California MLPA Master Plan Science Advisory Team
Evaluation of North Coast Round 2 Draft MPA Proposals: Habitat Representation, Habitat Replication, MPA Size and MPA Spacing Analyses

Revised July 14, 2010

The Marine Life Protection Act (MLPA) Master Plan Science Advisory Team (SAT) evaluates marine protected area (MPA) proposals in relation to the goals of the MLPA. SAT evaluations of habitat representation and habitat replication primarily address goals 1 and 4 of the MLPA, which focus on ecosystems and habitats. SAT evaluations of MPA size and MPA spacing between protected habitats primarily address goals 2 and 6 of the MLPA, which focus on marine life populations and connectivity. The discussion and associated figures and tables in this document compare the four draft MPA proposals (Ruby 1, Ruby 2, Sapphire 1, and Sapphire 2, abbreviated RU1, RU2, SA1, and SA2, respectively) developed during Round 2 of the north coast MPA planning process and the 'no change' alternative (Proposal 0, labeled as "P0" in graphs and tables) for each of the four evaluations listed above.

Methods for these analyses, including explanations of levels of protection (LOPs), are described in an associated document, *Draft Methods Used to Evaluate Marine Protected Area Proposals in the MLPA North Coast Study Region* (SAT Evaluation Methods Document).

A number of MPAs in each draft proposal allowed non-commercial tribal gathering, but did not describe the species taken and gear types used. For Round 2 evaluations of draft MPA proposals, the SAT included MPAs allowing tribal uses using the best information available. MPAs that included undefined tribal uses were assigned an "undetermined" LOP until species and gear types are identified. All other MPAs, including MPAs that proposed undefined tribal consumptive uses *and* other uses, were assigned LOPs based on defined uses.

Habitat Representation

Habitat abundance in the MLPA North Coast Study Region (NCSR) varies by habitat type and bioregion (Figure 1.1a). The most abundant open coast habitat in the study region is soft bottom at 30-100 meters (m) depth, which is also the most abundant habitat in each of the two bioregions where it encompasses over 200 square miles (sq mi) in each. Several rock and rock-associated habitats, including rocky shores, kelp, and rock 0-30m are more abundant in the southern bioregion, whereas soft bottom habitats are more abundant in the northern bioregion with the exception of deep soft bottom habitat (100-3000m). Deep rock (100-3000m) is rare in the study region, found only between Cape Mendocino and Shelter Cove, with just 0.38 sq mi available in each bioregion. Canyon habitat also is rare in the study region, with 3.04 sq mi available in the northern bioregion and 4.54 sq mi available in the southern bioregion.

Estuarine habitats, including total estuary area, tidal flats, and coastal marsh are much more abundant in the northern bioregion (Figure 1.1b). Total estuary habitat available in the northern bioregion is 42.44 sq mi compared to a total of 1.05 sq mi in the southern bioregion. In particular, approximately two-thirds of the available estuarine habitat in the northern bioregion is found within Humboldt Bay (as indicated in Figure 1.1b). Humboldt Bay encompasses an area of 27.44 sq mi, which is over six times greater than the next largest estuary in the study region, the Eel River estuary (4.24 sq mi). The other large estuaries (> 1.0 sq mi) in the study region also are all located in the northern bioregion (Lake Earl, Big Lagoon, Klamath River and

Smith River), whereas the largest estuary in the southern bioregion is the Big River estuary (0.35 sq mi). Furthermore, most of the estuaries found in the southern bioregion are characterized by narrow channels and surrounded by steep sides, limiting the availability of coastal marsh, tidal flats, and eelgrass habitat.

The availability of eelgrass is much higher in the northern bioregion due to the large, dense eelgrass beds found in Humboldt Bay. Eelgrass is not comprehensively mapped across the study region, and high resolution mapping appropriate for assessing area is only available for Humboldt Bay (labeled as “mapped eelgrass” in below figures and tables). MLPA Initiative staff also has confirmed eelgrass presence/absence for all major estuaries in the study region which allows the SAT to assess the proportion of known eelgrass locations protected (labeled as “all eelgrass locations” in figures and tables).

An overall summary of Round 2 draft MPA proposals by designation type and by LOP can be found in Figure 1.2. The SAT assigned MPAs that proposed to allow only undefined tribal consumptive uses an undetermined LOP. All other MPAs, including MPAs that proposed undefined tribal consumptive uses *and* other uses, were assigned LOPs based on defined uses.

Key Points from Proposal Summary Graphs Figure 1.2

- SA1 encompasses the largest proportion of the study region area within state marine reserves [SMRs (7.2%)], followed by RU1 (5.2%), RU2 (4.0%), and SA2 (2.8%).
- RU1 and SA1 encompass the largest proportion of the study region at or above moderate-high protection (13.1% and 13.5% respectively).
- RU2 and SA2 encompass under 10% of the study region at or above moderate-high protection.
- No MPAs were proposed at high protection.
- SA2 encompasses the largest proportion of both MPAs with proposed tribal consumptive uses and MPAs at undetermined protection, followed by RU1 and SA1, while RU2 encompasses the lowest proportion of MPAs with proposed tribal consumptive uses.

Key Points from Habitat Representation Analyses (figures 2.1 – 2.6)

Rocky Habitats

- All proposals protect a small proportion of shoreline and nearshore rocky habitats in very high protection MPAs (less than 1% to 4%).
- All proposals include more than 10% of available rock 30-100m depth in very high protection MPAs (range 11-24%).
- All proposals include at least 20% of available deep rock (100-3000m depth) in very high protection MPAs (range 20-36%), although this habitat is rare in the study region.
- SA1 includes a larger proportion of all rocky habitats at or above moderate-high protection as compared to other proposals. For shoreline and nearshore rocky habitats,

a substantial proportion of this habitat area proposes undefined tribal consumptive uses in addition to defined uses at moderate-high protection.

- At undetermined protection (includes MPAs at undetermined protection plus those at moderate-high and above), RU1, SA1, and SA2 protect a similar proportion of most rocky habitats, while RU2 includes less rocky habitat than the other proposals.

Soft-bottom Habitats

- All proposals protect a small proportion of shoreline and nearshore soft-bottom habitats in very high protection MPAs (less than 1% to 4%).
- All proposals include roughly 20% of available canyon habitat in very high protection MPAs, although this habitat is rare in the study region.
- SA1 and RU1 include a larger proportion of most soft bottom habitats at or above moderate-high protection as compared to other proposals, although there are some exceptions. For shoreline and nearshore soft-bottom habitats, a substantial proportion of this habitat area proposes undefined tribal consumptive uses in addition to defined uses at moderate-high protection.
- At undetermined protection (includes MPAs at undetermined protection plus those at moderate-high and above), RU1, SA1, and SA2 protect a similar proportion of most soft-bottom habitats, while RU2 includes less soft bottom habitat than the other proposals.

Estuarine Habitats

- None of the round 2 draft MPA proposals include any estuarine habitats at very high protection. At moderate-high protection, all proposals include only a very small proportion of available estuarine habitats with the exception of eelgrass locations.
- All proposed estuarine MPAs across all proposals include undefined tribal consumptive uses. In the northern bioregion, where only undefined tribal uses are proposed in estuaries, all estuarine MPAs were assigned an undetermined LOP. In the southern bioregion, some estuarine MPAs were assigned moderate-high protection due to defined uses (e.g. take of Dungeness crab).
- In general, RU1 and SA1 include a larger proportion of estuarine habitats in the northern bioregion than other proposals, due to inclusion of two MPAs in Humboldt Bay in both proposals and one in Stone Lagoon in RU1.
- All proposals include at least 25%, of all available estuarine habitats in the southern bioregion at or above moderate high, with the exception of tidal flats in SA2. Note that estuarine habitats are comparatively rare in the southern bioregion.
- At undetermined protection (includes MPAs at undetermined protection plus those at moderate-high and above), all proposals include 30-97% of each available estuarine habitat in the southern bioregion, with the exception of tidal flats in SA2. Note that tidal flats are rare in the southern bioregion and poorly mapped across the study region.
- Mapped eelgrass occurs only in Humboldt Bay within the northern bioregion at undetermined protection. SA1 includes the highest proportion of mapped eelgrass

(13%), followed by RU1 (4%), and both RU2 and SA2 include less than 1% of the available habitat for mapped eelgrass.

- Ranking of proposals by average representation at or above moderate-high protection across all habitats:
  - SA1 > RU1 > SA2 > RU2
  - This ranking holds true at undetermined protection as well.

Habitat Replication

The replication guideline in the *California Marine Life Protection Act Master Plan for Marine Protected Areas*, specifies that each habitat should be replicated in three to five SMRs in each biogeographical region (Point Conception to the Oregon border). This guideline has already been met by existing MPAs from the central coast and north central coast study regions. However, for within-habitat ecosystem representation and for monitoring and evaluation opportunities, the SAT has recommended that habitats are replicated in at least one MPA in each of the two bioregions of the NCSR. In order to be counted in the replication analysis the MPA must meet the minimum size guideline (9 sq mi), and a given habitat within the MPA must be present in a sufficient amount to encompass 90% of associated biodiversity (see Chapter 5: Habitat Replication Analyses in the SAT Evaluation Methods Document for further details.).

The results of the habitat replication analysis are displayed in Figures 3.1 to 3.4. In Figure 3.1, the number of open coast MPAs that contain a sufficient amount of each habitat to count as a replicate are shown for each MPA proposal at very high (Figure 3.1a), moderate-high (Figure 3.1b), and undetermined protection levels (Figure 3.1c). Figure 3.2 contains similar information to 3.1, but is conducted only for estuarine habitats. The proportion of these replicates that are contained within MPAs that propose undefined tribal consumptive uses is also indicated in Figures 3.1 and 3.2. Figure 3.3 shows the number of open coast MPAs that contain sufficient amount of each habitat to count as a replicate by bioregion for each MPA proposal at very high (Figure 3.3a), moderate-high (Figure 3.3b), and undetermined protection levels (Figure 3.3c). The portion of bars outlined in black in figure 3.3 indicates the number of replicates available if proposed MPAs are split at the bioregion boundary. Figure 3.4 contains similar information to 3.3, but is conducted only for estuarine habitats. Grey bars in Figures 3.1 – 3.4 indicate the number of replicates elsewhere in the biogeographic region (e.g. in the north central and central coast study regions).

Key Points from the Habitat Replication Analyses (Figures 3.1 – 3.2)

- At very high protection, there are at least 3-5 replicates already existing elsewhere in the biogeographic region for all open coast and estuarine habitats except soft 0-30m and soft 100-3000m. At moderate-high protection, there are at least 3-5 replicates already existing elsewhere in the biogeographic region for all open coast and estuarine habitats.
- At very high protection, none of the proposals replicates three of the shoreline and nearshore habitats: beaches, kelp, and rock 0-30m.

- At moderate-high protection all proposals include at least one and up to 8 replicates of each habitat, with the exception of rock 0-30m, which is not replicated in SA2. The habitats with the largest number of replicates across most proposals include soft-bottom habitats and rock 30-100m.
- For all proposals, the overall number of replicates of open coast habitats changes little between moderate-high and undetermined protection, although some proposals add replicates of shoreline and nearshore habitats.
- None of the round 2 draft MPA proposals includes a replicate of any estuarine habitat at very high protection. At moderate-high protection, all proposals include one replicate of two or three estuarine habitats, however mapped eelgrass is not replicated in any proposal. At undetermined protection, all proposals include at least 1-3 replicates of each estuarine habitat.
- On average, SA1 and RU1 include the largest number of replicates of open coast habitats at very high and moderate-high protection. At undetermined protection, SA2 includes a similar number of replicates to SA1 and RU1, but RU2 includes fewer replicates than the other proposals.
- RU1 includes the greatest number of replicates for each estuarine habitat at undetermined protection; all proposals include only one replicate of one or two estuarine habitats at or above moderate-high protection.
- RU1 includes six estuary replicates at undetermined protection.
- Ranking of proposals for replication across all habitats at or above moderate-high protection:
  - SA1 > RU1 > SA2 > RU2

Key Points from the Analyses of Habitat Replication by Bioregion (Figures 3.3 – 3.4)

- Existing MPAs located in the northern bioregion of the NCCSR contribute to replication of many habitats except rock 100-3000m, soft 0-30m, soft 100-3000m, and mapped eelgrass. Replicates of habitats in existing NCCSR MPAs are counted toward replication in the southern bioregion of the NCSR. Because of the bioregional overlap between the NCCSR and the southern bioregion of the NCSR, draft MPA proposals for the NCSR can achieve replication guidelines for many habitats by replicating habitats in the northern bioregion only.
- At very high protection, all proposals include a replicate of every open coast habitat in the southern bioregion except soft 0-30m in SA2. However, many of these habitat replicates are contributed by existing MPAs in the NCCSR, not newly proposed MPAs.
- In the northern bioregion, three habitats (beaches, kelp, and rock 0-30m) are not replicated in any proposal at very high protection. Several other habitats (rock 100-3000m, soft bottom 30-100m and soft bottom 100-3000m) are replicated in an MPA that spans the bioregion boundary in most proposals, but not elsewhere in the northern bioregion. Note that rock 100-3000m is rare and only available in one location near the bioregion boundary, however, the other habitats are available elsewhere in the northern bioregion.

