

The background image is a coastal landscape. In the foreground, there is a dense kelp forest with large, brown, leafy kelp plants growing out of the water. The water is a deep blue. In the middle ground, there are waves breaking on a rocky shore. The background shows a rugged coastline with cliffs and hills under a clear blue sky.

Marine Protected Area Monitoring: IMPACT Submersible Baseline Survey CA Collaborative Fisheries Research Program

Rick Starr

California Sea Grant Extension Program
Moss Landing Marine Laboratories

Baseline Studies



- 5 Peer-reviewed Projects Funded for Baseline Surveys of Central CA MPAs
 - Intertidal
 - SCUBA
 - Socio-economic
 - **Submersible**
 - **Collaborative Fishing**



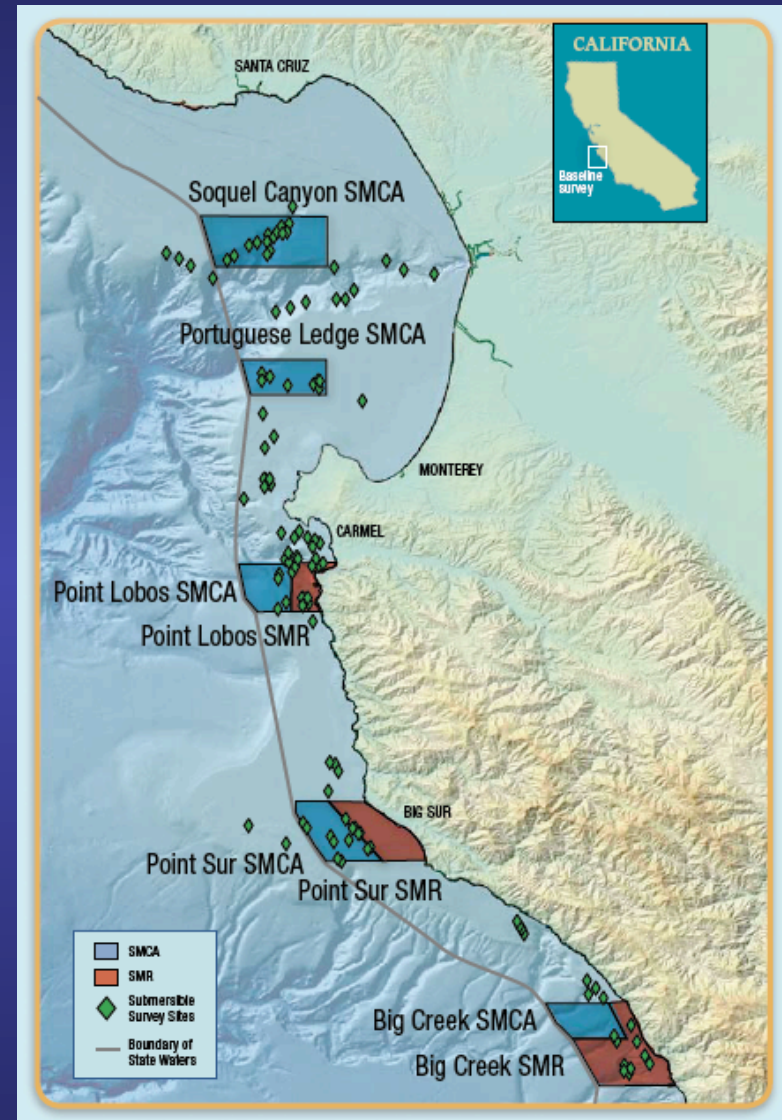
IMPACT Submersible Baseline Survey 2007-2008

- Mary Yoklavich and colleagues at the National Marine Fisheries Service
 - MPAs
 - Reference sites
- Direct observations from manned submersible
 - Delta Sub



