

# Marine Life Protection Act Initiative



## Science Guidelines for Marine Protected Area Planning

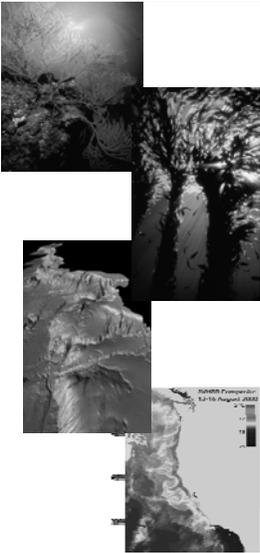
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Presentation to the South Coast Regional Stakeholder Group  
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# Marine Life Protection Act Goals



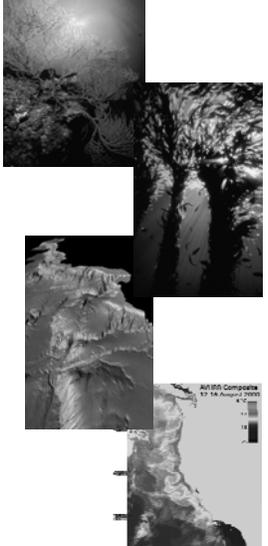
1. Protect **natural diversity** and **ecosystem functions**.
2. Sustain and restore marine life **populations**.
3. Improve recreational, educational, and study **opportunities**.
4. Protect representative and unique **habitats**.
5. Clear objectives, effective management, adequate enforcement, sound science.
6. Ensure that MPAs are designed and managed as a **network**.





## Goals for Habitats and Ecosystems

1. Protect **natural diversity** and **ecosystem functions**.
2. Sustain and restore marine life **populations**.
3. Improve recreational, educational, and study **opportunities**.
4. Protect representative and unique **habitats**.
5. Clear objectives, effective management, adequate enforcement, sound science.
6. Ensure that MPAs are designed and managed as a **network**.



## Habitat Representation (Goals 1 and 4)

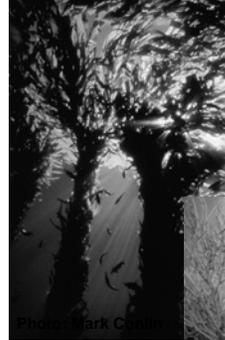
- For an objective of protecting key and unique marine habitats and to include a range of species likely to benefit, MPAs should extend from intertidal to offshore areas





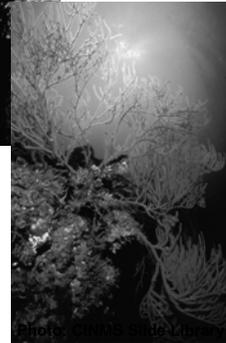
## Habitat Representation (Goals 1 and 4)

- For an objective of protecting the diversity of species that live in different habitats and those that move among different habitats over their lifetime, every “key” marine habitat should be represented in the MPA network.



Cruz

Monterey



## Key Marine Habitats

### Marine Habitats

- Intertidal zones
- Estuaries
- Rocky reefs
- Sandy/soft ocean bottoms
- Underwater pinnacles
- Submarine canyons

### Biogenic Habitats

- Kelp forests
- Seagrass beds

### Depth Zones

- Intertidal
- Intertidal to 30 meters
- 30 to 100 meters
- 100 to 200 meters
- 200 meters and deeper

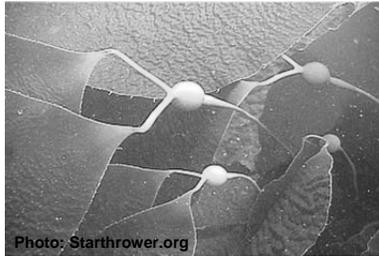
### Oceanographic Habitats

- Upwelling areas
- Freshwater plumes
- Retention zones



## Unique Marine Habitats

- Surfgrass beds
- Eelgrass beds
- Oil seeps and shallow hydrothermal vents
- Elk kelp beds



## Habitat Replication (Goals 1 and 4)

- Protect each habitat type in three to five MPAs within each biogeographic region
- Set aside enough habitat in each MPA to include 90% of biodiversity for that habitat





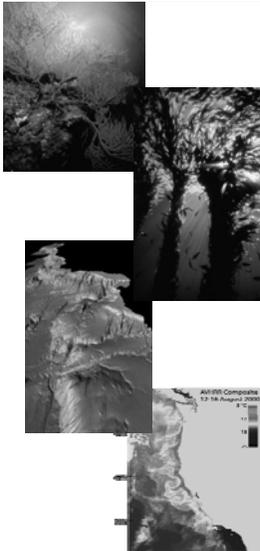
## Habitat Representation

Habitat	Representation needed to encompass 90% of biodiversity	Data Source
Rocky Intertidal	~0.5 linear miles	PISCO Biodiversity
Shallow Rocky Reefs/Kelp Forests (0-30 M)	~1 linear mile	PISCO Subtidal
30-100m Rocky Reefs	~0.30 square miles	Love surveys
100-200m Rocky Reefs	~0.28 square miles	Love surveys
Sandy Beaches	~1 linear mile	
Sandy Habitat (0-30 M)	~1 linear mile	Based on shallow rocky reefs
Sandy Habitat (30-100 M)	~10 square miles	NMFS triennial trawl surveys 1977-2007
Estuary	~0.12 square miles	SONGS mitigation team surveys



