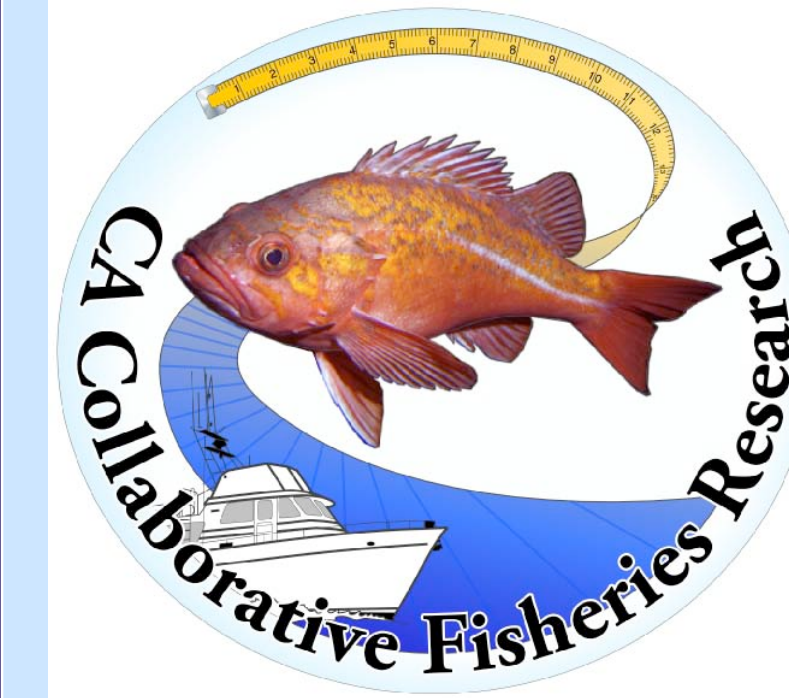


# Getting Hooked: Working with Recreational Anglers to Collect Baseline Data in Marine Protected Areas

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## Project Overview

- In 2007 and 2008, we conducted baseline surveys of 4 new Marine Protected Areas (MPAs) along the central CA coast (**Figure 1**)
- We worked with volunteer recreational anglers and Commercial Passenger Fishing Vessel (CPFV) captains to catch, tag, and release fishes using standardized monitoring protocols
- This project is a collaboration of resource managers, academic scientists, NGOs, and California fishing communities
- Over the course of the project, we worked with 10 CPFV vessels and nearly 400 recreational anglers, completed 82 survey days, and caught nearly 18,000 fishes
- Results are presented for the Point Lobos study area
- The 2007 and 2008 survey data can be used to create a baseline to evaluate inter-annual variability and MPA effects on fish populations over time (**Figure 2**)

