


1

Marine Life Protection Act Initiative




Updates to Habitat Data and Habitat Representation and Replication Evaluation Methods

Presentation to the MLPA Master Plan Science Advisory Team
May 12, 2010 • Teleconference and Webinar

Dr. Karina Neilsen and Dr. Pete Raimondi, Members • MLPA Master Plan
Science Advisory Team and Emily Saarman, Science Planner • MLPA Initiative

2



Key Habitats in the North Coast

<p>Shoreline</p> <ul style="list-style-type: none"> • rocky shores • sandy beaches • surfgrass 	<p>Estuarine</p> <ul style="list-style-type: none"> • coastal marsh • tidal flats • estuarine waters • eelgrass
<p>Rocky reef</p> <ul style="list-style-type: none"> • rocky reef 0-30m • rocky reef 30-100m • rocky reef 100-200m • rocky reef >200m • kelp forests • pinnacles 	<p>Soft bottom</p> <ul style="list-style-type: none"> • soft bottom 0-30m • soft bottom 30-100m • soft bottom 100-200m • soft bottom >200m • submarine canyons
<p>Pelagic habitats</p> <ul style="list-style-type: none"> • upwelling centers • retention zones • river plumes • oceanographic fronts 	

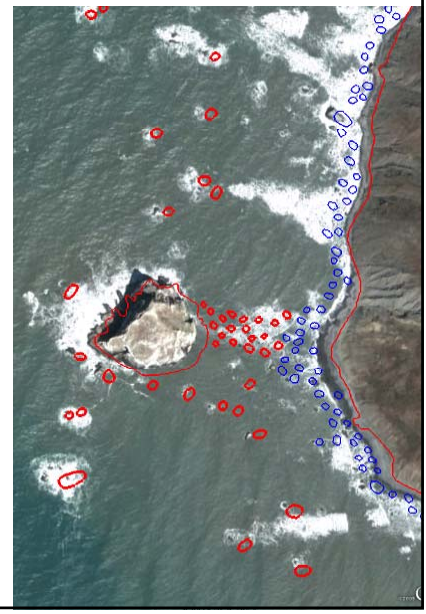
Note: blue habitats have special data considerations or limitations *m = meter*



Updates to Habitat Data

Refinement of the offshore rocks layer:

- Larger rocks are more accurately mapped in the dataset, so all large (>1000 m²) rocks were retained
- Small rocks very close to shore are poorly mapped and contiguous with shoreline intertidal zone, so only small rocks >100m from shore were retained
- Previously unmapped rocks WAY offshore are now mapped through hand digitization of aerial imagery



Updates to Habitat Data

Major upwelling centers now mapped:

- Mapping courtesy John Largier
- Major upwelling centers identified using satellite data, buoy data, and monthly and annual averages
- Only the most persistent upwelling zones are identified in layer; other areas may experience weaker or more episodic upwelling
- To be used for marine protected area (MPA) planning purposes, but no associated evaluation
- Recommend proposals include MPAs both within and outside upwelling centers





Updates to Habitat Data

Major river plumes now mapped:

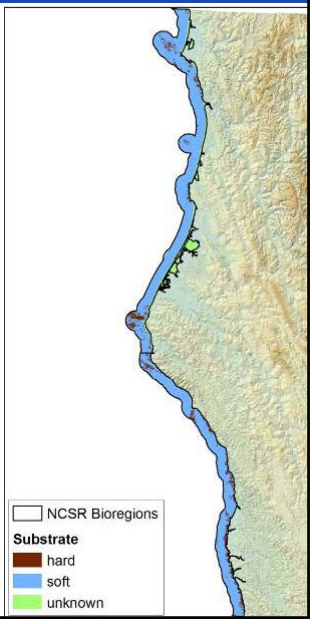
- Mapping courtesy John Largier
- River plumes are areas likely to be influenced by sediment and freshwater during flow events
- Major river plumes for five largest rivers mapped based on oceanographic currents and peak river flow
- Smaller rivers with plumes of unknown size indicated with a one mile diameter buffer around river mouths
- To be used for MPA planning purposes, but no associated evaluation



