



# Marine Protected Areas Science 101

Monterey Bay Sanctuary Foundation  
MPA education & outreach training  
October 31 2009





# What are MPAs?



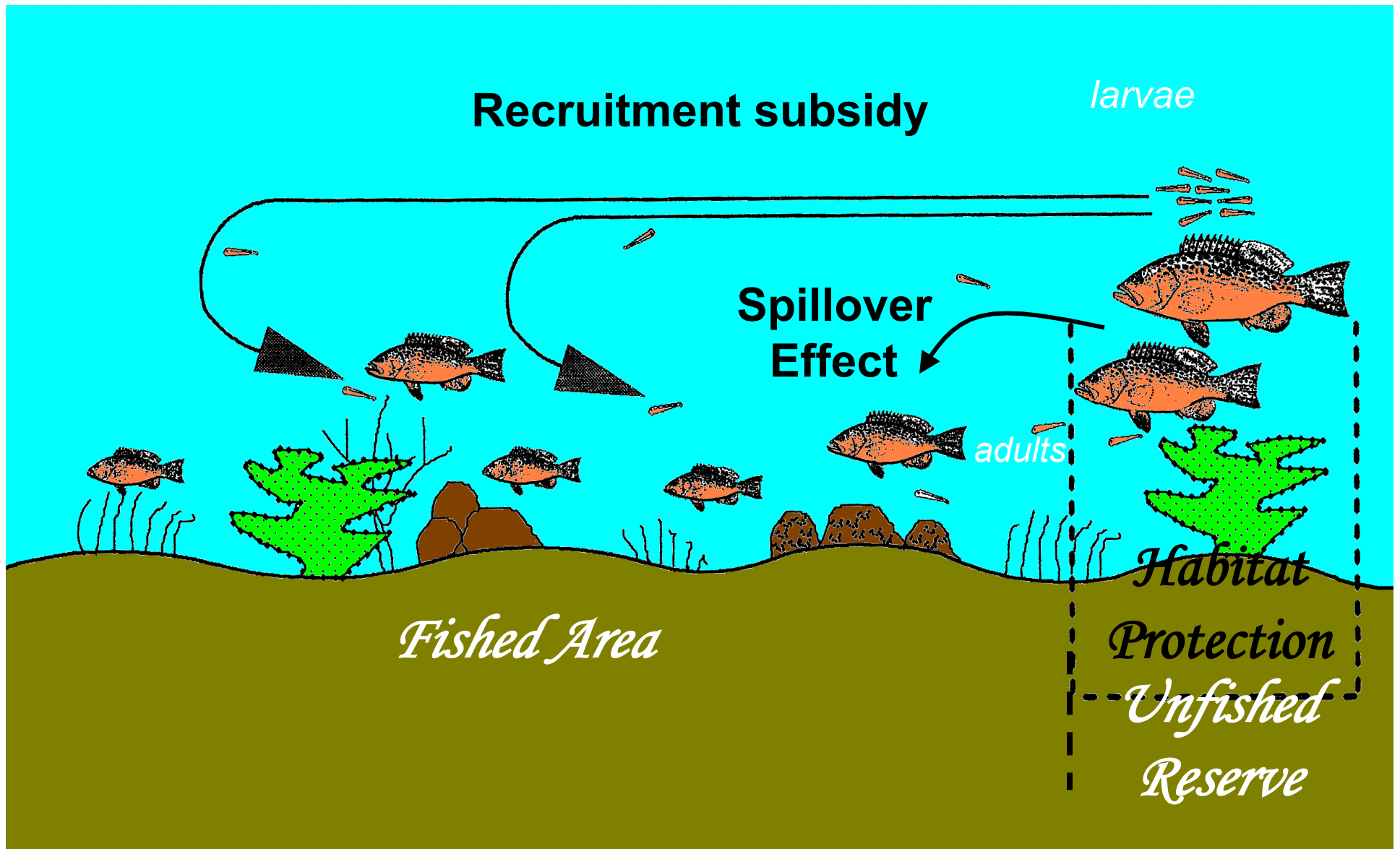
MPAs are separate geographic marine or estuarine areas designed to protect or conserve marine life and habitat

- **State Marine Reserve (SMR):** No take with possible access and use restrictions (e.g., swimming, boating, diving) The most restrictive type of MPA
- **State Marine Park (SMP):** Prohibits commercial extraction, but allows recreational fishing
- **State Marine Conservation Area (SMCA):** Allows for specified commercial and recreational activities
- **State Marine Recreational Management Area (SMRMA):** may restrict some recreational opportunities (often duck hunting areas). Only one in Central coast region

