Establishing a Baseline and Assessing Initial Spatial and Economic Change in the California South Coast Commercial Fisheries

Report to the California Sea Grant College Program

In partial fulfillment of Grant No. #10-049
through the California Sea Grant College Program

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January 30, 2015

This publication was supported by the State Coastal Conservancy, the State of California, and the California Department of Fish and Wildlife under Grant Agreement #10-049, project #R/MPA-29, through the California Sea Grant College Program. The views expressed herein do not necessarily reflect the views of any of those organizations.

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EXECUTIVE SUMMARY

The primary goal of this project was to inform long-term marine protected area (MPA) monitoring efforts by gathering up-to-date socioeconomic information to illustrate historical trends, establish a post MPA baseline, and assess initial changes since MPA implementation for the commercial fishing fleet in the South Coast region of California. To accomplish this goal our research team conducted extensive community outreach and engagement in the region and conducted in-person interviews with 114 commercial fishermen to gather post MPA baseline socioeconomic data and spatial fishing data for the year 2012. In it important to note that the interview data gathered is self-reported data and thus as with all self-reported data may be subject to recall error or under/over-reporting. Additional to the interview data gathered, we summarized commercial fishing landings data from 1992 to 2012 obtained from the California Department of Fish and Wildlife (CDFW) to explore historical economic trends and initial changes in South Coast commercial fisheries.

This study is a part of the baseline marine protected area monitoring effort to characterize the ecological and socioeconomic conditions and changes within the South Coast region since MPA implementation. As part of the baseline MPA monitoring effort, this report provides three sets of primary findings:

1. A baseline characterization of spatial fishing patterns and socioeconomic status of commercial fishermen in the South Coast region;
2. An assessment of initial spatial and economic changes following MPA implementation; and
3. A qualitative investigation into the impact of MPAs on commercial fishermen and the specific MPAs impacting commercial fisheries at the port and region scale.

The South Coast region of California is a large contributor towards statewide commercial fishing landings. In 2012 the South Coast was responsible for 68.3 percent of total state landings (241.2 million pounds), 39.8 percent of total state ex-vessel revenue ($88.8 million), and 37.3 percent of fishermen (782 fishermen).

Fisheries that occur in state waters comprise the bulk of the South Coast regions' landings. This trend has increased over the 1992–2012 study period. In 1992, state fisheries were 71.5 percent of total pounds landed in the region, this percentage increased to 98.3 percent in 2012. Similarly, in 1992 state fisheries were 61.9 percent of ex-vessel revenue, which increased to 98.3 percent in 2012.

In 2012, the only post MPA year in the study period, the market squid–net fishery accounted for the majority of the ex-vessel revenue generated in the South Coast region (52.5 percent) and had 90 participants within the region. The lobster–trap and urchin–dive fisheries had the largest number of participants in the region (165 and 175, respectively) and generated 14.8 and 6.3 percent of the region's ex-vessel revenue.

Many of the fisheries of interest examined in this report are specific to the South Coast region within the state of California. In other words, regional landings constituted the majority of the state's revenue for those fisheries. In the sea cucumber fishery, for example, which was small but increased over the study period, regional ex-vessel revenues made up 99–100 percent of state sea cucumber ex-vessel revenues. For regional fisheries that experienced an overall decline over the study period, namely urchin, coastal pelagics, and the nearshore finfish fisheries, the average fisherman's landings and ex-vessel revenues actually increased in most South Coast ports because the number of total fishermen was decreasing at a faster rate.

On average, fishermen interviewed were 51.9 years old and had 28.8 years of experience commercial fishing. For the year 2012, fishermen indicated that commercial fishing constitutes approximately 90.8 percent of their overall income—many fishermen indicated that commercial fishing was their only income source. Fishermen also indicated that in 2012, they spent approximately 45.3 percent of their commercial fishing gross revenue on operating costs such as fuel, crew, bait, etc. This operating cost percentage remained fairly the same from data gathered in Point 97/Ecotrust's study in 2008 in which fishermen on average spent 47.6 percent of gross revenue on operating costs. In the report we also detail for each

fishery the average number of days fishing, the number of crew used, and the percentage of gross revenue used toward paying crew and purchasing fuel.
All fishermen interviewed indicated they had been impacted by MPAs in some way in at least one of the fisheries they targeted in 2012. Across all fisheries and ports, Carrington Point SMR at Santa Rosa Island impacted the largest percentage of respondents (36 percent) in the study region. Specific MPAs impacted a much larger percentage of respondents at the port level:

- In Santa Barbara and Port Hueneme/Oxnard, Carrington Point SMR impacted the largest percentage of respondents in (63 percent and 80 percent respectively).
- In Ventura, Point Dume SMR, impacted the most respondents (67 percent).
- In San Pedro/Los Angeles, Richardson Rock SMR at San Miguel Island impacted 76 percent of respondents.
- In Dana Point, Laguna Beach SMR and SMCA impacted 89 percent of respondents.
- In San Diego all participants were impacted by Swami's SMCA.

The most commonly reported types of impacts from MPAs were: 1) Not being able to fish in traditional areas; 2) crowding/compaction of people and/or gear in areas that remain open; and 3) needing to travel longer distances in order to fish. Since 2010 the regional ex-vessel price per pound in the lobster–trap fishery has increased dramatically. Prices for lobster were $11.30 per pound in 2009 but have since averaged nearly $16 per pound in the years following. Fishermen expressed that the high price they've been receiving helped them cope with the negative impacts from MPAs. They also expressed concern for the future should the high price not be maintained.

The majority of fishermen indicated they were happy with most aspects of the commercial fishing profession; however, most fishermen indicated they were unhappy with the management of the rules of commercial fishing. When asked what they would change about their job, the majority of fishermen provided responses that were regulatory in nature. Specifically, fishermen expressed they want better relationships between managers, scientists, and fishermen—that fishermen want to be more involved in fisheries management, and they feel better science and data is needed to inform fisheries management. Additionally, fishermen expressed that they would like to see MPAs removed and/or rotated.

This report also details the spatial fishing data gathered during fisherman interviews as well as data assessing initial changes in spatial fishing patterns between pre and post MPA periods, which are provided in a separate Map Appendix document. Spatial changes between pre and post MPA periods are not necessarily a direct impact from the implementation of MPAs and we would like to emphasize that the spatial change maps should not be interpreted as such. Instead the spatial change maps we present serve as an example of how spatial pre and post MPA data can be analyzed to assess initial spatial changes since MPA implementation but any causation as to these changes are not evaluated.

Finally, in this report we offer lessons learned and future recommendation on community engagement, existing data gaps, future analyses, advancing fisheries data collection to digital platforms, presenting fisheries data in an online format so as to better facilitate its use and accessibility, and key commercial fisheries monitoring metrics.

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Point 97

Point 97 is a high-tech spin-off of Ecotrust, delivering impact technology solutions and engagement strategies for coastal and marine planning in regions around the world. Working to improve marine and coastal management practices, Point 97 helps partners and clients strengthen coastal communities and ocean ecosystems, bridge different ocean user perspectives and implement management decisions in an inclusive and transparent way. Learn more at pointnineseven.com

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For more than 20 years, Ecotrust has converted $80 million in grants into more than $500 million in capital for local people, businesses, and organizations from Alaska to California. Ecotrust's Marine Consulting Initiative builds tools that help people make better decisions about the ocean. Our tools help visualize and map marine ecosystems and uses, bridge differing perspectives, and implement management decisions in a more inclusive and transparent way. The marine planning tools are part of Ecotrust's 20-year history of doing innovative things with knowledge, technology, and capital to create enhanced conservation and economic development for coastal communities on a global scale. Learn more at http://www.ecotrust.org.

Acknowledgements

Conducting research in coastal communities is as challenging as it is rewarding. We have learned a tremendous amount from the commercial fishermen who provided guidance and feedback during this study as well as the countless other community members, state agency staff, and observers of this project. We are deeply thankful to the commercial fishermen who participated in this project and for making time in their busy schedules, overcoming sometimes considerable reservations, and sharing their knowledge and experience with us.

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1. INTRODUCTION

The coastal and ocean waters of the California South Coast region, which spans from Point Conception to the north and the California/Mexico border to the south (Map 1), is home to a confluence of two major ocean currents that mixes nutrient rich waters from the north with warm waters from the south. This convergence zone forms a dynamic and highly biodiverse ocean ecosystem that has long supported a rich cultural and economic history of fishing in the region. Indeed, fisheries exemplify the interdependencies between the natural environment and coastal communities that have characterized California since well before statehood.

On January 1, 2012, as part of the Marine Life Protection Act (MLPA) Initiative, the California Fish and Wildlife Commission (CFWC) designated 50 marine protected areas (MPAs) within the South Coast state waters of California. This study is a part of the baseline marine protected area monitoring effort to characterize the ecological and socioeconomic conditions and changes within the South Coast Region since MPA implementation

As part of the baseline marine protected area monitoring effort, this report provides three sets of primary findings:

1. A baseline characterization of spatial fishing patterns and economic status of commercial fishermen in the South Coast (SC) region;
2. An assessment of initial spatial and economic changes following MPA implementation; and
3. A qualitative investigation into the impact of MPAs on commercial fishermen and the specific MPAs impacting commercial fisheries at the port and region scale.

Establishing a baseline characterization of the commercial fishing fleet of the California South Coast provides a better understanding of the current economic health of South Coast fishing communities and provides a benchmark of economic conditions and spatial fishing patterns against which future MPA impacts and benefits can be measured. Furthermore, assessing historical trends along with initial changes in economic conditions and spatial fishing patterns that followed MPA implementation will help inform how MPAs and other driving factors may interplay to influence observed changes.

This project will directly inform the 5-year management review of the South Coast MPAs in which the California Department of Fish and Wildlife (CDFW) will make management recommendation to the California Fish and Wildlife Commission based on findings from the baseline MPA monitoring projects and other sources of information. This project was developed in close coordination with the MPA Monitoring Enterprise (Monitoring Enterprise), a program of the California Ocean Science Trust, in partnership the California Department of Fish and Wildlife, and supported by the California Sea Grant College Program and the California Ocean Protection Council (OPC).

The primary goal of this project was to inform long-term MPA monitoring efforts by gathering up-to-date socioeconomic information to illustrate historical trends, establish a post MPA baseline, and assess initial changes since MPA implementation for the commercial fishing fleet in the South Coast region of California. To accomplish this goal our research team conducted extensive community outreach in the region and developed and deployed an interactive, web browser-based interview and mapping instrument powered by Point 97's ViewPoint survey platform that was customized to the South Coast region and project objectives. The survey instrument was utilized by field staff on laptop computers to collect geo-referenced information from fishermen about the extent and relative importance of California South Coast marine waters and related economic data. Data collection occurred during the summer and fall months of 2013. The data were then compiled in aggregate form into spatial datasets (e.g., raster data layers, kernel density layers, pdf maps) and various excel workbooks and delivered to the California Sea Grant College Program and MPA Monitoring Enterprise. We would like to emphasize that no individual information was delivered; only data in the aggregated form (requiring three or more fishermen in each data point) was delivered. This report details the approach and methods we used to collect, analyze, verify, and interpret the various data sets utilized in this project.

The main body of this report consists of two main sections–1) a region-wide profile of the commercial fisheries and 2) commercial fishing profiles for each port. To help better facilitate the use of the data presented in this report in accordance with the Monitoring Enterprises' monitoring framework, each sub-section is further broken out into the MPA monitoring framework components of 'initial changes' and 'baseline characterization'. Furthermore, specific spatial baseline and spatial change sections are provided in this report to organize all the information about spatial data into specific sections rather than distributing them throughout the report. These sections detail the spatial data sets and map products developed as part of this project and that are available for dissemination. To better organize and present all the map products we have created a separate Map Appendix to complement this technical report.

We would like to emphasize that the purpose of this report is not to measure or assess the economic impact of MPAs on the commercial fishing fleet in the region. To quantitatively measure the impact of MPAs requires robust long term economic data sets in both pre and post MPA periods that enable analyses to account or control for the complex interplay of regulatory, environmental, and economic factors that drive economic change in commercial fishing. Such a study was beyond the scope of this project but to provide insights into the possible impacts of MPAs we collected qualitative information from commercial fishermen as to the ways in which MPAs are affecting their success as a commercial fisherman. The information we have collected can be used to help better understand the complex system of commercial fishing and how MPAs may directly or indirectly be impacting a commercial fisherman's success as well as inform future research efforts to possibly measure and quantify these impacts.

2. SURVEY AND ANALYSIS METHODS

2.1. Commercial Fisheries and Ports of Interest

To focus efforts upon information that would be most useful and cost effective in informing a 5-year management review of the South Coast MPAs, this project identified key consumptive user groups and associated fisheries in which to target our data collection and analysis efforts. These user groups and key fisheries have been identified as occurring mostly in state waters and are most likely to experience both short-term spatial and economic changes associated with MPA implementation and are of high economic importance to the South Coast region.

The following is the list of key commercial fisheries targeted for this project. This list below was developed in collaboration with the California Department of Fish and Wildlife, the MPA Monitoring Enterprise, and the South Coast fishing community to define when applicable the species groupings that compose a fishery. The fisheries of interest for this project are:

1. California halibut–hook & line (*Paralichthys californicus)*
2. California halibut–trawl (*Paralichthys californicus)*
3. Coastal pelagics-–net
4. Lobster–trap (Panulirus interruptus)
5. Market squid–brail (*Loligo opalescens*)
6. Market squid–net (*Loligo opalescens*)
7. Nearshore finfish–live–fixed gear
    a. Nearshore finfish–dead–hook & line
    b. Nearshore finfish–dead–longline
    c. Nearshore finfish–live–hook & line
    d. Nearshore finfish–live–longline
    e. Nearshore finfish–live–trap
8. Rock crab–trap
9. Sea cucumber–dive
10. Sea cucumber–trawl
11. Urchin–dive (Strongylocentrotus franciscanus)

The coastal pelagic species-seine/net fishery consists of Pacific sardine (*Sardinops sagax*), Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), and northern anchovy (*Engraulis mordax*). The rock crab fishery is comprised of three species: the Yellow rock crab, (*Cancer anthonyi),* Brown rock crab (*Cancer antennarius) and* Red rock crab (*Cancer productus).* The sea cucumber fishery consists of warty sea cucumber cucumber (*Parastichopus parcimensis*) and giant red sea (*Parastichopus californicus*).

The nearshore finfish fishery is a state fishery grouping managed through the California Nearshore Fishery Management Plan which consists of the following 19 species: Rockfish, gopher (*Sebastes carnatus*); Rockfish, black (*S. melanops*); Rockfish, black-and-yellow (*S. chrysomelas*); Rockfish, blue (*S. mystinus*); Rockfish, kelp (*S. atrovirens*); Rockfish, copper (*S. caurinus*); Rockfish, grass (*S. rastrelliger*); Rockfish, brown (*S. auriculatus*); Rockfish, quillback (*S. maliger*); Rockfish, china (*S. nebulosus*); Rockfish, calico (*S. dallii*); Treefish (*S. serriceps*); Rockfish, olive (*S. serranoides*); Cabezon (*Scorpaenichthys marmoratus*); California sheephead (*Semicossyphus pulcher*); California scorpionfish (*Scorpaena guttata*); Kelp greenling (*Hexagrammos decagrammus*); Rock greenling (*Hexagrammos lagocephalus*); and Monkeyface prickleback (*Cebidichthys violaceus*).

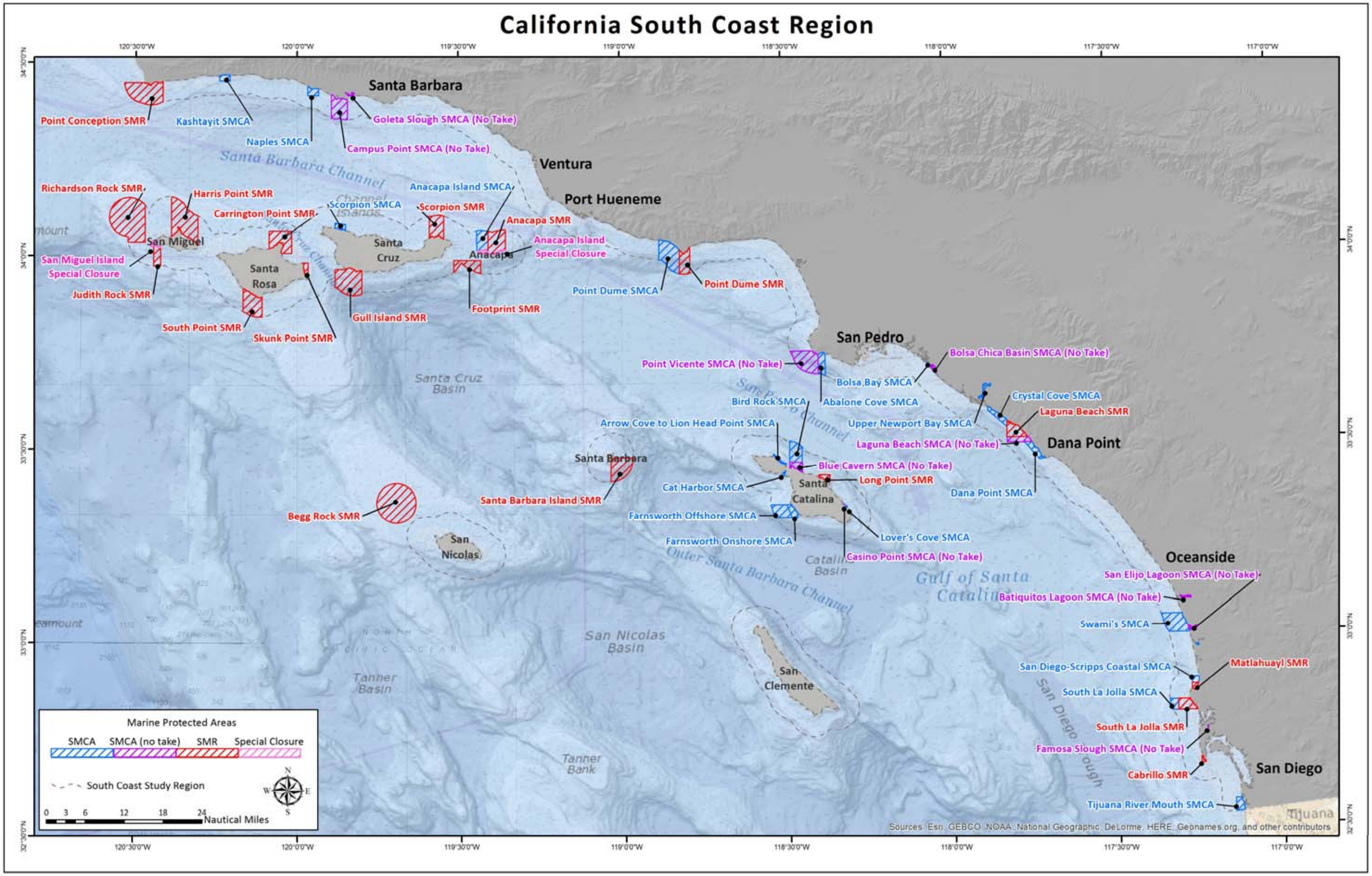
We'd like to note that we provided commercial landings and ex-vessel revenue data on the Nearshore finfish-dead fisheries to provide context but did not target this fishery for interviews with fishermen. We did not target this fishery for interviews as this fishery has now largely transitioned into a live fish fishery and dead fish are landed as a byproduct of the live fish fishery.

Based on California Department of Fish and Wildlife landings data the commercial fishing ports of interest for this project are defined as (Map1):

1. Santa Barbara
2. Ventura
3. Port Hueneme/Oxnard
4. San Pedro/Los Angeles
5. Dana Point
6. Oceanside
7. San Diego

For a full listing of how CDFW commercial landings data were grouped into theses target fisheries and port groupings, please see this report's accompanying excel workbook summarizing commercial fishing landings data.

Map 1. South Coast study region, ports, and marine protected areas



2.2. CDFW Landings Data Analysis Methods

Under a non-disclosure agreement with the California Department of Fish and Wildlife (CDFW), the commercial fisheries landings data presented throughout this report was developed in collaboration with CDFW staff using ex-vessel landings receipt data contained in the CDFW's Commercial Fisheries Information System (CFIS) database. As the CFIS database is continually updated it is important to document the date the CFIS database was queried so that the status of the data sets used are known. For 1992–2009 landings data the CFIS database was queried on March 9th, 2011, for 2010 landings data the CFIS database was queried on April 18, 2012, for the 2011 landings data the CFIS database was queried on September 22, 2012, and for the 2012 landings data the CFIS database was queried on September 12, 2013. All data were sent to Point 97/Ecotrust by CDFW staff.

All dollar values presented in this report are corrected for inflation, and are reported in 2010 dollars using the Implicit Price Deflators for Gross Domestic Product from the U.S. Bureau of Economic Analysis. It is important to note that ex-vessel revenues are merely suggestive of differences in economic value, as they do not account for differences in operating costs, and thus profitability, across fisheries. Likewise, they are only first order approximations of the value of fisheries to local economies; a comprehensive assessment of fishery operating costs, multiplier effects, and the full value of fishing activities to local economies are important to assess but are beyond the scope of this study.

Finally, we present only a subset of the landings data available—following CDFW protocol we suppressed all landings data with fewer than 3 commercial fishermen. We strived to summarize the landings data in the most compelling and visual formats. We have consistently color-coded fisheries throughout the report and presented data in consistently formatted and scaled graphs in order to facilitate quick reference of specific fisheries and comparison across fisheries or ports. We avoid repetition whenever possible and recognize there are many more ways to query and analyze the data, however, throughout this report we aimed to present the most relevant and informative analyses possible.

2.3. Survey Data Collection and Analysis Methods

While the use of GIS technology and analysis in marine and fisheries management has expanded steadily over the past decade (Kruse et al. 2001; Breman 2002; Valavanis 2002; Fisher and Rahel 2004; Meaden 2009), its use for socioeconomic research is still somewhat limited. Nevertheless, a growing body of literature has examined GIS-enabled approaches to community-based MPA design and assessment (Aswani and Lauer 2006; Hall and Close 2006; St. Martin et al. 2007; Ban et al. 2009; Gleason et al. 2010) and there are several good examples to build on for improving the spatial specificity of the West Coast knowledge base and data landscape.

Some of the most pertinent applications of GIS technology to socioeconomic questions in marine fisheries concern the spatial extent and intensity of fishing effort (Caddy and Carocci 1999; Green and King 2003; Parnell et. al 2010; Lee et. al 2010) and the use of participatory methods similar to the ones employed here (Wedell et al. 2005; St. Martin 2004; 2005; 2006; Scholz et al. 2011a). We built on these approaches and adapted them for the California South Coast context, following best practices for the use of participatory GIS in natural resource management (Quan et al. 2001), as described in the remainder of this section.

Our project approach builds on methods developed in previous projects on the West Coast of the United States (Chen et al. 2012 and 2013; Steinback et al. 2010; Scholz et al. 2004; 2005; 2006a; 2006b; 2008; 2010; 2011a; 2011b), which demonstrated novel approaches for collecting, compiling, and analyzing spatial fishing patterns and associated economic information at various geographic resolutions to aid the design and assessment of various marine spatial planning efforts (e.g., marine protected areas and wave energy siting). Moreover, the spatial mapping methods used in this study have been assessed against CDFW commercial fishing logbook data (Wilen and Abbott, 2006). The assessment was designed to validate the methodology of interviewing fishermen to map their commercial fishing grounds and assign value/importance by allocating 100 pennies across their fishing grounds. The results of this study concluded that the spatial fishing patterns of fishermen interviewed reflected actual behavior (when examining logbook data). Furthermore, in using our sample method, the group of fishermen who were not interviewed but participated in the fishery exhibited similar spatial fishing patterns (when examining logbook data) as those interviewed. The proven methods, successes, and lessons learned in these past projects were directly applied to the methods and tools deployed in this project.

As Point 97 continues to conduct MPA monitoring work in other regions in California we aim to help close existing coastal and marine use information gaps and provide a tested, consistent, and cost-effective method for long-term monitoring across California.

Specifically, Point 97's approach involved several steps that are designed to engage the fishing community throughout the project from project/survey design to the development of final products. These steps are generally categorized below:

1. Fishing community outreach/engagement;
2. Survey questions and survey tool design;
3. Data collection;
4. Data analysis;
5. Review and validation of data analysis results; and
6. Final reporting.

Point 97 conducted a series of outreach meetings with key fishing community members and fishing organizations/associations prior to beginning interviews in the region and in each port. The objectives of these meetings were to provide a project overview, answer questions, develop relationships, gain insights into the current fishery issues/challenges, raise general awareness, and solicit potential interview participants. During these initial meetings Point 97 also gathered feedback on its proposed project and survey design, such as on what types of information the fishing community felt were important to capture, and when possible the feedback received was incorporated into the data collection tool and data analysis plan.

2.3.1. Sampling Method

Point 97 carried out field work in the summer and fall months of 2013 to collected data on the 2012 post MPA implementation fishing year. To determine a sampling method for the commercial fishing sector, Point 97 compiled CDFW commercial fishing ex-vessel revenue and landings data and as well as contact data (phone numbers taken from the CDFW permits database). We then organized these data into port-fishery combinations to identify commercial fishermen[1] to interview in each target fishery in each port in the region. Since the 2013 commercial landings data were not available during the field work season we utilized 2012 commercial landings data to target commercial fishermen.

As fishermen may land fish in more than one port, the port specific listing of commercial fishermen was not a mutually exclusive list. Thus we could not conduct a random sample of fishermen at the port level as this would bias the sample towards fishermen who land in multiple ports. Furthermore, implementing any systematic or random sample strategy is difficult as at times fishermen are unwilling to participate in interviews. Our experience is that at times fishermen who make a relatively small amounts of revenue in a fishery are less invested in participating in interviews which in itself creates a sample bias and together essentially results in a convenience sample.

Given the considerations above, project staff set out to contact every commercial fisherman in the landings database in each of our port-fishery lists with the sampling goal of interviewing as many fishermen as possible. For the purpose of this project, Point 97 defines a commercial fisherman as an individual who has commercial fishery landings data (pounds and ex-vessel revenue) associated with his/her commercial license number (L number).

Given our sample strategy, we sought to investigate how our sample was spread across the various ex-vessel revenue ranges for each fishery. This was important as ideally gathering baseline economic

[1] The term 'fishermen' is used to denote people who fish. In the California fishing community this is the preferred term regardless of gender.

information from the commercial fishing fleet would be representative of the fishing community as a whole and represent information from fishermen across varying revenue ranges. To investigate how our sampling was distributed across these revenue ranges we stratified each fishery into four revenue strata. Please see Table 1 for the number of commercial fishermen interviewed in each target fishery compared to the number of fishermen in the landing database separated by the four revenue stratification levels. We indicated the approximate revenue range when possible for each stratification to demonstrate the multitude of relatively small dollar values that are landed by individuals in each fishery. This may be due to several reasons which could include amongst others: fish caught as bycatch in a different fishery but were still landed/sold; fishermen who were trying out a new fishery or new gear type for a fishery and thus landed a relatively small amount; families of fishermen who fish together and land their catch on various L numbers of family members—sometimes just once or twice for an individual; fishermen from outside the region who landed only once or a few times in the region; or fishermen who must land some amount of catch to maintain a permit but do not actively fish the permit as a major income source.

Table 1. Number of fishermen interviewed as a percent of each quartile revenue strata for each fishery, 2012, South Coast Region

Fishery	Revenue strata (quartiles)	Number of individuals in 2012 landings	Number of individuals interviewed with 2012 landings	Percent of individuals in landings strata interviewed	Approximate 2012 Revenue Strata Range (2010$)
California halibut–hook & line	**Total**	**110**	**3**	**3%**	**$199,351**
	1	2	—	—	*
	2	5	—	—	$7,500 - $18,000
	3	12	—	—	$3,000 - $6,000
	4	91	3	3%	$0 - $2,500
California halibut–trawl	**Total**	**26**	**5**	**19%**	**$246,412**
	1	1	1	100%	*
	2	1	—	—	$54,000
	3	2	—	—	$27,500 - $32,500
	4	22	4	18%	$75 - $12,000
Coastal pelagics–net	**Total**	**44**	**5**	**11%**	**$4,069,765**
	1	2	1	50%	*
	2	3	—	—	$270,500 - $464,500
	3	5	2	40%	*
	4	34	2	6%	*
Lobster–trap	**Total**	**165**	**43**	**26%**	**$13,190,202**
	1	15	10	67%	$188,000 - $324,000
	2	20	8	40%	$134,000 - $186,000
	3	32	13	41%	$80,000 - $131,000
	4	98	12	12%	$75 - $78,500
Market squid–brail	**Total**	**70**	**3**	**4%**	**$3,393,970**
	1	3	1	33%	*
	2	5	—	—	$122,500 - $182,000
	3	12	1	8%	*
	4	50	1	2%	*
Market squid–net	**Total**	**90**	**10**	**11%**	**$46,677,219**
	1	6	2	33%	*
	2	10	4	40%	$1,061,000 - $1,494,500
	3	16	—	—	$1,006,500 - $502,000
	4	58	4	7%	$50 - $499,00
Nearshore finfish live–fixed gear	**Total**	**45**	**11**	**24%**	**$401,587**
	1	3	1	33%	*
	2	4	1	25%	*
	3	6	2	33%	*
	4	32	7	22%	$0-$2,500
Rock crab–trap	**Total**	**99**	**20**	**20%**	**$2,280,955**
	1	3	2	67%	*

	2	4	2	50%	*
	3	8	5	63%	$47,000 - $91,000
	4	84	11	13%	$0 - $46,500
Sea cucumber–dive	**Total**	**59**	**12**	**20%**	**$1,074,175**
	1	2	1	50%	*
	2	5	3	60%	$43,000 - $69,000
	3	9	4	44%	$25,500 - $37,500
	4	43	4	9%	$75 - $24,500
Sea cucumber–trawl	**Total**	**24**	**4**	**17%**	**$700,625**
	1	1	—	—	*
	2	2	1	50%	*
	3	3	—	—	$55,000 - $62,000
	4	18	3	17%	$0 - $45,500
Spot prawn–trap	**Total**	**17**	**3**	**18%**	**$2,996,653**
	1	1	—	—	*
	2	2	2	100%	*
	3	3	—	—	$192,000 - $248,500
	4	11	1	9%	*
Urchin–dive	**Total**	**175**	**32**	**26%**	**$5,559,458**
	1	12	3	67%	$92,000 - $151,000
	2	18	10	40%	$50,500 - $90,000
	3	32	10	41%	$36,000 - $58,000
	4	113	9	12%	$0 - $35000

Source: CDFW, Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

2.3.2. Interview Protocol

Field Staff Training

Building upon our experience conducting large scale human use data collection projects with fishing communities, Point 97 has established rigorous field staff training procedures and interview protocols to ensure that:

1. Field staff are able to effectively engage in conversations with fisherman about the goals/objectives of this project and the larger MPA monitoring/assessment effort this project will inform;
2. Sensitive fishermen contact information is kept secure and confidential;
3. Fishermen are properly informed of the research project goals and possible risk and agreements on data use before the fishermen engages in an interview;
4. Fisherman data remains confidential and is securely stored, transmitted, and analyzed;
5. Interviews are conducted professionally and consistently; and
6. High quality data is consistently collected across interviews.

To accomplish this, Point 97 staff who are trained in human subjects research protocols conducted extensive training with field staff on proper research protocols and interview approach and procedures. This training includes providing background on Point 97/Ecotrust project history with fishing communities, the Marine Life Protection Act planning process, the MPA monitoring program, and possible reservations fisherman may have to participate in interviews in order for field staff to effectively engage in meaningful conversations with fishermen to solicit interviews. Furthermore, field staff were trained in being aware and respectful of the sensitivities of collecting fishing data and were provided with human subjects research protocols to ensure field staff are aware of proper ways of presenting the research goals and risks to fishermen and that proper informed consent is obtained before interviews begin.

Furthermore, strict procedures and mechanisms are put in place so that individual fisherman data is kept secure and confidential throughout the project from data collection, to transmission of the data, to data analysis, and subsequent storage of the data. Interviews were conducted under individual non-disclosure consent forms and all data were collected on password protected laptop computers. Furthermore, data collection and analysis protocols were utilized which masks all names and identifying characteristics of an individual's fishing grounds.

Field staff are also fully trained in how to ask survey questions and capture responses in a consistent manner. The field staff coordinator initially conducted fisherman interviews with each field staff member to ensure the quality of interviews and periodically conducted fisherman interviews with field staff throughout the field season to ensure that interview quality was maintained. Furthermore, survey data is checked as it is transmitted to the Point 97 main office and reviewed by Point 97 staff to ensure quality data are being captured consistently across field staff.

2.3.3. Interview Procedure

The data collection methods in this project were designed to complement existing data previously acquired from commercial fishermen in the South Coast Region (see Scholz et al. 2008) before the MPA network was established. Interviews in this project were conducted in person using a one-on-one interview format. All interview data were entered directly into a spatially enabled survey tool developed by Point 97 powered by its ViewPoint survey platform technology. Field staff used the survey tool (Screenshot 1) to collect non-spatial survey data (e.g., demographics, basic operating information, descriptive fishing characteristics, impacts from MPAs and other factors, and associated qualitative questions) and to map areas representing a participant's fishing grounds. The survey tool's mapping component utilizes NOAA nautical charts which can be zoomed in and out to reveal more detailed nautical charts and moved directionally (similar to Google Maps) to allow fishermen to draw fishing areas in their natural sizes (polygons) rather than confining responses to a statistical grid or to political boundaries.

Figure 1. Screenshot of survey mapping tool showing mock fishing ground

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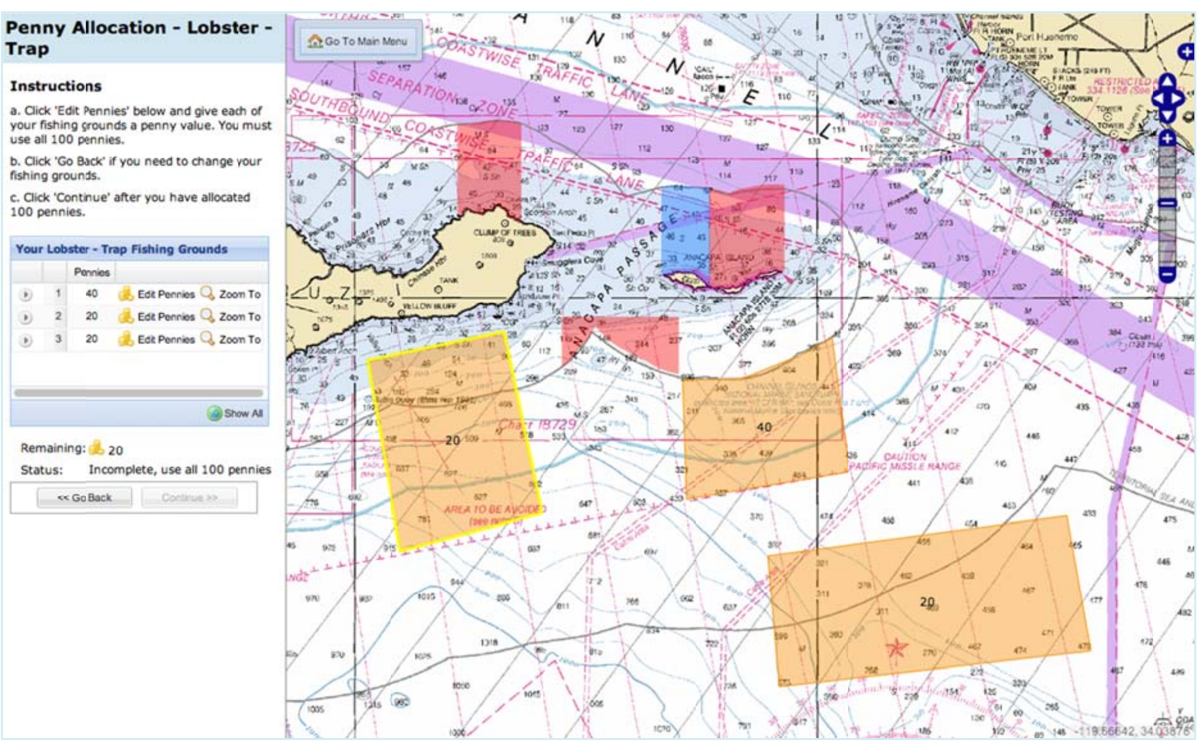

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All interviews followed a shared protocol:

1. Interviews begin with an explanation of the project goals/objectives, the types of data collected, how data will be analyzed, possible risks of participating in the interview, and any other project information the fisherman would like to discuss.

2. The fisherman is presented an informed consent form agreement which allows Point 97 to utilize interview data, however, the agreement legally binds Point 97 to present data only in the aggregate form and to never release individual data or the identities of those interviewed.
3. Non-spatial survey data is collected on questions pertaining to individual fisherman characteristics and overall commercial fishing operations.
4. Non-spatial survey data is collected for each fishery/activity within a commercial fisherman's portfolio.
5. Fishing grounds are mapped following these steps (see Screenshot 2). These steps are repeated to map each fishery separately:
    a. <u>Establish a maximum extent:</u> Using the electronic nautical charts embedded in survey tool, fishermen were asked to identify the maximum extent north, south, east, and west they would target a fishery. This is done to orient the map to the full extent of their fishing area before fishermen are asked to identify/delineate specific fishing grounds.
    b. <u>Map fishing grounds:</u> Within this maximum extent, fishermen were then asked to delineate the area(s) they fish for a particular species/fishery in a given time period. Under the guidance of the fisherman, field staff drew these fishing areas in the survey tool and record associated boundary information for each area such as depth limits and geographic landmarks.
    c. <u>Assign value:</u> Fishermen are then asked to rank these fishing areas using a weighted percentage — in which they split and distribute 100 points or '100 pennies' over the various fishing areas based on their relative importance.

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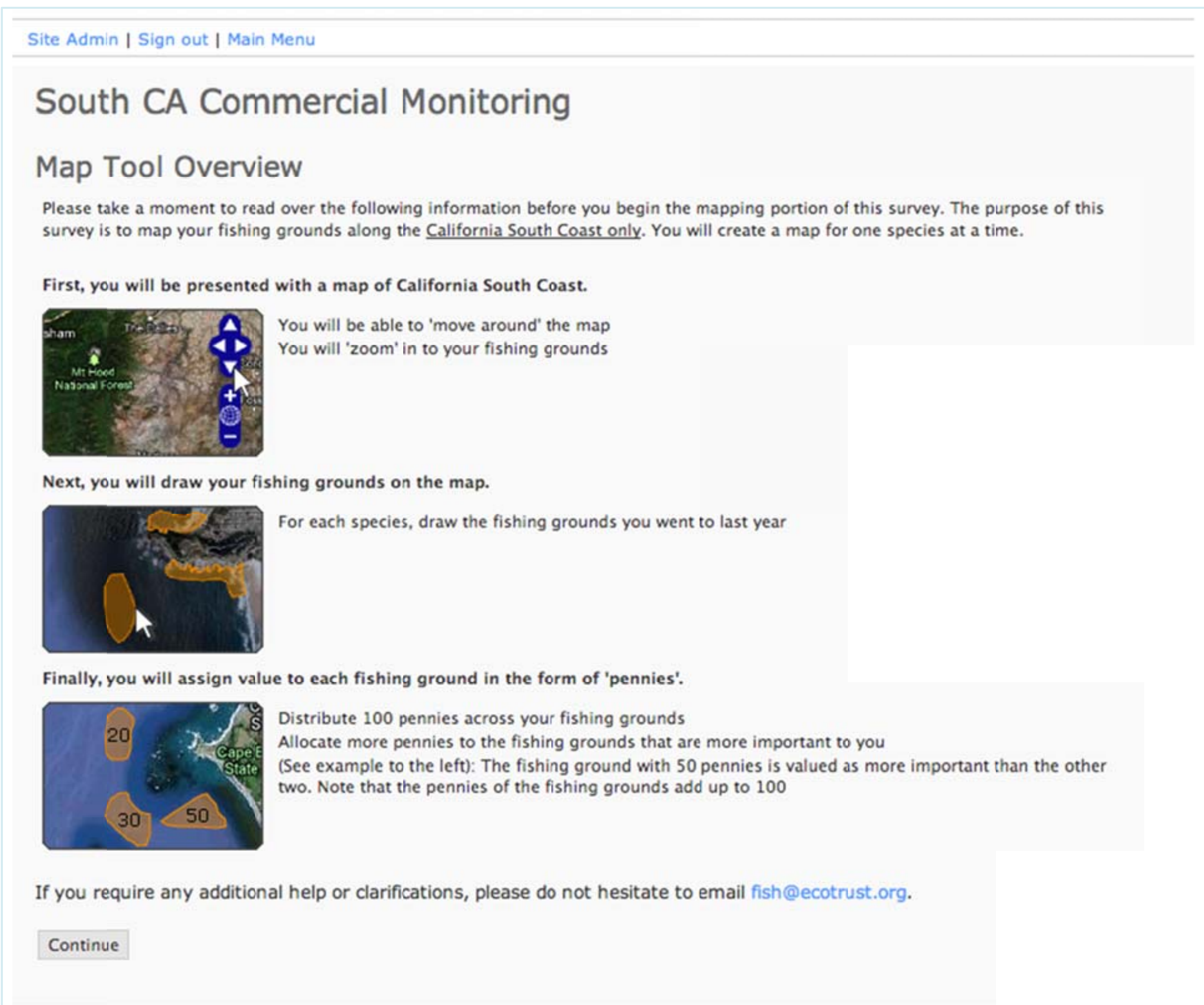
Figure 2. Screenshot of survey mapping tool overview



2.3.4. Data Review and Verification

There are several data review and verifications steps throughout this project. The following standard quality assurance and quality control (QAQC) steps were conducted:

1. Editing of spatial data by Point 97 staff based on notes from interviews and when required to standardize the data (e.g. clipping a shape to the shoreline or specific depth);
2. Review by each participant of his/her individual maps and information; and
3. Review by fishing community, through group and individual meetings, to verify aggregated results (see Appendix A for a summary of key themes from the community data review).

The collection of spatial data has an inherent higher margin of error and thus several QAQC steps were implemented in our project to ensure the spatial data collected were of the highest quality possible. First, notes were taken on the boundaries of each fishing area drawn during an interview with a fisherman. Once spatial data are collected and transmitted to Point 97 staff for analysis, each spatial dataset is checked against spatial data notes to ensure fishing areas are drawn to the indicated depth limits and spatial extent. Furthermore, if any spatial outliers are identified within a given fishery, individual fishermen are contacted to verify their spatial dataset is accurate. Second, each individual fisherman is mailed maps of his/her fishing grounds for each fishery they provided spatial information on to review/verify its accuracy. These individual maps are printed on security paper that cannot be photocopied and are mailed with a return addressed and stamped envelope and contact information so fisherman may easily communicate any changes to their spatial data. Third, once all spatial fishing data are aggregated, these maps are reviewed by the fishing community with Point 97 staff.

These review meetings with the fishing community are complimentary to the individual interviews and take a synergistic approach that is important in several ways. Review meetings are an opportunity to review and verify map products as well as share other data analysis results such as having the fishing community assist in interpreting logbook data analysis results, review drafts of the project report, discuss project next steps, build trust within the fishing community, and continue established relationships.

For review meetings, each individual who participated in interviews was contacted to participate in the project results review. During these individual or group review meetings, map products were reviewed for errors. It should be emphasized that spatial data sets are not augmented based on the where an individual who reviews the map(s) thinks areas of importance should be. Instead, the purpose of reviewing the map products are to ensure there are no large errors in the data sets made during the collecting, editing, and compiling of the data. Examples of errors include fishing areas that extend beyond regulatory depth limits or geographic areas in which the fishery occurs (e.g., nearshore finfish grounds extending into rockfish conservation area boundaries) or areas in which no fishing is allowed. Based on our experience, having the community review these map products helps ground-truth the data sets, produce data sets that are of higher quality, and help establish transparency and trust between researchers and the fishing community. For a full summary of the key themes that emerged from the community data review process, please see Appendix A.

Data validation with independent data sets is an important step in providing rigorous research methods, as data collected in any survey are liable to the inconsistencies of memory, subjective judgment, and possible deliberate falsification. Furthermore, validating data sets may also reveal possible sample biases, which can inform interpretation of survey results. Much of the data Point 97 collected in this project from commercial fishermen are novel, or similar data sets to our knowledge do not exist or are not readily accessible to compare survey results. To verify the spatial fishing data sets, commercial logbook data could have been used, however this data is confidential at the individual level and would take considerable resources to compile and analyze at the aggregate level. Furthermore, the spatial scale in which data are collected with logbooks (10 by 10 mile square blocks) are at a much larger scale than Point 97's data, making it difficult to compare data sets.

For the commercial fishing sector, the landings database provided by CDFW did not contain data on individual fishermen that were comparable to our survey results and we were unable to identify any other data sources to utilize for validation. In light of the difficulties in obtaining and analyzing existing data sets to compare our results, Point 97 thoroughly reviewed all data sets with the fishing community to ensure all data products submitted were verified and accepted by the fishing community and are of the best quality possible.

2.3.5. Spatial Data Analysis Methods

In this section we further detail how spatial data were analyzed in this project. Point 97/Ecotrust's methodology to analyze spatial fishing data collected was developed and refined through collaboration with fishing communities across California during the MLPA process (Scholz et al. 2011a). The analysis of the fishing grounds information is broadly comprised of two components: determination of the fishing grounds and determination of relative (economic) importance. Below we present a detailed methodology for how spatial data were weighted, analyzed, and aggregated for the commercial fishing sector's spatial fishing data.

As stated above all fishermen were asked to map fishing grounds for each fishery separately. For each commercial fisherman, individual spatial fishing data were weighted based on the ex-vessel revenue for the year 2012 from each specific fishery/activity.

The following is a detailed methodology of how we analyzed and aggregated individual spatial fishing data to create port and region level spatial data sets on the relative importance of fishing areas. We would like to emphasize that fishermen are asked to map each fishery separately and the spatial data analysis methodology detailed below is conducted for each fishery separately as well.

Step 1: Individual weighted fishing grounds

During the interview process, each fisherman was presented with a navigable nautical chart (e.g., interviewer could zoom in/out and move the map around) contained within the mapping portion of the survey tool (Figure 1). Fishermen were then asked to direct field staff to draw polygons or areas that could be of any shape or size. Each fisherman was asked to identify his or her fishing grounds for a particular fishery if fishing from any port in the South Coast region. This may include mapping areas outside the study region such as north or south of the study region. Furthermore, these fishing grounds could be one or more set of polygon/areas and together they *comprise his or her total fishing grounds for a particular fishery.*

Once the fishing area(s) were mapped, we then ask fishermen to allocate some portion of 100 pennies to each fishing area (or if there is only one fishing area all 100 pennies would be allocated to that area by default) such that the sum of the pennies allocated across his/her fishing areas for a particular fishery equals to 100. This is done to determine the relative importance of fishing areas in comparison to each other.

Step 2: Standardize and apply economic value to individual fishing grounds

The second step is to apply economic value to the individual fishing areas and distribute that value spatially based on the proportion of pennies allocated to each fishing area. For commercial fishermen we utilized the reported ex-vessel revenue for each fisherman earned from a fishery (found in the CDFW landings data) and distributed that economic value across the fishing area(s) proportionally with the amount of pennies allocated to a specific fishing area. For example, if a commercial fisherman's ex-vessel revenue from rockfish was $50,000 and one fishing area was assigned 50 pennies we would allocate $25,000 in economic value to that specific fishing area. This allocation of economic value is applied to each individual spatial fishing data set.

Individual spatial fishing data were weighted based on the specific fisherman's ex-vessel revenue for the full calendar year 2012. To standardize each data set for aggregation we then converted each fisherman's fishing ground data layer (polygon layer) for a particular fishery into a 100 x 100 meter cell size grid or raster layer.

Step 3: Aggregate individual fishing ground values to port level data set

To aggregate the individual fishing ground data layers (raster layers) we simply summarize the values in each cell across the individual raster data layers for all respondents in a given landing port. The resulting data set is a 'heat map' depicting the relative value of fishing areas for a given fishery in a given port.
Step 4: Aggregate port level data sets to regional data sets

To create regional level data sets for a specific fishery each port data layer is further weighted by the port's total ex-vessel revenue for the specific fishery (for the given year of interest), which is provided by the CDFW landings data and then combined into a regional data layer. We apply the total ex-vessel revenue to each port level data layer when combining data layers to control for any sample bias at the port level. For example, if we interviewed more fishermen in a given port it may not necessarily mean that the economic value of that port is greater than that of another port in which we interviewed less commercial fishermen.

Applying this aggregation weight is done by distributing the total ex-vessel revenue value across the respective port level data layer proportionally by the value in each raster cell. Each of these port level raster data layers are then aggregated by summing the values in each raster cell across the port data layers in the region.

2.3.6. Non-spatial Data Analysis Methods

The design of survey questions within this project were largely modeled from survey questions developed through the survey work Point 97/Ecotrust conducted during the MLPA planning process (2005-20011) as well as through a peer review consultation with regional fishery social scientists. The survey was further refined through review with key informants within the South Coast fishing community to tailor the questions to the South Coast Region. The survey questions were designed so that fishermen could easily provide answers/estimates from readily available knowledge commonly known by fishermen. For the instances in which fishermen were unable to provide answers using on-hand information, Point 97 field staff later followed up with the individual to collect the information or the information was omitted when calculating averages.

All non-spatial survey data were exported from the survey tool to an MS Access database and then imported into MS Excel files, which were then summarized into tabular format primarily using pivot table queries. As emphasized above, all data for ports or fisheries with fewer than three respondents have been withheld from publication to protect the confidentiality of the survey respondents. An asterisk, '*', can be found in the data tables in which data has been suppressed. A dash, '–', in the data tables indicates a zero value or that data was not collected for a given port-fishery combination. Often if data were not collected in a given port-fishery combination the fishery does not occur or is not a significant fishery in a port (e.g., is not a target fishery).

Ex-vessel revenue and landings data points with less than three fishermen were suppressed and to ensure the confidentiality of fishermen data, secondary suppression were also made when appropriate in order to prevent the back calculation of suppressed data points from regional totals. In ports with suppressed landings data, the data were not deleted from the aggregate port totals, but instead coded and included as 'other'.

In the report, there are several survey summary tables that report out on characteristics of fishing activities/income from the year 2008. These averages were taken from a study conducted by Point 97/Ecotrust in 2008 (Scholz et al. 2010). We provide this information to investigate possible initial economic change since 2008.

3. SOUTH COAST REGIONAL PROFILES

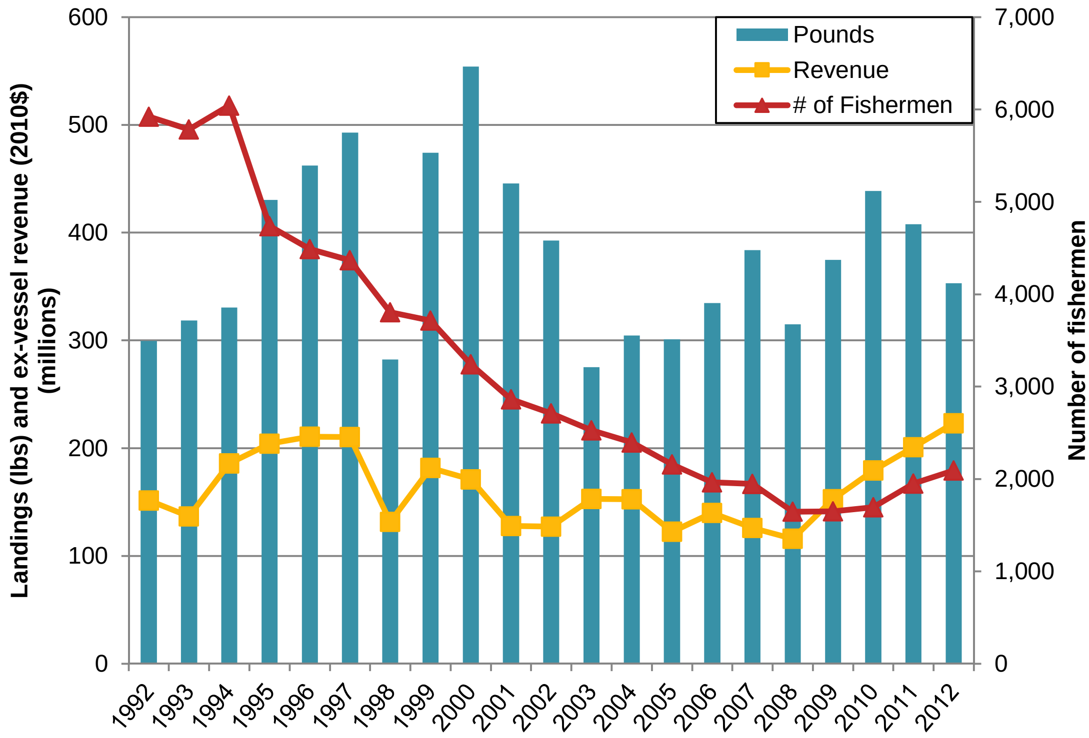
3.1. South Coast Region Commercial Fishing Historical Trends and Initial Changes

Figure 3 displays statewide commercial landings in California from 1992–2012. Landings fluctuated over the study period; they were lowest in 2003 at 275.3 million pounds and highest in 2000 at nearly 554

million pounds. Landings of 353 million pounds were observed in 2012, the final year of the study period. The ex-vessel revenue over the study period increased from $151.5 million in 1992 to $210.6 million in 1996, before generally declining. In 2008, ex-vessel revenue increased again reaching a period high of approximately $223.3 million by the end of 2012. It is interesting to note that the highest and lowest years of ex-vessel revenue do not correspond with the highest and lowest years for volume or pounds landed. This is likely due to changing composition of landings and ex-vessel prices paid in particular fisheries each year. Overall, landings and ex-vessel revenue for the state of California increased by 17.9 and 47.3 percent respectively from 1992 to 2012. Meanwhile, the number of fishermen consistently declined over the study period, by 64.6 percent overall, from 5,920 in 1992 to 2,094 in 2011. Some fishermen noted that increased operating expenses and regulations made it difficult for small boat and small revenue fishermen to operate and many of them are finding it too costly to remain in operation.
Figure 4 displays the total commercial landings, ex-vessel revenue, and number of fishermen over the study period in the South Coast region specifically. The number of fishermen peaked early on; there were 2,304 fishermen in 1994, before declining almost every year thereafter reaching a low of 715 fishermen by 2010. However, in the last couple years of the study period a few more fishermen participated than the previous year, 759 in 2001 and 782 by 2012. Like the state, landings peaked in the South Coast in 2000 (at 428.8 million pounds), while ex-vessel revenue peaked a year earlier in 1999 ($106.9 million). While annual amounts varied (usually in tune with the market squid–net fishery, see below), overall the region saw increases from the beginning of the study period.

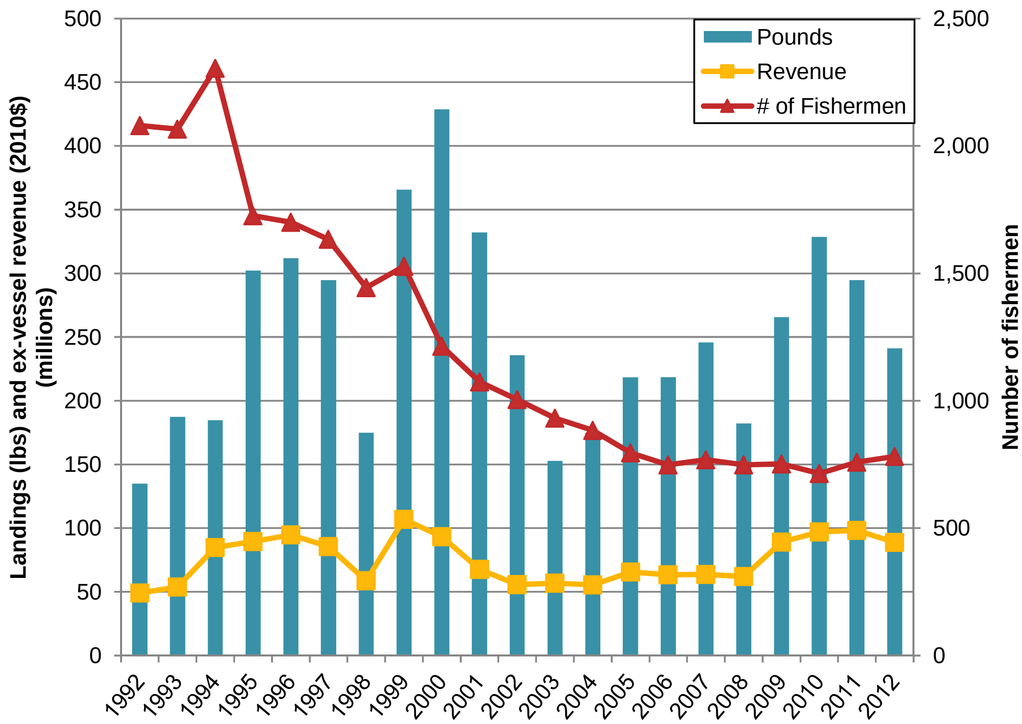
Over the study period, the South Coast region was responsible for an average of 65.1 percent of total state landings and 46.6 percent of total state ex-vessel revenue, see Figure 5. Just over a third of California's commercial fishermen made landings in the South Coast; and this proportion has remained relatively stable over the study period as declines in active commercial fishermen were observed at both scales. Because the total number of South Coast fishermen declined faster than total landings and ex-vessel revenue changed and even increased over the study period, the average fishermen's yearly landings and ex-vessel revenue increased significantly from 1992 to 2012, see Figure 6. In 1992, the average South Coast fisherman (out of 2,080 total) landed 64,902 pounds for $23,592 in ex-vessel revenue; in 2012 the average South Coast fisherman (out of 782 total) landed 308,409 pounds for $113,600 in ex-vessel revenue. In other words the fishermen of 2012 landed nearly five times as much as the fishermen of 1992. As will be presented later in the report, there are many instances in fisheries and ports where this trend was observed, overall landings decreasing but individual fishermen average ex-vessel increasing due to the quicker decline in the number of participating fishermen overall.

Figure 3. State of California total commercial landings, ex-vessel revenue, and number of fishermen, 1992–2012



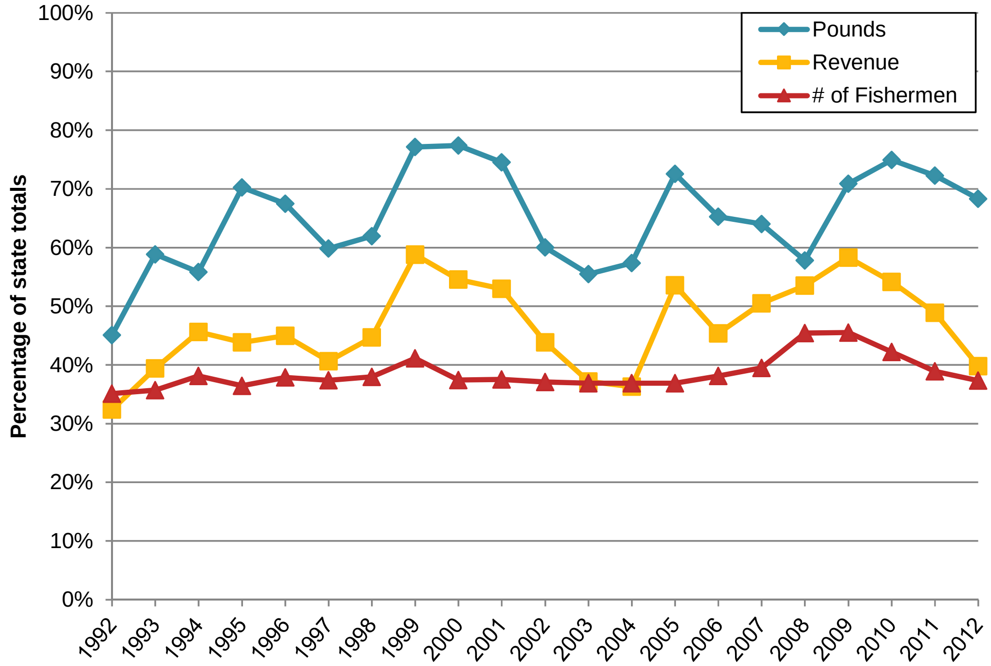
Source: Current study, based off landings data from CDFW.

