

## Habitat Replication for the North Coast Study Region

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### Valuation of habitat size

- Habitat size
  - Did not consider connectivity or adult movement
    - These are accounted for in marine protected area (MPA) size and spacing guidelines
  - Based on conservation value
    - How much area or linear distance would likely result in X% of available species in meaningful abundances.
    - In other regions 90% of available species has been the required percentage
      - Underlying assumption (related to conservation goals) is that 100% is desirable, and that this may be achieved with enforced protection

## Area versus linear distance

- For habitats where the biological community varies more with depth than area, the key measurement is linear distance (distance along coastline). **This assumes that the zone of protection extends from shoreline to the offshore edge of that habitat.** Such habitats include:
  - Rocky Intertidal
  - Shallow rocky reefs
  - Kelp forests
  - Shallow sandy habitat
- For other habitats the key measurement is area. Such habitats include:
  - Deep rocky reefs
  - Deep sandy habitat
  - Estuaries

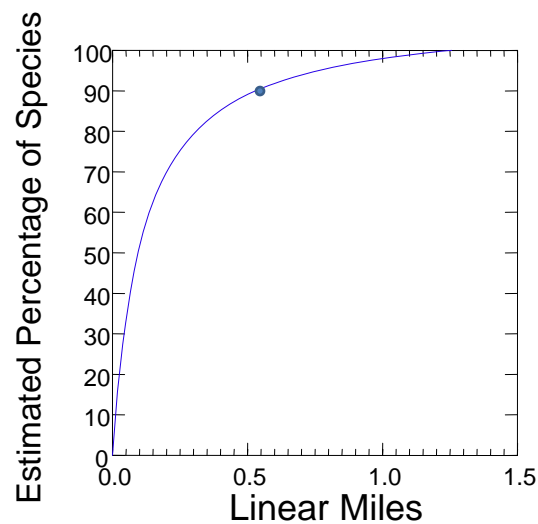
## Data considerations

- Need spatially explicit data for biogeographic area
  - Allows assembly of areas of varying sizes
  - Maintains a realistic set of species

## Analysis

- Spatially explicit abundance data
- Resampling
  - Areas or distances of increasing sizes
    - Average number of species in 1000 iterations of size 1, 1000 of size 2, etc.
    - Likelihood of a species occurring increases with increasing abundances
- Fit curve to resampled data

## Intertidal Rocky Reef



## Habitat replication

Habitat	Amount needed to encompass 90% of biodiversity	Data Source
Rocky Intertidal	~0.55 linear miles	PISCO Biodiversity
Shallow Rocky Reefs/Kelp Forests (0-30 M)	~1.1 linear miles	PISCO Subtidal
Deep Rocky Reefs (30-100 M)	~0.13 square miles	Starr surveys
Deep Rocky Reefs (>100 M)	~0.13 square miles	Starr surveys
Sandy Habitat (0-30 M)	~1.1 linear miles	Based on shallow rocky reefs
Sandy Habitat (30-100 M)	~7.6 square miles	NMFS triennial trawl surveys 1977-2007
Sandy Habitat (>100 M) - contiguous	~6 square miles <sup>1</sup>	NMFS triennial trawl surveys 1977-2007
Sandy Habitat (>100 M) –non-contiguous	~17.2 square miles <sup>1</sup>	NMFS triennial trawl surveys 1977-2007
Sandy Beaches	~ 1.1 linear mile	For discussion
Estuarine Habitats	Analysis not complete yet	

<sup>1</sup>Habitat is limited

<sup>2</sup>mixture of vegetated marsh, subtidal, and mudflats

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Rocky Intertidal	~0.55 linear miles
Shallow Rocky Reefs/Kelp Forests (0-30 M)	~1.1 linear miles
Deep Rocky Reefs (30-100 M)	~0.13 square miles
Deep Rocky Reefs (>100 M)	~0.13 square miles
Sandy Habitat from sandy beaches to sandy habitat >100 M (where >100 M is available).	10 square miles including at least 1.1 linear miles of sandy beach habitat
Estuarine Habitats	To be completed