- Kelp and rock 0-30m are not replicated in the northern bioregion in any proposals at any LOP.
- Replicates of rock 30-100m, rock 100-3000m, soft 30-100m, and soft 100-3000m are included in an MPA that spans the bioregion boundary in all proposals. These replicates that fall on the bioregional divide can reasonably be assigned to either bioregion.
- Overall, RU1, SA1, and SA2 include a similar number of replicates of open coast habitats at undetermined protection (includes MPAs at undetermined protection plus those at moderate-high and above) with similar distribution across bioregions.
- RU1 is the only proposal to include a replicate of deep soft (100-3000m) in the northern bioregion. There is only one location in the northern bioregion (near Point St. George) where this habitat exists in sufficient quantities to count as a replicate.
- None of the estuarine habitats are replicated at or above moderate-high protection in the northern bioregion. RU1 and SA1 include at least one replicate of each estuarine habitat at undetermined protection.

MPA Size

MPA size guidelines were developed to provide for the persistence of important bottom-dwelling fish and invertebrate groups within MPAs (see Chapter 6: MPA Size in the SAT Evaluation Methods Document for further details). To accommodate adult movements and life history needs for a range of species, science guidelines in the *California Marine Life Protection Act Master Plan for Marine Protected Areas* state that MPAs should have a minimum alongshore span of 3-6 statute miles (preferably 6-12.5 statute miles) and should extend offshore to deep waters (note that state waters generally extend offshore to 3 nautical miles). The SAT combined and simplified these two guidelines to recommend that an individual MPA or MPA cluster should have a minimum area of 9-18 square statute miles (preferably 18-36 square statute miles).

The size analysis considers the number of MPA “clusters” (adjacent MPAs at or above a given LOP) that meet the minimum and preferred size guidelines at very high, moderate-high, and undetermined protection. An MPA cluster may consist of a single MPA, or several contiguous MPAs. Estuarine MPAs are not included in the size analysis because the sizes of estuaries vary and their boundaries are fixed.

Figure 4.1 displays results of the MPA size analysis. Each proposal is displayed on a separate line of the figures and each circle indicates the size of an MPA "cluster", with larger MPA clusters further to the right and smaller MPA clusters further to the left. The pink shaded area to the far left of a figure indicates MPA clusters that fall below the minimum MPA size recommended by the SAT (9 square statute miles). The yellow shaded area in the middle of the figure indicates MPA clusters that are bigger than the minimum size guideline, but smaller than the preferred size recommended by the SAT (18 square statute miles). The blue shaded area to the right of the figure indicates MPA clusters that fall within the preferred size range recommended by the SAT (18 – 36 square statute miles). At all protection levels, particularly for undetermined protection, the sizes of two or more MPAs in a given proposal are identical or

very similar. In these cases, the blue circles of very similar or identical size are encompassed within a slightly larger black circle and denoted by a number above to indicate how many MPAs are within the larger black circle (e.g. “x3” means there are three MPAs of nearly identical size). These results also are tabulated on the right hand side of the figure. Table 4.2 lists MPA cluster sizes from smallest to largest for each proposal. As with other size analyses estuarine MPAs are not included in table 4.2.

Key Points from the Size Analyses (Figure 4.1 and Table 4.2)

- SA1 and RU1 include the largest number of MPA clusters that meet the size guidelines (i.e., within the minimum *or* preferred size ranges) and the largest number of MPA clusters at very high protection (5), followed by RU2 (4) and SA2 (2).
- None of the round 2 draft MPA proposals include an MPA cluster that meets the preferred size guidelines at very high protection.
- RU1 includes the largest number of MPA clusters that meet the size guidelines at moderate-high protection (10), followed by SA1 (9), SA2 (7), and RU2 (6).
- All proposals include at least one MPA cluster that meets the preferred size guidelines at moderate-high protection, with both SA1 and RU1 including two and both SA2 and RU2 including one preferred size range MPA cluster.
- The size distribution of MPA clusters at undetermined protection (includes MPAs at undetermined protection plus those at moderate-high and above) is only slightly different from that at moderate-high. RU1 adds one MPA cluster that is below minimum size and SA2 adds two MPA clusters that meet the size guidelines at undetermined protection.
- Ranking of arrays for median cluster size at moderate-high protection:
  - SA1 > SA2 > [RU1, RU2]

MPA Spacing

MPA spacing guidelines were developed to provide for the dispersal of larvae for a range of important bottom-dwelling fish and invertebrate groups between MPAs and to promote connectivity in the network. Further details on these methods are available in Chapter 7: MPA Spacing of the SAT Evaluation Methods Document. To facilitate dispersal and connectivity, spacing guidelines along the mainland recommend that habitats be replicated in MPAs placed at a maximum of 31-62 statute miles from each other. Since marine populations are generally habitat specific, the spacing evaluation is conducted for each habitat. To be included in the spacing analysis, habitat must be protected in sufficient quantity to count as a replicate, which encompasses the amount of habitat needed to include 90% of the associated species (see habitat replication, above). MPAs or MPA clusters also must meet the minimum size guidelines (9 square statute miles) to count as a replicate in the spacing analysis.

Spacing analyses include 1) the maximum distance (gap) between MPA clusters that include a replicate of each habitat (figures 5.1-5.2) and 2) the number of spacing gaps that exceed SAT spacing guidelines (> 62 square statute miles) for a given habitat (Figure 5.3 a-d). Both analyses are conducted for MPAs at very high, moderate-high, and undetermined protection.

Maximum Distance (gap)

Figure 5.1 displays the results of the MPA spacing analysis for all open coast habitats. Figure 5.2 displays the results of the MPA spacing analysis for all estuarine habitats. The height of each bar indicates the maximum distance between adjacent habitat replicates in a given proposal. These maximum distances, or gaps, for each habitat may be compared to the spacing guidelines, a maximum of 31 to 62 miles between MPAs, which is indicated by the horizontal dashed red lines on the figure. Habitats marked with an asterisk in the legend are distributed such that it is not possible for the spacing guidelines to be met. For all habitats, spacing in excess of the guideline or minimum possible is reflected with hatch marks across the bars. Note that the spacing results for the beach habitat changed based on a recent amendment to Stewarts Point SMR in the NCCSR approved by the California Fish and Game Commission on June 24, 2010. Changes to the Stewarts Point MPA reduced the amount of beach habitat included at very high protection to below the minimum threshold to count as a replicate. The nearest MPA containing a replicate of beach habitat in the NCCSR is Bodega Head SMR located approximately 58 miles south of the NCCSR northern boundary. The nearest MPA containing a replicate for soft 0-30m habitat is the Point Reyes SMR located approximately 90 miles south of the NCCSR northern boundary.

Gaps that Exceed the Spacing Guidelines

Table 5.3a-d provides the number of spacing gaps that exceed spacing guidelines between adjacent MPA clusters for a given habitat. The location and distance of each gap also is identified for each habitat. The intent of this analysis is to provide detailed information about spacing gaps by habitat for each proposal, in order to identify specific MPA proposal designs that result in large spacing gaps that could compromise the network function of the proposed MPAs.

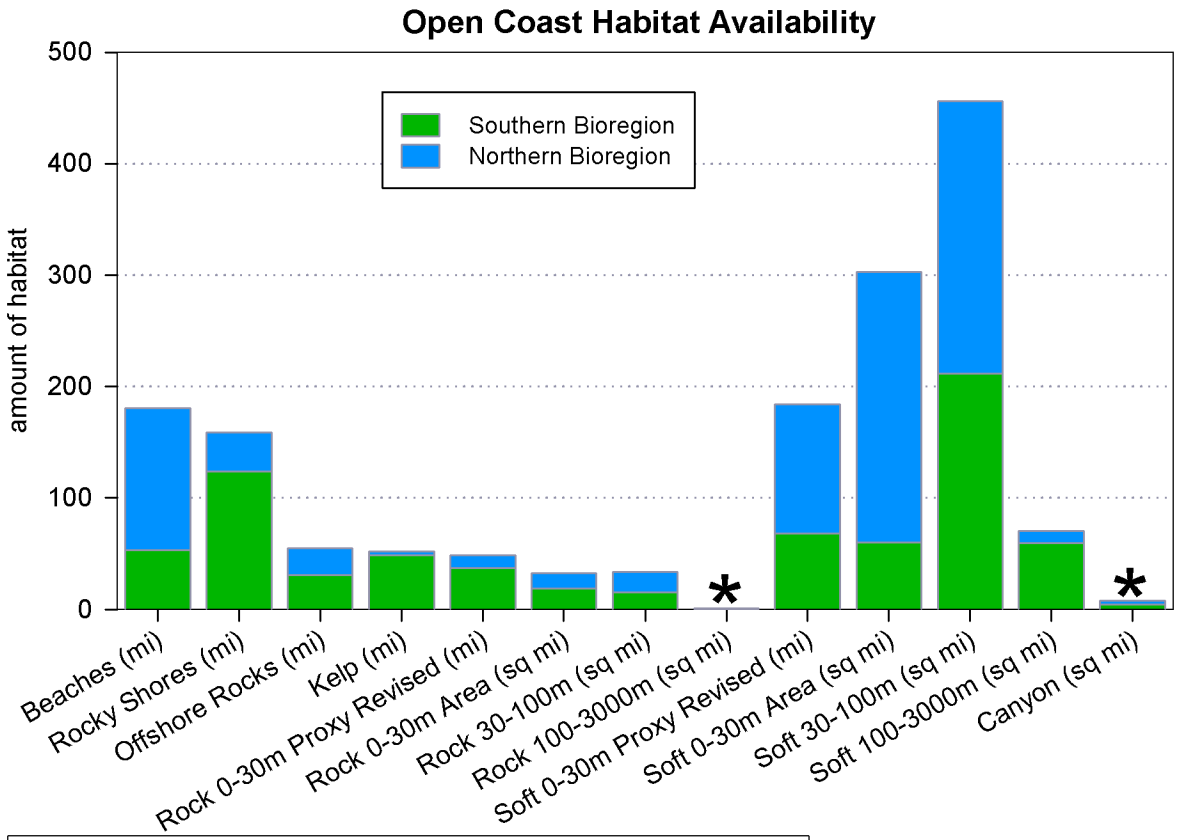
Key Points from the Spacing Analyses (Figures 5.1 and 5.2, Table 5.3a-d):

- Spacing guidelines cannot be met for three open coast habitats: Kelp (115 mi minimum gap), rock 100-3000m (110 mi minimum gap), and soft bottom 100-3000m (95 mi minimum gap).
- None of the round 2 draft MPA proposals meet the minimum spacing guidelines for any habitat at very high protection. Furthermore, gaps in round 2 draft MPA proposals increased for nearly all habitats as compared to round 1 external proposed MPA arrays.
- None of the proposals meet the minimum spacing guidelines for any habitats at moderate-high protection, however:
  - RU1 is close to meeting the minimum spacing guideline for rock 30-100m and soft 30-100m.
  - SA1 and SA2 are close to meeting the minimum spacing guideline for rock 30-100m, soft 0-30m, and soft 30-100m.
  - All proposals approach the minimum possible spacing for rock 100-3000m at or above moderate-high protection.