Updates to Habitat Data

Additions and corrections to multibeam substrate data:

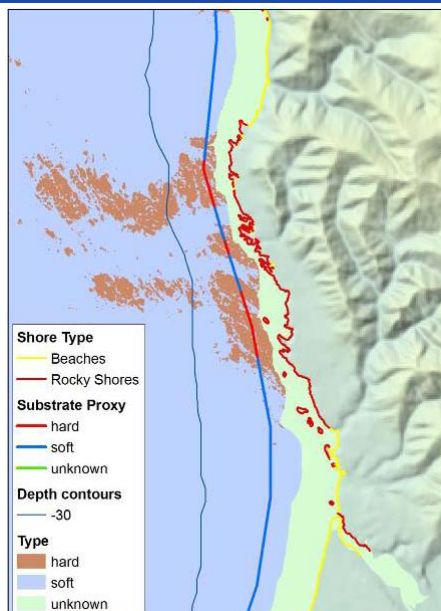
- Multibeam substrate data now available for full study region (except for very nearshore area)
- An error made while processing previous versions of substrate data artificially inflated area of rocky substrate by ~ 25%
- Error was corrected and Round 1 MPA proposals re-evaluated; changes to evaluations results were minor and summarized in written document (Briefing document J.2 of May 3-4 MLPA Blue Ribbon Task Force meeting)



Updates to Habitat Data

Refinements to nearshore proxy line:

- Consideration of areas where rocky habitat may be concentrated in unmapped nearshore areas
- Inclusion of offshore rocks that occur beyond the coastal 30 meter contour

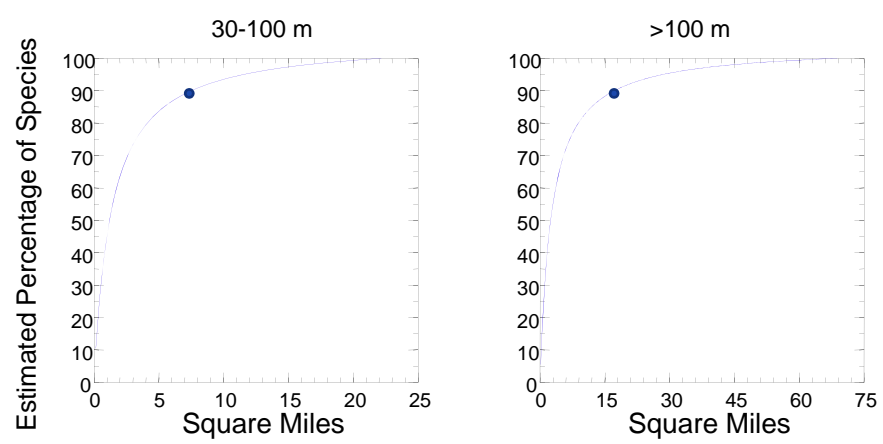


Habitat Size Guidelines for Replication

- **Habitat size guidelines for replication do not consider connectivity or adult movement – these accounted for in MPA size and spacing guidelines**
- **Based on conservation value:**
 - How much area or linear distance would likely result in 90% of available species in meaningful abundances?