Figure 4. South Coast region total commercial landings, ex-vessel revenue, and number of fishermen, all fisheries, 1992–2012



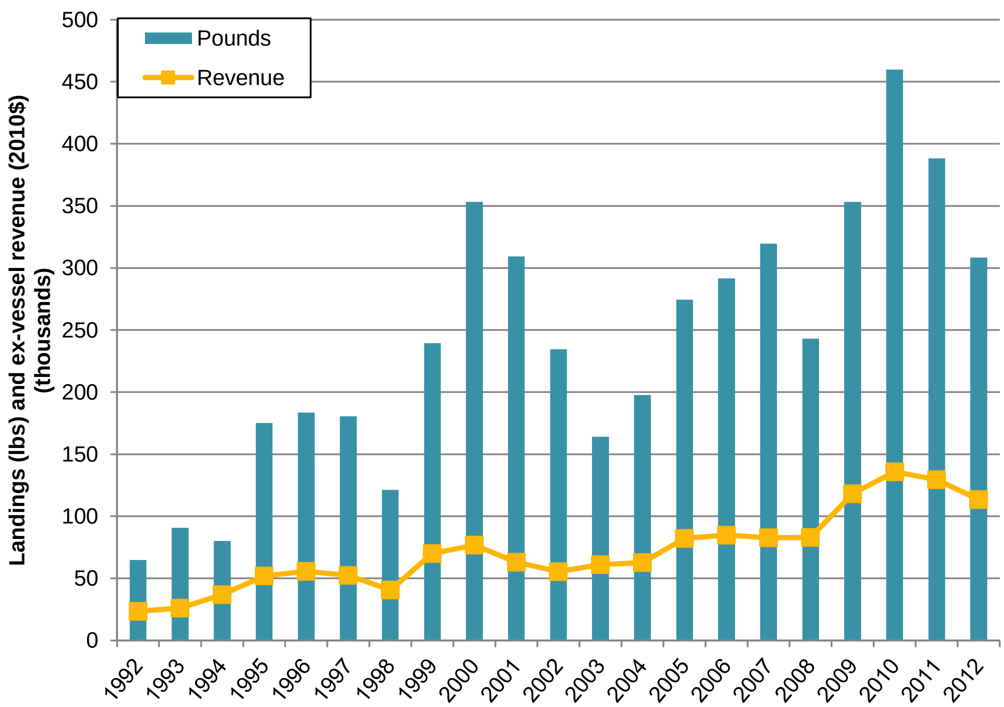
Source: Current study, based off landings data from CDFW.

Figure 5. South Coast region total commercial landings as a percentage of state commercial landings and ex-vessel revenue, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 6. Average commercial landings and ex-vessel revenue per fisherman in the South Coast region, 1992–2012



Source: Current study, based off landings data from CDFW.

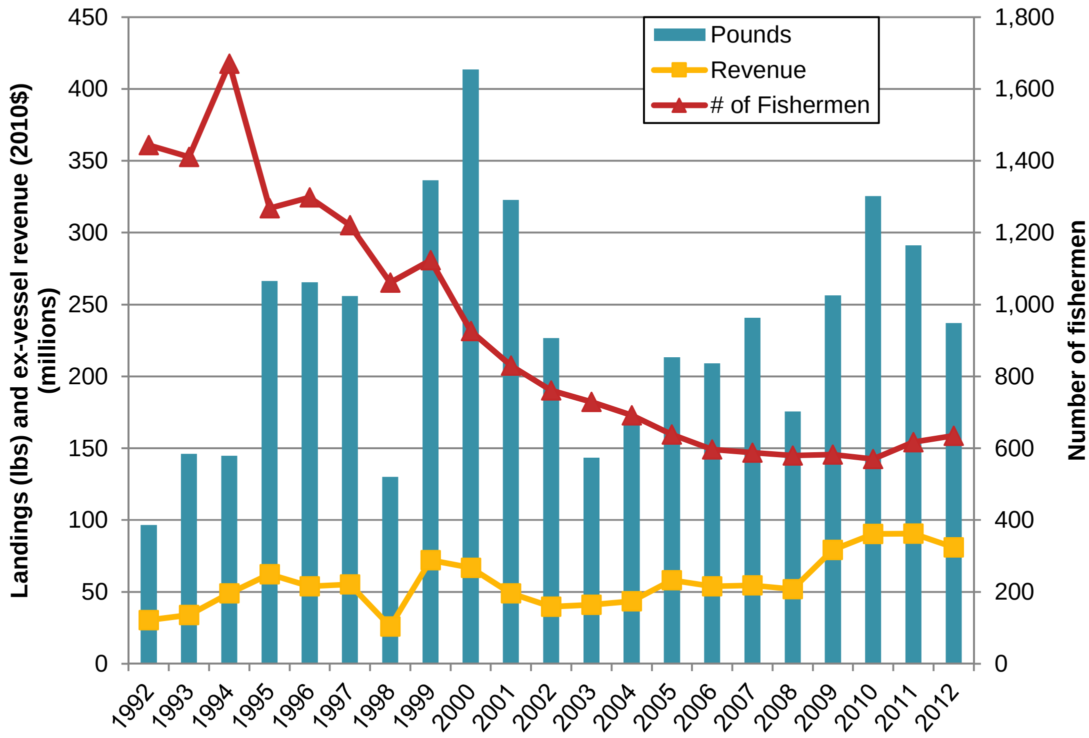
It is important to note that unless marked ‘all fisheries’, the majority of this report examines commercial landings and ex-vessel revenue trends specific to the sixteen fisheries of interest presented in Table 2. Of course, these sixteen fisheries of interest are not the only fisheries that occur in the South Coast region, additional landings and ex-vessel revenue from other fisheries may be mentioned in the narrative for a South Coast region port when notable. As stated earlier in the methods section these fisheries were selected for further analysis as they occur mostly in state waters and are most likely to experience both short-term spatial and economic changes associated with MPA implementation and because they were of high economic importance to the South Coast region over the study period.

Table 2. Commercial fisheries of interest

Fisheries of Interest
California halibut–hook & line
California halibut–trawl
Coastal pelagics–net
Lobster–trap
Market squid–brail
Market squid–net
Nearshore finfish–dead–hook & line
Nearshore finfish–dead–longline
Nearshore finfish–live–hook & line
Nearshore finfish–live–longline
Nearshore finfish–live–trap
Rock crab–trap
Sea cucumber–dive
Sea cucumber–trawl
Spot prawn–trap
Urchin–dive

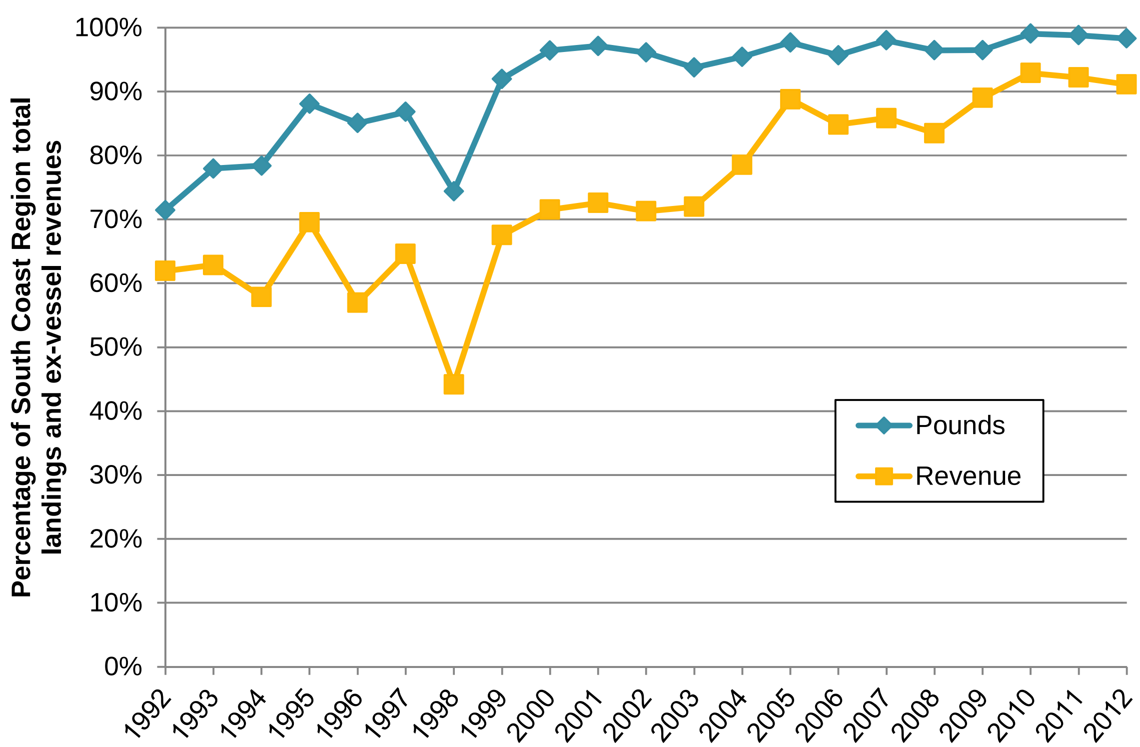
Total landings in the South Coast region for the fisheries of interest averaged 231.6 million pounds annually and $56.3 million in ex-vessel revenue from 1992–2012, see Figure 7. Figure 8 displays the portion of total regional landings and ex-vessel revenue from all fisheries in the South Coast that the sixteen fisheries of interest represented annually over the study period, which was an increasing percentage. Beginning in 1992 as 71.5 percent and 61.9 percent of total landings and ex-vessel revenue respectively, by 2012 landings and ex-vessel revenue from the sixteen fisheries of interest constituted a total of 98.3 percent of South Coast landings and 91.1 percent of total South Coast ex-vessel revenue. The exceptional dip in 1998 is largely due to landings and ex-vessel revenue made in the tuna and swordfish fisheries those years.

Figure 7. South Coast region commercial landings, ex-vessel revenue, and number of fishermen, fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 8. Fisheries of interest as a percentage of all commercial fisheries landings and ex-vessel revenue in the South Coast region, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 9 and Figure 10 illustrate shifts in the composition of total landings and ex-vessel revenue from the sixteen fisheries of interest in the South Coast region graphically. We would like to highlight that in the ex-vessel revenue and landings composition figures shown throughout this report at the port level, not all sixteen fisheries of interest are visible in the figures due to relatively low values of some fisheries in relation to total landings and ex-vessel revenue in that port. These compositional figures display the total landings and ex-vessel revenue for all fisheries with non-fisheries of interest represented as 'other' in light, transparent blue shading.

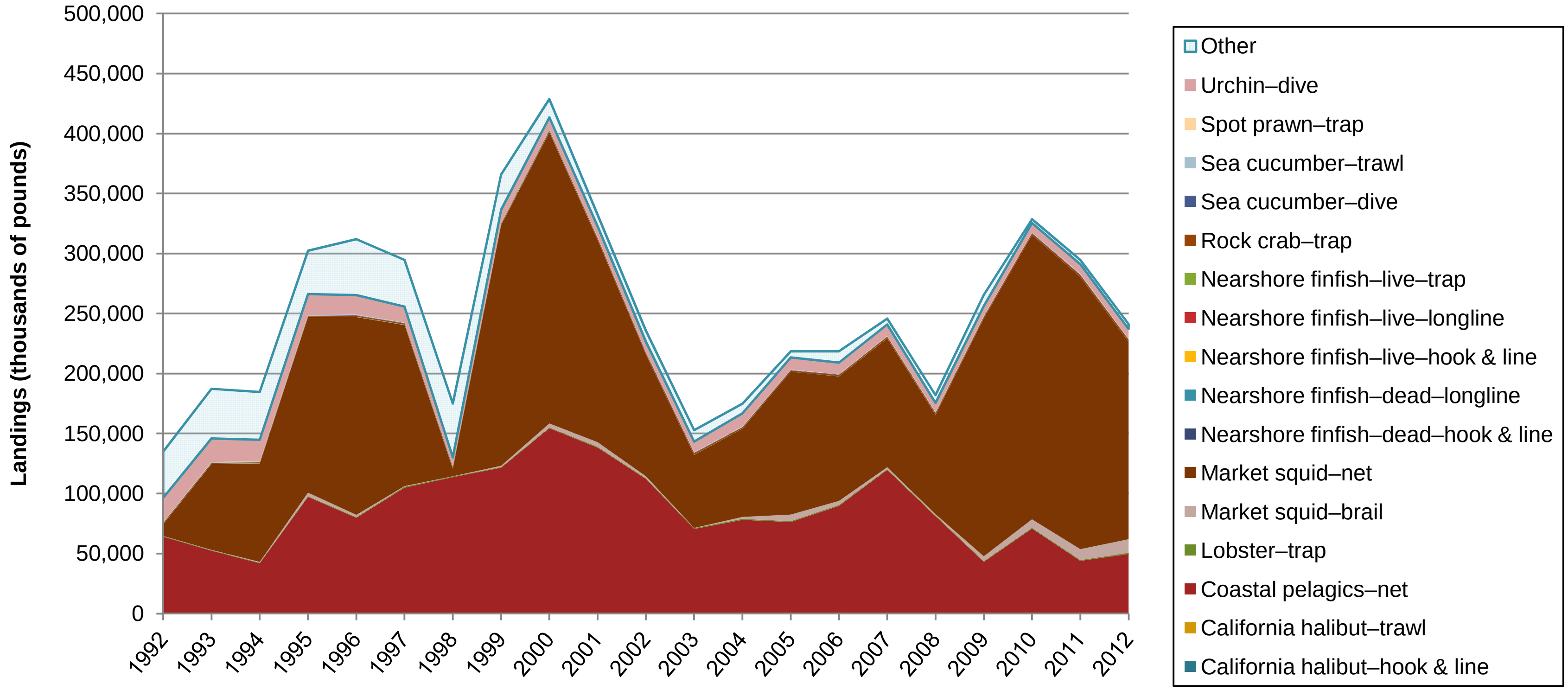
The trend represented in Figure 8 is also apparent in Figure 9 and Figure 10: the sixteen fisheries of interest have become relatively more significant in relation to other fisheries in the South Coast region over the study period.

The most significant fisheries of interest in the South Coast in terms of pounds landed over the study period included the market squid–net (representing an average annual 48.1 percent of total pounds from all fisheries), coastal pelagics–net (35.6 percent), and urchin–dive (5.1 percent) fisheries. In terms of ex-vessel revenue, the most significant fisheries of interest in the South Coast over the study period included the market squid–net (representing an average annual 33.7 percent of total ex-vessel revenue from all fisheries), urchin–dive (14.4 percent), and lobster–trap (9.9 percent).

While informative, averages do not indicate the change in fisheries over time. Notable is the decline of the urchin–dive fishery in the region over the study period. In 1992 landings and ex-vessel revenue from this fishery constituted 15 percent and 29.4 percent to total landings and ex-vessel revenue respectively; by 2012 these portions had dropped to 3.4 percent and 6.3 percent. While not as apparent, because still relatively small in absolute terms, several other fisheries of interest experienced considerable growth in the South Coast, including the lobster–trap, spot prawn–trap, California halibut–hook & line, and sea cucumber fisheries. These trends are more apparent at the regional port level, see Section 4.

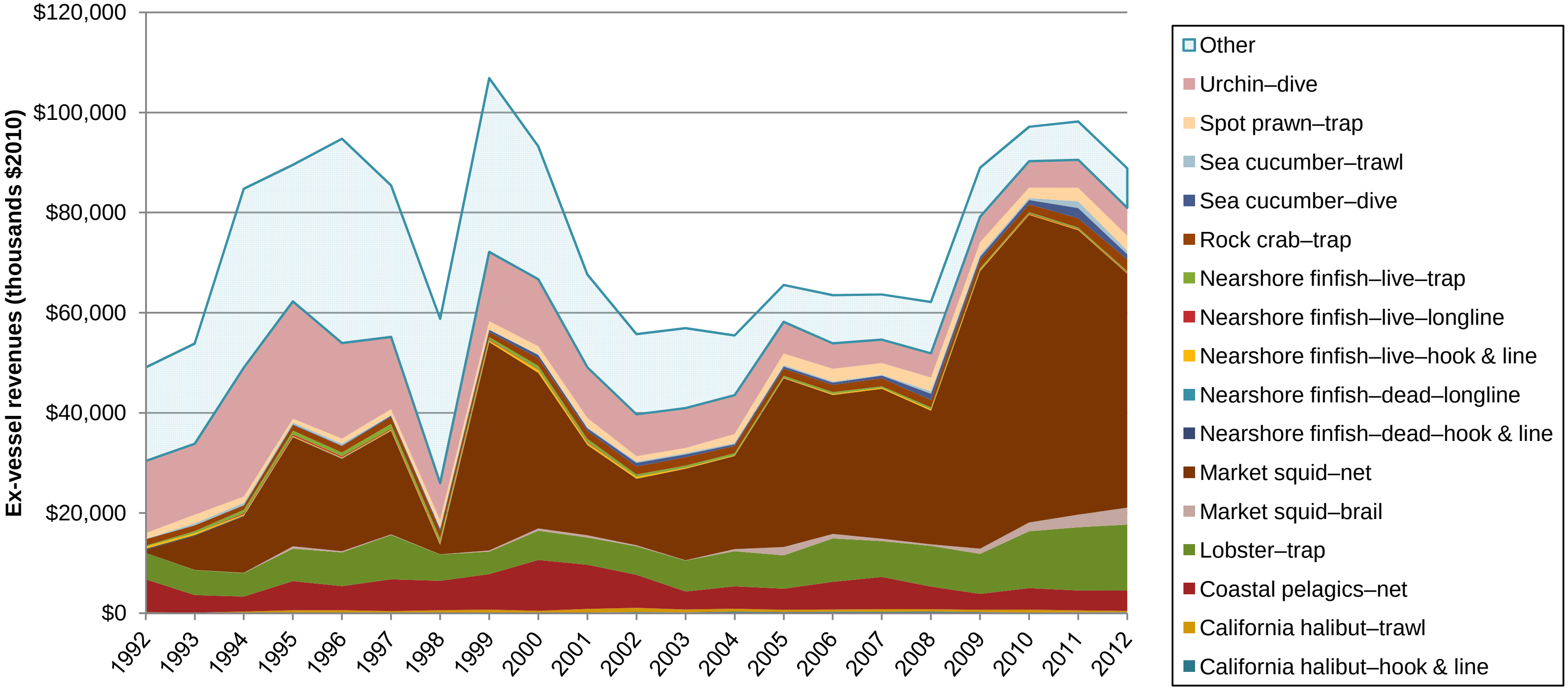
It is also worth noting that several of the fisheries of interest examined in this report are nearly 'specialization' fisheries in the South Coast, or in other words, fisheries that occur primarily in the South Coast region relative to the rest of the state. For example, landings and ex-vessel revenue from the South Coast's lobster–trap fishery constitute an average of 99.8 percent of total state landings and ex-vessel revenue over the study period annually. From 1992–2012, this was also true for the sea cucumber–trawl fishery (where an annual average of 100 percent of total California ex-vessel revenue occurred in the South Coast), market squid–brail (99.4 percent), sea cucumber–dive (93 percent), market squid–net (88.5 percent), and the coastal pelagics–net (77.7 percent, though decreasingly so) fisheries. The South Coast region of California is certainly a productive one.

Figure 9. South Coast region commercial landings for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 10. South Coast region commercial ex-vessel revenue for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 11 displays the average relative percent fishing income from the sixteen commercial fisheries of interest from 1992–2012 and was created using CDFW landings data. Similar figures are presented for each regional South Coast port later in the report. These figures were developed to explore changes in how much fishermen rely upon specific fisheries of interest over time. It should be noted that these percentages may not reflect a fisherman's full fishing portfolio, we examined the majority of ex-vessel revenue (approximately 90–100 percent each year)[2] from only the South Coast region. Fishermen who fish outside of the region may have additional fishing income that is not accounted for in these figures.

To create this figure, ex-vessel revenue from 48 distinct fisheries, including the sixteen fisheries of interest, were summed by year for each individual fisherman making landings in the region (or a specific port) to estimate a 'total fishing income'. The fisheries outside of the fisheries of interest are represented in the 'other' category, displayed in light, transparent blue shading. Using the 'total fishing income' sum, the percentage of fishing ex-vessel revenue from each fishery of interest and from the aggregated 'other' fishery was calculated for an individual. These individual percentages were then averaged across all fishermen throughout the region (or port). The resulting percentages indicate the relative importance of the sixteen fisheries of interest to all other fisheries in the South Coast region (or in a particular port). Later in this report, where the analysis is presented at the port level, total averages will not add up to 100 percent as fishermen may land in multiple South Coast region ports.

Although created from individual fishermen's landings data, the figures are not intended to portray an individual fisherman; in the South Coast region most fishermen tended to fish only one fishery a year (57.7 percent) and made landings at only one port per year (approximately 75 percent) on average. Instead, the figures display how the relative ex-vessel revenue contribution from a specific fishery compared to the other fisheries for an average fisherman over time.

In the South Coast, fishermen in the urchin–dive fishery were most reliant on the ex-vessel revenue from that singular fishery than were other fishermen reliant on other fisheries in the region. Landings from the urchin–dive fishery constituted an annual average of 5.1 percent of total landings and 14.4 percent of total ex-vessel revenue in the region, but represented 25.7 percent of the average fisherman's individual income over the study period. Fishermen who fished lobster–trap were also observed to be particularly reliant on ex-vessel revenue from that fishery, as it constituted 15 percent of the average South Coast fisherman's individual income over the study period annually. Market squid–net, on the other hand, which represented 48.1 percent of total landings and 33.7 percent of total ex-vessel revenue in the region annually, constituted only 7.9 percent of the average fisherman's individual income per year over the study period.

Again, it should be noted that these figures represent all fishermen combined and averaged together. For example, the data shows that fishermen who participated in the urchin–dive fishery often only participated in one other fishery on average, deriving an average of 93.5 percent of their income from ex-vessel revenue received from their urchin–dive catch. On the other hand, fishermen making landings in the nearshore finfish–dead–longline fishery, for example, tended to additionally fish about six other fisheries on average each year, and ex-vessel revenue from their nearshore finfish–dead–longline landings constituted only 8.5 percent of their total fishing income on average annually. Netted together across all fishermen, this averaged out to, say for the urchin–dive fishery, 25.7 percent of the fishing income of the average South Coast fisherman's fishing income was attributable to ex-vessel revenue made in that fishery. The figure is much lower than the aforementioned 93.5 percent figure which only represented participating urchin–dive fishermen's income. This is because the 25.7 percent figure also includes the hundreds of fishermen that did not participate in the urchin–dive fishery (i.e. ex-vessel revenues of zero).

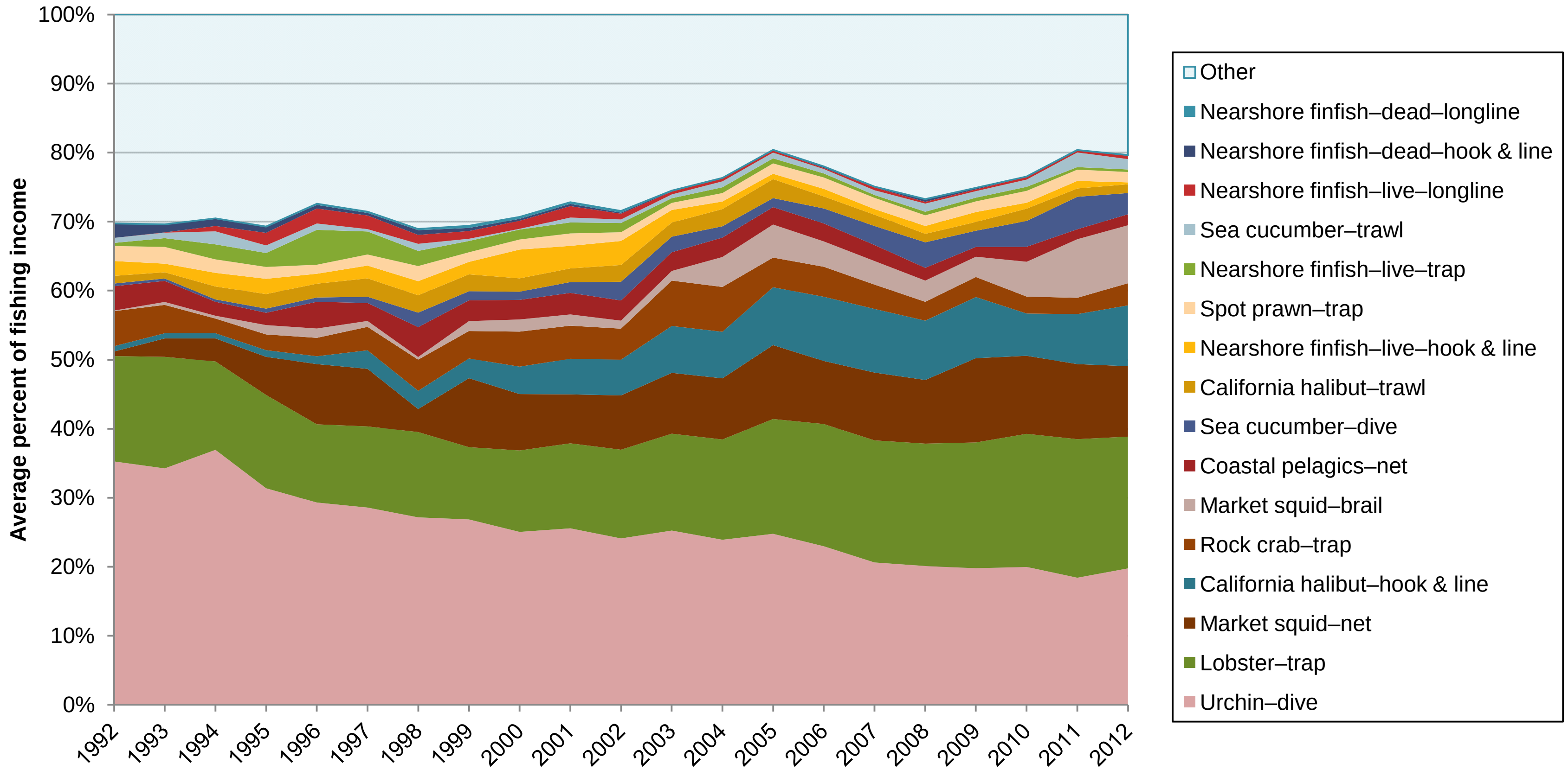
Compared with the exact percentage of total ex-vessel revenue per year numbers, these average individual income numbers indicate the increasing or decreasing significance of ex-vessel revenue form a particular fishery of interest to the average fisherman's total fishing income over time. For example,

[2] Some landings/ex-vessel revenue may have been made in marginal or rare fisheries which may not be captured in this analysis; additionally, in some years fishing license numbers or their associated landings/ex-vessel revenue may have been entered incorrectly and thus were removed from this particular average percent of individual fishing income analysis.

averaged over the total, the California halibut–hook & line fishery constituted only 0.8 percent of regional fishing incomes in 1992, and increased to account for 8.8 percent of total regional fishing incomes by 2012. This means that over the study period, ex-vessel revenue from this fishery became increasing important to fishermen making landings in this fishery *relative* to their landings made in other fisheries. This is indeed the case; the percent contribution California halibut–hook & line ex-vessel revenue made to participating fishermen's total fishing income grew from 26.5 percent of a California halibut–hook & line fisherman's total income in 1992 to 60 percent in 2012. Looking only at the percentage of total ex-vessel revenue percentages this trend would not be observable. The spot prawn–trap fishery also experienced a similar increase in significance to South Coast fishermen over the study period.

Further observable in Figure 11 is the declining significance of ex-vessel revenue made in the 'other' fisheries outside these fisheries of interest examined in this report. In 1992, income from these 'other' fisheries, mostly swordfish and tuna in this region, constituted 30.4 percent of the average South Coast fisherman's total fishing income, by 2012 this portion declined to 20.4 percent.

Figure 11. Average percent of individual fishing income from commercial fisheries of interest, South Coast region, 1992–2012



Source: Current study, based off landings data from CDFW.

3.2. South Coast Region Commercial Fishing Baseline Characterization

In the commercial fishing baseline characterization sections found throughout this report we summarized the primary data collected from commercial fisherman interviews carried out in the summer and fall of 2013. In addition to data collected in 2013 regarding the 2012 fishing year we include information from interviews conducted in the 2008 study by Point 97/Ecotrust, which asked questions regarding a fisherman's cumulative fishing experience prior to the point of interview.

In Table 3 below, the number of fishermen interviewed and provided data for the non-spatial (or fishing grounds mapping) portion of the interview is organized by target fishery and homeport. As some fishermen declined to participate in the fisheries mapping portion of the interview, the number of fishermen contributing to the spatial datasets developed in this project will differ. That information is provided in a separate section of this report.

Homeport is identified by the fisherman interviewed and is typically where they land the majority of their catch. While each individual may be included in more than one of the target fisheries, each individual is only associated with one homeport. For example, we interviewed 35 fishermen who indicated that Santa Barbara was their homeport. Fourteen of these individuals participated in the urchin–dive fishery and two participated in the sea cucumber–dive fishery. Some fishermen in the sea cucumber–dive fishery also participated in the urchin–dive fishery. We interviewed the most respondents in Santa Barbara (35), followed by San Pedro/Los Angeles (23), San Diego (19), Ventura (12), Port Hueneme/Oxnard (10), and then Dana Point (9) and Oceanside (6).

Table 4 shows the number of fishermen who made landings in each of the target interview fisheries within the South Coast study region and the total revenue generated by those landings. The market squid–net fishery generated the most ex-vessel revenue, over $46.7 million, in 2012 (58 percent of the total ex-vessel revenue landed by the target interview fisheries) and we interviewed 11 of the 90 fishermen who landed in this fishery. All the target interview fisheries combined generated $80.8 million and we interviewed 114 of the 635 fishermen who made landings in the study region in 2012.

Table 3. Number of commercial fishermen interviews conducted, non-spatial survey, 2012,South Coast Region

Fishery	Santa Barbara	Ventura	Port Hueneme/ Oxnard	San Pedro/ Los Angeles	Dana Point	Oceanside	San Diego	Unique individuals
California halibut–hook & line	2	—	—	1	—	—	1	4
California halibut–trawl	5	—	—	—	—	—	—	5
Coastal pelagics–net	—	2	1	3	—	—	—	6
Lobster–trap	13	6	2	8	9	5	13	56
Market squid–brail	—	—	—	3	—	—	1	4
Market squid–net	—	5	2	4	—	—	—	11
Nearshore finfish live–fixed gear	3	1	1	2	1	1	5	14
Rock crab–trap	11	5	2	3	1	2	3	27
Sea cucumber–dive	2	—	4	4	—	—	3	13
Sea cucumber–trawl	4	—	—	—	—	—	—	4
Spot prawn–trap	—	1	—	1	—	1	1	4
Urchin–dive	14	—	6	8	—	—	6	34
All target fisheries (unique individuals)	35	12	10	23	9	6	19	114

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 4. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, South Coast Region

Fishery	2012 Landings revenue (2010$)	Total number of individuals in 2012 landings revenue	Number of individuals interviewed
California halibut–hook & line	$199,351	110	4
California halibut–trawl	$246,412	26	5
Coastal pelagics–net	$4,069,765	44	6
Lobster–trap	$13,190,202	165	56
Market squid–brail	$3,393,970	70	4
Market squid–net	$46,677,219	90	11
Nearshore finfish live–fixed gear	$401,587	45	14
Rock crab–trap	$2,280,955	99	27
Sea cucumber–dive	$1,074,175	59	13
Sea cucumber–trawl	$700,625	24	4
Spot prawn–trap	$2,996,653	17	4
Urchin–dive	$5,559,458	175	34
Total	$80,790,371	635	114

Source: Current study

As shown below in Table 5, the average fisherman across all target fisheries was 51.9 years old at the time of interview and had 28.8 years of experience commercial fishing. It should be noted that this question inquired about the number of years of experience an individual had commercial fishing as a whole, not the number of years of experience they had in a specific fishery. This average, for all target fisheries, is for unique individuals and includes each individual only once, regardless of how many fisheries they participated in. The oldest individual we interviewed was 75 years old, while the youngest was 25 years old.

Table 5. Average age and years of experience commercial fishing, 2012, South Coast Region

	Age			Years of experience		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	4	50.0	3.6	4	24.5	6.8
California halibut–trawl	5	62.4	11.8	5	44.0	12.9
Coastal pelagics–net	6	52.0	17.9	6	30.3	22.4
Lobster–trap	56	49.6	11.2	56	27.1	12.2
Market squid–brail	4	48.3	15.5	4	28.5	13.3
Market squid–net	11	47.9	15.2	11	27.4	18.6
Nearshore finfish live–fixed gear	14	50.2	7.6	14	29.5	8.9
Rock crab–trap	27	50.4	8.7	27	29.9	9.7
Sea cucumber–dive	13	57.0	9.5	13	33.3	8.2
Sea cucumber–trawl	4	61.5	13.4	4	45.0	14.7
Spot prawn–trap	4	57.3	7.6	4	24.8	15.3
Urchin–dive	34	55.5	8.2	34	31.1	8.9
All target fisheries (unique individuals)	114	51.9	11.3	114	28.8	12.7

Source: Current study

Table 6 lists permits that individuals cited they owned, but did not use in 2012. This question was asked to further investigate underlying factors that may be driving change in fishing opportunities in the region. The most frequently unused permit in 2012 was a rock crab–trap fishery permit, as eight were reported unused. The most common reason for not using a permit was that the fisherman was too busy fishing other fisheries.

Table 6. Permits owned but not used in 2012, South Coast Region

Permit type	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Alaska permits	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Albacore	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Coastal pelagics–net	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Deeper nearshore finfish	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Drift swordfish/shark	2	—	2	—	1	1	—	—	—	—	—	—	—	—	—	—
General trap	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Gillnet	3	—	—	—	—	—	1	2	1	1	—	—	—	—	—	—
Groundfish, west coast limited entry	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Hagfish	1	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—
Hook and line	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Lobster	2	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish	5	—	2	—	—	1	—	1	—	—	1	2	—	—	1	—
Ridgeback prawns	3	—	—	—	—	1	1	—	2	—	—	—	1	1	1	—
Rock crab–trap	8	—	1	—	—	—	—	—	—	2	1	—	1	—	2	1
Sablefish	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Salmon	3	1	—	—	—	—	—	—	—	—	—	—	1	1	—	—
Sea cucumber–dive	3	—	2	1	—	1	—	—	—	—	—	—	—	—	—	—
Swordfish	5	—	—	—	—	—	—	—	1	1	—	—	—	2	—	1
Urchin–dive	5	—	3	2	—	1	—	1	—	1	—	—	—	—	—	—
Urchin (Alaska)	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
All permit types (not unique individuals)	50	4	14	3	1	5	2	4	5	6	2	2	4	4	4	6

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. Fishing elsewhere
B. Did not have time, too busy fishing other fisheries
C. Fishery is too physically demanding
D. Boat is too small
E. Other fisheries are more profitable
F. Lack of market
G. MPAs
H. Poor environmental/oceanic conditions
I. Fishery not financially viable
J. Personal/family reasons
K. Does not like the way fishery is regulated
L. Hard fishery to participate in
M. Not enough fish to catch
N. Prefers other fisheries
O. No explanation given

Fishermen were also asked if they added or dropped any fishery since 2008.The reasoning behind these questions was to investigate any underlying factors that may be driving socioeconomic change in specific fisheries. All sixteen fisheries shown in Table 7 were added by at least one fisherman between 2008 and 2012. Among the most added fisheries, eight individuals added the rock crab–trap fishery and seven individuals added the lobster–trap fishery between 2008 and 2012. The most common reason for adding a fishery among all respondents was that the fisherman had an opportunity to expand or diversify their operations.

Table 7. Reason for adding a fishery since 2008, South Coast Region

Permit type	Number responding	A	B	C	D	E	F	H	I	J
Alaska Salmon	1	—	—	—	—	—	—	1	—	—
Bait fish	1	—	—	—	1	—	—	—	—	—
Canner crab	1	—	—	—	—	—	—	1	—	—
CPFV	1	—	—	—	1	—	—	—	—	—
Gillnet	1	—	—	—	1	—	—	—	—	—
Lobster–trap	7	2	—	—	6	—	1	—	—	—
Market squid–net	1	—	—	—	1	—	—	—	—	—
Nearshore finfish	3	1	1	1	1	—	—	—	—	—
Rock crab–trap	8	2	1	—	2	—	—	3	1	—
Sablefish	3	2	1	—	—	1	—	1	—	—
Salmon	1	—	—	—	—	—	—	—	—	1
Sea cucumber–dive	3	1	1	—	3	—	—	—	—	—
Sea cucumber–trawl	2	—	—	—	2	—	—	—	—	—
Swordfish (drift net)	1	—	—	—	1	—	—	—	—	—
Whelk	1	—	—	—	—	—	—	1	—	—
White seabass	1	1	—	—	—	—	—	—	—	—
All permit types (not unique individuals)	36	9	4	1	19	1	1	7	1	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. Good market/economic opportunity
B. Productive fishery
C. Used to fish, added back in (able to obtain permit)
D. Opportunity for expansion/diversification
E. Had time due to cuts in other fisheries
F. Started using a crew
G. Sustainable fishery
H. No reason given
I. Added as a fall back
J. Added when it was reopened

All 22 fisheries shown in Table 8 were dropped by at least one fisherman between 2008 and 2012. Five individuals dropped the nearshore finfish fishery between 2008 and 2012. Of the five nearshore finfish fishermen, four different reasons were given for dropping the fishery. The two most common reasons for dropping a fishery were that the fisherman had lost his permit due to landing requirements and loss of fishing areas due to MPAs and/or the Rockfish Conservation Area (RCA).

Table 8. Reason for dropping a fishery since 2008, South Coast Region

Permit type	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Abalone	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Alaska herring	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Albacore	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Alaska purse seine	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Blackgill	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
CPFV	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Deeper nearshore	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
Gillnet	2	—	—	—	—	—	1	—	1	2	—	—	—	—	—	—
Kelp	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Lobster–trap	4	—	—	—	—	—	2	1	—	—	—	1	—	—	—	—
Market squid–net	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
Nearshore finfish	5	—	—	—	—	—	1	2	—	—	—	—	1	—	—	1
Rock crab–trap	3	—	—	1	—	—	1	—	—	—	—	—	—	—	1	—
Rockfish (open access)	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—
Sablefish	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Salmon	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Sea cucumber–dive	2	—	—	1	—	—	—	1	—	—	1	—	—	—	—	—
Spider crab	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
Spot prawn–trap	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Swordfish (drift net)	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
Urchin–dive	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—
Whelk	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—
All permit types (not unique individuals)	33	1	2	4	1	2	6	6	2	2	3	1	1	2	2	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. Fishery closed
B. Moved to California to fish
C. Prefers other fisheries
D. Quota reduced
E. No reason given
F. Lost permit due to landing requirements
G. Loss of fishing areas (MPAs/RCAs)
H. Difficult fishery to participate in
I . Unable to sell permit
J. Poor market/ not economically viable
K. Sold permit, needed money
L. Regulations (FMP)
M. Prefers not to fish at night
N. Gave permit to family member
O. Difficult to focus on multiple fisheries at the same time

Fishermen were asked what percent of their personal income came from commercial fishing in the 2012 calendar year. In Table 9 below, we compare the averages across respondents for 2012 to averages reported in 2008, which, as mentioned before were in regards to a fisherman's cumulative fishing experience in 2007, which, as mentioned before, are from the Point97/Ecotrust study conducted in 2008 (Scholz. et al 2010). Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years.

Across respondents in each survey effort there was an average increase of 0.9 percent of total personal income from commercial fishing. Fishermen who participated in the market squid–net and California halibut–hook & line fisheries reported the greatest increase (15.6 and 12.8 percent, respectively). Additionally, the average respondent in seven (more than half) of the target fisheries expressed they experienced a decrease or no change in the percent of their income coming from commercial fishing between 2008 and 2012.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher. As shown below in Table 10, the majority of respondents in all fisheries, except the sea cucumber–trawl fishery, perceived no change. In the sea cucumber–trawl fishery, two of the respondents stated they perceived no change, while two stated that a significantly lower percent of the income came from commercial fishing in 2012 relative to 2008. All respondents in the market squid–brail, market squid–net, and spot prawn–trap fisheries indicated they felt they were making the same or a larger percentage of their income from commercial fishing in 2012 as they were in 2008.

Table 9. Percent change in income from overall commercial fishing from 2008 - 2012, South Coast Region

	2008^			2012			
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
California halibut—hook & line	9	88.7%	21.8%	4	100.0%	—	12.8%
California halibut—trawl	2	*	*	5	96.0%	8.9%	*
Coastal pelagics—net	29	95.2%	15.4%	6	99.2%	2.0%	4.2%
Lobster—trap	90	86.9%	24.8%	56	86.9%	22.3%	0.0%
Market squid—brail	3	86.7%	23.1%	4	95.0%	10.0%	9.6%
Market squid—net	44	86.1%	27.6%	11	99.5%	1.5%	15.6%
Nearshore finfish live—fixed gear	35	99.2%	3.5%	14	95.0%	10.2%	-4.3%
Rock crab—trap	46	95.6%	14.8%	27	94.6%	11.5%	-1.0%
Sea cucumber—dive	21	95.5%	8.5%	13	91.3%	19.4%	-4.4%
Sea cucumber—trawl	4	98.8%	2.5%	4	95.0%	10.0%	-3.8%
Spot prawn—trap	16	99.4%	2.5%	4	97.5%	5.0%	-1.9%
Urchin—dive	75	94.9%	10.4%	34	93.0%	17.2%	-2.0%
All target fisheries (unique individuals)	220	90.0%	21.6%	114	90.8%	18.8%	0.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 10. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, South Coast Region

		Percent response				
Fisheries	Number responding	Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	4	—	—	100.0%	—	—
California halibut–trawl	5	—	—	60.0%	—	40.0%
Coastal pelagics–net	6	—	—	100.0%	—	—
Lobster–trap	53	5.7%	5.7%	77.4%	7.5%	3.8%
Market squid–brail	4	25.0%	25.0%	50.0%	—	—
Market squid–net	11	9.1%	9.1%	81.8%	—	—
Nearshore finfish live–fixed gear	14	—	—	100.0%	—	—
Rock crab–trap	27	—	3.7%	88.9%	3.7%	3.7%
Sea cucumber–dive	13	—	—	92.3%	—	7.7%
Sea cucumber–trawl	4	—	—	50.0%	—	50.0%
Spot prawn–trap	4	—	25.0%	75.0%	—	—
Urchin–dive	34	2.9%	2.9%	88.2%	2.9%	2.9%
All fisheries (unique individuals)	111	5.4%	5.4%	80.2%	4.5%	4.5%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their income coming from commercial fishing. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Table 11 lists the reason for the change as well as the number for each fishery. The most common reason for a decrease in personal income due to fishing was 'personal reasons'. Specifically, fishermen mentioned life changes such as having a family or ageing. , The most commonly cited reason indicating an increase, was 'less revenue from other sources of income.

.

Table 11. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, South Coast Region

		Responses indicating increase								Responses indicating decrease					
Fishery	**Number responding**	A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	2	—	—	—	—	—	—	—	—	1	—	—	—	2	1
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	12	—	1	1	2	—	—	1	1	—	3	1	3	1	2
Market squid–brail	2	1	—	—	1	—	—	—	—	—	—	—	—	—	—
Market squid–net	2	—	—	1	1	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	3	—	—	—	—	—	—	—	—	—	2	1	1	—	1
Sea cucumber–dive	1	—	—	—	—	—	—	—	—	—	1	—	1	—	—
Sea cucumber–trawl	2	—	—	—	—	—	—	—	—	1	—	—	—	2	1
Spot prawn–trap	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Urchin–dive	4	1	1	1	—	1	1	—	—	—	2	—	1	—	—
All fisheries (unique individuals)	22	2	2	3	4	1	1	1	1	1	5	1	4	3	3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

Fishermen were asked what percent of their gross economic revenue (GER) went towards their overall commercial fishing operating costs. In Table 12 below, we compare the averages across respondents for 2012 to averages reported in 2008, which, as mentioned before were in regards to a fisherman's cumulative fishing experience (Scholz et al. 2010). Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years. Overall, fishermen reported that in 2012 on average 45.3 percent of their gross economic revenue was spent on operating costs, which is 5.0 percent less than the number reported in 2008. Again we emphasize that this question is asked about overall commercial fishing operating costs across all fisheries for a particular fisherman.

Table 12. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, South Coast Region

	2008^			2012			
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
California halibut–hook & line	8	42.5%	11.6%	4	34.3%	5.1%	-19.2%
California halibut–trawl	2	*	*	5	56.0%	35.2%	*
Coastal pelagics–net	27	55.0%	19.0%	6	43.3%	26.0%	-21.2%
Lobster–trap	80	45.6%	13.9%	56	46.4%	16.4%	1.8%
Market squid–brail	2	67.5%	10.6%	3	56.7%	5.8%	-16.0%
Market squid–net	40	52.6%	19.3%	11	45.6%	25.7%	-13.4%
Nearshore finfish live–fixed gear	30	47.2%	14.8%	14	50.2%	20.8%	6.3%
Rock crab–trap	38	45.9%	14.2%	27	45.6%	13.3%	-0.7%
Sea cucumber–dive	19	51.8%	21.9%	13	49.0%	27.7%	-5.5%
Sea cucumber–trawl	4	43.8%	20.6%	4	45.0%	29.2%	2.9%
Spot prawn–trap	13	46.8%	16.1%	4	50.8%	11.4%	8.3%
Urchin–dive	72	45.1%	20.2%	34	41.1%	20.2%	-8.9%
All target fisheries (unique individuals)	201	47.6%	18.1%	95	45.3%	18.5%	-5.0%

Source: Current study

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher.

Table 13. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, South Coast Region

Fisheries	Number responding	Percent response: Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	4	75.0%	—	25.0%	—	—
California halibut–trawl	5	60.0%	40.0%	—	—	—
Coastal pelagics–net	6	33.3%	—	66.7%	—	—
Lobster–trap	56	25.0%	39.3%	26.8%	8.9%	—
Market squid–brail	4	25.0%	25.0%	50.0%	—	—
Market squid–net	10	30.0%	10.0%	60.0%	—	—
Nearshore finfish live–fixed gear	14	35.7%	35.7%	28.6%	—	—
Rock crab–trap	27	37.0%	44.4%	11.1%	7.4%	—
Sea cucumber–dive	12	33.3%	16.7%	33.3%	8.3%	8.3%
Sea cucumber–trawl	4	50.0%	50.0%	—	—	—
Spot prawn–trap	3	—	50.0%	50.0%	—	—
Urchin–dive	31	22.6%	32.3%	25.8%	12.9%	6.5%
All fisheries (unique individuals)	110	29.1%	33.6%	27.3%	8.2%	1.8%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Between 2008 and 2012 studies, the market squid–brail fishery saw a decrease in operational expenses from 67.5 percent of gross economic revenue in 2008 to 56.7 percent of gross economic revenue in 2012 (a decrease of 16.0 percent). Despite the overall decrease between 2008 and 2012 reported operational expenses, most fishermen perceived an increase in expenses, as shown in (Table 13), and in the market squid–brail fishery half of respondents indicated that they perceived an increase. This however may be due to differences in interview sample size between 2008 and 2012. In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their gross economic revenue going towards operating costs. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. The most frequently reported reason for increasing operating costs was the increased cost of fuel, followed by general increases in costs of goods and labor (Table 14).

Table 14. Cause of change in percent income going towards overall operating costs from 2008 – 2012, South Coast Region

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	3	3	—	—	2	1	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	5	4	—	1	3	—	—	2	1	—	1	—	—	—	—	—	—	—
Coastal pelagics–net	2	2	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	40	31	5	5	20	2	—	3	9	4	—	1	3	2	—	—	1	3
Market squid–brail	2	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	4	4	1	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	10	10	—	2	3	3	—	—	4	—	—	—	—	1	—	—	—	—
Rock crab–trap	24	20	1	3	15	3	—	2	5	3	—	1	2	—	—	—	—	2
Sea cucumber–dive	8	5	2	2	2	—	—	1	1	—	—	—	—	—	—	1	1	1
Sea cucumber–trawl	4	4	—	1	3	—	—	1	1	—	—	—	—	—	—	—	—	—
Spot prawn–trap	2	2	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	23	13	5	6	7	—	1	3	2	1	—	1	—	—	1	2	3	3
All fisheries (unique individuals)	79	58	11	14	38	3	1	8	13	5	1	2	3	2	1	2	4	6

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

Of the 114 fishermen we interviewed, 36 of them reported they had an additional source of income in 2012 besides commercial fishing. The most commonly reported additional source of income was from charter (recreational) fishing and real estate/rental properties. Additional sources of income are shown below in Table 15.

Table 15. Other sources of income besides commercial fishing in 2012, South Coast Region

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	1	—	—	1	1	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	18	7	1	3	2	1	1	2	2	—	1	—	—	—	1
Market squid–brail	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	2	—	—	2	—	—	1	—	—	—	—	—	—	—	—
Rock crab–trap	6	1	—	1	1	—	1	—	2	—	1	—	—	—	1
Sea cucumber–dive	5	—	1	2	—	2	—	—	—	—	—	—	—	1	—
Sea cucumber–trawl	5	—	1	2	—	2	—	—	—	—	—	—	—	1	—
Spot prawn–trap	5	—	1	2	—	2	—	—	—	—	—	—	—	1	—
Urchin–dive	12	—	1	3	1	2	—	2	—	2	1	1	1	1	—
Unique individuals	36	9	2	8	4	3	1	5	3	2	2	1	1	1	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. Charter operations (fishing for recreation)
B. Marine related research
C. Real estate/rental properties
D. Investments
E. Social security/retirement
F. Salmon disaster relief
G. Construction/carpentry/welding
H. Other fishing industry related work
I. Handyman/odd jobs
J. Gardening/yard work
K. Lifeguard
L. Photographer
M. Oil royalties
N. Industrial work (oil related)

We asked fishermen how many years of experience and how many days they spent targeting each of the fisheries in which they participated. As indicated in Table 16, urchin–dive fishermen have been fishing the longest, on average 30 years. Fishermen in the California halibut–hook & line had the fewest number of years of experience of all the target fisheries, 8.7 years. Fishermen spent the fewest number of days targeting market squid–brail in 2012, an average of just 20.7 days. The most frequently targeted fishery was spot prawn–trap, which was targeted an average of 130 days in 2012.

Fishermen were also asked how many crew they used for each fishery and what percent of their gross economic revenue was spent on their crew. Most target fisheries, reported using an average of one crew member, as seen in Table 17 below. The market squid–net and coastal pelagics–net fisheries utilized the highest average number of crew (5 and 4 respectively) and therefore also reported the highest percent of gross economic revenue (GER) spent on crew (38.1 and 43.2 respectively). The average percent of fishery specific gross economic revenue spent on fuel was the highest for the California halibut–trawl fishery (20 percent) and the lowest for the California halibut–hook & line fishery (4.5 percent).

Table 16. Years of experience and number of days targeting specific fisheries in 2012, South Coast Region

	Years of experience in fishery			Number of days targeting fishery in 2012		
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
California halibut–hook & line	4	8.7	7.1	4	28.7	23.2
California halibut–trawl	5	29.8	8.0	5	36.2	38.2
Coastal pelagics–net	6	25.6	12.5	6	93.0	98.5
Lobster–trap	56	23.6	12.2	56	110.7	37.8
Market squid–brail	4	14.3	9.3	4	20.7	19.0
Market squid–net	11	18.6	11.5	11	94.9	52.8
Nearshore finfish live–fixed gear	14	19.8	9.9	14	33.2	22.3
Rock crab–trap	27	25.4	9.7	27	105.2	94.5
Sea cucumber–dive	13	17.8	12.3	13	62.1	44.3
Sea cucumber–trawl	4	27.3	14.4	4	106.3	71.1
Spot prawn–trap	3	14.0	9.9	4	130.0	30.0
Urchin–dive	34	30.0	8.4	34	105.4	52.1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 17. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, South Coast Region

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
California halibut–hook & line	4	1	1	4	7.8%	8.4%	4	4.5%	4.9%
California halibut–trawl	5	1	1	5	12.0%	11.0%	5	20.0%	7.4%
Coastal pelagics–net	6	4	—	6	43.2%	12.3%	6	14.0%	10.2%
Lobster–trap	56	1	1	56	10.5%	9.0%	56	15.2%	8.6%
Market squid–brail	4	2	1	4	30.0%	20.0%	4	16.7%	5.8%
Market squid–net	11	5	2	11	38.1%	8.7%	11	10.0%	4.9%
Nearshore finfish live–fixed gear	14	1	1	14	8.8%	7.0%	14	13.3%	6.8%
Rock crab–trap	27	1	1	27	9.9%	7.6%	27	14.6%	9.7%
Sea cucumber–dive	13	1	1	13	4.7%	6.5%	13	17.6%	6.9%
Sea cucumber–trawl	4	1	1	4	10.0%	11.5%	4	18.0%	7.7%
Spot prawn–trap	4	2	—	4	18.8%	13.1%	4	12.0%	5.2%
Urchin–dive	34	1	1	34	6.6%	12.7%	34	18.2%	7.3%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Fishermen were asked separately for each fishery they participated in to compare his/her success in the fishery in 2012 to that of the last ten years. As shown in Table 18 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishery. This questions was asked as an open ended question and responses were later coded, categorized into positive and negative environmental factors (Table 19), positive and negative economic factors (Table 20), negative regulatory factors (Table 21), and other positive and negative factors **(**Table 22).

Some target fisheries saw a greater variety of responses than others. For example, in the urchin–dive, sea cucumber–dive, rock crab–trap, and lobster–trap fisheries, at least one respondent indicated each of the response options.

In the urchin–dive fishery, the largest group of respondents (35.3 percent) indicated the fishery was somewhat better than the previous ten years and, followed by significantly better and no change (17.6 percent each) and somewhat worse and significantly worse (14.7 percent each). The most common positive factors influencing the urchin–dive fishery were the high quality of the urchin product (Table 19) and individual fisherman's increase in effort (Table 22). In terms of negative factors influencing the urchin–dive fishery, the most commonly cited influences were bad weather and oceanic conditions **(**Table 19) and MPAs (Table 21).

Similarly, the lobster–trap fishery had a wide variety of responses—although the majority of respondents indicated the fishery was somewhat worse (34.5 percent). The primary negative influences where lack of available product (Table 19), MPAs (Table 21) and general crowding and compaction (Table 22). One positive factor that several participants in the lobster–trap fishery mentioned was the high ex-vessel price **(**Table 20). In fact, in review, some fishermen indicated they felt that without the high price they would not have been successful in the fishery in 2012.

Other fisheries had less variance in terms of responses regarding the overall success of their fishery. For example, all fishermen in both the California halibut–trawl and sea cucumber–trawl fisheries reported their fishery was either somewhat or significantly worse. All respondents in the market squid–net fishery indicated they experienced a somewhat or significantly better year in 2012 than in the previous ten. They expressed there was an abundance of fish and good oceanic conditions (Table 19).

The most commonly cited economic factor was the price –either good or bad. Similarly, the largest number of people indicated that the presence or absence of fish/product was the largest environmental factor influencing their success. Lastly, respondents indicated that MPAs or other closures were the leading negative regulatory factor influencing the success of their fishery.

