

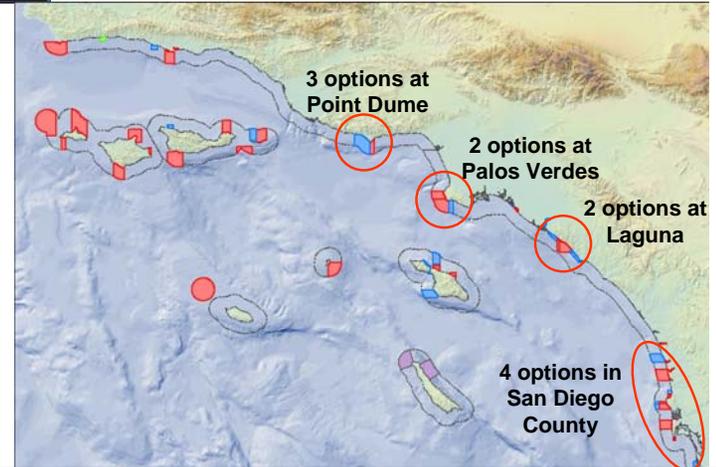
## Marine Life Protection Act Initiative



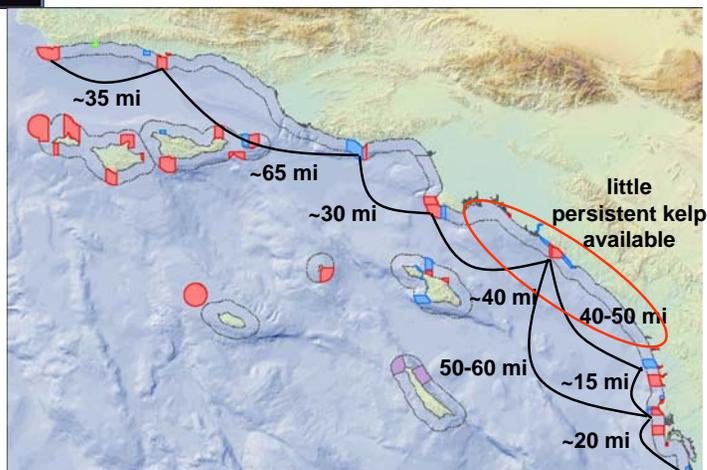
### Ecological Assessment of MPA Options under Consideration by the MLPA Blue Ribbon Task Force

Presentation to the MLPA Blue Ribbon Task Force  
November 10, 2009 • Los Angeles, CA  
Steven Murray, MLPA Master Plan Science Advisory Team

## BRTF Options



## BRTF Options: MPA Spacing



## BRTF Options: Size and Spacing

- **Marine protected area (MPA) size and spacing guidelines are based on many species and presented as a set of ranges (minimum and preferred)**
  - Size: Minimum (9-18 square miles), preferred (18-36 square miles)
  - Spacing: 31-62 miles
- **MPA size and spacing influence the diversity of species protected by an MPA network**
  - Smaller MPAs: Protect fewer species
  - MPAs farther apart: Reduce the number of species with larval exchange between MPAs and enhanced larval supply outside MPAs

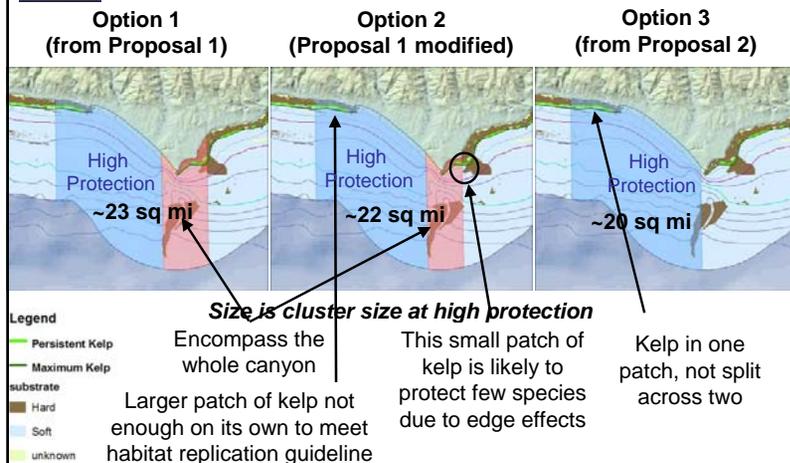
## BRTF Options: Size and Spacing

- **Choosing smaller or more distantly spaced MPAs:**
  - Reduces the number of species likely to respond positively to the MPA network
  - Increases the risk that the MPA network will fail to provide desired protection for species and ecosystem benefits
- **Choosing smaller plus more distantly spaced MPAs creates even further risk that the network will not achieve its objectives because size and spacing work together to create network outcomes**