- Habitat spacing at undetermined protection as compared to moderate-high protection is largely unchanged, except for a minor gap reduction in RU1 for soft 0-30m.
- Spacing guidelines cannot be met for three estuarine habitats: Mapped eelgrass (occurs only in Humboldt Bay), coastal marsh (unevenly distributed), and eelgrass locations (unevenly distributed).
- None of the proposals meet the minimum spacing guidelines for any estuarine habitats, and large to maximum spacing gaps exist for all proposals and all habitats at or above moderate-high protection. Spacing gaps are substantially reduced, but still do not meet the guidelines, when MPAs with undetermined protection are included in the analyses, except for coastal marsh in RU2 and SA2.
- Ranking of arrays based on average gap in excess of the guideline or minimum possible spacing:
  - [RU1, SA1] < SA2 < RU2

Figure 1.1: North Coast Study Region Habitat Availability

a)



* 0.8 sq mi of Rock 100-300m habitat available in the study region.
* 7.5 sq mi of Canyon habitat available in the study region.

b)

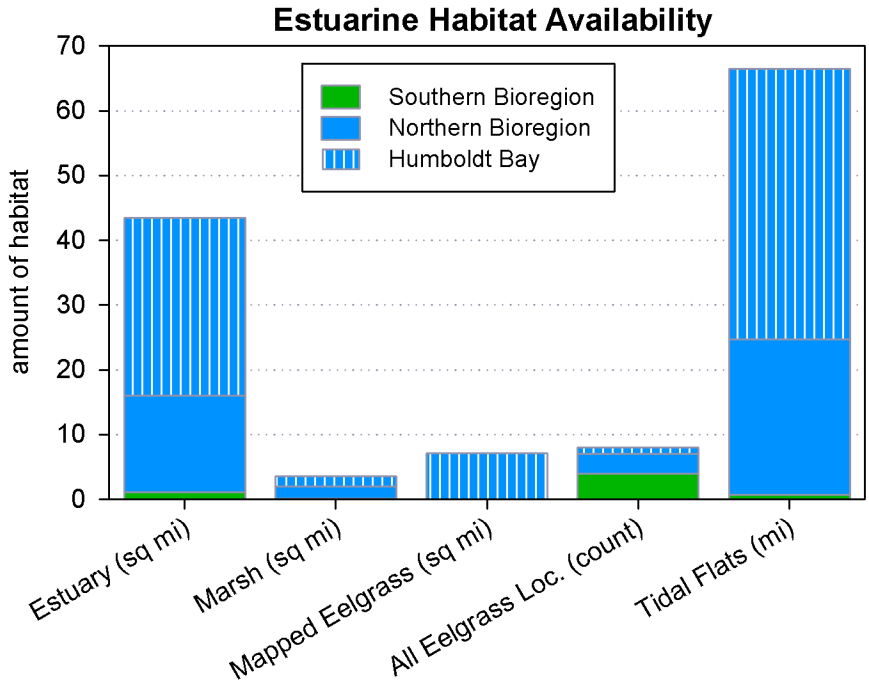
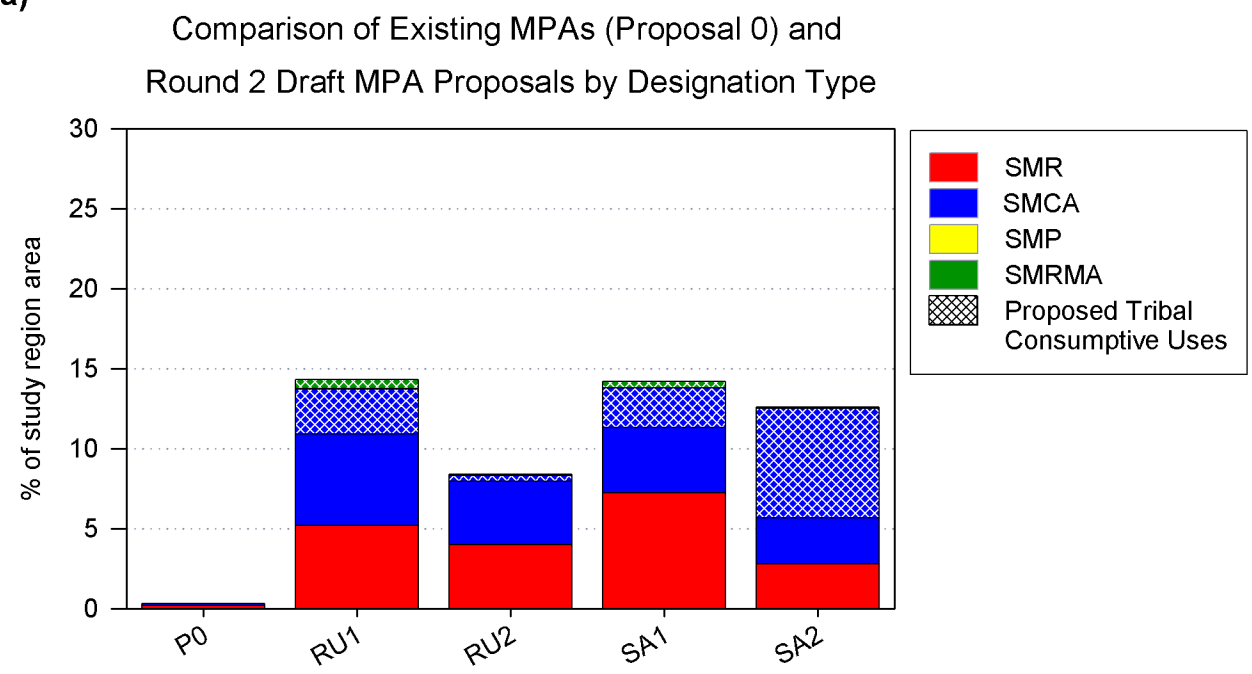
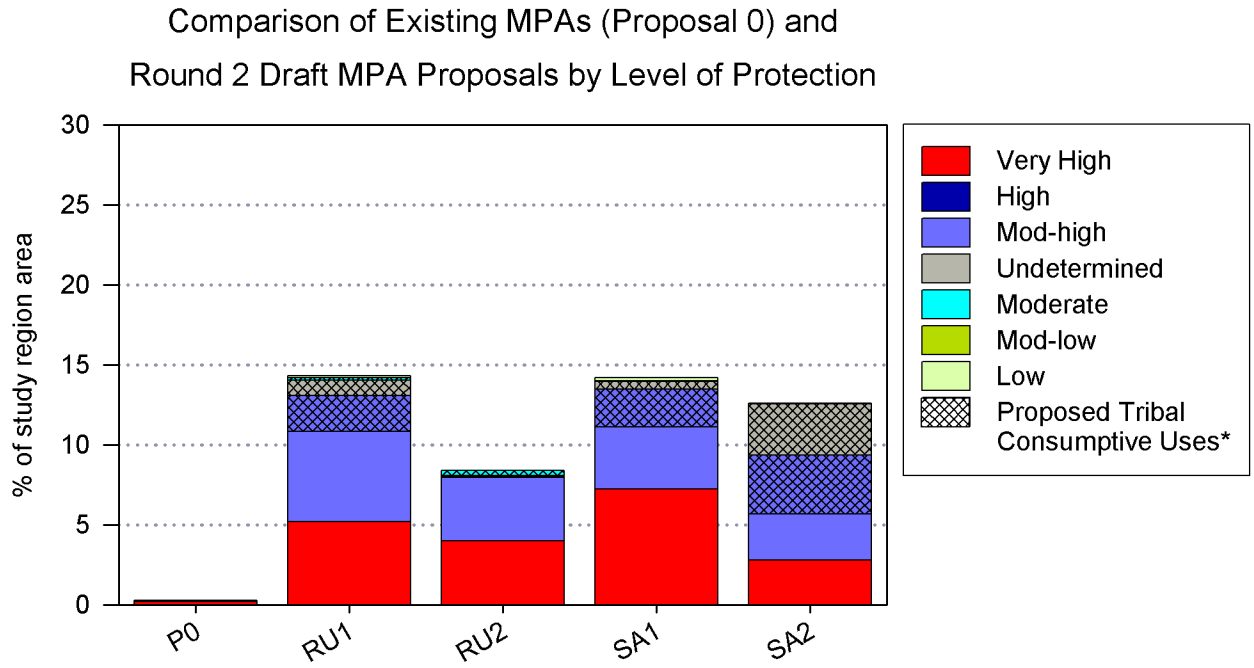


Figure 1.2: Summary of MPA Designations and Levels of Protection for Existing MPAs (P0) and All Round Two Draft MPA Proposals

a)

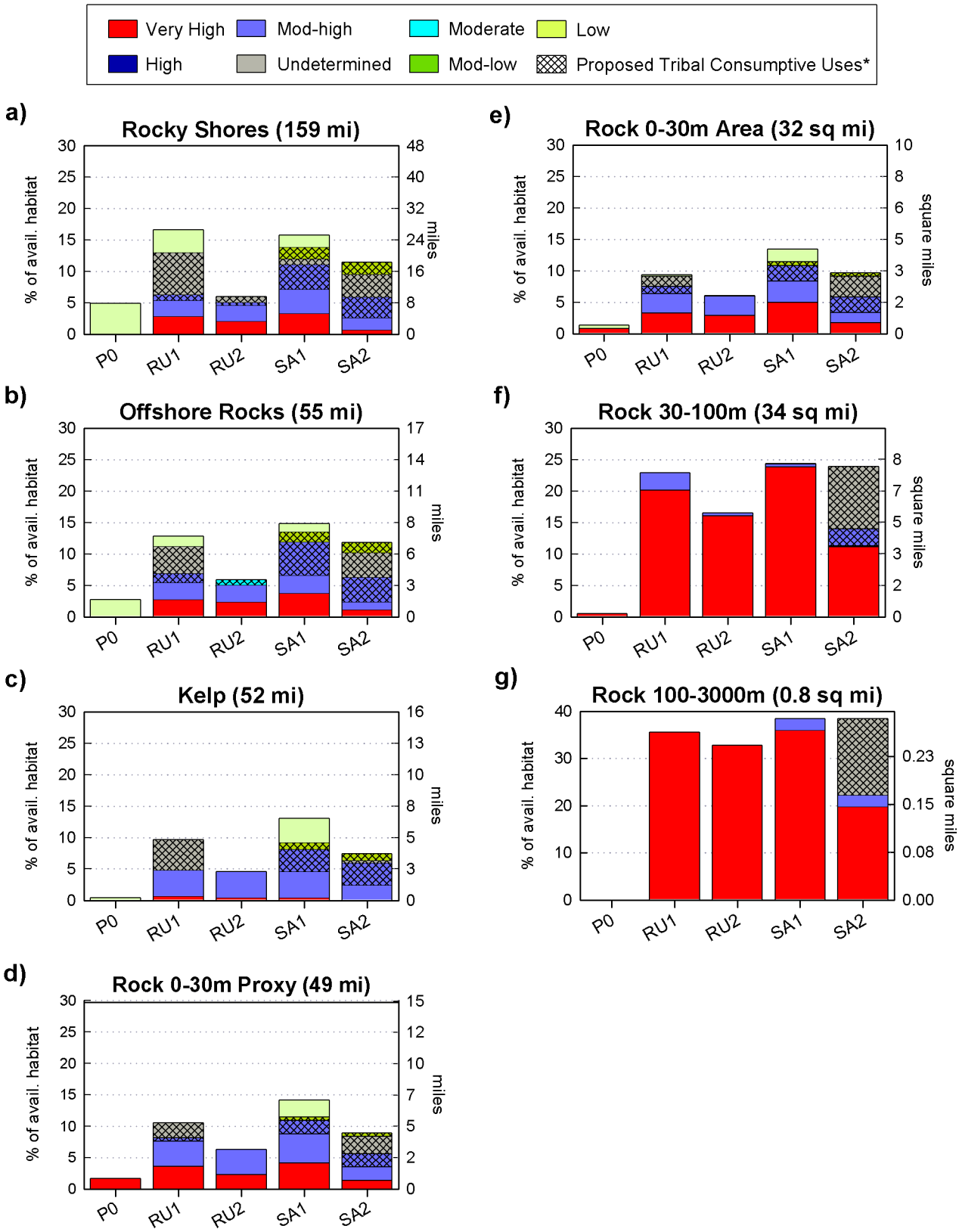


b)



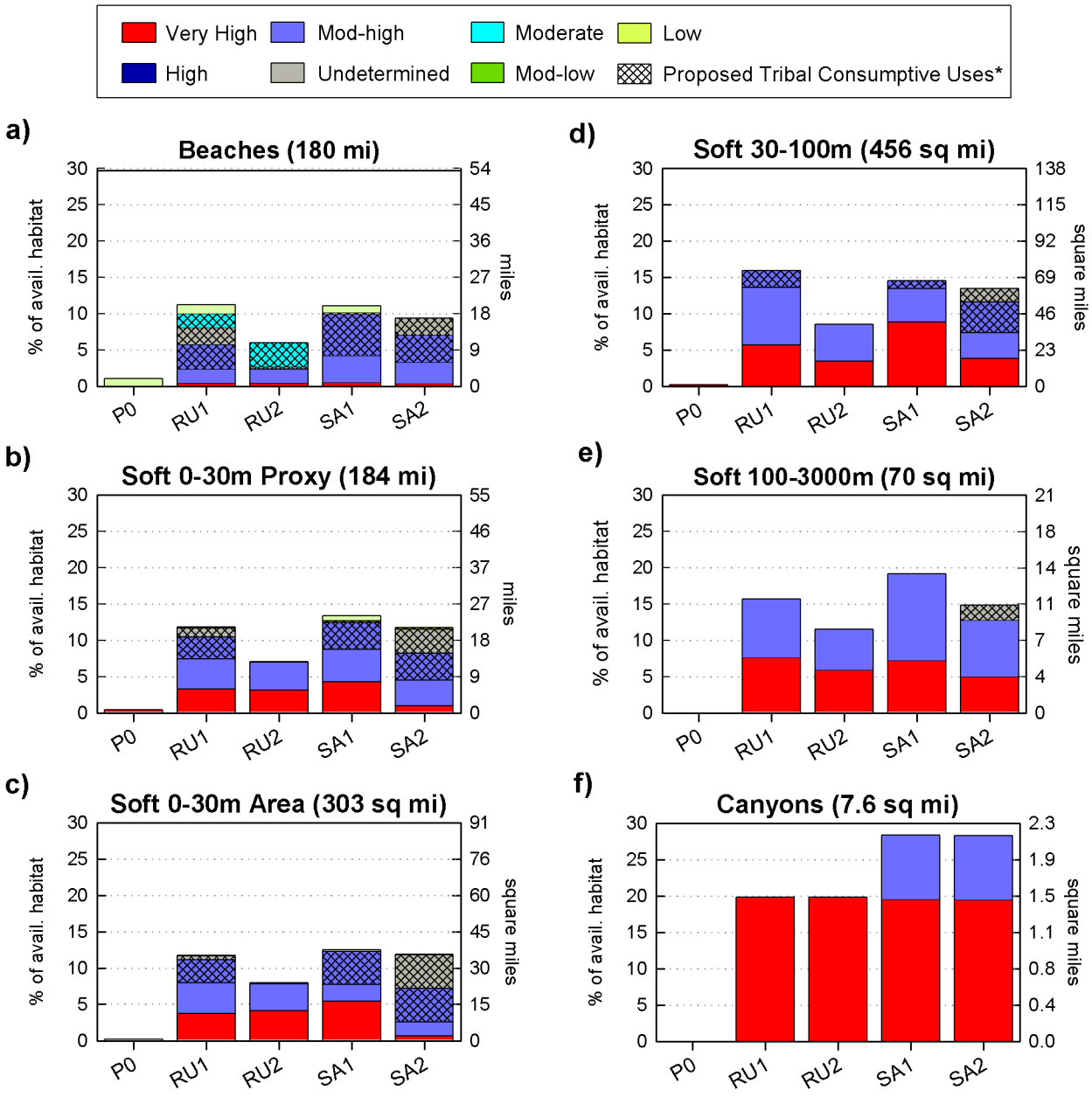
* In round two, MPAs that proposed to allow only tribal consumptive uses were assigned an "undetermined" level of protection. All other MPAs, including MPAs that proposed undefined tribal consumptive uses *and* other uses, were assigned levels of protection based on defined uses.