Table 18. Overall success in specific commercial fishery, 2012 compared to previous ten years, South Coast Region

		Percent response					
Fisheries	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
California halibut–hook & line	3	—	—	—	66.7%	—	33.3%
California halibut–trawl	5	—	—	—	—	20.0%	80.0%
Coastal pelagics–net	5	—	—	—	20.0%	40.0%	40.0%
Lobster–trap	55	3.6%	10.9%	16.4%	18.2%	34.5%	16.4%
Market squid–brail	3	—	—	33.3%	—	—	66.7%
Market squid–net	10	—	40.0%	50.0%	10.0%	—	—
Nearshore finfish live–fixed gear	13	—	—	30.8%	53.8%	15.4%	—
Rock crab–trap	26	—	3.8%	3.8%	65.4%	19.2%	7.7%
Sea cucumber–dive	13	—	23.1%	7.7%	15.4%	23.1%	30.8%
Sea cucumber–trawl	4	—	—	—	—	50.0%	50.0%
Spot prawn–trap	3	—	33.3%	33.3%	33.3%	—	—
Urchin–dive	34	—	17.6%	35.3%	17.6%	14.7%	14.7%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 19. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, South Coast Region

		Positive					Negative				
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	1	—	—	—	—	—	1	—	—	—	—
Coastal pelagics–net	2	—	—	—	—	—	2	—	—	—	—
Lobster–trap	15	2	1	1	—	—	8	—	5	—	2
Market squid–brail	1	—	—	1	—	—	—	—	—	—	—
Market squid–net	8	6	—	3	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	2	1	—	—	—	—	1	—	—	—	—
Rock crab–trap	2	—	—	—	—	—	1	—	—	1	—
Sea cucumber–dive	5	1	—	—	—	—	3	—	1	—	—
Sea cucumber–trawl	1	—	—	—	—	—	1	—	—	—	—
Spot prawn–trap	2	2	—	1	—	—	—	—	—	—	—
Urchin–dive	12	1	2	3	6	1	—	1	2	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 20. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, South Coast Region

		Positive			Negative			
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
California halibut–hook & line	1	—	—	—	1	—	—	—
California halibut–trawl	1	—	—	—	—	1	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—
Lobster–trap	15	14	—	3	1	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—
Market squid–net	6	6	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—
Rock crab–trap	5	—	—	—	1	3	—	1
Sea cucumber–dive	5	2	—	—	1	1	1	—
Sea cucumber–trawl	1	—	—	—	—	—	—	1
Spot prawn–trap	—	—	—	—	—	—	—	—
Urchin–dive	14	5	2	—	5	—	—	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 21. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, South Coast Region

		Negative					
Fishery	Number responding	A	B	C	D	E	F
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	1	—	—	1	—	—	—
Coastal pelagics–net	1	—	—	1	—	—	—
Lobster–trap	19	—	—	17	1	1	—
Market squid–brail	1	—	—	—	—	—	1
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	—	—	1	—	—	—
Rock crab–trap	2	—	—	2	—	—	—
Sea cucumber–dive	5	—	—	5	—	—	—
Sea cucumber–trawl	2	—	—	2	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—
Urchin–dive	8	2	1	6	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 22. Other changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, South Coast Region

		Positive						Negative						
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
California halibut–hook & line	1	—	—	—	—	—	—	—	—	—	—	1	—	—
California halibut–trawl	2	—	—	—	—	—	—	—	—	—	—	—	2	—
Coastal pelagics–net	2	—	—	—	—	—	—	—	—	—	—	—	—	2
Lobster–trap	14	—	1	1	—	1	—	1	5	9	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	3	—	1	—	—	1	—	—	—	1	—	—	—	—
Rock crab–trap	2	—	1	—	—	—	—	—	—	1	—	—	—	—
Sea cucumber–dive	4	2	—	—	—	—	—	—	—	1	1	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	11	6	2	—	1	2	1	—	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

3.3. South Coast Region MPAs and Commercial Fishing

Determining and measuring the impact of MPAs upon commercial fishermen is challenging to quantify and unravel from the multitude of environmental, regulatory, and economic factors influencing systems of fishing. Despite this, we sought to capture information from fishermen as to how they perceive they have been impacted by MPAs and the specific MPAs, which are impacting their fisheries. This section provides information at the region and port levels and summarizes the response from the following four questions which were asked for each fishery during interviews:

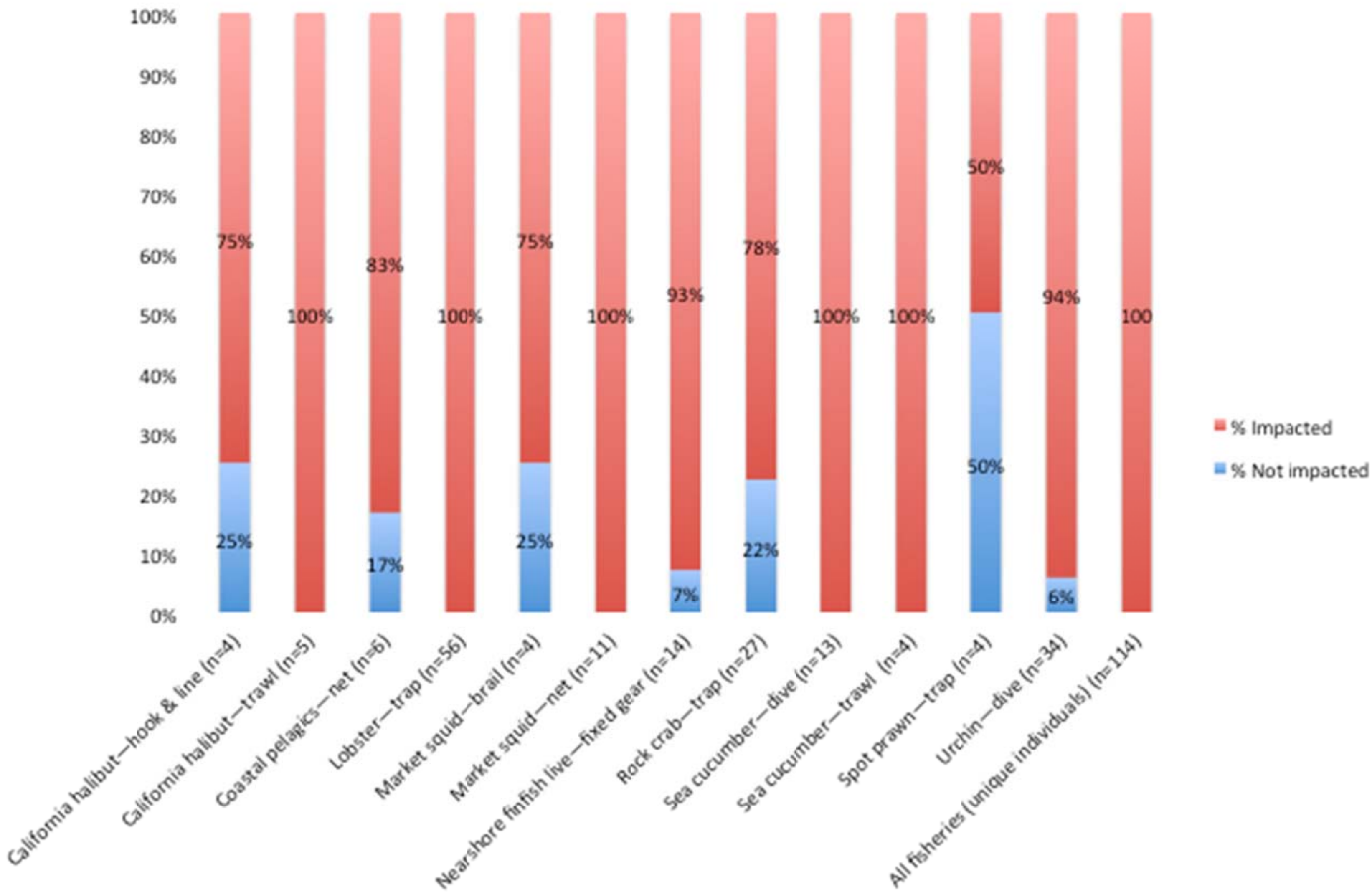
1) Has your fishery been directly impacted by the recently established MPAs?;
2) If so, how have you been impacted?;
3) What MPAs have impacted your specific fishery?; and,
4) How has your community been impacted by MPAs (either your fishing community or your community as a whole)?

Question one was posed as a simple yes or no response and questions two and three were open-ended questions in which responses were later coded and categorized into the tables below. Additionally, fishermen were given a map of the MPAs in the South Coast to aid in identifying and naming the MPAs impacting them. The questions above were asked for every fishery an individual participated in. We'd like to note that the data provided here is only from fishermen who are currently still fishing or participating in a fishery. Fishermen who dropped out of fishing or who dropped out of specific fisheries since MPA implementation are not captured here. The last question, regarding community level impacts was typically the last question asked of participants and in long running interviews, was often skipped.

As shown below in Figure 12, 100 percent of individuals we interviewed indicated they had been directly impacted by MPAs in a least one of their target fisheries. Impacts varied by fishery; with between 50 and 100 percent of participants in each fishery indicating they were impacted. There were five fisheries where all participants mentioned they had felt impacts (California halibut–trawl, lobster–trap, market squid–net, sea cucumber-dive, and sea cucumber-trawl). The spot prawn–trap fishery had the lowest percentage of respondents indicating they had been impacted by MPAs (50 percent), however; it should be noted that we were only able to interview four fishermen from this fishery.

Some fishermen who responded that they were not impacted by MPAs mentioned that they were concerned about impacts they might incur in future years when their fishery might be less productive or ex-vessel prices would be lower. Additionally, fishermen often expressed that they feared the impacts they felt in 2012 would be exacerbated in years with fewer fish or lower ex-vessel prices. In particular this was mentioned throughout the region regarding the market squid–net fishery. Fishermen noted that over the past few years there has been such an abundance of squid their fishery has remained strong, but they expressed concern that they would not have access to traditionally productive fallback areas in years when squid are less abundant. Similarly, many lobster–trap fishermen expressed that high ex-vessel prices in 2012 minimized the financial burden they experienced as a result of the MPAs. Many fishermen are concerned that the unusually high ex-vessel lobster price is not likely sustainable and lower prices coupled with MPAs will have a much larger impact than was experienced in 2012.

Figure 12. Percent of respondents indicating direct impacts on a specific fishery by MPAs in 2012, South Coast Region



Below, in Figure 13 through Figure 19 the percentage of individuals being impacted by MPAs is broken out by each of the homeports in the South Coast region. Fisheries not shown in the figures were either not represented in that port or were suppressed due to confidentiality constraints. (Any data suppressed in Figure 13 through Figure 19 is still included in Figure 12, above). In all port/fishery combinations, excluding rock crab-trap in San Pedro, the majority of those interviewed indicated they had been impacted by MPAs. In San Pedro, all three fishermen who target rock crab-trap indicated MPAs did not impact that fishery in 2012 (Figure 19).

Figure 13. Percent of respondents indicating direct impacts on a specific fishery by MPAs in 2012, Santa Barbara

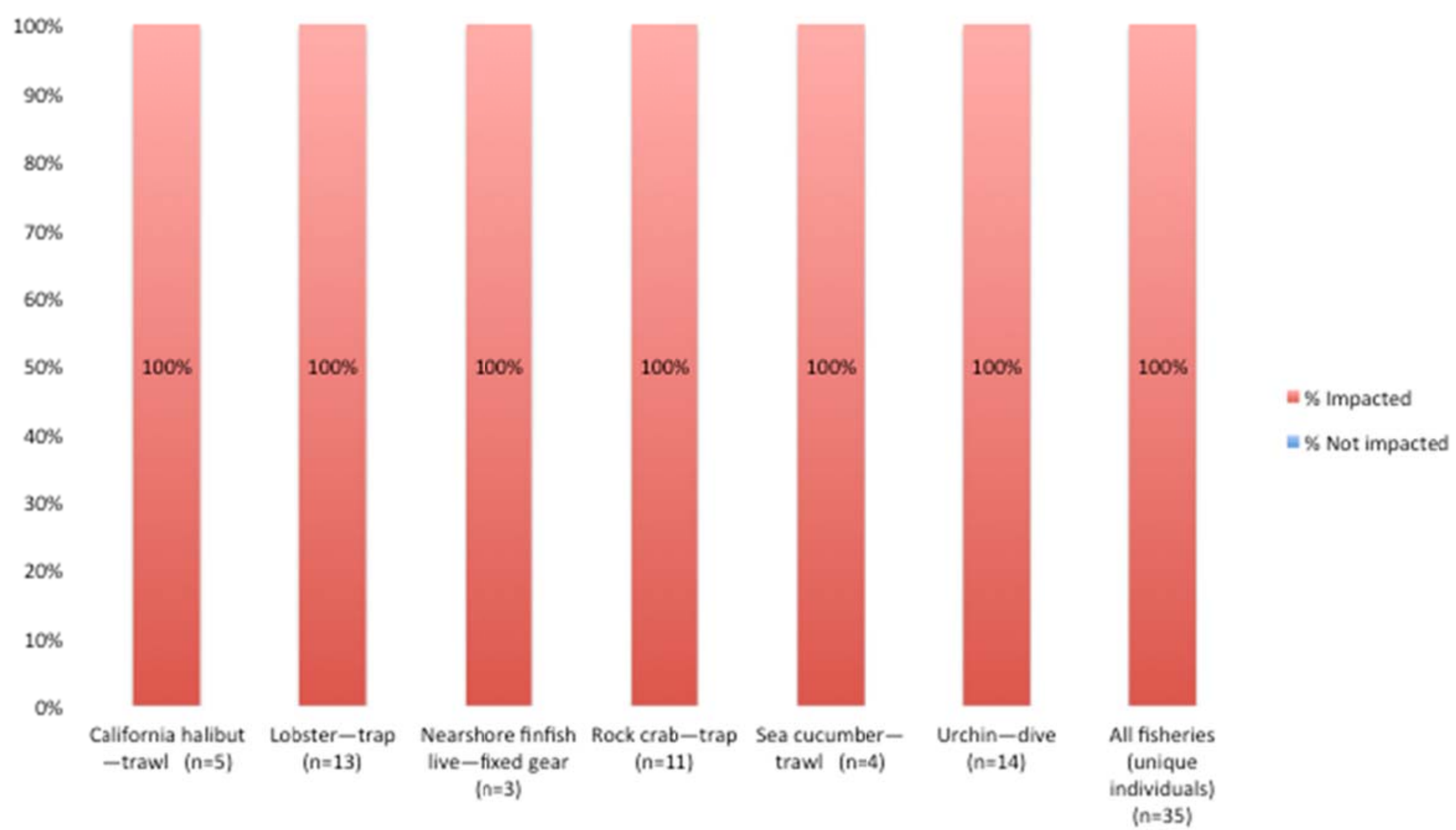


Figure 14. Percent of respondents indicating direct impacts on a specific fishery by MPAs in 2012, Ventura

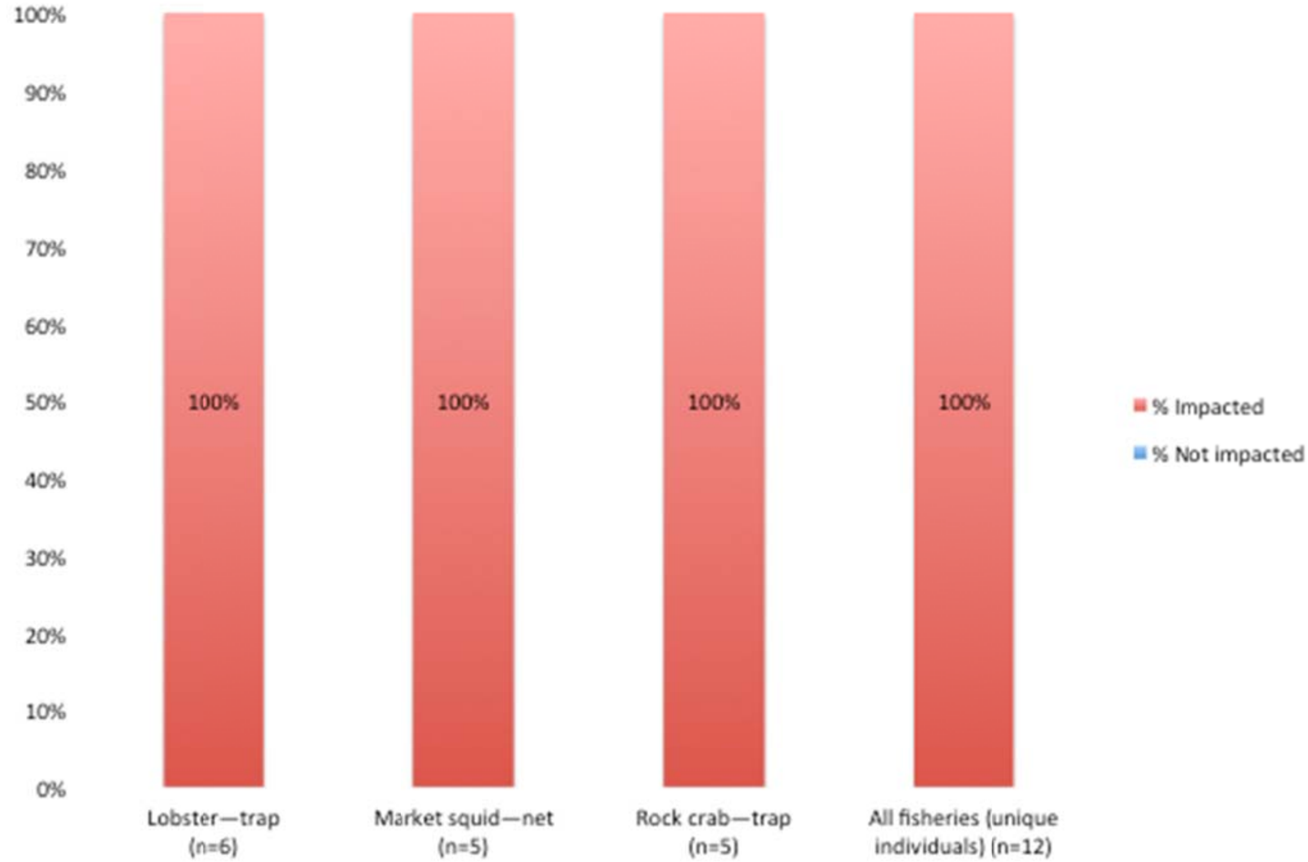


Figure 15. Percent of respondents indicating direct impacts on a specific fishery by MPAs in 2012, Port Hueneme/ Oxnard

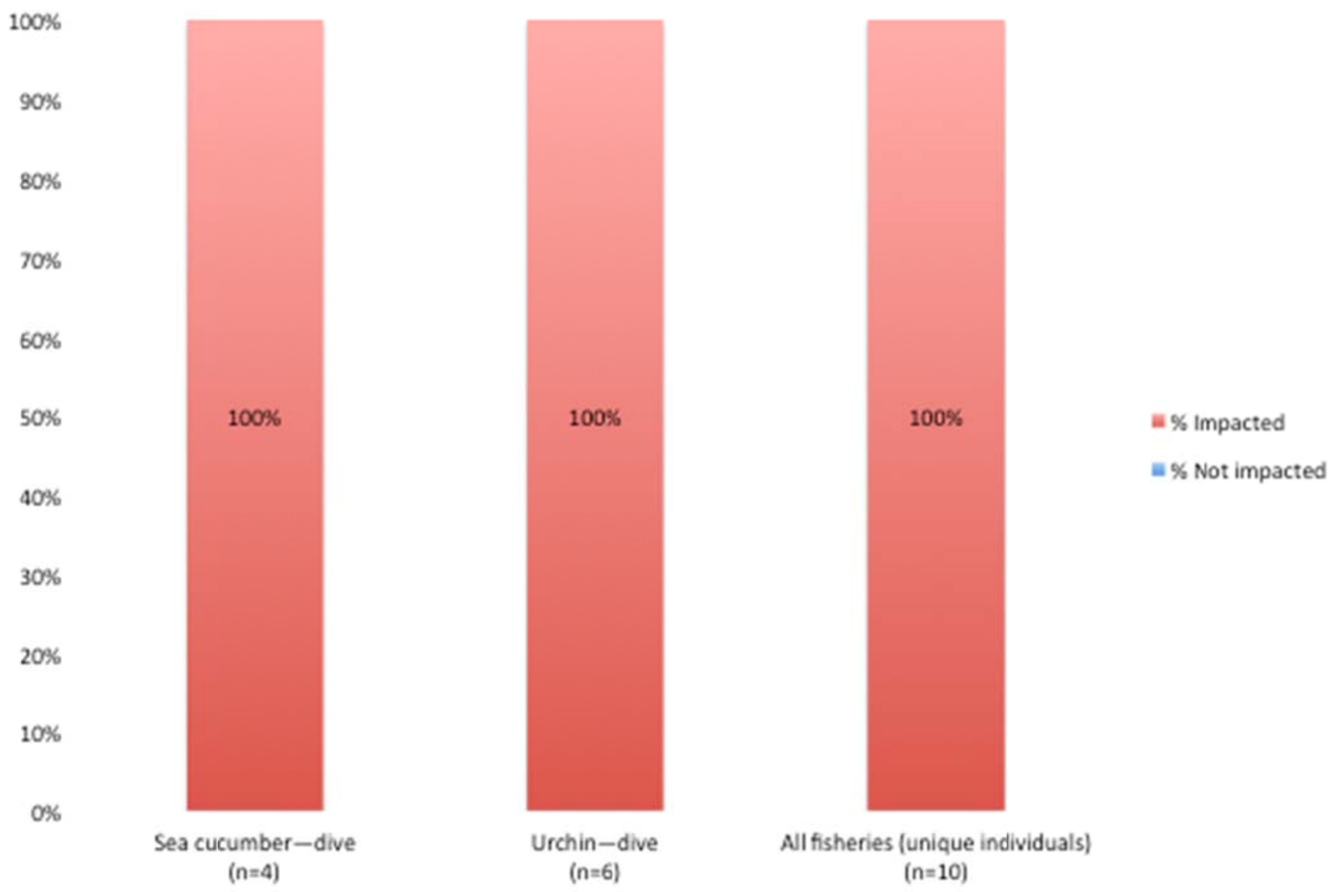


Figure 16. Percent of respondents indicating direct impacts on a specific fishery by MPAs in 2012, San Pedro/ Los Angeles

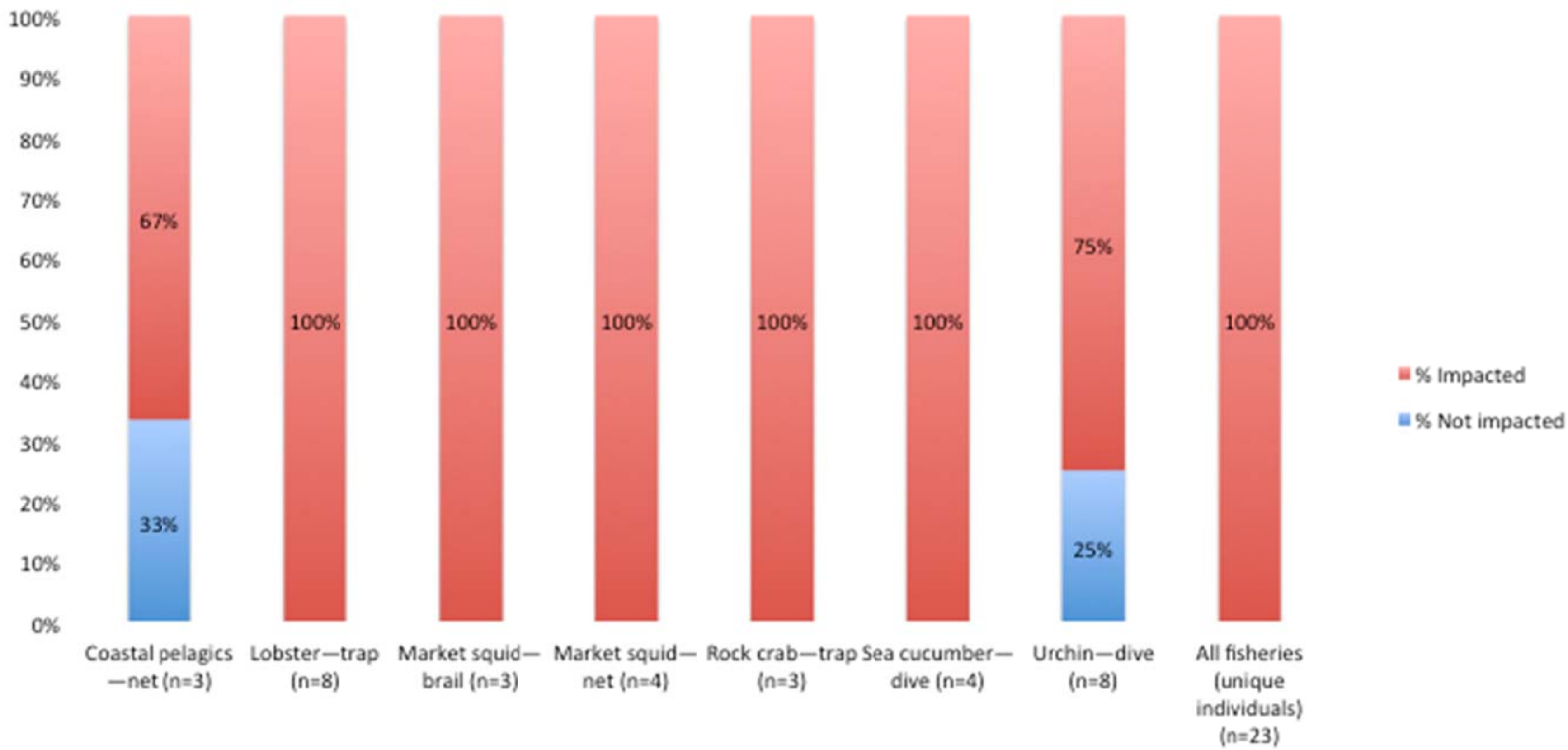


Figure 17. Percent of respondents indicating direct impacts on a specific fishery by MPAs in 2012, Dana Point

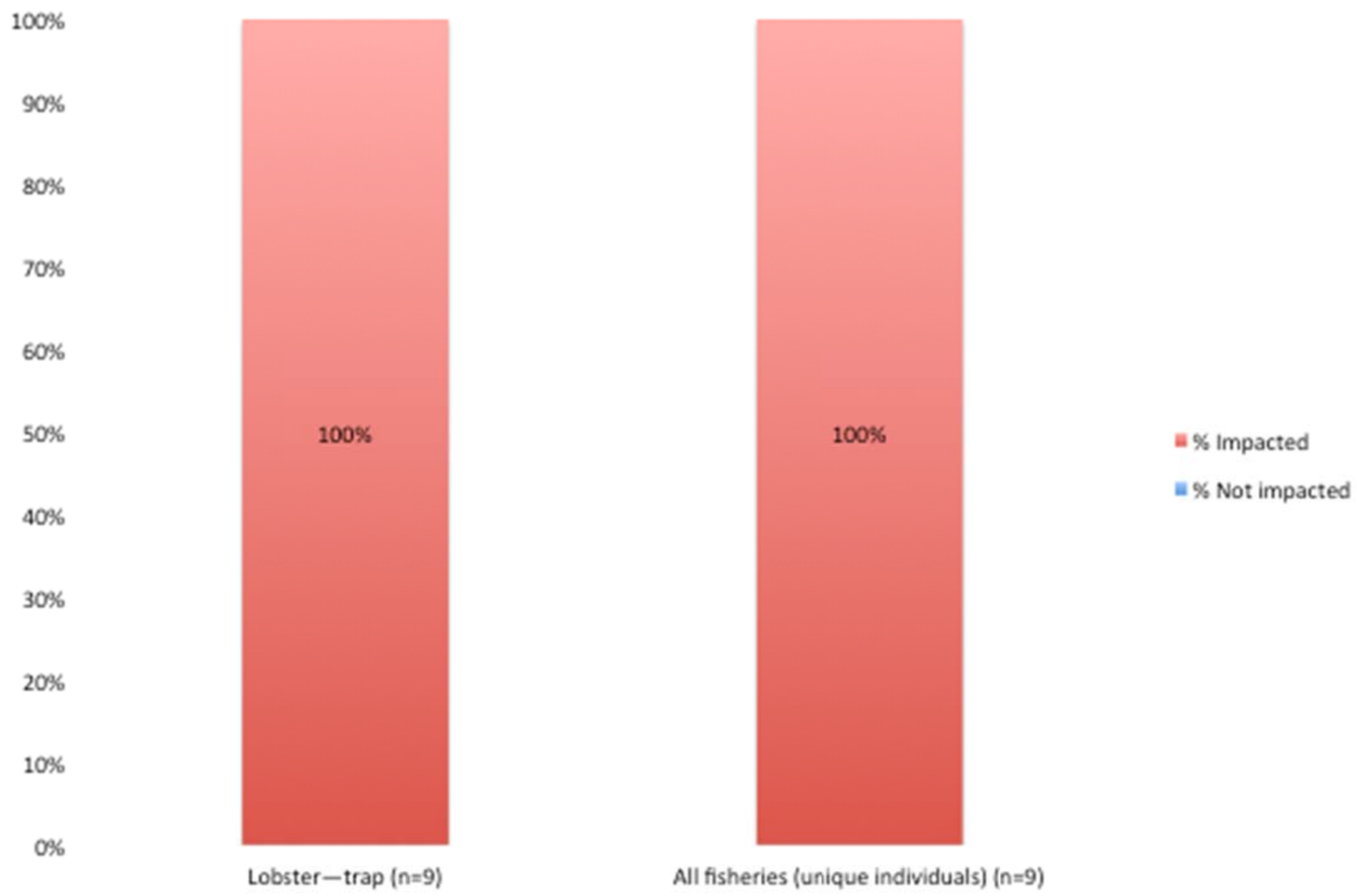


Figure 18. Percent of respondents indicating direct impacts on a specific fishery by MPAs in 2012, Oceanside

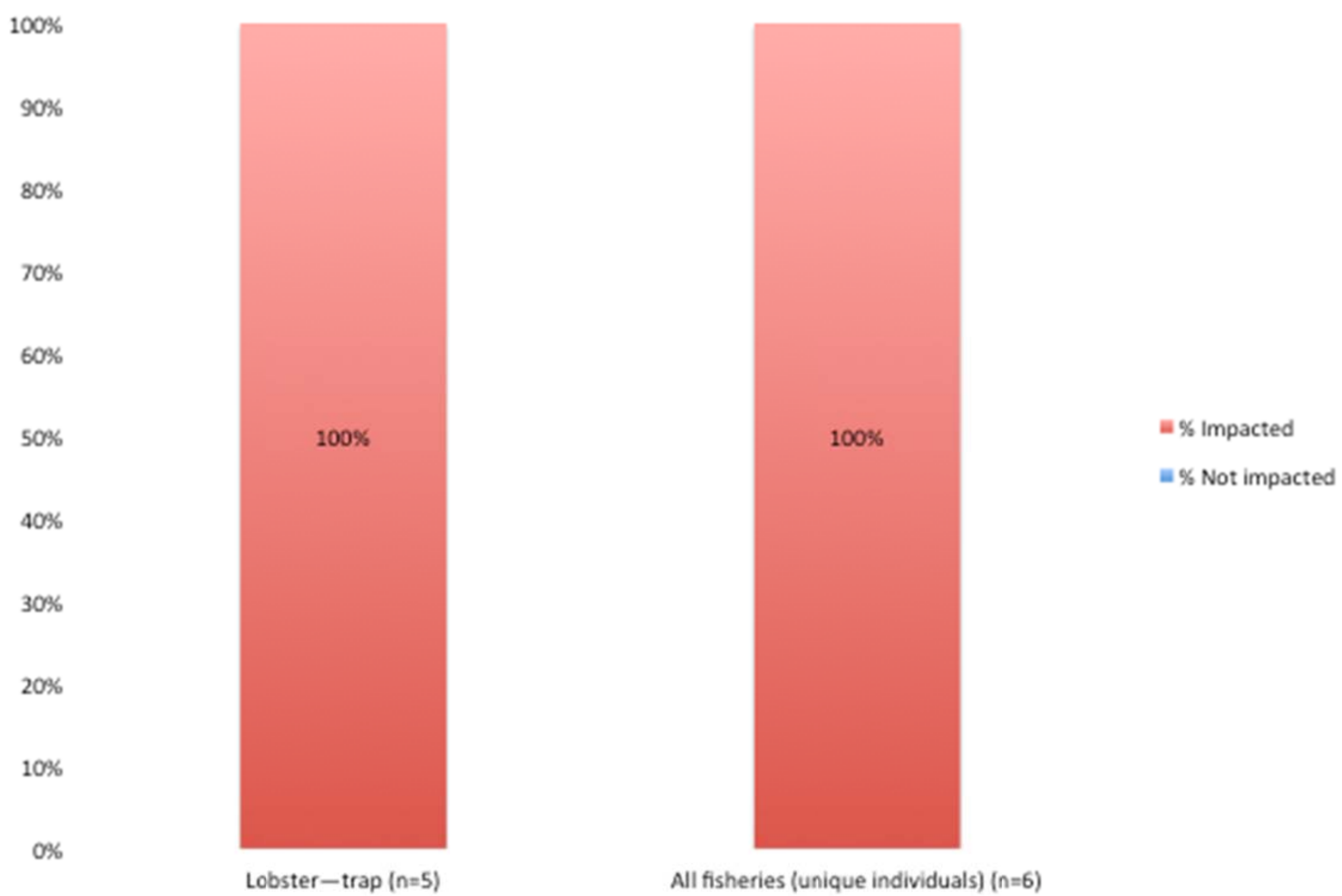
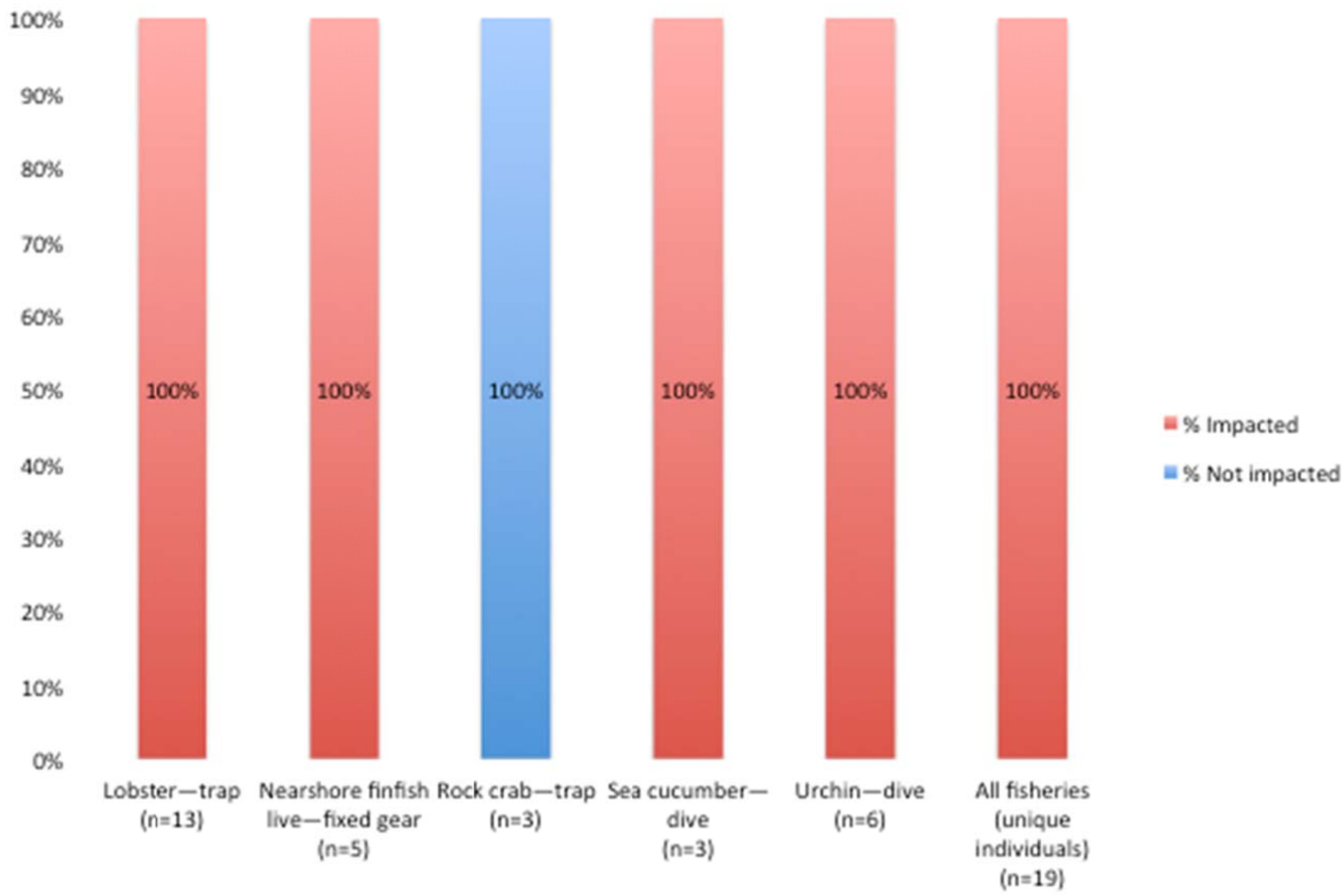


Figure 19. Percent of respondents indicating direct impacts on a specific fishery by MPAs in 2012, San Diego



There are a total of 50 marine protected areas in the South Coast study region, encompassing 355 square miles, or 15 percent of Southern California state waters. There are two additional special closures within the region. As shown below in Table 23, across the entire study region the Carrington Point State Marine Reserve (SMR) impacted the largest percentage of interview participants (36 percent). The individual participants column includes those who indicated that a specific MPA impacted any one of their fisheries. Many MPAs have an impact on only fishermen from a specific port in the region and so impacts on smaller ports may not be well represented in this table. Port specific tables (Table 24 through Table 30) should be referenced for this. Participants from the lobster trap–fishery reported the largest number of MPAs impacting them (53 MPAs, which include “other” closure types that are not formally MPAs). When mentioning other closures besides MPAs, fishermen noted things such as closures at San Clemente and San Nicolas Islands, as well as halibut trawl closures. Respondents from both of the trawl fisheries (sea cucumber–trawl and California halibut–trawl) reported that they were being impacted by fewer MPAs (four and six, respectively). However, it should be noted that trawl gear is limited to fishing in areas in which the gear type is no prohibited. Additionally, we only spoke to trawlers from Santa Barbara and this may have impacted which MPAs were reported by interviewees as impacting trawl fishing.

The maps shown throughout this section display the percentage of individuals from the region or port that indicated at least one fishery was impacted by a specific MPA. This is a spatial representation of the ‘all target fisheries’ column in the tables. The color of each MPA indicates the intensity of individuals responding that they were impacted by that MPA. For example, in Figure 20, the MPAs surrounding Santa Rosa Island are the darkest red, indicating they impacted the largest number of people and those shown in orange and yellow impacted fewer respondents.

Figure 20. Percent of individuals indicating impacts from specific MPAs in 2012, South Coast Study Region

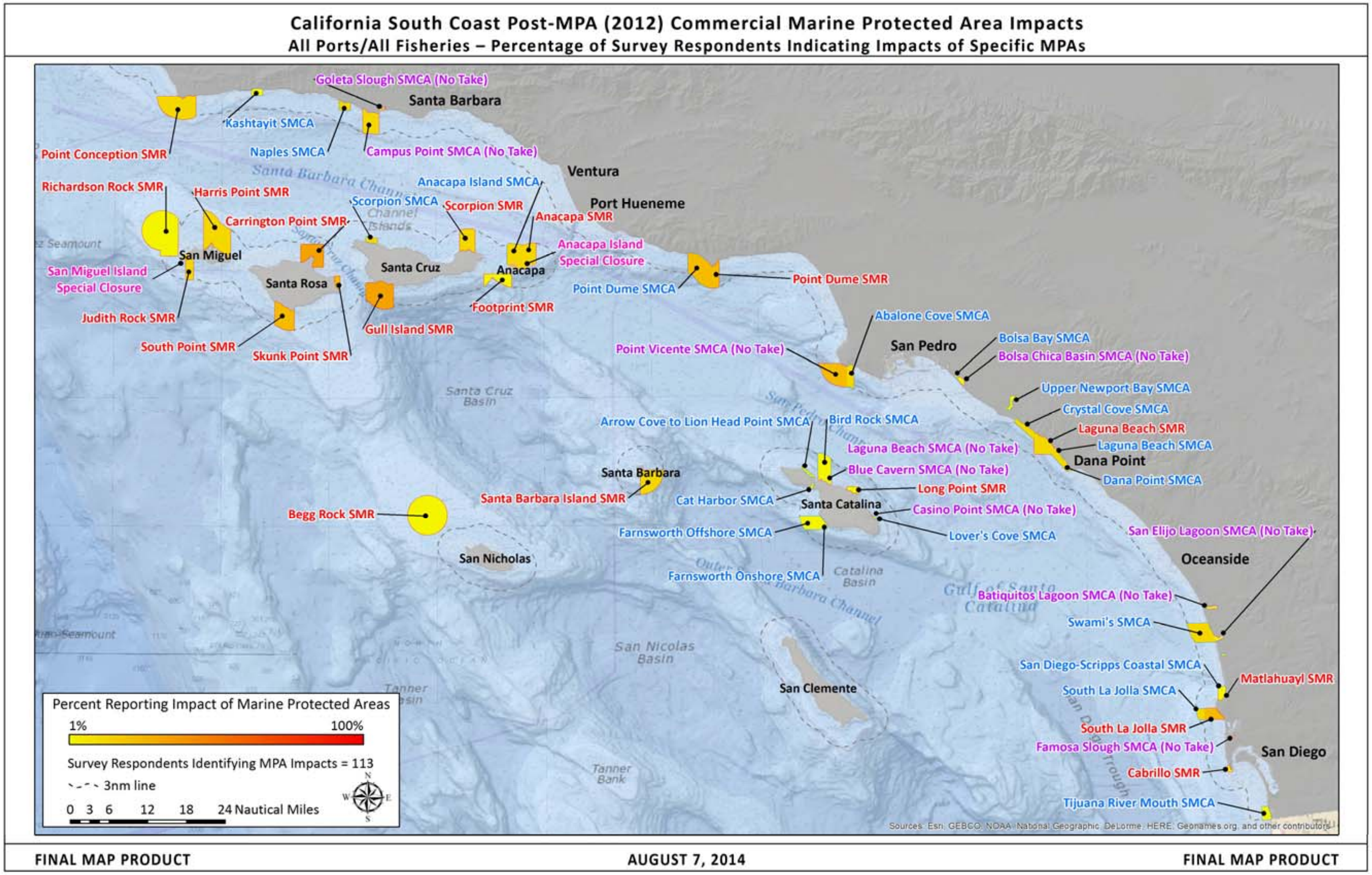


Table 23. Percent of respondents indicating specific MPA impacting commercial fishery in 2012, South Coast Region

	Percent responding												
MPAs	Ca. halibut–hook & line	Ca. halibut–trawl	Coastal pelagics–net	Lobster–trap	Market squid–brail	Market squid–net	Nearshore finfish live—fixed gear	Rock crab–trap	Sea cucumber—dive	Sea cucumber—trawl	Spot prawn–trap	Urchin– dive	**All target fisheries (unique individuals)**
Number responding	**4**	**5**	**6**	**56**	**4**	**11**	**14**	**27**	**13**	**4**	**3**	**34**	**113**
Abalone Cove SMCA	—	—	50%	9%	—	18%	7%	4%	23%	—	—	12%	**12%**
Anacapa Island SC	—	—	33%	7%	25%	36%	14%	4%	38%	—	—	15%	**15%**
Anacapa Island SMCA	—	—	33%	9%	25%	55%	14%	4%	46%	—	—	18%	**19%**
Anacapa Island SMR	—	—	33%	11%	25%	64%	14%	4%	46%	—	—	15%	**19%**
Arrow Point to Lion Head Point (Catalina Is.) SMCA	—	—	—	2%	25%	—	—	—	—	—	—	6%	**4%**
Batiquitos Lagoon SMCA	—	—	—	2%	—	—	—	—	—	—	—	—	**1%**
Begg Rock (San Nicholas Island Quad) SMR	—	—	—	4%	—	—	7%	—	8%	—	—	3%	**3%**
Bird Rock (Catalina Is.) SMCA	—	—	—	2%	25%	—	—	—	31%	—	33%	9%	**8%**
Blue Cavern (Catalina Is.) SMCA	—	—	—	2%	75%	—	—	—	8%	—	33%	9%	**7%**
Bolsa Bay SMCA	—	—	—	2%	—	—	—	—	—	—	—	—	**1%**
Bolsa Chica Basin SMCA	—	—	—	2%	—	—	—	—	—	—	—	—	**1%**
Cabrillo SMR	—	—	—	14%	—	—	14%	4%	—	—	—	3%	**8%**
Campus Point SMCA	—	80%	17%	13%	—	27%	7%	11%	15%	75%	—	24%	**20%**
Carrington Point (Santa Rosa Is.) SMR	25%	—	33%	20%	—	73%	14%	33%	38%	—	—	59%	**36%**
Casino Point (Catalina Is.) SMCR	—	—	—	2%	25%	9%	—	—	—	—	—	—	**2%**
Cat Harbor (Catalina Is.) SMCA	—	—	—	2%	25%	—	—	—	8%	—	—	3%	**3%**
Crystal Cove SMCA	—	—	17%	16%	25%	9%	21%	11%	23%	—	—	9%	**15%**
Dana Point SMCA	—	—	—	11%	25%	9%	21%	4%	8%	—	—	6%	**12%**
Famosa Slough SMCA	—	—	—	2%	—	—	—	—	—	—	—	—	**1%**
Farnsworth Offshore (Catalina Is.) SMCA	—	—	17%	5%	—	9%	—	—	8%	—	33%	3%	**6%**
Farnsworth Onshore (Catalina Is.) SMCA	—	—	33%	7%	—	18%	—	—	15%	—	—	12%	**10%**
Footprint (Anacapa Channel) SMR	—	—	—	4%	—	—	14%	—	31%	—	—	12%	**6%**
Goleta Slough SMCA	—	—	—	2%	—	—	7%	—	8%	—	—	3%	**3%**
Gull Island (Santa Cruz Is.) SMR	—	—	33%	16%	—	64%	14%	7%	46%	—	—	53%	**31%**
Harris Point (San Miguel Is.) SMR	25%	—	—	7%	—	—	14%	11%	31%	—	—	41%	**18%**
Judith Rock (San Miguel Is.) SMR	25%	—	—	4%	—	—	14%	7%	31%	—	—	50%	**19%**
Kashtayit SMCA	—	20%	17%	9%	—	9%	7%	11%	8%	25%	—	9%	**10%**
Laguna Beach SMCA	—	—	50%	23%	25%	36%	21%	15%	15%	—	—	9%	**19%**
Laguna Beach SMR	—	—	50%	23%	25%	36%	21%	15%	15%	—	—	9%	**19%**
Long Point (Catalina Is.) SMR	—	—	—	2%	75%	9%	—	—	15%	—	—	—	**5%**
Lover's Cove (Catalina Is.) SMCA	—	—	—	4%	25%	—	—	—	—	—	—	—	**3%**
Matlahuayl SMR	—	—	—	9%	—	9%	7%	4%	8%	—	—	6%	**7%**
Naples SMCA	25%	100%	33%	9%	—	27%	7%	11%	15%	100%	—	24%	**20%**
Painted Cave (Santa Cruz Is.) SMCA	—	—	33%	7%	—	55%	14%	—	31%	—	—	24%	**16%**
Point Conception SMR	—	20%	33%	7%	25%	45%	7%	11%	8%	25%	—	9%	**13%**
Point Dume SMCA	—	20%	50%	13%	—	18%	14%	15%	31%	—	—	38%	**22%**
Point Dume SMR	—	20%	67%	13%	25%	55%	14%	15%	31%	—	—	38%	**27%**
Point Vicente SMCA	25%	—	17%	14%	75%	27%	7%	7%	31%	—	—	26%	**21%**
Richardson Rock (San Miguel Is.) SMR	25%	—	—	4%	—	—	14%	7%	8%	—	—	18%	**9%**
San Diego	—	—	—	9%	—	9%	14%	4%	8%	—	—	3%	**5%**
San Dieguito Lagoon SMCA	—	—	—	2%	—	—	—	—	—	—	—	—	**1%**
San Elijo Lagoon SMCA	—	—	—	2%	—	—	7%	—	—	—	—	—	**2%**
San Miguel Island SC	—	—	—	4%	—	—	7%	—	23%	—	—	35%	**12%**
Santa Barbara Island SMR	—	—	—	5%	25%	36%	14%	—	54%	—	—	32%	**18%**
Scorpion (Santa Cruz Is.) SMR	—	—	17%	14%	—	27%	14%	4%	31%	—	—	26%	**19%**
Skunk Point (Santa Rosa Is.) SMR	25%	—	17%	13%	—	18%	14%	26%	23%	—	—	41%	**24%**
South La Jolla SMCA	—	—	17%	27%	—	36%	36%	7%	8%	—	—	9%	**20%**
South La Jolla SMR	—	—	17%	27%	—	36%	36%	7%	15%	—	—	15%	**21%**
South Point (Santa Rosa Is.) SMR	—	—	—	16%	—	9%	21%	22%	54%	—	—	65%	**30%**
Swami's SMCA	—	—	—	27%	—	27%	36%	7%	15%	—	—	9%	**19%**
Tijuana River Mouth SMCA	—	—	—	9%	—	—	—	—	—	—	—	3%	**5%**
Upper Newport Bay SMCA	—	—	—	2%	—	—	—	—	8%	—	—	3%	**2%**
Other	—	—	—	4%	—	—	—	—	—	—	—	—	**2%**
Total number of MPAs impacting fishery/port	**7**	**6**	**23**	**53**	**18**	**31**	**36**	**29**	**41**	**4**	**3**	**43**	**53**

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A total of 32 different MPAs impacted the Santa Barbara fishermen we spoke to. Across individuals the Carrington Point SMR on Santa Rosa Island impacted the largest percentage of fishermen in Santa Barbara (63 percent). Carrington SMR also impacted the largest percent of lobster–trap and rock crab–trap fishermen (69 and 64 percent, respectively). The largest percentage of fishermen in the urchin–dive fishery indicated they were impacted by the South Point SMR on Santa Rosa Island (93 percent). All fishermen in the California halibut–trawl and sea cucumber–trawl fisheries indicated the Naples SMCA impacted them.

As shown in Figure 21, the MPAs surrounding the northern Channel Islands impacted the largest percent of respondents from Santa Barbara. Additionally, coastal MPAs as far north as Point Conceptions and as far south as Dana Point impacted fishermen from Santa Barbara.

Table 24. Percent of respondents indicating specific MPA impacting commercial fishery in 2012, Santa Barbara

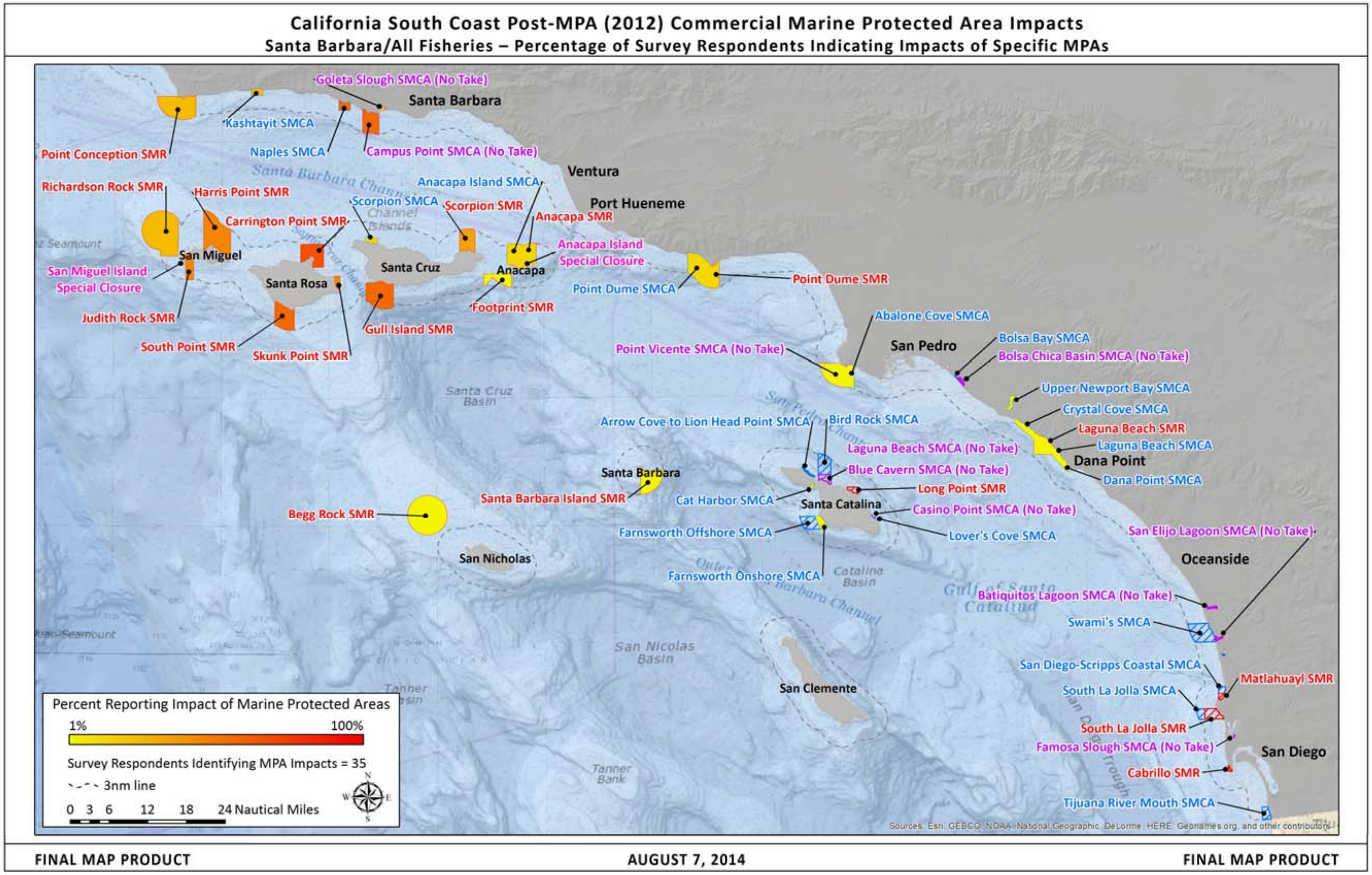
MPAs	Percent responding: California halibut—hook & line	California halibut—trawl	Lobster—trap	Nearshore finfish live—fixed gear	Rock crab—trap	Sea cucumber—dive	Sea cucumber—trawl	Urchin—dive	All target fisheries (unique individuals)
Number responding	2	5	13	3	11	2	4	14	35
Abalone Cove SMCA	*	—	—	—	—	*	—	7%	3%
Anacapa Island SC	*	—	15%	33%	9%	*	—	14%	14%
Anacapa Island SMCA	*	—	15%	33%	9%	*	—	21%	17%
Anacapa Island SMR	*	—	23%	33%	9%	*	—	14%	17%
Begg Rock (San Nicholas Island Quad) SMR	*	—	8%	33%	—	*	—	7%	6%
Campus Point SMCA	*	80%	38%	33%	27%	*	75%	57%	51%
Carrington Point (Santa Rosa Is.) SMR	*	—	69%	33%	64%	*	—	86%	63%
Cat Harbor (Catalina Is.) SMCA	*	—	—	—	—	*	—	7%	3%
Crystal Cove SMCA	*	—	—	—	—	*	—	14%	6%
Dana Point SMCA	*	—	—	—	—	*	—	7%	3%
Farnsworth Onshore (Catalina Is.) SMCA	*	—	—	—	—	*	—	7%	3%
Footprint (Anacapa Channel) SMR	*	—	8%	33%	—	*	—	14%	9%
Goleta Slough SMCA	*	—	—	33%	—	*	—	7%	6%
Gull Island (Santa Cruz Is.) SMR	*	—	46%	33%	18%	*	—	79%	51%
Harris Point (San Miguel Is.) SMR	*	—	23%	67%	27%	*	—	79%	46%
Judith Rock (San Miguel Is.) SMR	*	—	8%	67%	18%	*	—	86%	43%
Kashtayit SMCA	*	20%	23%	33%	27%	*	25%	21%	23%
Laguna Beach SMCA	*	—	—	—	—	*	—	7%	3%
Laguna Beach SMR	*	—	—	—	—	*	—	7%	3%
Naples SMCA	*	100%	23%	33%	27%	*	100%	57%	51%
Painted Cave (Santa Cruz Is.) SMCA	*	—	15%	33%	—	*	—	36%	20%
Point Conception SMR	*	20%	23%	33%	27%	*	25%	21%	23%
Point Dume SMCA	*	20%	8%	33%	—	*	—	36%	20%
Point Dume SMR	*	20%	8%	33%	—	*	—	36%	20%
Point Vicente SMCA	*	—	—	—	—	*	—	14%	6%
Richardson Rock (San Miguel Is.) SMR	*	—	8%	67%	18%	*	—	43%	26%
San Miguel Island SC	*	—	8%	33%	—	*	—	71%	31%
Santa Barbara Island SMR	*	—	8%	33%	—	*	—	7%	6%
Scorpion (Santa Cruz Is.) SMR	*	—	31%	33%	9%	*	—	43%	31%
Skunk Point (Santa Rosa Is.) SMR	*	—	38%	33%	45%	*	—	64%	46%
South Point (Santa Rosa Is.) SMR	*	—	54%	67%	36%	*	—	93%	60%
Upper Newport Bay SMCA	*	—	—	—	—	*	—	7%	3%
Total number of MPAs impacting fishery/port	*	6	22	23	15	*	4	32	32

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Figure 21. Percent of individuals indicating impacts from specific MPAs in 2012, Santa Barbara



A total of 31 different MPAs impacted the Ventura fishermen we spoke to. Across individuals the Point Dume SMR on the coast impacted the largest percentage of respondents (Table 25). This varied by fishery and respondents in the market squid – net fishery, indicated there were several MPAs that impacted them more than the Point Dume SMR. These included Anacapa Island SMR, Carrington Point SMR, Gull Island SMR, and Point Conception SMR.

As shown in Figure 22, in addition to the Point Dume coastal MPA, the MPAs surrounding the northern Channel Islands impacted the largest percent of respondents from Ventura. Additionally, coastal MPAs as far north as Point Conceptions and as far south as San Diego impacted fishermen from Ventura.

Table 25. Percent of respondents indicating specific MPA impacting commercial fishery in 2012, Ventura

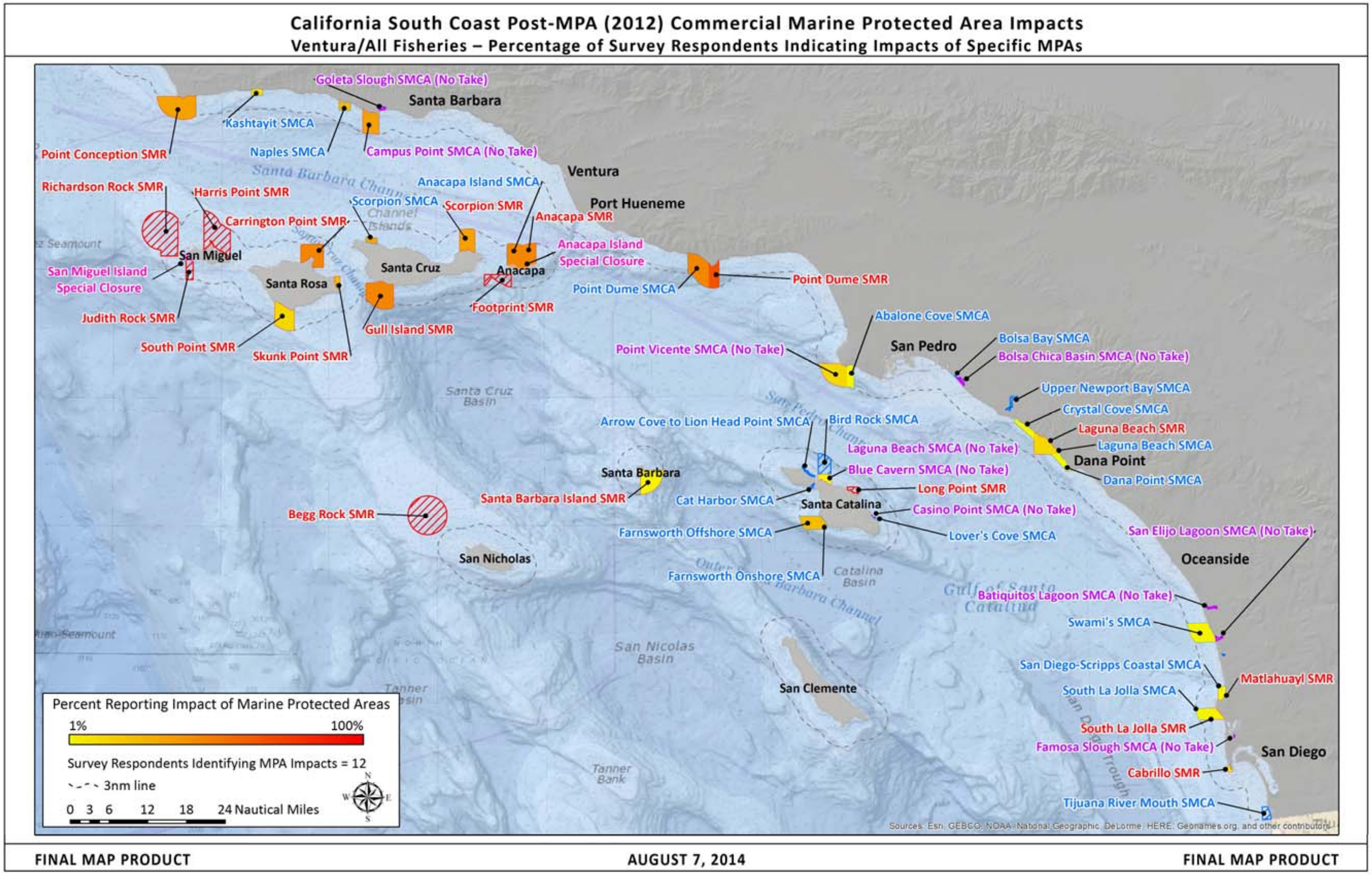
	Percent responding						
MPAs	Coastal pelagics—net	Lobster—trap	Market squid—net	Nearshore finfish live—fixed gear	Rock crab—trap	Spot prawn—trap	All target fisheries (unique individuals)
Number responding	2	6	5	1	5	1	12
Abalone Cove SMCA	*	—	—	*	—	*	8%
Anacapa Island SC	*	17%	20%	*	—	*	25%
Anacapa Island SMCA	*	33%	60%	*	—	*	42%
Anacapa Island SMR	*	33%	80%	*	—	*	50%
Blue Cavern (Catalina Is.) SMCA	*	—	—	*	—	*	8%
Cabrillo SMR	*	17%	—	*	20%	*	8%
Campus Point SMCA	*	17%	60%	*	—	*	33%
Carrington Point (Santa Rosa Is.) SMR	*	17%	80%	*	40%	*	50%
Crystal Cove SMCA	*	17%	—	*	20%	*	8%
Dana Point SMCA	*	17%	—	*	20%	*	8%
Farnsworth Offshore (Catalina Is.) SMCA	*	17%	20%	*	—	*	25%
Farnsworth Onshore (Catalina Is.) SMCA	*	17%	40%	*	—	*	25%
Gull Island (Santa Cruz Is.) SMR	*	33%	80%	*	—	*	50%
Kashtayit SMCA	*	17%	20%	*	—	*	17%
Laguna Beach SMCA	*	17%	20%	*	20%	*	17%
Laguna Beach SMR	*	17%	20%	*	20%	*	17%
Matlahuayl SMR	*	—	—	*	20%	*	8%
Naples SMCA	*	17%	40%	*	—	*	25%
Painted Cave (Santa Cruz Is.) SMCA	*	17%	60%	*	—	*	33%
Point Conception SMR	*	—	80%	*	—	*	33%
Point Dume SMCA	*	50%	—	*	60%	*	42%
Point Dume SMR	*	50%	60%	*	60%	*	67%
Point Vicente SMCA	*	17%	—	*	20%	*	17%
San Diego	*	17%	—	*	20%	*	8%
Santa Barbara Island SMR	*	—	20%	*	—	*	8%
Scorpion (Santa Cruz Is.) SMR	*	50%	20%	*	—	*	33%
Skunk Point (Santa Rosa Is.) SMR	*	17%	20%	*	40%	*	25%
South La Jolla SMCA	*	17%	—	*	20%	*	8%
South La Jolla SMR	*	17%	—	*	20%	*	8%
South Point (Santa Rosa Is.) SMR	*	17%	—	*	40%	*	17%
Swami's SMCA	*	17%	—	*	20%	*	8%
Total number of MPAs impacting fishery/port	*	26	18	10	16	*	31

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Figure 22. Percent of individuals indicating impacts from specific MPAs in 2012, Ventura



A total of 28 different MPAs impacted the Port Hueneme/Oxnard fishermen we spoke to. Similar to Santa Barbara, the Carrington Point SMR impacted the largest percentage of respondents (80 percent, as shown in Table 26). Several MPAs impacted 100 percent of urchin – dive fishermen including Carrington Point SMR, Gull Island SMR, Point Dume SMCA and SMR, and South Point SMR on Santa Rosa Island.

