



Commercial Fisheries in the South Coast's Marine Protected Areas

Researchers from the California Department of Fish and Wildlife (CDFW) used landings data from CDFW's Commercial Fisheries Information System to characterize the status of commercial fishing in the South Coast which encompasses California's jurisdictional waters (0-3 nautical miles from shore) from Point Conception in Santa Barbara County to the US-MEX border, including state waters around offshore Islands, from 1992-2015. The analysis includes an overview of all commercial fisheries with additional focus on specific species, referred to as fisheries of interest (FOIs) and gear types (Table 1).

Table 1- South Coast Fisheries of Interest

Commercial Fishery	Included Species	Gear Type(s)
Halibut	California Halibut	Hook and line; bottom trawl
Coastal Pelagic Species	Pacific Mackerel, Jack Mackerel, Pacific Sardine, Juvenile Sardine, and Northern Anchovy	Purse seine net
Lobster	California Spiny Lobster	Trap
Squid	Market Squid	Brail; purse seine net
Nearshore Finfish	California Sheephead, Copper (Whitebelly) Rockfish, Black and Yellow Rockfish, Black Rockfish, China Rockfish, California Scorpionfish, Cabezon, Gopher Rockfish, Brown Rockfish, Kelp Greenling, Monkeyface Prickleback, Olive Rockfish, Grass Rockfish, Copper Rockfish, Treefish, Kelp Rockfish, Blue Rockfish, Bolina Group Rockfish, Gopher Group Rockfish, Black/Blue Group Rockfish, Nearshore Group Rockfish, Deep Nearshore Group Rockfish	Hook and line; longline; trap
Rock Crab	Red, Yellow, Brown, and unspecified Rock Crabs (Dungeness Crab not taken in South Coast)	Trap
Sea Cucumber	Giant Red, Warty, and unspecified Sea Cucumbers	Dive; bottom trawl
Prawn	Spot Prawn	Trap
Urchin	Red and Purple Sea Urchins	Dive

Commercial Landings and Ex-Vessel Revenue

Total landings, ex-vessel revenue, and the number of active fishermen within the commercial fishing industry can fluctuate within a year, and through time, as a multitude of factors come into play.

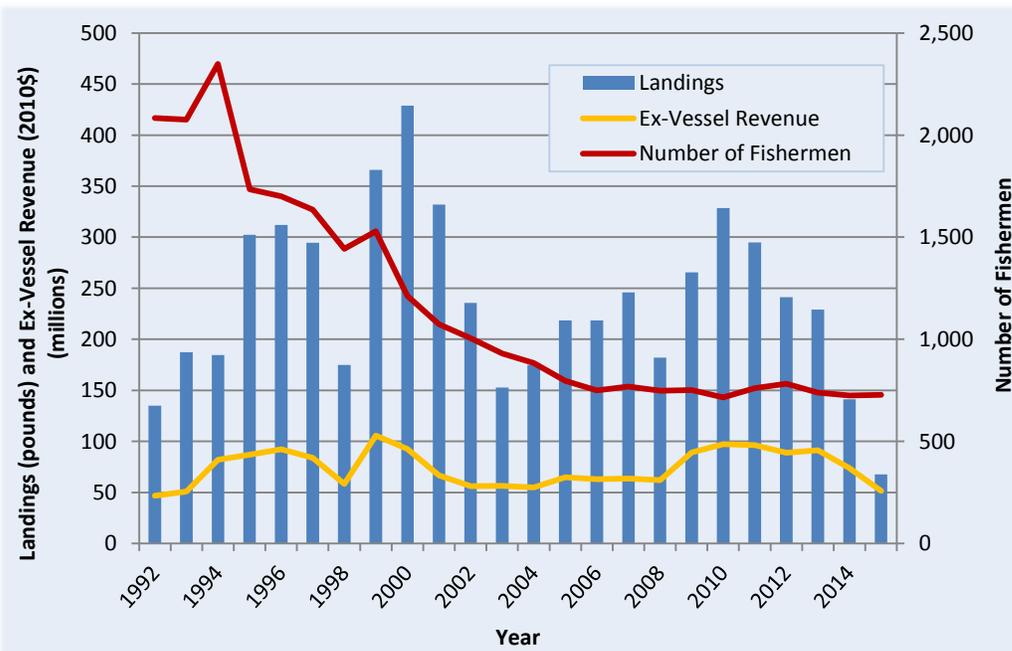
Commercial fisheries can be impacted:

- If the quantity or quality of harvestable species change in response to environmental conditions (e.g. El Niño),
- As consumer demand and willingness to pay within an economy fluctuates,
- If the cost of fuel increases or decreases, and
- If there are regulatory changes in a fishery (e.g. the amount of fish that can be caught).