Delta Dives in Baseline Survey

- 8 areas
- 337 transects
- 164,000 square meters of seafloor habitat



2007 Results



- 64,000 fish recorded
- 118 species

- 170 dives
- 342 transects



2007 Results

- 157,000 patch invertebrates
- 9,000 structure forming inverts (corals, sponges)
- 75 invertebrate taxa



Club-tipped Anemone

Brian Tissot



Hydrocorals

Tory O'Connell



Common Barrel sponge

Rick Starr



CA Collaborative Fishing Research Program (CCFRP)

- Dean Wendt, Cal Poly San Luis Obispo/ SLOSEA
- Rick Starr, Moss Landing Marine Laboratories/ CA Sea Grant
- Collaborative Research Program:
 - Improve Resource Management
 - Involve Local Communities
 - Area-based management
 - Baseline Monitoring



CCFRP MPA Monitoring



- Objectives
 - Develop rigorous scientific monitoring protocols
 - Generate baseline comparisons between MPA and reference sites
 - Engage the fishing community in MPA monitoring



CCFRP MPA Monitoring



Recreational Hook-and-Line 2007, 2008 and 2009



- Año Nuevo SMCA
- Point Lobos SMR
- Piedras Blancas SMR (2008 and 09 only)
- Point Buchon SMR

Commercial Trapping 2008 and 2009



- Año Nuevo SMCA (2008 only)
- Point Lobos SMR
- Piedras Blancas SMR
- Cambria SMCA



Hook-and-Line Sampling



- 4 Days/ Month (each MPA) for 3 Months/Year
 - 2 in the MPA
 - 2 in the corresponding reference site



Fishing Protocols





Tagging Protocols



Photo by R. Robinson





Hook-and-Line Summary



- 118 Days of Sampling
- 1,123 Volunteer Days
- 12 CPFVs
- 14 Captains
- 22,310 fishes
- 45 species, 25 genera





Trapping Sampling



- 4 Days/ Month (each MPA), 3 Months/Year
 - 2 in the MPA
 - 2 in the reference site





