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Marine Life Protection Act Initiative

Habitat, Size, and Spacing Evaluations of BRTF Recommended MPA Proposals for the MLPA North Coast Study Region

Presentation to the California Fish and Game Commission and the MLPA Blue Ribbon Task Force
February 2, 2011 • Sacramento, CA

Dr. Eric Bjorkstedt, Co-chair • MLPA Master Plan Science Advisory Team

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Notes on Evaluations

- **Results presented for marine protected areas (MPAs) at very high and moderate-high levels of protection (LOPs)**
  - **No high protection MPAs** were included in the Revised Round 3 MLPA North Coast Regional Stakeholder Group (NCRSG) MPA Proposal (RNCP) or the North Coast Enhanced Compliance Alternative MPA Proposal (ECA); thus evaluations at high protection are omitted from all evaluation materials.

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Notes on Evaluations

- **Nearshore "ribbon" MPAs proposed in ECA**
  - Confine uses with assigned LOPs below moderate-high to a narrow ribbon along the shoreline (extending from the shore to about 1000 feet offshore)
  - "Ribbon" MPAs split the 0-30m (meter) depth zone into multiple MPAs with different LOPs. For evaluation purposes, 0-30m habitats are evaluated at the lowest LOP within the 0-30m zone.

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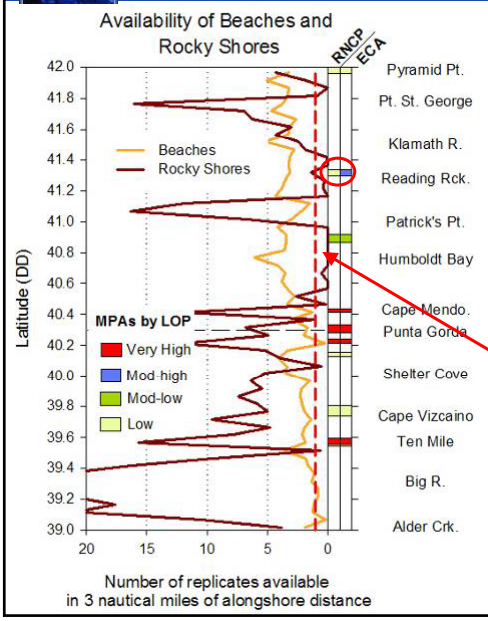
Habitat Distribution in the NCSR



Beaches and Rocky Shores

Replicates of beach habitat are available throughout the North Coast Study Region (NCSR).

Replicates of rocky shore habitat are available along most sections of coast, with the exception of the area near Humboldt Bay.

Differences in shoreline protection between RNCP and ECA at Reading Rock.

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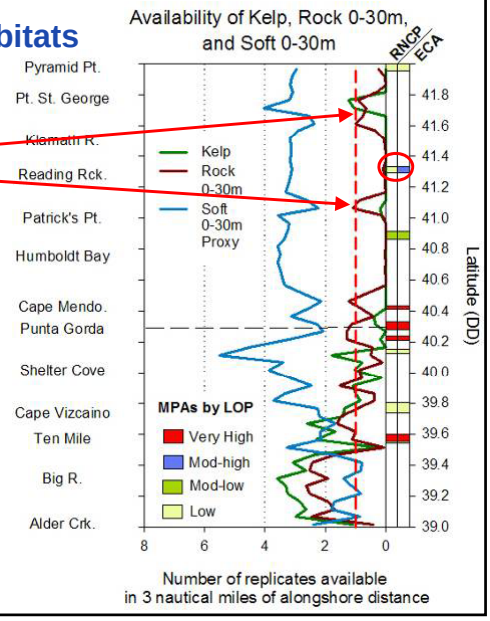
Habitat Distribution in the NCSR

Nearshore (0-30m) Habitats

Replicates of kelp and rock 0-30m habitat are rare north of Shelter Cove.

Replicates of soft 0-30m habitat are available throughout the NCSR.

Differences in nearshore protection between RNCP and ECA at Reading Rock.



6

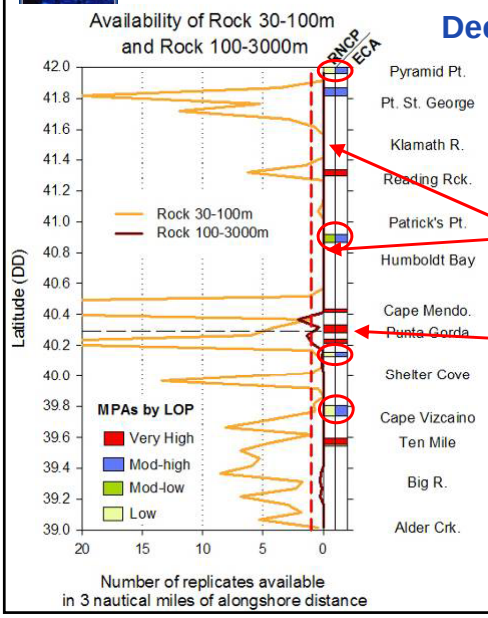
Habitat Distribution in the NCSR

Deeper Rock (30-3000m) Habitats

Replicates of rock 30-100m habitat are available along most sections of coast, with the exception of areas near the Klamath River and Humboldt Bay.

Replicates of rock 100-3000m are available only near Cape Mendocino.

Differences in deeper habitat protection between RNCP and ECA at multiple MPAs.



