

California Management of Forage Fish Species

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Overview

- State Management Authorities
- Major forage species under state management (Market squid and Pacific herring)
- State Objectives Relative to Forage Fish
- Fish and Game Commission policies





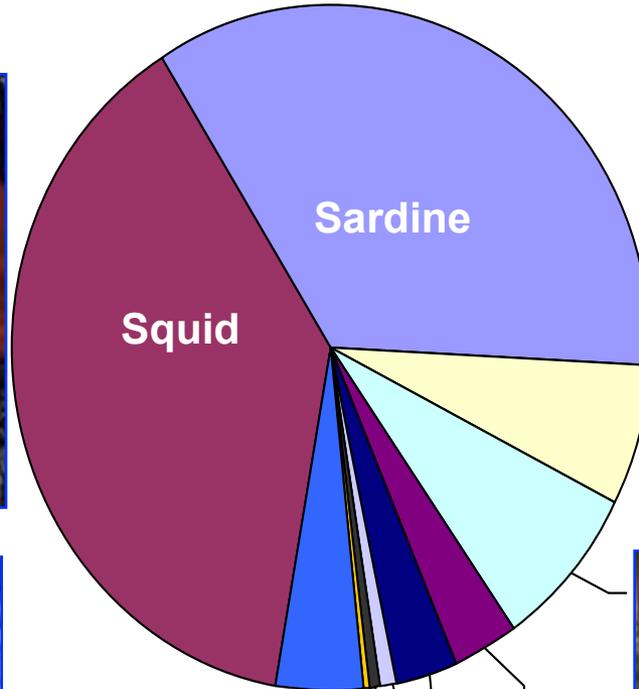
State Management Authorities



- Guided by the Marine Life Management Act since 1998
 - More management authority to the Fish and Game Commission (particularly for commercial fisheries)
 - Highest priority is on sustainable resources
 - Ecosystem-based management founded in sound science – consider needs of communities
 - Direction for emerging fisheries
 - Use Fishery Management Plans