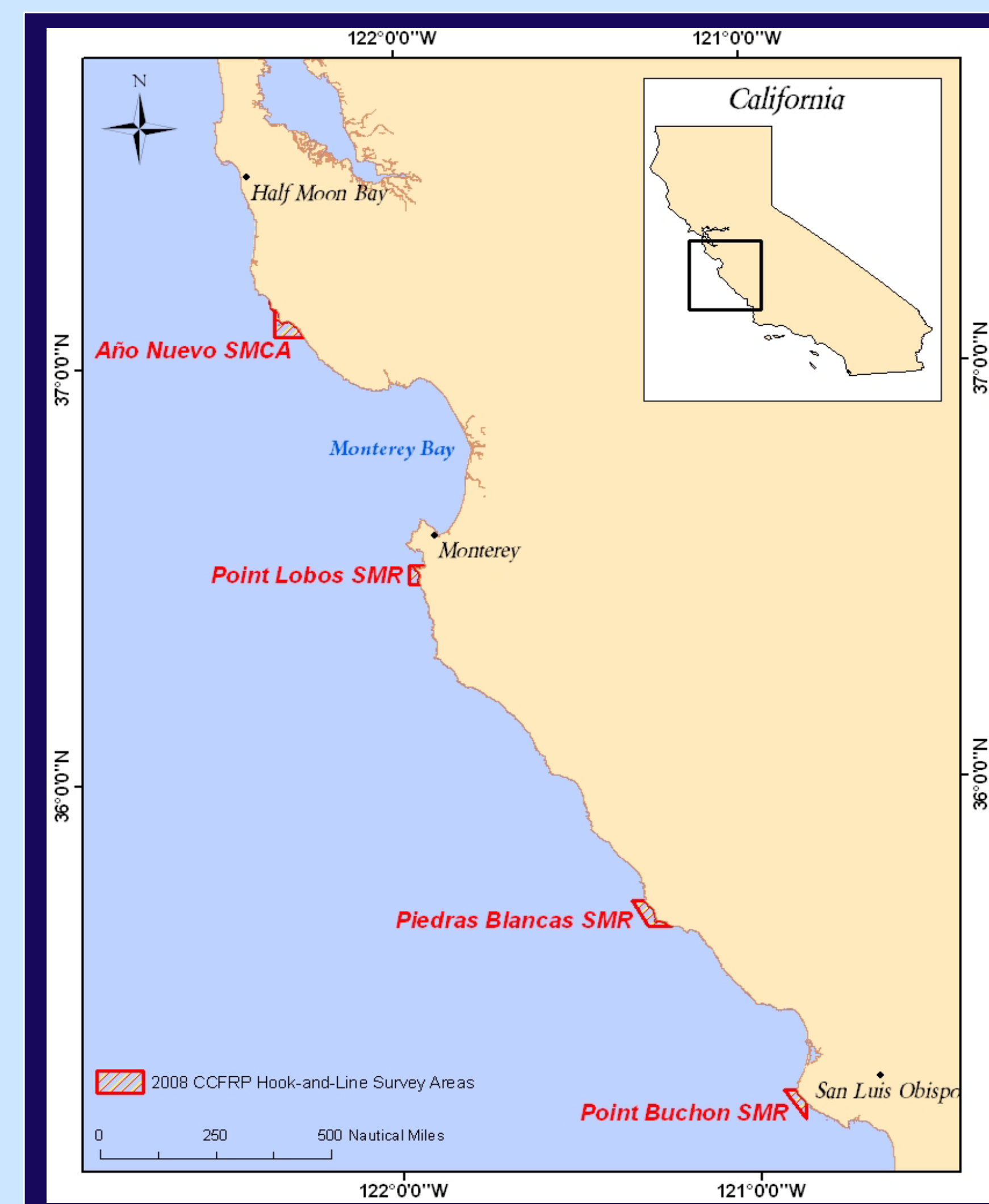


Figure 1. The MPAs (State Marine Reserves, SMRs, and State Marine Conservation Areas, SMCAs) that were surveyed for this project.

## Survey Protocols

- Each MPA and reference pair was sampled 4 days per month for 3 months
- 500m x 500m grid cells were created in each MPA and corresponding reference site based on:
  - Fishermen knowledge
  - Bathymetry (less than 40m)
  - Substrate data (presence of rocky habitat)
- Each survey day, 4 grid cells were chosen at random and sampled aboard CPFVs using hook-and-line fishing techniques (**Photo 1**)
- Volunteer anglers caught all fishes with standardized fishing tackle (**Photo 2**)
- Anglers fished 30- 45 min per grid cell
- Captured fish were measured, tagged, and released (**Photos 3-5**)
- Fishes exhibiting barotrauma were vented using a hypodermic needle and/or were released using a fish descending device (**Photo 6**)