As shown in Figure 23, in addition to the Point Dume SMR and SMCA coastal MPAs, the MPAs surrounding the northern Channel Islands impacted the largest percent of respondents from Point Hueneme/Oxnard. Additionally, coastal MPAs as far north as Point Conceptions and as far south as San Diego impacted fishermen from Point Hueneme/Oxnard.

Table 26. Percent of respondents indicating specific MPA impacting commercial fishery in 2012, Port Hueneme/ Oxnard

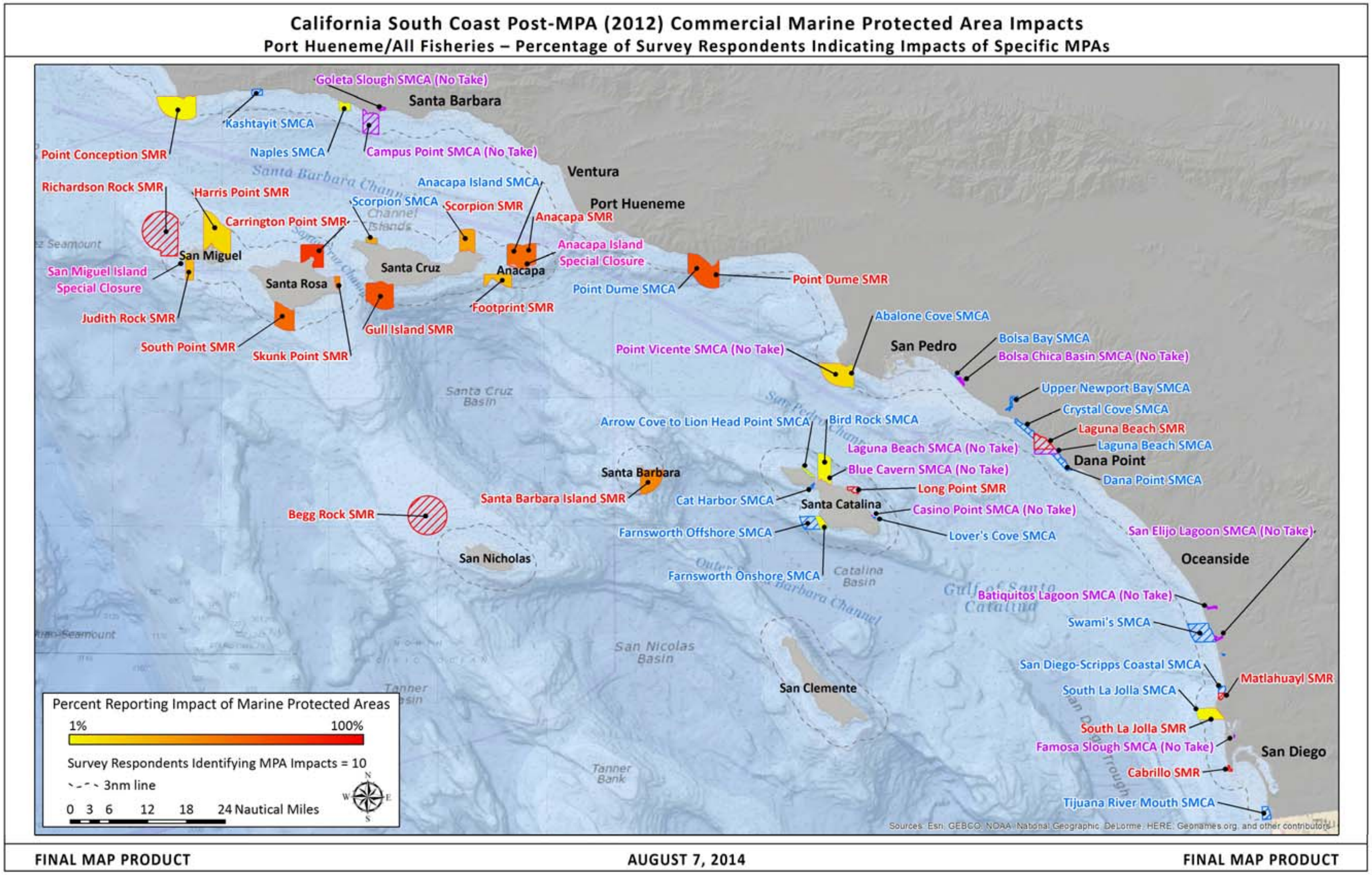
	Percent responding							
MPAs	Coastal pelagics—net	Lobster—trap	Market squid—net	Nearshore finfish live—fixed gear	Rock crab—trap	Sea cucumber—dive	Urchin—dive	All target fisheries (unique individuals)
Number responding	1	2	2	1	2	4	6	10
Abalone Cove SMCA	*	*	*	*	*	25%	17%	20%
Anacapa Island SC	*	*	*	*	*	75%	50%	60%
Anacapa Island SMCA	*	*	*	*	*	75%	50%	60%
Anacapa Island SMR	*	*	*	*	*	75%	50%	60%
Arrow Point to Lion Head Point (Catalina Is.) SM	*	*	*	*	*	—	17%	10%
Bird Rock (Catalina Is.) SMCA	*	*	*	*	*	—	17%	10%
Blue Cavern (Catalina Is.) SMCA	*	*	*	*	*	—	17%	10%
Carrington Point (Santa Rosa Is.) SMR	*	*	*	*	*	50%	100%	80%
Farnsworth Onshore (Catalina Is.) SMCA	*	*	*	*	*	—	17%	10%
Footprint (Anacapa Channel) SMR	*	*	*	*	*	50%	33%	30%
Gull Island (Santa Cruz Is.) SMR	*	*	*	*	*	75%	100%	70%
Harris Point (San Miguel Is.) SMR	*	*	*	*	*	25%	33%	20%
Judith Rock (San Miguel Is.) SMR	*	*	*	*	*	25%	50%	30%
Naples SMCA	*	*	*	*	*	—	—	10%
Painted Cave (Santa Cruz Is.) SMCA	*	*	*	*	*	50%	50%	40%
Point Conception SMR	*	*	*	*	*	—	—	10%
Point Dume SMCA	*	*	*	*	*	50%	100%	70%
Point Dume SMR	*	*	*	*	*	50%	100%	70%
Point Vicente SMCA	*	*	*	*	*	25%	33%	20%
San Miguel Island SC	*	*	*	*	*	25%	17%	10%
Santa Barbara Island SMR	*	*	*	*	*	50%	83%	50%
Scorpion (Santa Cruz Is.) SMR	*	*	*	*	*	25%	50%	40%
Skunk Point (Santa Rosa Is.) SMR	*	*	*	*	*	25%	67%	50%
South La Jolla SMCA	*	*	*	*	*	—	—	10%
South La Jolla SMR	*	*	*	*	*	—	—	10%
South Point (Santa Rosa Is.) SMR	*	*	*	*	*	75%	100%	60%
Total number of MPAs impacting fishery/port	*	*	*	*	*	18	22	26

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Figure 23. Percent of individuals indicating impacts from specific MPAs in 2012, Port Hueneme/Oxnard



As show in Table 27, fishermen in Los Angeles/San Pedro indicated they were impacted by all MPAs in the South Coast Study Regions (this includes 50 MPAs, 2 special closures, and “other”). The Point Vicente SMR impacted the largest percentage of individual respondents (78 percent). Additionally, Point Vicente was the most frequently reported MPA impacting fishermen from each of the target fisheries, except for rock crab – trap. Participants in this fishery reported they were most impacted by Crystal Cove SMCA and Laguna Beach SMR and SMCA.

As shown in Figure 24, in addition to the Point Vicente coastal SMR, the MPAs surrounding Santa Barbara Island, Santa Catalina Island, and near Dana Point impacted the larges percent of respondents across fisheries. Additionally, coastal MPAs as far north as Point Conceptions and as far south as San Diego impacted fishermen from Los Angeles/ San Pedro.

Table 27. Percent of respondents indicating specific MPA impacting commercial fishery in 2012, San Pedro/ Los Angeles

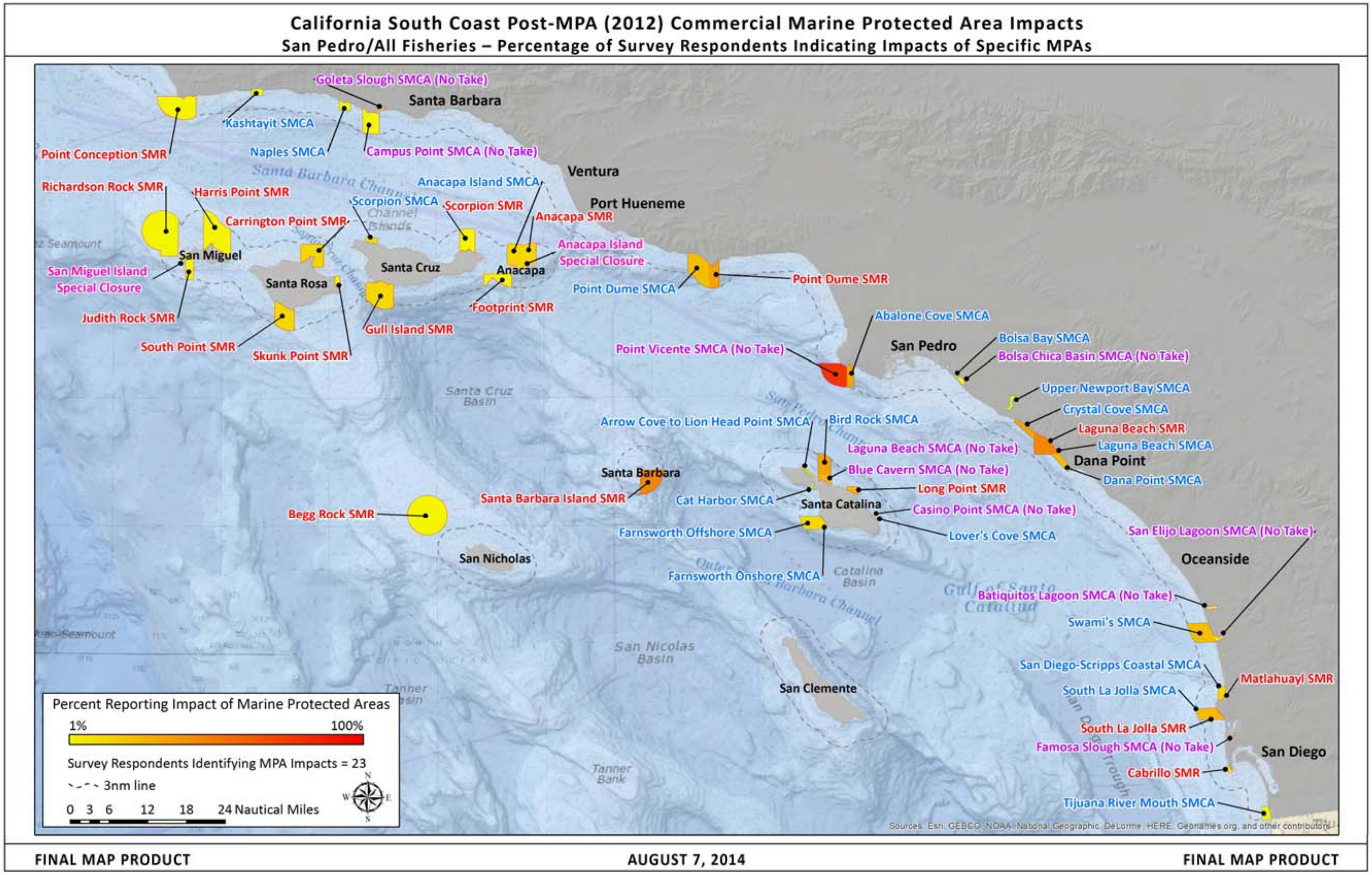
	Percent responding										
MPAs	California halibut—hook & line	Coastal pelagics—net	Lobster—trap	Market squid—brail	Market squid—net	Nearshore finfish live—fixed gear	Rock crab—trap	Sea cucumber—dive	Spot prawn—trap	Urchin—dive	All target fisheries (unique individuals)
Number responding	1	3	8	3	4	2	3	4	1	8	23
Abalone Cove SMCA	*	33%	63%	—	25%	*	33%	50%	*	25%	39%
Anacapa Island SC	*	—	13%	33%	25%	*	—	—	*	—	13%
Anacapa Island SMCA	*	—	13%	33%	25%	*	—	—	*	—	13%
Anacapa Island SMR	*	—	13%	33%	25%	*	—	—	*	—	13%
Arrow Point to Lion Head Point (Catalina Is.) SM	*	—	13%	33%	—	*	—	—	*	13%	13%
Batiquitos Lagoon SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Begg Rock (San Nicholas Island Quad) SMR	*	—	13%	—	—	*	—	—	*	—	4%
Bird Rock (Catalina Is.) SMCA	*	—	13%	33%	—	*	—	100%	*	25%	35%
Blue Cavern (Catalina Is.) SMCA	*	—	13%	100%	—	*	—	25%	*	25%	26%
Bolsa Bay SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Bolsa Chica Basin SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Cabrillo SMR	*	—	13%	—	—	*	—	—	*	—	4%
Campus Point SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Carrington Point (Santa Rosa Is.) SMR	*	—	13%	—	50%	*	—	—	*	—	13%
Casino Point (Catalina Is.) SMCR	*	—	13%	33%	25%	*	—	—	*	—	9%
Cat Harbor (Catalina Is.) SMCA	*	—	13%	33%	—	*	—	—	*	—	9%
Crystal Cove SMCA	*	33%	50%	33%	25%	*	67%	25%	*	13%	39%
Dana Point SMCA	*	—	38%	33%	25%	*	—	—	*	13%	30%
Famosa Slough SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Farnsworth Offshore (Catalina Is.) SMCA	*	—	25%	—	—	*	—	—	*	13%	13%
Farnsworth Onshore (Catalina Is.) SMCA	*	—	25%	—	—	*	—	—	*	25%	17%
Footprint (Anacapa Channel) SMR	*	—	13%	—	—	*	—	—	*	—	4%
Goleta Slough SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Gull Island (Santa Cruz Is.) SMR	*	—	13%	—	50%	*	—	—	*	—	13%
Harris Point (San Miguel Is.) SMR	*	—	13%	—	—	*	—	—	*	—	4%
Judith Rock (San Miguel Is.) SMR	*	—	13%	—	—	*	—	—	*	13%	9%
Kashtayit SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Laguna Beach SMCA	*	67%	50%	33%	75%	*	67%	25%	*	25%	43%
Laguna Beach SMR	*	67%	50%	33%	75%	*	67%	25%	*	25%	43%
Long Point (Catalina Is.) SMR	*	—	13%	100%	25%	*	—	50%	*	—	26%
Lover's Cove (Catalina Is.) SMCA	*	—	13%	33%	—	*	—	—	*	—	9%
Matlahuayl SMR	*	—	25%	—	25%	*	—	—	*	—	13%
Naples SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Painted Cave (Santa Cruz Is.) SMCA	*	—	13%	—	50%	*	—	—	*	—	13%
Point Conception SMR	*	—	13%	33%	—	*	—	—	*	—	9%
Point Dume SMCA	*	33%	38%	—	25%	*	33%	—	*	25%	26%
Point Dume SMR	*	33%	38%	33%	50%	*	33%	—	*	25%	35%
Point Vicente SMCA	*	33%	88%	100%	75%	*	33%	50%	*	63%	78%
Richardson Rock (San Miguel Is.) SMR	*	—	13%	—	—	*	—	—	*	—	4%
San Diego	*	—	25%	—	25%	*	—	—	*	—	13%
San Dieguito Lagoon SMCA	*	—	13%	—	—	*	—	—	*	—	4%
San Elijo Lagoon SMCA	*	—	13%	—	—	*	—	—	*	—	4%
San Miguel Island SC	*	—	13%	—	—	*	—	—	*	13%	9%
Santa Barbara Island SMR	*	—	25%	33%	75%	*	—	50%	*	38%	43%
Scorpion (Santa Cruz Is.) SMR	*	—	13%	—	25%	*	—	—	*	—	9%
Skunk Point (Santa Rosa Is.) SMR	*	—	13%	—	25%	*	—	—	*	—	9%
South La Jolla SMCA	*	—	25%	—	75%	*	—	—	*	—	22%
South La Jolla SMR	*	—	25%	—	75%	*	—	—	*	—	22%
South Point (Santa Rosa Is.) SMR	*	—	13%	—	25%	*	—	—	*	13%	13%
Swami's SMCA	*	—	25%	—	75%	*	—	—	*	—	22%
Tijuana River Mouth SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Upper Newport Bay SMCA	*	—	13%	—	—	*	—	—	*	—	4%
Other	*	—	13%	—	—	*	—	—	*	—	4%
Total number of MPAs impacting fishery/port	*	7	53	18	25	*	7	9	*	17	53

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Figure 24. Percent of individuals indicating impacts from specific MPAs in 2012, San Pedro/Los Angeles



Respondents from Dana Point indicated they were impacted by seven MPAs. Across fisheries, the largest percentage of individuals reported that Laguna Beach SMR and SMCA were impacting them (89 percent for both, as shown in Table 28). As shown in Figure 24, the MPAs nearest Dana Point impacted the largest percentage of respondents in Dana Point. Additionally, MPAs near San Diego and Catalina impacted a small percentage of respondents.

Table 28. Percent of respondents indicating specific MPA impacting commercial fishery in 2012, Dana Point

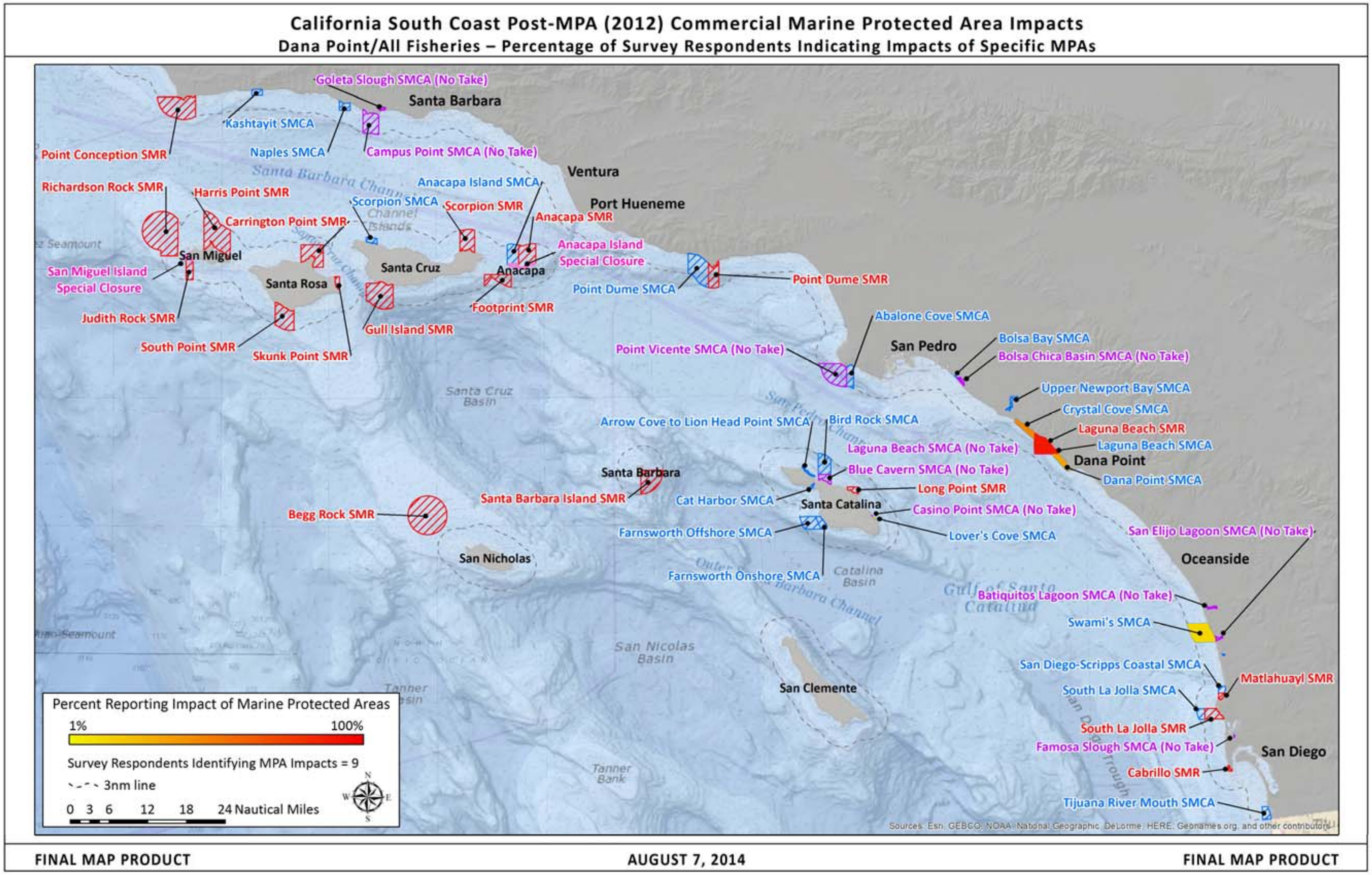
	Percent responding			
MPAs	Lobster—trap	Nearshore finfish live—fixed gear	Rock crab—trap	All target fisheries (unique individuals)
Number responding	9	1	1	9
Crystal Cove SMCA	44%	*	*	44%
Dana Point SMCA	22%	*	*	33%
Laguna Beach SMCA	89%	*	*	89%
Laguna Beach SMR	89%	*	*	89%
Lover's Cove (Catalina Is.) SMCA	11%	*	*	11%
Swami's SMCA	11%	*	*	11%
Other	11%	*	*	11%
Total number of MPAs impacting fishery/port	7	*	*	7

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Figure 25. Percent of individuals indicating impacts from specific MPAs in 2012, Dana Point



Four different MPAs impacted the Oceanside fishermen we spoke to. As shown in Table 29, all Oceanside respondents indicated they were impacted by Swami's SMCA. Additionally, both South La Jolla SMR and SMCA impacted 60 percent of respondents, and 20 percent of respondents were impacted by Farnsworth Offshore SMCA near Catalina Island. The locations of the MPAs in proximity to the port of Oceanside are shown below in Figure 26.

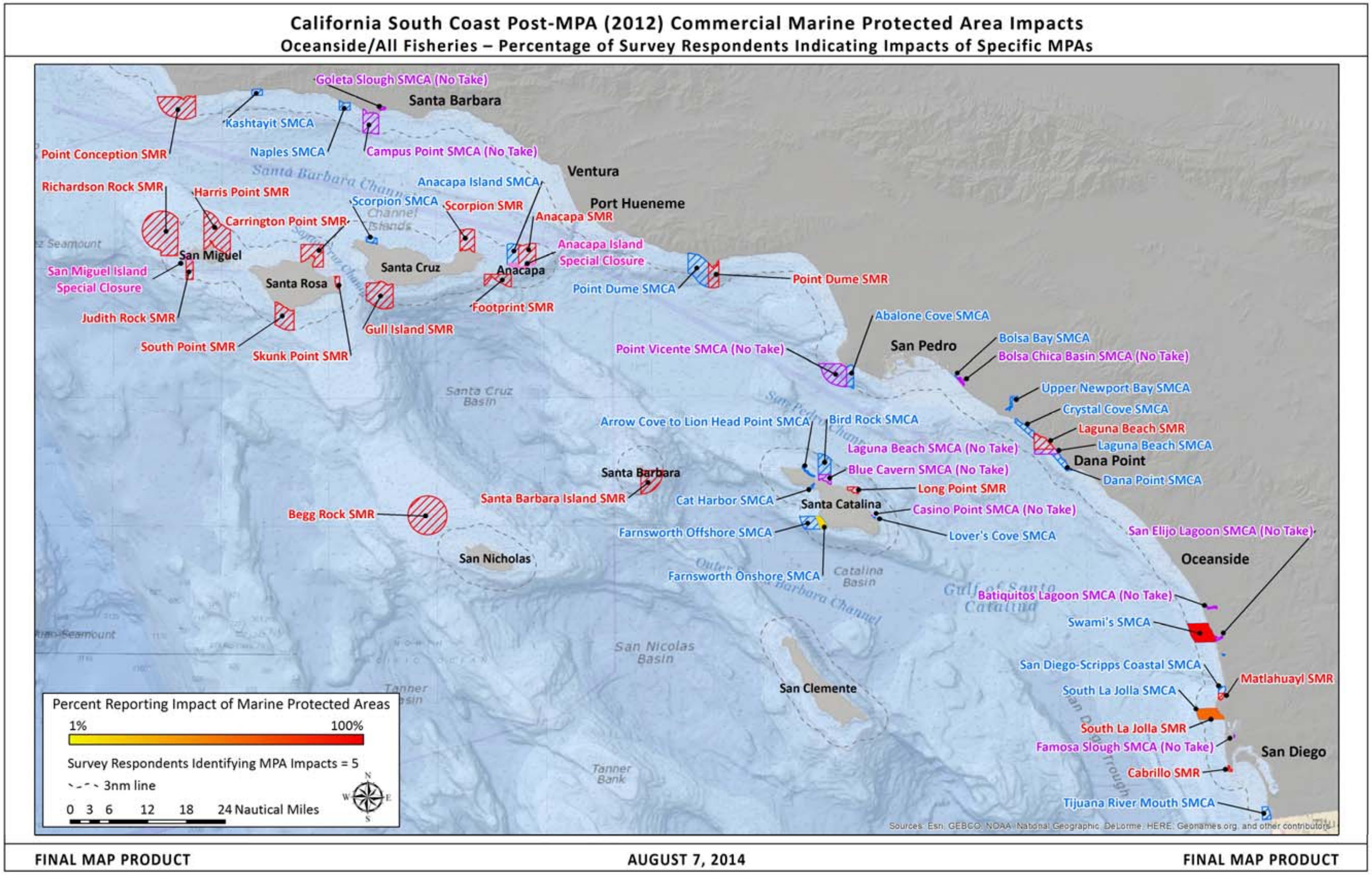
Table 29. Percent of respondents indicating specific MPA impacting commercial fishery in 2012, Oceanside

	Percent responding				
MPAs	Lobster–trap	Nearshore finfish live–fixed gear	Rock crab–trap	Spot prawn–trap	All target fisheries (unique individuals)
Number responding	5	1	2	1	5
Farnsworth Onshore (Catalina Is.) SMCA	20%	*	*	*	20%
South La Jolla SMCA	60%	*	*	*	60%
South La Jolla SMR	60%	*	*	*	60%
Swami's SMCA	100%	*	*	*	100%
Total number of MPAs impacting fishery/port	4	*	*	*	4

Source: Current study

** indicates data were collected but cannot be shown due to confidentiality constraints*

Figure 26. Percent of individuals indicating impacts from specific MPAs in 2012, Oceanside



A total of 24 different MPAs impacted the San Diego fishermen we spoke to. Across individuals the South La Jolla SMR and SMCA impacted the largest percentage of respondents (74 and 68, respectively).

As shown in Figure 27 the coastal MPAs nearest the city of San Diego had the largest impact on respondents from San Diego. Some San Diego fishermen also indicated that coastal MPAs near Dana Point were impacting their fishing. MPAs as far north as the northern Channel Islands (San Miguel, Santa Cruz, and Santa Rosa Islands) were also noted as impacting a small percentage of San Diego fishermen.

Table 30. Percent of respondents indicating specific MPA impacting commercial fishery in 2012, San Diego

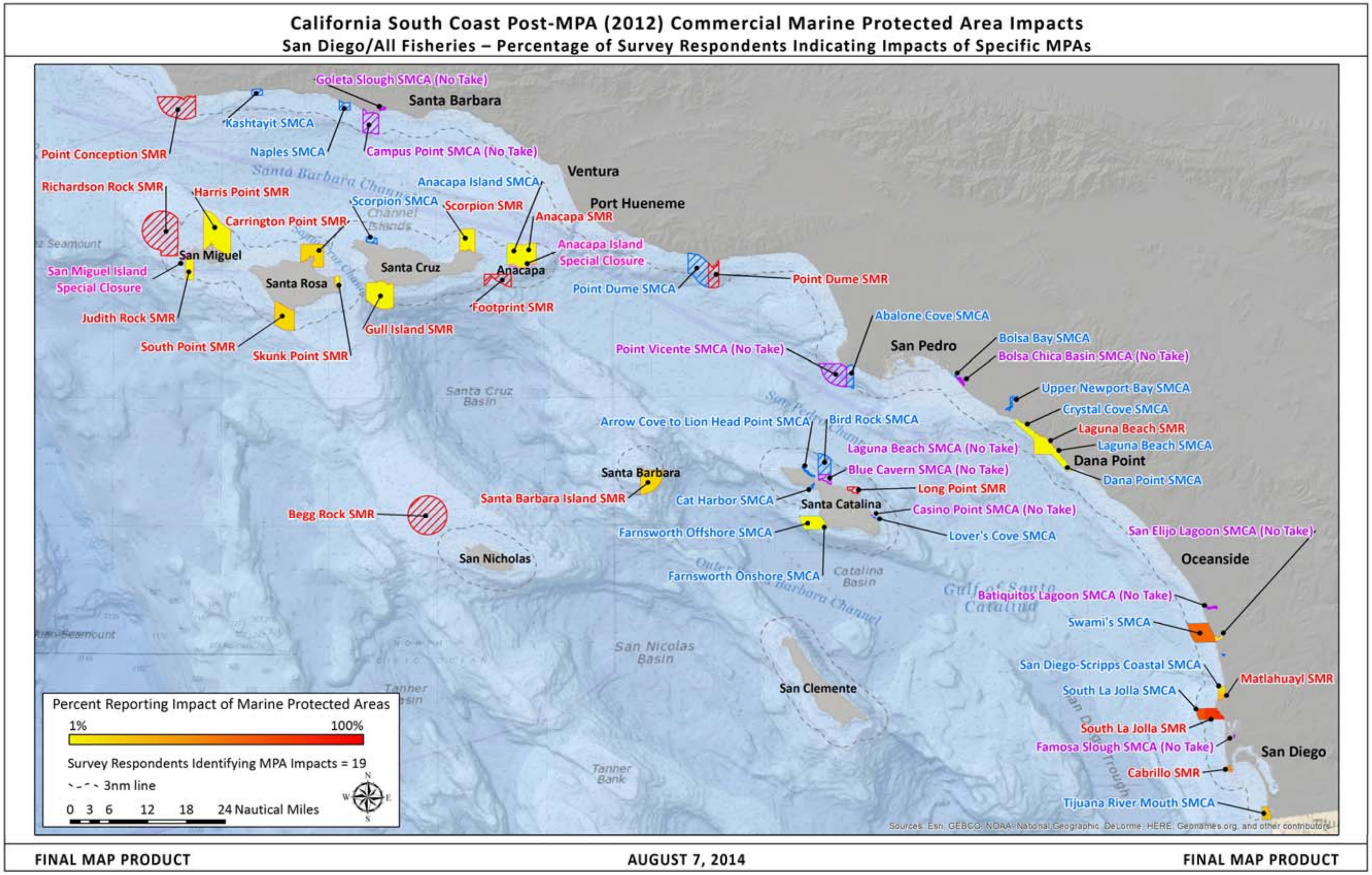
	Percent responding							
MPAs	California halibut–hook & line	Lobster–trap	Market squid–brail	Nearshore finfish live–fixed gear	Rock crab–trap	Sea cucumber–dive	Urchin–dive	All target fisheries (unique individuals)
Number responding	1	13	1	5	3	3	6	19
Anacapa Island SMCA	*	—	*	—	—	33%	—	5%
Anacapa Island SMR	*	—	*	—	—	33%	—	5%
Cabrillo SMR	*	46%	*	20%	—	—	17%	37%
Carrington Point (Santa Rosa Is.) SMR	*	—	*	—	—	33%	33%	11%
Crystal Cove SMCA	*	—	*	—	—	33%	—	5%
Dana Point SMCA	*	—	*	—	—	33%	—	5%
Farnsworth Offshore (Catalina Is.) SMCA	*	—	*	—	—	33%	—	5%
Farnsworth Onshore (Catalina Is.) SMCA	*	—	*	—	—	33%	—	5%
Gull Island (Santa Cruz Is.) SMR	*	—	*	—	—	33%	17%	5%
Harris Point (San Miguel Is.) SMR	*	—	*	—	—	33%	17%	5%
Judith Rock (San Miguel Is.) SMR	*	—	*	—	—	33%	17%	5%
Laguna Beach SMCA	*	—	*	—	—	33%	—	5%
Laguna Beach SMR	*	—	*	—	—	33%	—	5%
Matlahuayl SMR	*	23%	*	—	—	33%	33%	21%
San Diego	*	15%	*	20%	—	33%	17%	11%
San Elijo Lagoon SMCA	*	—	*	20%	—	—	—	5%
Santa Barbara Island SMR	*	—	*	—	—	67%	33%	11%
Scorpion (Santa Cruz Is.) SMR	*	—	*	—	—	33%	—	5%
Skunk Point (Santa Rosa Is.) SMR	*	—	*	—	—	—	17%	5%
South La Jolla SMCA	*	69%	*	80%	—	33%	50%	68%
South La Jolla SMR	*	69%	*	80%	—	67%	83%	74%
South Point (Santa Rosa Is.) SMR	*	—	*	—	—	67%	33%	11%
Swami's SMCA	*	46%	*	80%	—	67%	50%	53%
Tijuana River Mouth SMCA	*	31%	*	—	—	—	17%	26%
Total number of MPAs impacting fishery/port	*	7	*	6	—	20	14	24

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Figure 27. Percent of individuals indicating impacts from specific MPAs in 2012, San Diego



As shown below in Table 31, loss of traditional fishing grounds was the most frequently cited type of impact for each fishery and across all individuals in the study region (97 of 108 individuals reported they had lost traditional fishing areas). Some of the areas fishermen lost were especially productive fishing areas (16 fishermen mentioned this) and some areas lost were safe havens that fishermen could rely upon in bad weather. Some noted that this resulted in them not being able to fish on days when they once could have.

Many individuals (60 out of 108) also indicated that since the MPAs had gone into effect they had experienced crowding and compaction on the water in fishing areas that remained open to fishing. Displacement of some fishermen by MPAs has led to an increase in the number of people, boats, and gear in finite fishing areas. Some fishermen with small boats may not have the ability to target fishing areas that are further offshore due to safety concerns and this results in the crowding of coastal fishing areas. In the lobster–trap fishery, fishermen noted that the increase of gear in the water has resulted in fishermen needing to fish harder and for longer periods of time. Additionally, the crowding has led to changes in how fishing within the lobster–trap fishery is conducted. Specifically, prior to MPAs coastal fishermen began the season working close to shore and would move into deeper water as the season progressed. Due to MPAs, compacting, crowding, and generally more gear in smaller areas, there is a “race to fish” mentality, which has resulted in traps being set in all depths of water at the start of the season. Some fishermen felt that this has also led to an overall shorter fishing season. In terms of crowding and compactions, urchin–dive fishermen noted that the relocation of fishing effort has resulted in a decrease in the size of urchin in open areas and an overcrowding of urchin in closed areas.

Fishermen also indicated that they had to spend more time traveling to reach some of their fishing areas and were spending more time in the water (58 out of 108 individuals). They further expressed that this leads to spending more money on fuel and more time away from home. Quality of life impacts, like time away from home and family, may not be adequately accounted for in economic or spatial analyses, which are the primary objective of this project. However, they are important to consider in order to understand the full range of impacts MPAs have had on the fishing communities. Another social factor, that is not represented in the tables below, but came up in review meetings, is that MPAs have made it easier for inexperienced fishermen to catch fish. This was primarily expressed within the lobster–trap fishery where inexperienced fishermen wait at the border of MPAs for lobsters to crawl out. More experienced fishermen explained that this ‘levels the playing field’ between fishermen who have spent years of time and effort determining productive fishing areas. Additionally, some fishermen noted that MPAs have taken the “hunt” out of fishing.

Nearly all respondents mentioned that they were concerned regarding the potential expansion of MPAs and in some cases mentioned they were hesitant to provide any additional information that could potentially be used against them, such as the current spatial extent of their fishing grounds.

Types of impacts are broken out by homeport, below in Table 32 through Table 39. Patterns were fairly consistence across ports, with loss of traditional fishing grounds being the most commonly cited type of impact across all port/fishery combinations. The second most commonly cited impact was crowding and compaction, for all ports except Oceanside and San Diego (Table 37 and Table 38 respectively). For both of these ports the impact cited by the second largest number of respondents was having to travel further to fish.

Table 31. Types of impacts from MPAs on specific fisheries in 2012, South Coast Region

A. Need to travel longer distances to fish in other areas
B. Shifted fishing efforts into areas in which weather is less predictable
C. Moved homeport location or fish out of another port
D. Cannot fish or go in traditional areas
E. Crowding/compaction/relocation in areas remaining open (of people and/or gear)
F. Loss of particularly productive area
G. People changing fisheries
H. Loss of safe haven
I. Have to increase effort and/or number of days spent fishing
J. Unable to rotate fishing grounds
K. Wind/current pushes gear into MPAs
L. Financial hardship
M. Less catch/smaller catch
N. Increased animosity between fishermen
O. Increased expenses

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
California halibut–hook & line	3	—	—	—	3	—	1	—	—	—	1	—	—	—	—	—
California halibut–trawl	5	2	—	—	4	2	2	—	—	1	—	—	—	1	—	—
Coastal pelagic—net	5	3	1	—	5	1	—	—	—	—	—	—	—	—	—	1
Lobster–trap	53	30	11	1	44	36	5	2	1	4	1	—	—	1	2	1
Market squid–brail	3	—	—	—	3	1	1	—	—	—	—	—	—	—	—	—
Market squid–net	10	5	2	—	9	2	1	—	—	—	—	1	—	—	—	1
Nearshore finfish live–fixed gear	10	8	1	—	9	2	1	—	1	2	1	—	—	—	—	1
Rock crab–trap	21	9	5	—	17	12	2	—	—	3	2	—	—	2	1	—
Sea cucumber–dive	11	5	4	—	11	3	—	—	1	3	1	—	1	—	—	1
Sea cucumber–trawl	4	3	—	—	4	1	—	—	—	1	—	—	—	2	—	—
Spot prawn–trap	2	—	—	—	2	1	—	—	—	—	—	—	—	—	—	—
Urchin–dive	31	15	13	1	29	16	7	—	6	3	1	—	5	—	—	1
All fisheries (unique individuals)	108	58	27	2	97	60	16	2	7	10	4	1	5	4	2	3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 32. Types of impacts from MPAs on specific fisheries in 2012, Santa Barbara

A. Need to travel longer distances to fish in other areas
B. Shifted fishing efforts into areas in which weather is less predictable
C. Moved homeport location or fish out of another port
D. Cannot fish or go in traditional areas
E. Crowding/compaction in areas remaining open (of people and/or gear)
F. Loss of particularly productive area
G. People changing fisheries
H. Loss of safe haven
I. Have to increase effort and/or number of days spent fishing
J. Unable to rotate fishing grounds
K. Wind/current pushes gear into MPAs
L. Financial hardship
M. Less catch/smaller catch
N. Increased animosity between fishermen
O. Increased expenses

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
California halibut–hook & line	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
California halibut–trawl	5	2	—	—	4	2	2	—	—	1	—	—	—	1	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	12	4	3	—	11	11	2	1	—	2	—	—	—	1	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	—	—	—	1	1	—	—	—	—	1	—	—	—	—	—
Rock crab–trap	11	6	3	—	11	6	2	—	—	3	1	—	—	2	—	—
Sea cucumber–dive	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–trawl	4	3	—	—	4	1	—	—	—	1	—	—	—	2	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	14	3	8	—	13	8	4	—	4	—	1	—	3	—	—	—
All fisheries (not unique individuals)	34	13	11	—	32	23	8	1	4	4	3	—	3	4	—	—

Source: Current study
— indicates that the port/fishery was not sampled or a zero value data point
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Table 33. Types of impacts from MPAs on specific fisheries in 2012, Ventura

A. Need to travel longer distances to fish in other areas
B. Shifted fishing efforts into areas in which weather is less predictable
C. Moved homeport location or fish out of another port
D. Cannot fish or go in traditional areas
E. Crowding/compaction in areas remaining open (of people and/or gear)
F. Loss of particularly productive area
G. People changing fisheries
H. Loss of safe haven
I. Have to increase effort and/or number of days spent fishing
J. Unable to rotate fishing grounds
K. Wind/current pushes gear into MPAs
L. Financial hardship
M. Less catch/smaller catch
N. Increased animosity between fishermen
O. Increased expenses

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lobster–trap	6	3	2	—	4	6	—	—	—	—	1	—	—	—	1	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	4	2	1	—	4	—	—	—	—	—	—	—	—	—	—	1
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	5	1	1	—	3	4	—	—	—	—	1	—	—	—	1	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	11	5	3	—	9	6	—	—	—	—	1	—	—	—	1	1

Source: Current study
— indicates that the port/fishery was not sampled or a zero value data point
** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 34. Types of impacts from MPAs on specific fisheries in 2012, Port Hueneme/ Oxnard

A. Need to travel longer distances to fish in other areas
B. Shifted fishing efforts into areas in which weather is less predictable
C. Moved homeport location or fish out of another port
D. Cannot fish or go in traditional areas
E. Crowding/compaction in areas remaining open (of people and/or gear)
F. Loss of particularly productive area
G. People changing fisheries
H. Loss of safe haven
I. Have to increase effort and/or number of days spent fishing
J. Unable to rotate fishing grounds
K. Wind/current pushes gear into MPAs
L. Financial hardship
M. Less catch/smaller catch
N. Increased animosity between fishermen
O. Increased expenses

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lobster–trap	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	6	6	4	1	6	2	1	—	1	3	—	—	1	—	—	1
All fisheries (not unique individuals)	10	9	6	1	10	5	1	—	1	3	—	—	1	—	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 35. Types of impacts from MPAs on specific fisheries in 2012, San Pedro/ Los Angeles

A. Need to travel longer distances to fish in other areas
B. Shifted fishing efforts into areas in which weather is less predictable
C. Moved homeport location or fish out of another port
D. Cannot fish or go in traditional areas
E. Crowding/compaction in areas remaining open (of people and/or gear)
F. Loss of particularly productive area
G. People changing fisheries
H. Loss of safe haven
I. Have to increase effort and/or number of days spent fishing
J. Unable to rotate fishing grounds
K. Wind/current pushes gear into MPAs
L. Financial hardship
M. Less catch/smaller catch
N. Increased animosity between fishermen
O. Increased expenses

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
California halibut–hook & line	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	2	2	—	—	2	1	—	—	—	—	—	—	—	—	—	—
Lobster–trap	8	5	—	1	5	7	—	—	—	—	—	—	—	—	—	—
Market squid–brail	3	—	—	—	3	1	1	—	—	—	—	—	—	—	—	—
Market squid–net	4	2	—	—	3	1	1	—	—	—	—	1	—	—	—	—
Nearshore finfish live–fixed gear	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	3	1	—	—	2	1	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	3	1	—	—	3	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Urchin–dive	5	1	—	—	4	3	2	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	22	10	—	1	18	13	4	—	—	—	—	1	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 36. Types of impacts from MPAs on specific fisheries in 2012, Dana Point

A. Need to travel longer distances to fish in other areas
B. Shifted fishing efforts into areas in which weather is less predictable
C. Moved homeport location or fish out of another port
D. Cannot fish or go in traditional areas
E. Crowding/compaction in areas remaining open (of people and/or gear)
F. Loss of particularly productive area
G. People changing fisheries
H. Loss of safe haven
I. Have to increase effort and/or number of days spent fishing
J. Unable to rotate fishing grounds
K. Wind/current pushes gear into MPAs
L. Financial hardship
M. Less catch/smaller catch
N. Increased animosity between fishermen
O. Increased expenses

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	7	3	—	—	6	4	1	—	—	2	—	—	—	—	1	1
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	7	3	—	—	6	4	1	—	—	2	—	—	—	—	1	1

Source: Current study
— indicates that the port/fishery was not sampled or a zero value data point
** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 37. Types of impacts from MPAs on specific fisheries in 2012, Oceanside

A. Need to travel longer distances to fish in other areas
B. Shifted fishing efforts into areas in which weather is less predictable
C. Moved homeport location or fish out of another port
D. Cannot fish or go in traditional areas
E. Crowding/compaction in areas remaining open (of people and/or gear)
F. Loss of particularly productive area
G. People changing fisheries
H. Loss of safe haven
I. Have to increase effort and/or number of days spent fishing
J. Unable to rotate fishing grounds
K. Wind/current pushes gear into MPAs
L. Financial hardship
M. Less catch/smaller catch
N. Increased animosity between fishermen
O. Increased expenses

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	5	3	1	—	4	1	1	—	—	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	5	3	1	—	4	1	1	—	—	—	—	—	—	—	—	—

Source: Current study
— indicates that the port/fishery was not sampled or a zero value data point
** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 38. Types of impacts from MPAs on specific fisheries in 2012, San Diego

A. Need to travel longer distances to fish in other areas
B. Shifted fishing efforts into areas in which weather is less predictable
C. Moved homeport location or fish out of another port
D. Cannot fish or go in traditional areas
E. Crowding/compaction/relocation in areas remaining open (of people and/or gear)
F. Loss of particularly productive area
G. People changing fisheries
H. Loss of safe haven
I. Have to increase effort and/or number of days spent fishing
J. Unable to rotate fishing grounds
K. Wind/current pushes gear into MPAs
L. Financial hardship
M. Less catch/smaller catch
N. Increased animosity between fishermen
O. Increased expenses

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	13	10	5	—	12	5	1	1	1	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	4	4	—	—	4	—	—	—	—	1	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	2	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	6	5	1	—	6	3	—	—	1	—	—	—	1	—	—	—
All fisheries (unique individuals)	19	15	6	—	18	8	1	1	2	1	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

As previously mentioned, not all interview participants were asked what impacts the community as a whole had experienced. Of the 48 individuals across the study region who did have the opportunity to respond to the question 27 indicated that crowding and compaction where the largest community level impacts, 16 mentioned social strife between fishermen, and 12 mentioned relocation of fishing efforts (Table 39). In general fishermen felt that the reduction of fishing areas let to more stress between fishermen. Sometimes fishermen said specifically that people who could no longer fish in a certain area moved into an area that had traditionally been fished by someone else. Increased competition and animosity between fishermen was reported in Santa Barbara (Table 40), Ventura (Table 41), Port Hueneme/Oxnard (Table 42), San Pedro/Los Angeles (Table 43), and San Diego (Table 44). Additionally, fishermen noted that in port without slip assignments there has been a overcrowding which in some cases has led to changes in port social dynamics. Additional types of community level impacts can be found below in Table 39 through Table 44.

Table 39. Types of community level impacts, South Coast Region

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	5	2	—	—	—	1	—	—	—	—	1	1	1	—	—	—	—	1
Coastal pelagics–net	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	18	11	7	9	1	—	1	1	—	—	—	1	—	2	1	1	—	—
Market squid–brail	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Market squid–net	3	—	—	1	—	1	—	—	—	—	—	—	—	1	—	—	—	—
Nearshore finfish live–fixed gear	4	4	3	1	—	—	1	1	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	15	9	6	7	1	—	1	1	—	1	—	1	—	1	—	1	—	—
Sea cucumber–dive	5	3	1	2	1	1	1	2	1	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	4	1	—	—	—	1	—	—	—	—	—	1	1	—	—	—	—	1
Spot prawn–trap	4	1	—	—	—	1	—	—	—	—	—	1	1	—	—	—	—	1
Urchin–dive	18	11	3	5	2	1	1	3	5	—	—	—	—	—	—	2	1	—
Unique individuals	48	27	12	16	5	5	3	5	6	2	2	3	2	4	2	4	2	3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. Crowding/compaction
B. Relocation of effort into areas where others are fishing
C. Social stress between fishermen
D. Loss of options/flexibility
E. Impacts fisheries disproportionality
F. Crowding recreational fishery into smaller areas
G. More travel
H. People are doing things that are unsafe to catch more
I. Recreational fishermen now fishing in traditionally commercial areas
J. Lack of new entrants into fishing business
K. Impacting personal lives (health, family life, etc.)
L. Buyers want more than can be provided
M. Shoreside impacts
N. Loss of heritage/culture
O. Relationships between managers and fishermen are worse now
P. Population at large unaware of MPAs
Q. Fewer fishermen/ People not using permits

Table 40. Types of community level impacts, Santa Barbara

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
California halibut–trawl	5	2	—	—	—	1	—	—	—	—	1	1	1	—	—	—	—	1
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	8	7	2	4	1	—	—	—	—	—	—	1	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	9	7	2	4	1	—	—	—	—	1	—	1	—	—	—	—	—	—
Sea cucumber–dive	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–trawl	4	1	—	—	—	1	—	—	—	—	—	1	1	—	—	—	—	1
Spot prawn–trap	4	1	—	—	—	1	—	—	—	—	—	1	1	—	—	—	—	1
Urchin–dive	11	9	2	2	2	1	—	1	3	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	26	19	4	6	4	2	—	1	3	1	1	2	1	—	—	—	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

A. Crowding/compaction
B. Relocation of effort into areas where others are fishing
C. Social stress between fishermen
D. Loss of options/flexibility
E. Impacts fisheries disproportionally
F. Crowding recreational fishery into smaller areas
G. More travel
H. People are doing things that are unsafe to catch more
I. Rec fishermen now fishing in traditionally commercial areas
J. Lack of new entrants into fishing business
K. Impacting personal lives (health, family life, etc.)
L. Buyers want more than can be provided
M. Shoreside impacts
N. Loss of heritage/culture
O. Relationships between managers and fishermen are worse now
P. Population at large unaware of MPAs
Q. Fewer fishermen/ People not using permits

Table 41. Types of community level impacts, Ventura

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lobster–trap	6	3	3	3	—	—	1	1	—	—	—	—	—	2	—	1	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	3	—	—	1	—	1	—	—	—	—	—	—	—	1	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	5	2	3	2	—	—	1	1	—	—	—	—	—	1	—	1	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	9	3	3	4	—	1	1	1	—	—	—	—	—	3	—	1	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

A. Crowding/compaction
B. Relocation of effort into areas where others are fishing
C. Social stress between fishermen
D. Loss of options/flexibility
E. Impacts fisheries disproportionally
F. Crowding recreational fishery into smaller areas
G. More travel
H. People are doing things that are unsafe to catch more
I. Rec fishermen now fishing in traditionally commercial areas
J. Lack of new entrants into fishing business
K. Impacting personal lives (health, family life, etc.)
L. Buyers want more than can be provided
M. Shoreside impacts
N. Loss of heritage/culture
O. Relationships between managers and fishermen are worse now
P. Population at large unaware of MPAs
Q. Fewer fishermen/ People not using permits

Table 42. Types of community level impacts, Port Hueneme/ Oxnard

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	4	2	—	2	—	—	1	1	1	—	—	—	—	—	—	1	—	—
All fisheries (unique individuals)	4	2	—	2	—	—	1	1	1	—	—	—	—	—	—	1	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

A. Crowding/compaction
B. Relocation of effort into areas where others are fishing
C. Social stress between fishermen
D. Loss of options/flexibility
E. Impacts fisheries disproportionally
F. Crowding recreational fishery into smaller areas
G. More travel
H. People are doing things that are unsafe to catch more
I. Rec fishermen now fishing in traditionally commercial areas
J. Lack of new entrants into fishing business
K. Impacting personal lives (health, family life, etc.)
L. Buyers want more than can be provided
M. Shoreside impacts
N. Loss of heritage/culture
O. Relationships between managers and fishermen are worse now
P. Population at large unaware of MPAs
Q. Fewer fishermen/ People not using permits

Table 43. Types of community level impacts, San Pedro/ Los Angeles

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–brail	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	2	—	1	1	—	—	—	1	1	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	3	—	1	1	—	—	—	1	1	—	—	—	—	—	—	1	1	—
All fisheries (unique individuals)	6	1	2	2	—	1	—	1	1	—	—	—	—	—	—	1	1	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. Crowding/compaction
B. Relocation of effort into areas where others are fishing
C. Social stress between fishermen
D. Loss of options/flexibility
E. Impacts fisheries disproportionally
F. Crowding recreational fishery into smaller areas
G. More travel
H. People are doing things that are unsafe to catch more
I. Rec fishermen now fishing in traditionally commercial areas
J. Lack of new entrants into fishing business
K. Impacting personal lives (health, family life, etc.)
L. Buyers want more than can be provided
M. Shoreside impacts
N. Loss of heritage/culture
O. Relationships between managers and fishermen are worse now
P. Population at large unaware of MPAs
Q. Fewer fishermen/ People not using permits

Table 44. Types of community level impacts, San Diego

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	3	1	2	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	1	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	3	1	2	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. Crowding/compaction
B. Relocation of effort into areas where others are fishing
C. Social stress between fishermen
D. Loss of options/flexibility
E. Impacts fisheries disproportionally
F. Crowding recreational fishery into smaller areas
G. More travel
H. People are doing things that are unsafe to catch more
I. Rec fishermen now fishing in traditionally commercial areas
J. Lack of new entrants into fishing business
K. Impacting personal lives (health, family life, etc.)
L. Buyers want more than can be provided
M. Shoreside impacts
N. Loss of heritage/culture
O. Relationships between managers and fishermen are worse now
P. Population at large unaware of MPAs
Q. Fewer fishermen/ People not using permits

3.4. Job Satisfaction in South Coast Commercial Fisheries

When assessing socioeconomic changes within commercial fishing communities it is important to measure both economic and social change. For example, from year to year fishermen may be earning the same amount or more revenue and from an economic perspective it would seem that fishermen are doing well. However, maintaining or increasing revenue levels may at times come with significant social costs. These social costs may include spending more time fishing, which in turn means less time spent with family and friends. A fisherman's work conditions could also change in a way that affects their daily work life or aspects of their job they most enjoy.

It has also been shown that significant relationships exist between job satisfaction and an individual's overall health and wellbeing (Pollnac and Poggie 2006; Pollnac and Littlefield, 1983). Given this we adapted a job satisfaction question set from Pitchon (2011) and Gatewood and McCay (1990) and to establish a job satisfaction baseline for South Coast commercial fisheries and ports.

Fishermen were presented 18 characteristics of their job and asked to determine if they are happy, neutral, or unhappy with that particular aspect of their job. As seen in Figure 28 the majority of fishermen across the South Coast region are happy with:

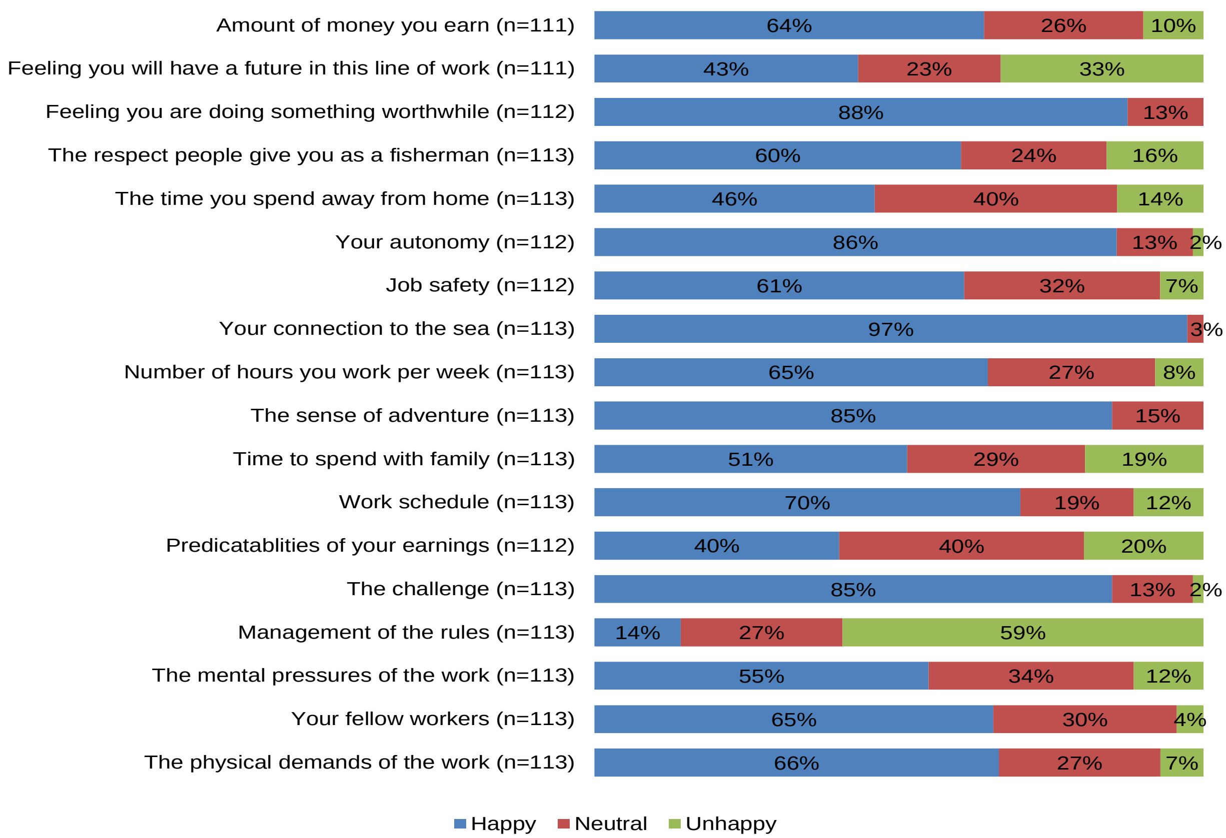
- Their connection to the sea (97%)
- Feeling they are doing something worthwhile (88%)
- Their autonomy on the job (86%)
- Sense of adventure (85%)
- The challenge (85%)
- Work schedule (70%)
- The physical demand of the work (66%)
- The number of hours they work (65%)
- Their fellow workers (65%)
- The amount of money they earn (64%)
- Job safety (61%)
- The respect people give them as a fisherman (60%)
- The mental pressures of work (55%)
- Time spent with family (51%)

The majority of fishermen are either neutral or unhappy about the following

- Predictabilities in their earnings (60%)
- Feeling they will have a future in this line of work (56%)
- Time they spend away from home (54%)

The majority of fishermen (59%) are unhappy with the management of the rules or regulations for commercial fishing.