2009 Important Commercial Fisheries

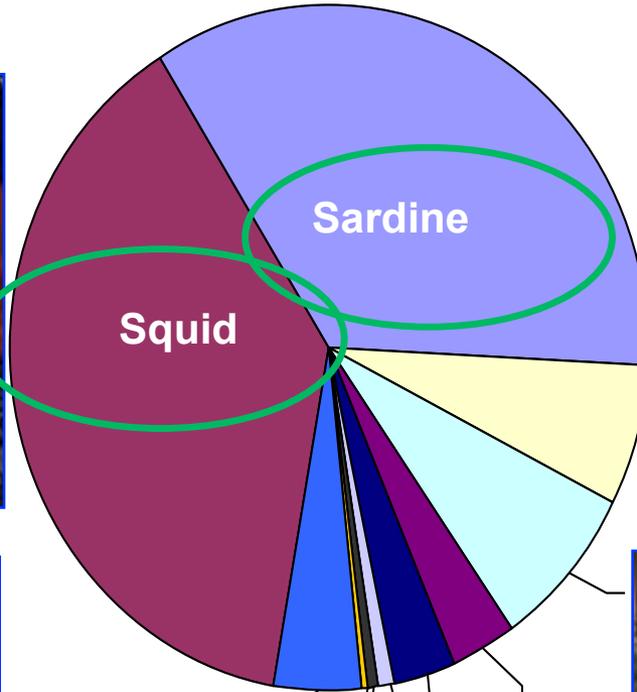


Dungeness Crab

Groundfish

- Urchin
- Mackerel
- Bonito
- Salmon
- Shrimp

2009 Important Commercial Fisheries



Dungeness Crab

Groundfish

Salmon

Shrimp

Urchin

Mackerel

Bonito

Market Squid

AK

Canada

Range

US

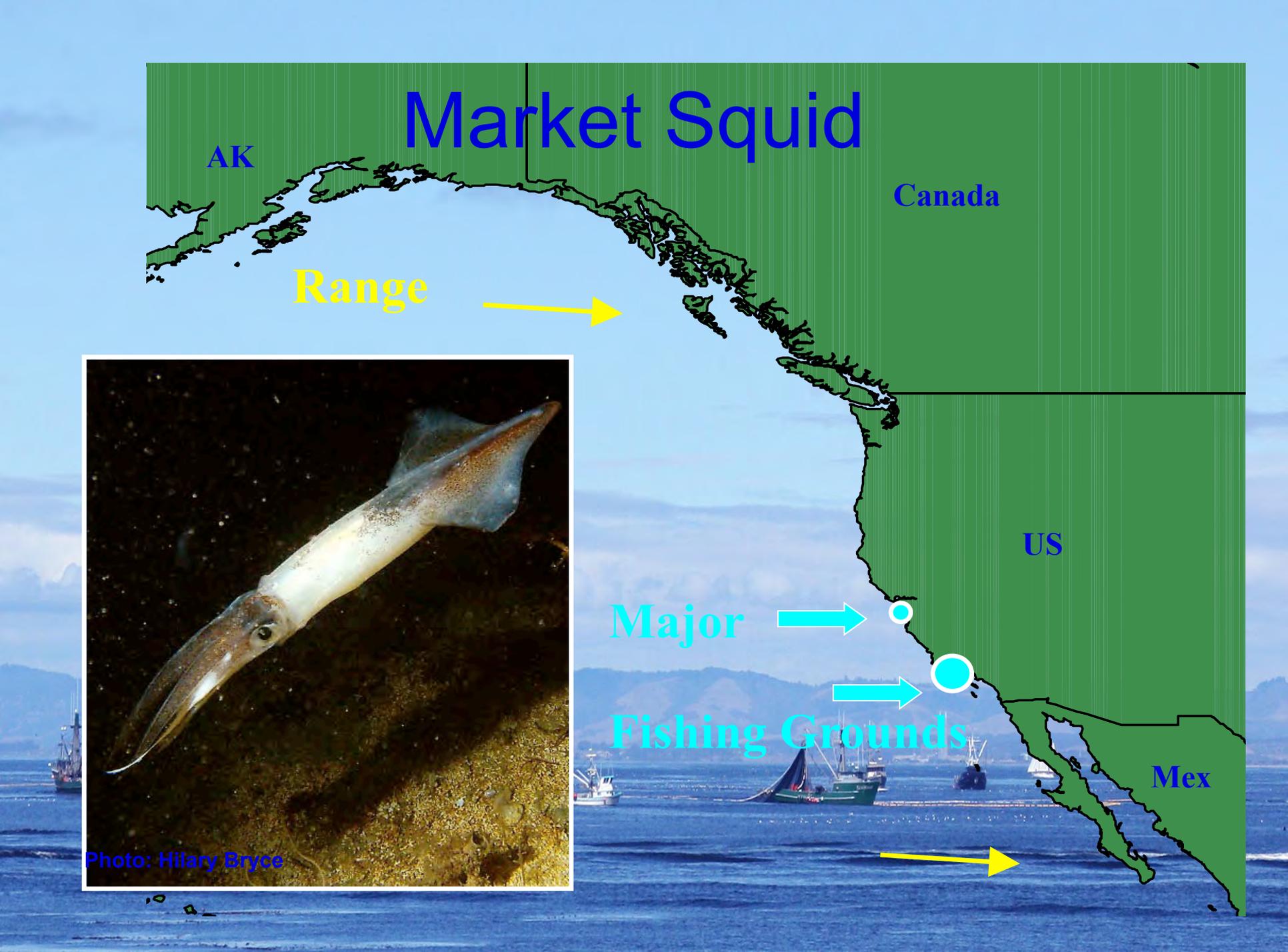
Major

Fishing Grounds

Mex



Photo: Hilary Bryce



Market Squid Management



FINAL MARKET SQUID FISHERY MANAGEMENT PLAN



25 March 2005

STATE OF CALIFORNIA
RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
MARINE REGION



Market Squid Management

MSFMP Goals

- Ensure long-term resource conservation and sustainability
- Reduce the potential for overfishing
- Management responsive to environmental and socioeconomic changes and ecosystem needs