Commercial Protocols



10 Traps per Set



One Pint of Squid





Commercial Protocols





Trapping Summary



- 3,767 Fishes
- 4,191 Invertebrates



- 67 Days of Sampling
- 5 Captains



Rockfishes (*Sebastes spp.*) Caught



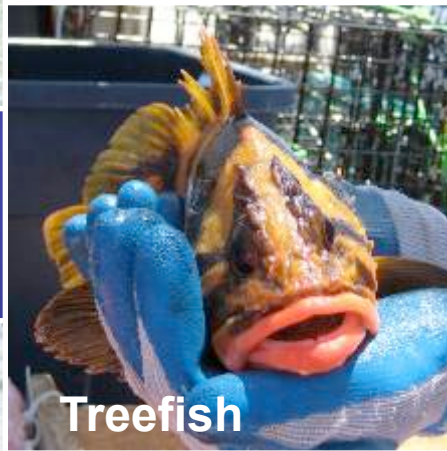
Gopher Rockfish



Black-and-Yellow



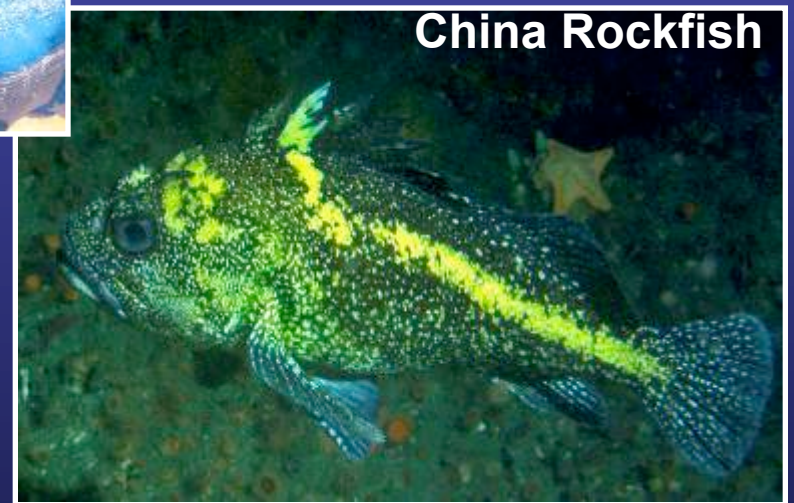
Treefish



Brown Rockfish



China Rockfish





Rockfishes (*Sebastes spp.*) Caught



Copper Rockfish



Kelp Rockfish



Vermilion Rockfish



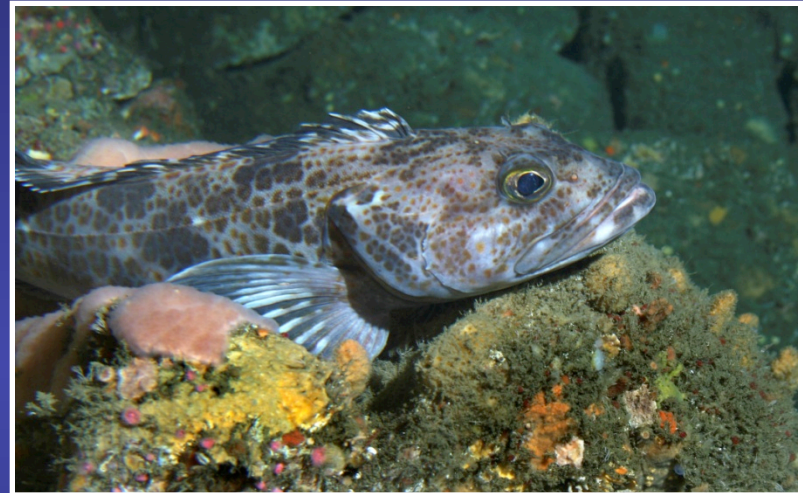
Other Caught Fishes



Kelp Greenling (*Hexagrammos decagrammus*)



Lingcod (*Ophiodon elongatus*)





Other Caught Fishes



Sea Perch



Cabezon (*Scorpaenichthys marmoratus*)





Invertebrate Catch (Traps)

Crabs:

Brown Rock, Cryptic Kelp, Decorator, Dungeness, Northern Kelp, Red Rock, Slender, Sharpnose, Spider

Decorator Crab



Dungeness Crab



Red Rock Crab



Northern Kelp Crab



Invertebrate Catch (Traps)



Sea Stars:

6-armed, Blood, Bat, Giant Pink, Giant Spined, Leather, Rainbow, Short Spined, Sunflower

Other:

Brittlestars, Chiton, Snails, Whelk, Urchin



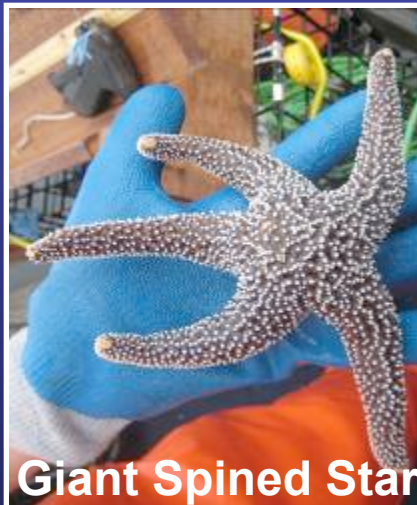
Leather Star



Giant Pink Star



Gumboot Chiton



Giant Spined Star



Bat Star

Acknowledgements

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- The Ocean Protection Council
- Packard Foundation
- Pacific States Marine Fisheries Commission
- The Resource Legacy Fund Foundation
- Universities and others



Questions?



For more information:

- <http://seagrant.mlm1.calstate.edu/research/ccfrp/>
- <http://seagrant.mlm1.calstate.edu/research/submersible-surveys/delta-sub/>
- <http://www.slosea.org/collaborative/>