Figure 28. Percent of respondents indicating level of satisfaction with particular aspects of their work, South Coast Region



Source: Current study

Additionally, we asked fishermen and open-ended question about what aspect of their job they would change if they could. We split fishermen responses into non-regulatory in nature and regulatory in nature (Table 45 and Table 46). Some fishermen indicated that they wouldn't change a thing (n=8) The most frequent non-regulatory aspect fishermen would change about their job was receiving a better price for fish from processors (n=8), make more money, have a better market their fishery, better/more consistent weather, the number of hours working, and to have a bigger boat (each response, n=4). In regards to regulations, the things fishermen most frequently mentioned they would like to change are: removing MPAs (n=10), better relationships between managers, science, and fishermen (n=8), fewer fishermen/less competition/less crowding (n=8), better science informing management (n=7), and better management/regulations (n=7).

Table 45. Aspect of job individual would change – non regulatory in nature, South Coast Region

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
California halibut–hook & line	3	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	1
California halibut–trawl	2	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—
Coastal pelagics–net	2	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Lobster–trap	16	1	—	—	—	1	1	—	2	—	3	—	3	1	1	3	—	1	—
Market squid–brail	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
Market squid–net	4	—	—	—	1	—	—	—	—	—	—	—	2	1	—	—	—	—	—
Nearshore finfish live–fixed gear	6	—	—	—	—	—	1	—	1	—	—	—	—	—	—	2	—	1	1
Rock crab–trap	8	—	—	—	—	—	—	—	2	—	2	—	1	—	1	2	—	—	1
Sea cucumber–dive	5	2	1	—	—	1	—	—	1	1	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	2	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	1	—	—
Spot prawn–trap	2	—	—	—	—	—	—	—	—	—	—	—	1	—	—	1	—	—	—
Urchin–dive	14	6	1	3	—	2	—	—	1	1	—	1	—	—	1	—	—	—	1
Unique individuals	39	8	2	4	2	4	1	1	4	1	4	2	8	3	3	4	2	2	3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. Get better price from processor
B. More opportunities for direct marketing, not have to sell to processor
C. Make more money
D. More financial security
E. Better market for urchin
F. More control over pricing
G. Lower cost of fuel
H. Better/more consistent weather
I. Be able to surf more while out diving
J. Number of hours working
K. Be younger
L. Wouldn't change anything
M. More time for family
N. Would change location (where he lives)
O. Bigger boat
P. Not work so early in the morning
Q. Amount of time it takes to prepare for fishing
R. Make improvements to boat

Table 46. Aspect of job individual would change – regulatory in nature, South Coast Region

Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
California halibut–hook & line	2	—	—	—	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—
California halibut–trawl	4	—	1	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—
Coastal pelagics–net	3	—	—	—	—	—	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	1	—
Lobster–trap	36	2	4	—	4	2	2	1	7	2	5	1	—	—	—	3	1	6	—	—	—	2	—	1
Market squid–brail	3	—	—	—	1	—	1	—	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—
Market squid–net	6	—	—	—	—	—	—	—	—	—	—	—	2	—	1	—	—	—	—	1	1	—	1	—
Nearshore finfish live–fixed gear	8	—	1	—	3	—	1	—	—	1	1	—	—	—	—	1	—	—	—	—	—	—	—	1
Rock crab–trap	17	1	2	—	3	1	1	—	2	1	3	1	—	—	—	—	—	3	—	—	—	1	—	1
Sea cucumber–dive	5	—	—	—	—	2	1	—	—	—	1	—	—	—	1	1	—	—	—	—	—	—	—	—
Sea cucumber–trawl	3	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—
Spot prawn–trap	2	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
Urchin–dive	14	—	—	2	1	3	1	—	2	—	1	—	—	1	4	1	—	—	—	—	—	—	—	—
Unique individuals	66	3	6	3	8	6	7	2	10	4	7	3	3	2	6	5	2	8	4	2	2	3	1	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

A. More informed public perception fishing industry	M. Rotate MPAs
B. Less politics	N. More freedom to determine which days to fish
C. Less regulation	O. Better enforcement of existing regulations
D. Better relationships between managers, science, and fishermen	P. More monitoring
E. Fishermen more involved in fisheries management	Q. Fewer fishermen/less competition/less crowded
F. Better science informing management	R. More freedom to determine where to fish
G. Fewer charter fishermen	S. More quota
H. Remove MPAs	T. Rules written more clearly
I. More security regarding access to fishing grounds	U. More access to permits
J. Better management/regulations	V. Eliminate derby style fishing
K. More transparent/honest governance	W. Better process for making rules
L. No light boats	

3.4.1. Job Satisfaction in South Coast Fisheries

To better understand how job satisfaction varies across fisheries we summarized responses to the job satisfaction questionnaire by fishery, which are presented from Figure 29 to Figure 40. It should be noted that the jobs satisfaction questions were about their commercial fishing job in general. For fishermen whom participate in multiple fisheries, his/her response may not be in reference to the specific fishery we summarized their response to.

In the California halibut-hook and line fishery (Figure 29), for the most part fishermen whom participate in this fishery are happy with their job. Fishermen were most in agreement and happy with feeling like they are doing something worthwhile (100%), the respect people give you as a fisherman (100%), the connection to the sea (100%), the challenge of the job (100%), the sense of adventure (100%), and the physical demand of the work (100%). However, a major portion of these fishermen are not happy with the management of commercial fishing rules (50%) and were either neutral or unhappy about the predictability of earning (75%).

In the California halibut-trawl fishery (Figure 30), fishermen for the most part are happy with their job. Fishermen were most in agreement and happy with the feeling like they are doing something worthwhile (100%), the time they are able to spend with family (100%), and the physical demands of the work (100%). However, the majority of fishermen were unhappy about the respect people give them as a fisherman (60%) and the management of commercial fishing rules (80%).

In the coastal pelagics-net fishery (Figure 31) job satisfaction was more mixed than other fisheries. Fishermen were most in agreement and happy with the amount of money they earn (100%) and feeling like they are doing something worthwhile (100%). However, the majority of fishermen were unhappy about the time they spend away from home (83%) and the time they get to spend with family (83%). Furthermore, the majority of fishermen are either neutral or unhappy about the number of hours they work per week (67%), their work schedule (67%), management of commercial fishing rules (83%).

In the lobster-trap fishery (Figure 32), fishermen for the most part are happy with their job. The only item fishermen agreed upon across responses were that they are satisfied with their connection to the sea (100%). The majority of fishermen unhappy with the management of the rules of commercial fishing (62%) and the majority of fishermen were either neutral of unhappy about feeling they will have a future in this line of work (58%), the predictabilities of their earnings (58%), and the mental pressures of the work (51%)

In the Market squid-brail fishery (Figure 33), job satisfaction was more mixed than other fisheries. Fishermen were most in agreement and happy with the amount of money they earn (100%), feeling like they are doing something worthwhile (100%), their connection to the sea (100%), their work schedule (100%), and their fellow workers (100%). However, all fishermen were unhappy with the management of commercial fishing rules (100%). Furthermore, the majority of fishermen were either neutral or unhappy with feeling they will have a future in this line of work (100%), the time they spend away from home (75%), and predictabilities of their earnings (100%).

In the Market squid-net fishery (Figure 34), job satisfaction was more mixed than other fisheries. The only aspect fishermen were in agreement and happy with is the feeling they are doing something worthwhile (100%). The majority of fishermen are unhappy with the amount of time they spend with family (64%) and the majority of fishermen were either neutral or unhappy with the time they spend away from home (72%), the management of commercial fishing rules (82%), and the mental pressures of the work (64%).

In the nearshore finfish live-fixed gear fishery (Figure 35), fishermen for the most part are happy with their job. The item fishermen agreed upon across responses were that they are happy with their connection to the sea (100%) and the majority were happy with 15 out of the 18 job satisfaction questions. The majority of fishermen were not happy about the management of commercial fishing rules (64%).

In the rock crab-trap fishery (Figure 36), fishermen for the most part are happy with their job. The item fishermen agreed upon across responses were that they are happy with their connection to the sea

(100%). The majority of fishermen were unhappy with the management of commercial fishing rules (63%). The majority of fishermen were either neutral or unhappy about the time they spend away from home (59%) and the time they spend with family (51%).

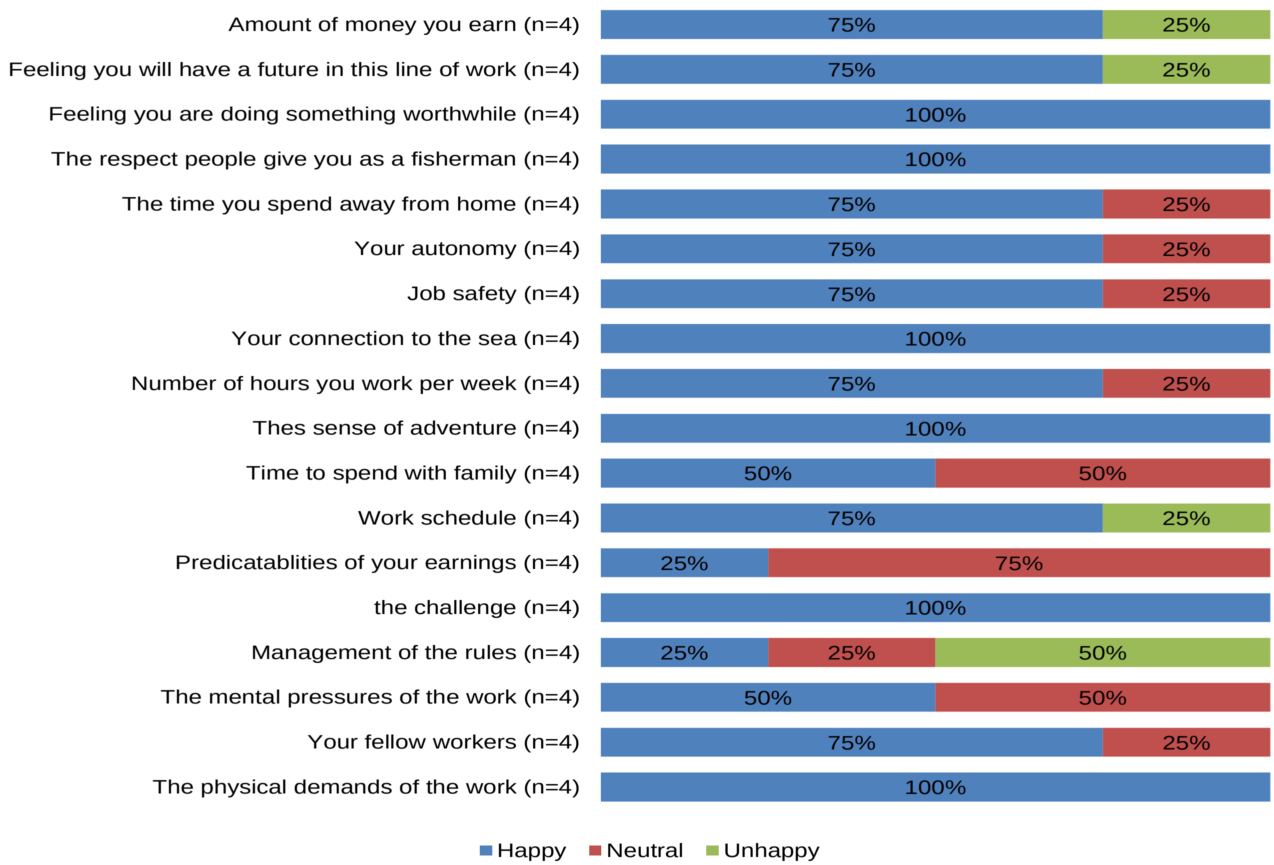
In the sea cucumber-diver fishery (Figure 37), fishermen for the most part are happy with their job. The item fishermen agreed upon across responses were that they are satisfied with their connection to the sea (100%). The majority of fishermen were unhappy with the management of commercial fishing rules (54%). The majority of fishermen were either neutral or unhappy about feeling they will have a future in this line of work (53%) and the time they spend away from home (53%).

In the sea cucumber-trawl fishery (Figure 38), fishermen for the most part are happy with their job. The items fishermen agreed upon across responses were that they happy with: feeling like they are doing something worthwhile (100%), that they have job safety (100%), their connection to the sea (100%), the time they spend with family (100%), the challenge of the job (100%), and the physical demands of the work (100%). The majority of fishermen were unhappy about the respect people give them as a fisherman (75%) and the management of commercial fishing rules (75%).

In the spot prawn-trap fishery (Figure 39), fishermen for the most part are happy with their job. Fishermen across the board agreed they are happy with the amount of money they earn (100%), feeling like they are doing something worthwhile (100%), their autonomy (100%), their connection to the sea (100%), the number of hours they work per week (100%), the sense of adventure (100%), their work schedule (100%), and the challenge of the job (100%). The majority of fishermen were unhappy with the management of the rules of commercial fishing (75%).

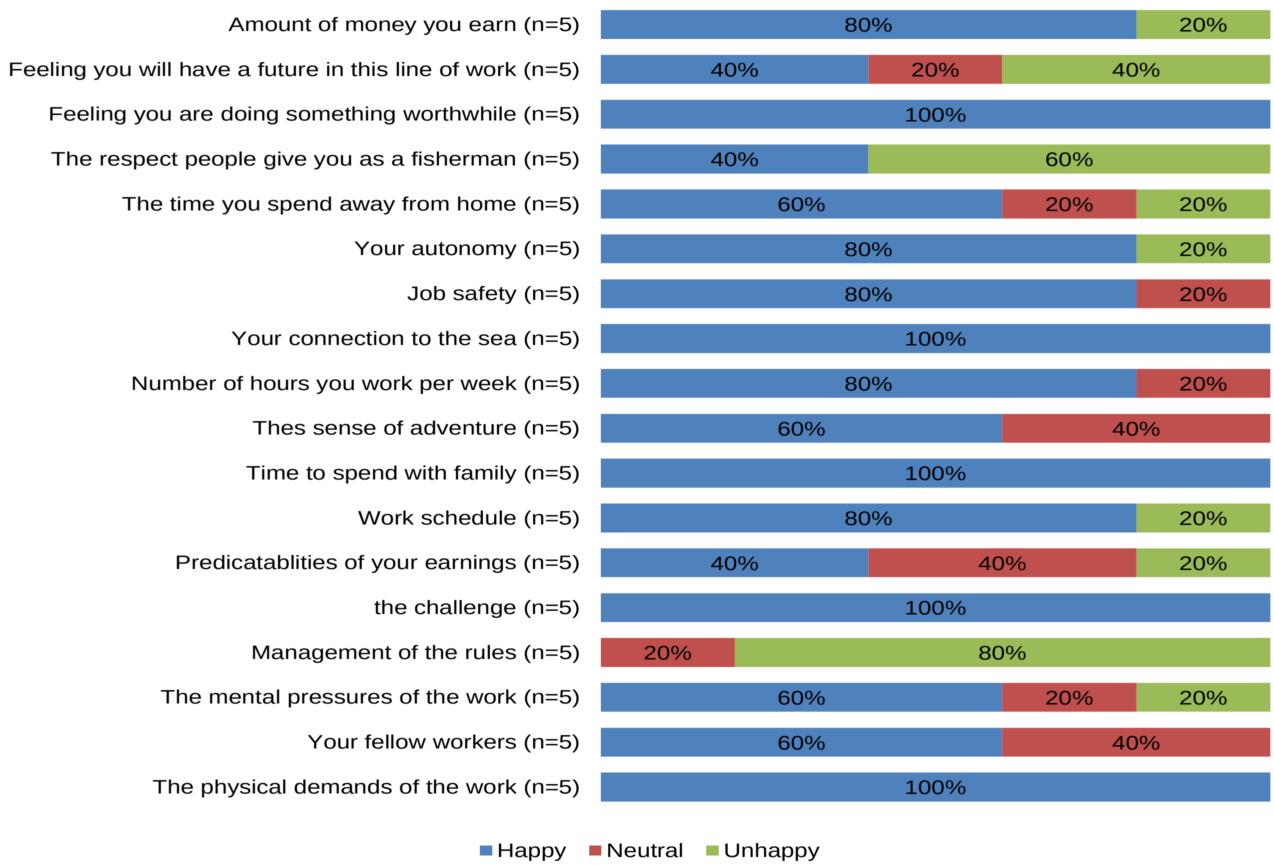
In the urchin-dive fishery (Figure 40), fishermen for the most part are happy with their job. Fishermen did not completely agree on their satisfaction of any one aspect of their job but the majority was happy with 12 out of the 18 job satisfaction metrics. However, the majority of fishermen responded they are unhappy with the management of the rules of commercial fishing (56%).

Figure 29. Percent of respondents indicating level of satisfaction with particular aspects of their work, California halibut–hook & line



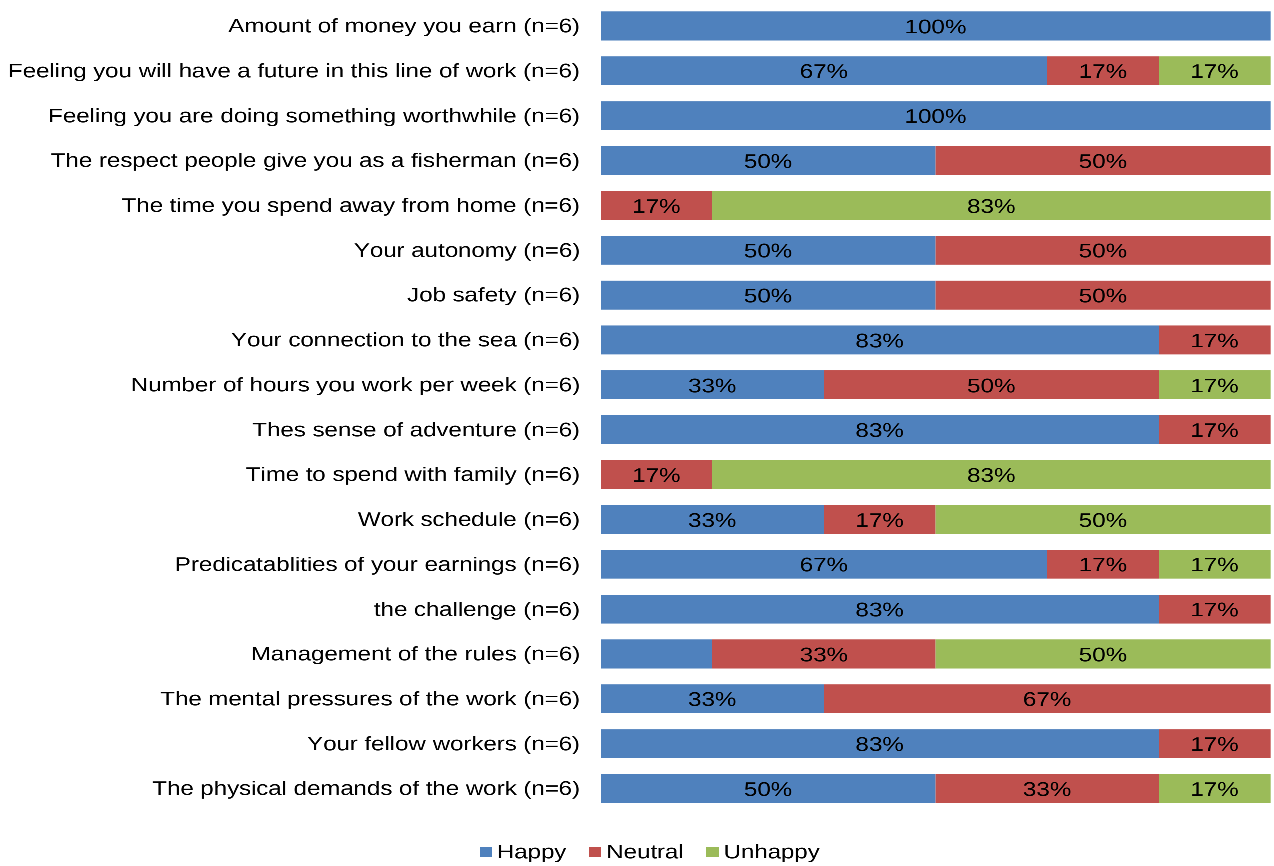
Source: Current study

Figure 30. Percent of respondents indicating level of satisfaction with particular aspects of their work, California halibut–trawl



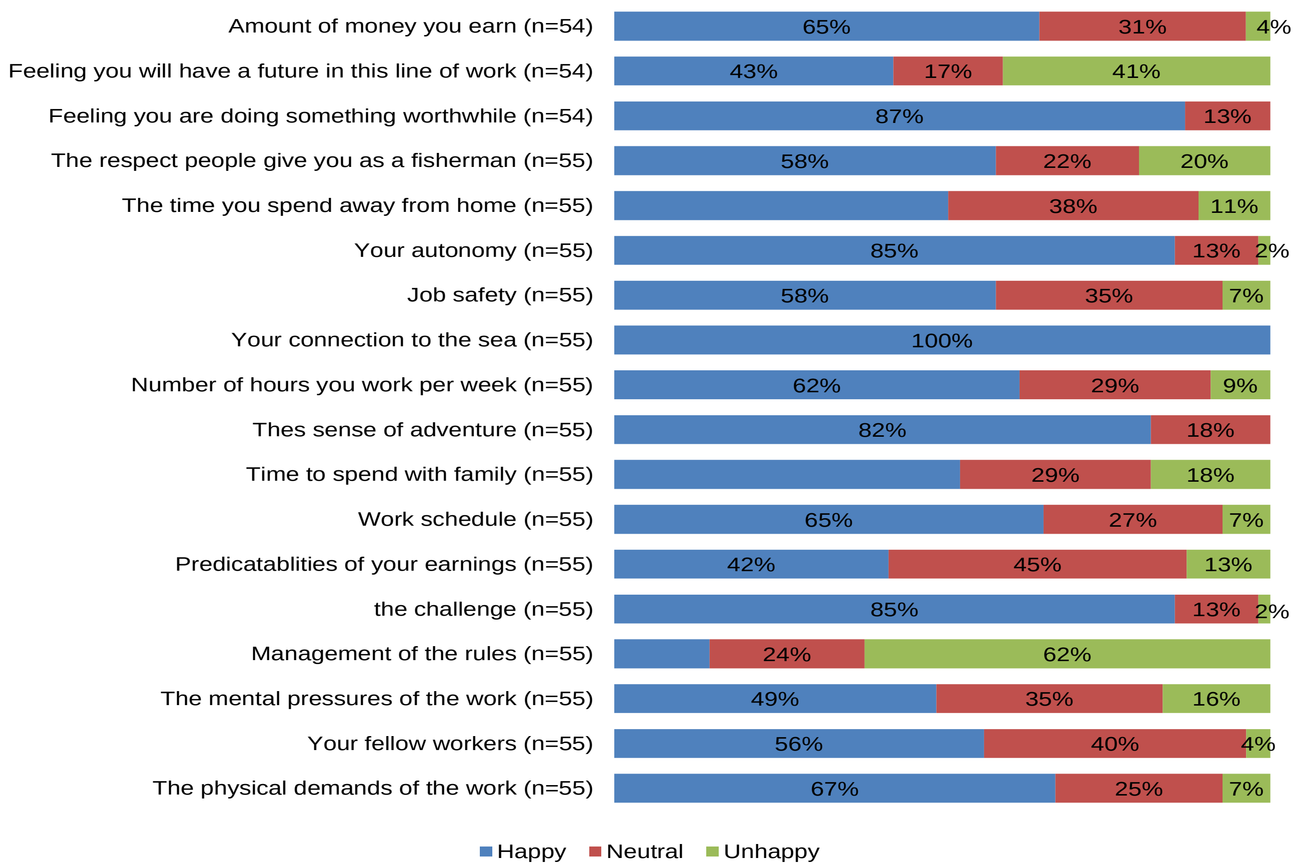
Source: Current study

Figure 31. Percent of respondents indicating level of satisfaction with particular aspects of their work, Coastal pelagics–net



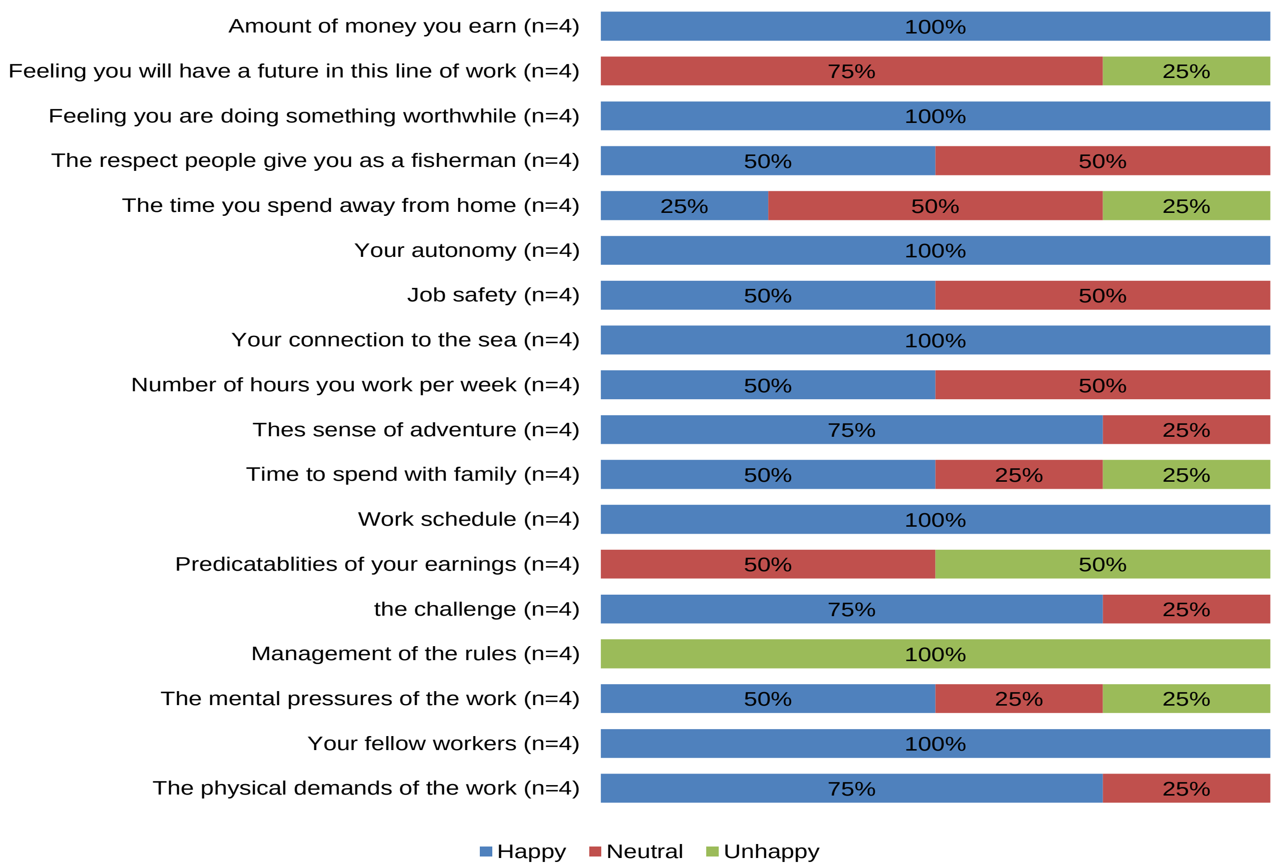
Source: Current study

Figure 32. Percent of respondents indicating level of satisfaction with particular aspects of their work, Lobster–trap



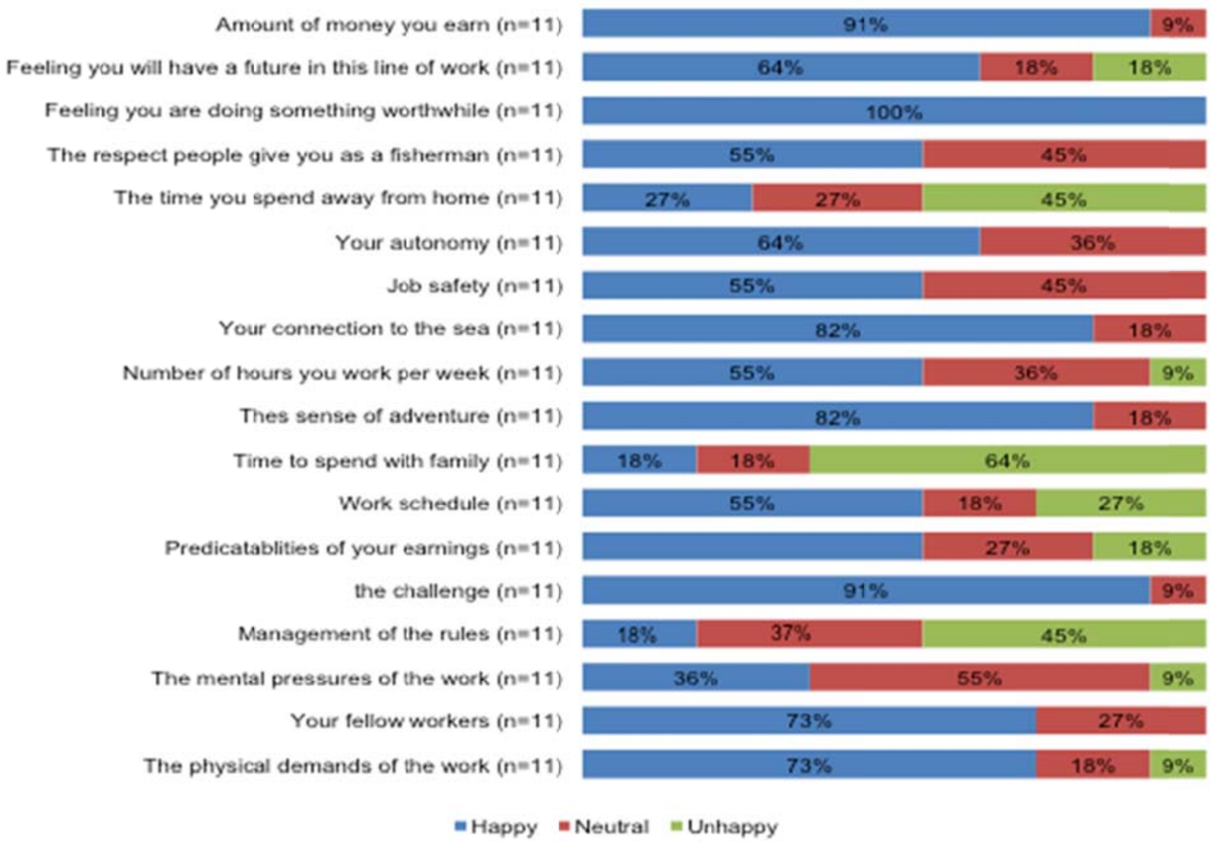
Source: Current study

Figure 33. Percent of respondents indicating level of satisfaction with particular aspects of their work, Market squid–brail



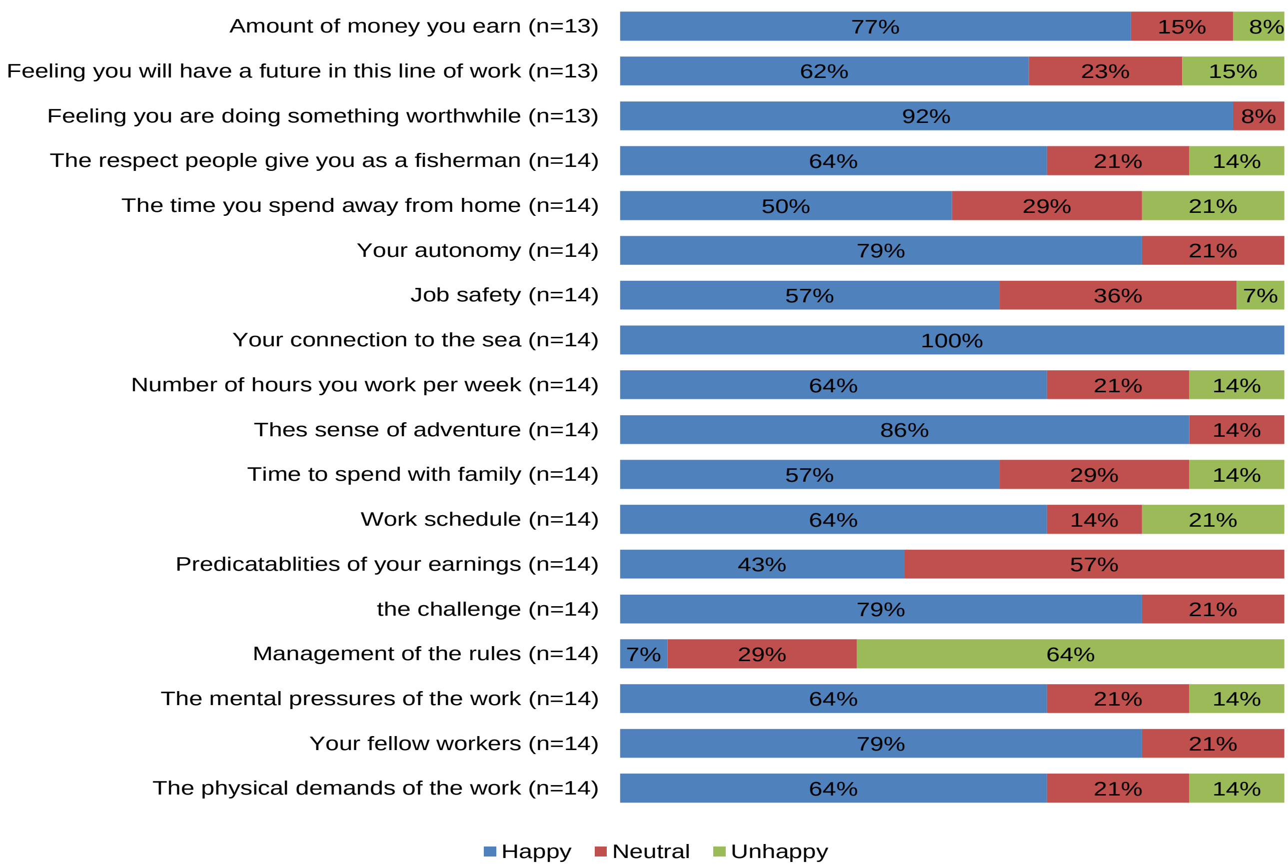
Source: Current study

Figure 34. Percent of respondents indicating level of satisfaction with particular aspects of their work, Market squid–net



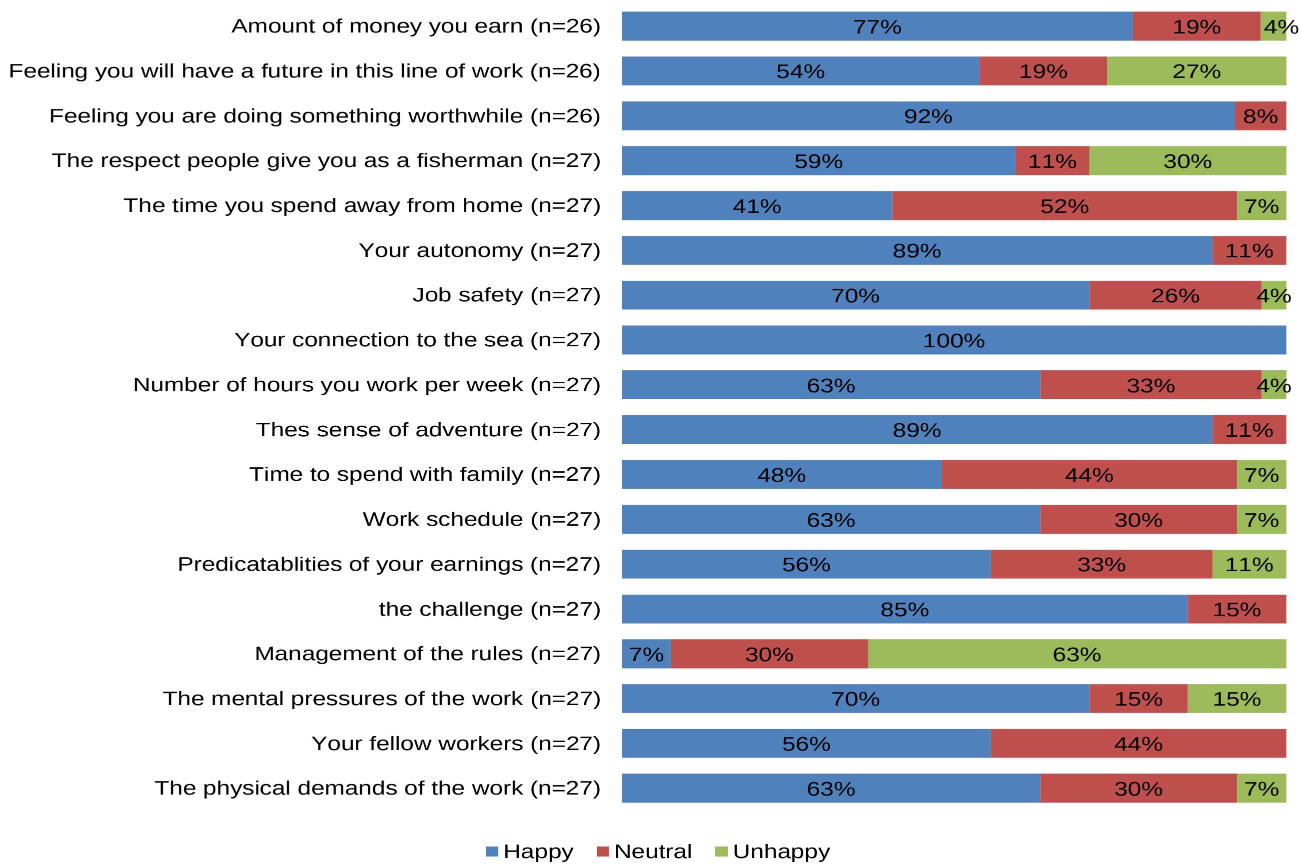
Source: Current study

Figure 35. Percent of respondents indicating level of satisfaction with particular aspects of their work,, Nearshore finfish live–fixed gear



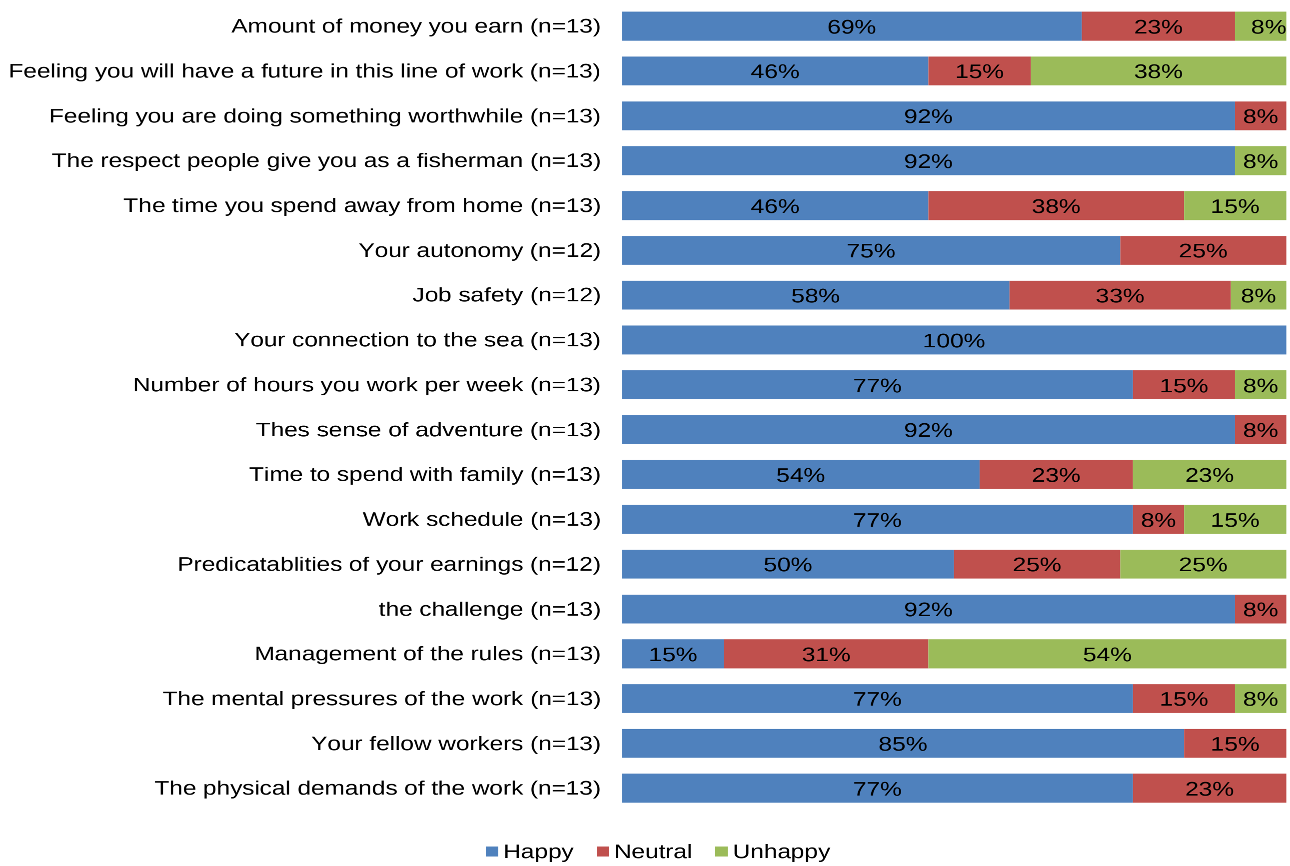
Source: Current study

Figure 36. Percent of respondents indicating level of satisfaction with particular aspects of their work, Rock crab–trap



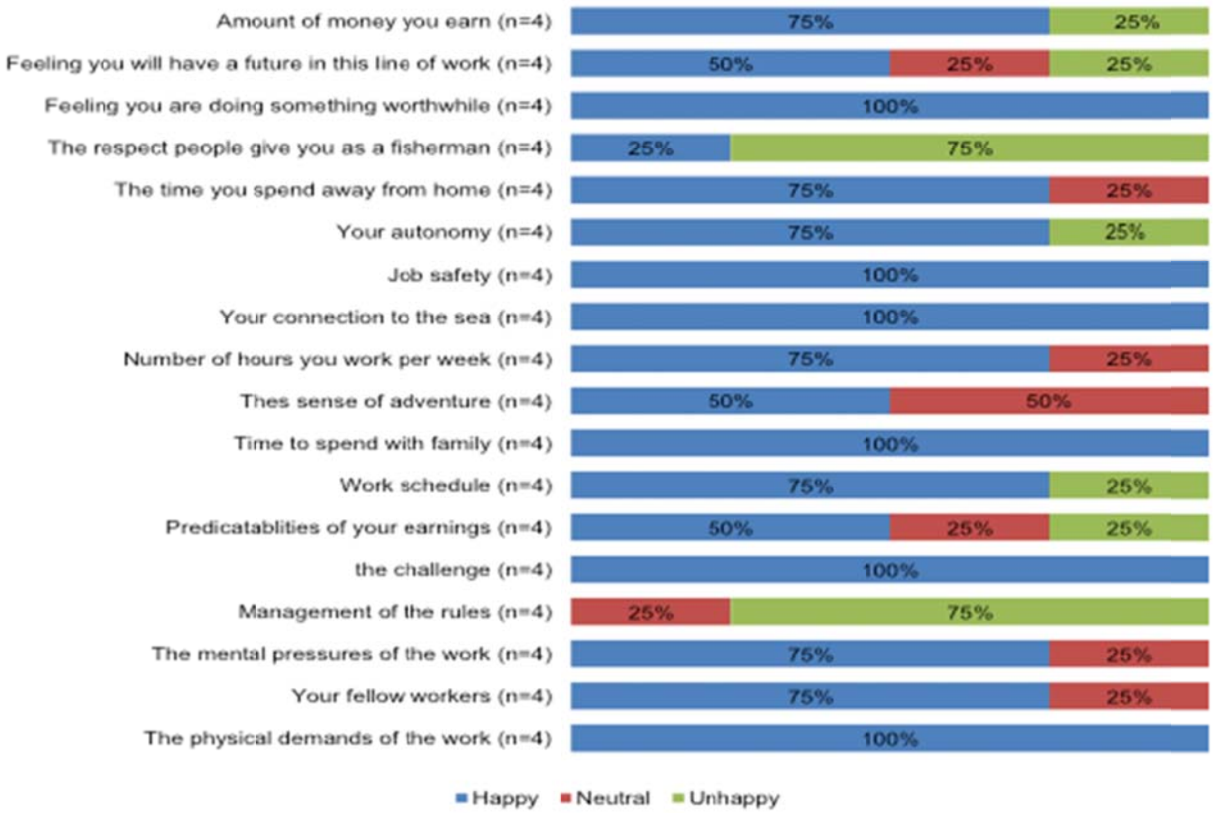
Source: Current study

Figure 37. Percent of respondents indicating level of satisfaction with particular aspects of their work, Sea cucumber–dive



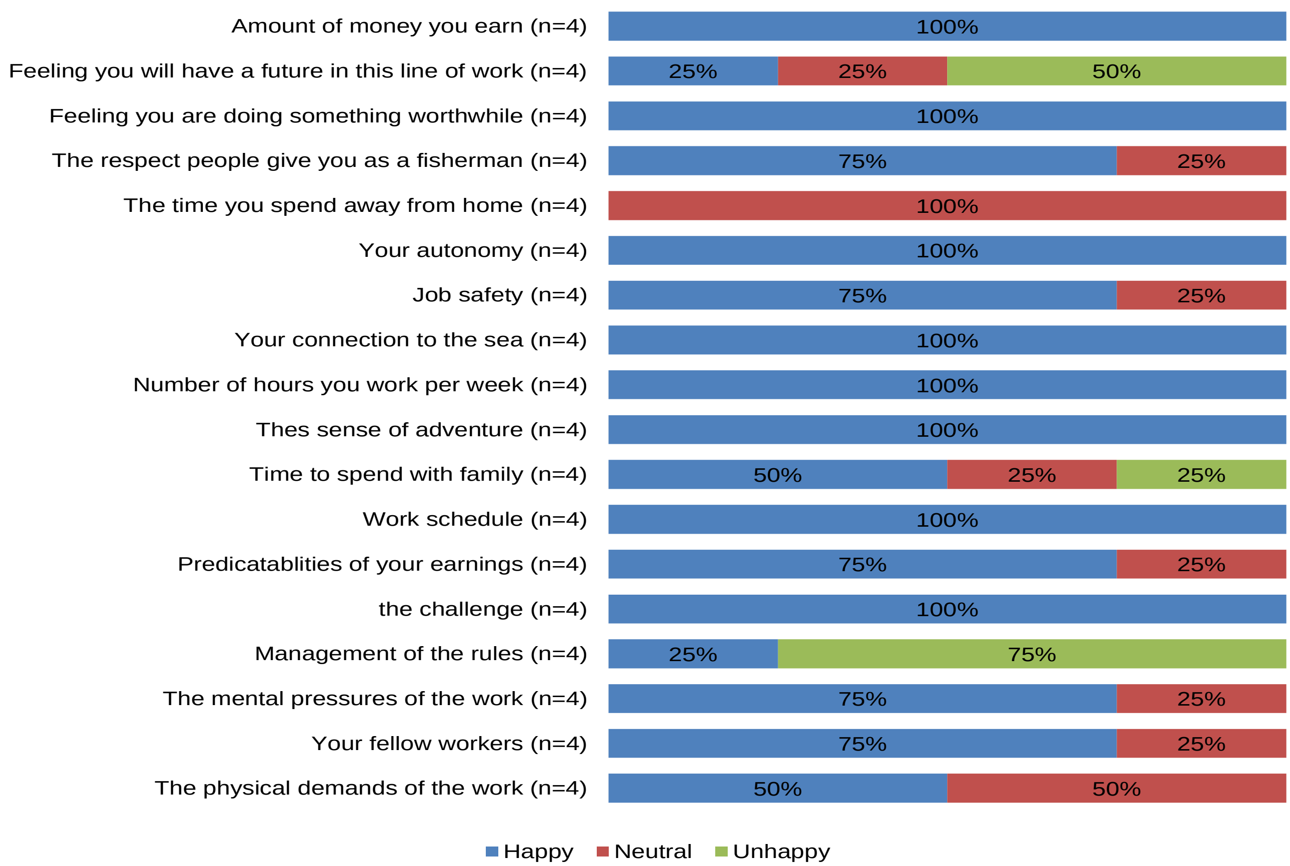
Source: Current study

Figure 38. Percent of respondents indicating level of satisfaction with particular aspects of their work, Sea cucumber–trawl



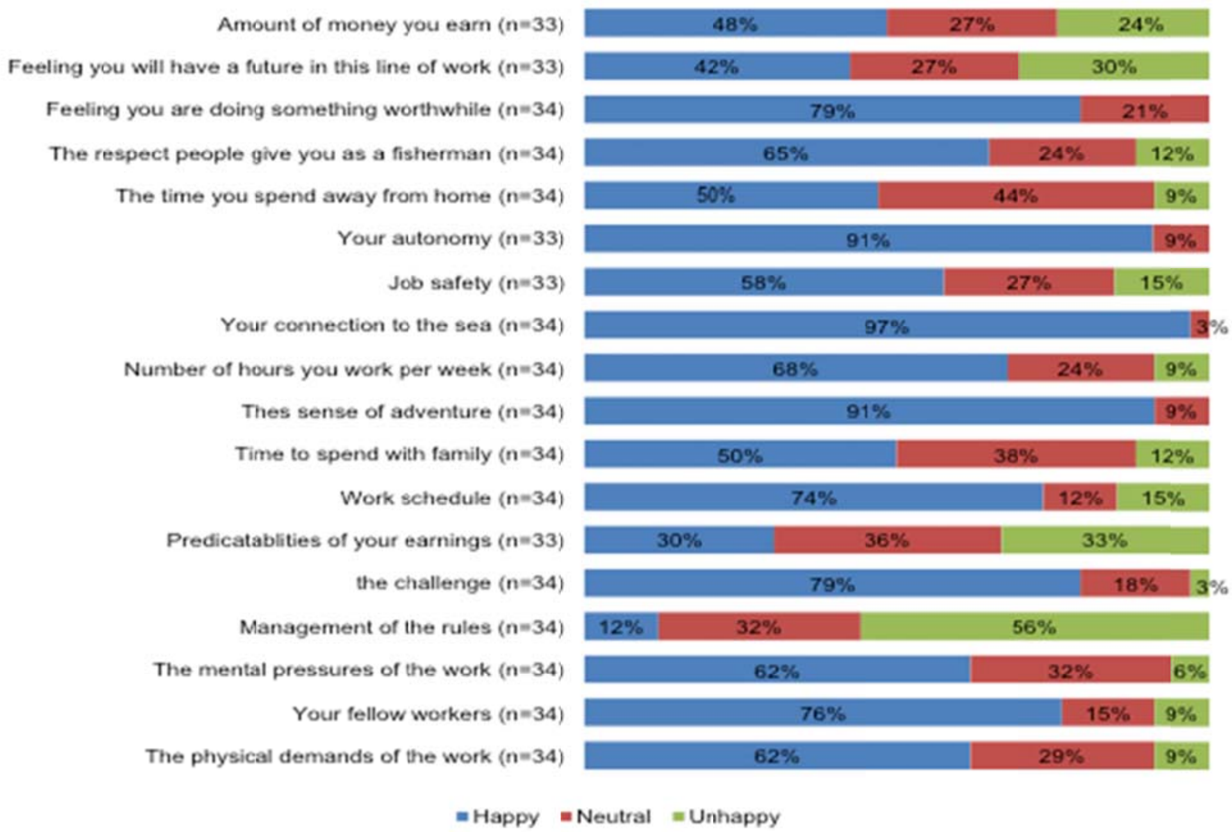
Source: Current study

Figure 39. Percent of respondents indicating level of satisfaction with particular aspects of their work, Spot prawn–trap



Source: Current study

Figure 40. Percent of respondents indicating level of satisfaction with particular aspects of their work, Urchin–dive



Source: Current study

3.5. Regional Commercial Fishery Profiles

3.5.1. California halibut–hook & line: Initial Changes and Baseline Characterization

California halibut (*Paralichthys californicus*) ranges from the Olympic Peninsula in Washington State to Baja, California; however the commercial fishery is primarily centered from Bodega Bay in northern California to San Diego in Southern California (CDFG 2004). The fishery was formally developed in the early 1900s and was targeted primarily by trawl and gill net gear types. At that time hook and line gear made up a fairly small portion of the California halibut landings (Ish 2006, CDFG 2004). Regulations have prohibited trawling for California halibut within state waters except in the designated California halibut trawl grounds, which span from Point Arguello in Santa Barbara County to Point Magu in Ventura County (CDFG 2004). Additionally, in 2006 the Pacific Fishery Management Council prohibited the use of trawl gear in designated Essential Fish Habitat conservation zones (Frey et al. 2012). With limitations placed on other types of gear and the fact that the California halibut fishery remains an open access fishery, the hook and line fishery has increasingly made up a larger percent of statewide landings (CDFG 2004).

Figure 41 displays several trends related to the California halibut–hook & line fishery in the South Coast region of California. Commercial landings remained under 7,000 pounds until 1995, increasing relatively consistently until 2000, after which annual landings remained relatively stable. Average annual landings for the study period were 29,847 pounds; the maximum catch occurred in 2004 at 47,561 pounds. Beginning in 1992 at a low of $22,526, ex-vessel revenue increased over the study period, peaking at $324,775 in 2008, and ending in 2012 at $199,351. The number of fishermen also grew substantially in the first half of the study period, from 47 fishermen in 1992 to up to 127 in 2001. Participation began declining afterwards, though 2012 saw a resurgence in participation, with 110 participating California halibut–hook & line fishermen.

Average ex-vessel revenue per fishermen increased in the California halibut–hook & line fishery over the study period, see Figure 42. In 1994 the average fisherman made $458 in ex-vessel revenue, the lowest average over the study period, to a peak of $3,248 per fisherman in 2008; by 2012 average ex-vessel revenue was at $1,812. On average annually, California halibut–hook & line fishermen in the South Coast region landed 318 pounds of fish per year, with a high occurring in in 2004 where average landings topped 480 pounds. Count of landings per year varied; in 1993, fishermen completed three annual landings on average, increasing to 13 in 2004. By the end of the study period the average fisherman made about six landings over 2012.

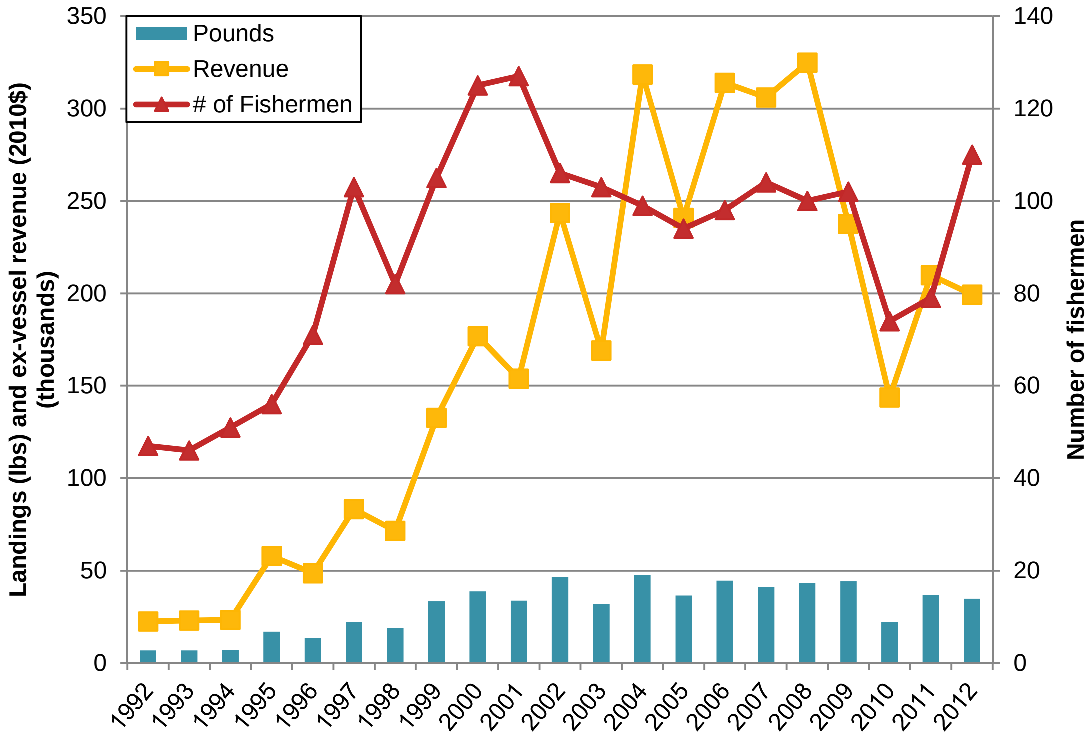
The ex-vessel price per pound of California halibut-hook & line increased over the course of the study period. In 1992 ex-vessel price per pound was at its lowest at $3.30, rose to a peak in 2008 at $7.51, and concluded the study period at $5.74 per pound in 2012, see Figure 43. Over 1992–2012, the value of California halibut–hook & line increased by 73.1 percent and the average price of California halibut-hook & line was $5.09 per pound.

Figure 44 displays ex-vessel revenue for the California halibut–hook & line commercial fishery across South Coast ports over the study period of 1992–2012. The top two contributing ports were San Pedro/Los Angeles and Santa Barbara, constituting annual averages of 42.3 percent and 34.8 percent of total ex-vessel revenue in the study period in the region. From the beginning to the end of the study period the portion of San Pedro/Los Angeles' ex-vessel revenue to total regional ex-vessel revenue fell by 24.3 percent, while that of Ventura grew over time from 5.6 percent in 1992 to as much as 36.1 percent in 2011.

Figure 45 displays the percent change in California halibut–hook & line commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Regionally, the average per fisherman trends followed closely to the aggregate trends, though less so from 2008 on. By 2012, ex-vessel revenue decreased by five percent in the South Coast region, and by 31.8 percent for the average individual fisherman from 2011. These declines were on par with the trends observed in the state California halibut–hook and line fishery, but for the majority of the study period, trends between the region and state weren't very similar.