7

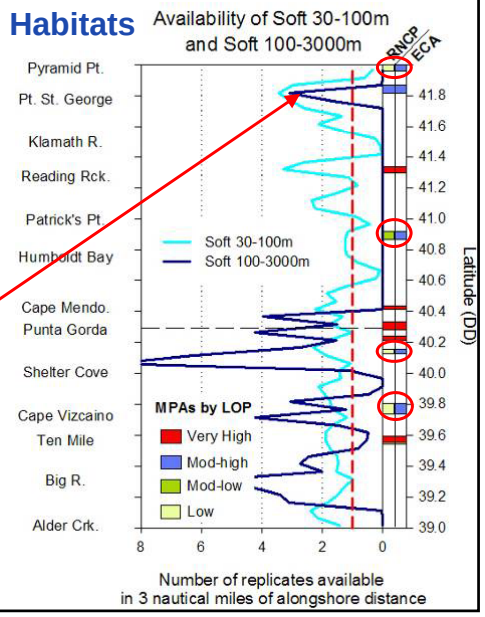
Habitat Distribution in the NCSR

Deeper Soft bottom (30-3000m) Habitats

Replicates of soft 30-100m habitat are available along most sections of the coast and included in most MPAs.

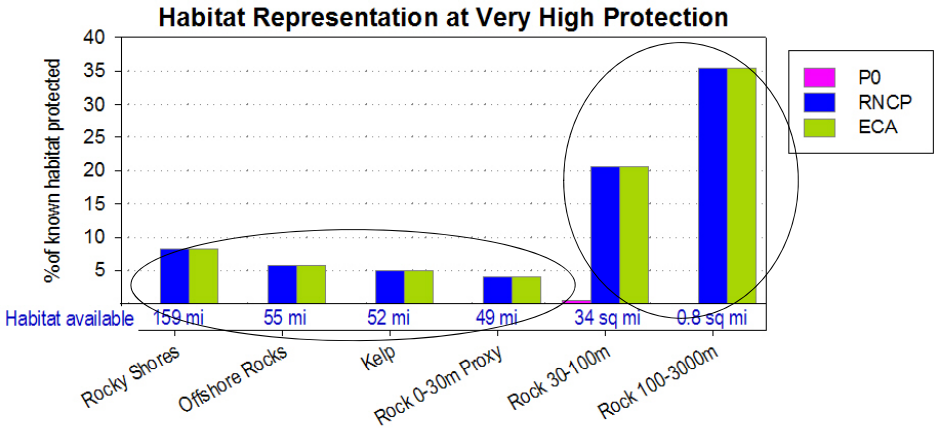
Replicates of soft 100-3000m habitat are rare north of Cape Mendocino and available only near Point St. George.

Differences in deeper habitat protection between RNCP and ECA at multiple MPAs.



8

Representation: Rocky Habitats

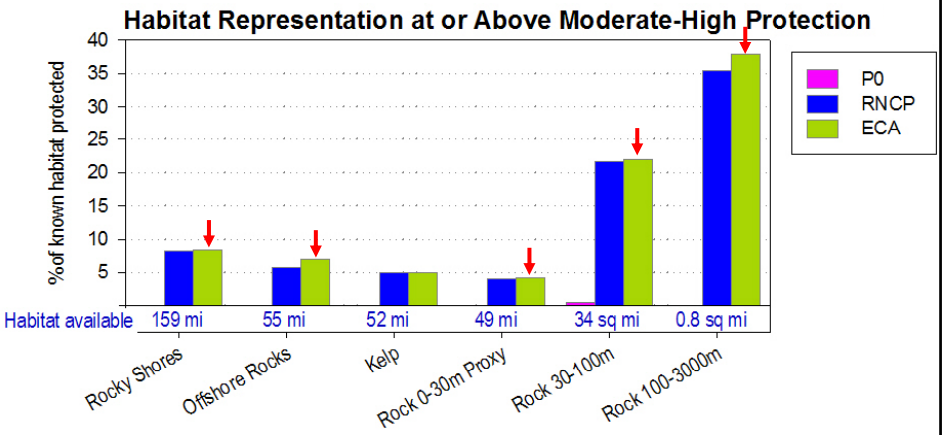


At very high protection the RNCP and ECA are identical.

- **4-8% of available shoreline and nearshore rocky habitats included**
- **20-36% of deeper rock habitats included**

9

Representation: Rocky Habitats



At or above moderate-high protection:

- **ECA includes a slightly larger percentage of most rocky habitats than RNCP.**
- **Both proposals include less than 10% of shoreline and nearshore rocky habitats and more than 20% of deeper rocky habitats.**

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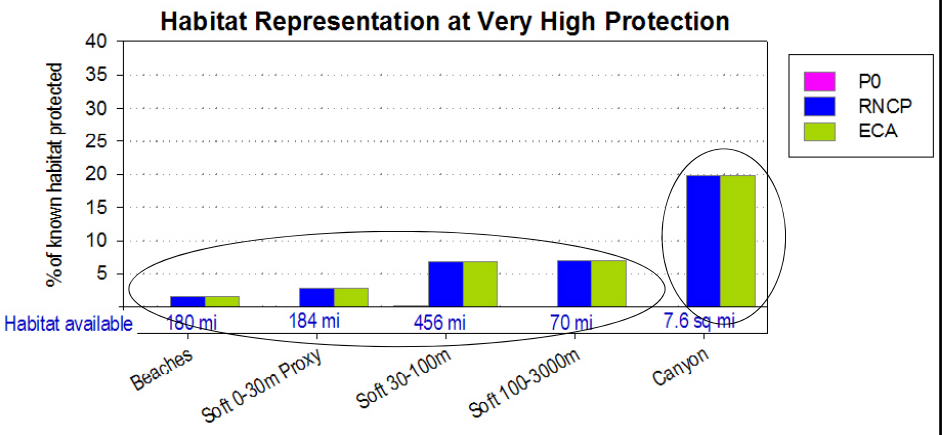
Representation: Soft Bottom Habitats



At very high protection the RNCP and ECA are identical.