Figure 2.1: Rocky Habitat Representation for Existing MPAs (P0) and All Round Two Draft MPA Proposals



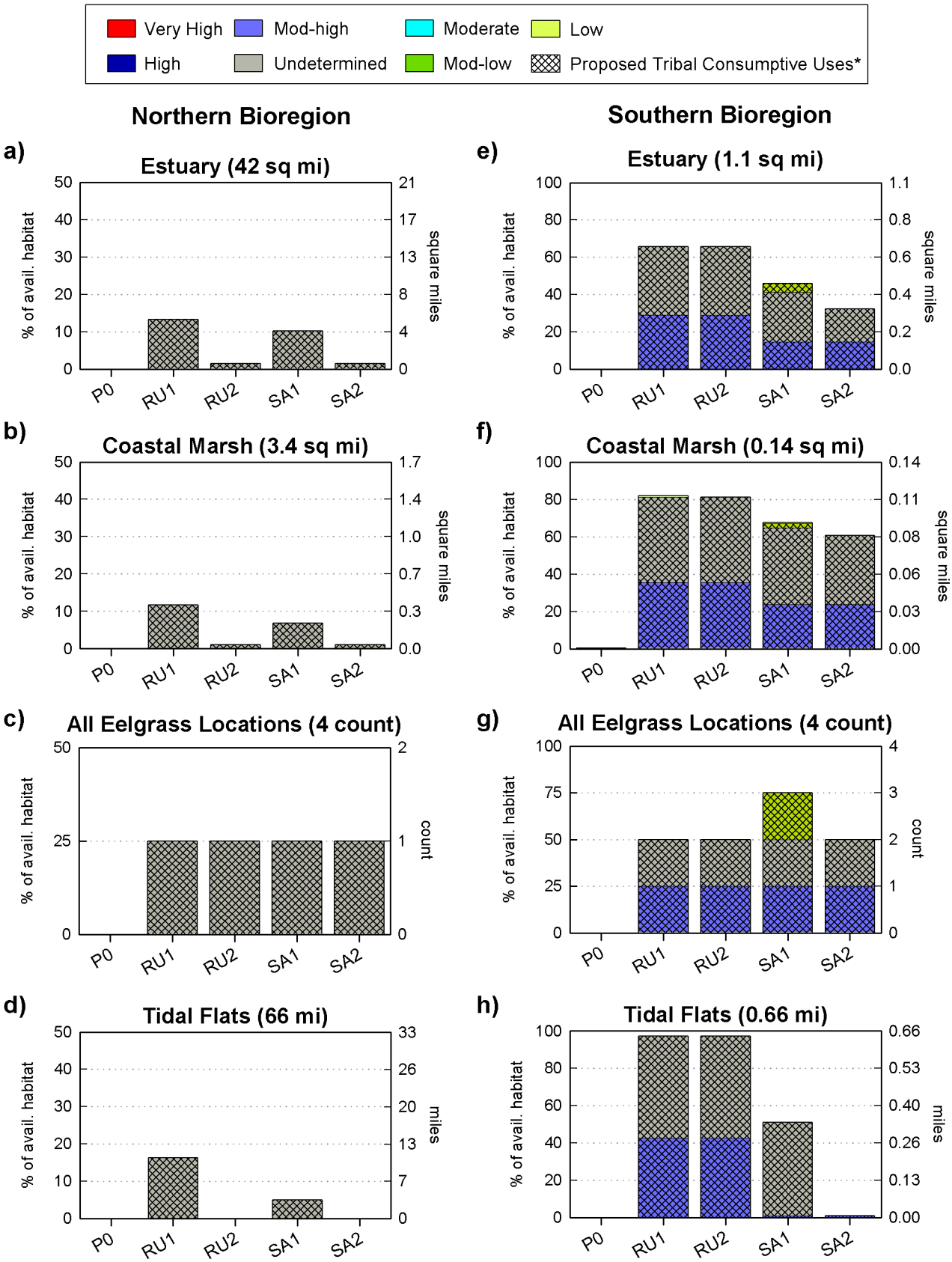
* In round two, MPAs that proposed to allow only tribal consumptive uses were assigned an "undetermined" level of protection. All other MPAs, including MPAs that proposed undefined tribal consumptive uses *and* other uses, were assigned levels of protection based on defined uses.

Figure 2.2: Soft Bottom Habitat Representation for Existing MPAs (P0) and All Round Two Draft MPA Proposals



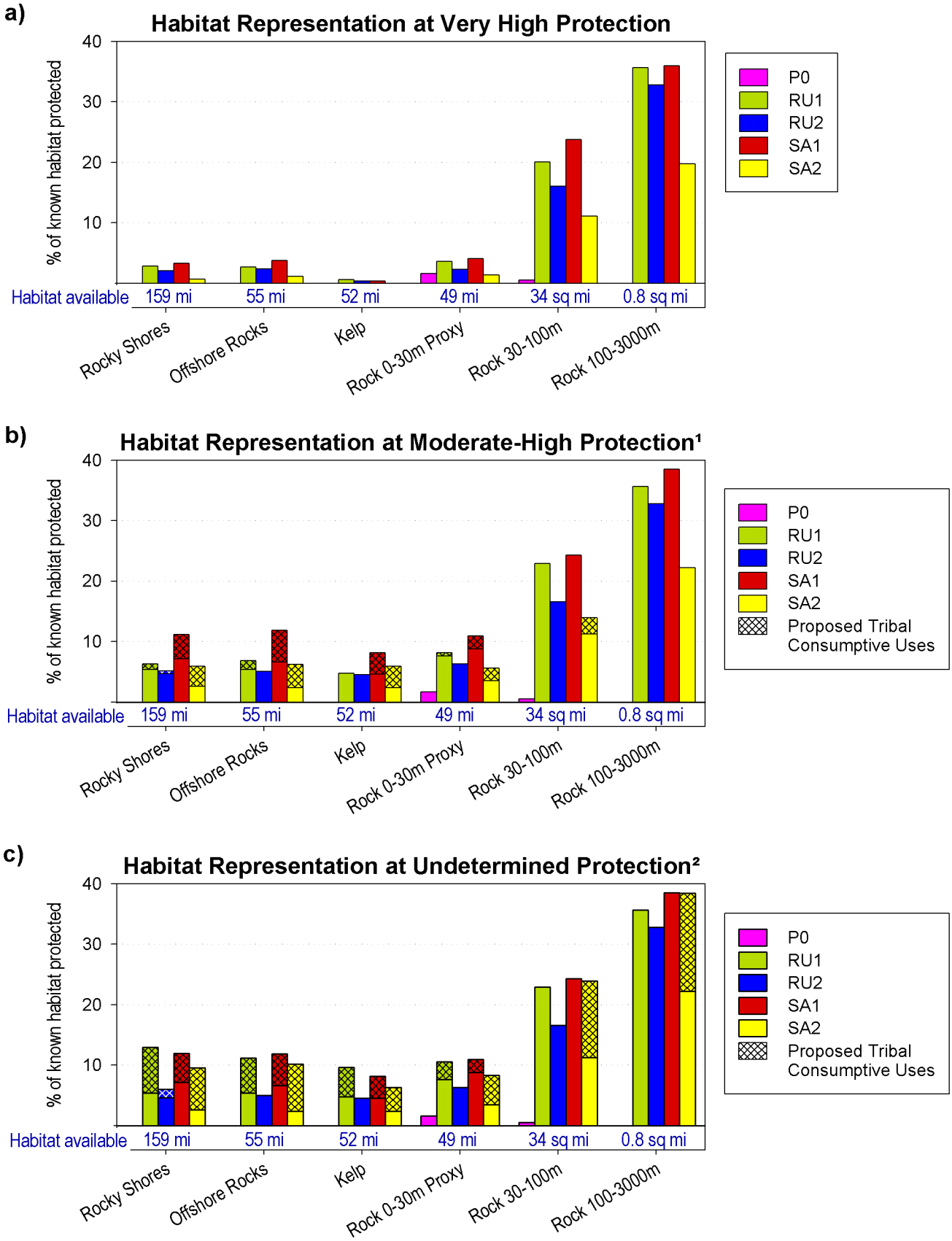
* In round two, MPAs that proposed to allow only tribal consumptive uses were assigned an "undetermined" level of protection. All other MPAs, including MPAs that proposed undefined tribal consumptive uses *and* other uses, were assigned levels of protection based on defined uses.

Figure 2.3: Estuarine Habitat Representation by Bioregion for Existing MPAs (P0) and All Round Two Draft MPA Proposals



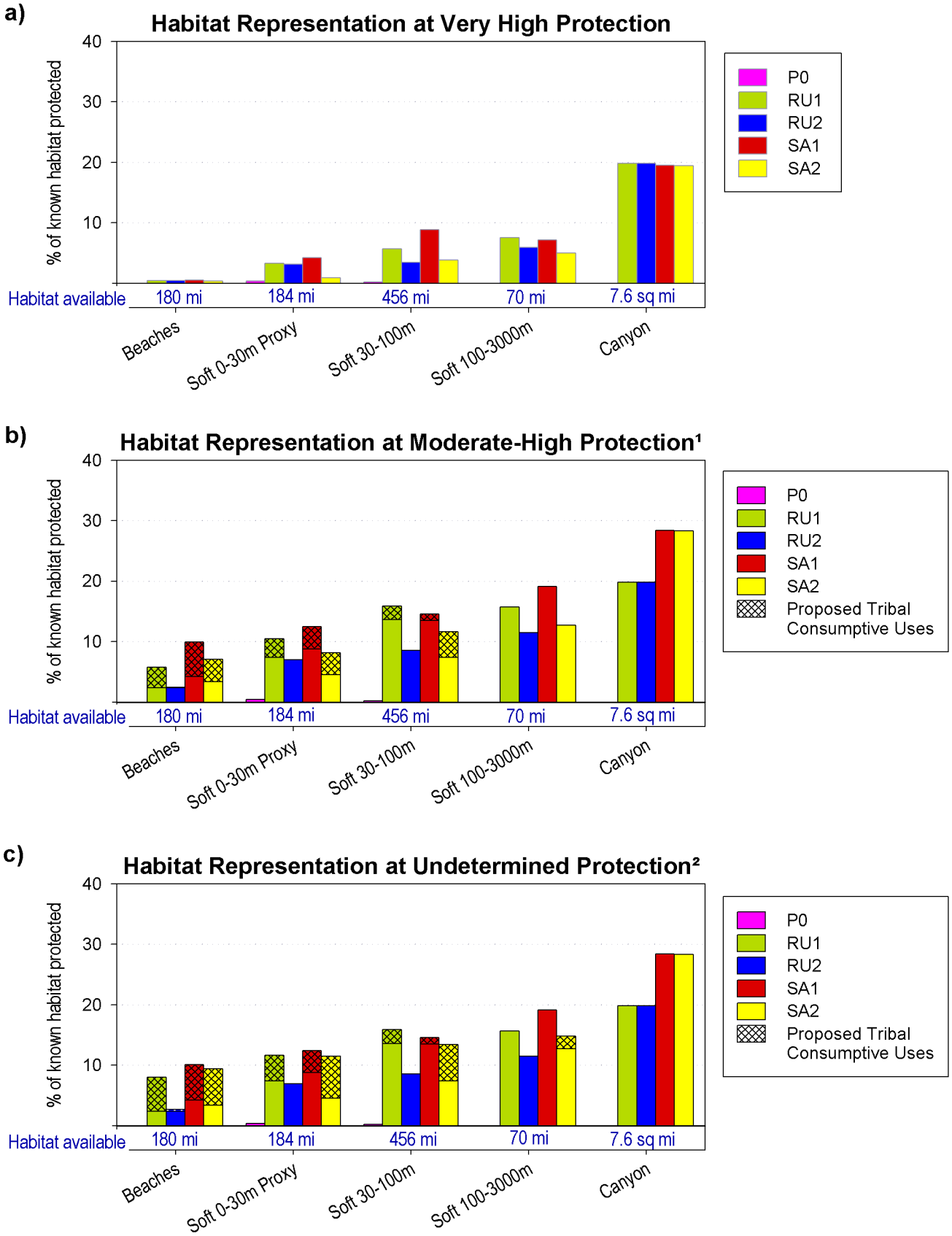
* In round two, MPAs that proposed to allow only tribal consumptive uses were assigned an "undetermined" level of protection. All other MPAs, including MPAs that proposed undefined tribal consumptive uses *and* other uses, were assigned levels of protection based on defined uses.