Ex-vessel revenue is the reported dollar amount paid to fishermen for their landings.



From 1992-2015, the South Coast’s reported total commercial landings for all commercial fisheries has fluctuated with a high in 2000 of approximately 428 million pounds landed to a low in 2015 of less than 70 million pounds landed (Figure 1).



Reported ex-vessel revenue, as adjusted for inflation (2010\$), also fluctuated through time, with relatively high revenues from 2009-2013 followed by a steep decrease in 2014-2015. The total number of fishermen per year decreased from more than 2500 in 1994 to a low of 715 in 2010 and has remained fairly constant through 2015.

Figure 1. Reported South Coast annual commercial landings (pounds), ex-vessel revenue (2010\$), and number of fishermen for all fisheries, 1992-2015. Data Source: CDFW.

Commercial Landings and Ex-Vessel Revenue: Fisheries of Interest

Reported landings and ex-vessel revenue for the South Coast FOIs, shown in Figure 2, followed a similar trend as all commercial fisheries in the region, shown in Figure 1. This is attributed to the significant proportion FOIs contribute to reported landings and ex-vessel revenue (Figure 3).

From 1992-2015, reported landings fluctuated from a high of 410 million pounds in 2000 to a low of 60 million pounds in 2015. Reported ex-vessel revenue averaged \$57 million from 1992-2015, with a maximum of \$90 million in 2010, and a minimum of \$26 million in 1998. The number of active fishermen in the South Coast FOIs decreased from 1994-2006, remained relatively stable from 2006-2013, and then decreased to an all-time low of 532 fishermen in 2015 (Figure 2).

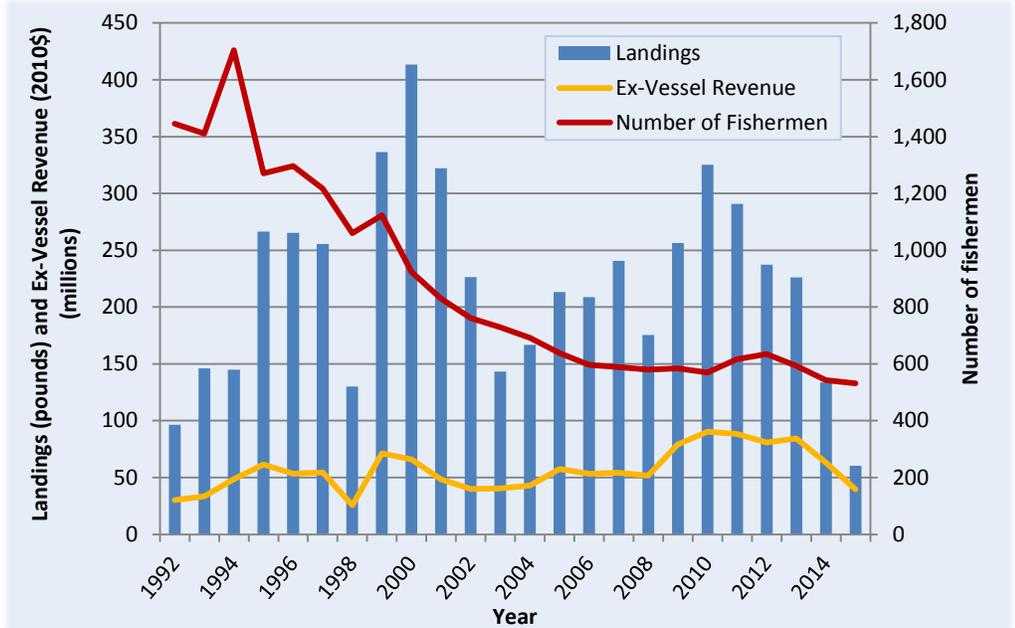


Figure 2. Reported South Coast annual commercial landings (pounds), ex-vessel revenue (2010\$), and number of fishermen for fisheries of interest, 1992-2015. Data source: CDFW.