- **1.5-7% of available soft-bottom habitats included**
- **~20% of rare canyon habitat included**

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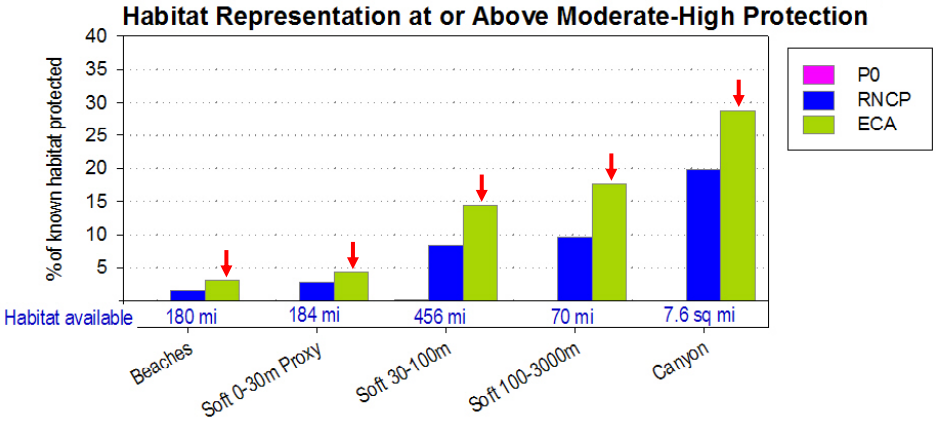
Representation: Soft Bottom Habitats



At or above moderate-high protection:

- **ECA includes a larger percentage of all soft bottom habitats.**
- **Both proposals include less than 5% of shoreline and nearshore soft-bottom habitats.**

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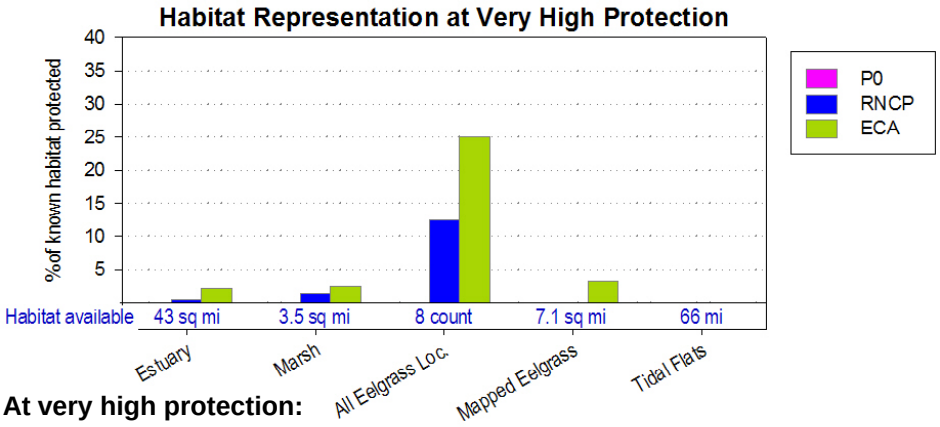
Representation: Estuarine Habitats



At very high protection:

- RNCP includes 0-1.4% of estuary, marsh, mapped eelgrass, and tidal flats and 1 of 8 (12.5%) known eelgrass locations.
- ECA includes 0-3.3% of estuary, marsh, mapped eelgrass and tidal flats and 2 of 8 (25%) known eelgrass locations.

Identical evaluation results at or above moderate-high protection.

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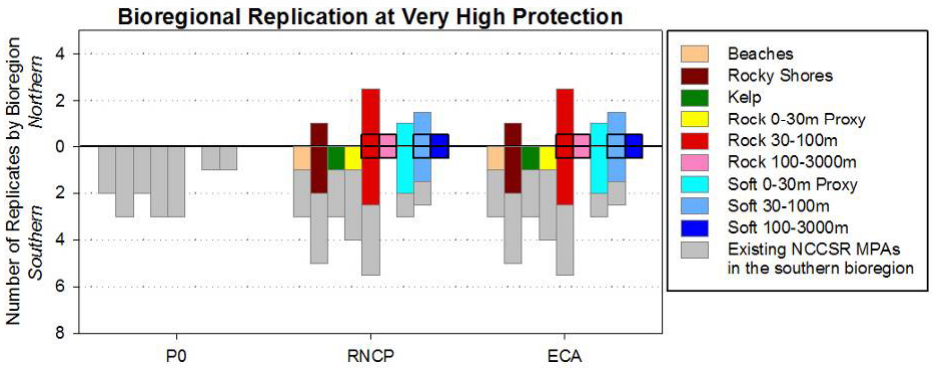
Bioregional Replication



At very high protection the RNCP and ECA are identical.