Figure 2.4: Rocky Habitat Representation Overview for Existing MPAs (P0) and All Round Two Draft MPA Proposals



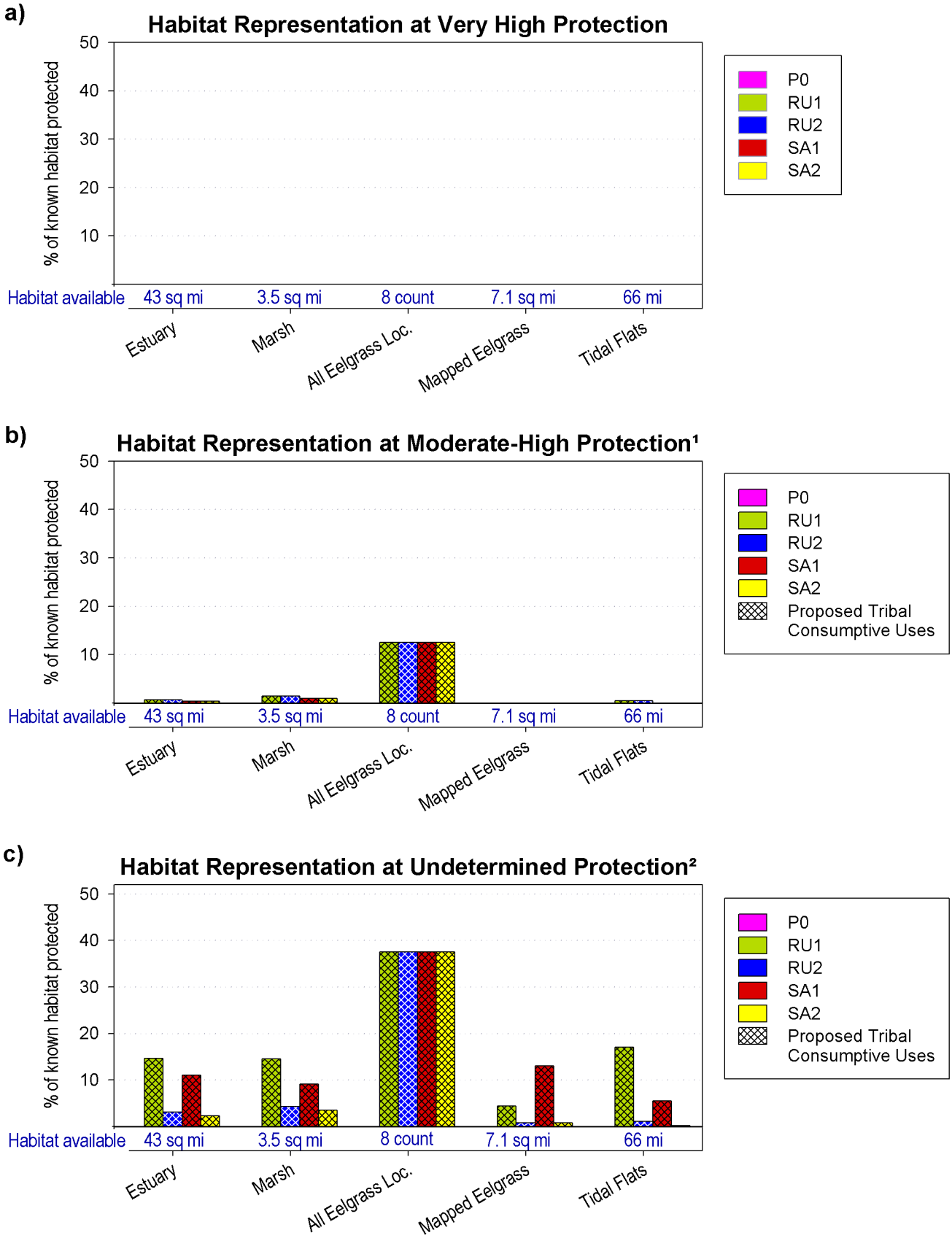
¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Figure 2.5: Soft Bottom Habitat Representation Overview for Existing MPAs (P0) and All Round Two Draft MPA Proposals



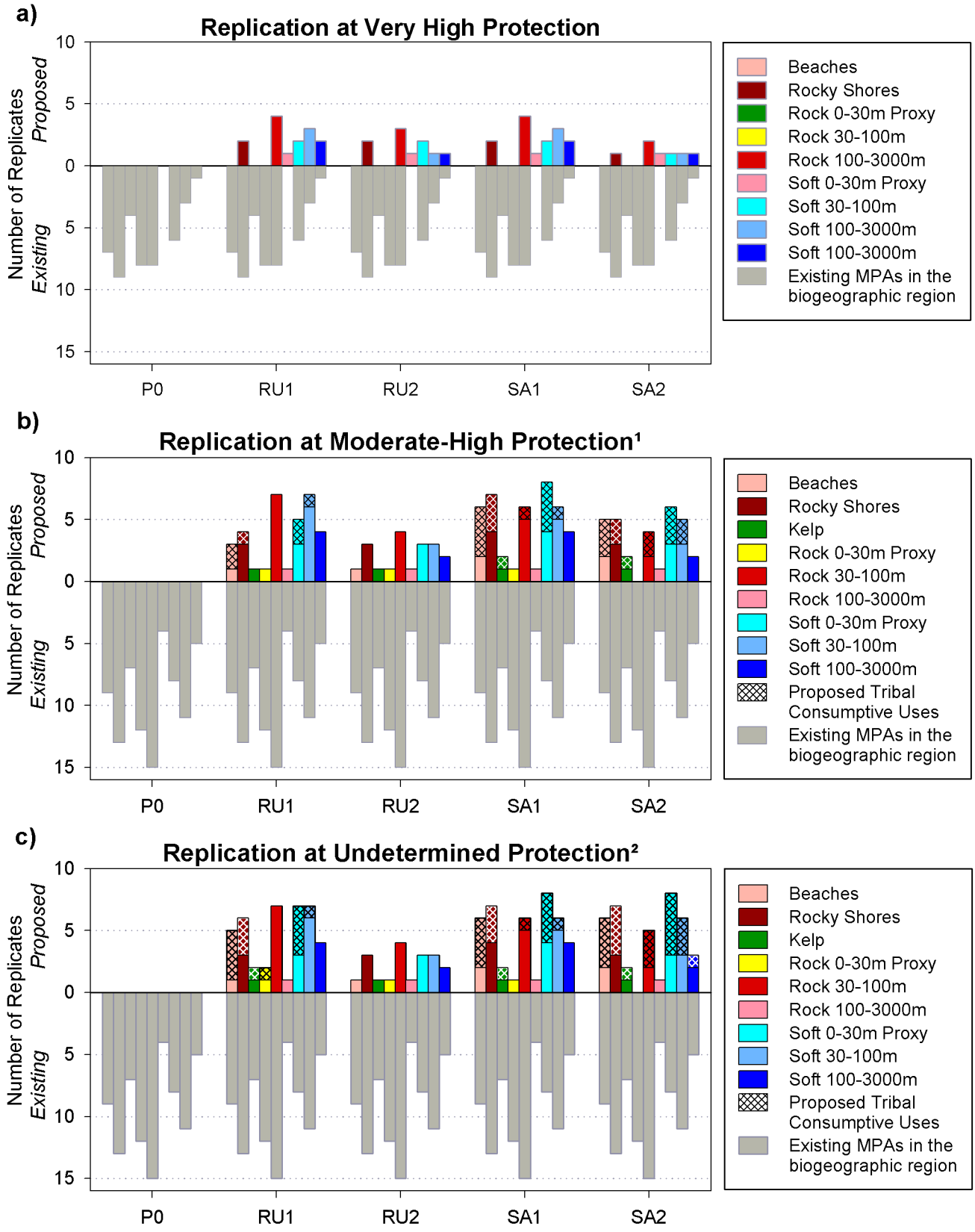
¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Figure 2.6: Estuarine Habitat Representation Overview for Existing MPAs (P0) and All Round Two Draft MPA Proposals



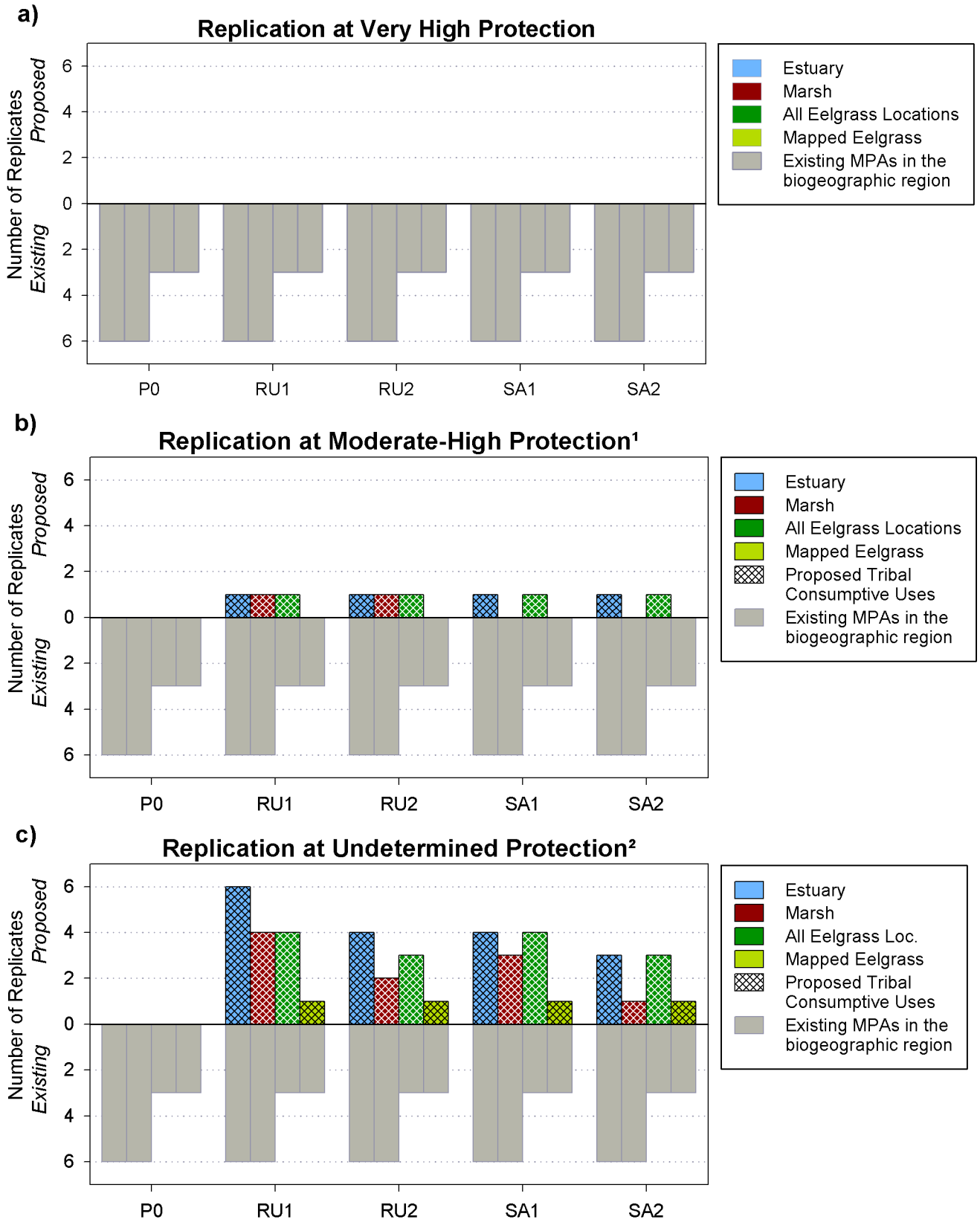
¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Figure 3.1: Open Coast Habitat Replication for Existing MPAs (P0) and All Round Two Draft MPA Proposals