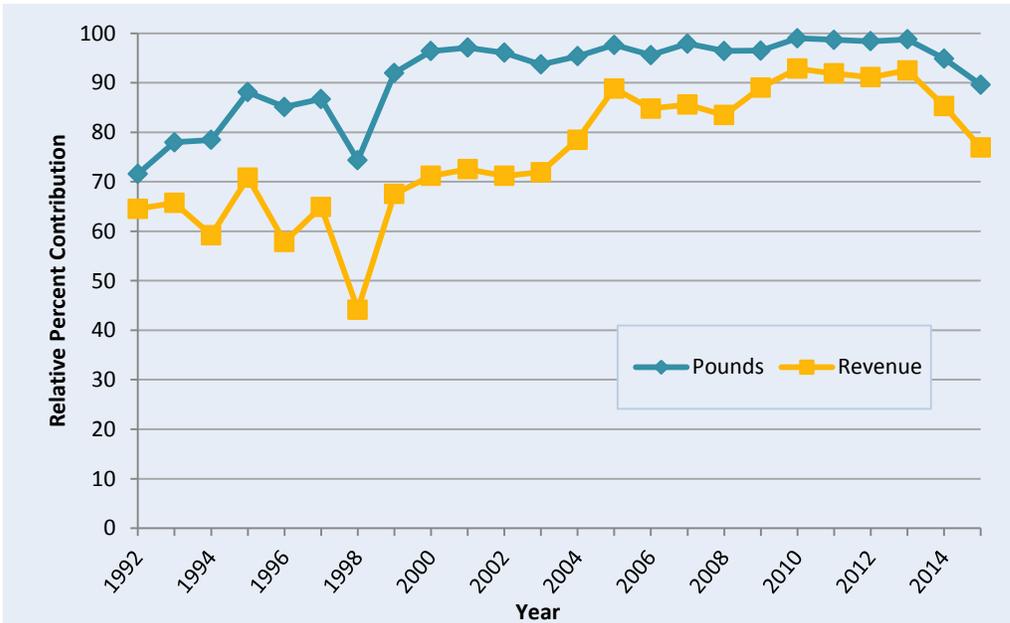


Figure 3. Fisheries of interest as a percentage of all reported commercial fisheries landings and ex-vessel revenue in the South Coast, 1992–2015. Data source: CDFW.



High Volume Fisheries

High volume fisheries contribute considerably to total landings and reported ex-vessel revenue. For example, Market Squid thrives in relatively cool waters (50-60°F), so the presence of three strong El Niño events (1991-1992, 1997-1998, and 2015-2016) and the resulting above average sea surface temperature contributed to sharp declines in reported Market Squid landings (Figure 4A). Reduced Market Squid landings correlate to three of the lowest years in the South Coast’s reported ex-vessel revenue (Figure 1). In warm water years, fishery effort typically shifts from Market Squid towards Coastal Pelagic Species, driven by the abundant Pacific Sardine. However, **Pacific Sardine has experienced declines in biomass by about 90% since 2007**, resulting in a federal fishery closure along the entire US west coast in 2014 which has continued into 2016. The combination of low Market Squid landings and a fishery closure for Pacific Sardines contributed to the reduced commercial fishing season for 2015 (Figure 2).