## 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**.





## Size and Spacing (Goals 2 and 6)

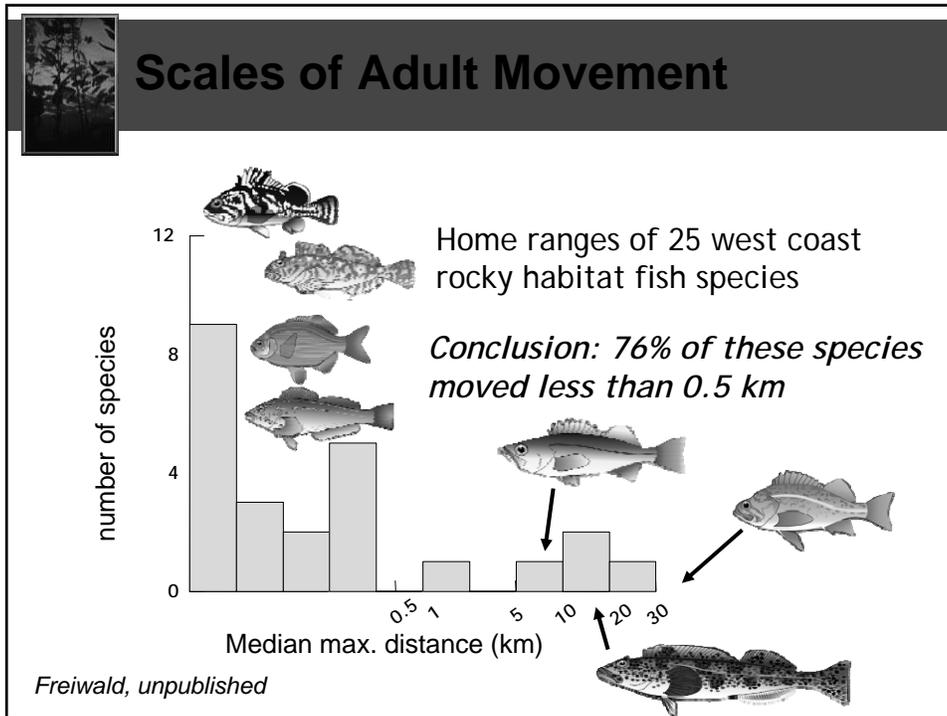
- Are proposed MPAs large enough to encompass adult movements for a range of species?
- Are proposed MPAs close enough together so that larvae can move from one MPA to another?



## Guideline for Alongshore Span of MPAs

- For an objective of protecting adult populations, based on adult neighborhood sizes and movement patterns, MPAs should have an alongshore span of 5-10 kilometers (3-6 miles) of coastline, and preferably 10-20 kilometers (6-12.5 miles). Larger MPAs would be required to fully protect marine birds, mammals, and migratory fish.





## Scales of Adult Movement

0 – 1 km	1 – 10 km	10 – 100 km	100 – 1000 km	> 1000 km
Many rockfish	Some rockfish	Some rockfish	Few rockfish	Some schooling fish
Other reef fish	Some surfperch	Other reef fish	Some schooling fish	Tunas
Some surfperch		Some flatfish	Salmon	Many sharks
			More flatfish	

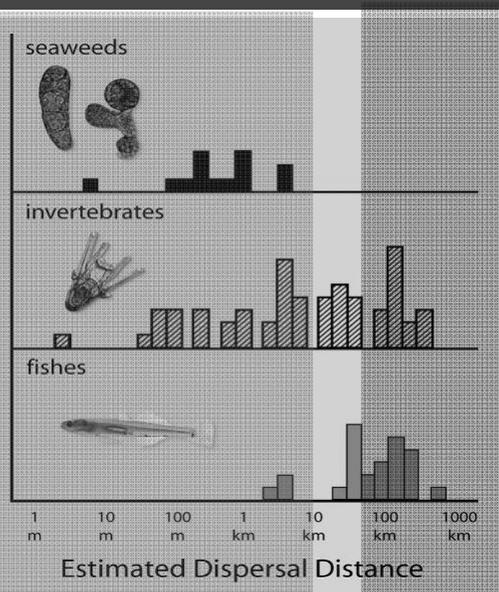


## Guideline for MPA Spacing

- For an objective of facilitating dispersal of important bottom-dwelling fish and invertebrate groups among MPAs, based on currently known scales of larval dispersal, MPAs should be placed within 50-100 kilometers (31-62 miles) of each other.



## Scales of Larval Dispersal



Recommended spacing:  
50-100 kilometers

Palumbi 2003  
Kinlan and Gaines 2003



## Marine Birds and Mammals (Goal 2)

- Include breeding and resting areas for marine birds and mammals within MPAs
- Include foraging areas within MPAs



Photo Credit: iStockphoto/Robert Deal



## Science Guidelines for MPA Design

- **No single optimum network design**
- **Include:** all bioregions  
all 'key' marine habitats
- **Extent:** intertidal to deep water
- **Alongshore span:** 3-6 miles (5-10 km; minimum)  
6-12.5 miles (10-20 km; preferred)
- **Spacing:** 31-62 miles (50-100 km)
- **Replication:** 3-5 replicates
- **Species:** include breeding, feeding and resting areas for birds and mammals