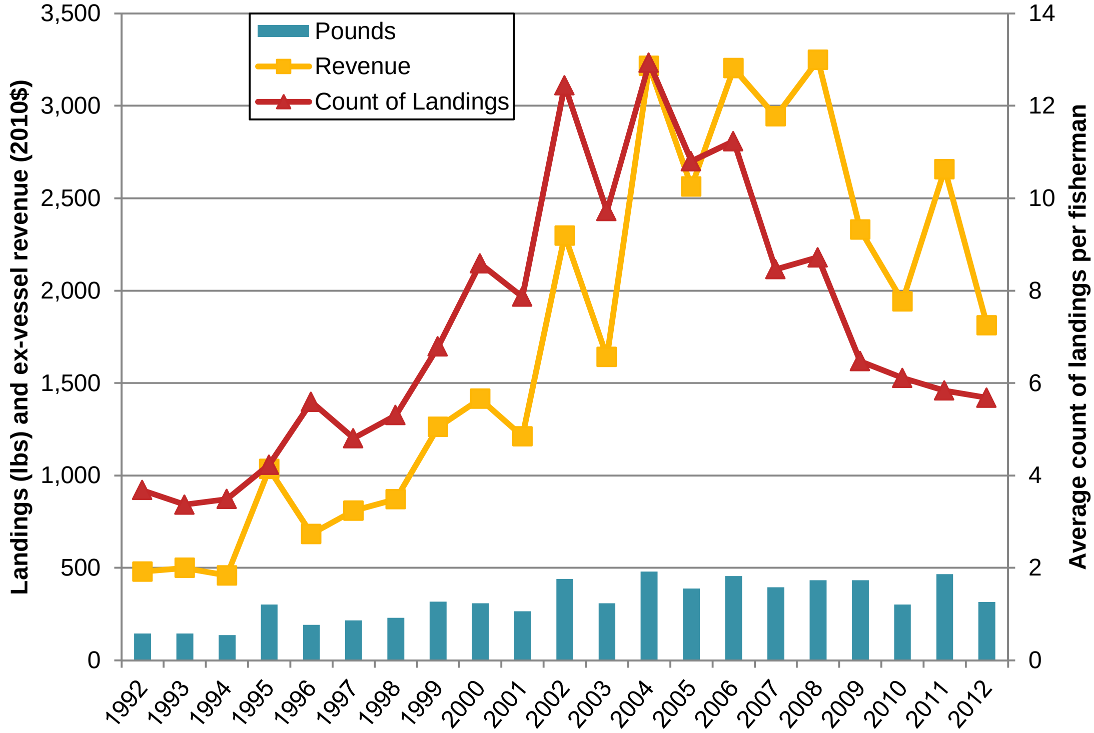
For example, between 2003 and 2004, state ex-vessel revenue declined only slightly, by 2.7 percent, while regional ex-vessel revenue increased by 88.3 percent. At the same time, state fishermen in this fishery saw an increase in their average ex-vessel revenue of only 11 percent, while South Coast fishermen's ex-vessel revenue increased 95.9 percent on average. Despite the variation between state and region, overall changes in average ex-vessel revenue per fisherman from 2000 to 2012 decreased by similar percentages: 21.1 percent in the region and 24.2 percent throughout the state.

Figure 41. California halibut–hook & line commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



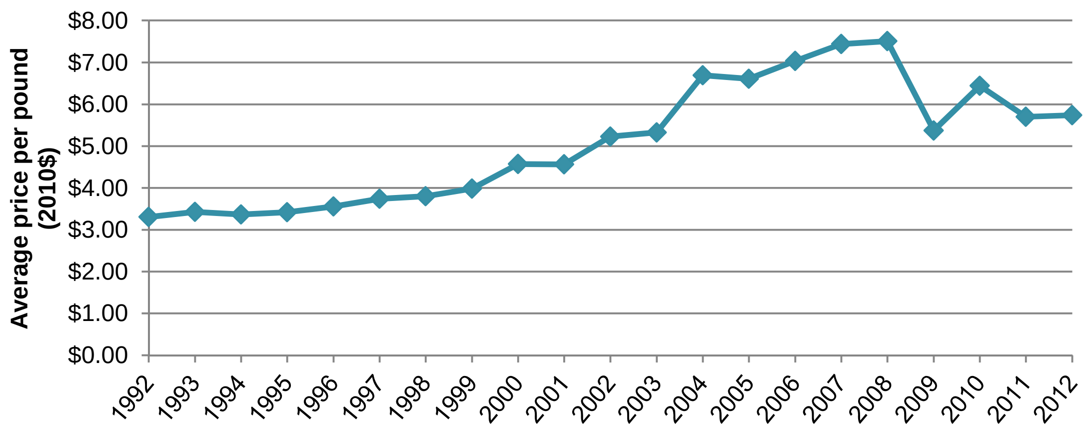
Source: Current study, based off landings data from CDFW.

Figure 42. California halibut–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



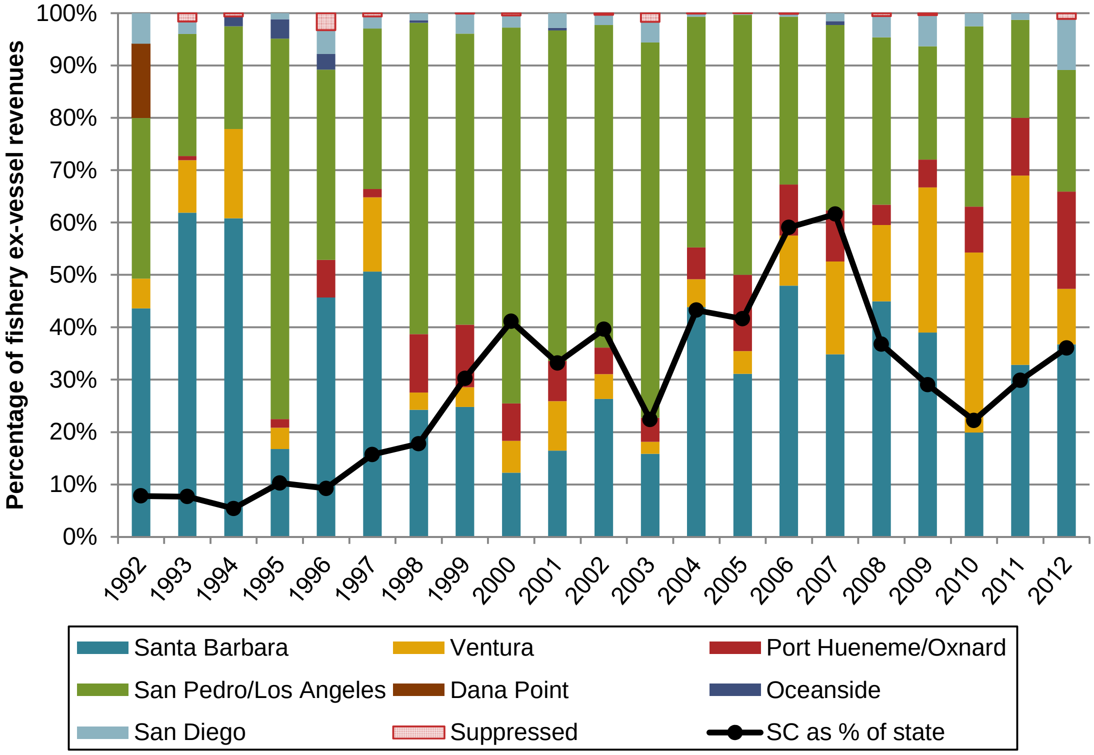
Source: Current study, based off landings data from CDFW.

Figure 43. California halibut–hook & line commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



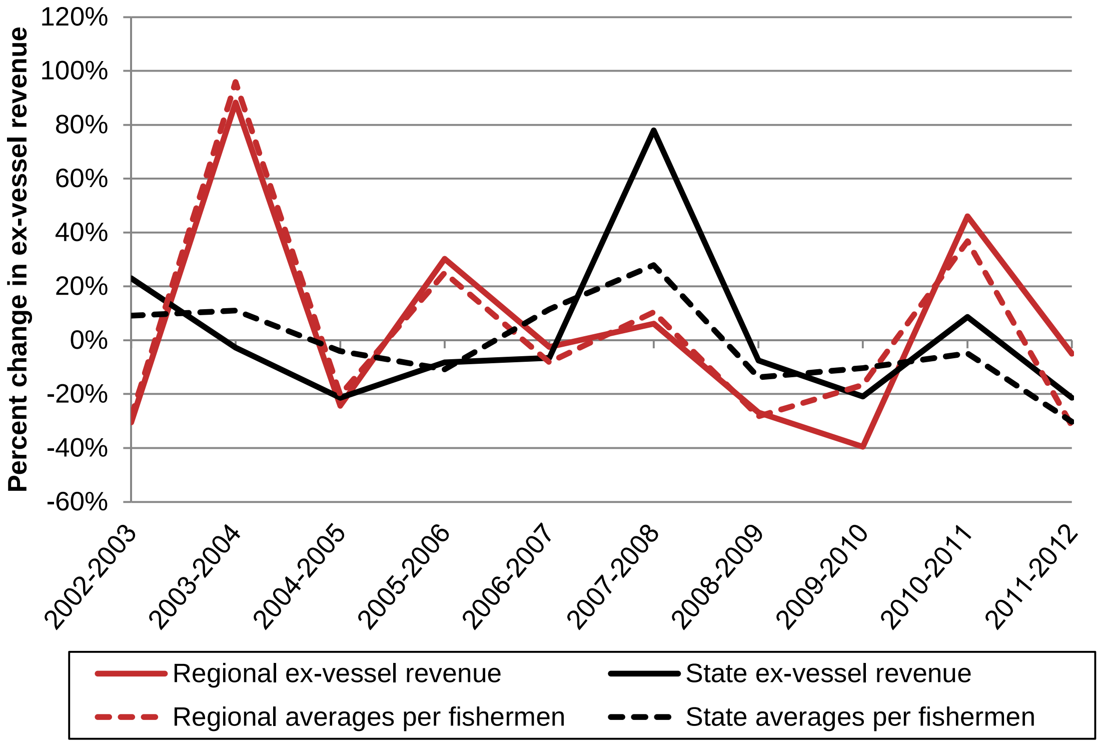
Source: Current study, based off landings data from CDFW.

Figure 44. California halibut–hook & line commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 45. California halibut–hook & line: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 110 individuals made landings in the California halibut—hook and line fishery. Combined, they generated $199,351 in ex-vessel revenue, which is 0.2 percent of the $80.8 million generated by the target interview fisheries over the entire study region. The majority of the California halibut—hook & line fishery landings came from Santa Barbara (36.7 percent), while most fishermen made landings in Dana Point (39 individuals). We interviewed 4 fishermen in the California halibut—hook & line fishery (Table 219).

Table 47. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, California halibut–hook & line

Port	2012 Landings revenue (2010$)	Total number of individuals in 2012 landings revenue	Number of individuals interviewed
Santa Barbara	$73,213	31	2
Ventura	$21,161	11	—
Port Hueneme/Oxnard	$37,020	16	—
San Pedro/Los Angeles	$46,246	39	1
Dana Point	*	1	—
Oceanside	*	3	—
San Diego	$19,539	20	1
Unique individuals	$199,351	110	4

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The California halibut–hook & line fishermen we interviewed on average were slightly younger and had less years of experience than the average fisherman throughout the South Coast study region. As shown in Table 48, the four California halibut—hook and line fishermen we interviewed had an average age of 50 years, and 24.5 years of experience.

Table 48. Average age and years of experience commercial fishing in 2012, California halibut–hook & line

	Age			Years of experience		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	2	*	*	2	*	*
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	1	*	*
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	1	*	*	1	*	*
All ports (unique individuals)	4	50.0	3.6	4	24.5	6.8

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

On average, across the region California halibut–hook & line fishermen saw an increase of 12.8 percent in their personal income that came from commercial fishing (Table 49). Despite this increase, four respondents indicated that they perceived no change in the amount of income from commercial fishing (Table 50).

California halibut–hook & line fishermen provided explanations as to why they felt their percent of total income from commercial fishing had changed, but these data cannot be shown due to confidentiality constraints. Again, it is important to note that this question was not asked in regards to California halibut–hook & line specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from a study conducted by Point 97/Ecotrust during to inform the MPA planning process.

Table 49. Percent change in income from overall commercial fishing from 2008 - 2012, California halibut–hook & line

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	6	84.7%	26.2%	2	*	*	*
Ventura	1	*	*	—	—	—	—
Port Hueneme/Oxnard	1	*	*	—	—	—	—
San Pedro/Los Angeles	—	—	—	1	*	*	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	1	*	*	1	*	*	*
All ports (unique individuals)	9	88.7%	21.8%	4	100.0%	—	12.8%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 50. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, California halibut–hook & line

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	2	—	—	*	—	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	1	—	—	*	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	1	—	—	*	—	—
All Ports (unique individuals)	4	—	—	100.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 51, California halibut–hook & line fishermen on average, experienced a 19.2 percent decrease in average gross economic revenue going toward operating costs from 2008 to 2012, which is a larger percent decrease that the entire region. Despite this decrease, most respondents indicated that they perceived expenses were significantly higher in 2012 relative to 2008 (Table 52), and the most common reason cited was the increase in fuel prices (Table 53).

Table 51. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, California halibut–hook & line

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	6	40.0%	12.6%	2	*	*	*
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	*	*	—	—	—	—
San Pedro/Los Angeles	—	—	—	1	*	*	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	1	*	*	1	*	*	*
All ports (unique individuals)	8	42.5%	11.6%	4	34.3%	5.1%	-19.2%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 52. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, California halibut–hook & line

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	2	*	*	*	*	*
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	*	*	*
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	1	*	*	*	*	*
All Ports (unique individuals)	4	75.0%	—	25.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 53. Cause of change in percent income going towards overall operating costs from 2008 – 2012, California halibut–hook & line

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	3	3	—	—	2	1	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

Shown below in Table 54, data were collected regarding the number of years of experience and days in 2012 targeting the California halibut—hook and line fishery, but cannot be shown due to confidentiality constraints.

Table 54. Years of experience and number of days targeting specific fisheries in 2012, California halibut–hook & line

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	2	*	*	2	*	*
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	1	*	*
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	1	*	*	1	*	*

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

All respondents were asked to compare his/her success in the California halibut—hook & line fishery in 2012 to the previous ten years. As shown in Table 55 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: regulatory, environmental, economic, and other factors.

Two out of the three California halibut–hook & line respondents indicated that their overall success was the same in 2012 relative to the preceding 10 years. None of the factors are shown here because of confidentiality constraints or the lack of data.

Table 55. Overall success in specific commercial fishery, 2012 compared to previous ten years, California halibut–hook & line

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	2	*	*	*	*	*	*
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	*	*	*	*
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	3	—	—	—	67%	—	33%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

3.5.2. California halibut–trawl: Initial Changes and Baseline Characterization

California halibut (*Paralichthys californicus*) ranges from the Olympic Peninsula in Washington State to Baja, California; however the commercial fishery is primarily centered from Bodega Bay in northern California to San Diego in Southern California (CDFG 2004). The fishery was formally developed in the early 1900s and was targeted primarily by trawl and gill net gear types. At that time hook and line gear made up a fairly small portion of the California halibut landings (Ish 2006, CDFG 2004). Regulations have prohibited trawling for California halibut within state waters except in the designated California halibut trawl grounds which span from Point Arguello in Santa Barbara County to Point Magu in Ventura County (CDFG 2004). Additionally, in 2006 the Pacific Fishery Management Council prohibited the use of trawl gear in designated Essential Fish Habitat conservation zones (Frey et al. 2012). With limitations placed on other types of gear and the fact that the California halibut fishery remains an open access fishery, the hook and line fishery has increasingly made up a larger percent of statewide landings (CDFG 2004).

Over the study period, the California halibut–trawl fishery produced an average of 98,485 pounds for $456,173 in ex-vessel revenue with 47 participating fishermen, see Figure 46. Variation was standard; ex-vessel revenue as at its lowest near the beginning of the study period in 1993 $95,991, and at its highest by 2002 at $836,680. The number of participating fishermen in the California halibut–trawl fishery decreased over 1992–2012, from a high of 87 ion 1999 to a low in 2011 of 21 fishermen.

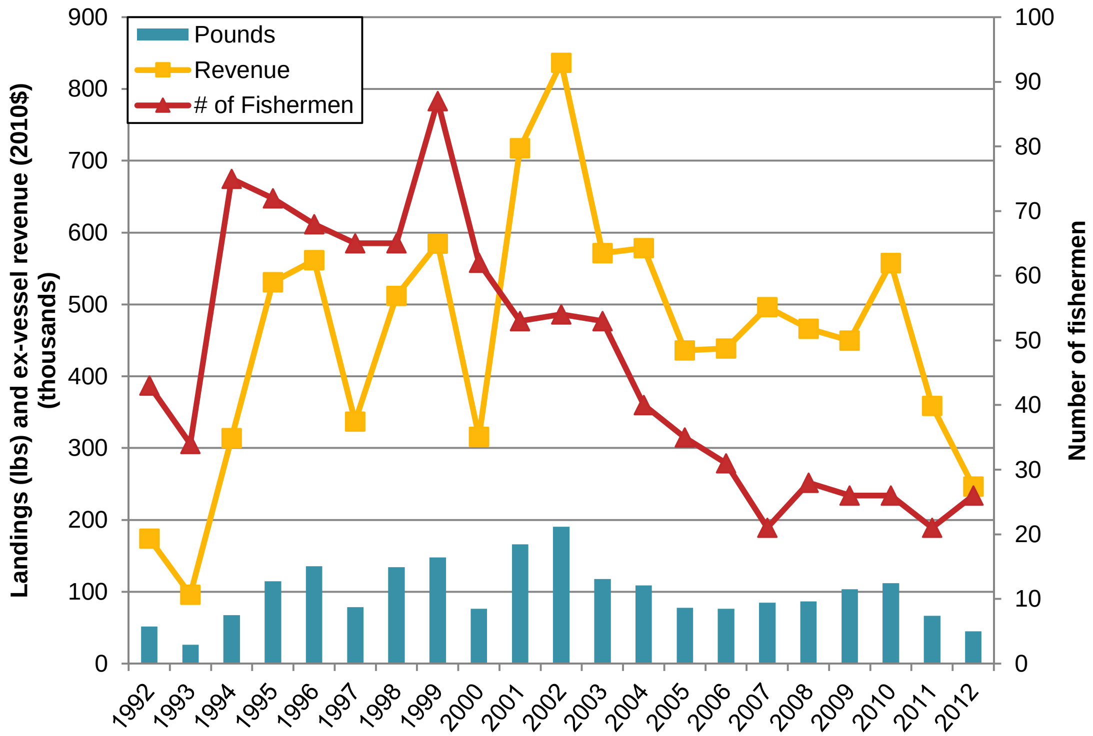
During this study, a California halibut–trawl fisherman in this region landed an average of 2,346 pounds for $11,335 in ex-vessel revenue annually, see Figure 47. Overall, the California halibut–trawl fishery grew in ex-vessel revenue per fisherman in the South Coast region. In 1993, annual ex-vessel revenue grew from a minimum average of $2,823 per fisherman in to $23,628 per fisherman at most by 2007. Average declined again by 2012, the average California halibut–trawl fisherman landed 20 times over the year, for a total of 1,725 pounds at $9,477 in ex-vessel revenue. The large gains at the individual level were likely due to the overall decreasing number of fishermen over the study period.

Figure 48 shows that the ex-vessel price per pound of California halibut-trawl has grown over 1992–2012. The lowest average price during the study period per pound of product was $3.37 in 1992 and rose to a high of $5.85 in 2007. From the first to last year of the study period, the average price of California halibut-trawl increased by 63.2 percent and was $4.68 per pound in 2012.

Figure 49 displays ex-vessel revenue for the California halibut–trawl commercial fishery across South Coast ports over the study period of 1992–2012. Like the hook & line fishery, the ports of Santa Barbara and San Pedro/Los Angeles contributed the largest portions of ex-vessel revenue for the California halibut–trawl in the region. However, while one increased, the other decreased; with Santa Barbara being the top contributor for six consecutive years over 2005–2010. In 2011 and 2012, the port of Ventura represented the largest portion of ex-vessel revenue among other South Coast ports, at 32.8 and 31.4 percent respectively. Ventura contributed even more, however, in 1992 when ex-vessel revenue of $129,421 represented 74.4 percent of regional totals.

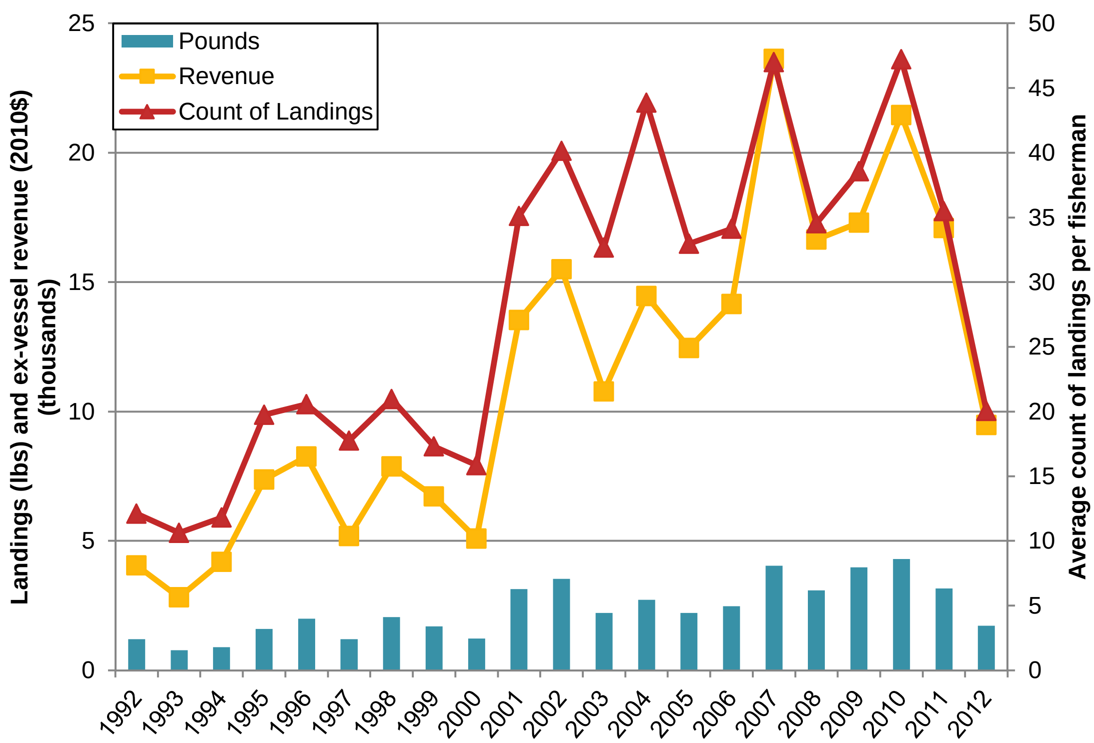
Figure 50 displays the percent change in California halibut–trawl commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Regional trends roughly followed state trends from 2002–2006, although faring slightly worse (greater declines, smaller increases). In 2007, however, regional ex-vessel revenue in the California halibut–trawl fishery increased by 13 percent while state ex-vessel revenue in this fishery fell by 5034 percent. On the individual level, regional fishermen saw their ex-vessel revenue increase by 66.9 percent on average from 2006 to 2007 while average per fishermen ex-vessel revenue through the state declined by 23 percent. This anomaly was short lived, however, and state trends exceeded regional trends again from 2008 onwards; with the exception of 2010.

Figure 46. California halibut–trawl commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



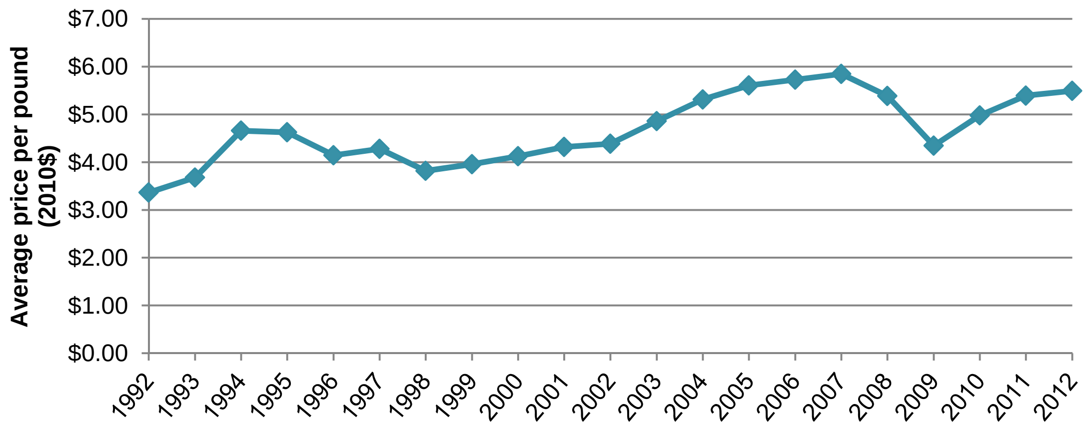
Source: Current study, based off landings data from CDFW.

Figure 47. California halibut–trawl: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



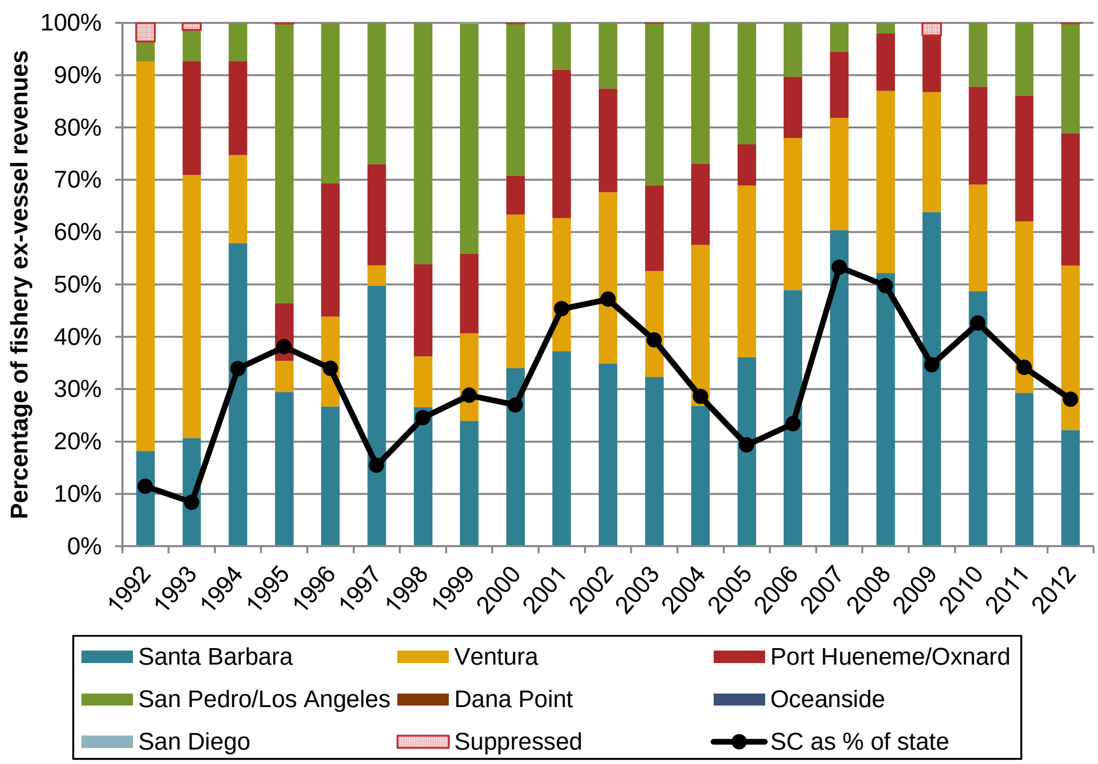
Source: Current study, based off landings data from CDFW.

Figure 48. California halibut–trawl commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



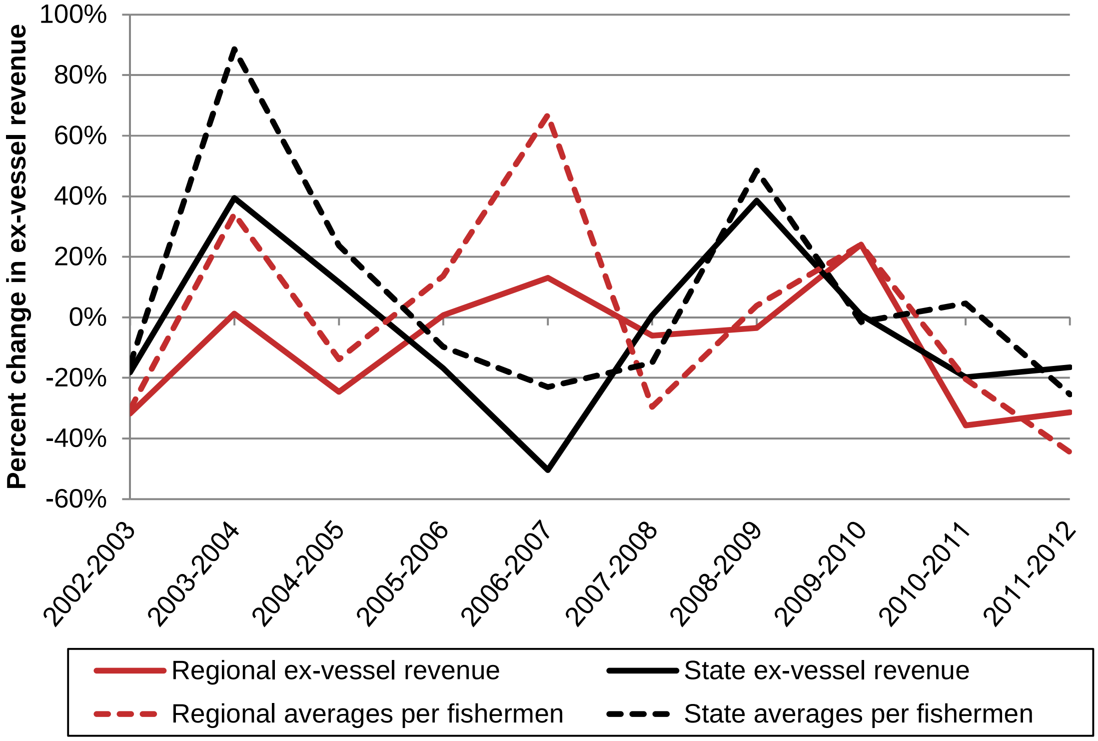
Source: Current study, based off landings data from CDFW.

Figure 49. California halibut–trawl commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 50. California halibut–trawl: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 26 individuals made landings in the California halibut—trawl fishery. Combined, they generated $246,412 in ex-vessel revenue, which is 0.3 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the California halibut—trawl fishery landings came from Ventura (31.4 percent), however, most fishermen in the fishery made landings in Santa Barbara (11 individuals). We interviewed 5 fishermen in the California halibut—trawl fishery, and all were from Santa Barbara (Table 56).

Table 56. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, California halibut–trawl

Port	2012 Landings revenue (2010$)	Total number of individuals in 2012 landings revenue	Number of individuals interviewed
Santa Barbara	$54,647	11	5
Ventura	$77,487	6	—
Port Hueneme/Oxnard	$62,280	6	—
San Pedro/Los Angeles	*	9	—
Dana Point	—	—	—
Oceanside	*	1	—
San Diego	—	—	—
Unique individuals	$246,412	26	5

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The California halibut–trawl fishermen we interviewed on average were older and had more years of experience than the average fisherman throughout the South Coast study region. As shown in Table 57, the five California halibut—trawl fishermen had an average age of 62.4 years, and 44 years of experience.

Table 57. Average age and years of experience commercial fishing in 2012, California halibut–trawl

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	5	62.4	11.8	5	44.0	12.9
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All ports (unique individuals)	5	62.4	11.8	5	44.0	12.9

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Due to confidentiality constraints, data is not shown (Table 58) regarding the percent change in income from commercial fishing from 2008 to 2012, but 60 percent indicated they perceived no change while 40 percent reported a significantly lower amount of income from fishing (Table 59). The most common reason cited for perceived decreases in income were less revenue from fishing, followed by decrease in fish abundance and changes in regulations (Table 60). Again, it is important to note that this question was not asked in regards to California halibut–trawl specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 58. Percent change in income from overall commercial fishing from 2008 - 2012, California halibut–trawl

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	2	*	*	5	96.0%	8.9%	*
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	2	*	*	5	96.0%	8.9%	*

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 59 Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, California halibut–trawl

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	5	—	—	60.0%	—	40.0%
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All Ports (unique individuals)	5	—	—	60.0%	—	40.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 60. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, California halibut–trawl

Fishery	Number responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Santa Barbara	2	—	—	—	—	—	—	—	—	1	—	—	—	2	1
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	2	—	—	—	—	—	—	—	—	1	—	—	—	2	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

As shown in Table 61, the percent change in gross economic revenue used on operating costs in the California halibut–trawl fishery are not shown due to confidentiality constraints for the data collected in 2008. However, all respondents indicated that they perceived somewhat higher (40 percent) or significantly higher (60 percent) percent of gross economic revenue going toward expenses in 2012 relative to 2008 (Table 62), and the most common reason cited was the increase in fuel prices (Table 63).

Table 61 Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, California halibut–trawl

	2008^			2012			
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
Santa Barbara	2	*	*	5	56.0%	35.2%	*
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	2	*	*	5	56.0%	35.2%	*

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 62 Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, California halibut–trawl

		Percent response				
Ports	Number responding	Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
Santa Barbara	5	60.0%	40.0%	—	—	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All Ports (unique individuals)	5	60.0%	40.0%	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 63. Cause of change in percent income going towards overall operating costs from 2008 – 2012, California halibut–trawl

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	5	4	—	1	3	—	—	2	1	—	1	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	5	4	—	1	3	—	—	2	1	—	1	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 64, fishermen had on average 29.8 Years of experience and 36.2 days in 2012 targeting the California halibut—trawl fishery. Both of these numbers are higher for the Santa Barbara respondents than in the South Coast study region as a whole. Crew is not always used in the California halibut–trawl fishery, but Santa Barbara fishermen participating in the California halibut—trawl fishery had, on average, 0.6 crew members and they received 12 percent of the gross economic revenue (Table 65).

Table 64. Years of experience and number of days targeting specific fisheries in 2012, California halibut–trawl

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	5	29.8	8.0	5	36.2	38.2
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 65. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, California halibut–trawl

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	5	0.6	0.5	5	12.0%	11.0%	5	20.0%	7.4%
Ventura	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

All respondents were asked to compare his/her success in the California halibut—trawl fishery in 2012 to the previous ten years. As shown in Table 66 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 67), economic (Table 68), regulatory (Table 69), and other factors (Table 70).

Respondents for the California halibut–trawl fishery indicated that their overall success was somewhat worse (20 percent) or significantly worse (80 percent) in 2012 relative to the preceding 10 years. Among the factors negatively influencing fishermen's success over the past 10 years were the availability of farmed fish and MPAs or other closures.

Table 66. Overall success in specific commercial fishery, 2012 compared to previous ten years, California halibut–trawl

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	5	—	—	—	—	20.0%	80.0%
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	5	—	—	—	—	20%	80%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 67. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, California halibut–trawl

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	1	—	—	—	—	—	1	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	1	—	—	—	—	—	1	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 68. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, California halibut–trawl

Ports	Number responding	Positive			Negative			
		A	B	C	D	E	F	G
Santa Barbara	1	—	—	—	—	1	—	—
Ventura	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—
All ports (unique individuals)	1	—	—	—	—	1	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 69. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, California halibut–trawl

		Negative					
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
Santa Barbara	1	—	—	1	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	1	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 70. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, California halibut–trawl

		Positive						Negative						
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Santa Barbara	2	—	—	—	—	—	—	—	—	—	—	—	2	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	2	—	—	—	—	—	—	—	—	—	—	—	2	—

Source: Current study
— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

3.5.3. Coastal pelagics–net: Initial Changes and Baseline Characterization

The coastal pelagic species fishery often referred to as wetfish because of the traditional way they were packaged "wet" or raw in cans, include the species Pacific sardine (*Sardinops sagax*), Pacific mackerel (*Scomber japonicus*), jack mackerel (*Trachurus symmetricus*), and northern anchovy (*Engraulis mordax*). Together these species make up one of the largest fisheries in California, both in terms of pounds landed and ex-vessel revenue (Leet et al. 2001). The California coastal pelagic species–seine/net fishery is centered in three geographical regions; the Monterey/Moss Landing area in the Central Coast and the Ventura/Port Hueneme and San Pedro/Terminal Island regions in the South Coast. At these ports receivers and processors are set up to offload catch via a pump system. The majority of the catch is then frozen and sold overseas (Pomeroy et al. 2002). The coastal pelagic species–seine/net fishery is highly variable; often operating in a 'boom or bust' fashion (Leet et al. 2001) and species composition and abundance of catch often changes with water temperatures and El Niño patterns (Pomeroy et al. 2002).

Figure 51 displays that the coastal pelagics–net fishery is a large fishery in terms of pounds landed, peaking at 154.3 million pounds in 2000. The fishery experienced both growth and decline during the study period with annual landings decreasing to 49.6 million pounds by 2012, a quantity similar to those observed at the beginning of the study period. Ex-vessel revenue for the coastal pelagics–net fishery in the South Coast region also peaked in 2000, at $10.2 million, declining again to $4.1 million by 2012. The number of fishermen participating in the fishery peaked at 128 in 1996 and then declined steadily thereafter (to 44 commercial fishermen by 2012). In review meetings, fishermen expressed the 1996 peak in number of fishermen was likely due to a fear of potential regulatory changes in the coastal pelagic fishery. In 1997 an amendment was made to the coastal pelagics fishery management plan, making the coastal pelagics fishery limited entry and allowing only those who landed a minimum of 100 metric tons during the 1993–1997 timeframe to obtain permits.[3] Fishermen also expressed that because most CPS fishermen are dual permit holders, the subsequent decreases in participating fishermen in recent years and pounds landed was due to the increase in the abundance of squid.

Figure 52 displays that during the study period; each coastal pelagic–net fisherman landed 1.9 million pounds for $75,413 in ex-vessel revenue on average, making a total of 24 landings throughout the year to do so. Landings per fishermen peaked in 2000 at 2.1 million pounds, and generally decreased since. Ex-vessel revenue per fishermen varied slightly, but was only 1.4 percent less for the average fisherman in 2012 compared to 1992.

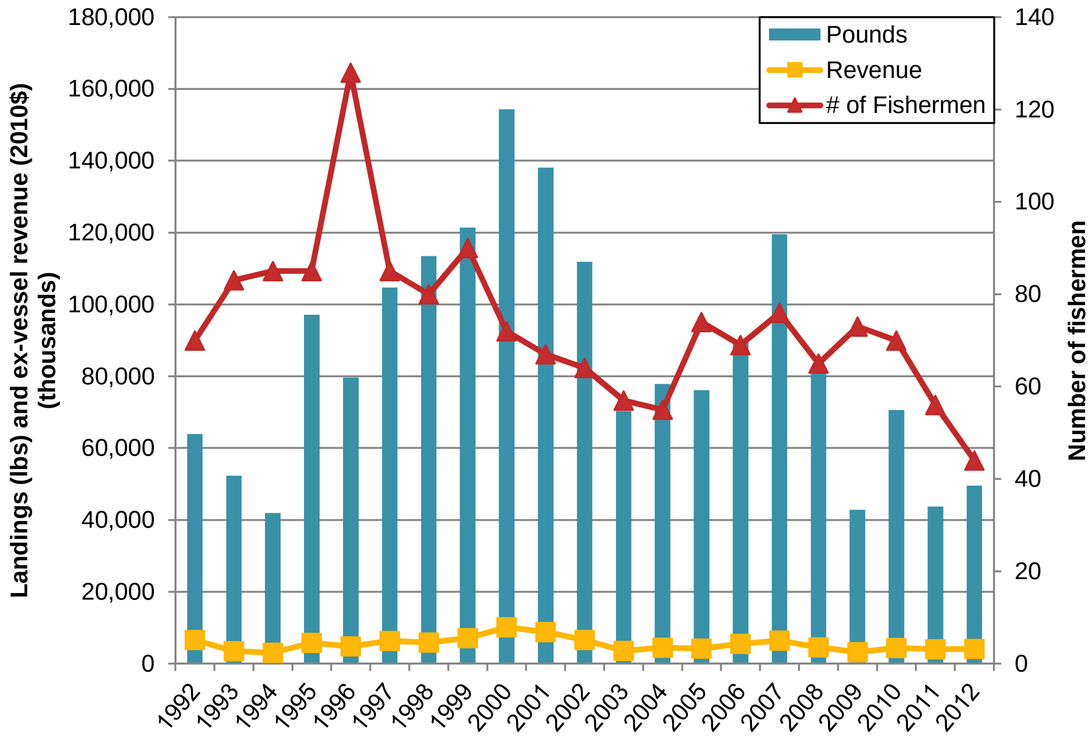
Figure 53 displays the average price per pound observed over 1992–2012 for the coastal pelagics–net commercial fishery, which varied little overall. The highest price during the study period was $0.10 per pound in 1992, the lowest value was $0.05 towards the middle of the study period; in 2012 the average price per pound was $0.08.

Figure 54 displays ex-vessel revenue for the coastal pelagics–net commercial fishery across South Coast ports over the study period of 1992–2012. There is significantly less diversity among participating regional ports as San Pedro/Los Angeles represented approximately 90.3 percent of total ex-vessel revenue annually. Port Hueneme/Oxnard was the second largest contributor, with an average annual portion of 8.3 percent over the study period.

Figure 55 displays the percent change in coastal pelagics–net commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Regional trends largely followed state trends from 2002–2009, performing only slightly poorer. Over 2009–2010, however, while the state fishery continued to decline by about 25 percent both overall and at the individual fisherman level, regional ex-vessel revenue increased by 35.8 percent total and 41.6 percent per average fisherman.

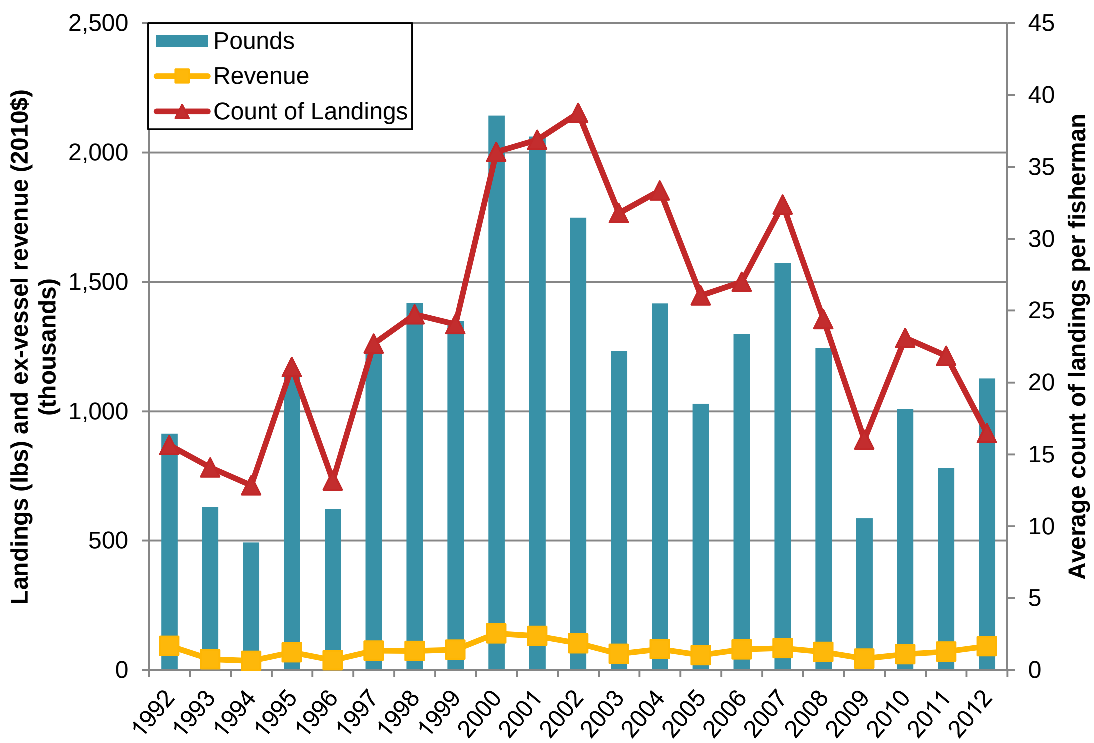
[3] http://www.pcouncil.org/coastal-pelagic-species/fishery-management-plan-and-amendments/

Figure 51. Coastal pelagics–net commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



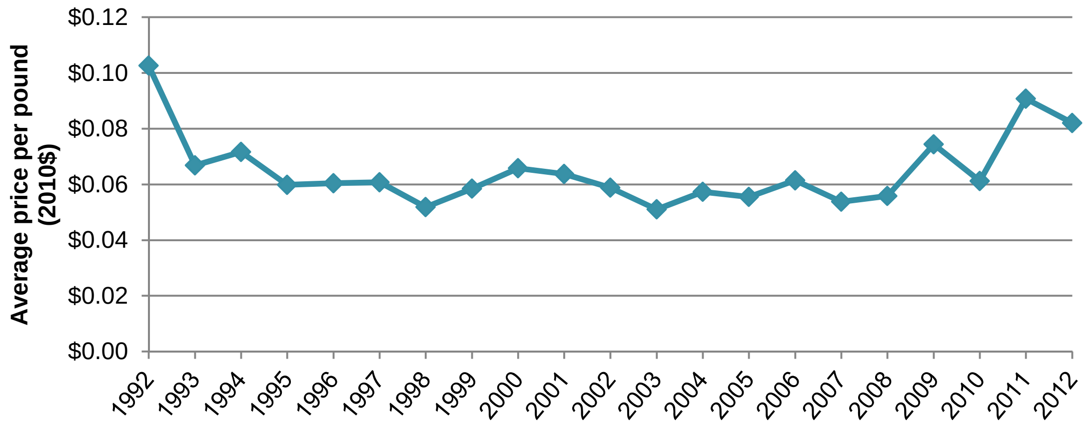
Source: Current study, based off landings data from CDFW.

Figure 52. Coastal pelagics–net: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



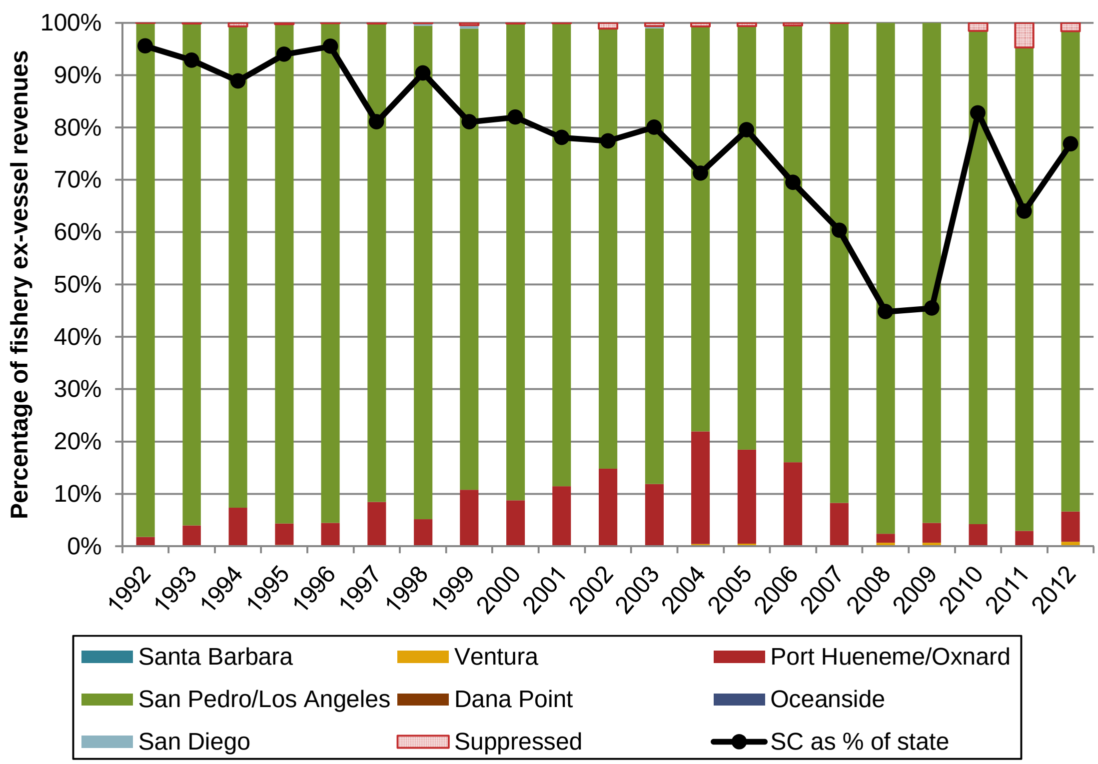
Source: Current study, based off landings data from CDFW.

Figure 53. Coastal pelagics–net commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



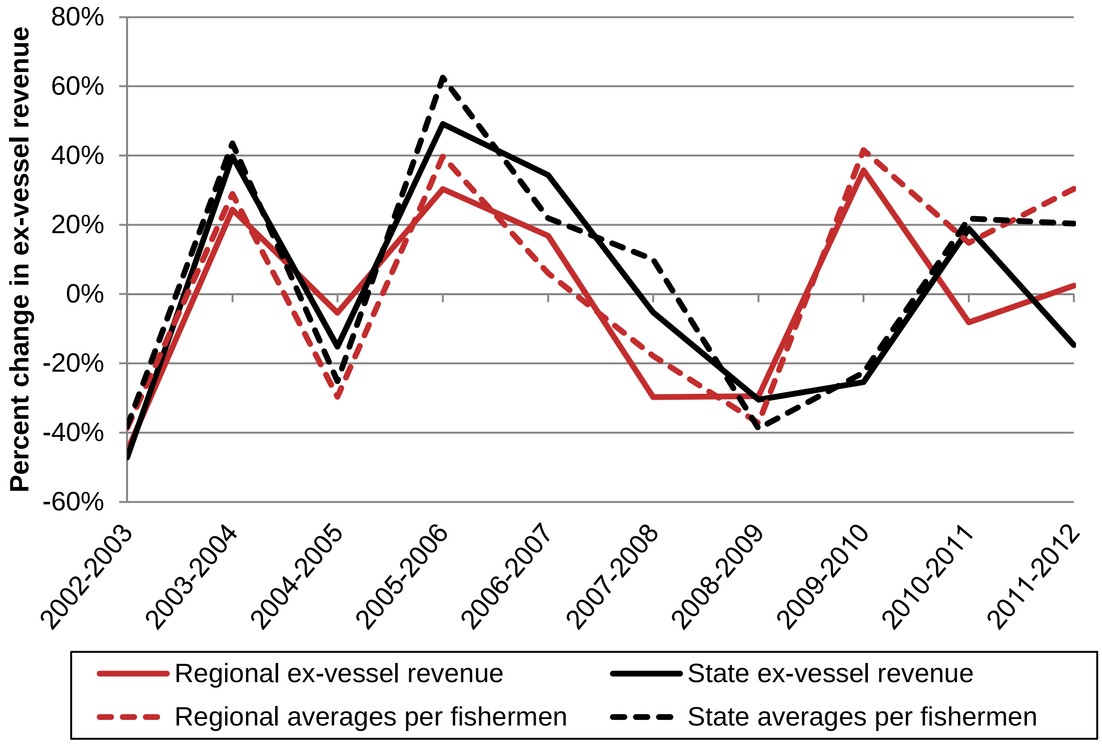
Source: Current study, based off landings data from CDFW.

Figure 54. Coastal pelagics–net commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 55. Coastal pelagics–net: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 44 individuals made landings in the coastal pelagics—net fishery. Combined, they generated $4.1 million in ex-vessel revenue, which is 5 percent of the $80.8 million generated by the target interview fisheries over the entire study region. The majority of the coastal pelagics—net fishery landings came from San Pedro/Los Angeles (91.7 percent) and was also where the most number of fishermen in the fishery were making landings (29 individuals). We interviewed 6 fishermen in the coastal pelagics—net fishery (Table 71).

Table 71. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Coastal pelagics—net

Port	2012 Landings revenue (2010$)	Total number of individuals in 2012 landings revenue	Number of individuals interviewed
Santa Barbara	—	—	—
Ventura	*	13	**2**
Port Hueneme/Oxnard	$235,745	11	1
San Pedro/Los Angeles	$3,732,970	29	3
Dana Point	—	—	—
Oceanside	*	1	—
San Diego	—	—	—
All ports (unique individuals)	$4,069,765	44	6

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

The coastal pelagics—net fishermen we interviewed on average were older and had more Years of experience than the average fisherman throughout the South Coast study region. As shown in Table 72, the coastal pelagics—net fishermen had an average age of 52 years, and 30.3 years of experience.

Table 72. Average age and years of experience commercial fishing in 2012, Coastal pelagics—net

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	—	—	—	—	—	—
Ventura	2	*	*	2	*	*
Port Hueneme/Oxnard	1	*	*	1	*	*
San Pedro/Los Angeles	3	37.7	12.7	3	12.7	15.9
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All ports (unique individuals)	6	52.0	17.9	6	30.3	22.4

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 73, for all ports the coastal pelagics—net fishery there was average of 4.2 percent increase in income from commercial fishing between 2012 and 2008. In the San Pedro/Los Angeles port complex fishermen reported on average a 6.8 percent increase in income from commercial fishing. All coastal pelagics—net fishermen reported perceiving no change in income from commercial fishing (Table 74). Again, it is important to note that this question was not asked in regards to coastal pelagics—net specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 73. Percent change in income from overall commercial fishing from 2008 - 2012, Coastal pelagics–net

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	—	—	—	—	—	—	—
Ventura	1	*	*	2	*	*	*
Port Hueneme/Oxnard	3	100.0%	—	1	*	*	*
San Pedro/Los Angeles	22	93.6%	17.5%	3	100.0%	—	6.8%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	3	100.0%	—	—	—	—	—
All ports (unique individuals)	29	95.2%	15.4%	6	99.2%	2.0%	4.2%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 74. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Coastal pelagics–net

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	—	—	—	—	—	—
Ventura	2	—	—	*	—	—
Port Hueneme/Oxnard	1	—	—	*	—	—
San Pedro/Los Angeles	3	—	—	100.0%	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All Ports (unique individuals)	6	—	—	100.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 75, the gross economic revenue used on operating costs in the coastal pelagics--net fishery decreased from 2008 to 2012 by 21.2 percent. Despite this decrease, two fishermen indicated they did not perceive a change in gross economic revenue going toward expenses, while one fisherman indicated that he perceived a significantly higher amount of expenses (Table 76), and the most common reason cited was the increase in fuel prices (Table 77).

Table 75. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Coastal pelagics–net

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	—	—	—	—	—	—	—
Ventura	1	*	*	2	*	*	*
Port Hueneme/Oxnard	3	58.3%	29.3%	1	*	*	*
San Pedro/Los Angeles	20	53.6%	18.3%	3	48.3%	36.9%	-9.9%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	3	59.3%	24.0%	—	—	—	—
All ports (unique individuals)	27	55.0%	19.0%	6	43.3%	26.0%	-21.2%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 76. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Coastal pelagics–net

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	—	—	—	—	—	—
Ventura	2	*	*	*	*	*
Port Hueneme/Oxnard	1	*	*	*	*	*
San Pedro/Los Angeles	3	33.3%	*	66.7%	*	*
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All Ports (unique individuals)	6	33.3%	—	66.7%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 77. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Coastal pelagics—net

		Responses indicating increase														Responses indicating decrease		
Fishery	**Number responding**	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	*	*
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	2	2	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point
** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 78, fishermen in San Pedro/Los Angeles had on average 16 Years of experience and 120 days in 2012 targeting the coastal pelagics—net fishery. Crew is not always used in the coastal pelagics—net fishery, but Santa Barbara fishermen had, on average, 4.5 crew members and they received 54 percent of the gross economic revenue (Table 79).

Table 78. Years of experience and number of days targeting specific fisheries in 2012, Coastal pelagics–net

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	—	—	—	—	—	—
Ventura	2	*	*	2	*	*
Port Hueneme/Oxnard	1	*	*	1	*	*
San Pedro/Los Angeles	3	16.0	9.9	3	120.0	113.1
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 79. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Coastal pelagics—net

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	—	—	—	—	—	—	—	—	—
Ventura	2	*	*	2	*	*	2	*	*
Port Hueneme/Oxnard	1	*	*	1	*	*	1	*	*
San Pedro/Los Angeles	3	4.5	0.7	3	54.0%	1.4%	3	17.5%	17.7%
Dana Point	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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All respondents were asked to compare his/her success in the coastal pelagics—net fishery in 2012 to the previous ten years. As shown in Table 80 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 81), economic (confidential), regulatory (confidential), and other factors (Table 82).

Across all ports, respondents indicated that their success in the coastal pelagics—net fishery was somewhat worse (40 percent) or significantly worse (40 percent). In Santa Barbara specifically, all respondents indicated that their success was somewhat worse in 2012 when compared to the last ten years. Among the factors negatively influencing fishermen's success over the past 10 years were the lack of fish or product, and the doing well in another fishery so not having to target the coastal pelagics fishery.

Table 80. Overall success in specific commercial fishery, 2012 compared to previous ten years, Coastal pelagics—net

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	—	—	—	—	—	—	—
Ventura	2	*	*	*	*	*	*
Port Hueneme/Oxnard	1	*	*	*	*	*	*
San Pedro/Los Angeles	2	*	*	*	*	100.0%	*
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	5	—	—	—	20%	40%	40%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 81. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Coastal pelagics—net

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—
Ventura	1	*	*	*	*	*	*	*	*	*	*
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	—	—	—	—	—	1	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	2	—	—	—	—	—	2	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 82. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, Coastal pelagics—net

		Positive						Negative						
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	1	*	*	*	*	*	*	*	*	*	*	*	*	*
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	*	*	*	*	*	*	*	*	*	*	*
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	2	—	—	—	—	—	—	—	—	—	—	—	—	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

3.5.4. Lobster–trap: Initial Changes and Baseline Characterization

The commercial fishery for California spiny lobster (*Panulirus interruptus*) originated in the late 1800s in Santa Barbara and quickly spread throughout the entire south coast region. The fishery peaked in the 1950s and landings declined until 1976 when escape ports were mandated for all commercial lobster traps. Landings continually increased through the 1990s peaking again during the 1997-1998 season and continue to maintain averages higher than pre 1976 landings.

Lobster season typical spans a 26-week time frame beginning in October and ending in March. The largest landings occur in the first two weeks of the season and typically 80 percent of catch is landed in the first 15 weeks of the season (CDFG 2013). The fishery became limited entry in 1996 and 298 permits were issued. Available permits have continued to decline and in 2011 there were 197 permits. Of these permits approximately 150 of them are actively fished and two thirds of them are transferable (CDFG 2013). The majority of catch is sold to Asian countries and prices have increased over the past decade as Chinese demand has grown (CDFG 2013).

Figure 56 shows a steady increase in ex-vessel revenue from the lobster–trap fishery over the study period in the South Coast region, with ex-vessel revenue peaking in 2012 at $13.2 million. On average annually, 700,005 pounds were landed while the maximum and the minimum landings both occurred before 2000, in 1994 at 459,491 pounds and in 1997 at 912,516 pounds. In review meetings fishermen mentioned that warm water (El Niño) years provide the best fishing conditions for lobster. They recalled that 1997 was an El Nino and accounted the boom in landings to this factor. The quantity of pounds landed stayed relatively stable since 2000 despite large increases in ex-vessel revenue. However, at the same time, the number of participating fishermen in this fishery progressively decreased from a peak of 345 fishermen in 1994 and leveled out to a range of 152 to 168 Lobster trap fishermen after 2002.