<http://www.dfg.ca.gov/mlpa>

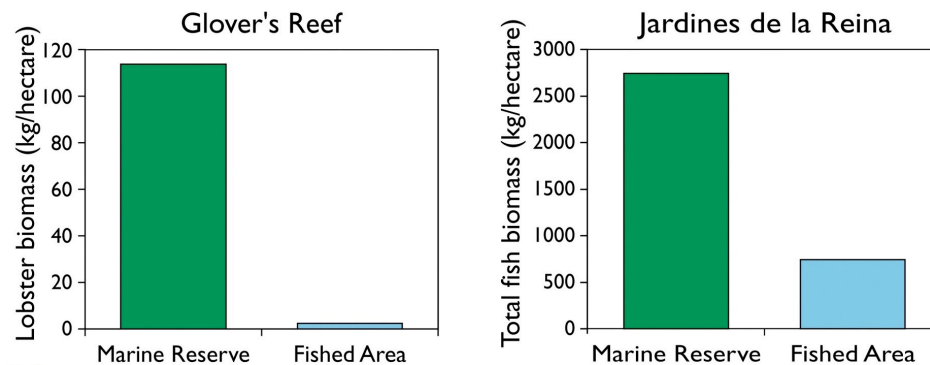


# How no-take marine reserves work



# Benefits of marine reserves

- Higher abundances
- Increase in size
- Increase diversity
- Increase biomass
  - Of targeted (fished) species



Differences between marine reserves and adjacent fished areas in lobster biomass at Glover's Reef (left graph) and total fish biomass at Jardines de la Reina (right graph). Data: Newman et al. (2006) *Ecology Letters*; Acosta (2002) *ICES Journal of Marine Science*; Acosta & Robertson (2003) *Coral Reefs*