## BRTF Options: Habitats

- **The MLPA Master Plan Science Advisory Team (SAT) provided guidance that key habitats should be represented and replicated in MPAs across a range of depths and environmental gradients**
- **Habitat representation influences the diversity of species and ecosystems protected across the MPA network**
  - MPAs with fewer habitats protect fewer species and ecosystems
  - Replication of habitats in fewer bioregions will protect fewer species and ecosystems.

## BRTF Options at Point Dume

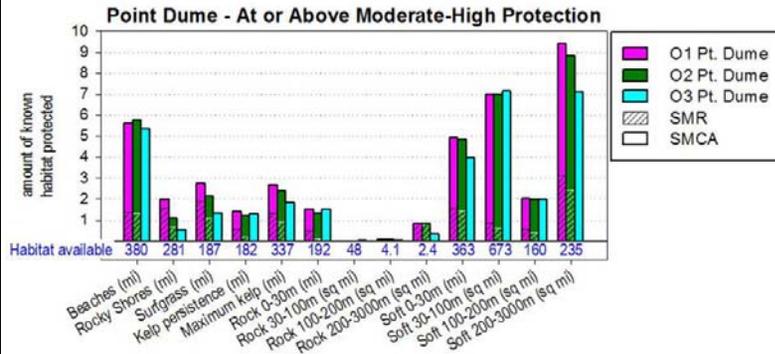


## BRTF Options at Point Dume

The guideline for replication of persistent kelp is 1.14 miles

	Persistent Kelp in Point Dume SMCA	Persistent Kelp in Point Dume SMR	Total Persistent Kelp in Cluster
Option 1	0.84 mi	0.57 mi	1.41 mi
Option 2	1.01 mi	0.21 mi	1.22 mi
Option 3	1.30 mi	NA	1.30 mi

## BRTF Options at Point Dume



Representation across the three options is similar for many habitats

Representation of shoreline habitats scales with cluster size

## BRTF Options at Point Dume

	Mod-High Protection	Pt. Dume		
		O1	O2	O3
Shore-line	Beaches (mi)	1	1	1
	Rocky Shores (mi)	1	1	1
	Surfgrass (mi)	1	1	1
Rocky	Kelp persistence (mi)	1	1	1
	Maximum kelp (mi)	1	1	1
	Rock 0-30m (mi)	1	1	1
	Rock 30-100m (sq mi)	0	0	0
	Rock 100-3000m (sq mi)	1	1	1
Soft bottom	Soft 0-30m (mi)	1	1	1
	Soft 30-100m (sq mi)	1	1	1
	Soft 100-200m (sq mi)	1	1	1
	Soft 200-3000m (sq mi)	1	1	1
	Soft 0-3000m (sq mi)	1	1	1

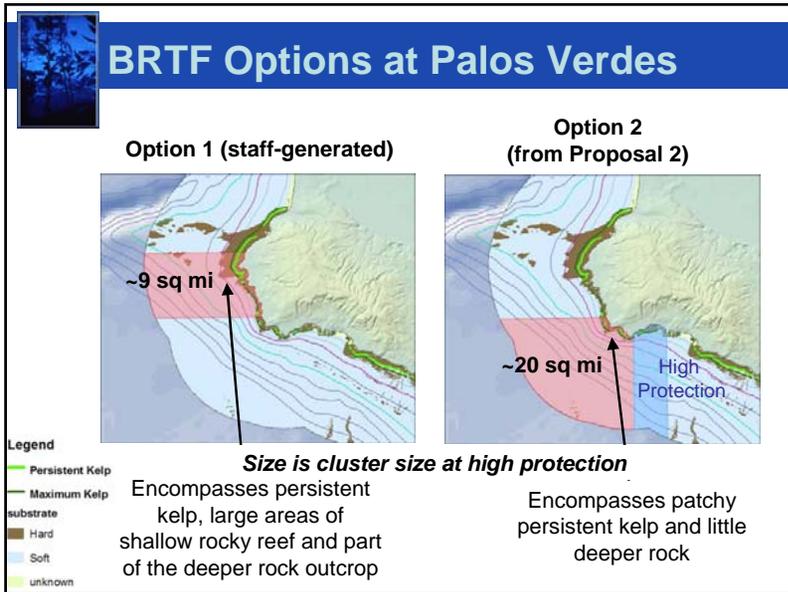
The 3 options perform identically with respect to replication of habitats