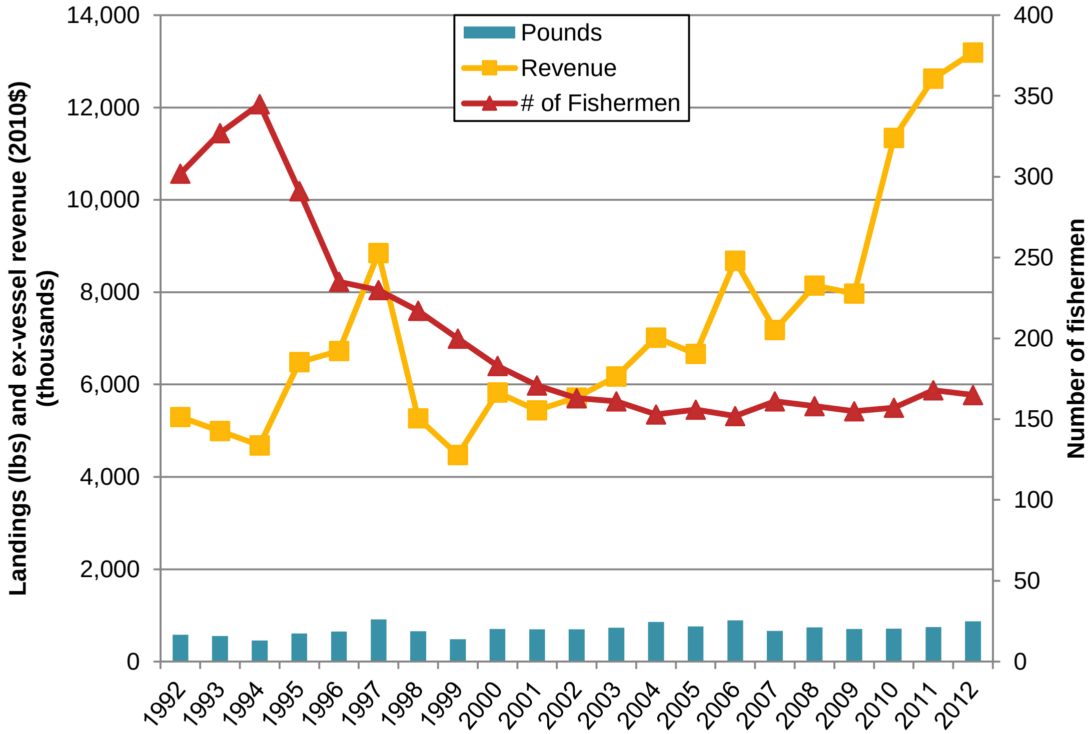
Figure 57 displays the average number of landings, ex-vessel revenue, and count of landings that occurred for the average lobster–trap fisherman over the study period. The amount of lobster–trap landed by the average fisherman grew steadily from a low of 1,332 pounds in 1994 to a high of 5,850 pounds in 2005. As the overall number of participating fishermen declined, the ex-vessel revenue per fisherman grew substantially over the study period with fishermen in 2012 making almost five times as much as his 1992 counterpart ($79,941 vs. $17,545 respectively). The number of landings made per year also increased from 20 in 1992 to 38 by 2012.

As ex-vessel revenue increased, so did the average ex-vessel price per pound in the lobster-trap fishery, see Figure 58. While the minimum average ex-vessel price occurred in 1998 at $8.05 per pound, the highest average ex-vessel price occurred in 2011 at $16.83 per pound. Some fishermen felt that the 1997 El Niño conditions led to a saturation of the market and resulted in the decreased ex-vessel price in 1998. Additionally, some mentioned they felt that the increase in ex-vessel price in recent years was due to an increased demand from the Chinese market. Over the study period, the value of the lobster-trap fishery increased by 65.2 percent and the average ex-vessel price per pound between 1992 and 2012 was $10.31. By far, and for almost every year of the study period, this fishery fetched the highest average price per pound in the South Coast region over the study period.

Figure 59 displays ex-vessel revenue for the lobster–trap commercial fishery across South Coast ports over the study period of 1992–2012. Unlike other fisheries of interest, every South Coast port had a somewhat significant portion of ex-vessel revenue in the lobster–trap fishery. Average annual portions of total fishery ex-vessel revenue ranged from 5.5 percent from Port Hueneme/Oxnard to 25.6 percent in San Diego. Furthermore, the region saw little change across ports over time in this regard.

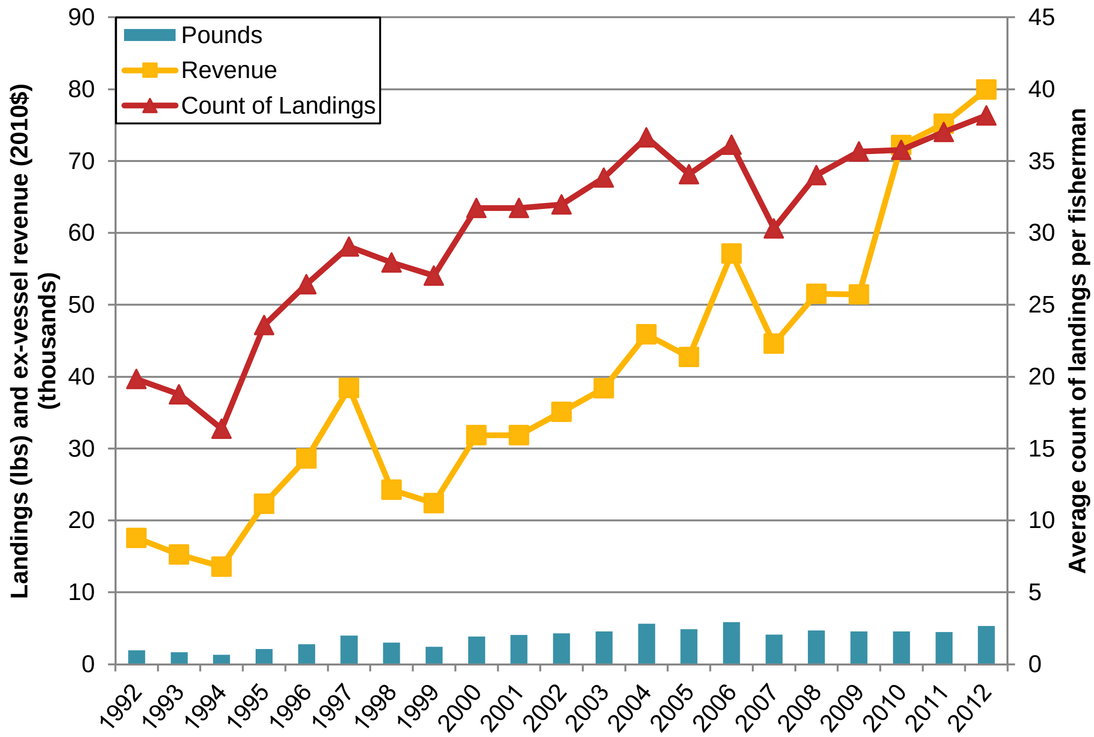
Figure 60 displays the percent change in lobster–trap commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Trends at the regional level for this fishery were so similar to state trends that regional trend lines, though displayed, are almost invisible in Figure 60. This is because the South Coast lobster–trap fishery constituted over 99 percent of all lobster–trap ex-vessel revenue across the entire state. This fishery saw increases in ex-vessel revenue both overall and at the per fisherman level every year over 2002–2012 except for in three years, declining slightly in 2005, more substantially in 2007, and just barely in 2009. Overall, regional ex-vessel revenue, total and per fisherman, increased by 130.5 percent 127.7 percent respectively from 2000 to 2012.

Figure 56. Lobster–trap commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



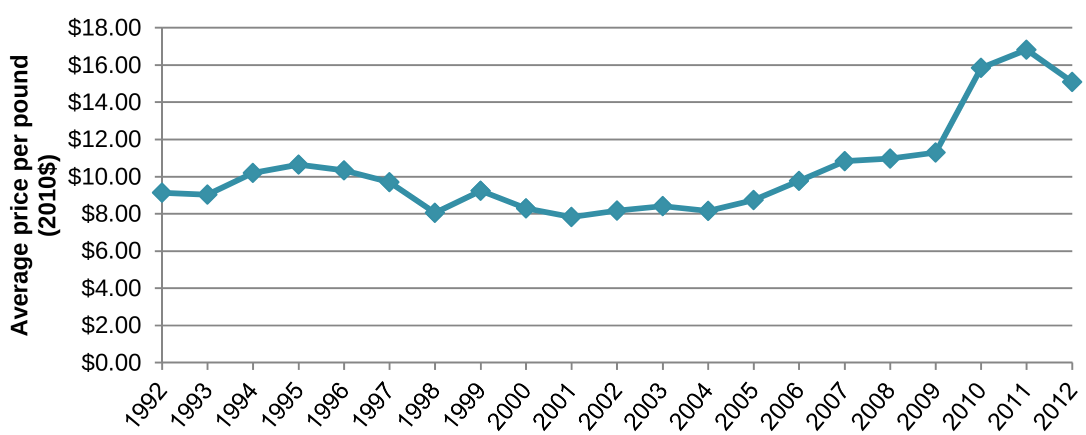
Source: Current study, based off landings data from CDFW.

Figure 57. Lobster–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



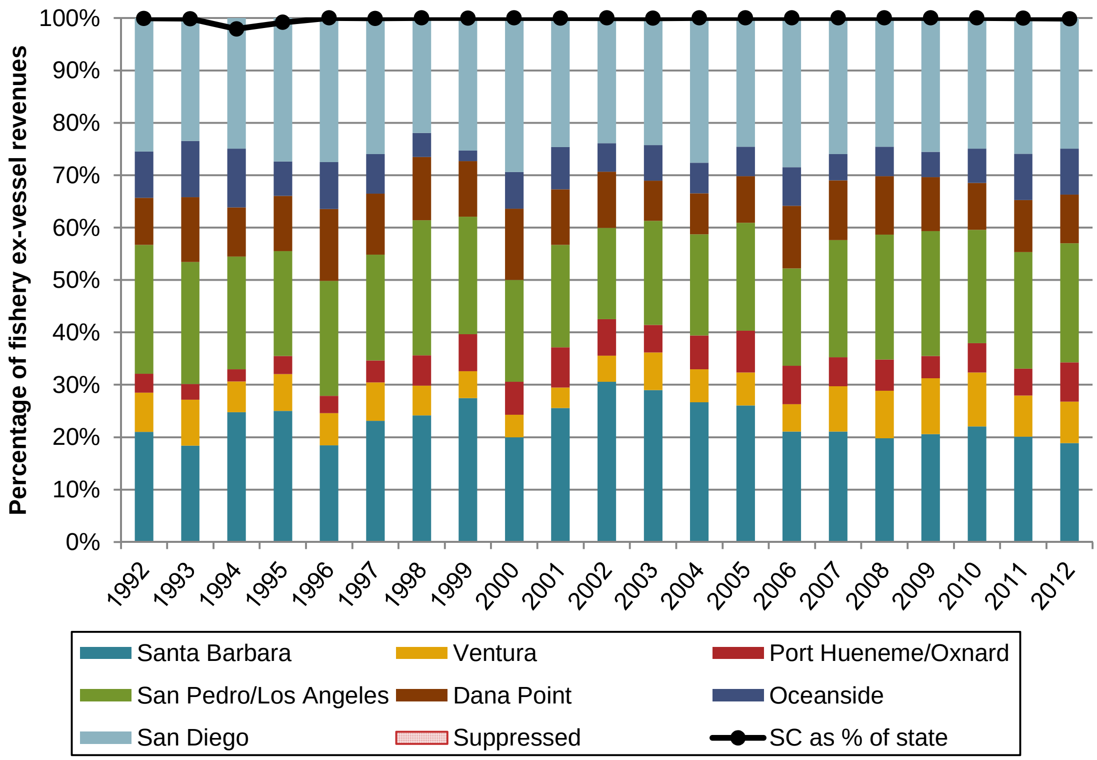
Source: Current study, based off landings data from CDFW.

Figure 58. Lobster–trap commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



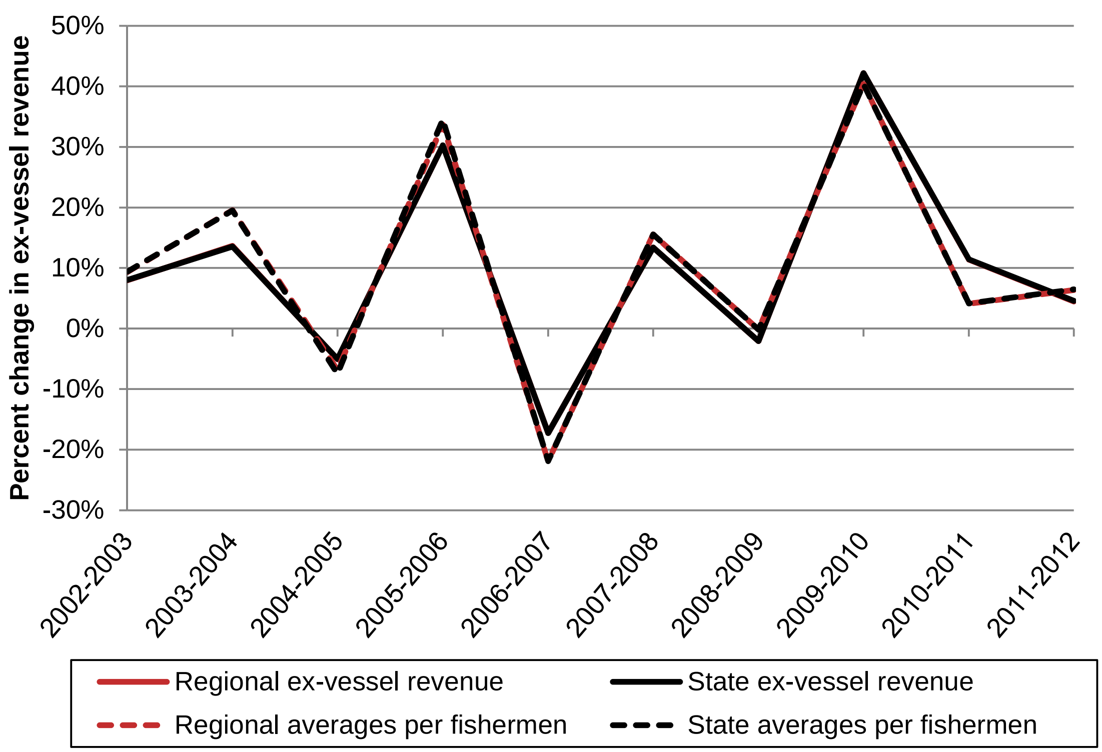
Source: Current study, based off landings data from CDFW.

Figure 59. Lobster–trap commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 60. Lobster–trap: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 165 individuals made landings in the lobster—trap fishery. Combined, they generated $13.2 million in ex-vessel revenue, which is 16.3 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the lobster—trap fishery landings came from San Diego (24.9 percent), and was also where most fishermen in the fishery made landings (58 individuals). We interviewed 56 fishermen in the lobster—trap fishery, and all were from Santa Barbara (Table 83).

Table 83. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Lobster—trap

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	$2,487,332	43	13
Ventura	$1,044,215	12	6
Port Hueneme/Oxnard	$995,264	15	2
San Pedro/Los Angeles	$2,994,398	43	8
Dana Point	$1,218,510	25	9
Oceanside	$1,161,419	14	5
San Diego	$3,289,063	58	13
Unique individuals	$13,190,202	165	56

Source: Current study

The lobster—trap fishermen we interviewed on average were slightly younger and had less Years of experience than the average fisherman throughout the South Coast study region. As shown in Table 84, the lobster—trap fishermen had an average age of 49.6 years, and 27.1 years of experience. Dana Point had the oldest fishermen with an average of 54.1 years, but Ventura had the fishermen with the most years of experience commercial fishing, 32 years.

Table 84. Average age and years of experience commercial fishing in 2012, Lobster—trap

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	13	53.5	5.6	13	30.2	10.3
Ventura	6	48.8	12.8	6	32.0	10.6
Port Hueneme/Oxnard	2	*	*	2	*	*
San Pedro/Los Angeles	8	44.9	8.0	8	22.6	10.5
Dana Point	9	54.1	14.8	9	28.4	15.4
Oceanside	5	38.4	11.2	5	16.4	10.0
San Diego	13	51.4	10.0	13	27.8	11.5
All ports (unique individuals)	56	49.6	11.2	56	27.1	12.2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 85, across the study region there was no change in average percent income coming from commercial fishing between 2008 and 2012. However, there were both increases and decreases in average percent income from commercial fishing at the port level. For example, San Diego lobster fishermen experienced on average a 16.9 percent increase, while those in Ventura experienced a 16.8 percent decrease in income from commercial fishing between 2012 and 2008. The majority of lobster fishermen in all ports perceived no change in income (Table 86), but the most commonly cited reasons for a change included personal reasons and more revenue from other sources (Table 204). Again, it is important to note that this question was not asked in regards to lobster—trap specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the study conducted by Point 97/Ecotrust in 2008 to inform the MPA planning process.

Table 85. Percent change in income from overall commercial fishing from 2008 - 2012, Lobster—trap

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	20	90.0%	16.6%	13	84.2%	28.4%	-6.4%
Ventura	6	100.0%	—	6	83.2%	23.2%	-16.8%
Port Hueneme/Oxnard	3	100.0%	—	2	*	*	*
San Pedro/Los Angeles	16	88.1%	25.0%	8	90.0%	19.3%	2.1%
Dana Point	10	83.0%	31.2%	9	76.1%	29.3%	-8.3%
Oceanside	4	100.0%	—	5	90.0%	17.3%	-10.0%
San Diego	31	80.0%	30.2%	13	93.5%	12.8%	16.9%
All ports (unique individuals)	90	86.9%	24.8%	56	86.9%	22.3%	0.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 86. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Lobster—trap

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	12	8.3%	—	66.7%	8.3%	16.7%
Ventura	6	—	—	100.0%	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*
San Pedro/Los Angeles	8	—	25.0%	75.0%	—	—
Dana Point	8	—	—	62.5%	37.5%	—
Oceanside	4	50.0%	—	50.0%	—	—
San Diego	13	—	7.7%	92.3%	—	—
All Ports (unique individuals)	53	5.7%	5.7%	77.4%	7.5%	3.8%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 87. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Lobster—trap

Fishery	Number responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Santa Barbara	7	—	1	1	—	—	—	—	—	—	1	1	1	1	1
Ventura	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/ Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	3	—	—	—	1	—	—	—	1	—	—	—	—	—	—
Dana Point	4	—	—	—	—	—	—	—	—	—	1	—	2	—	1
Oceanside	2	—	—	—	1	—	—	1	—	—	—	—	—	—	—
San Diego	3	—	—	—	—	—	—	—	—	—	1	—	—	—	—
All Ports (unique individuals)	22	—	1	1	2	—	—	1	1	—	3	1	3	1	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

As shown in Table 88, there was a slight increase of 1.8 percent in the overall percent change in gross economic revenue used for operating costs from 2008 to 2012. This slight increase is reflected in lobster fishermen's perception, as the majority of respondents indicated that there was a somewhat higher (39.3 percent) increase of gross economic revenue going toward expenses (Table 89), and the most commonly cited reasons were the increase in fuel prices and the increase in costs of goods and labor (Table 90).

Table 88. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Lobster—trap

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	21	39.6%	12.6%	13	42.5%	14.2%	7.5%
Ventura	6	47.7%	10.7%	6	37.5%	12.9%	-21.3%
Port Hueneme/Oxnard	2	57.5%	3.5%	2	*	*	*
San Pedro/Los Angeles	13	41.0%	11.3%	8	46.6%	11.7%	13.8%
Dana Point	9	47.6%	15.2%	9	48.4%	17.0%	1.9%
Oceanside	2	60.0%	14.1%	5	61.6%	14.5%	2.7%
San Diego	27	49.4%	14.8%	13	47.9%	21.4%	-3.1%
All ports (unique individuals)	80	45.6%	13.9%	56	46.4%	16.4%	1.8%

Source: Current study

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 89. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Lobster—trap

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	13	15.4%	46.2%	23.1%	15.4%	—
Ventura	6	66.7%	16.7%	16.7%	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*
San Pedro/Los Angeles	8	25.0%	25.0%	37.5%	12.5%	—
Dana Point	9	22.2%	55.6%	11.1%	11.1%	—
Oceanside	5	20.0%	40.0%	20.0%	20.0%	—
San Diego	13	23.1%	30.8%	46.2%	—	—
All Ports (unique individuals)	56	25.0%	39.3%	26.8%	8.9%	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 90. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Lobster—trap

		Responses indicating increase														Responses indicating decrease		
Fishery	**Number responding**	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	9	6	—	1	4	—	—	2	—	2	—	—	—	—	—	—	—	1
Ventura	5	5	1	1	5	—	—	1	—	1	—	1	—	—	—	—	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	5	3	—	2	2	—	—	—	2	—	—	—	1	—	—	—	1	—
Dana Point	8	6	3	—	4	—	—	—	2	—	—	—	1	—	—	—	—	1
Oceanside	4	2	1	1	—	1	—	—	—	—	—	—	—	1	—	—	—	1
San Diego	7	7	—	—	3	1	—	—	5	1	—	—	1	1	—	—	—	—
All Ports (unique individuals)	40	31	5	5	20	2	—	3	9	4	—	1	3	2	—	—	1	3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 91, most fishermen had at least 20 years of experience in the lobster—trap fishery except in Oceanside where fishermen had an average of 9.4 years of experience. Lobster fishermen reported a range of days targeting the fishery in 2012, from an average of 88.8 days in Oceanside to 131.7 days in Ventura. Crew is not always used in the lobster—trap fishery, but the highest average number of crew members was reported in Ventura with 1.3 crew members, and they received the highest average percent of gross economic revenue, 15.3 percent (Table 92).

Table 91. Years of experience and number of days targeting specific fisheries in 2012, Lobster—trap

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	13	25.0	10.5	13	89.8	36.3
Ventura	6	27.7	11.8	6	131.7	32.0
Port Hueneme/Oxnard	2	*	*	2	*	*
San Pedro/Los Angeles	8	20.9	8.8	8	96.1	20.8
Dana Point	9	28.1	13.8	9	115.6	34.0
Oceanside	5	9.4	13.3	5	88.8	28.5
San Diego	13	23.8	10.4	13	125.4	37.9

Source: Current study

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 92. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Lobster—trap

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	13	0.8	0.6	13	13.9%	10.5%	13	14.2%	8.3%
Ventura	6	1.3	0.8	6	15.3%	9.8%	6	16.6%	7.3%
Port Hueneme/Oxnard	2	*	*	2	*	*	2	*	*
San Pedro/Los Angeles	8	0.8	0.7	8	6.1%	5.4%	8	14.0%	9.1%
Dana Point	9	0.7	0.5	9	10.2%	10.6%	9	16.4%	13.6%
Oceanside	5	1.2	0.4	5	15.0%	7.1%	5	14.6%	5.5%
San Diego	13	0.6	0.7	13	6.2%	6.5%	13	14.1%	6.1%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

All respondents were asked to compare his/her success in the lobster—trap fishery in 2012 to the previous ten years. As shown in Table 93 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 94), economic (Table 95), regulatory (Table 96), and other factors (Table 97).

Most respondents for the lobster—trap fishery indicated that their overall success was somewhat worse (35 percent) or significantly worse (16 percent) in 2012 relative to the preceding 10 years. The only exception was in Ventura where a majority of lobster fishermen indicated that they did significantly better (50 percent) or somewhat better (33.3 percent). Among the most commonly cited factors negatively influencing fishermen's success over the past 10 years were the lack of fish or product, MPAs or other closures, and crowding, compaction, or increased efforts.

Table 93. Overall success in specific commercial fishery, 2012 compared to previous ten years, Lobster—trap

		Percent response					
Ports	Number responding	Did not participate in previous seasons	Significantly better	Somewhat better	The same	Somewhat worse	Significantly worse
Santa Barbara	13	7.7%	7.7%	38.5%	23.1%	15.4%	7.7%
Ventura	6	—	50.0%	33.3%	—	—	16.7%
Port Hueneme/Oxnard	2	*	*	*	*	*	*
San Pedro/Los Angeles	8	—	—	—	37.5%	50.0%	12.5%
Dana Point	8	—	12.5%	—	12.5%	37.5%	37.5%
Oceanside	5	20.0%	—	—	60.0%	20.0%	—
San Diego	13	—	7.7%	15.4%	—	53.8%	23.1%
All ports (unique individuals)	55	4%	11%	16%	18%	35%	16%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 94. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Lobster—trap

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	2	—	—	—	—	—	2	—	1	—	—
Ventura	3	1	1	1	—	—	1	—	—	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	1	—	—	—	—	—	1	—	1	—	—
Dana Point	4	1	—	—	—	—	1	—	1	—	1
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	3	—	—	—	—	—	1	—	2	—	1
All ports (unique individuals)	15	2	1	1	—	—	8	—	5	—	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 95. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Lobster—trap

		Positive			Negative			
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Santa Barbara	6	6	—	2	—	—	—	—
Ventura	4	4	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—
Dana Point	1	1	—	1	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—
San Diego	4	3	—	—	1	—	—	—
All ports (unique individuals)	15	14	—	3	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 96. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Lobster—trap

Ports	Number responding	Negative					
		A	B	C	D	E	F
Santa Barbara	2	—	—	1	—	1	—
Ventura	1	—	—	1	—	—	—
Port Hueneme/Oxnard	1	*	*	*	*	*	*
San Pedro/Los Angeles	2	—	—	2	—	—	—
Dana Point	4	—	—	3	1	—	—
Oceanside	1	—	—	1	—	—	—
San Diego	8	—	—	8	—	—	—
All ports (unique individuals)	19	—	—	17	1	1	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point
** indicates data were collected but cannot be shown due to confidentiality constraints*

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 97. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, Lobster—trap

		Positive						Negative						
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Santa Barbara	2	—	—	—	—	—	—	—	—	2	—	—	—	—
Ventura	2	—	1	1	—	1	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	1	—	—	—	—	—	—	—	—	1	—	—	—	—
Dana Point	2	—	—	—	—	—	—	—	1	2	—	—	—	—
Oceanside	1	—	—	—	—	—	—	—	—	1	—	—	—	—
San Diego	4	—	—	—	—	—	—	1	3	2	—	—	—	—
All ports (unique individuals)	14	—	1	1	—	1	—	1	5	9	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

3.5.5. Market squid–brail: Initial Changes and Baseline Characterization

Market squid (*Loligo opalescens)* has a wide range that stretches from Baja, California to southwestern Alaska. Within the state of California the fishery is centered in three geographical regions; the Monterey/Moss Landing area in the Central Coast and the Ventura/Port Hueneme and San Pedro/Terminal Island regions in the South Coast (CDFG 2005). The market squid fishery is one of California's most valuable fisheries both in terms of pounds landed and revenue. Additionally, it is known to be highly sensitive to environmental conditions and populations fluctuate with water temperatures, El Niño patterns, and natural fishery abundance cycles (Pomeroy et al. 2003). Market squid are sensitive to warm temperatures that are associated with El Niño years and are more prevalent in cold water during La Niña years (CDFG 2008).

The market squid fishery was almost exclusively targeted with brail (scoop) nets until the late 1970s when the majority of the fleet switched to purse seines. During the 1996 to 2006 time period 95% of market squid were landed by purse seine and the remaining 5 percent by brail nets.

The market squid–brail fishery experienced significant increases and growth over the study period, despite undergoing many peaks and troughs in many categories, including ex-vessel revenue, landings and number of fishermen fishing in this fishery, see Figure 61. The smallest number of pounds landed occurred in 1992 at 29,040 pounds; conversely the highest number of pounds landed was 11.4 million in 2012. While landings and ex-vessel revenue increased overall from 1992–2012, four short periods of growth and sudden decline were observed in the market squid–brail fishery. The number of participating fisherman in this fishery closely followed landing and ex-vessel revenue trends, with the highest participation occurring in 2011 at 73 fishermen. This fishery is unique among other fisheries of interest as the number of participating fishermen did not decline but increased substantially over the study period. In 1992, revenue for market squid brail was at $2,280 and it has grown sporadically over the study period reaching $3.4 million by 2012.

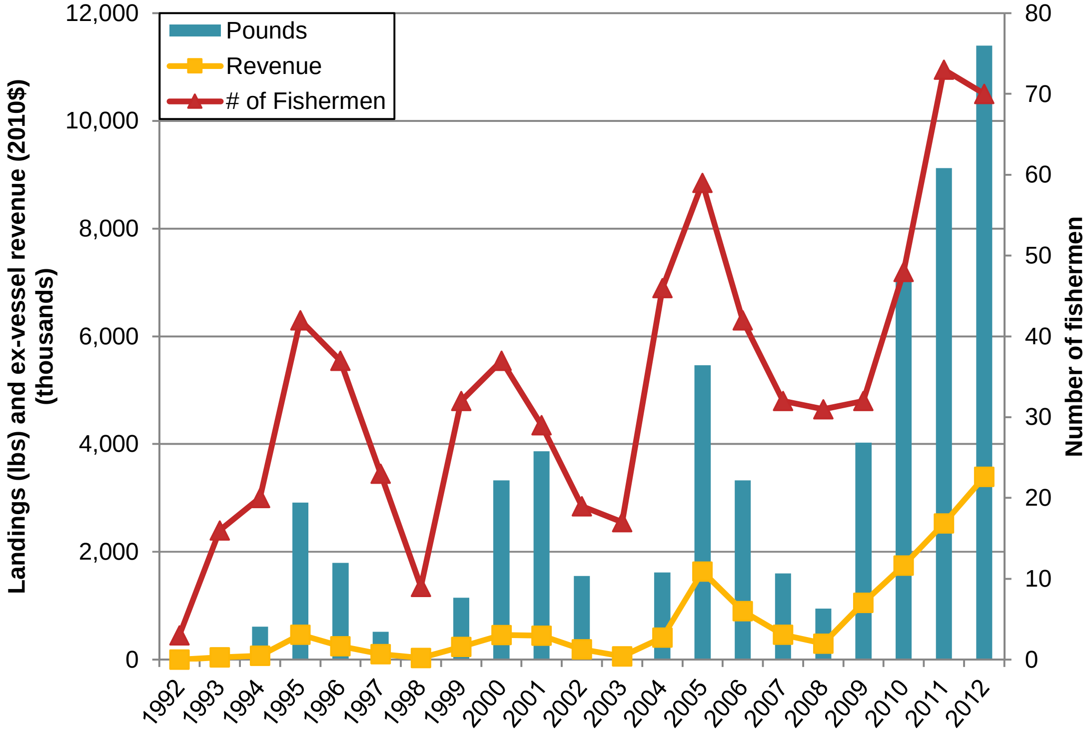
Figure 62 displays average landings, ex-vessel revenue, and count of landings per fisherman per year. Ex-vessel revenue per fisherman increased from 1992 at $760 to a high in 2012 at $48,485 on average. Commercial landings per fisherman rose and fell over the study period, following overall trends; a 2012 fisherman made approximately 17 times the landings and nearly 64 times the ex-vessel revenue on average than his 1992 counterpart. The average fisherman made only one landing in 1992, whereas the 2012 fisherman landed approximately 20 times overall throughout the year.

Figure 63 shows that the average ex-vessel price per pound has grown over the study period in the market squid–brail fishery. The lowest ex-vessel price occurred in the first year of the study period, 1992, at an average of $0.08 per pound. The average ex-vessel price peaked in 1998 at $0.58 per pound, fell in following years, then grew at a slower rate for the remainder of the study period. In review meetings fishermen mentioned they felt the high ex-vessel price in 1998 was a consequence of low squid abundance during the 1997 El Nino period and increased demand from Chinese markets. Between 1992 and 2012, the value of market squid–brail rose by 279.4 percent and the average ex-vessel price of this squid was $0.23 per pound.

Figure 64 displays ex-vessel revenue for the market squid–brail commercial fishery across South Coast ports over the study period of 1992–2012. San Pedro/Los Angeles dominated the market squid–brail fishery, representing 97.6 percent of total ex-vessel revenue in the region on average annually; only in 1993 did this port's portion of ex-vessel revenue fall below 90 percent.

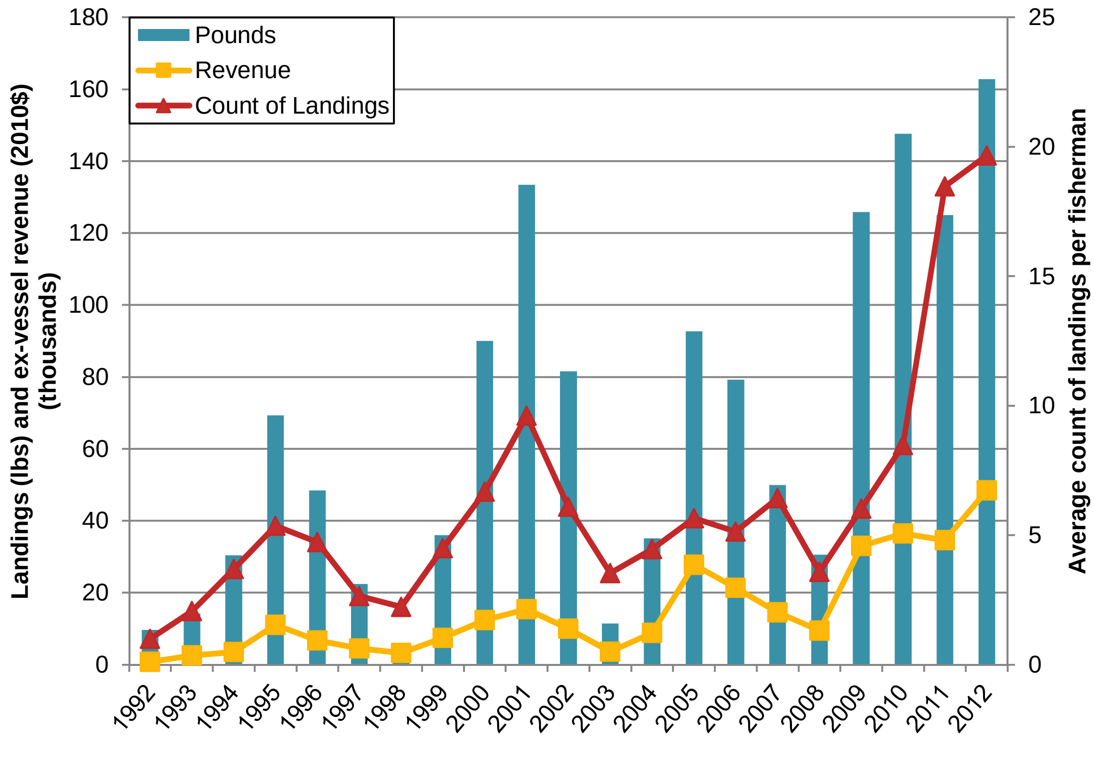
Figure 65 displays the percent change in market squid–brail commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Similar to the lobster–trap fishery, the market squid–brail fishery in the South Coast region constituted 100 percent of state ex-vessel revenue for all but four years over the twenty one year study period, falling at most to 88.3 percent of state totals in 1994. Thus again, it is difficult to see the regional trend lines displayed in Figure 65 as they are directly overlapping with state trend lines. As is typical to a squid fishery, ex-vessel revenue trends varied greatly, increasing by almost as much as 600 percent from 2003–2004, and falling by nearly 50 percent just a few years later from 2006–2007. Overall, the fishery grew substantially from 2000–2012.

Figure 61. Market squid–brail commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



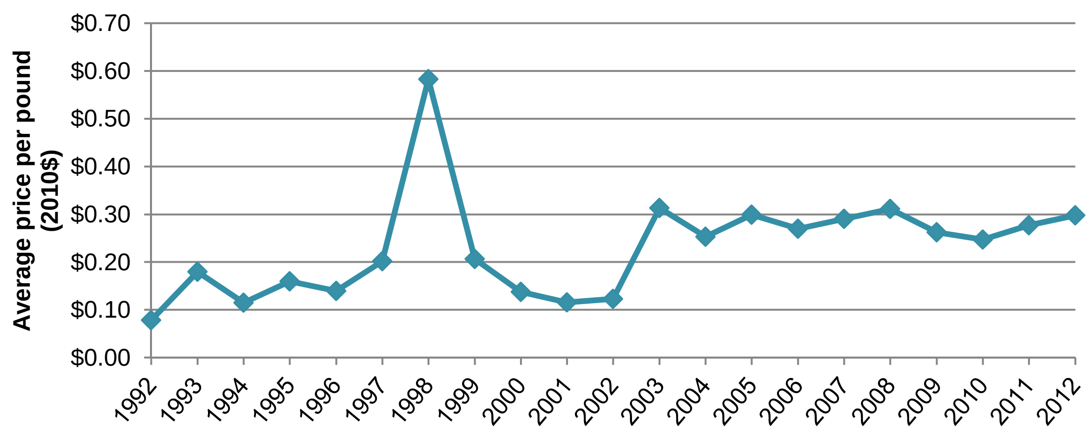
Source: Current study, based off landings data from CDFW.

Figure 62. Market squid–brail: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



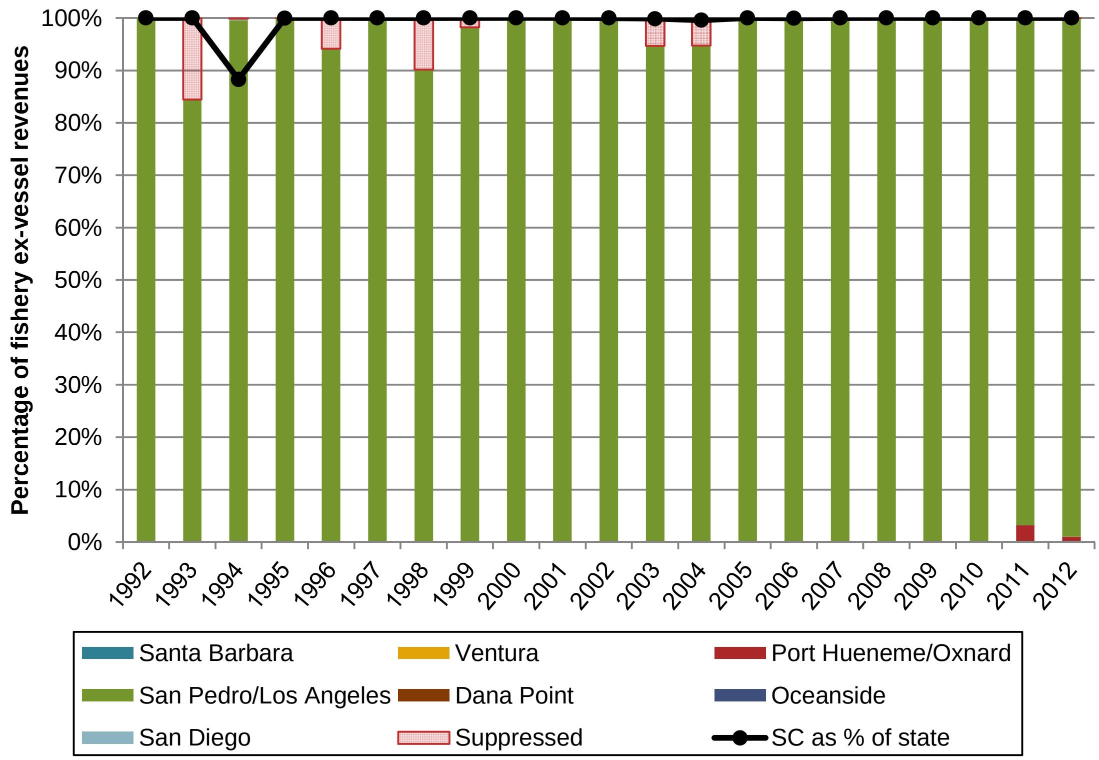
Source: Current study, based off landings data from CDFW.

Figure 63. Market squid–brail commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



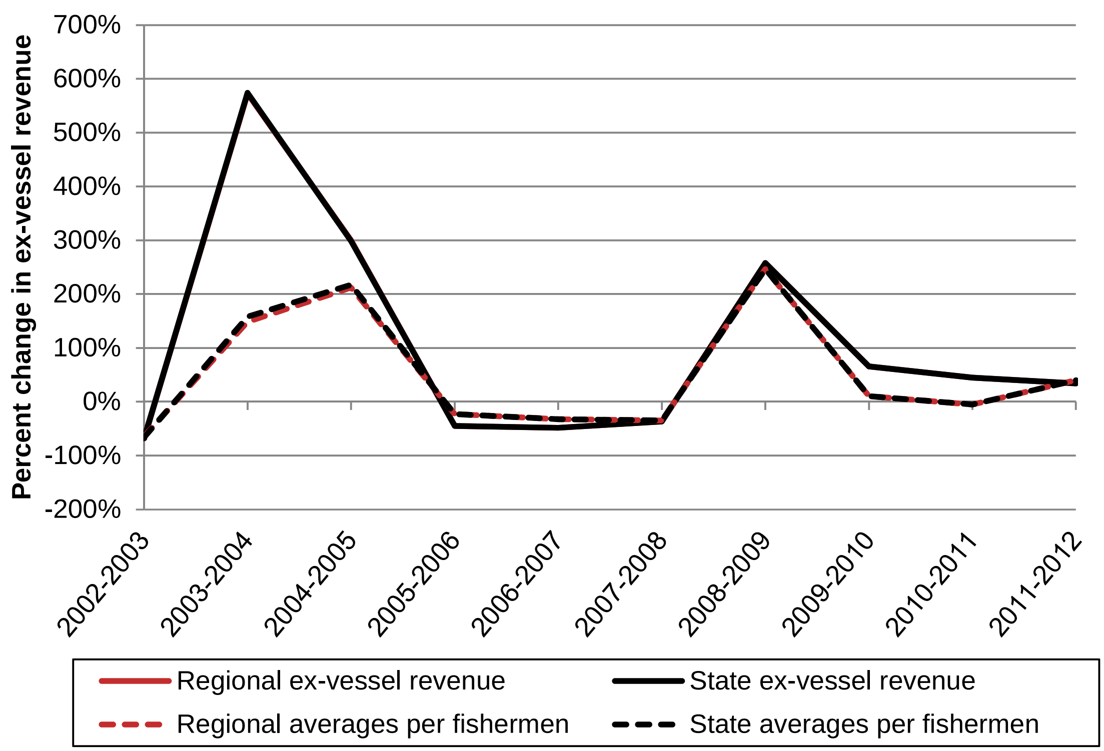
Source: Current study, based off landings data from CDFW.

Figure 64. Market squid–brail commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 65. Market squid–brail: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 70 individuals made landings in the market squid—brail. Combined, they generated $3.4 million in ex-vessel revenue, which is 4.2 percent of the $80.8 million generated by the target interview fisheries over the entire study region. The majority of the market squid—brail fishery landings came from San Pedro/Los Angeles (99 percent), which was where the most number of individuals made landings (67 individuals). We interviewed 4 fishermen in the market squid—brail fishery (Table 98).

Table 98. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Market squid—brail

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	*	1	—
Ventura	—	—	—
Port Hueneme/Oxnard	$35,007	5	—
San Pedro/Los Angeles	$3,357,870	67	3
Dana Point	—	—	—
Oceanside	—	—	—
San Diego	*	1	1
Unique individuals	$3,392,877	70	4

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The market squid--brail fishermen we interviewed on average were slightly younger and had less Years of experience than the average fisherman throughout the South Coast study region. As shown in Table 99, the fishermen had an average age of 48.3 years, and 28.5 years of experience.

Table 99. Average age and years of experience commercial fishing in 2012, Market squid--brail

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	—	—	—	—	—	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	3	47.0	18.7	3	27.3	16.0
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	1	*	*	1	*	*
All ports (unique individuals)	4	48.3	15.5	4	28.5	13.3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 100, across the study region there was an average increase of 9.6 percent in percent income coming from commercial fishing between 2008 and 2012. The majority of market squid—brail fishermen in all ports perceived significantly higher (25 percent) or somewhat higher (25 percent) increases in personal income coming from commercial fishing (Table 101). The only reasons attributed to this increase were an increase in fish abundance and less revenue derived from other income sources (Table 102). Again, it is important to note that this question was not asked in regards to market squid—brail specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 100. Percent change in income from overall commercial fishing from 2008 - 2012, Market squid—brail

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	*	*	—	—	—	—
San Pedro/Los Angeles	2	*	*	3	93.3%	11.5%	16.7%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	1	*	*	—
All ports (unique individuals)	3	86.7%	23.1%	4	95.0%	10.0%	9.6%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 101. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Market squid—brail

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	—	—	—	—	—	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	3	33.3%	33.3%	33.3%	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	1	*	*	*	*	*
All Ports (unique individuals)	4	25.0%	25.0%	50.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 102. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Market squid—brail

Fishery	Number of individuals responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/ Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	2	1	—	—	1	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	2	1	—	—	1	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

As shown in Table 103, there was a decrease of 16 percent in the overall average percent change in gross economic revenue used for operating costs from 2008 to 2012. Despite this decrease, squid fishermen perceived significantly higher (25 percent), somewhat higher (25 percent), or no change (50 percent) in the portion of gross economic revenue going toward expenses (Table 104). The most commonly cited reasons for this perceived change were the increase in fuel prices and the increase in costs of goods and labor (Table 105).

Table 103. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Market squid—brail

	2008^			2012			
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
Santa Barbara	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	*	*	—	—	—	—
San Pedro/Los Angeles	1	*	*	3	56.7%	5.8%	*
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	1	*	*	—
All ports (unique individuals)	2	67.5%	10.6%	3	56.7%	5.8%	-16.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 104. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Lobster—trap

		Percent response				
Ports	Number responding	Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
Santa Barbara	—	—	—	—	—	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	3	—	33.3%	66.7%	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	1	*	*	*	*	*
All Ports (unique individuals)	4	25.0%	25.0%	50.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 105. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Market squid—brail

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
All Ports (unique individuals)	2	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 106, squid fishermen in San Pedro/Los Angeles had at least an average of 14.3 years of experience in the market squid—brail fishery, and an average of 20.7 days targeting that fishery in 2012. Squid fishermen in San Pedro/Los Angeles reported employing an average of 1.7 crew members and that an average of 40 percent of gross economic revenue went to the crew (Table 107).

Table 106. Years of experience and number of days targeting specific fisheries in 2012, Market squid—brail

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	—	—	—	—	—	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	3	14.3	9.3	3	20.7	19.0
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	1	*	*	1	*	*

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 107. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Market squid—brail

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	3	1.7	0.6	3	40.0%	—	3	16.7%	5.8%
Dana Point	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—
San Diego	1	*	*	1	*	*	1	*	*

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

All respondents were asked to compare his/her success in the market squid—brail fishery in 2012 to the previous ten years. As shown in Table 108 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 109), economic (no data), regulatory (Table 110), and other factors (no data).

Two out of the three respondents for the market squid--brail fishery indicated that their overall success was significantly worse (66 percent), and the other indicated they had done somewhat better (33 percent) in 2012 relative to the preceding 10 years. Two explanations for the impacts to success were given, one positive environmental factor (good oceanic conditions), and one negative regulatory factor (met quota early).

Table 108. Overall success in specific commercial fishery, 2012 compared to previous ten years, Market squid—brail

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	3	—	—	33.3%	—	—	66.7%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	3	—	—	33%	—	—	67%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 109. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Market squid—brail

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	—	—	1	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	1	—	—	1	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 110. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Market squid—brail

		Negative					
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
Santa Barbara	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	—	—	—	—	—	1
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	1	—	—	—	—	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

3.5.6. Market squid–net: Initial Changes and Baseline Characterization

Market squid (*Loligo opalescens)* has a wide range that stretches from Baja, California to southwestern Alaska. Within the state of California the fishery is centered in three geographical regions; the Monterey/Moss Landing area in the Central Coast and the Ventura/Port Hueneme and San Pedro/Terminal Island regions in the South Coast (CDFG 2005). Like other coastal pelagic species the market squid fishery is one of California's most valuable fisheries both in terms of pounds landed and revenue. Additionally, it is known to be highly sensitive to environmental conditions and populations fluctuate with water temperatures, El Niño patterns, and natural fishery abundance cycles (Pomeroy et al. 2003). Market squid are sensitive to warm temperatures that are associated with El Niño years and are more prevalent in cold water during La Niña years (CDFG 2008). The market squid–seine fishery is a restricted access fishery (as of 2005), closed to fishing on weekends, and managed by a quota system (Petterson et al. 2010). In 2010, the fishery reached its quota (118,000 tons) for the first time since it was implemented in 2002 and has been reached every year since (CDFG 2010).

The market squid fishery was almost exclusively targeted with brail (scoop) nets until the late 1970s when the majority of the fleet switched to purse seines. During the 1996 to 2006 time period 95 percent of market squid were landed by purse seine and the remaining 5 percent by brail nets. Typically, seiners operate at night and are accompanied by a light boat which uses high intensity lights to attract squid (CDFG 2008).

Figure 66 displays overall growth in the market squid–net fishery, despite annual variations, with the lowest ex-vessel revenue in 1992 at $599,291 and maximum ex-vessel revenue at $61.4 million in 2010. The number of fishermen in this fishery grew from 30 in 1992, its lowest, to a peak of 194 fishermen in 1996. The number of fishermen dropped again in 1997, with the establishment of a permit system for the squid fishery. Additionally, a moratorium was placed on the fishery restricting new entrants into the fishery. In discussions with fishermen they noted that the large number of participants in 1996 was due fishermen wanting to secure landings before the moratorium took place. The number of market squid–net fishermen decreased since, and in 2012 was at 90 fishermen. Landings of market squid–net varied over the study period from the lowest amount in 1992 at 9.9 million pounds to a maximum of 214.6 million pounds just two years later in 2000. In the last year, 2012, 164.6 pounds were landed for $46.7 million in ex-vessel revenue. The year of 1998 was exceptionally poor for the market squid–net fishery in the South Coast, and negatively impacted regional ports' landings an ex-vessel revenue as a result. In review meetings, fishermen explained that they felt this decrease was primarily due to the 1997-1998 El Niño effect., coupled with regulatory changes.

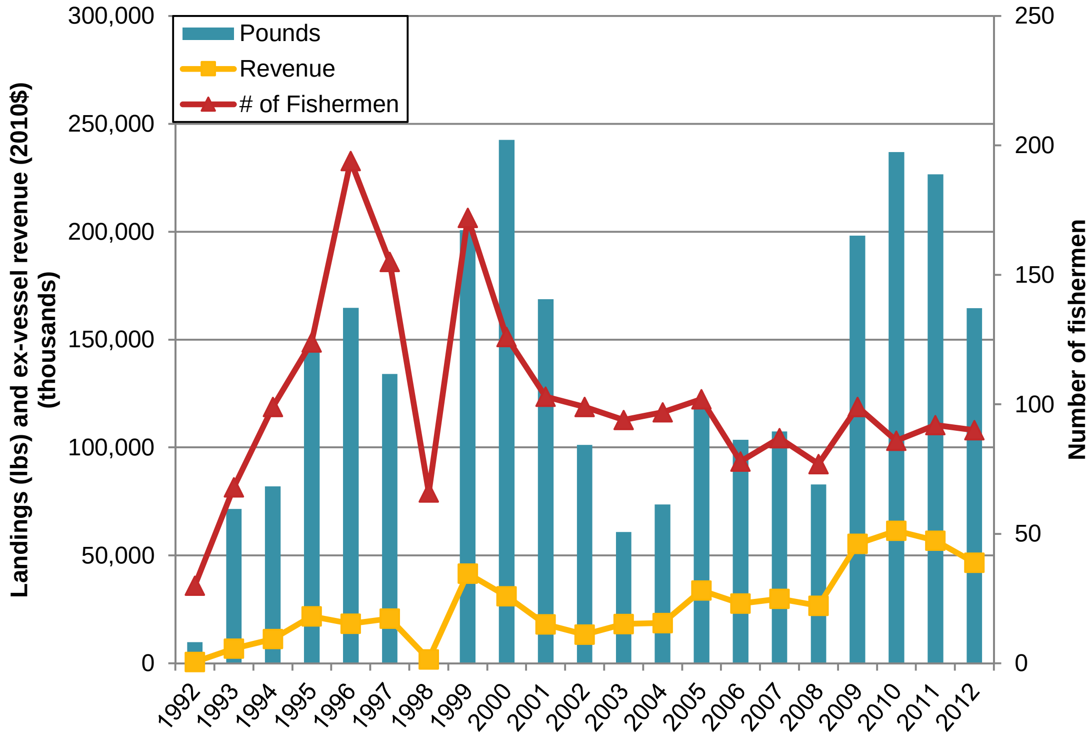
Figure 67 displays average landings, ex-vessel revenue, and count of landings for the average individual fisherman in the market squid–net fishery in the South Coast region. Average ex-vessel revenue per fisherman increased from $19,976 in 1992 to the highest amount of $714,285 per average fisherman in 2010. This was the first year that the 118,000-ton quota (roughly 236 million pounds) was met. The quota was subsequently met in 2011, 2012, and 2013 (2013 is not shown below). It should be noted that the quota includes other gear types, such as brail, and in Figure 67 the total pounds landed for these years does not equal 236 million pounds because only the seine net gear type is represented. Commercial landings per fisherman increased and decreased every few years, rising from 95,321 pounds in 1998 to 2.8 million pounds per fisherman on average in 2010. As the overall number of participating fishermen in this fishery declined, landings, ex-vessel revenue, and total number of annual landings per average fisherman increased. In 2012 the average fisherman landed 1.8 million pounds of market squid–net for $518,636 in ex-vessel revenue, landing 27 throughout the year to do so. This is significantly more compared with his 1992 counterpart who landed 328,623 pounds for $19,976 in ex-vessel revenue over five landings.

Figure 68 displayed the average price per pound in the market squid–net fishery, which increased overall from 1992–2012. The minimum average ex-vessel price during this study was $0.06 per pound in 1992; the maximum was $0.32 per pound on average in 2008. By 2012 the average ex-vessel price per pound was $0.28.

Figure 69 displays ex-vessel revenue for the market squid–net commercial fishery across South Coast ports over the study period of 1992–2012. The top two contributors to regional ex-vessel revenue were the ports of San Pedro/Los Angeles and Port Hueneme/Oxnard, constituting 41.5 and 40.3 percent annually on average respectively. While ex-vessel revenue decreased in Port Hueneme/Oxnard, both San Pedro/Los Angeles and Ventura saw increases over the study period.

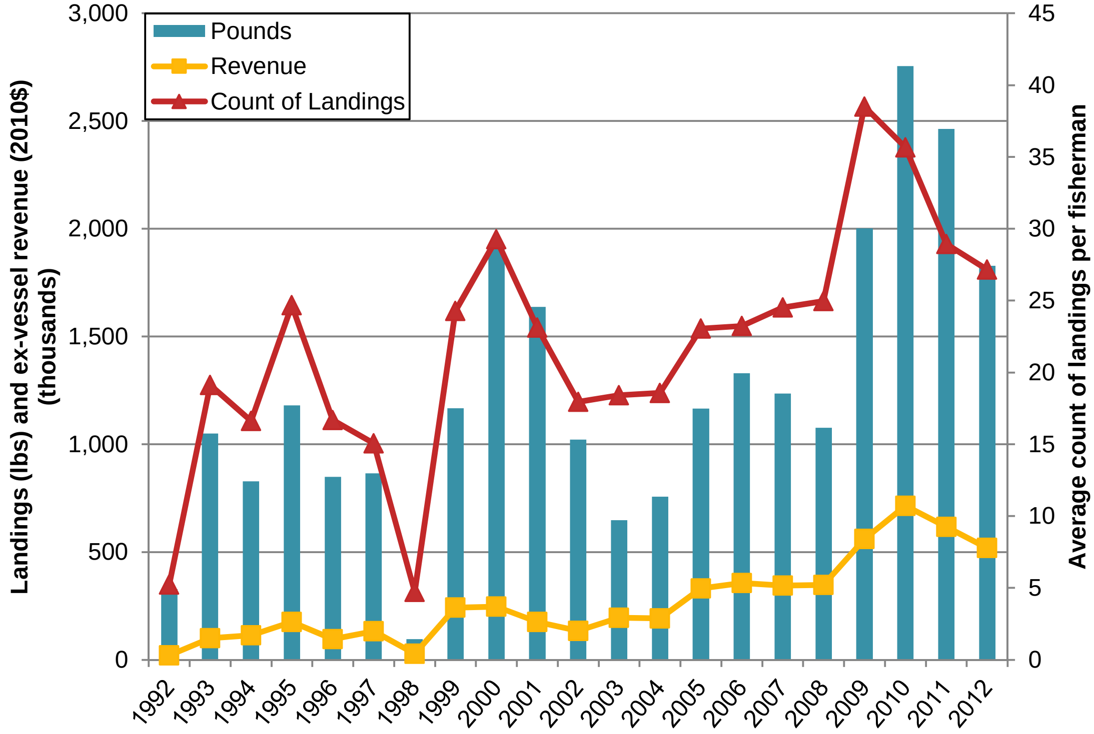
Figure 70 displays the percent change in market squid–net commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. As is typical to a squid fishery, ex-vessel revenue trends varied greatly, increasing one year and decreasing the next. The regional fishery slightly outperformed the state fishery from 2002–2009, but was generally consistent with state level trends over 2002–2012. Overall market squid–net ex-vessel revenue increased 251.1 percent in the South Coast region from 2002 to 2012, by 166.1 percent throughout the state. Trends between the state and regional level were more similar at the per fisherman level, 286.6 percent higher regionally and 224.3 percent higher in the state 2012 from 2002.

Figure 66. Market squid–net commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



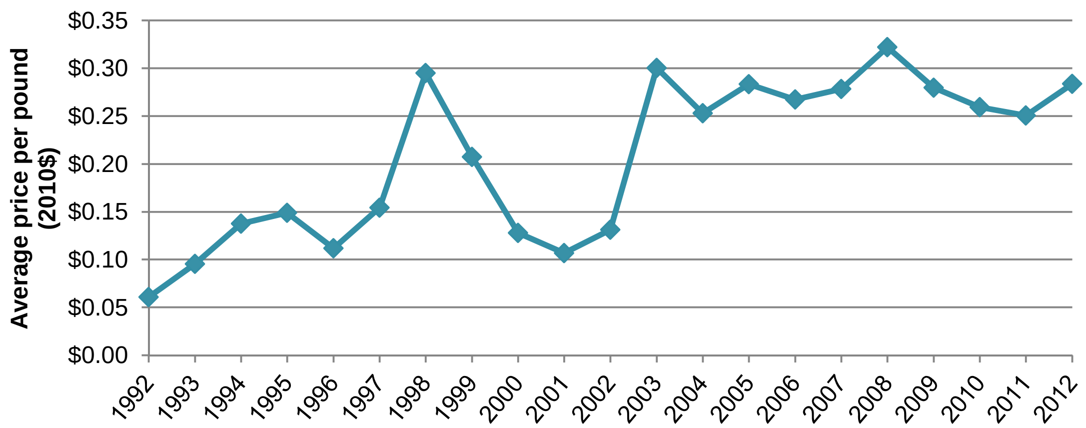
Source: Current study, based off landings data from CDFW.