- **Three habitats—beaches, kelp, and 0-30m rock—are not replicated in northern bioregion.**
- **Rare 100-3000m rock and soft bottom habitats are replicated in only one MPA that falls on bioregional divide.**

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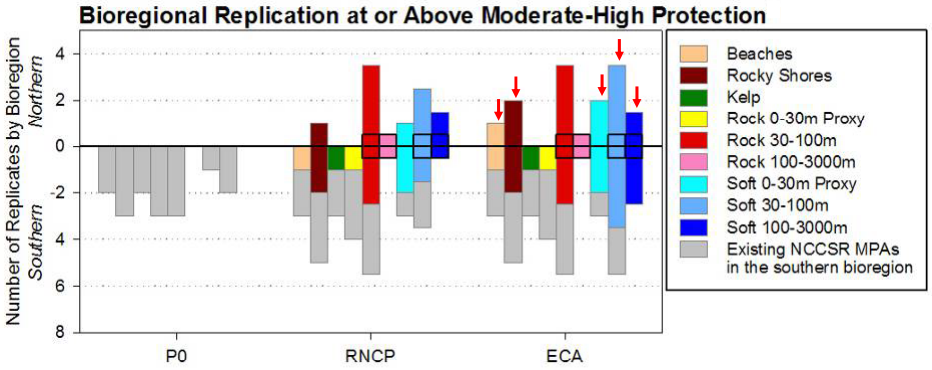
Bioregional Replication



At or above moderate-high protection:

- **Two habitats, kelp and 0-30m rock, are not replicated in northern bioregion in either proposal.**
- **As compared to RNCP, ECA includes more replicates of beaches, rocky shores, soft 0-30m, soft 30-100m, and soft 100-3000m.**

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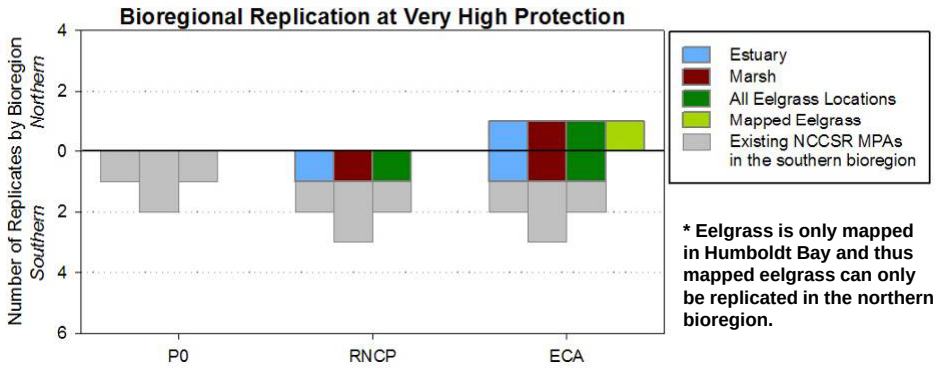
Bioregional Replication



*** Eelgrass is only mapped in Humboldt Bay and thus mapped eelgrass can only be replicated in the northern bioregion.**

At very high protection:

- RNCP includes replicates of each available estuarine habitat in the southern bioregion, but no estuarine replicates in the northern bioregion.
- ECA includes one replicate of each available estuarine habitat in both northern and southern bioregions.

Identical evaluation results at moderate-high protection.

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Summary of Habitat Evaluations

Guidelines Achieved

At very high protection:

- **Both proposals** represent all key habitats, except tidal flats, to some extent (1-36% of available)
- **Both proposals** meet replication guidelines for all key habitats at biogeographic scale (3-5 replicates), and at least one replicate of each is included in NCSR
- **RNCP** replicates **6 of 12** key habitats in both northern and southern bioregions
- **ECA** replicates **9 of 12** key habitats in both northern and southern bioregions (adds estuarine habitats relative to RNCP)

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Summary of Habitat Evaluations

Guidelines Achieved (continued)

At or above moderate-high protection:

- Tidal flats (poorly mapped) not represented in either proposal, but all other habitats represented to some extent
- **RNCP** replicates **6 of 12** key habitats in both northern and southern bioregions
- **ECA** replicates **10 of 12** key habitats in both northern and southern bioregions (adds estuarine habitats and rocky shores relative to RNCP)

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Summary of Habitat Evaluations

Guidelines Not Achieved

At very high protection:

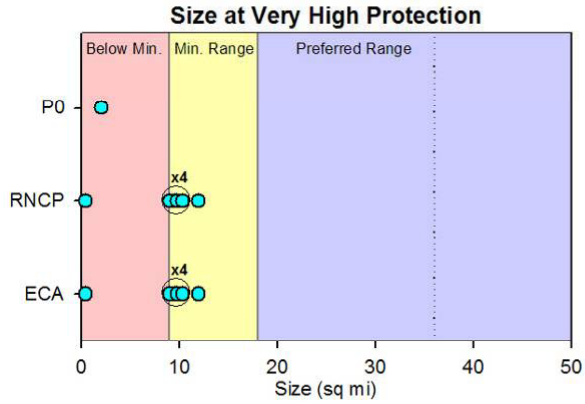
- **Neither proposal** represents tidal flats (poorly mapped) within NCSR
- **RNCP** does not replicate **6 of 12** key habitats in the northern bioregion of NCSR: beaches, kelp, rock 0-30m, estuary, marsh and eelgrass
- **ECA** does not replicate **3 of 12** key habitats in the northern bioregion of NCSR: beaches, kelp and rock 0-30m