## Point Dume Conclusions

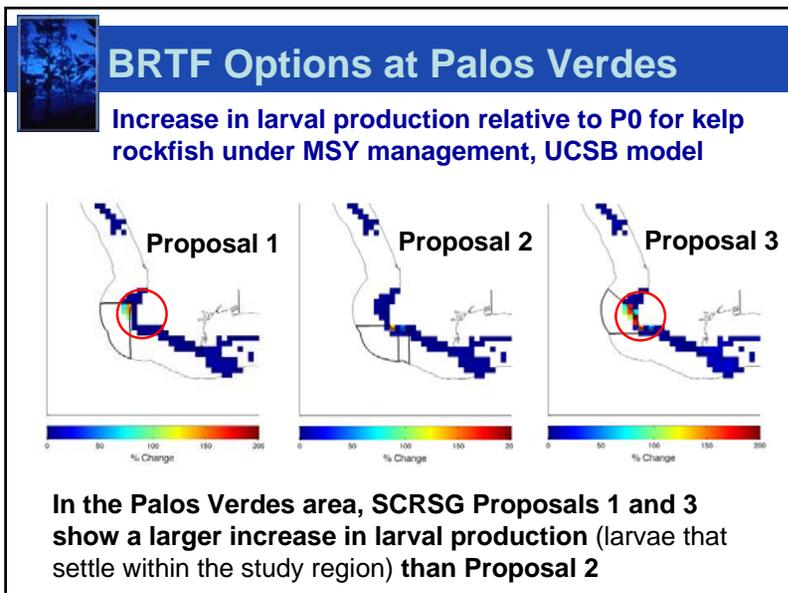
- The 3 options are similar with respect to habitat representation, replication, and their contribution to habitat spacing
- **Options 1 and 2** include the entire submarine canyon off Point Dume. **Option 3** provides limited protection for the canyon area
- **Options 1 and 2** include a known seabird foraging hotspot that extends to the east of Point Dume, potentially benefiting seabirds

## Point Dume Conclusions

- Kelp forest habitat differs to the east and west of Point Dume, and kelp habitat to the east may support more species and higher abundances than that to the west.
- **Option 1** includes substantial patches of kelp on both sides of Point Dume
- **Option 2** includes patches of kelp on both sides of Point Dume but the kelp patch to the east is small and may be compromised by edge effects
- **Option 3** includes a single larger patch of kelp on the west side of Point Dume

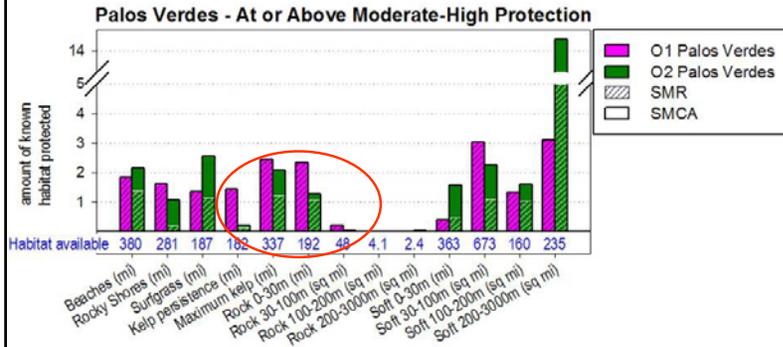


- ## BRTF Options at Palos Verdes
- Modeling shows that the Palos Verdes peninsula has the potential to be an important area for **high local productivity** and a **source of larvae** for the Channel Islands and mainland coast, but only if a variety of habitats are protected in sufficient quantities to support enhanced populations



- ## BRTF Options at Palos Verdes
- The proposed Palos Verdes SMRs from the SCRSG Proposals 1 and 3 overlap with BRTF Option 1. ***These MPAs were identified as the most important mainland MPAs in their networks with the largest effect on biomass throughout the study region.***
  - The Point Vicente SMR and Abalone Cove SMCA from SCRSG Proposal 2 contributed much less to overall biomass relative to other MPAs in SCRSG Proposal 2.
- SMR = state marine reserve    SMCA = state marine conservation area