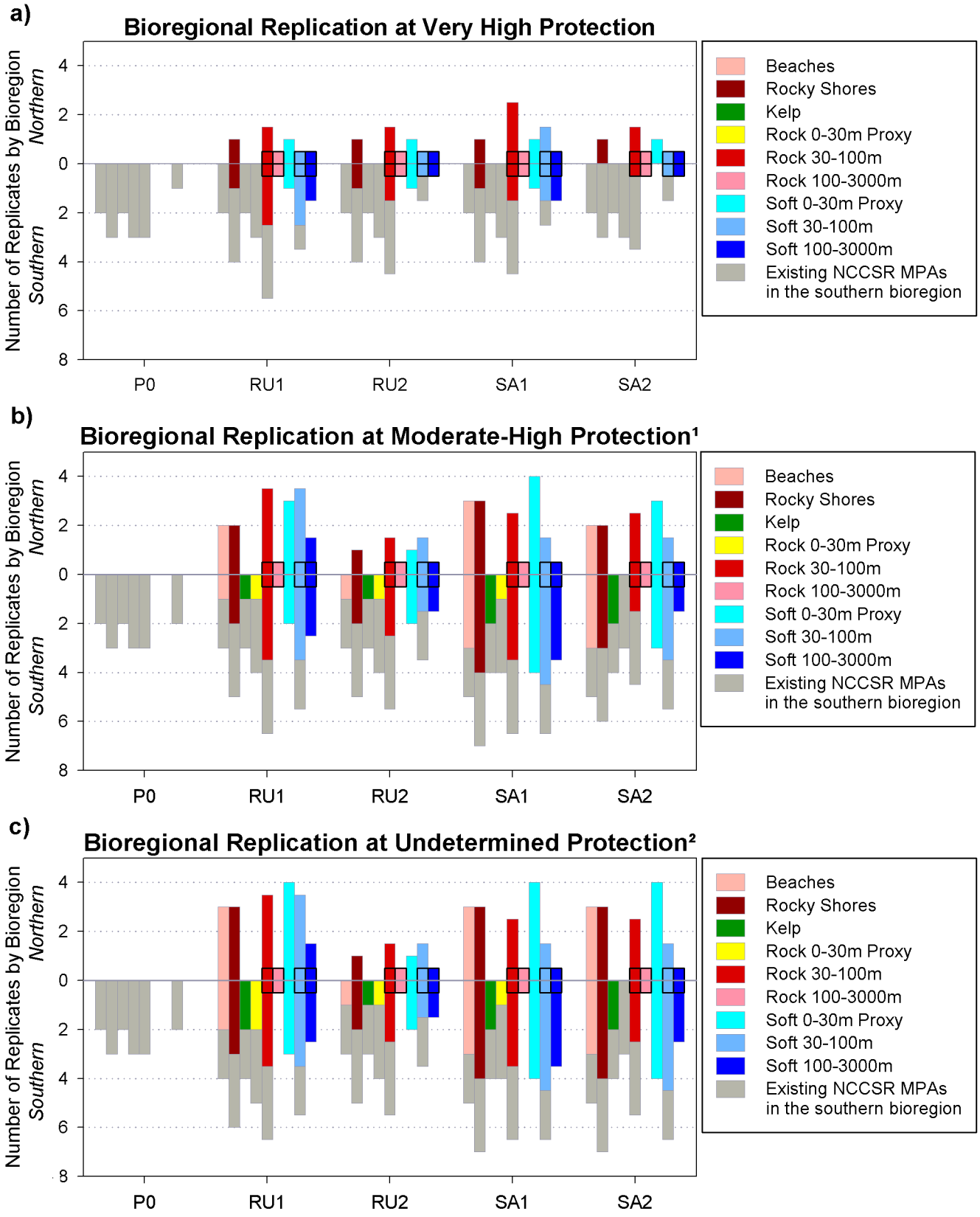
¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Figure 3.2: Estuarine Habitat Replication for Existing MPAs (P0) and All Round Two Draft MPA Proposals



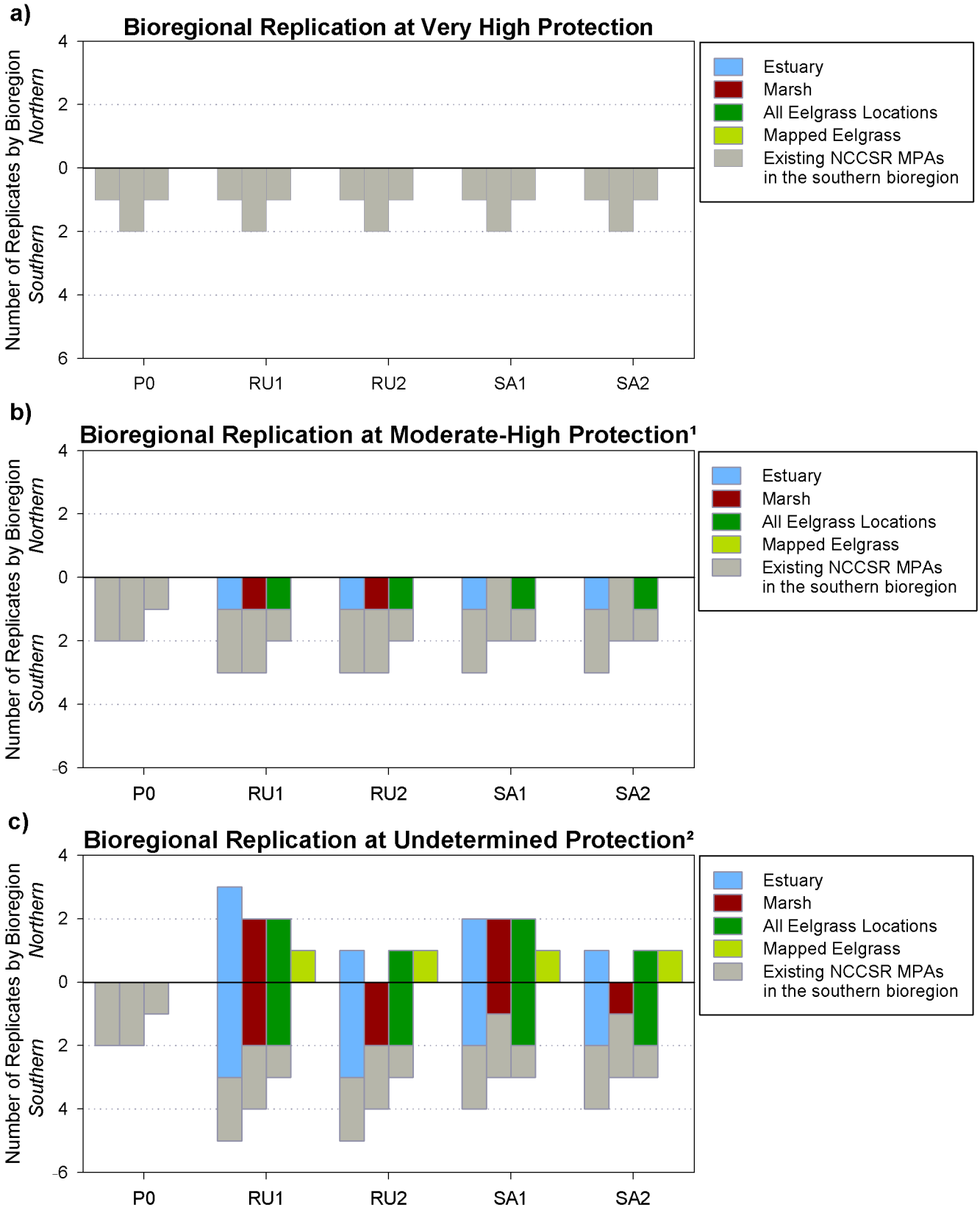
¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Figure 3.3: Open Coast Habitat Replication by Bioregion for Existing MPAs (P0) and All Round Two Draft MPA Proposals



¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

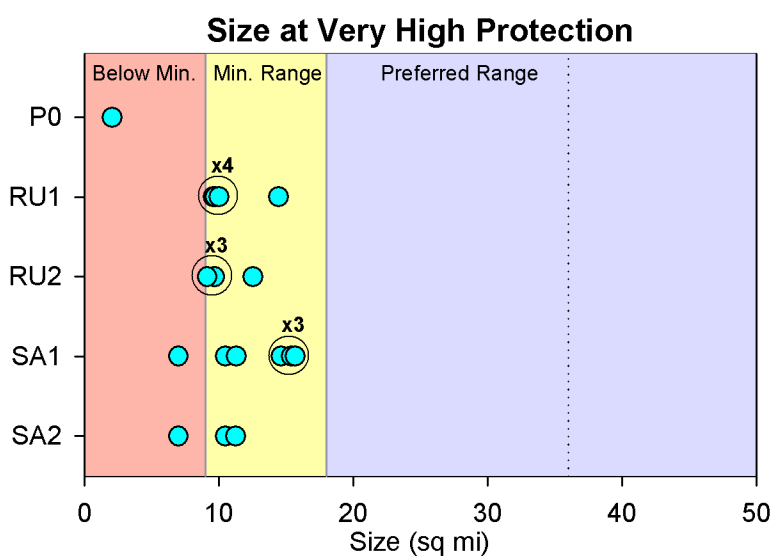
Figure 3.4: Estuarine Habitat Replication by Bioregion for Existing MPAs (P0) and All Round Two Draft MPA Proposals



¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

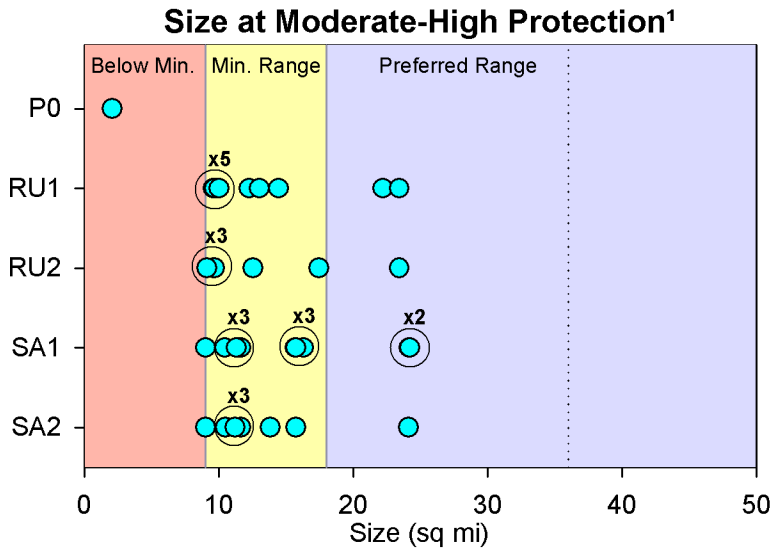
Figure 4.1: MPA Cluster Size for Existing MPAs (P0) and All Round Two Draft MPA Proposals

a)



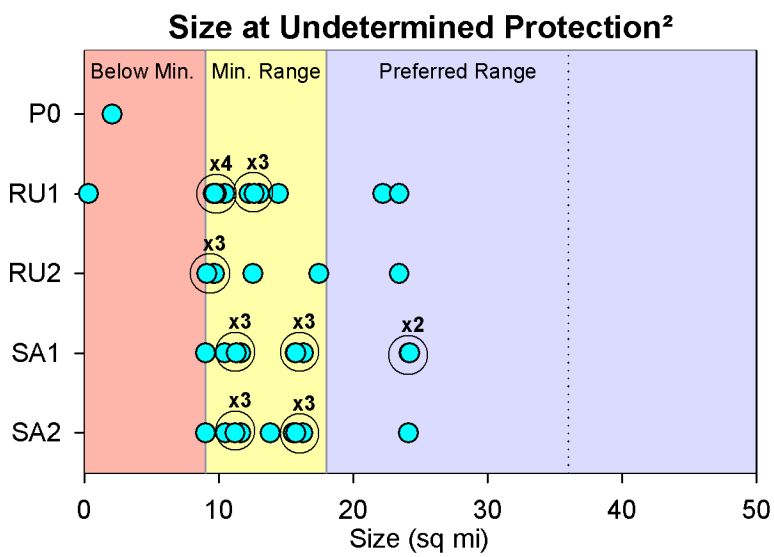
Number of MPA Clusters at Very High Protection				
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
P0	1	0	0	1
RU1	0	5	0	5
RU2	0	4	0	4
SA1	1	5	0	6
SA2	1	2	0	3

b)



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
RU1	0	8	2	10
RU2	0	5	1	6
SA1	0	7	2	9
SA2	0	6	1	7

c)



Number of MPA Clusters at Undetermined Protection				
Proposal	Below Min. Size	Min. Size Range	Pref. Size Range	Total # Clusters
P0	1	0	0	1
RU1	1	8	2	11
RU2	0	5	1	6
SA1	0	7	2	9
SA2	0	8	1	9

¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Table 4.2: MPA Cluster size for Existing MPAs (P0) and All Round Two Draft MPA Proposals