FINAL MARKET SQUID FISHERY MANAGEMENT PLAN

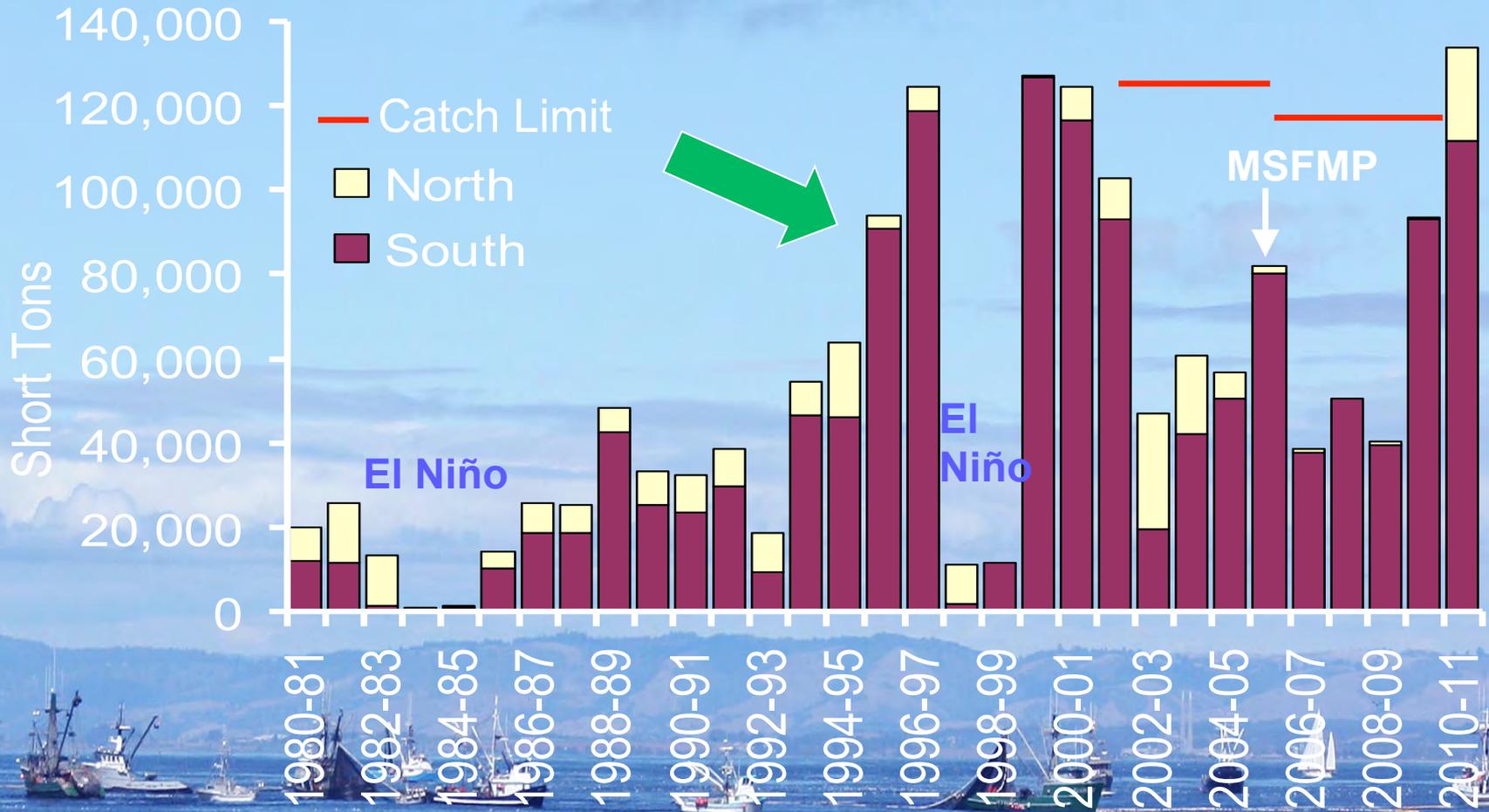


25 March 2005

STATE OF CALIFORNIA
RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
MARINE REGION



Landings: Northern and Southern CA by Season



MSFMP Tools



- Seasonal catch limit – prevent over-expansion
- Weekend closures - uninterrupted spawning
- Lights shields/ limit wattage - to minimize effects on coastal communities (birds and people)
- Monitoring program – monitor fishery/ resource
- Restricted Access – limit participation
- Spatial closures – MPAs, gear restrictions and to offer seabird protection