## BRTF Options at Palos Verdes



Option 1 includes more kelp and rocky habitats

Option 2 includes more of several soft-bottom habitats (beaches, 0-30 meter soft, and 200-300 meter soft)

## BRTF Options at Palos Verdes

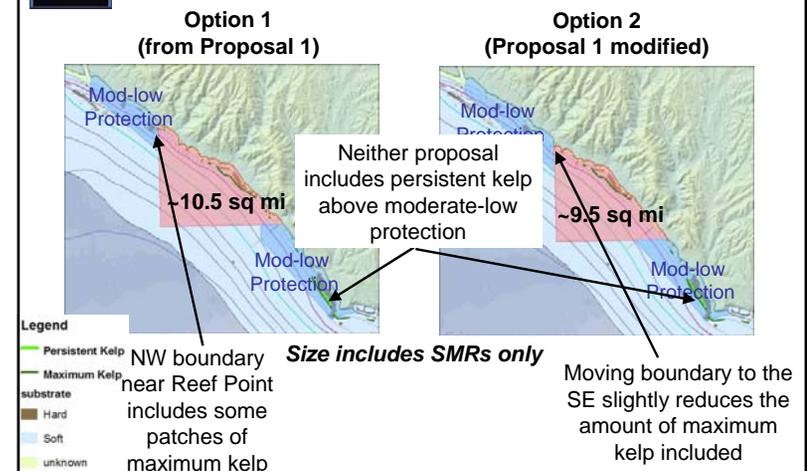
	Mod-High Protection	Palos Verdes	
		O1	O2
Shore line	Beaches (mi)	1	1
	Rocky Shores (mi)	1	1
	Surfgrass (mi)	1	1
Rocky	Kelp persistence (mi)	1	0
	Maximum kelp (mi)	1	1
	Rock 0-30m (mi)	1	1
	Rock 30-100m (sq mi)	1	0
Soft bottom	Rock 100-3000m (sq mi)	0	0
	Soft 0-30m (mi)	0	1
	Soft 30-100m (sq mi)	1	1
	Soft 100-200m (sq mi)	1	1
	Soft 200-3000m (sq mi)	1	1
Soft 0-3000m (sq mi)	1	1	