# How spillover works

Open

Reserve

10%



lingcod

40%



rockfish

8%



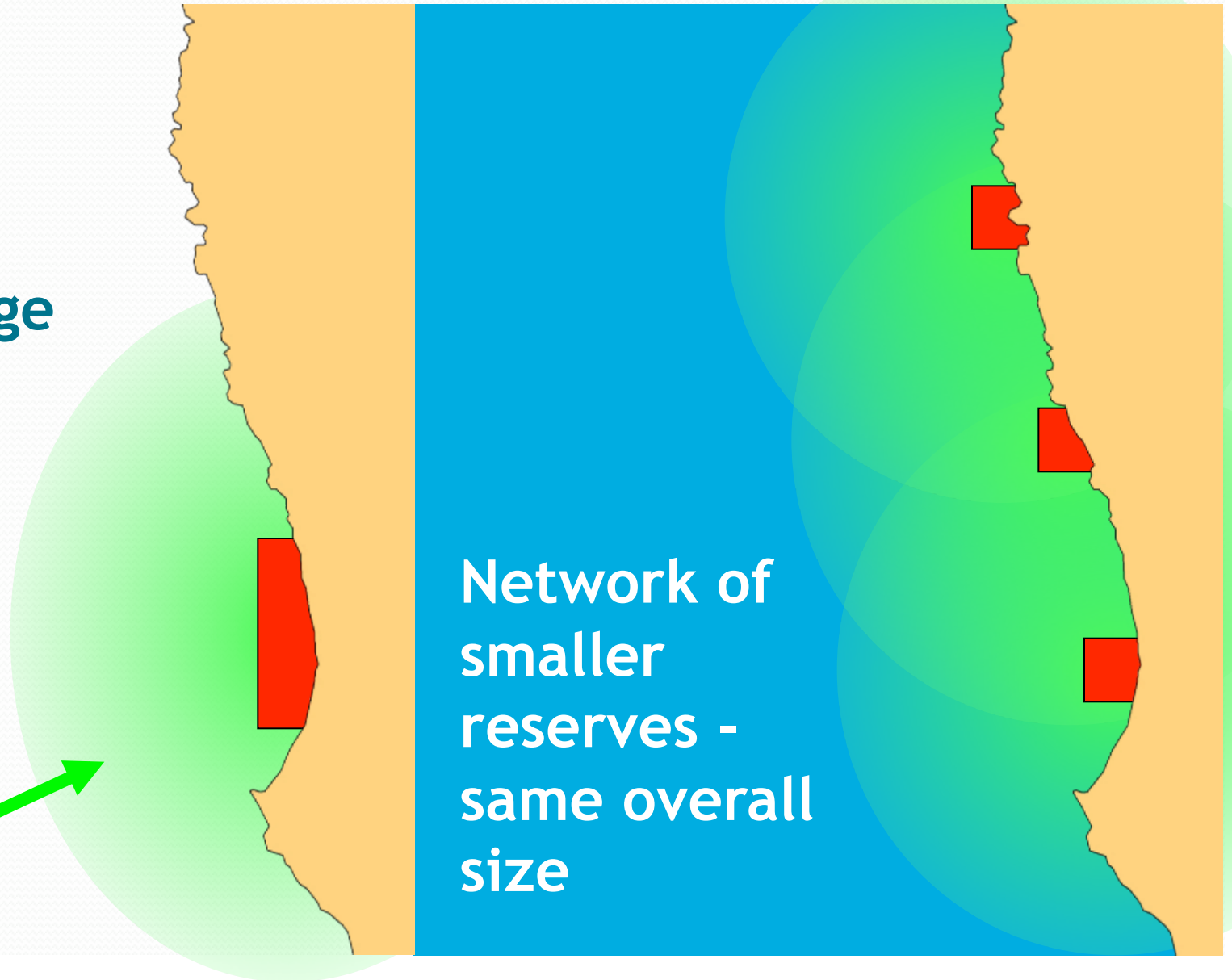
surfperch



# Characteristics of Networks

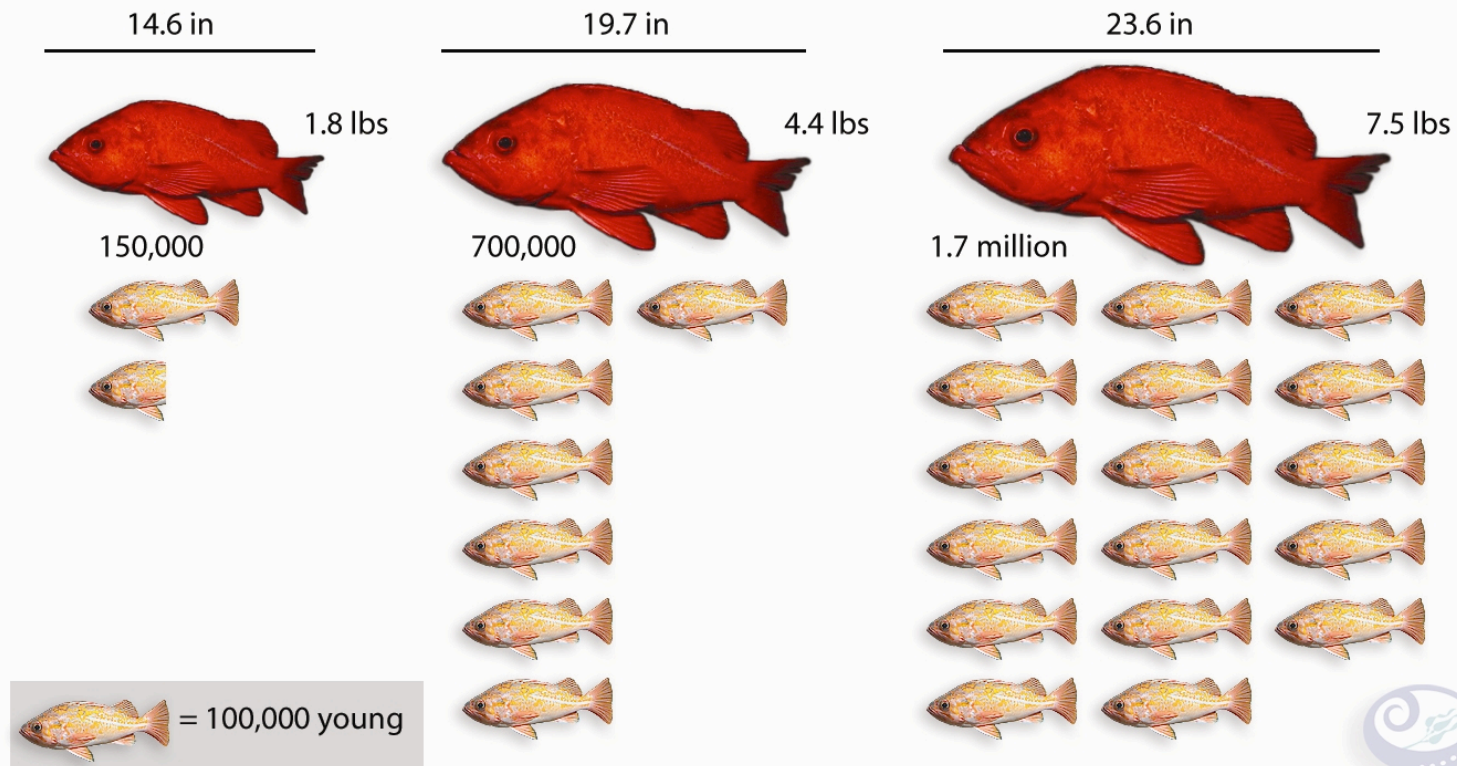
Single large  
reserve

dispersal  
of young



Network of  
smaller  
reserves -  
same overall  
size

# Importance of protecting larger, older fish



Average numbers of young produced by three different sizes of vermilion rockfish.  
Data: Love et al. (1990) NOAA Technical Report