Pacific Herring Fishery

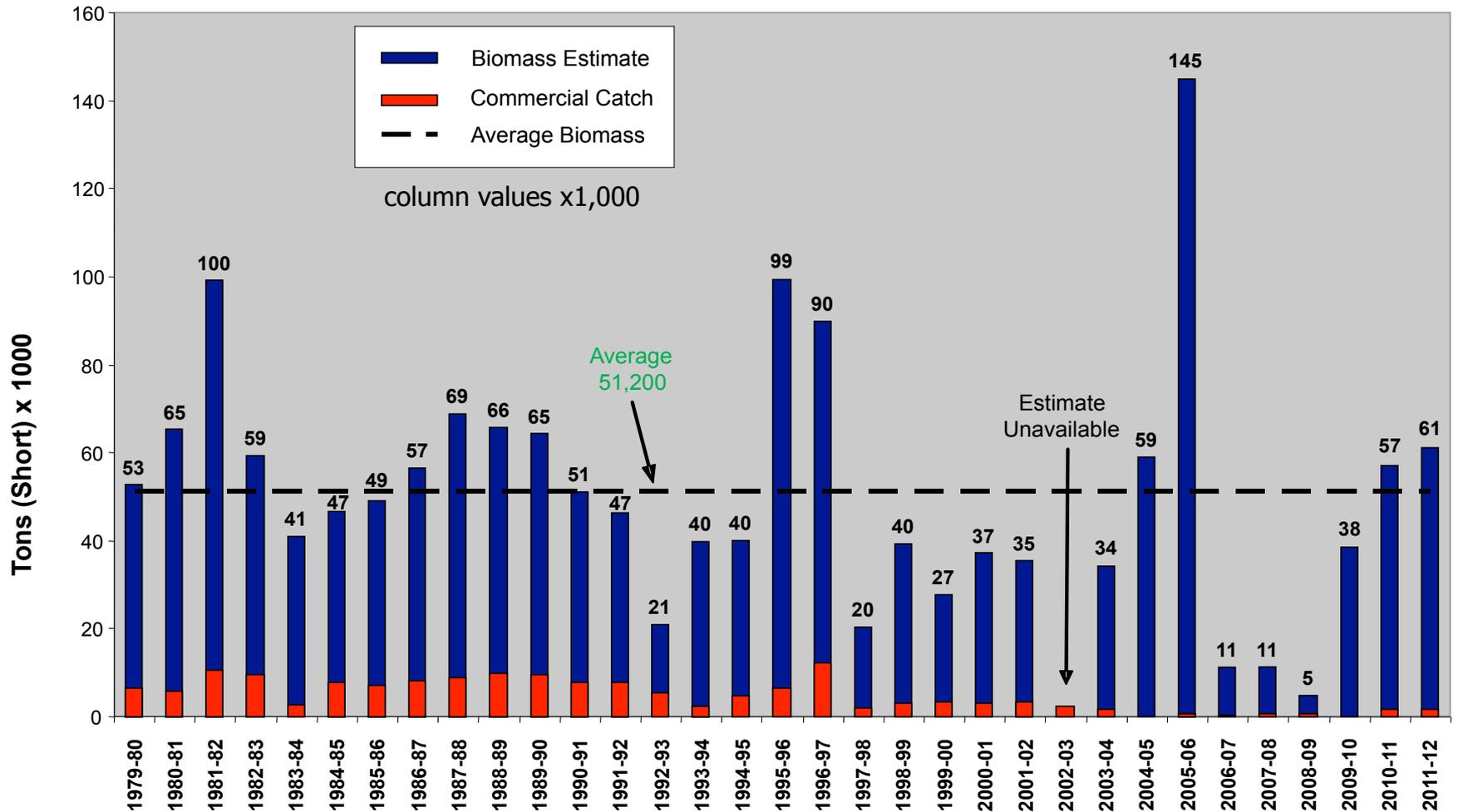
Management

- 🐟 Primary spawning and fishing areas: San Francisco, Tomales, and Humboldt Bays, & Crescent City Harbor
- 🐟 DFG has conducted annual assessments of the herring spawning population in San Francisco Bay since 1972
- 🐟 Fishing quotas are intended to provide for a sustainable fishery and are limited to 20% maximum take of the spawning biomass
- 🐟 Harvest levels are based on a peer reviewed model, ocean conditions, growth rates, year-class strength and recruitment
- 🐟 Quotas are the primary management tool -- with monitoring, seasonal closures and restricted access



Pacific Herring Fishery

San Francisco Bay Pacific Herring Biomass Estimates and Commercial Catch
1979 - 2012



State Objectives Relative to Forage Fish

- Recognized need to protect forage fish (managed or unmanaged)
- No new fisheries for forage species without sufficient science so they can be sustainable
- Existing fisheries are part of ecosystem-based management



Yellowtail rockfish, *Sebastes flavidus*, young-of-the-year, Platform Irene, © Rick Starr



Fish and Game Commission Policies

- Emerging Fisheries
- New DRAFT Fish and Game Commission Policy on Forage Fish
 - Final Draft at Marine Resources Subcommittee – August 10, 2012
 - Collaborative effort with FGC, CDFG, Industry and Environmental Organizations
 - Discussion – Fish and Game Commission meeting, October 3-4, 2012 Sacramento



Yellowtail rockfish, *Sebastes flavidus*, young-of-the-year, Platform Irene, © Rick Starr





Marine Region Activity

- 1998: Five staff for squid
 - Market Squid Logbooks
 - Fishery-dependent samples
 - Numerous publications
- 2002: Squid project absorbed into CPS project due to staffing shortages
- 2005-06: Maintain a Restricted Access program
- 2011-12: Seven staff for CPS (squid) and HMS
 - Logbook and dock-side monitoring continues