Soft Bottom Habitat Thresholds



Based on National Marine Fisheries Service (NMFS) trawl datasets from the north coast study region



Soft-bottom Habitat Thresholds

- NMFS trawl surveys identify fish to species level but not invertebrates
- Concerns raised that bias toward more mobile fish species in NMFS data may artificially increase area necessary to encompass 90% of biodiversity
- To address concern, analyzed Southern California Coastal Water Research Project trawl surveys in which both fish and invertebrates identified to species level
 - Area needed to encompass 90% of invert species was **greater** than that needed to encompass 90% of fish.
 - Area needed to encompass 90% of all identified species was **greater** than that needed to encompass 90% fish alone.
- Analysis suggests biodiversity curves based on NMFS data are not biased toward larger area by identification of fish only



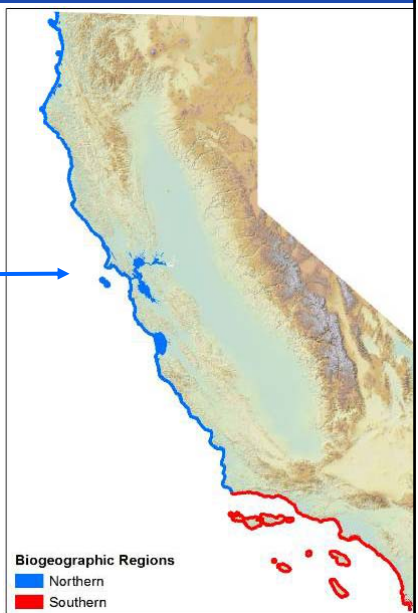
Soft-bottom Habitat Thresholds

Habitat	Amount of Habitat Needed to Encompass 90% of Biodiversity	Data Source
Soft bottom 0-30 m <i>when not combined with other depth zones</i>	1.1 linear miles <i>including the full 0-30m depth zone</i>	<i>See below</i>
Soft bottom 30-100 m <i>when not combined with other depth zones</i>	7 square miles	NMFS trawl surveys 1997-2007
Soft bottom >100 m <i>when not combined with other depth zones</i>	17 square miles	NMFS trawl surveys 1997-2007
Soft bottom 0-3000 m ^a <i>(includes replicates of 0-30m, 30-100m and >100m soft bottom)</i>	10 square miles total mapped soft bottom Distributed across depth zones including at least: 1.1 mi 0-30m 5 sq mi 30-100m 1 sq mi >100m	NMFS trawl surveys, 1977-2007
Soft bottom 0-100 m ^a <i>(includes replicates of 0-30m and 30-100m soft bottom)</i>	7 square miles total mapped soft bottom Distributed across depth zones including at least: 1.1 mi 0-30m 5 sq mi 30-100m	NMFS trawl surveys 1997-2007
Soft bottom 30-3000m ^a <i>(includes replicates of 30-100m and 100-3000m soft bottom)</i>	7 square miles total mapped soft bottom Distributed across depth zones including at least: 5 sq mi 30-100m 1 sq mi >100m	NMFS trawl surveys 1997-2007



Replication Guidelines

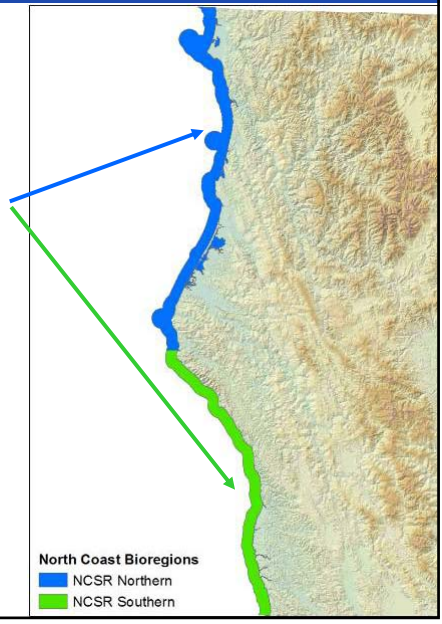
- Replication guidelines in *California Marine Life Protection Act Master Plan for Marine Protected Areas* call for 3-5 replicates within MLPA **biogeographic region**