## **Special recognition to our partners in making this event a success:**

*The Ocean Conservancy, Center for Ocean Solutions, Hearst Castle staff, California Fish & Game, California State Parks, Cal Seagrant, PISCO, GreenInfo, & all of our speakers*

## **Now our science panel.....**

*Dean Wendt, Cal Poly*

*Rick Starr, Moss Landing Marine Labs*

*Don Canestro, Ken Norris Marine Reserve*



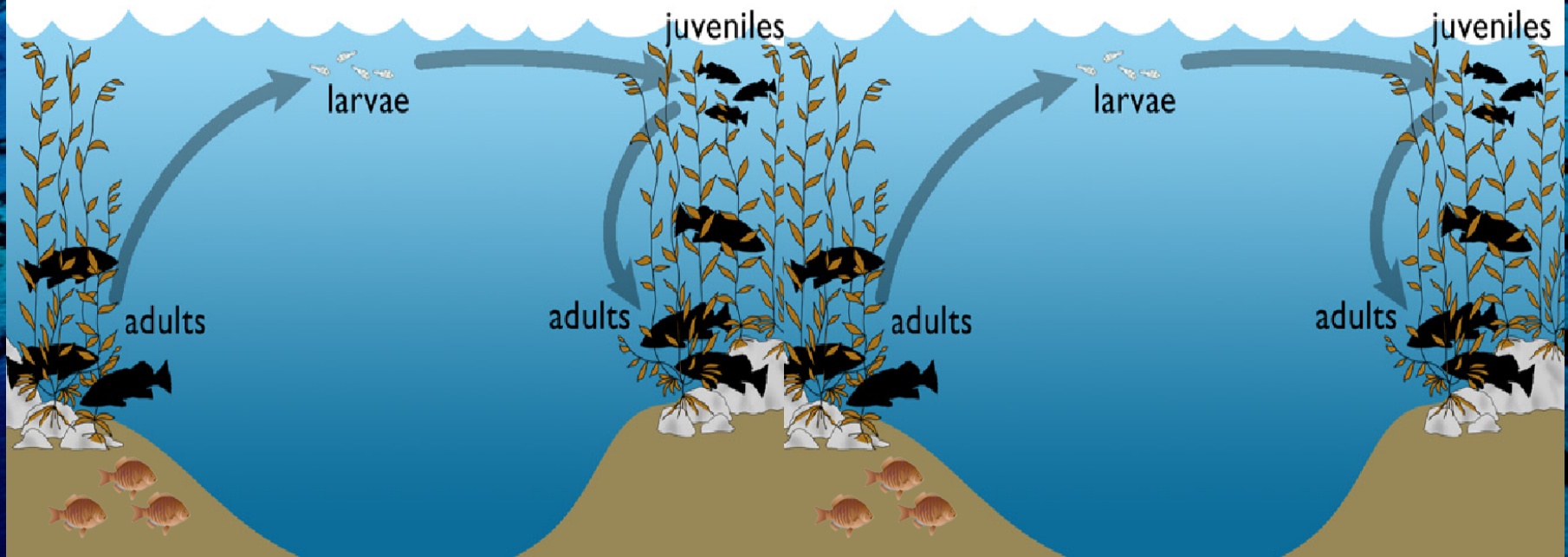
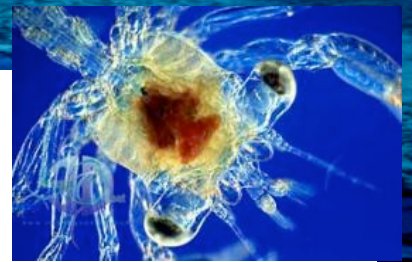
# Species Movements and MPAs





