Marine Life Protection Act Initiative



Overview of the Science Guidance in the California Marine Life Protection Act Master Plan for Marine Protected Areas

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Science Guidance

Marine Life Protection Act (MLPA)

- Provides some specific and mandated requirements (e.g. goals)
- Requires guidance be developed in other formats (e.g. Master Plan)

Master Plan for Marine Protected Areas

- Mandated by the MLPA
- Provides guidance on size and spacing
- Provides guidance on habitat representation and replication



Summary of MLPA Goals

- 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 habitats.
- 5. Clear objectives, effective management, adequate enforcement, and sound science.
- 6. To ensure that MPAs are designed and managed as a network.



Science Guidance in the Master Plan

- From the California Marine Life Protection Act
 Master Plan for Marine Protected Areas
 - Flexibility
 - Biogeographical regions (Goals 1, 2 and 4)
 - Species likely to benefit (Goals 1 and 2)
 - Levels of protection (Goals 1, 2, 4 and 6)
 - Habitat representation (Goals 1 and 4)
 - Habitat replication (Goals 1, 2, 3, 4 and 6)
 - MPA Size (Goals 2 and 6)
 - MPA Spacing (Goals 2 and 6)
 - Monitoring (Goals 3 and 5)



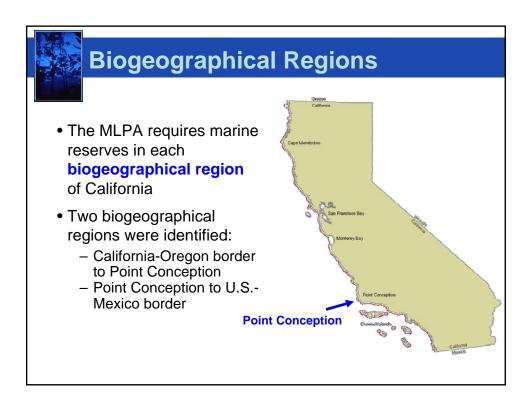
Flexibility in MPA Design

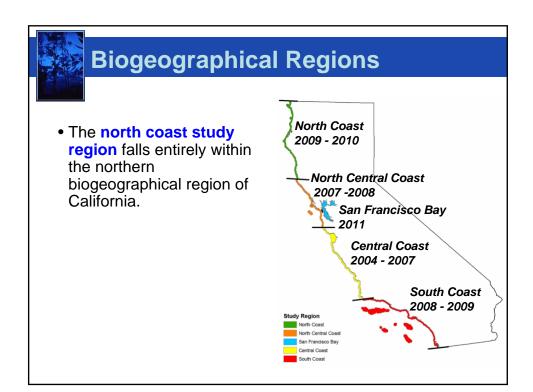
*The diversity of species and habitats to be protected, and the diversity of human uses of marine environments, **prevents a single optimum network design** in all environments.

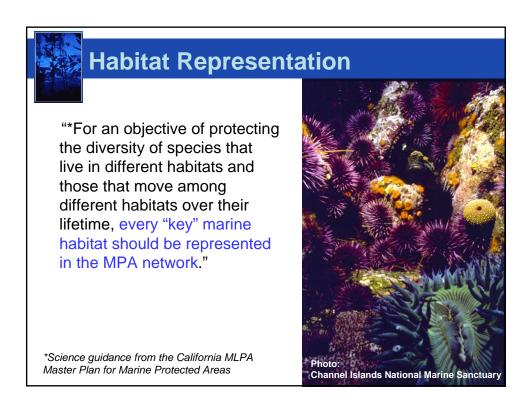


Photo: Steve Wertz

*Science guidance from the California MLPA Master Plan for Marine Protected Areas









Key Habitats

Intertidal/Nearshore

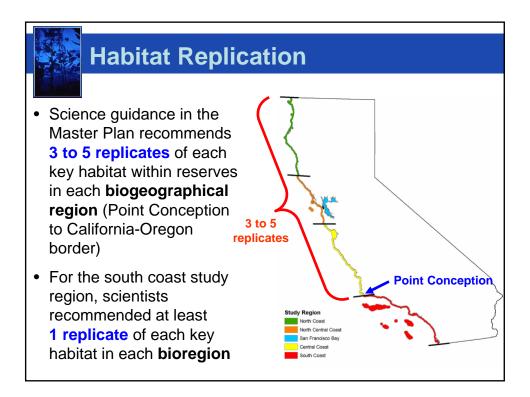
Rocky Shore
Sandy Beach
Coastal Marsh
Tidal Flats
Estuary
Eelgrass
Surfgrass

Oceanographic

Upwelling centers Retention areas Freshwater plumes

Subtidal

Hard/Soft Bottom
0-30 meters
30-100 meters
100-200 meters
>200 meters
Kelp forest
Canyons
Seamounts





Habitat Replication

*90% threshold for different habitats

Habitat	Area or Length of a Replicate	Data Source	
Rocky Intertidal	~0.5 linear miles	PISCO Biodiversity	
Shallow Rocky Reefs/Kelp Forests (0-30 m)	~1 linear miles	PISCO Subtidal Surveys	
Deep Rocky Reefs (30-100 m)	~0.1 square miles	Starr Surveys	
Sandy Beaches *	~1 linear miles		
Soft-Bottom Habitat (0-30 m)	~1 linear miles	Based on shallow rocky reefs	
Soft-Bottom Habitat (30-100 m)	~10 square miles	NMFS Triennial Trawl Surveys (1977-2007)	
	0.12 square miles		
Estuary	(77 acres)		