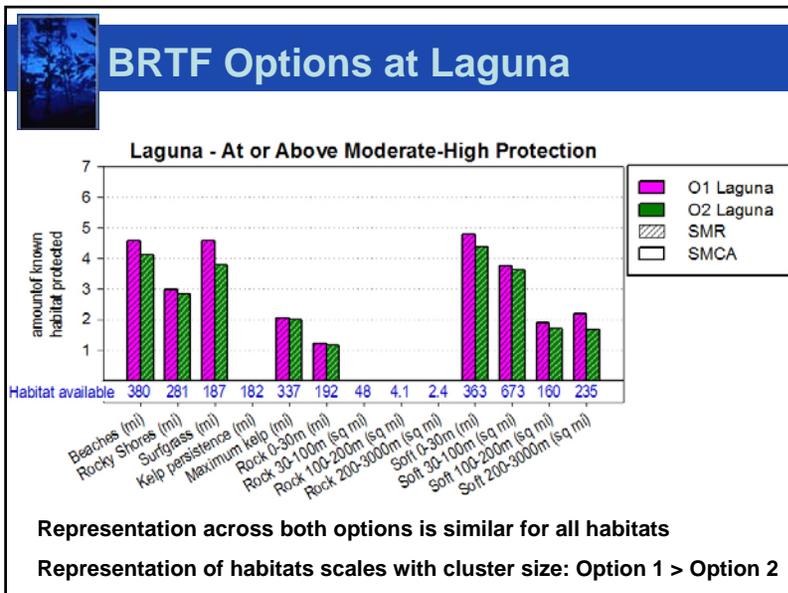
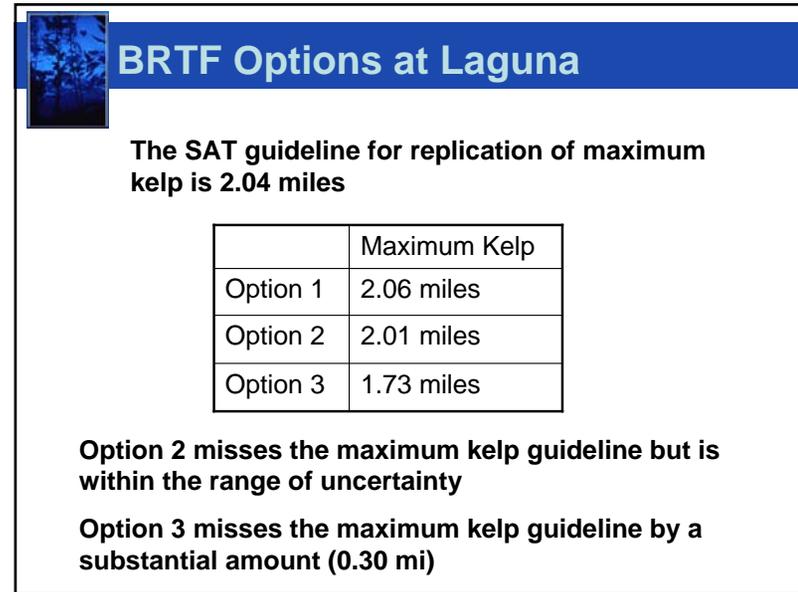
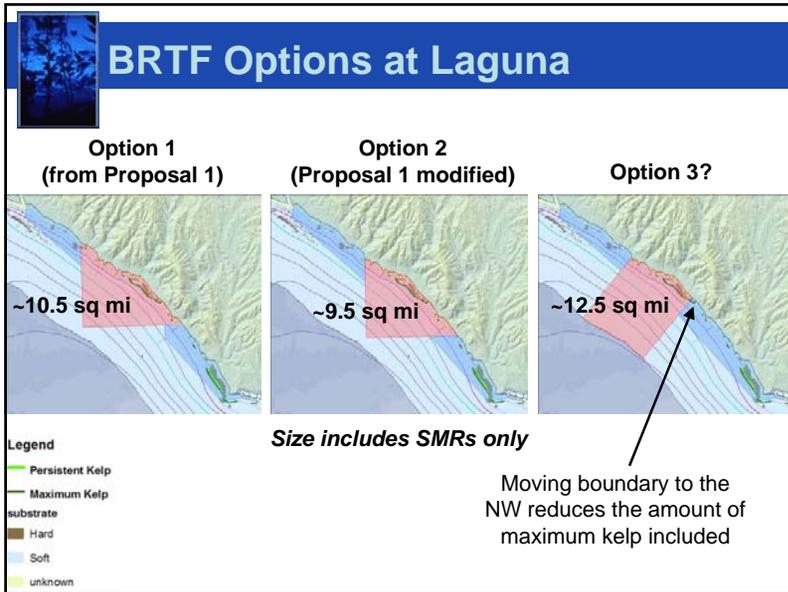
The biggest differences between the options are found in replication of rocky habitats and kelp

## Palos Verdes Conclusions

- The Palos Verdes area is a **major source of larvae**, especially for rocky reef fishes
- Option 1 meets a greater number of SAT guidelines than Option 2
- **Option 1** would serve as a backbone SMR in a network, considering the distribution of rocky reef and kelp habitats and other proposed MPAs
- **Option 2** would create a gap in protection of nearshore rocky habitats, reducing the likelihood that adjacent MPAs are connected through larval exchange

## BRTF Options at Laguna





### BRTF Options at Laguna

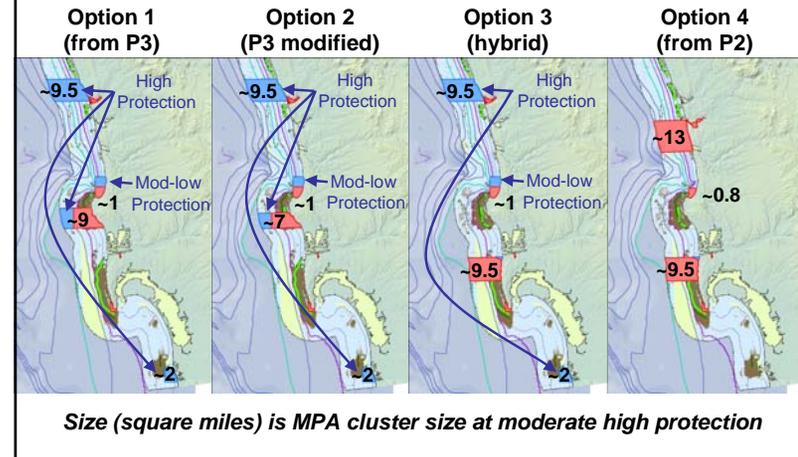
	Mod-High Protection	Laguna	
		O1	O2
<b>Shore &amp; line</b>	Beaches (mi)	1	1
	Rocky Shores (mi)	1	1
	Surfgrass (mi)	1	1
<b>Rocky</b>	Kelp persistence (mi)	0	0
	Combined kelp (mi)	1	0
	Maximum kelp (mi)	1	1
	Rock 0-30m (mi)	1	1
	Rock 30-100m (sq mi)	0	0
	Rock 100-3000m (sq mi)	0	0
<b>Soft bottom</b>	Soft 0-30m (mi)	1	1
	Soft 30-100m (sq mi)	1	1
	Soft 100-200m (sq mi)	1	1
	Soft 200-3000m (sq mi)	1	1
	Soft 0-3000m (sq mi)	1	1