Summary of Habitat Evaluations

Guidelines Not Achieved (continued)

- **At or above moderate-high protection:**
  - **Neither proposal** represents tidal flats (poorly mapped) within NCSR
  - **RNCP does not replicate 6 of 12 key habitats** in the northern bioregion of NCSR: beaches, kelp, rock 0-30m, estuary, marsh, and eelgrass
  - **ECA does not replicate 2 of 12 key habitats** in the northern bioregion of NCSR: kelp and rock 0-30m

Cluster Sizes: Very High Protection

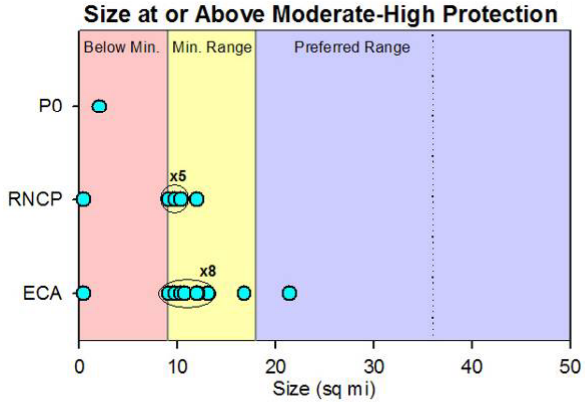


Number of MPA Clusters at Very High Protection

Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
P0	1	0	0	1
RNCP	1	5	0	6
ECA	1	5	0	6

At very high protection the RNCP and ECA are identical: most MPAs are within the minimum size range and no MPAs are within the preferred size range.

Cluster Sizes: Moderate-high Protection



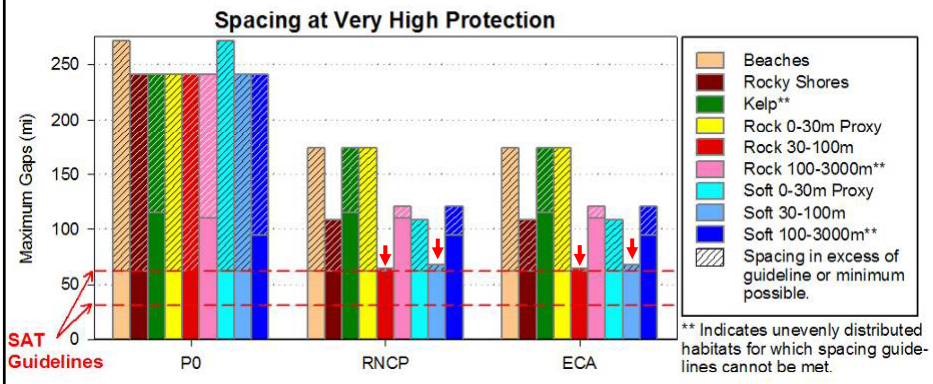
Number of MPA Clusters at Moderate-High Protection

Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
P0	1	0	0	1
RNCP	1	6	0	7
ECA	1	9	1	11

At or above moderate-high protection, as compared to very high protection:

- **RNCP includes one more minimum size MPA cluster.**
- **ECA includes four more minimum size MPA clusters and one preferred size MPA cluster.**

Max Gaps: Very High Protection



- **Not possible to meet spacing guidelines for kelp, rock 100-3000m, or soft 100-3000m habitats**
- **At very high protection, RNCP and ECA are identical: both approach spacing guidelines for rock 30-100m and soft 30-100m**

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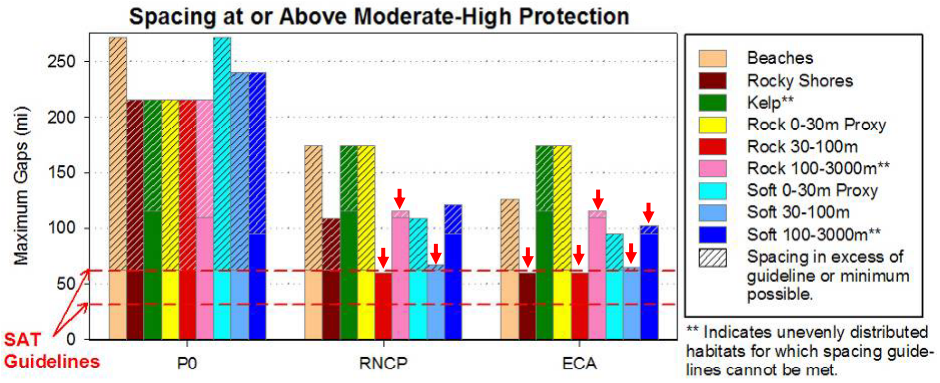
Max Gaps: Moderate-High Protection



- **RNCP achieves or approaches the spacing guidelines or minimum possible spacing for 3 habitats.**
- **ECA achieves or approaches the spacing guidelines or minimum possible spacing for 5 habitats.**
- **Spacing gaps remain in both proposals for beaches, kelp, rock 0-30m and soft 0-30m.**