Pacific Herring Fishery

Status of the Population

-  The 33 year average spawning biomass for San Francisco Bay is 51,200 tons. (2011-12 season = 61,000 tons)
-  The fishery has shown 3 years of increasing biomass following a historic low of 4,800 tons in 2009-2010
-  Ongoing age structure concern: few fish over 4 years of age. As a result DFG will continue to recommend conservative quotas for stock rebuilding (4% of stock)
-  The Department is currently working to develop a fishery model for Pacific herring



Coastal Pelagic Species (CPS)

- Pacific Sardine
Sardinops sagax



- Pacific Mackerel
Scomber japonicus



- Jack Mackerel
Trachurus symmetricus



- Northern Anchovy
Engraulis mordax



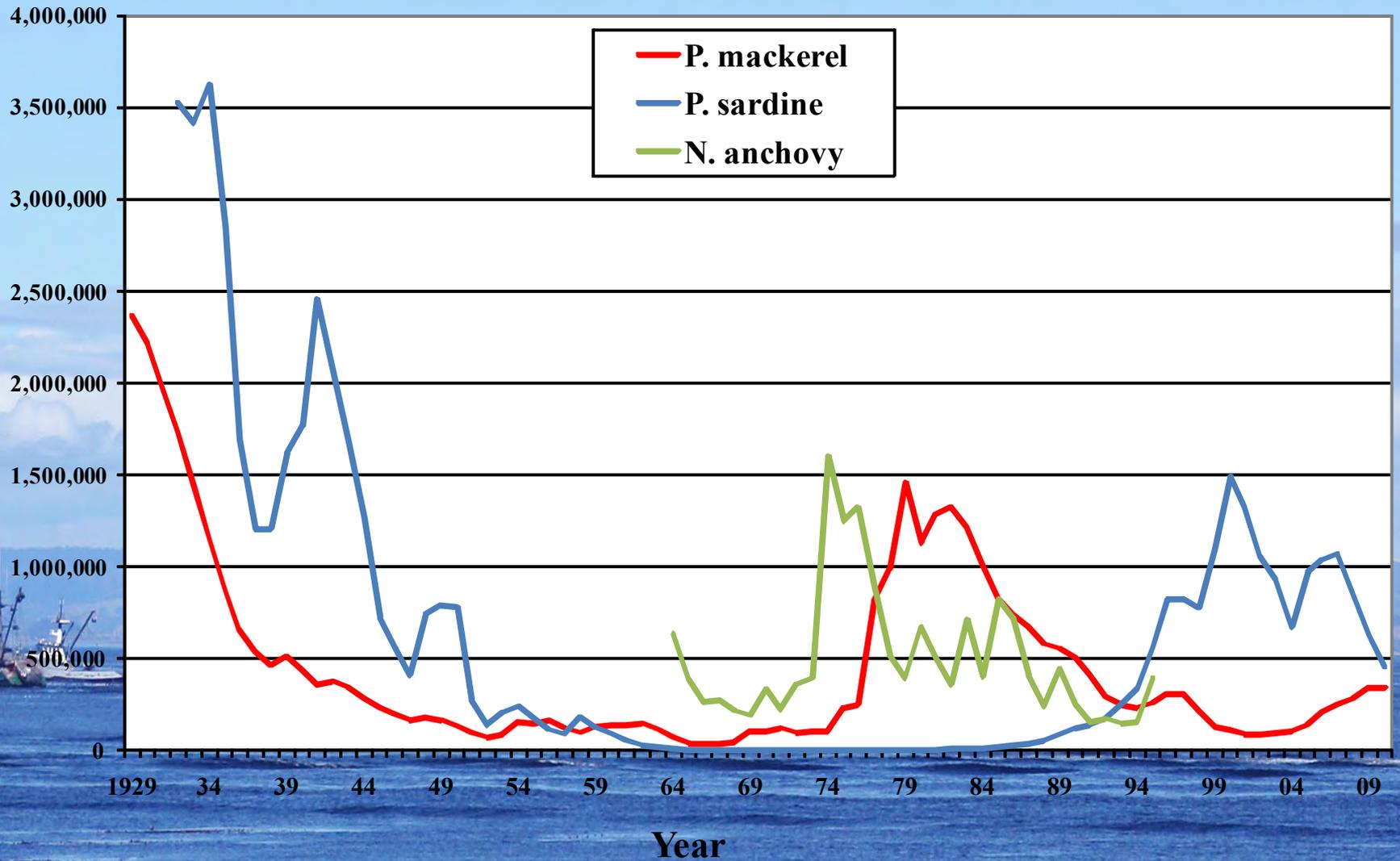
- Market Squid
Loligo opalescens





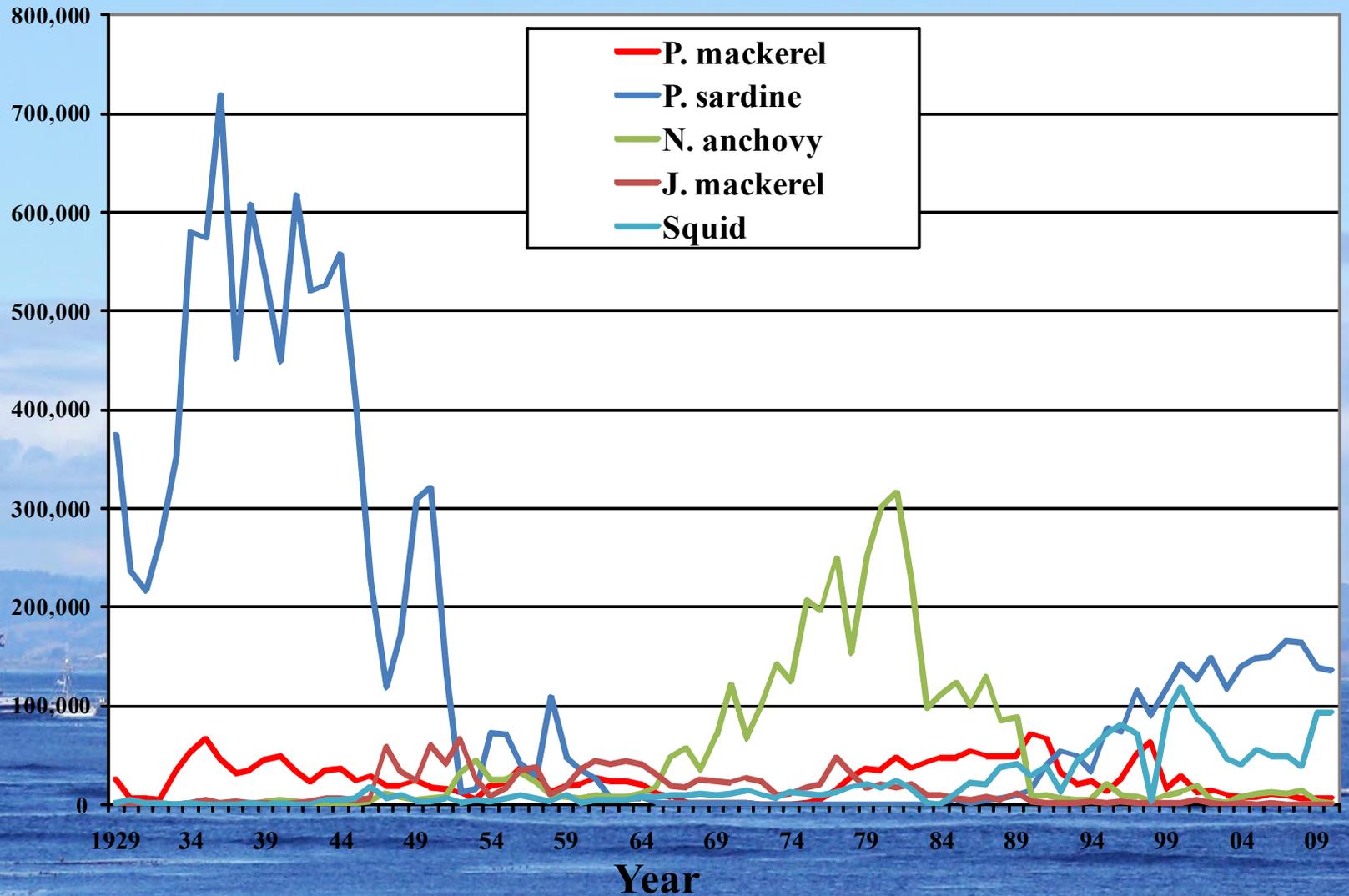
CPS Biomass Time Series

Biomass (mt)



CPS Catch Time Series

Catch (mt)



Pacific Fishery Management Council

Actions on Forage Fish

June 2012

- Established an objective for their approach to forage species

*It is the Council's intent to **recognize the importance** of forage fish to the marine ecosystem off our coast, and to **provide adequate protection** for forage fish. We declare that our objective is to **prohibit the development of new directed fisheries on forage species** that are not currently managed by our Council, or the States, until we have an adequate opportunity to **assess the science** relating to the fishery and any potential impacts to our existing fisheries and communities.*



Pacific Fishery Management Council

Actions on Forage Fish

June 2012



- Reaffirm priority that the Ecosystem Plan Development Team completes Draft Fishery Ecosystem Plan (FEP) for Council
- Revise the federal List of Fisheries with input from the states and include application guidelines in the FEP [& into the LOF federal regulations?]
- EPDT and other advisory bodies work on process of amending fishery management plan(s) to incorporate forage species