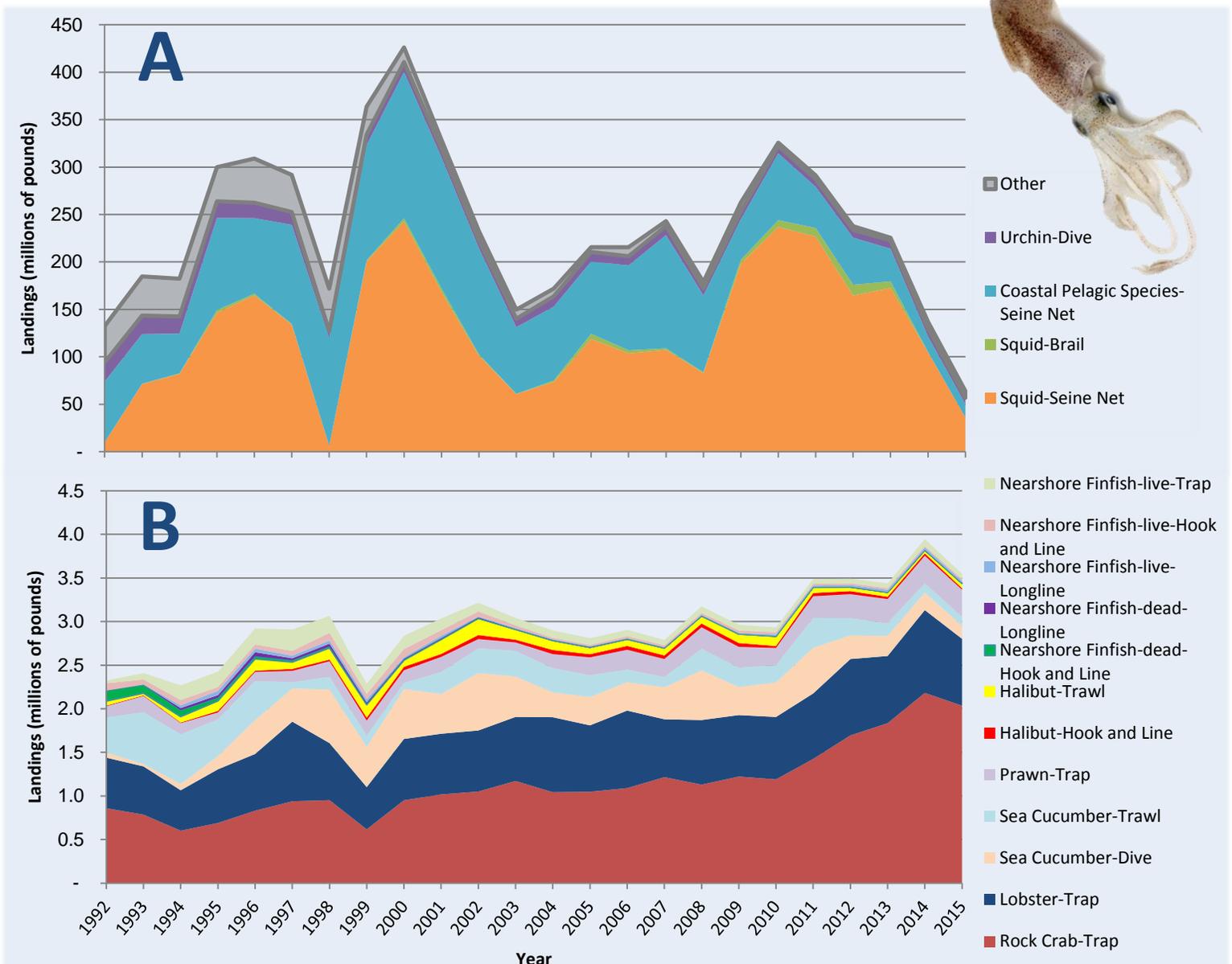


Figure 4. Reported commercial landings (pounds) for fisheries of interest (FOIs) in the South Coast, 1992-2015. A) Highest volume commercial FOIs and the “other category” which includes all additional species and fishing gears reported for South Coast commercial landings; B) lower volume commercial FOIs. Data source: CDFW.

- **Market Squid harvested by purse seine nets was the most important FOI in the South Coast for both reported landings (Figure 4A) and ex-vessel revenue (Figure 5A).**
- Coastal Pelagic Species and Urchins were the second and third most landed species in the South Coast respectively (Figure 4A).
- Urchins and Lobsters were the second and third most lucrative species for ex-vessel revenue in the South Coast respectively (Figure 5A).