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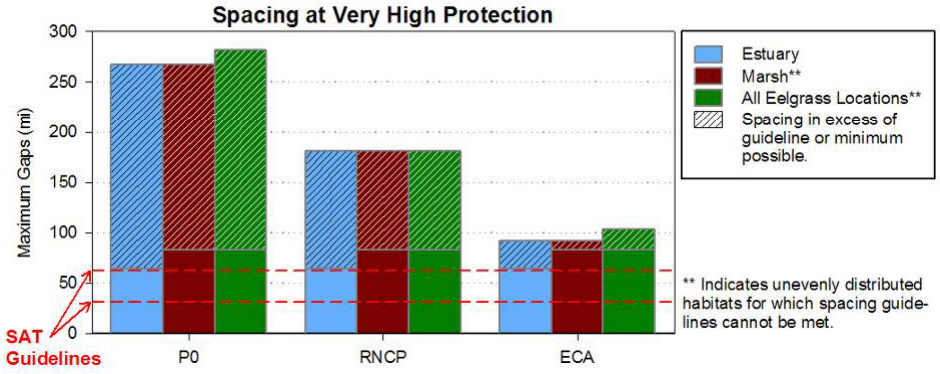
Estuarine Spacing: Very High Protection



- **It is not possible to meet spacing guidelines for marsh or eelgrass habitats due to uneven distribution of habitats.**
- **In RNCP, estuarine habitats are replicated only at Ten Mile estuary, thus largest gaps extend from Ten Mile estuary north to Oregon.**
- **In ECA, gaps for estuarine habitats are reduced by the South Humboldt Bay State Marine Recreational Management Area.**

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Size and Spacing Summary

Guidelines Achieved

- **At very high protection:**
  - **Both proposals** have all but one MPA within minimum size range
  - **RNCP** approaches guidelines or minimum possible spacing for **2 habitats**: rock 30-100m and soft 30-100m
  - **ECA** approaches guidelines or minimum possible spacing for **3 habitats**: rock 30-100m, soft 30-100m, and marsh

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Size and Spacing Summary

Guidelines Achieved (continued)

- **At or above moderate-high protection:**
  - **RNCP** includes 6 MPAs in the minimum size range and 1 below minimum size MPA
  - **ECA** includes 9 MPAs in the minimum size range, 1 preferred size MPA and 1 below minimum size MPA
  - **RNCP** achieves spacing guidelines for **1 habitat**: rock 30-100m
  - **ECA** achieves spacing guidelines for **2 habitats**: rocky shores and rock 30-100m
  - **RNCP** achieves or approaches guidelines or minimum possible spacing for **3 habitats**: rock 30-100m, rock 100-3000m and soft 30-100m
  - **ECA** achieves or approaches guidelines or minimum possible spacing for **6 habitats**: rocky shores, rock 30-100m, rock 100-300m, soft 30-100m, soft 100-3000m, and marsh

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Size and Spacing Summary

Guidelines Not Achieved

- **At very high protection:**
  - No MPAs within preferred size range exist in **either proposal**
  - In **RNCP,** spacing gaps for **10 of 12** key habitats substantially exceed guidelines or minimum possible spacing: beaches, rocky shores, kelp, rock 0-30m, rock 100-3000m, soft 0-30m, soft 100-3000m, estuary marsh and eelgrass
  - In **ECA,** spacing gaps for **9 of 12** key habitats substantially exceed guidelines or minimum possible spacing: beaches, rocky shores, kelp, rock 0-30m, rock 100-3000m, soft 0-30m, soft 100-3000m, estuary and eelgrass

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Size and Spacing Summary

Guidelines Not Achieved (continued)

- **At or above mod-high protection:**
  - **RNCP** includes no MPAs within preferred size range
  - In **RNCP**, spacing gaps for **9 of 12** key habitats substantially exceed guidelines or minimum possible spacing: beaches, rocky shores, kelp, rock 0-30m, soft 0-30m, soft 100-3000m, estuary, marsh and eelgrass
  - In **ECA**, spacing gaps for **6 of 12** key habitats substantially exceed guidelines or minimum possible spacing: beaches, kelp, rock 0-30m, soft 0-30m, estuary and eelgrass

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Background Information

The following slides include background information that will not be presented.

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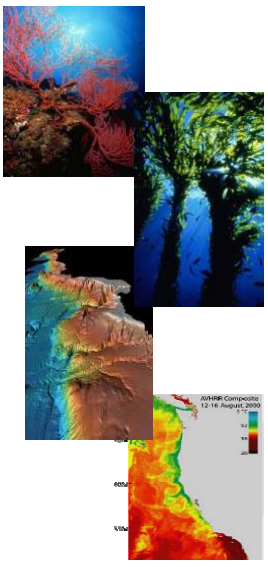
MLPA Goals*: Habitats

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*

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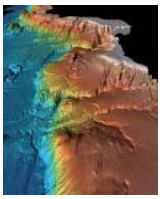
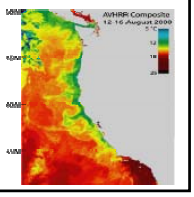
Protecting Habitats (Goals 1 & 4)

Habitat Guidelines





- Every 'key' marine habitat should be represented in the MPA network.
  - 12 key habitats in the NCSR
- 'Key' marine habitats should be replicated in multiple MPAs across large environmental and geographic gradients.
  - 3-5 replicates of each habitat per biogeographic region (Pt. Conception to Oregon border)
  - SAT recommends at least 1 replicate of each habitat per bioregion (northern and southern bioregions in NCSR).