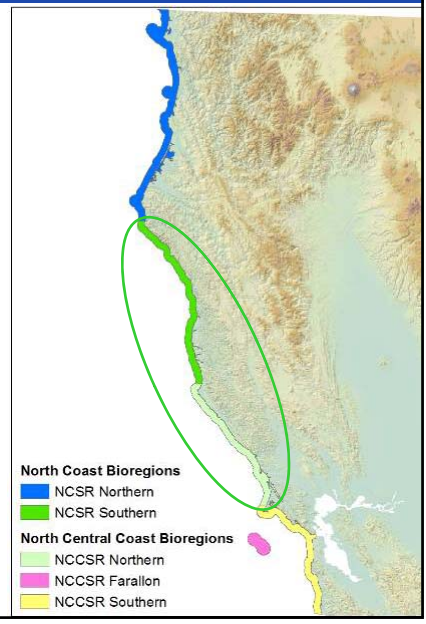
Replication Guidelines

- MLPA Master Plan Science Advisory Team additionally recommends at least one replicate of each habitat per **bioregion**
- Two **bioregions** in north coast study region
- Bioregional divide is not strong ecological break, but rather transition zone between areas with different habitat distributions and ecological assemblages



Replication Guidelines

- No strong biological break at Point Arena, thus the **southern bioregion of the MLPA North Coast Study Region extends into the northern half of the MLPA North Central Coast Study Region**

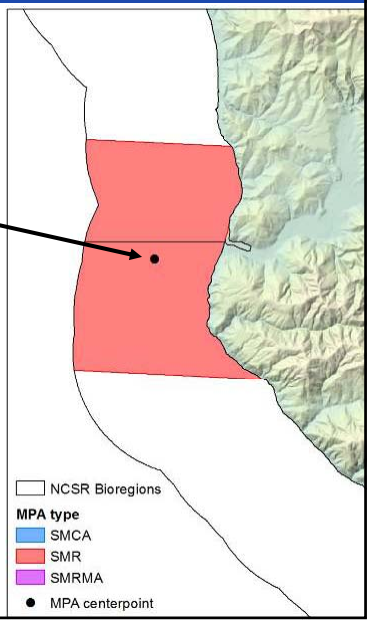




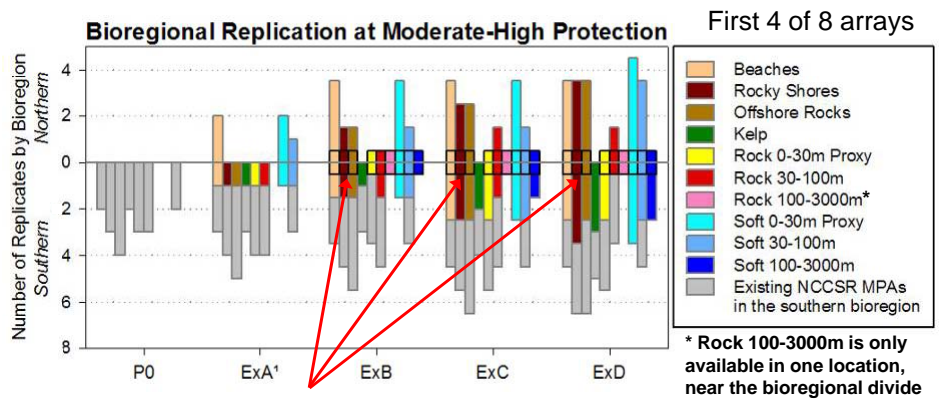
Habitat Replication and Bioregions

For an MPA that falls on bioregional divide:

- In Round 1 analyses, MPA **centerpoint** was used to determine which bioregion to assign habitat replicates
- This somewhat arbitrary division of replicates led to artifacts in bioregional replication analyses
- In Round 2 analyses, habitat replicates **will be divided** across two bioregions (1/2 replicate in each) to indicate they could reasonably be assigned to either bioregion



Example: Bioregional Replication



- Habitat replicates that fall on the bioregional divide are indicated with solid boxes and divided across the two bioregions in these figures.