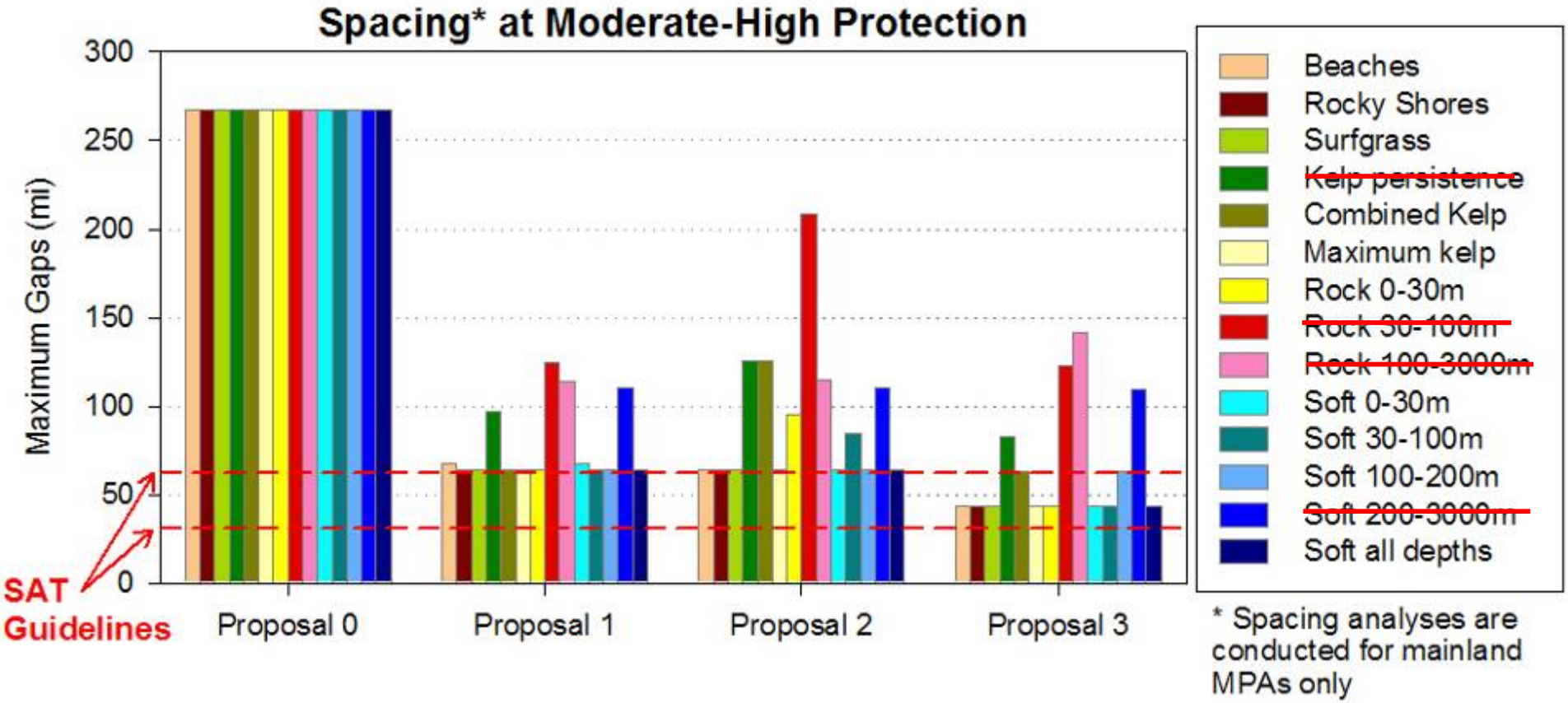
Max Gaps: High Protection



Proposals 1 and 3 meet spacing guidelines for all possible habitats
Proposal 3 approaches preferred spacing for many habitats
Proposal 2 exceeds spacing guidelines for several habitats

Max Gaps: Mod-high Protection

First 3 of 6 proposals



No change from high protection.

Spacing: Conclusions

- Maximum gaps are generally smaller in Round 3 as compared to Round 2.
- Spacing guidelines are impossible to meet for some habitats.
- Proposal 3 achieves gaps close to the lower end of the spacing guideline range for most habitats.
- Proposals 1 and 3 meet or approach spacing guidelines for all possible habitats.
- Proposal 2 exceeds spacing guidelines for shallow rock and kelp as well as 30-100m soft bottom.