The only difference in habitat replication between Option 1 and Option 2 is the amount of maximum kelp protected

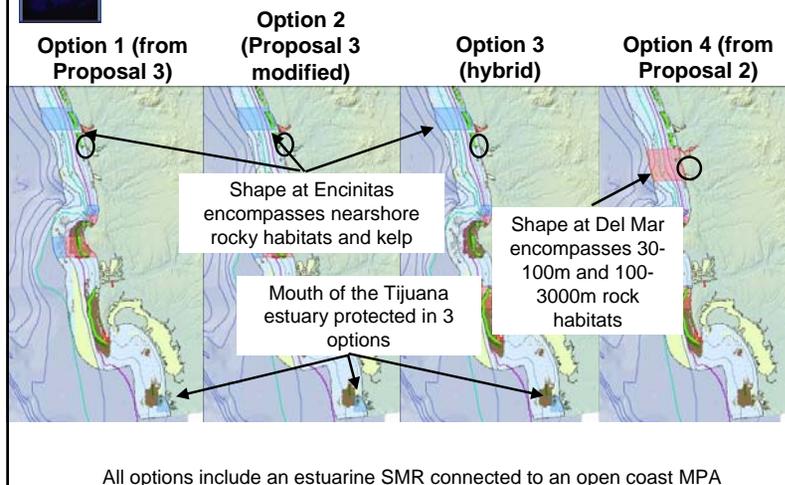
## Laguna Conclusions

- Persistent kelp is rare in this region so it is **not** possible to protect a full replicate (1.14 miles)
- In this region maximum kelp (2.04 miles) may be protected to reduce spacing between adjacent protected patches of persistent kelp, but maximum kelp is **not equivalent to** persistent kelp
- **Options 1 and 2** are similar with respect to representation and replication of habitats, including maximum kelp
- **Option 3** provides less protection for nearshore habitats and does not include a replicate of maximum kelp
- **Option 1** best addresses water quality guidance by avoiding the Aliso outfall buffer zone and partially overlapping with the Irvine Coast Area of Special Biological Significance