*Estimates for the north central coast study region



Species Likely to Benefit

- The Master Plan identifies "select species or groups of species likely to benefit from MPAs."
- Species likely to benefit include those:
 - directly **targeted** by fisheries
 - caught incidentally (bycatch)
 - indirectly affected through ecological changes within MPAs
- Species that move long distances likely will not benefit significantly from MPAs





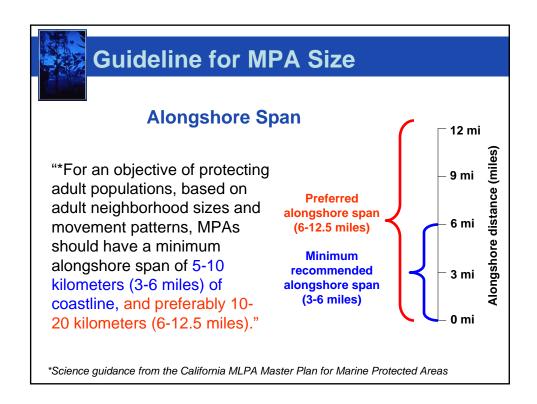


Species Likely to Benefit

- The list of species likely to benefit from MPAs in the north coast study region will be developed by the science advisory team.
- An example list from the North Central Study Region can be found in appendix G of the Master Plan:

www.dfg.ca.gov/mlpa/masterplan.asp





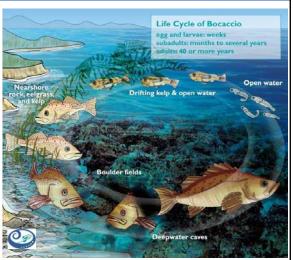
Scales of Adult Movement					
0-1 km	1-10 km	10-100 km	100-1000 km	>1000 km	
Invertebrates: abalone, mussel, octopus, sea star, snail, urchin Rockfishes: black & yellow, brown, copper, gopher, grass*, kelp, quillback, starry, treefish, vermilion Other Fishes: cabezon, eels, greenlings, giant seabass, black, striped and pile perch, pricklebacks	Rockfishes: black, China, greenspotted*, olive, yelloweye Other Fishes: walleye perch*	Invertebrates: Dungeness crab** Rockfishes: blue, bocaccio, yellowtail Other Fishes: California halibut, lingcod, starry flounder Birds: gulls, cormorants Mammals: harbor seal, otter	Rockfishes: canary Other Fishes: anchovy, big skate, herring, Pacific halibut, sablefish**, salmonids**, sole, sturgeon Birds: gulls** Mammals: porpoise, sea lion**	Invertebrates: jumbo squid** Other Fishes: sardine, shark**, tunas**, whiting** Reptiles: turtles** Birds: albatross**, pelican**, shearwater**, shorebirds**, terns** Mammals: dolphins, sea lion**, whales**	
* Studies of this species included fewer than 10 individuals ** Seasonal migration					



Guideline for MPA Size

Offshore Span

*To protect species at different depths and ontogenetic movements, MPAs should extend from the intertidal zone to deep waters offshore.



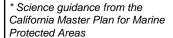
Art by Ryan Kleiner

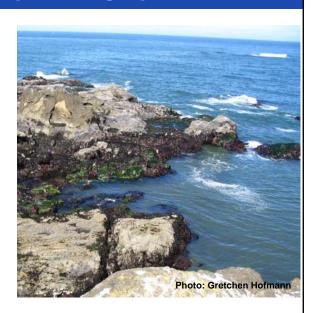
*Science guidance from the California MLPA Master Plan for Marine Protected Areas



Guideline for MPA Size

*Taking into account alongshore and offshore guidelines, the science advisory team recommended a minimum area of 9–18 square miles for each MPA, and preferably 18–36 square miles.







Guideline for MPA Spacing

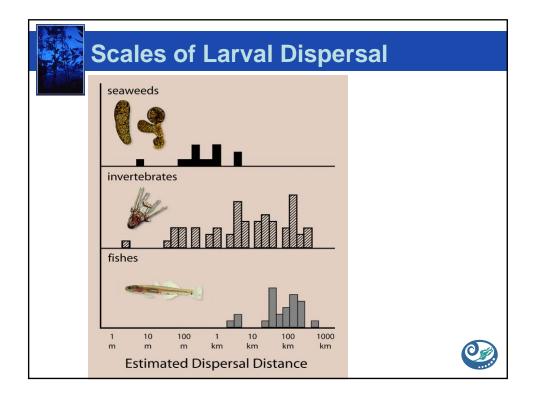
"*For an objective of facilitating dispersal of important bottom-dwelling fish and invertebrate groups among MPAs, based on currently known scales of larval dispersal, MPAs should be placed within 50-100 km (31-62 miles) of each other."







*Science guidance from the California MLPA Master Plan for Marine Protected Areas





Additional Guidelines

- For an objective of lessening negative impact while maintaining value, placement of MPAs should take into account local resource use and stakeholder activities
- Placement of MPAs should take into account the adjacent terrestrial environment and associated human activities
- For an objective of facilitating adaptive management of the MPA network into the future, and the use of MPAs as natural scientific laboratories, the network design should account for the need to evaluate and monitor biological changes within MPAs



For More Information

For more information about science guidelines:

 Master Plan for Marine Protected Areas http://www.dfg.ca.gov/mlpa/masterplan.asp