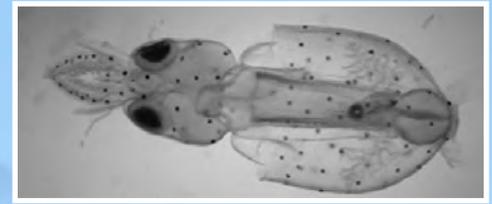


Pacific Fishery Management Council Timeline on Forage Fish

- June 2012 – adopt objective and plan of action
- November 2012 – Ecosystem Plan Development Team delivers Draft Fishery Ecosystem Plan to Council for review and comments
- March 2013 – Council receives revised Plan and adopts final Plan
- March 2013 – EPDT completes revision of List of Fisheries
- June 2013??– EPDT and other advisory bodies work on process of amending fishery management plan(s) to incorporate forage species



Development of MSFMP

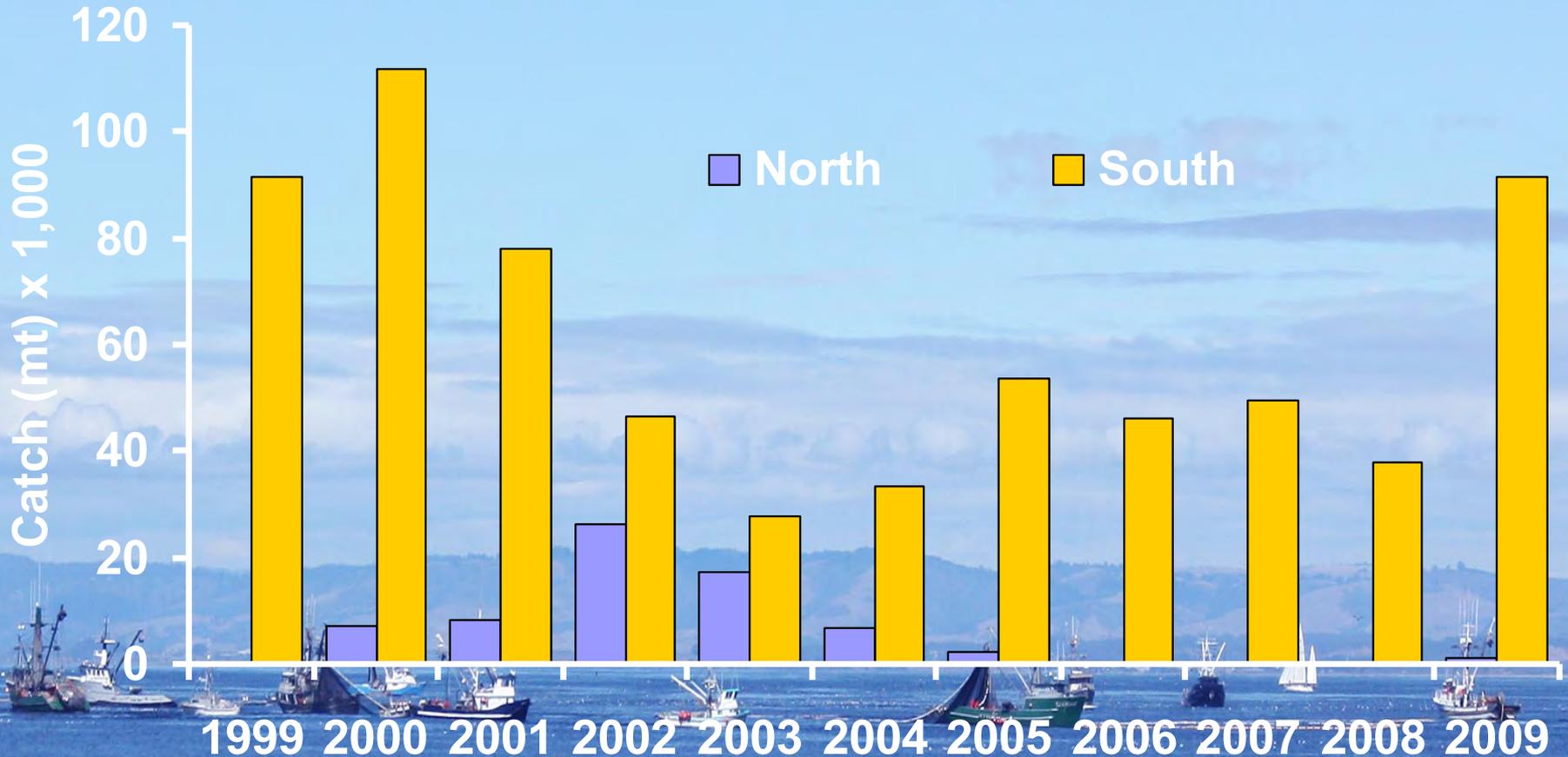


- 1997: SB 364 – Interim laws; Moratorium on vessels
- 1998-2000: Two advisory committees
 - OSFAC – Squid Fishery Advisory Committee
 - OSRSC – Squid Research Scientific Committee