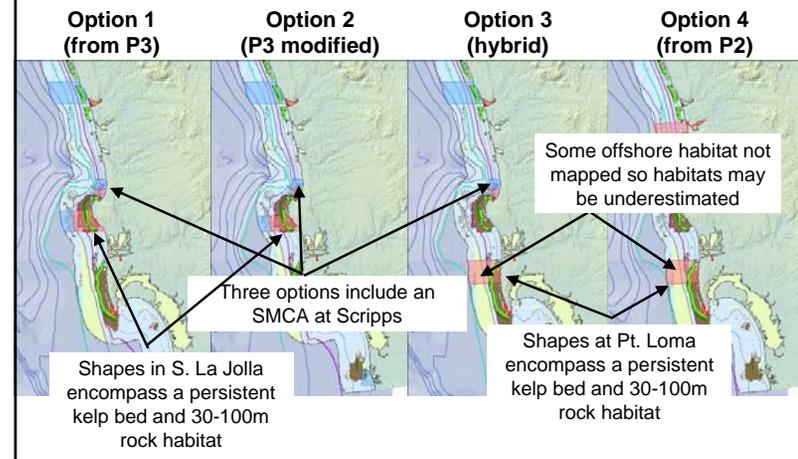
## BRTF Options in San Diego County

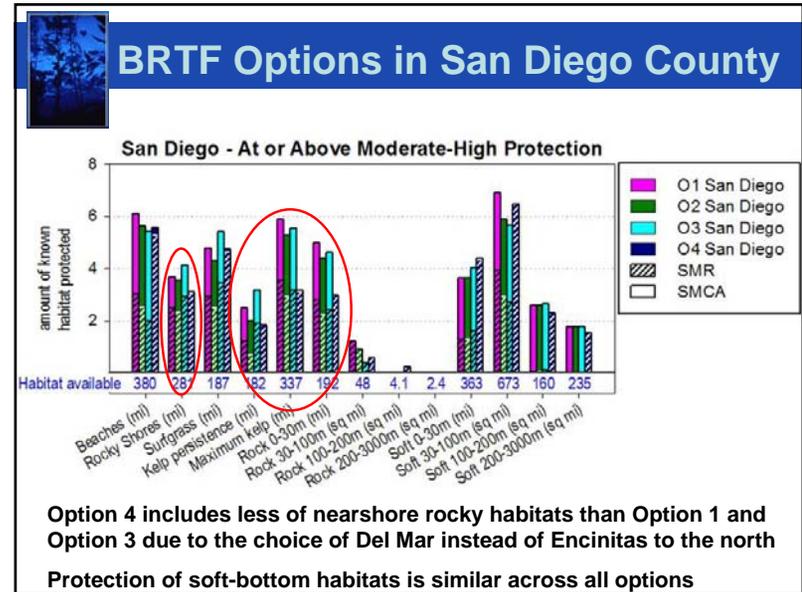
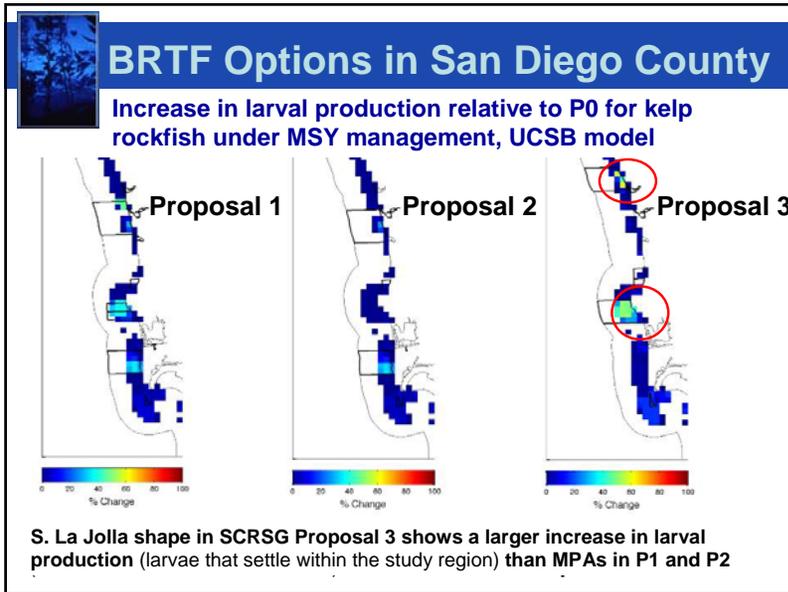


## BRTF Options in San Diego County



## BRTF Options in San Diego Co.





## BRTF Options in San Diego County

	Mod-High Protection	San Diego Co.			
		O1	O2	O3	O4
Shore line	Beaches (mi)	2	1	1	1
	Rocky Shores (mi)	2	1	2	1
	Surfgrass (mi)	2	1	2	2
Rocky	Kelp persistence (mi)	2	1	2	1
	Maximum kelp (mi)	2	1	2	1
	Rock 0-30m (mi)	2	1	2	1
	Rock 30-100m (sq mi)	1	0	1	2
	Rock 100-3000m (sq mi)	0	0	0	1
Soft bottom	Soft 0-30m (mi)	1	1	1	1
	Soft 30-100m (sq mi)	2	1	2	2
	Soft 100-200m (sq mi)	1	1	1	1
	Soft 200-3000m (sq mi)	1	1	1	1
	Soft 0-3000m (sq mi)	1	1	1	1

Option 1 and Option 3 have the same number of replicates of most habitats

In Option 2, the SMR in S. La Jolla is below minimum size, so does not contribute to replication