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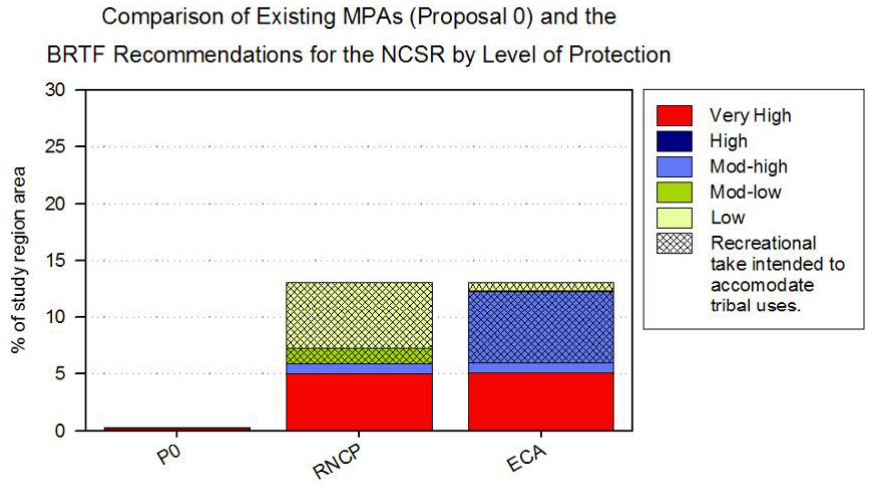
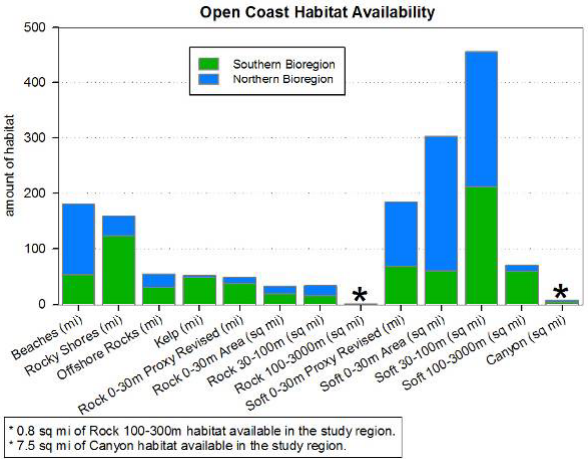
MPA Areas by Level of Protection



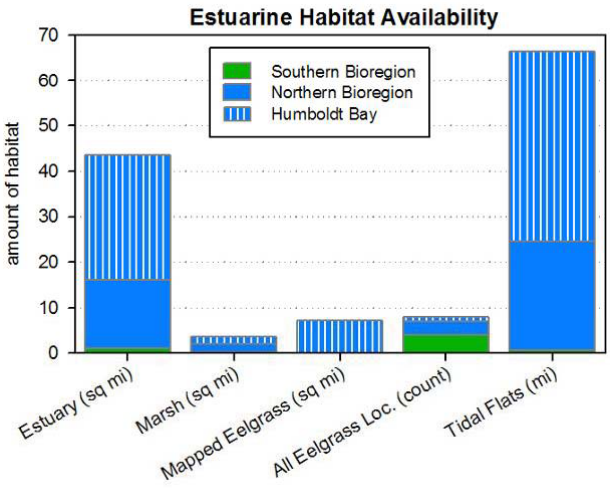
Habitat Availability

- Nearshore rocky habitats and kelp are less abundant in northern bioregion.
- >100 meter depth habitats are relatively rare across the region, occurring mostly in canyons and southern bioregion.
- Soft-bottom habitats are especially abundant in northern bioregion.



Habitat Availability

- Northern bioregion contains majority of estuarine habitats:
  98% of estuarine area
  96% of marsh area
  99% of tidal flats.
- Humboldt Bay contains 62% of all estuarine area and 100% of mapped eelgrass in MLPA North Coast Study Region (NCSR).
- Eelgrass is known to exist in 8 estuaries, 4 in the northern and 4 in the southern bioregions.



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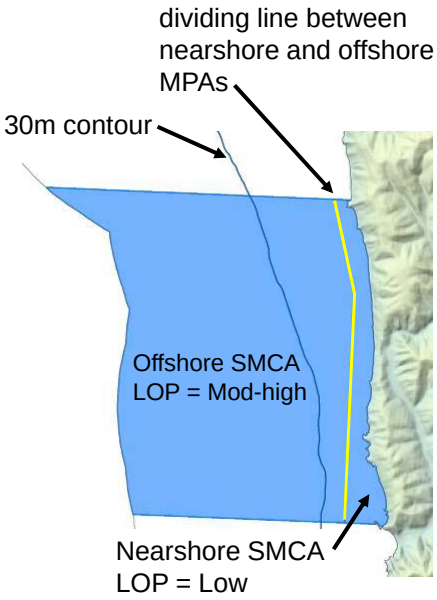
Protecting Nearshore Habitats

- To represent or replicate nearshore habitats, the entire 0-30m zone must be included in an MPA or cluster.
- Activities in the nearshore "ribbon" MPA may impact species across the 0-30m zone.
- Replication and representation of 0-30m habitats is assessed at the lowest LOP in the 0-30m zone (i.e. Low in this example) .