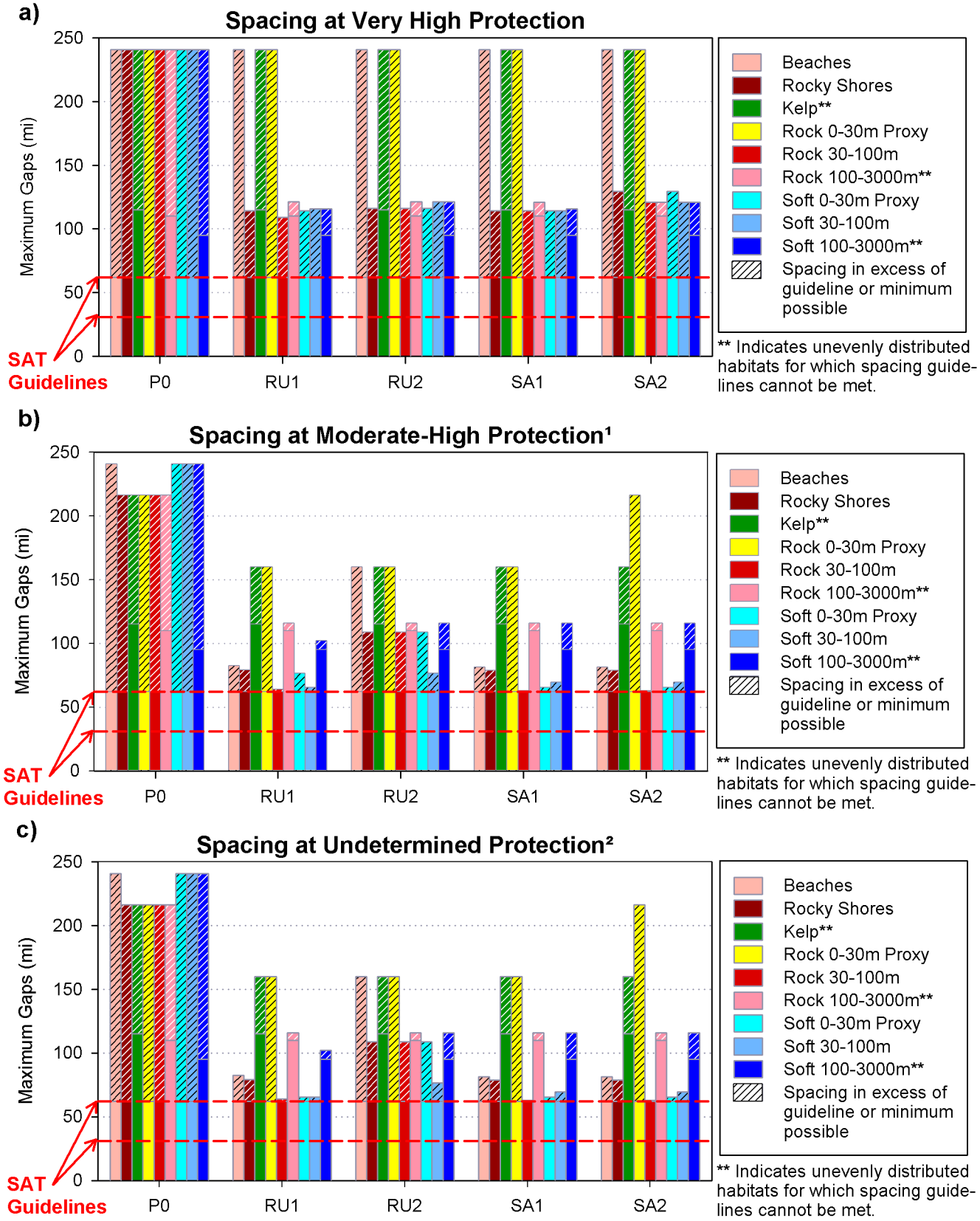
Very High Protection	Proposal				
	Proposal 0	Ruby 1	Ruby 2	Sapphire 1	Sapphire 2
Cluster size in square miles from smallest to largest excluding estuarine MPAs.	2.1	9.6	9.1	7.0	7.0
		9.6	9.6	10.5	10.5
		9.7	9.7	11.3	11.2
		10.0	12.5	14.6	
		14.4		15.4	
				15.7	

Moderate-High Protection[1]	Proposal				
	Proposal 0	Ruby 1	Ruby 2	Sapphire 1	Sapphire 2
Cluster size in square miles from smallest to largest excluding estuarine MPAs.	2.1	9.6	9.1	9.1	9.0
		9.6	9.6	10.5	10.5
		9.7	9.7	11.3	11.2
		9.8	12.5	11.7	11.7
		10.0	17.5	15.7	13.8
		12.3	23.4	15.8	15.8
		13.0		16.3	24.1
		14.4		24.2	
		22.2		24.2	
		23.4			

Undetermined Protection[2]	Proposal				
	Proposal 0	Ruby 1	Ruby 2	Sapphire 1	Sapphire 2
Cluster size in square miles from smallest to largest excluding estuarine MPAs.	2.1	0.3	9.1	9.1	9.0
		9.6	9.6	10.5	10.5
		9.7	9.7	11.3	11.2
		9.8	12.5	11.7	11.7
		10.5	17.5	15.7	13.8
		12.3	23.4	15.8	15.6
		12.6		16.3	15.8
		13.0		24.2	16.3
		14.4		24.2	24.1
		22.2			
		23.4			

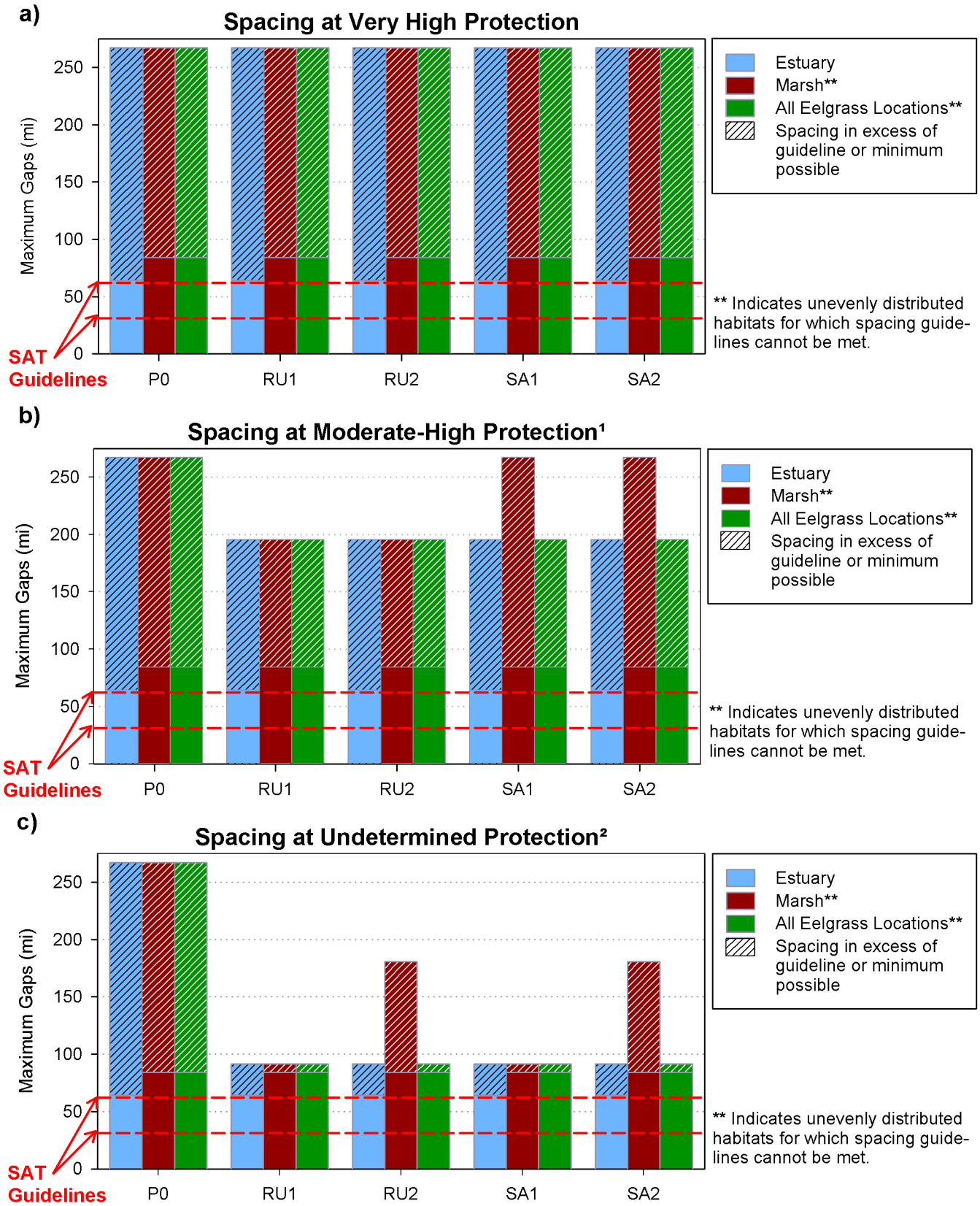
[1] Evaluations at high protection are not shown here because no high protection MPAs were proposed.
[2] Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Figure 5.1: Habitat Spacing for Existing MPAs (P0) and All Round Two Draft MPA Proposals



¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Figure 5.2: Estuarine Habitat Spacing for Existing MPAs (P0) and All Round Two Draft MPA Proposals



¹ Evaluations at high protection are not shown here because no high protection MPAs were proposed.
² Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Table 5.3a: Gaps that exceed the SAT spacing guidelines and their locations for Ruby Draft MPA Proposal 1

Ruby 1		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	241	Oregon Border to Stewarts Point Cluster				
Rocky Shores	2	114	Petrolia Lighthouse SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Kelp	1	241	Oregon Border to Stewarts Point Cluster				
Rock 0-30m Proxy	1	241	Oregon Border to Stewarts Point Cluster				
Rock 30-100m	2	109	Oregon Border to South Cape Mendocino SMR	65	Ten Mile Cluster to Stewarts Point Cluster		
Rock 100-3000m	2	121	Mattole Canyon SMR to Stewarts Point Cluster	116	Oregon Border to Mattole Canyon SMR		
Soft 0-30m Proxy	2	114	Petrolia Lighthouse SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Soft 30-100m	2	116	Oregon Border to Mattole Canyon SMR	65	Ten Mile Cluster to Stewarts Point Cluster		
Soft 100-3000m	2	116	Oregon Border to Mattole Canyon SMR	114	Petrolia Lighthouse SMR to Stewarts Point Cluster		
Estuary	1	267	Chetco River, OR to Russian River SMRMA				
Marsh	1	267	Chetco River, OR to Russian River SMRMA				
All Eelgrass Loc.	1	267	Chetco River, OR to Russian River SMRMA				

Ruby 1		Moderate-High Protection[1]					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	83	Samoa SMCA to Vizcaino SMCA	76	Vizcaino SMCA to Stewarts Point Cluster		
Rocky Shores	1	79	False Klamath Cove SMCA to South Cape Mendocino SMR				
Kelp	1	160	Oregon Border to Vizcaino SMCA				
Rock 0-30m Proxy	1	160	Oregon Border to Vizcaino SMCA				
Rock 30-100m	1	64	Reading Rock Cluster to South Cape Mendocino SMR				
Rock 100-3000m	2	116	Oregon Border to Mattole Canyon SMR	97	Mattole Canyon SMR to Point Arena Cluster		
Soft 0-30m Proxy	1	76	Vizcaino SMCA to Stewarts Point Cluster				
Soft 30-100m	1	65	Ten Mile Cluster to Stewarts Point Cluster				
Soft 100-3000m	2	102	Point St. George Reef SMCA to Mattole Canyon SMR	76	Vizcaino SMCA to Stewarts Point Cluster		
Estuary	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		
Marsh	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		
All Eelgrass Loc.	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		

Ruby 1		Undetermined Protection[2]					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	83	Samoa SMCA to Vizcaino SMCA	65	Ten Mile Cluster to Stewarts Point Cluster		
Rocky Shores	1	79	False Klamath Cove SMCA to South Cape Mendocino SMR				
Kelp	1	160	Oregon Border to Vizcaino SMCA				
Rock 0-30m Proxy	1	160	Oregon Border to Vizcaino SMCA				
Rock 30-100m	1	64	Reading Rock Cluster to South Cape Mendocino SMR				
Rock 100-3000m	2	116	Oregon Border to Mattole Canyon SMR	97	Mattole Canyon SMR to Point Arena Cluster		
Soft 0-30m Proxy	1	65	Ten Mile Cluster to Stewarts Point Cluster				
Soft 30-100m	1	65	Ten Mile Cluster to Stewarts Point Cluster				
Soft 100-3000m	2	102	Point St. George Reef SMCA to Mattole Canyon SMR	76	Vizcaino SMCA to Stewarts Point Cluster		
Estuary	2	92	North Humboldt Bay SMRMA to Ten Mile Estuary SMCA	64	Navarro River Estuary SMCA to Russian River SMRMA		
Marsh	3	92	North Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to North Humboldt Bay SMRMA	72	Big River Estuary SMP to Russian River SMRMA
All Eelgrass Loc.	3	92	North Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to North Humboldt Bay SMRMA	72	Big River Estuary SMP to Russian River SMRMA