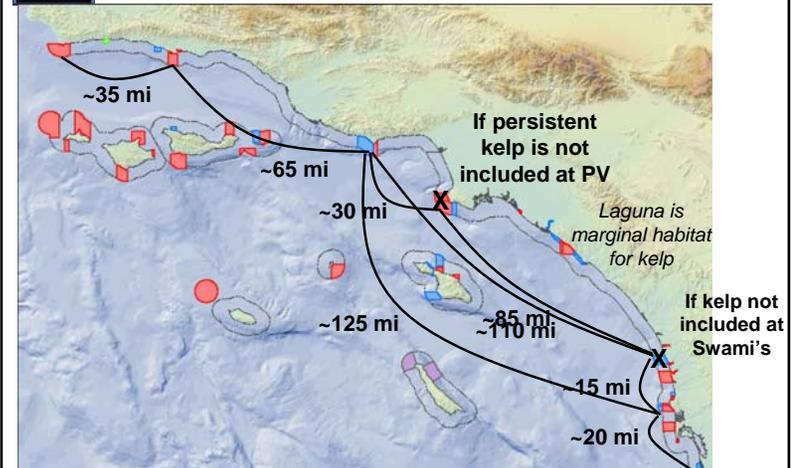
Option 4 encompasses replicates of the two deepest rock habitats, but has fewer replicates of other habitats than Option 1 and Option 3

- ## San Diego County Conclusions
- The combination of MPAs is important to consider because not all MPAs represent the same habitats
  - Most MPAs in this region are near the **minimum** (9 square miles) of the **minimum size range** (9-18 square miles) recommended by the SAT
  - Considering the small size of MPAs in this region, the SAT determined that **2 small, but above minimum size, MPAs** will better meet the conservation goals of the MLPA than 1 small MPA
  - South La Jolla SMR (**Option 2**) is not of sufficient size to meet the SAT guidelines for habitat replication

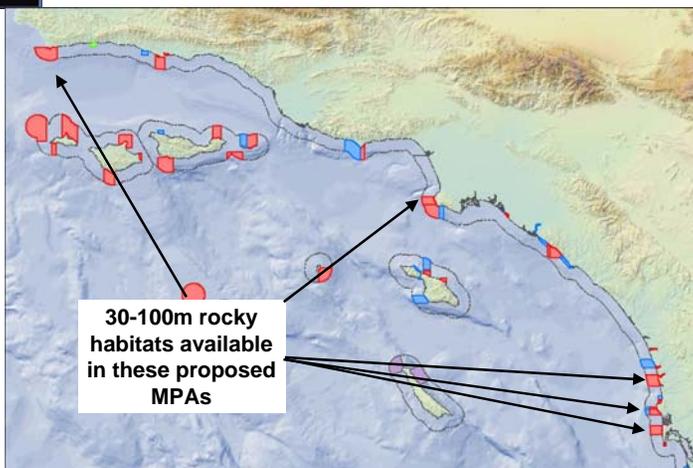
## San Diego County Conclusions

- **Swami's SMCA** (Options 1, 2 and 3): replicates many different habitats (including persistent kelp, shallow rock, and rocky shores)
- **Del Mar SMR** (Option 4): replicates a limited number of habitats (soft and deep rock habitats)
- Kelp at **Swami's** is known to be more persistent than kelp at **Del Mar**
- Kelp at **South La Jolla** is known to be persistent, high-quality kelp associated with high biodiversity; Kelp at **Point Loma** grows on lower relief rock and is not quite as productive as South La Jolla.

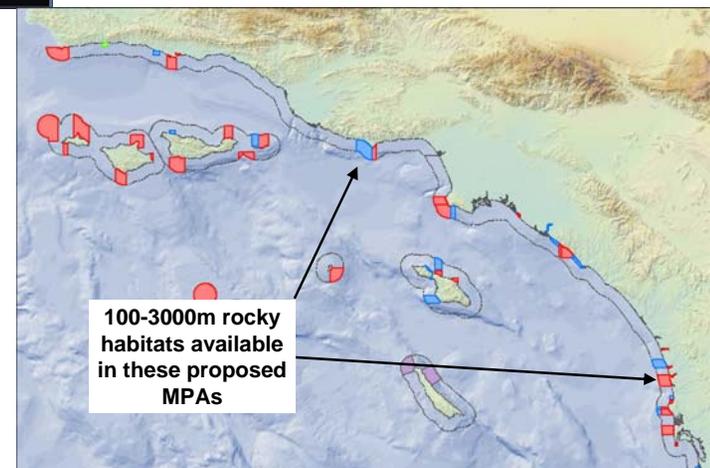
## BRTF Options: Persistent Kelp Spacing



## BRTF Options: Deep Rock Spacing



## BRTF Options: MPA Spacing



## BRTF Options: MPA Spacing