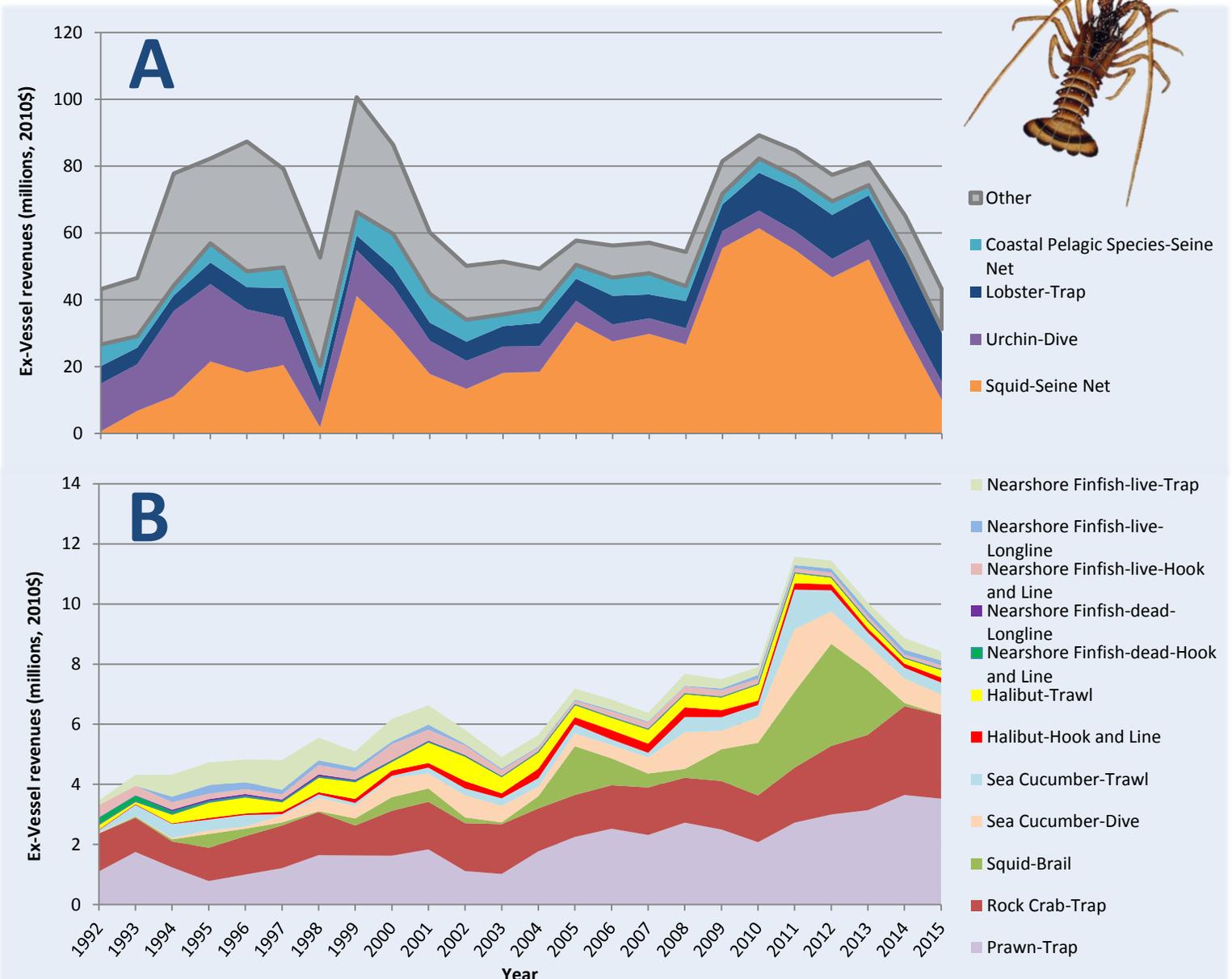


Figure 5. Reported ex-vessel revenue (2010\$) for fisheries of interest (FOIs) in the South Coast, 1992-2015. A) Highest grossing commercial FOIs and the "other category" which includes all additional species and fishing gears reported for South Coast commercial ex-vessel revenue; B) lower grossing commercial FOIs. Data source: CDFW.

Low Volume Fisheries

Vertebrate Fisheries

With the exclusion of Coastal Pelagic Species, additional vertebrate species such as California Halibut and Nearshore Finfish, contribute to smaller, but no less important South Coast commercial fisheries for both reported landings (Figure 4B) and ex-vessel revenue (Figure 5B). These FOIs, **while landed in low abundance relative to other FOIs in the South Coast, get markedly higher prices per pound landed than other FOIs in the region** (Figure 6).