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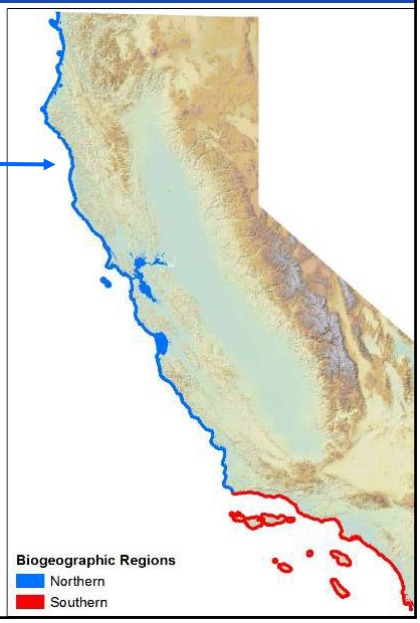
Replication Guidelines

- Replication guidelines in the *California Marine Life Protection Act Master Plan for Marine Protected Areas* call for **3-5 replicates within the MLPA biogeographic region.**



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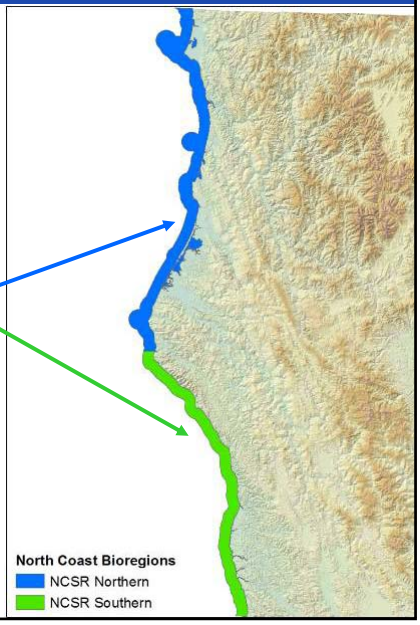
Replication Guidelines

- Replication guidelines in the *Master Plan* call for 3-5 replicates within the MLPA **biogeographic region**
- The SAT additionally recommends **at least 1 replicate of each habitat per bioregion.**
- Two **bioregions** in the north coast study region



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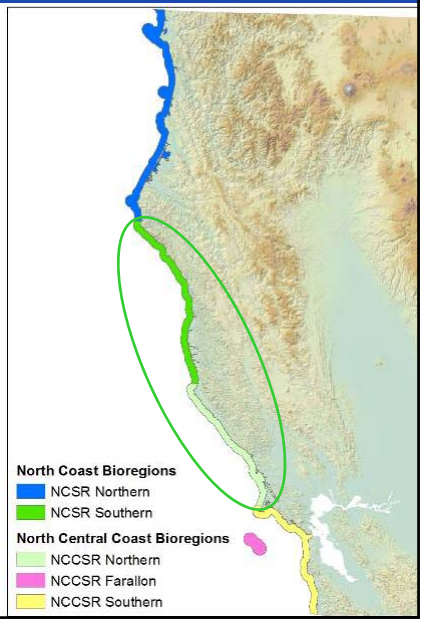
Replication Guidelines

- Replication guidelines in the *Master Plan* call for 3-5 replicates within the **biogeographic region**
- The SAT additionally recommends at least 1 replicate of each habitat per **bioregion**
- Two **bioregions** in the north coast study region
- No strong biological break at Point Arena, thus the southern bioregion of the NCSR extends into the northern half of the MLPA North Central Coast Study Region



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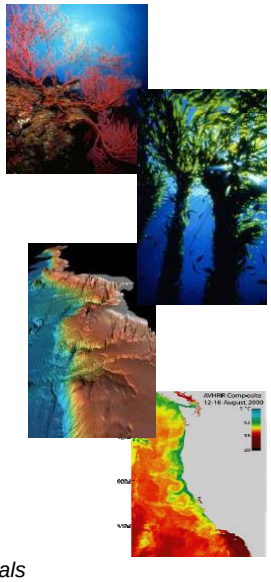
MLPA Goals*: Populations

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 represents a summary of the MLPA goals*

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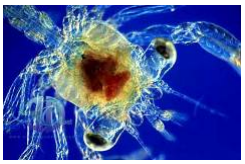
Protecting Populations (Goals 2 & 6)

Size and Spacing Guidelines

- MPAs should be large enough that adults do not move out of them too frequently and become vulnerable to fishing.
  - Minimum range of 9-18 square miles
  - Preferred range of 18-36 square miles

- MPAs should be close enough together that sufficient larvae can move from one to the next.
  - MPAs should be placed within 31-62 miles of each other
  - Spacing is evaluated for each habitat



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Spacing to Existing MPAs in NCCSR

- Spacing to the north is calculated to the nearest **potential habitat replicate** in Oregon.
- Spacing to the south is calculated to the nearest **protected habitat replicate** in north central coast MPAs.
- Recent changes to the Stewarts Point SMR and correction of previous errors increased gaps for beaches and soft 0-30m habitat.
  - Nearest beach and soft 0-30m habitat replicates are at Bodega Head SMR, approximately 58 miles south of north coast study region boundary.

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Spacing: Unevenly Distributed Habitats

- **For some unevenly distributed habitats, spacing guidelines are impossible to meet.**
- Minimum possible spacing for these habitats:

  Kelp: 115 miles (mi)

  Deep soft bottom (100-3000m): **95 mi**

  Deep rock (100-3000m)**: 110 mi**
  only available in one area in the NCSR