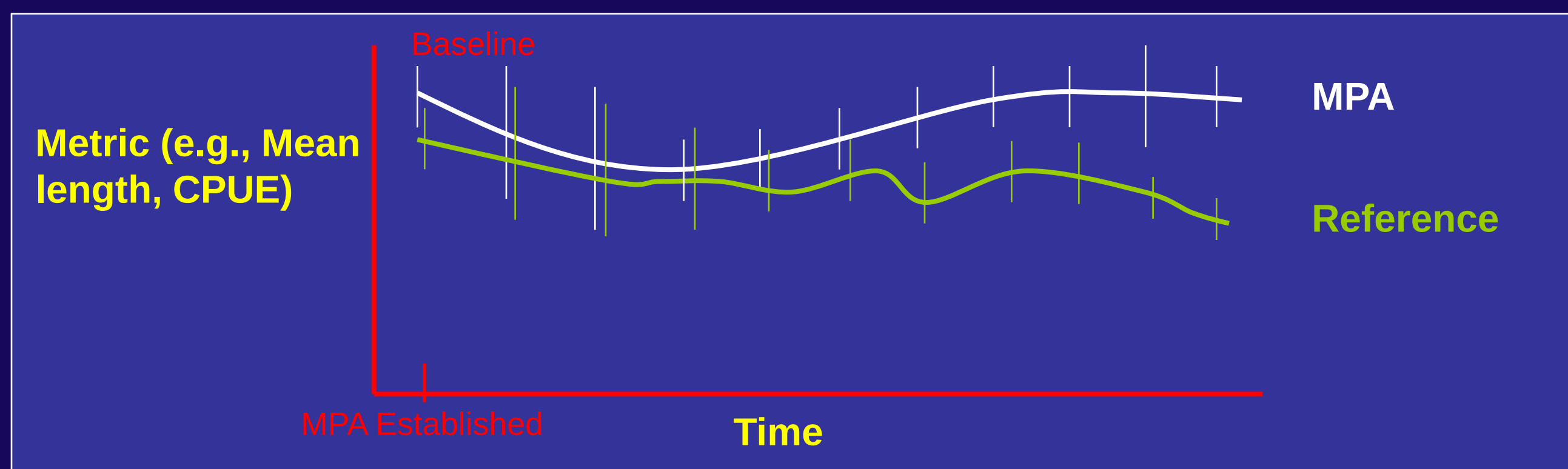


Figure 2. A theoretical model for evaluating trends in fish populations within a MPA relative to a reference site to assess MPA effects. The 2007 and 2008 survey data will serve as a baseline for monitoring.

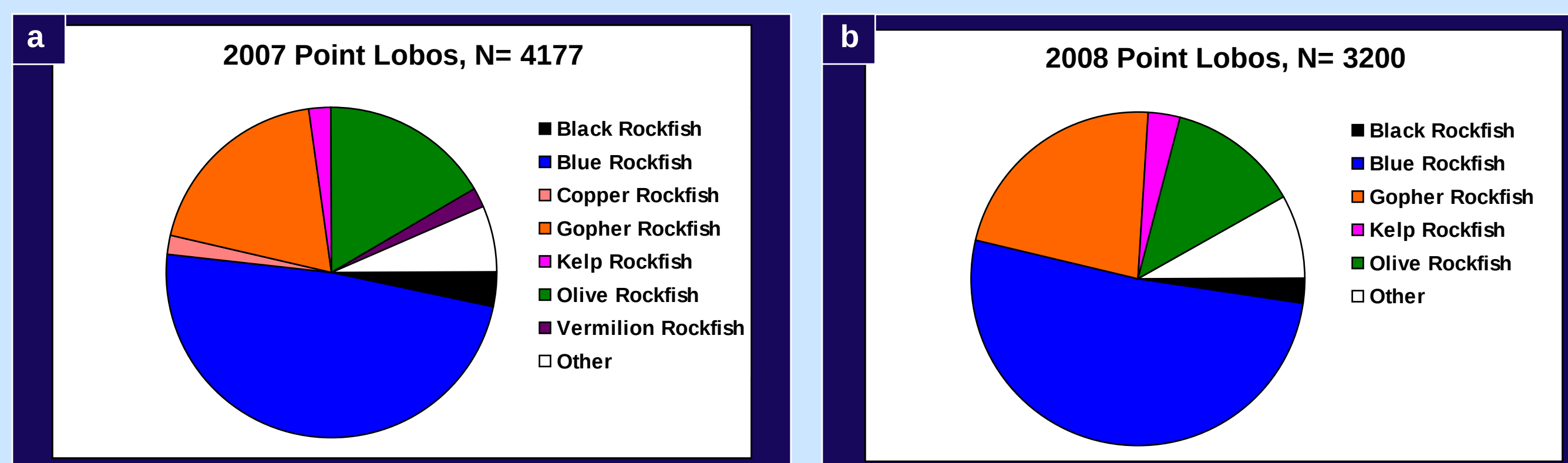


Figure 3. Species composition of fishes caught in the Point Lobos study area in 2007 (a) and 2008 (b).