[1] Evaluations at high protection are not shown here because no high protection MPAs were proposed.
[2] Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Table 5.3b: Gaps that exceed the SAT spacing guidelines and their locations for Ruby Draft MPA Proposal 2

Ruby 2		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	241	Oregon Border to Stewarts Point Cluster				
Rocky Shores	2	116	Petrolia Lighthouse SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Kelp	1	241	Oregon Border to Stewarts Point Cluster				
Rock 0-30m Proxy	1	241	Oregon Border to Stewarts Point Cluster				
Rock 30-100m	2	116	Petrolia Lighthouse SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Rock 100-3000m	2	121	Mattole Canyon SMR to Stewarts Point Cluster	116	Oregon Border to Mattole Canyon SMR		
Soft 0-30m Proxy	2	116	Petrolia Lighthouse SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Soft 30-100m	2	121	Mattole Canyon SMR to Stewarts Point Cluster	116	Oregon Border to Mattole Canyon SMR		
Soft 100-3000m	2	121	Mattole Canyon SMR to Stewarts Point Cluster	116	Oregon Border to Mattole Canyon SMR		
Estuary	1	267	Chetco River, OR to Russian River SMRMA				
Marsh	1	267	Chetco River, OR to Russian River SMRMA				
All Eelgrass Loc.	1	267	Chetco River, OR to Russian River SMRMA				

Ruby 2		Moderate-High Protection[1]					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	160	Oregon Border to Vizcaino SMCA	76	Vizcaino SMCA to Stewarts Point Cluster		
Rocky Shores	1	109	Oregon Border to South Cape Mendocino SMR				
Kelp	1	160	Oregon Border to Vizcaino SMCA				
Rock 0-30m Proxy	1	160	Oregon Border to Vizcaino SMCA				
Rock 30-100m	1	109	Oregon Border to South Cape Mendocino SMR				
Rock 100-3000m	2	116	Oregon Border to Mattole Canyon SMR	97	Mattole Canyon SMR to Point Arena Cluster		
Soft 0-30m Proxy	2	109	Oregon Border to South Cape Mendocino SMR	76	Vizcaino SMCA to Stewarts Point Cluster		
Soft 30-100m	2	76	Vizcaino SMCA to Stewarts Point Cluster	71	Reading Rock Cluster to Mattole Canyon SMR		
Soft 100-3000m	2	116	Oregon Border to Mattole Canyon SMR	76	Vizcaino SMCA to Stewarts Point Cluster		
Estuary	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		
Marsh	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		
All Eelgrass Loc.	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		

Ruby 2		Undetermined Protection[2]					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	160	Oregon Border to Vizcaino SMCA	76	Vizcaino SMCA to Stewarts Point Cluster		
Rocky Shores	1	109	Oregon Border to South Cape Mendocino SMR				
Kelp	1	160	Oregon Border to Vizcaino SMCA				
Rock 0-30m Proxy	1	160	Oregon Border to Vizcaino SMCA				
Rock 30-100m	1	109	Oregon Border to South Cape Mendocino SMR				
Rock 100-3000m	2	116	Oregon Border to Mattole Canyon SMR	97	Mattole Canyon SMR to Point Arena Cluster		
Soft 0-30m Proxy	2	109	Oregon Border to South Cape Mendocino SMR	76	Vizcaino SMCA to Stewarts Point Cluster		
Soft 30-100m	2	76	Vizcaino SMCA to Stewarts Point Cluster	71	Reading Rock Cluster to Mattole Canyon SMR		
Soft 100-3000m	2	116	Oregon Border to Mattole Canyon SMR	76	Vizcaino SMCA to Stewarts Point Cluster		
Estuary	3	92	South Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to South Humboldt Bay SMRMA	64	Navarro River Estuary SMCA to Russian River SMRMA
Marsh	2	181	Chetco River, OR to Ten Mile Estuary SMCA	72	Big River Estuary SMP to Russian River SMRMA		
All Eelgrass Loc.	3	92	South Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to South Humboldt Bay SMRMA	72	Big River Estuary SMP to Russian River SMRMA

[1] Evaluations at high protection are not shown here because no high protection MPAs were proposed.
[2] Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Table 5.3c: Gaps that exceed the SAT spacing guidelines and their locations for Sapphire Draft MPA Proposal 1

Sapphire 1		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	241	Oregon Border to Stewarts Point Cluster				
Rocky Shores	2	114	Petrolia Lighthouse SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Kelp	1	241	Oregon Border to Stewarts Point Cluster				
Rock 0-30m Proxy	1	241	Oregon Border to Stewarts Point Cluster				
Rock 30-100m	2	114	Petrolia Lighthouse SMR to Stewarts Point Cluster	63	Reading Rock Cluster to South Cape Mendocino SMR		
Rock 100-3000m	2	121	Mattole Canyon Offshore SMR to Stewarts Point Cluster	116	Oregon Border to Mattole Canyon Offshore SMR		
Soft 0-30m Proxy	2	114	Petrolia Lighthouse SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Soft 30-100m	2	114	Petrolia Lighthouse SMR to Stewarts Point Cluster	70	Reading Rock Cluster to Mattole Canyon Offshore SMR		
Soft 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	114	Petrolia Lighthouse SMR to Stewarts Point Cluster		
Estuary	1	267	Chetco River, OR to Russian River SMRMA				
Marsh	1	267	Chetco River, OR to Russian River SMRMA				
All Eelgrass Loc.	1	267	Chetco River, OR to Russian River SMRMA				

Sapphire 1		Moderate-High Protection[1]					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	81	Reading Rock Cluster to Big Flat SMCA	65	Ten Mile Cluster to Stewarts Point Cluster		
Rocky Shores	1	79	Wilson Rock SMCA to South Cape Mendocino SMR				
Kelp	1	160	Oregon Border to Vizcaino SMCA				
Rock 0-30m Proxy	1	160	Oregon Border to Vizcaino SMCA				
Rock 30-100m	1	63	Reading Rock Cluster to South Cape Mendocino SMR				
Rock 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	97	Mattole Canyon Offshore SMR to Point Arena Cluster		
Soft 0-30m Proxy	2	65	Ten Mile Cluster to Stewarts Point Cluster	63	Reading Rock Cluster to South Cape Mendocino SMR		
Soft 30-100m	2	70	Reading Rock Cluster to Mattole Canyon Offshore SMR	65	Ten Mile Cluster to Stewarts Point Cluster		
Soft 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	76	Vizcaino SMCA to Stewarts Point Cluster		
Estuary	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		
Marsh	1	267	Chetco River, OR to Russian River SMRMA				
All Eelgrass Loc.	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		

Sapphire 1		Undetermined Protection[2]					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	81	Reading Rock Cluster to Big Flat SMCA	65	Ten Mile Cluster to Stewarts Point Cluster		
Rocky Shores	1	79	Wilson Rock SMCA to South Cape Mendocino SMR				
Kelp	1	160	Oregon Border to Vizcaino SMCA				
Rock 0-30m Proxy	1	160	Oregon Border to Vizcaino SMCA				
Rock 30-100m	1	63	Reading Rock Cluster to South Cape Mendocino SMR				
Rock 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	97	Mattole Canyon Offshore SMR to Point Arena Cluster		
Soft 0-30m Proxy	2	65	Ten Mile Cluster to Stewarts Point Cluster	63	Reading Rock Cluster to South Cape Mendocino SMR		
Soft 30-100m	2	70	Reading Rock Cluster to Mattole Canyon Offshore SMR	65	Ten Mile Cluster to Stewarts Point Cluster		
Soft 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	76	Vizcaino SMCA to Stewarts Point Cluster		
Estuary	3	92	North Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to North Humboldt Bay SMRMA	72	Big River Estuary SMP to Russian River SMRMA
Marsh	3	92	North Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to North Humboldt Bay SMRMA	89	Ten Mile Estuary SMCA to Russian River SMRMA
All Eelgrass Loc.	3	92	North Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to North Humboldt Bay SMRMA	72	Big River Estuary SMP to Russian River SMRMA

[1] Evaluations at high protection are not shown here because no high protection MPAs were proposed.
[2] Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.

Table 5.3d: Gaps that exceed the SAT spacing guidelines and their locations for Sapphire Draft MPA Proposal 2

Sapphire 2		Very High Protection					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	1	241	Oregon Border to Stewarts Point Cluster				
Rocky Shores	2	130	South Cape Mendocino SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Kelp	1	241	Oregon Border to Stewarts Point Cluster				
Rock 0-30m Proxy	1	241	Oregon Border to Stewarts Point Cluster				
Rock 30-100m	2	121	Mattole Canyon Offshore SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Rock 100-3000m	2	121	Mattole Canyon Offshore SMR to Stewarts Point Cluster	116	Oregon Border to Mattole Canyon Offshore SMR		
Soft 0-30m Proxy	2	130	South Cape Mendocino SMR to Stewarts Point Cluster	109	Oregon Border to South Cape Mendocino SMR		
Soft 30-100m	2	121	Mattole Canyon Offshore SMR to Stewarts Point Cluster	116	Oregon Border to Mattole Canyon Offshore SMR		
Soft 100-3000m	2	121	Mattole Canyon Offshore SMR to Stewarts Point Cluster	116	Oregon Border to Mattole Canyon Offshore SMR		
Estuary	1	267	Chetco River, OR to Russian River SMRMA				
Marsh	1	267	Chetco River, OR to Russian River SMRMA				
All Eelgrass Loc.	1	267	Chetco River, OR to Russian River SMRMA				

Sapphire 2		Moderate-High Protection[1]					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	81	Reading Rock SMCA to Big Flat SMCA	65	Ten Mile Cluster to Stewarts Point Cluster		
Rocky Shores	1	79	Wilson Rock SMCA to South Cape Mendocino SMR				
Kelp	1	160	Oregon Border to Vizcaino SMCA				
Rock 0-30m Proxy	1	216	Oregon Border to Point Arena Cluster				
Rock 30-100m	1	63	Reading Rock SMCA to South Cape Mendocino SMR				
Rock 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	97	Mattole Canyon Offshore SMR to Point Arena Cluster		
Soft 0-30m Proxy	2	65	Ten Mile Cluster to Stewarts Point Cluster	63	Reading Rock SMCA to South Cape Mendocino SMR		
Soft 30-100m	2	69	Reading Rock SMCA to Mattole Canyon Offshore SMR	65	Ten Mile Cluster to Stewarts Point Cluster		
Soft 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	107	Big Flat SMCA to Stewarts Point Cluster		
Estuary	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		
Marsh	1	267	Chetco River, OR to Russian River SMRMA				
All Eelgrass Loc.	2	196	Chetco River, OR to Big River Estuary SMP	72	Big River Estuary SMP to Russian River SMRMA		

Sapphire 2		Undetermined Protection[2]					
Habitat	# gaps over guideline	gap #1	gap #1 location	gap #2	gap #2 location	gap #3	gap #3 location
Beaches	2	81	Reading Rock SMCA to Big Flat SMCA	65	Ten Mile Cluster to Stewarts Point Cluster		
Rocky Shores	1	79	Wilson Rock SMCA to South Cape Mendocino SMR				
Kelp	1	160	Oregon Border to Vizcaino SMCA				
Rock 0-30m Proxy	1	216	Oregon Border to Point Arena Cluster				
Rock 30-100m	1	63	Reading Rock SMCA to South Cape Mendocino SMR				
Rock 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	97	Mattole Canyon Offshore SMR to Point Arena Cluster		
Soft 0-30m Proxy	2	65	Ten Mile Cluster to Stewarts Point Cluster	63	Reading Rock SMCA to South Cape Mendocino SMR		
Soft 30-100m	2	69	Reading Rock SMCA to Mattole Canyon Offshore SMR	65	Ten Mile Cluster to Stewarts Point Cluster		
Soft 100-3000m	2	116	Oregon Border to Mattole Canyon Offshore SMR	107	Big Flat SMCA to Stewarts Point Cluster		
Estuary	3	92	South Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to South Humboldt Bay SMRMA	72	Big River Estuary SMP to Russian River SMRMA
Marsh	2	181	Chetco River, OR to Ten Mile Estuary SMCA	89	Ten Mile Estuary SMCA to Russian River SMRMA		
All Eelgrass Loc.	3	92	South Humboldt Bay SMRMA to Ten Mile Estuary SMCA	89	Chetco River, OR to South Humboldt Bay SMRMA	72	Big River Estuary SMP to Russian River SMRMA

[1] Evaluations at high protection are not shown here because no high protection MPAs were proposed.
[2] Evaluations at undetermined protection include MPAs with undetermined protection, plus all MPAs at moderate-high protection or above.