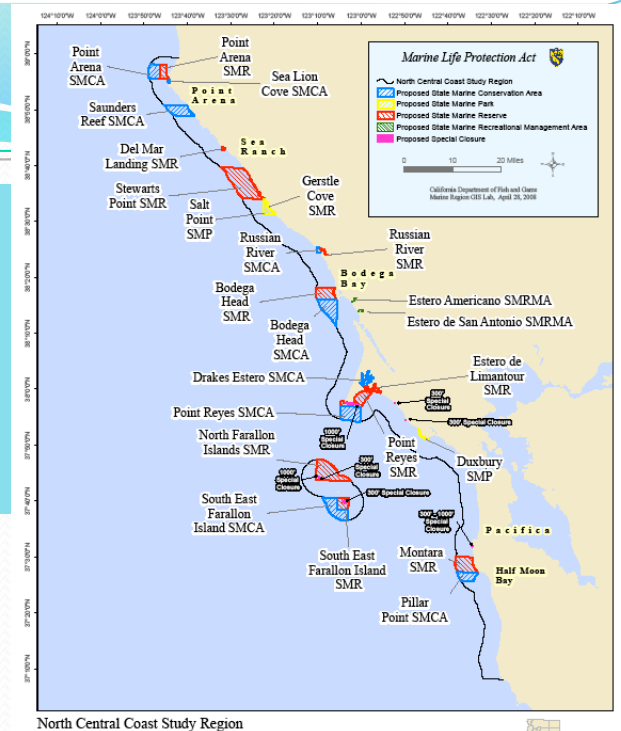
# Connectivity

Many marine organisms live in different places throughout their life cycle





**How much area was set aside off the central coast as MPAs and how much of that area will be closed to fishing?**

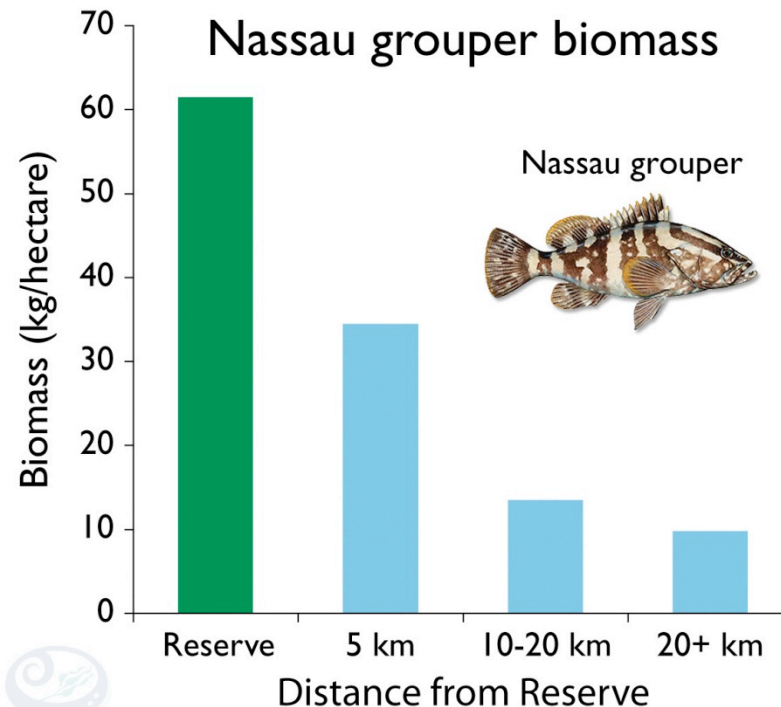


29 MPAs with varying degrees of protection  
Cover 204 sq miles - 18% of state waters

15 are no take

No take (fishing portion) covers 85 sq miles- 7.5% of study region.

# More fish closer to reserve



Biomass of Nassau grouper was highest in the marine reserve and decreased with distance from the reserve. This pattern strongly suggests that grouper from the reserve move into adjacent fished areas. *Data: Sluka et al. (1997) Proceedings of the 8th Annual International Coral Reef Symposium*