- 1998: DFG Monitoring and Research Program
- 2000: Interim measures by Commission
- 2001: SB 209 - Management to Commission
- 2001: Report to the Legislature
- 2001: Notice of Preparation filed; 2 public meetings
- 2002: Preliminary Draft MSFMP
- 2003: 2nd Draft MSFMP
- 2004: 3rd Draft MSFMP (April); 4th adopted December.



Market Squid

CA Landings North and South of Pt. Conception



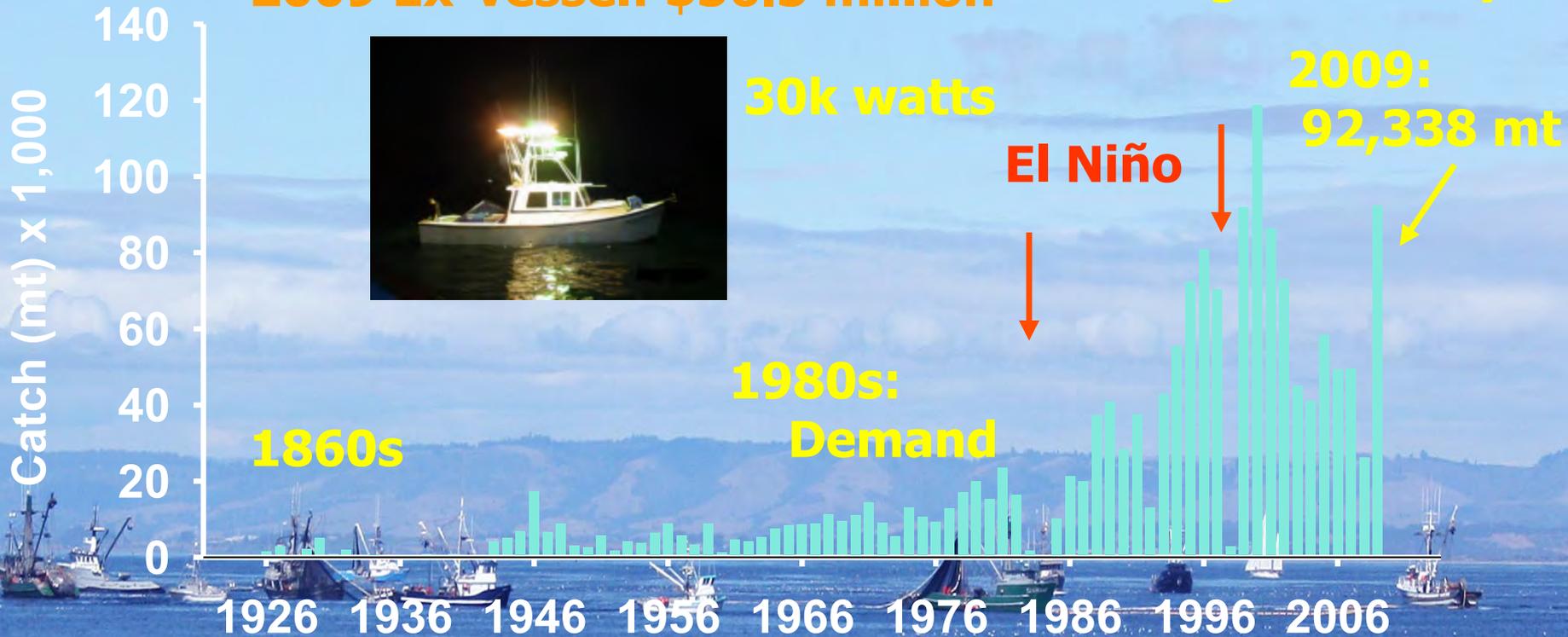
Data from CDFG Landing Receipts

Market Squid

Annual CA Landings 1926–2009

2009 Ex-vessel: \$56.5 million

Largest fishery



Data from CDFG Landing Receipts

Coastal Pelagic Species (CPS)^{CA}

- Ecology
 - Schooling
 - Forage fish
 - Fluctuate
- Fishery
 - Gear
 - Ports
 - Use
- Management
 - Federal FMP
 - State FMP
 - Permits