## Results and Conclusions

- Species compositions of fishes caught in 2007 and 2008 were similar (**Figure 3**)
- Mean total lengths of the most abundant fishes did not significantly change from 2007 to 2008 except for blue and olive rockfishes (**Figure 4**)
- In 2008, mean total lengths of blue and olive rockfishes significantly increased in the MPA, but did not significantly change in the reference site
- Catch rates for the most abundant fishes either remained the same or declined in both the MPA and reference sites
- Overall catch rates (all species combined) declined in both the MPA and reference sites
- Change (or lack of change) in species composition, mean length, or CPUE from 2007 to 2008 cannot be attributed to a MPA effect, a change in fish abundance, or natural temporal variation
- A 3<sup>rd</sup> year of data is needed to create a baseline in order to differentiate between inter-annual variability and MPA effects

For more information about this study, visit:  
<http://seagrant.mlm.calstate.edu/research/ccfrp/> and  
<http://www.slosea.org/collaborative/>

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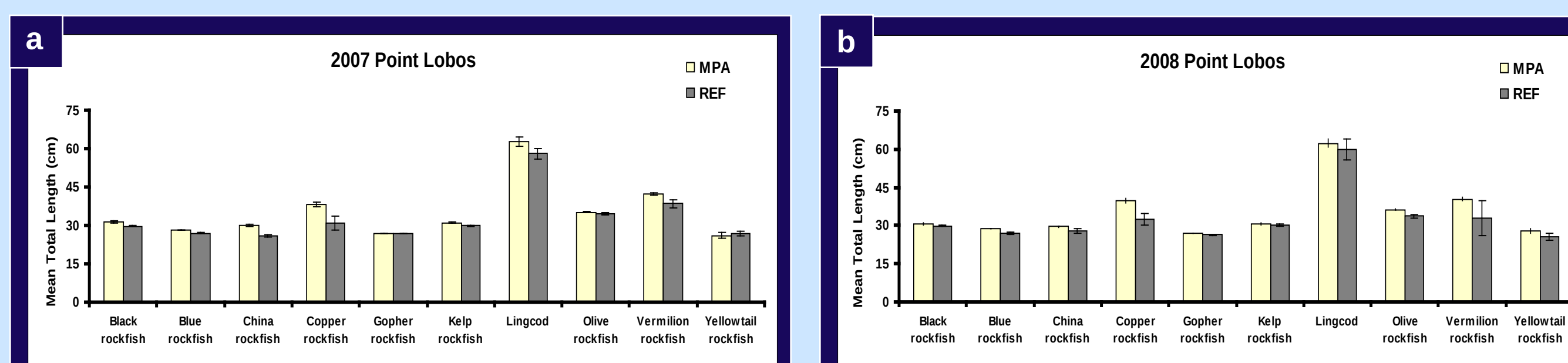


Figure 4. Mean total lengths (cm) of abundant fishes caught in 2007 (a) and 2008 (b) in the Point Lobos MPA and reference (REF) sites.

| Change in Point Lobos CPUEs from 2007 to 2008 |      |      |
|-----------------------------------------------|------|------|
|                                               | ΔMPA | ΔREF |
| Black rockfish                                | -0.1 | -0.8 |
| Blue rockfish                                 | -1.7 | -2.0 |
| China rockfish                                | -0.1 | -0.1 |
| Copper rockfish                               | -0.2 | 0.0  |
| Gopher rockfish                               | -0.7 | -1.0 |
| Kelp rockfish                                 | -0.1 | -0.1 |
| Lingcod                                       | 0.0  | 0.0  |
| Olive rockfish                                | -1.7 | -0.6 |
| Vermilion rockfish                            | -0.2 | -0.1 |
| Yellowtail rockfish                           | 0.0  | -0.1 |
| Average                                       | -0.5 | -0.5 |

**Table 1.** Change in Point Lobos MPA and reference (REF) site 2008 and 2007 (2008-2007) catch per angler hour values (CPUE) for abundant fishes