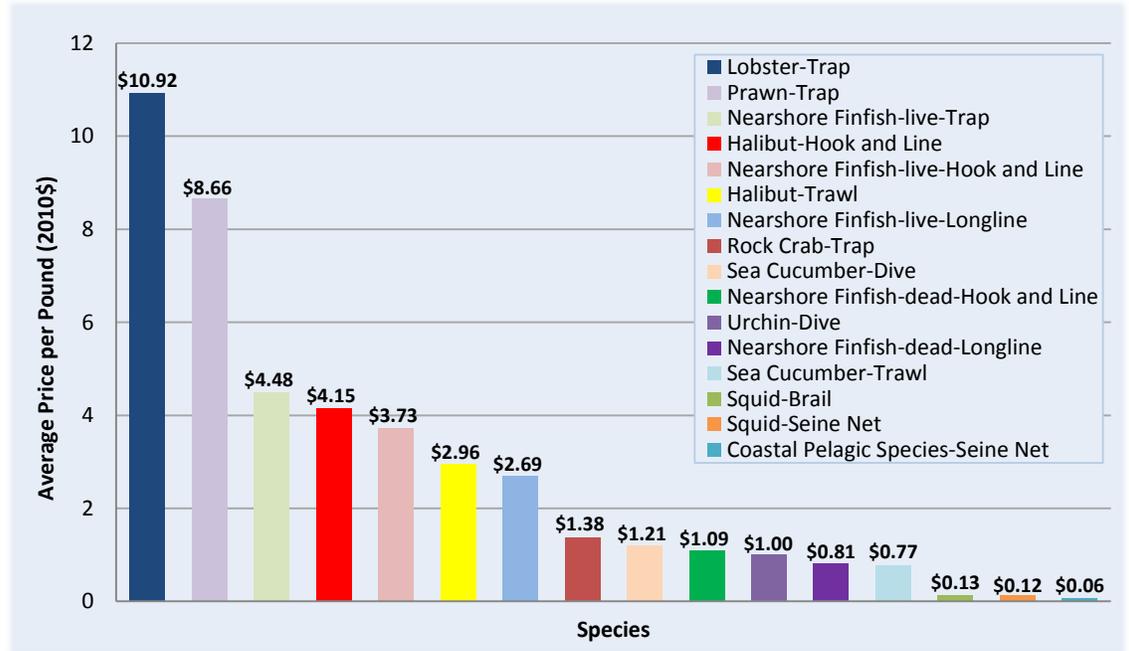


Figure 6. Average reported price per pound for South Coast fisheries of interest (2010\$), averaged years 1992-2015. Data source: CDFW.

Invertebrate Fisheries

Although Lobster does not contribute significantly in way of landings (Figures 4B), its average price per pound was the highest among all South Coast FOIs (Figure 6), and has increased for all ports combined since 2005 (Figure 7). This increase in average price per pound contributed to Lobster’s claim as the third most lucrative fishery in the South Coast (Figure 5A).



Figure 7. Average price per pound for Lobster across the South Coast, 1992-2015. Data source: CDFW.

Socioeconomics

Changes in the socioeconomic landscape (including changes in fish availability, fishery restrictions, and consumer demand) before, during, and after the implementation of MPAs in the South Coast, as well as the short time-scale since MPA implementation (3 years of data), impede the analysis of the effects of these MPAs on commercial fisheries in the region. Over time, analyses may be able to parse out any

potential MPA effects on the South Coast. However, an [independent survey](#) conducted by Point97/ECOTRUST looking at MPA impacts on fishermen identified that in 2012, 100% of the 114 fishermen interviewed throughout that South Coast indicated that at least one of the fisheries they participated in was directly impacted by the implementation of MPAs.



Acknowledgements

Author

Amanda Van Diggelen, CDFW, Marine Region Amanda.VanDiggelen@wildlife.ca.gov

Photo Credits

Docked Boats Header

CDFW Archive

Squid Pump

CDFW Archive

Purse Seine Boat

Steve Wertz, CDFW, Marine Region

Dockside Boat

CDFW Archive

Squid and Lobster Images

Microsoft Word ClipArt Gallery

Halibut Fisherman

Travis Tanaka, CDFW, Marine Region

Squid Eggs

Derek Stein, CDFW, Marine Region

Pacific Sardines

Amanda Van Diggelen, CDFW, Marine Region

Sea Cucumbers

CDFW/Marine Applied Research and Exploration Archive

Document Design

Amanda Van Diggelen, CDFW, Marine Region