Figure 67. Market squid–net: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



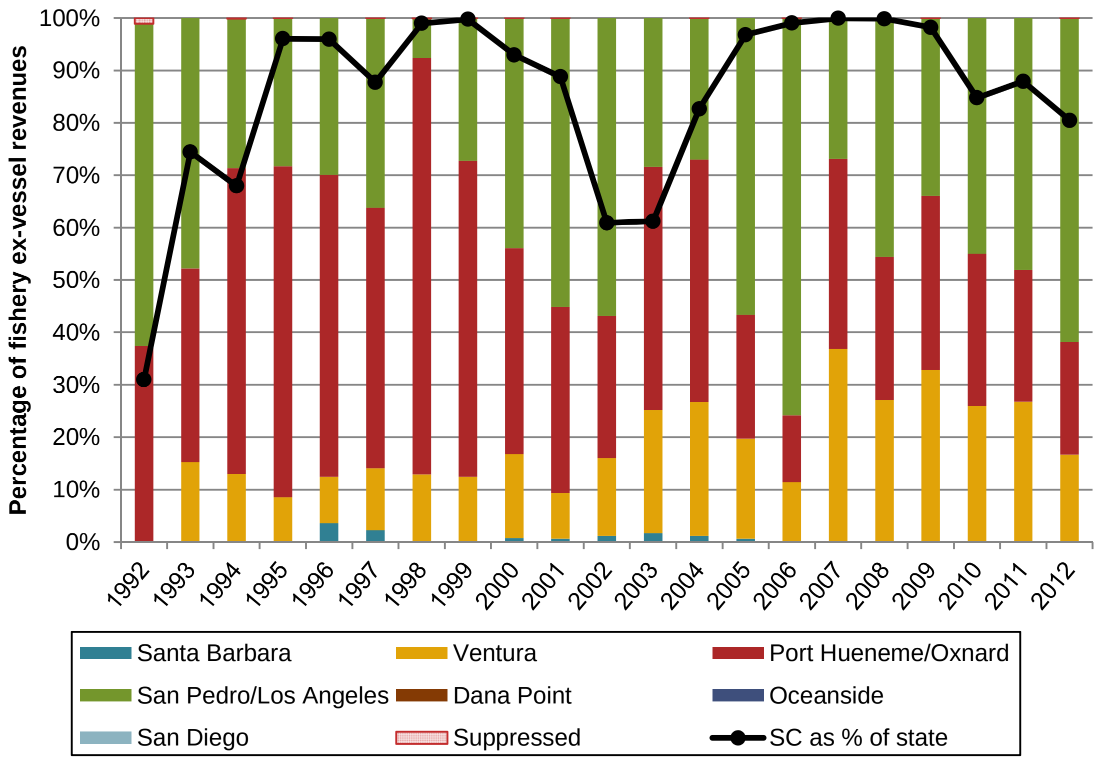
Source: Current study, based off landings data from CDFW.

Figure 68. Market squid–net commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



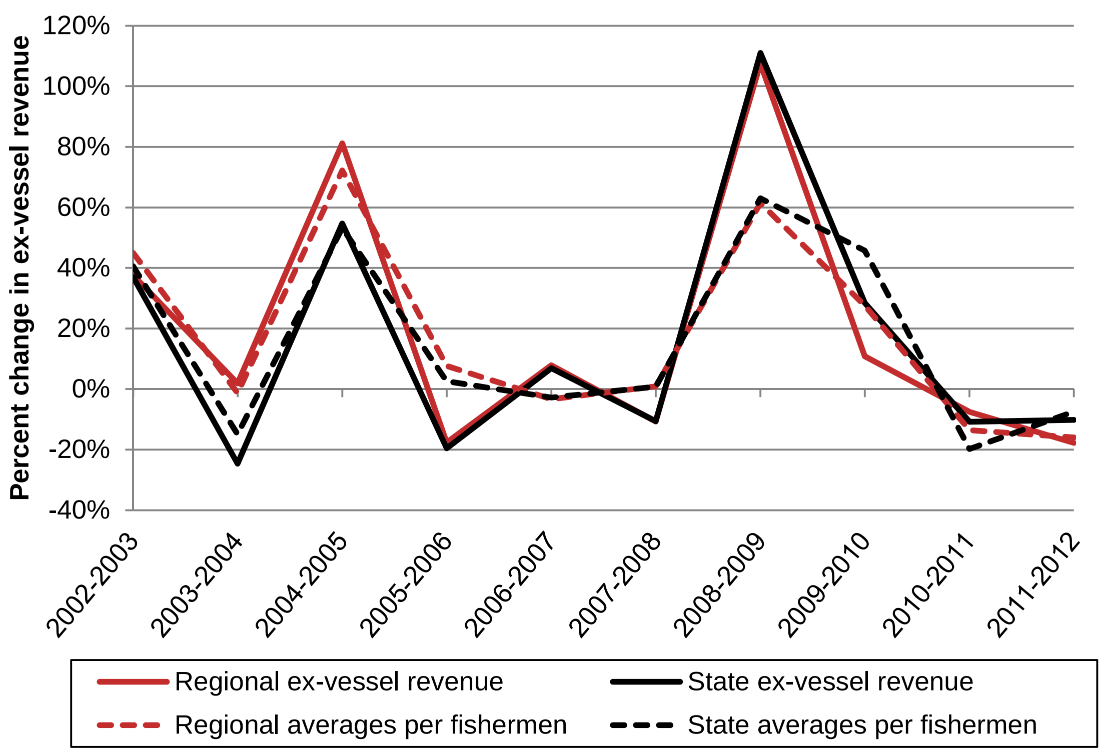
Source: Current study, based off landings data from CDFW.

Figure 69. Market squid–net commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 70. Market squid–net: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 90 individuals made landings in the market squid—net fishery. Combined, they generated $46.7 million in ex-vessel revenue, which is 57.8 percent of the $80.8 million generated by the target interview fisheries over the entire study region. The majority of the market squid—net fishery landings came from San Pedro/Los Angeles (61.9 percent), and was also where the most fishermen in the fishery made landings (66 individuals). We interviewed 11 fishermen in the market squid—net fishery (Table 111).

Table 111. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Market squid—net

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	—	—	—
Ventura	$7,798,682	33	5
Port Hueneme/Oxnard	$10,005,565	38	2
San Pedro/Los Angeles	$28,872,465	66	4
Dana Point	—	—	—
Oceanside	*	1	—
San Diego	—	—	—
Unique individuals	$46,677,219	90	11

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The market squid—net fishermen we interviewed on average were slightly younger and had less Years of experience than the average fisherman throughout the South Coast study region. As shown in

Table 112, the market squid—net fishermen had an average age of 47.9 years, and 27.4 years of experience. Ventura had the oldest fishermen with an average of 51.2 years, and had the fishermen with the most years of experience commercial fishing, 32 years.

Table 112. Average age and years of experience commercial fishing in 2012, Market squid—net

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	—	—	—	—	—	—
Ventura	5	51.2	13.1	5	32.0	16.2
Port Hueneme/Oxnard	2	*	*	2	*	*
San Pedro/Los Angeles	4	35.8	11.0	4	12.3	13.0
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All ports (unique individuals)	11	47.9	15.2	11	27.4	18.6

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 113, across the study region there was an increase of 15.6 percent in percent income coming from commercial fishing between 2008 and 2012. This increase in percent income from commercial fishing was true at both ports displayed below, but less so at Ventura with a smaller average percent increase of 2.6 percent. The majority (81.8 percent) of squid fishermen in all ports perceived no change in income (Table 114). The only two reasons given for a change included less revenue from other income sources and that the fisherman had been spending more time fishing (Table 115). Again, it is important to note that this question was not asked in regards to market squid—net specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 113. Percent change in income from overall commercial fishing from 2008 - 2012, Market squid—net

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	—	—	—	—	—	—	—
Ventura	4	97.5%	5.0%	5	100.0%	—	2.6%
Port Hueneme/Oxnard	2	*	*	2	*	*	*
San Pedro/Los Angeles	33	84.1%	29.1%	4	100.0%	—	18.9%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	5	100.0%	—	—	—	—	—
All ports (unique individuals)	44	86.1%	27.6%	11	99.5%	1.5%	15.6%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 114. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Market squid—net

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	—	—	—	—	—	—
Ventura	5	20.0%	—	80.0%	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*
San Pedro/Los Angeles	4	—	25.0%	75.0%	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All Ports (unique individuals)	11	9.1%	9.1%	81.8%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 115. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Market squid--net

Fishery	Number responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/ Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	2	—	—	1	1	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

As shown in Table 116, there was a decrease of 13.4 percent in the overall average percent change in gross economic revenue used for operating costs from 2008 to 2012. Despite this decrease, across all ports the majority of respondents perceived no change (60 percent) and some even perceived significantly higher (30 percent) change in gross economic revenue going toward expenses (Table 117). The most commonly cited reasons were the increase in fuel prices and the increase in costs of goods and labor (Table 118).

Table 116. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Market squid—net

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	—	—	—	—	—	—	—
Ventura	4	65.0%	5.8%	5	48.8%	24.6%	-25.0%
Port Hueneme/Oxnard	2	*	*	2	*	*	*
San Pedro/Los Angeles	29	50.8%	20.0%	4	48.8%	30.1%	-4.0%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	5	57.2%	20.6%	—	—	—	—
All ports (unique individuals)	40	52.6%	19.3%	11	45.6%	25.7%	-13.4%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 117. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Market squid—net

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	—	—	—	—	—	—
Ventura	4	—	25.0%	75.0%	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*
San Pedro/Los Angeles	4	25.0%	—	75.0%	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All Ports (unique individuals)	10	30.0%	10.0%	60.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 118. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Market squid—net

		Responses indicating increase														Responses indicating decrease		
Fishery	**Number responding**	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	1	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	4	4	1	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 119, fishermen in Ventura had the most experience at 20.4 years in the market squid—net fishery, but those in the San Pedro/Los Angeles area targeted the fishery more days in 2012, 106 days. Crew is commonly used in the market squid—net fishery. Both Ventura and San Pedro/Los Angeles carried about four crew members, but San Pedro/Los Angeles respondents indicated they give about 5 percent more than Ventura of gross economic revenue to crew members, on average 43.4 percent (Table 120).

Table 119. Years of experience and number of days targeting specific fisheries in 2012, Market squid—net

Port	Years of experience in fishery			Number of days targeting fishery in 2012		
	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	—	—	—	—	—	—
Ventura	5	20.4	13.7	5	81.0	36.1
Port Hueneme/Oxnard	2	*	*	2	*	*
San Pedro/Los Angeles	4	12.5	5.9	4	106.0	35.6
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 120. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Market squid—net

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	—	—	—	—	—	—	—	—	—
Ventura	5	4.2	0.4	5	38.2%	8.9%	5	7.5%	3.3%
Port Hueneme/Oxnard	2	*	*	2	*	*	2	*	*
San Pedro/Los Angeles	4	4.0	2.2	4	43.3%	8.5%	4	12.7%	6.4%
Dana Point	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

All respondents were asked to compare his/her success in the market squid—net fishery in 2012 to the previous ten years. As shown in Table 121 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 122), economic (Table 123), regulatory (no data), and other factors (Table 124).

Most respondents for the market squid—net fishery indicated that their overall success was somewhat better (50 percent) or significantly better (40 percent) in 2012 relative to the preceding 10 years. Among the most commonly cited factors positively influencing fishermen's success over the past 10 years were the abundance of fish and good prices.

Table 121. Overall success in specific commercial fishery, 2012 compared to previous ten years, Market squid—net

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	—	—	—	—	—	—	—
Ventura	4	—	50.0%	25.0%	25.0%	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*	*
San Pedro/Los Angeles	4	—	25.0%	75.0%	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	10	—	40%	50%	10%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 122. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Market squid—net

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—
Ventura	2	1	—	1	—	—	—	—	—	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	4	4	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	8	6	—	3	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 123. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Market squid—net

Ports	Number responding	Positive			Negative			
		A	B	C	D	E	F	G
Santa Barbara	—	—	—	—	—	—	—	—
Ventura	2	2	—	—	—	—	—	—
Port Hueneme/Oxnard	1	*	*	*	*	*	*	*
San Pedro/Los Angeles	3	3	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—
All ports (unique individuals)	6	6	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 124. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, Market squid—net

		Positive						Negative						
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	1	1	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

3.5.7. Nearshore finfish–fixed gear: Initial Changes and Baseline Characterization

The nearshore finfish fishery is a California state managed fishery and is comprised of 19 different species of groundfish found primarily in rocky reef or kelp habitat. Nearshore finfish were traditionally fished with gill net and trawl gear but these gear types have decreased in use as stricter regulations have been enacted such as the Rockfish Conservation Area (RCA) and other depth and area restrictions (CDFG 2002). During the 1990s groundfish landings decreased by 60 percent largely from these restrictions and the use of hook and line, longline, and trap gear increased to target nearshore finfish. (For the purposes of this report, the fixed gear category refers to the combination of hook and line and longline gear types.) Since the late 1990s the nearshore fishery has shifted into the live fish fishery due to the development of the market in response to Asian markets in the San Francisco and Los Angeles areas. Typically, buyers are willing to pay a much higher price for high quality live fish (CDFG 2002). In interviews fishermen noted that the live fish fishery makes up the majority of the nearshore finfish catch now and often dead fish are landed only if they cannot be sold as live fish.

Nearshore fixed gear fisheries are highly regulated under a variety of different management structures. The California Nearshore Fishery Management Plan in 2002 established permits to fish in nearshore waters (e.g., nearshore rockfish or deeper nearshore rockfish permits); limited the number of permits issued in each management region in California, and set individual quota limits. Additionally, in 2002 the Rockfish Conservation Area was implemented, restricting the depth of fishable areas. Currently, the number of nearshore and deeper nearshore permits issued are above target management goals and thus fishermen wishing to enter the fishery must purchase two permits from existing fishermen within their management region and retire one permit (CDFG 2002).

In the report we provide commercial landings and ex-vessel revenue data on the Nearshore finfish-dead fishery, however, we did not target this fishery for interviews with fishermen as the nearshore finfish fishery is now focused upon the live fish fishery. Landed dead fish are often fish caught in the live fish fishery but did not survive the trip to the landings site and thus are a byproduct of the live fish fishery. We provide nearshore finfish-dead fishery landings and ex-vessel revenue data to provide additional context and a historical perspective.

Nearshore finfish–dead–hook & line

The nearshore finfish–dead–hook & line fishery in the South Coast region experienced steep declines in ex-vessel revenue, landings, and number of fishermen over the study period. As Figure 71 displays, landings decreased exponentially from 1992 from 109,444 pounds of nearshore finfish–dead–hook & line to 1,374 pounds landed 2011, which was the lowest quantity of landings in the study period. In 1992 ex-vessel revenue was at $191,037 decreasing over the study period to its lowest value in 2011 of $1,424. Overall, ex-vessel revenue declined by 98.5 percent from 1992 to 2012. Simultaneously, the number of nearshore finfish–dead–hook & line fishermen decreased by 88.1 percent from a high in 1992 of 160 fishermen to 19 by 2012.

The average annual ex-vessel revenue per fisherman in the nearshore finfish–dead–hook & line fishery decreased over the study period from $1,194 in 1992 to $97 by 2009; in 2012 the average fisherman made $153 in ex-vessel revenue. Commercial landings per fisherman also decreased in the nearshore finfish–dead–hook & line fishery, with the average fisherman landing 84.1 percent less pounds in 2012 than his 1992 counterpart.

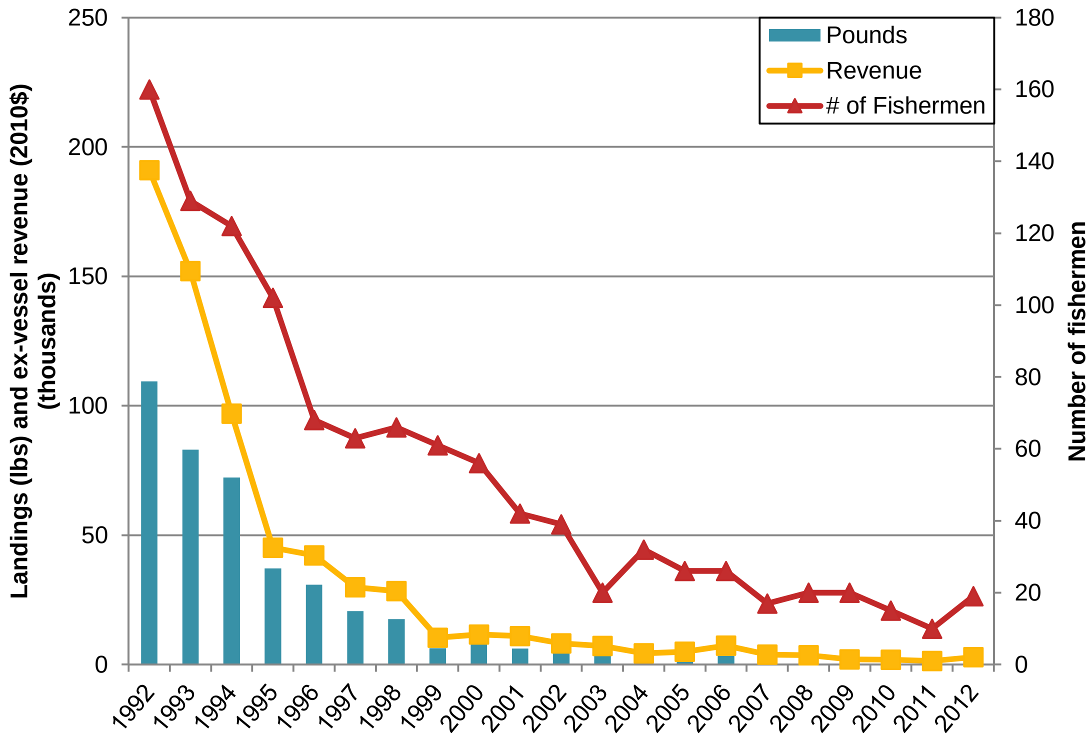
The ex-vessel price per pound in the nearshore finfish–dead–hook & line fisher declined over the study period, with a high of $2.36 observed in 2007. Figure 73 shows that over the study period, the ex-vessel price per pound decreased by 19.5 percent from 1992 to 2012, and the average annual ex-vessel price was $1.62 per pound in this fishery.

Figure 74 displays ex-vessel revenue for the nearshore finfish–dead–hook & line commercial fishery across South Coast ports over the study period of 1992–2012. While San Pedro/Los Angeles often contributed the greatest portion of ex-vessel revenue to the study region at almost 50 percent annually on average, other ports grew and declined in significance over the study period. For example, San Diego in

1993 represented only 5.9 percent of regional totals and 57.9 percent in 2012. Similarly, Port Hueneme/Oxnard represented only one percent of regional totals in 2009 while in 2003 was responsible for 25.1 percent.

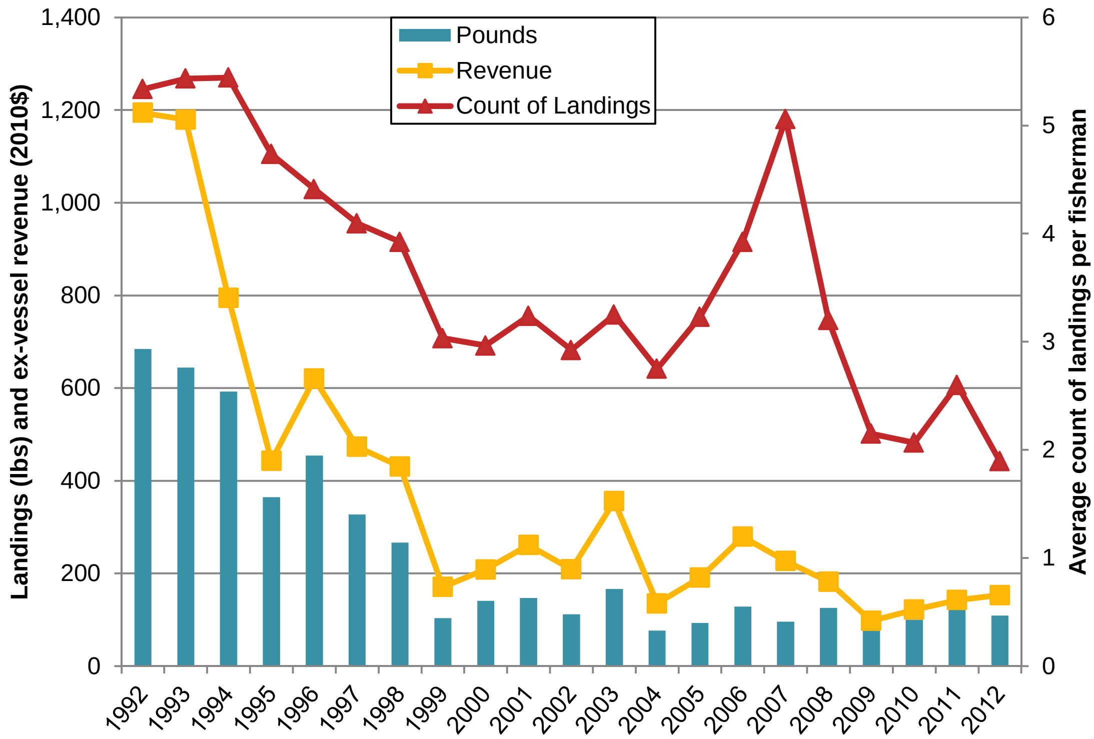
Figure 75 displays the percent change in nearshore finfish–dead–hook & line commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Unlike many other fisheries of interest, the nearshore finfish–dead–hook & line fishery regional trends varied significantly from state trends. This isn't surprising, however, as regional landings fell, so did the portion of South Coast ex-vessel revenue in this fishery to total state nearshore finfish–dead–hook & line ex-vessel revenue; constituting almost 35 percent in 1992, regional ex-vessel revenue made up under 5 percent of state total for the majority of the latter half of the study period. For almost every year from 2000–2012, regional trends were opposite of state trends. For example, in 2004 state ex-vessel revenue overall and per fishermen increased by 35.8 percent and 32.6 percent respectively, while regional ex-vessel revenue fell by 39.3 percent overall and 62.1 percent per fisherman from 2003 levels. By 2012, this mirrored trend continued; total regional ex-vessel revenue increased by 104.5 percent (from $1,424 to $2,912) while state ex-vessel revenue declined by 17.1 percent (from $53,417 to $44,263).

Figure 71. Nearshore finfish–dead–hook & line commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



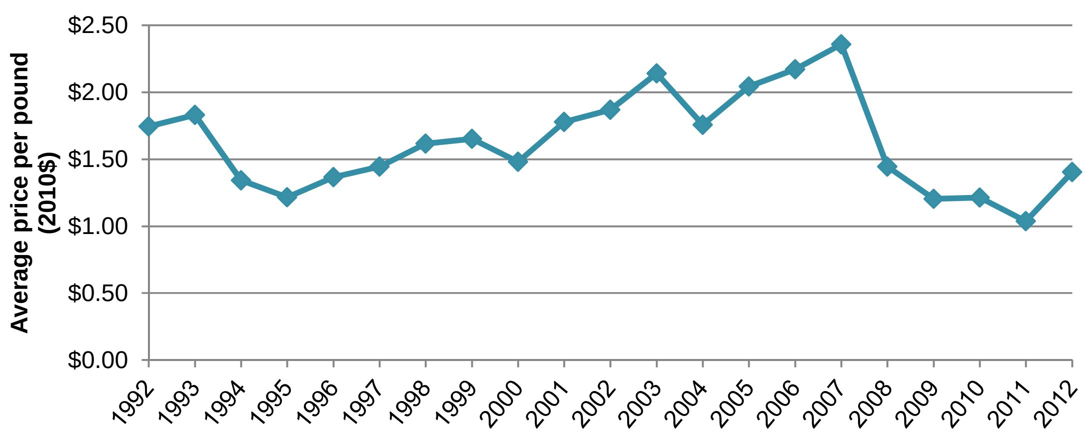
Source: Current study, based off landings data from CDFW.

Figure 72. Nearshore finfish–dead–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



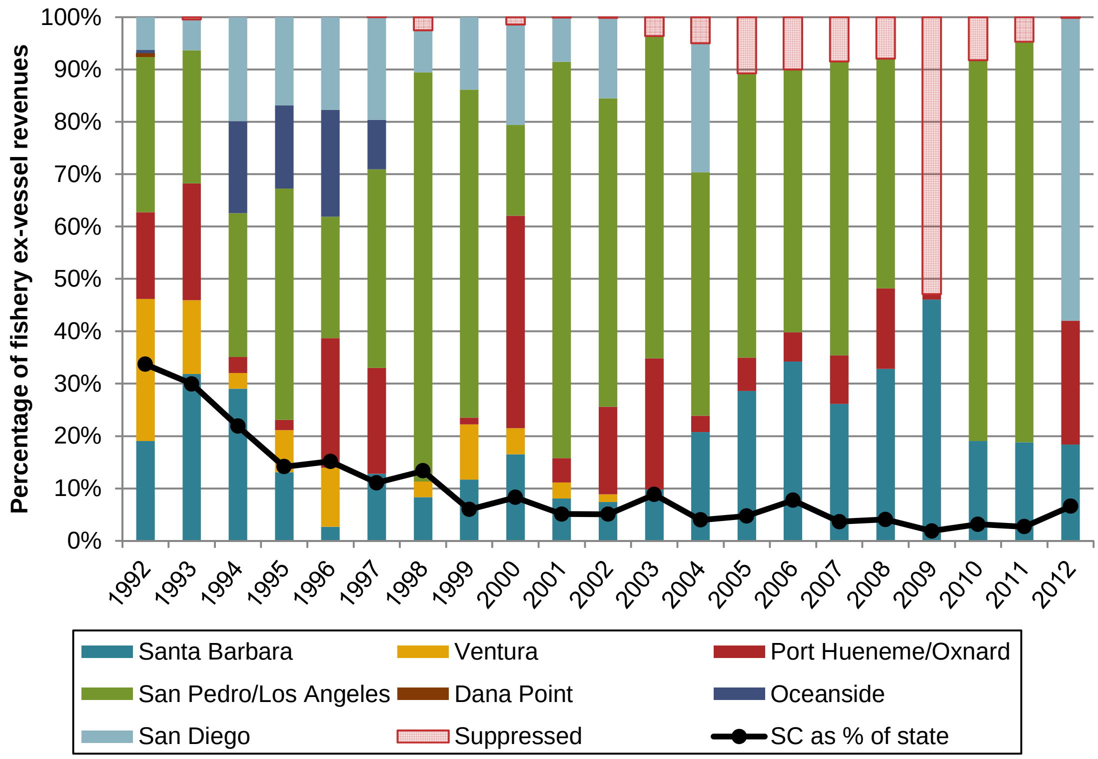
Source: Current study, based off landings data from CDFW.

Figure 73. Nearshore finfish–dead–hook & line commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



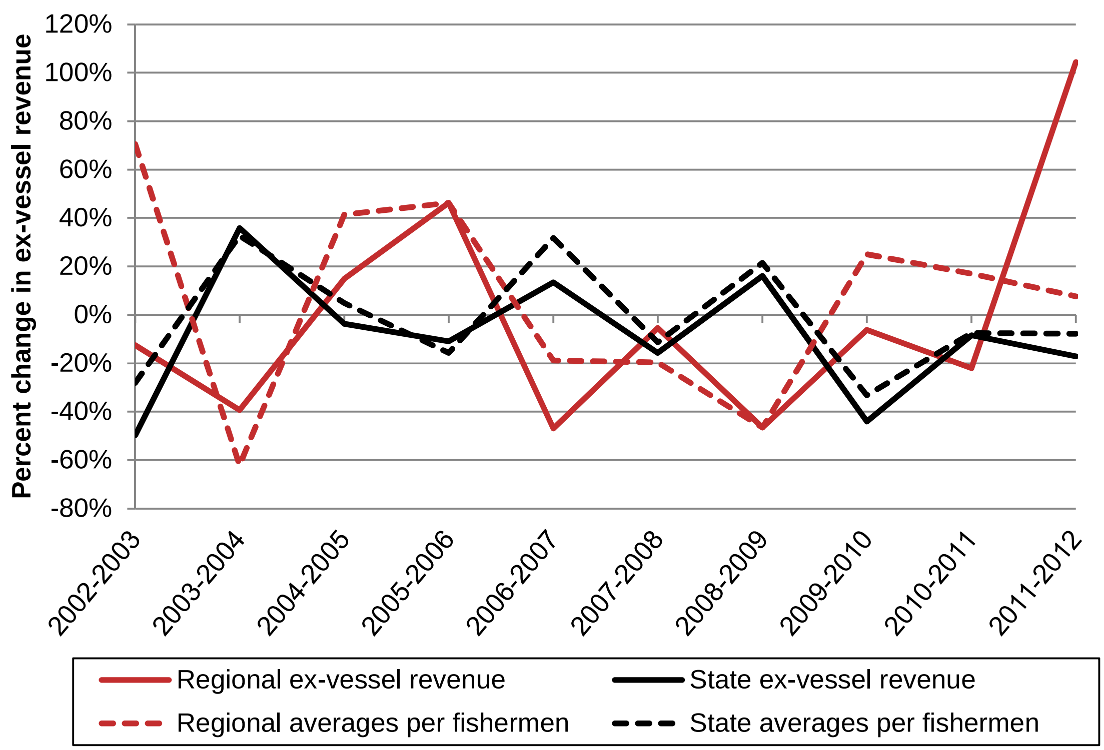
Source: Current study, based off landings data from CDFW.

Figure 74. Nearshore finfish–dead–hook & line commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 75. Nearshore finfish–dead–hook & line: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

Nearshore finfish–dead–longline

Figure 76 displays landings, ex-vessel revenue, and number of participating fishermen in the nearshore finfish–dead–longline fishery from 1992–2012. Despite an overall peak in the late 1990's for commercial landings, ex-vessel revenue and number of fishermen declined throughout the majority of the study period leaving the fishery as one of the smallest in the South Coast region. However, the fishery is in general decline throughout the state, and ex-vessel revenue from the South Coast region constituted over 50 percent of state totals in 2010 with only 608 pounds landed for $756 by six fishermen. The region has seen more prosperous years however, commercial landings peaked in 1996 at 45,353 pounds, the number of participating fishermen was 44 at most in 1997, and ex-vessel revenue peaked in 1998 at $58,943. The most recent data from 2012 saw ex-vessel revenue for this fishery at $1,682 for 1,089 pounds landed by 6 fishermen.

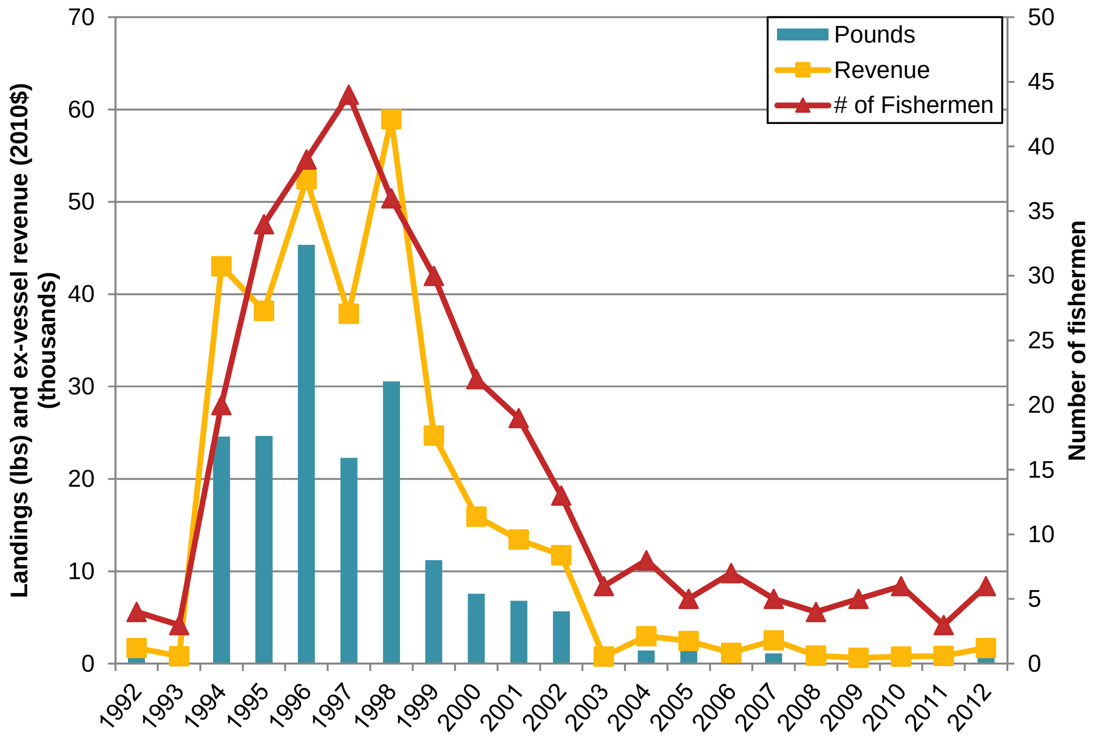
Figure 77 displays the landings, ex-vessel revenue, and a count of landings by the average fisherman in the nearshore finfish–dead–longline fishery over 1992–2012. Average landings and ex-vessel revenue per fisherman varied throughout the study period, peaking in 1994 at 1,230 pounds for $2,151 made over seven landings throughout the year. These values fell substantially by 2012, when the average fisherman landed only twice throughout the year for a total of 181 pounds for $280 in ex-vessel revenue.

The ex-vessel price of a pound of nearshore finfish–dead–longline has remained relatively stable despite large decreases in activity in this fishery by the end of the study period, see Figure 78. Beginning in 1992 at $1.45 per pound, by 2012 the average ex-vessel price per pound increased by only 6.6 percent to $1.55. The lowest observed average price per pound occurred in 2003 at $0.93 while the high occurred in 2007 at $2.27. The average price per pound over 1992–2012 was $1.78 for nearshore finfish–dead–longline.

Figure 79 displays ex-vessel revenue for the nearshore finfish–dead–longline commercial fishery across South Coast ports over the study period of 1992–2012. Landings in this port were relatively infrequent over the study period. But in the early years, 1994–2002 the ports of San Pedro/Los Angeles, Port Hueneme/Oxnard, and Ventura were the most active in the nearshore finfish–dead–longline fishery. At the end of the study period, Santa Barbara constituted the majority of regional ex-vessel revenue, at 88.9 percent in 2009 and 63.7 percent in 2010.

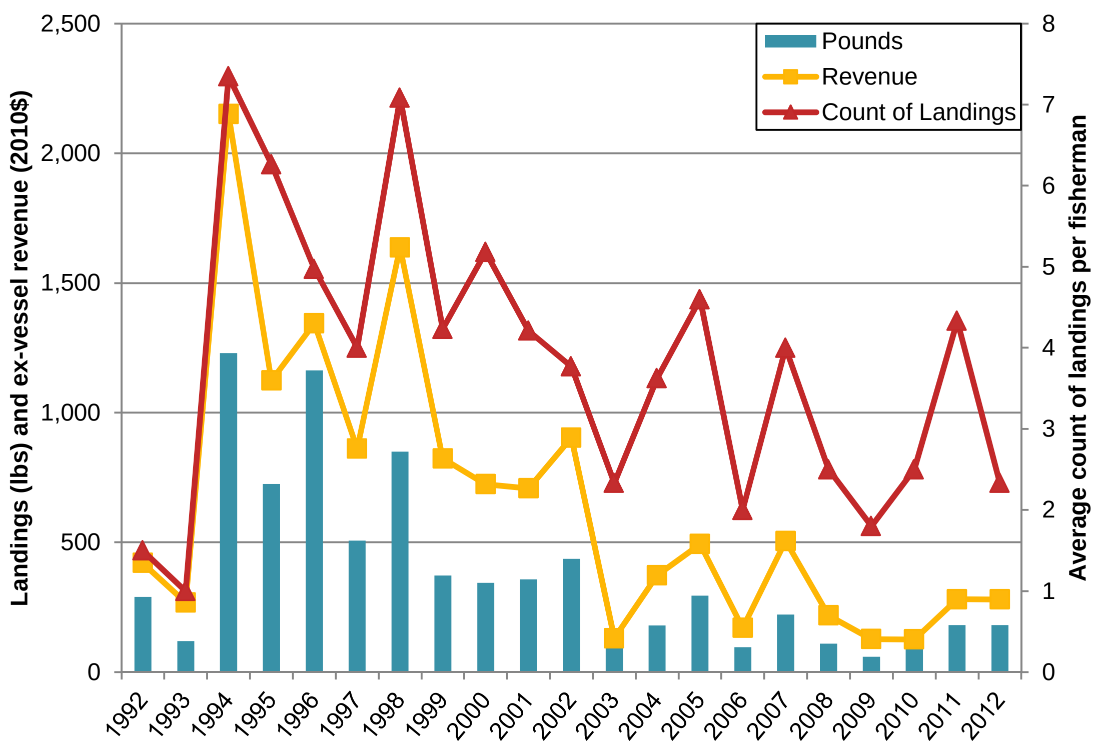
Figure 80 displays the percent change in nearshore finfish–dead–longline commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Regional trends largely outperformed state trends, with total ex-vessel revenue increasing substantially in 2004 both overall (281.9 percent) and per fisherman (186.4 percent) while state total ex-vessel revenue decreased by 4.2 percent and average ex-vessel revenue per fishermen increased by only 19.8 percent throughout the state. From 2005 onwards, trends became more closely aligned, with the region continuing to fare better than the state in general.

Figure 76. Nearshore finfish–dead–longline commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



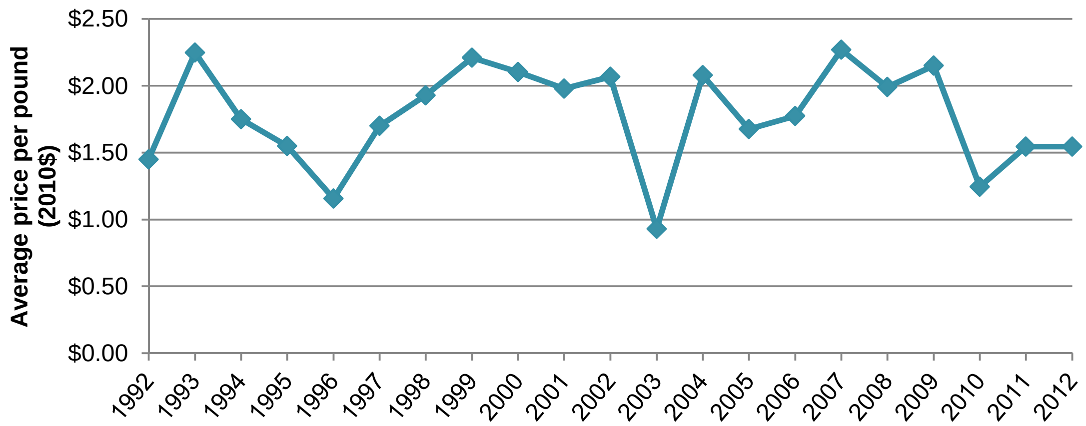
Source: Current study, based off landings data from CDFW.

Figure 77. Nearshore finfish–dead–longline: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



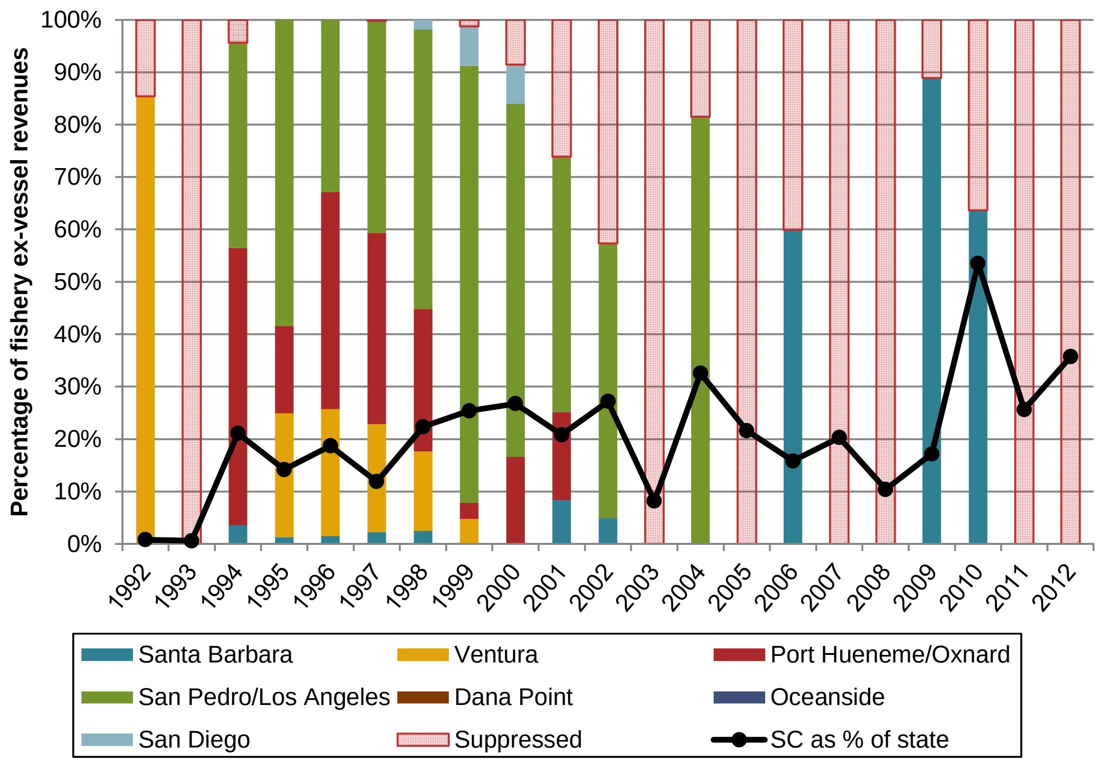
Source: Current study, based off landings data from CDFW.

Figure 78. Nearshore finfish–dead–longline commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



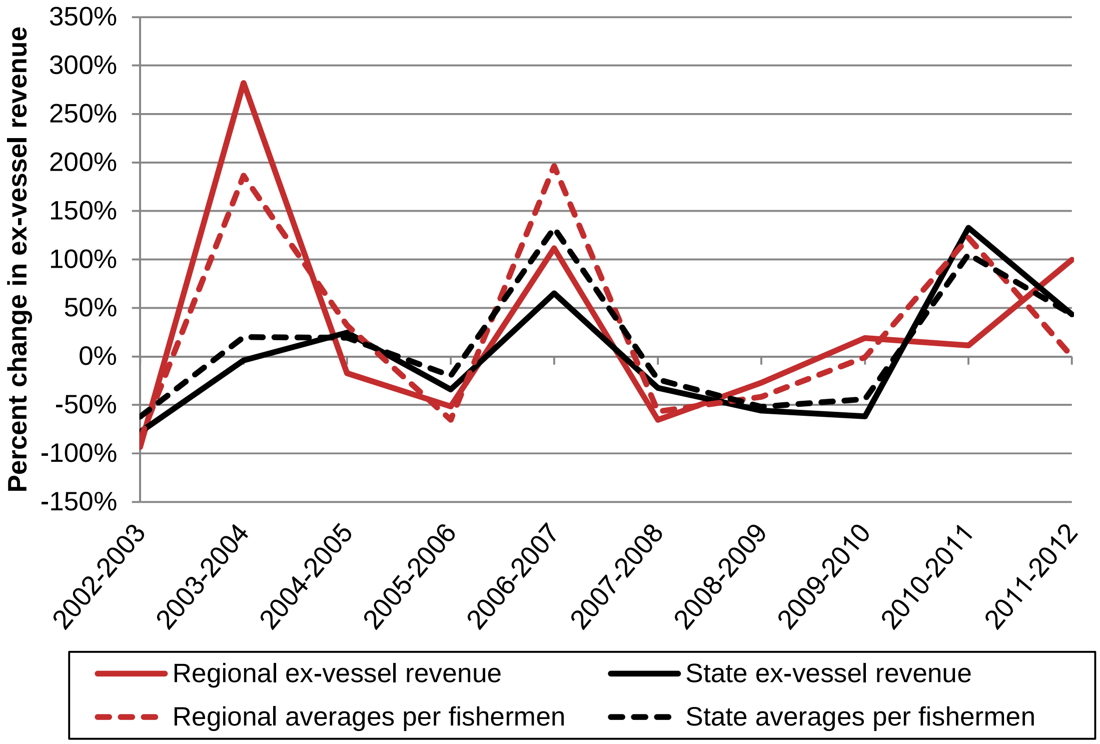
Source: Current study, based off landings data from CDFW.

Figure 79. Nearshore finfish–dead–longline commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 80. Nearshore finfish–dead–longline: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

Nearshore finfish–live–hook & line

Figure 81 displays landings, ex-vessel revenue, and number of participating fishermen for the nearshore finfish–live–hook & line fishery from 1992–2012 in the South Coast. Commercial landings decreased 79.9 percent overall from a maximum in 1992 of 94,386 pounds to 18,954 pounds in 2012. Ex-vessel revenue also decreased by 71.7 percent from $456,002 in 1992 to $129,222 in 2012, though peaking in 2000 at a value of $546,552.The number of participating fishermen closely followed ex-vessel revenue trends, and by the end of the study period there were 20 fishermen in the nearshore finfish–live–hook & line fishery.

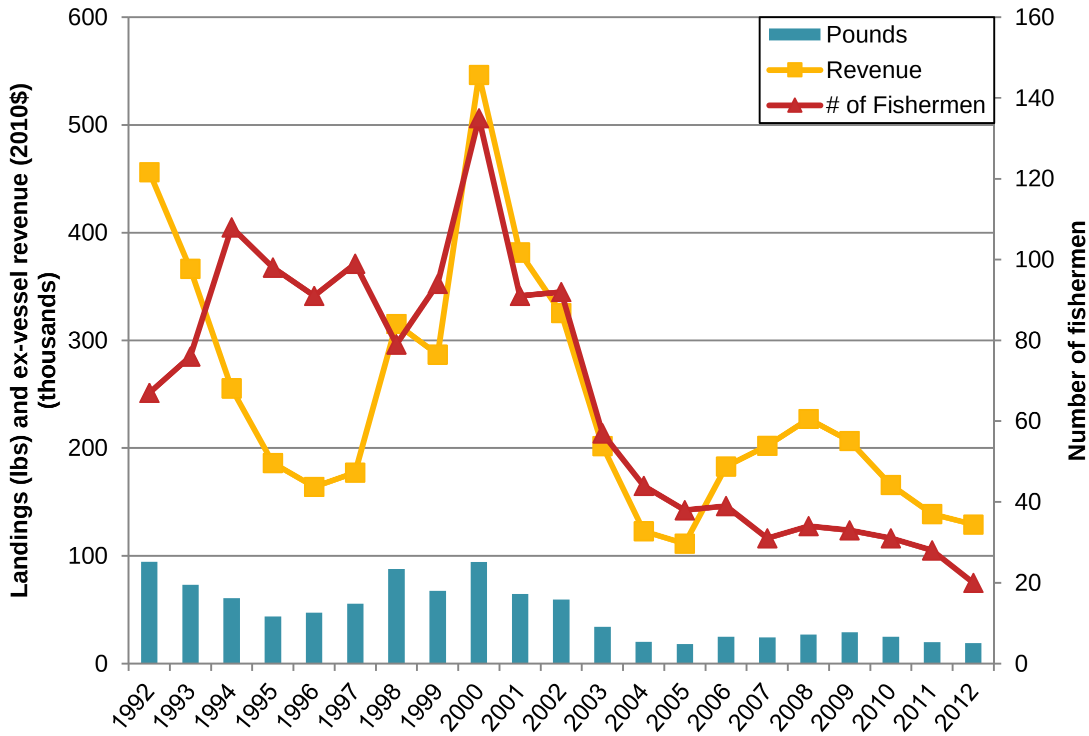
Despite an immediate decline at the beginning of the study period, nearshore finfish–live–hook & line landings and ex-vessel revenue per average fisherman increased from 1997 to the end of the study period, almost reaching 1992 levels by 2012, see Figure 82. By 2012, the average fisherman in this fishery landed 948 pounds for $6,461 in ex-vessel revenue over 11 landings made throughout the year.

Nearshore finfish–live fisheries experienced higher prices relative to other fisheries of interest. Overall, the average ex-vessel price per pound in the nearshore finfish–live–hook & line fisher has grown over the study period in the South Coast region, see Figure 83. Falling to a minimum value in 1997 at $3.18 per pound, the average ex-vessel price peaked at $8.42 in 2008; in 2012 the price per pound was $6.82. Over 1992–2012, average annual ex-vessel price was $5.70 per pound.

Figure 84 displays ex-vessel revenue for the nearshore finfish–live–hook & line commercial fishery across South Coast ports over the study period of 1992–2012. The majority of ex-vessel revenue for this fishery was made in Santa Barbara, constituting 61.9 percent annually of total ex-vessel revenue across South Coasts ports on average. Following were Port Hueneme/Oxnard with 21.6 percent and San Pedro/Los Angeles with 9.4 percent on average annually. In 1992 Santa Barbara constituted only 20.5 percent of regional nearshore finfish–live–hook & line ex-vessel revenue, and 83.9 percent by 2012.

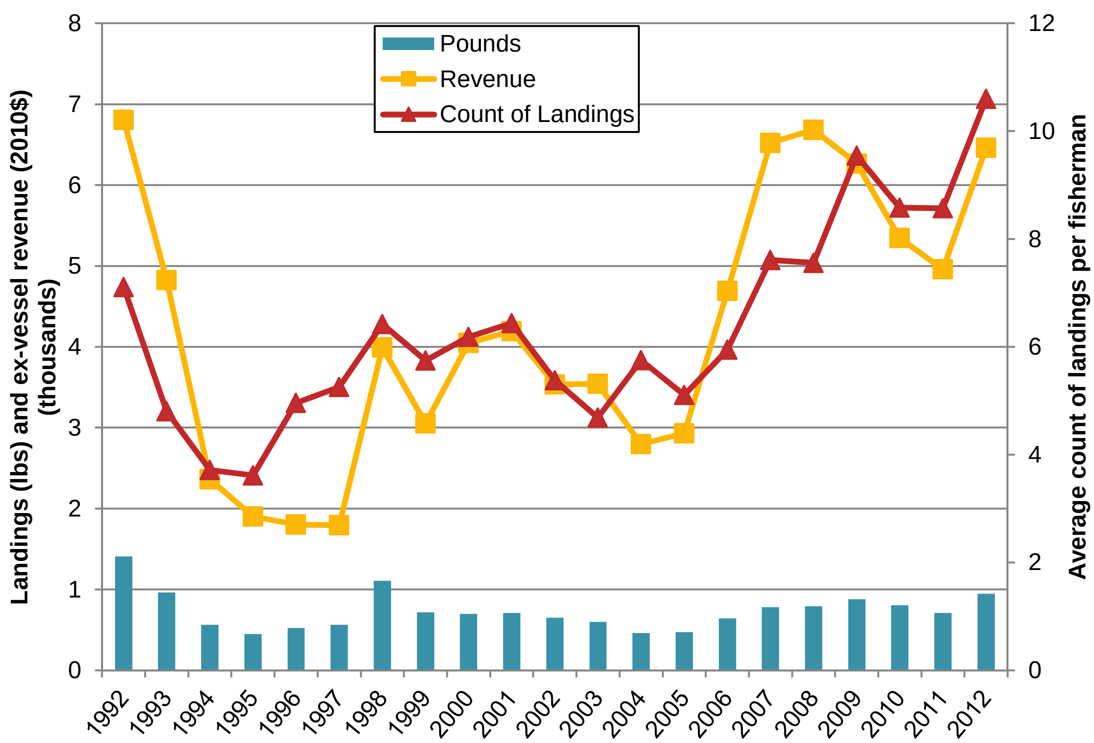
Figure 85 displays the percent change in nearshore finfish–live–hook & line commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. From 2002–2005, the regional fishery fared poorer than the state fishery overall, but in 2006 total ex-vessel revenue increased by 64.3 percent from 2005 regionally while the state fishery saw an increase of only 15.7 percent over the same time. Average per fishermen ex-vessel revenue trends followed the total overall trends for both the region and the state; increasing regionally in 2006 by 560.1 percent and by 19 percent throughout the state. From 2007 onwards, regional trends more closely aligned with state trends, faring slightly better in 2012, especially at the individual fisherman level (30.2 percent increase in ex-vessel revenue while all other trends decreased).

Figure 81. Nearshore finfish–live–hook & line commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



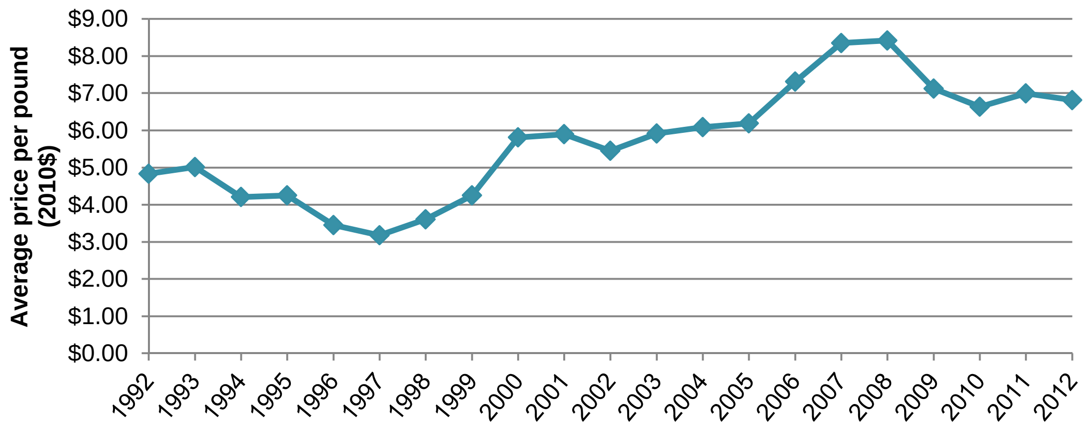
Source: Current study, based off landings data from CDFW.

Figure 82. Nearshore finfish–live–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



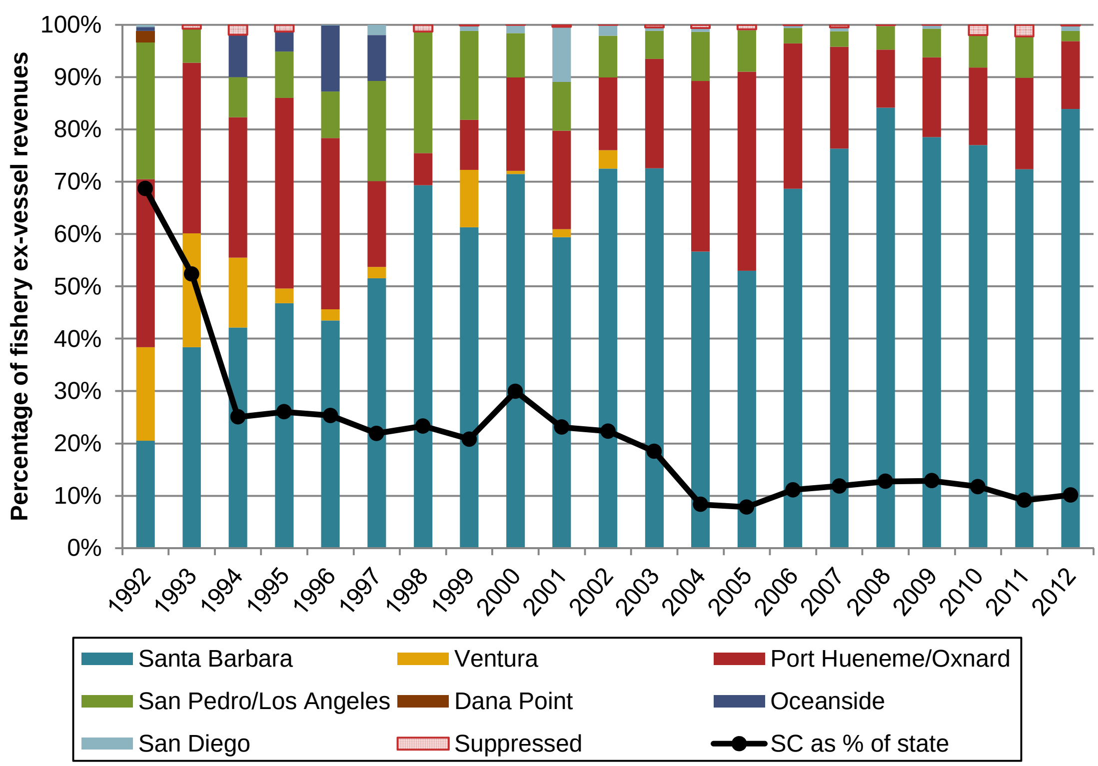
Source: Current study, based off landings data from CDFW.

Figure 83. Nearshore finfish–live–hook & line commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



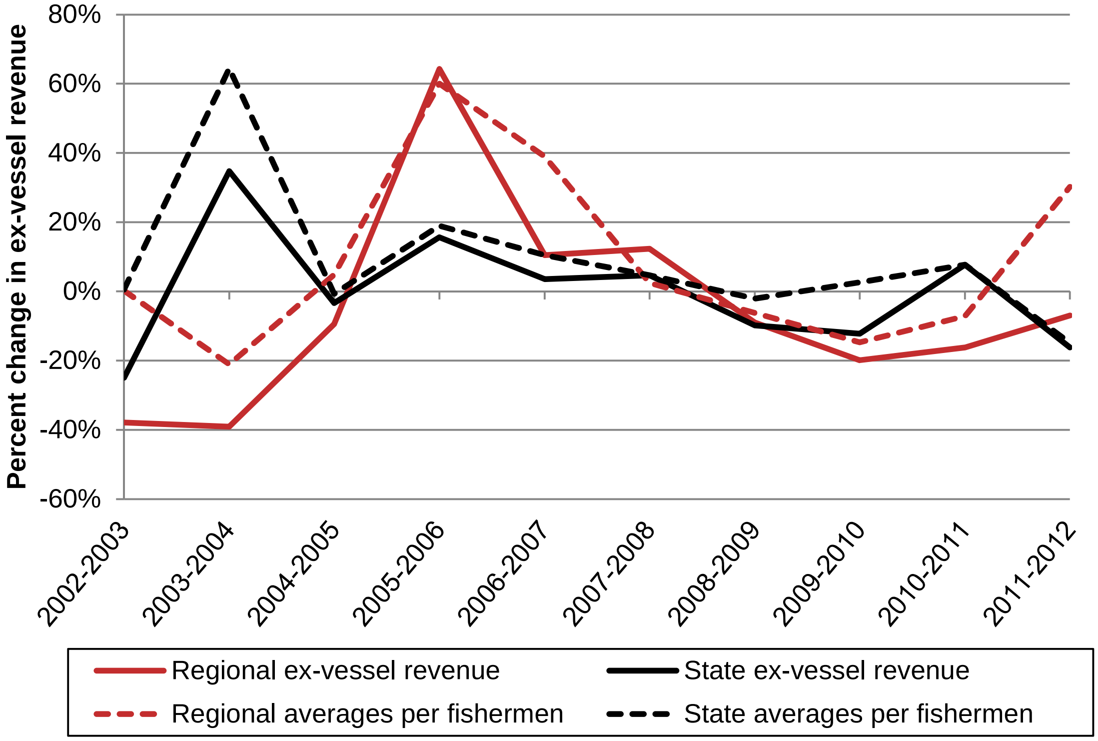
Source: Current study, based off landings data from CDFW.

Figure 84. Nearshore finfish–live–hook & line commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 85. Nearshore finfish–live–hook & line: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

Nearshore finfish–live–longline

Figure 86 displays commercial landings, ex-vessel revenue, and the number of fishermen for the nearshore finfish–live–longline fishery in the South Coast from 1992–2012. Commercial landings and ex-vessel revenue were highest in 1995 at 53,739 pounds for $297,524, after which they decreased relatively steadily until 2008. 2007 and 2008 had the lowest observed landings and ex-vessel revenue respectively, at 4,234 pounds and $21,834. The number of participatory fishermen in the nearshore finfish–live–longline fishery peaked in 1996 at 64, and had fallen 71.4 percent by 2012 to eight.

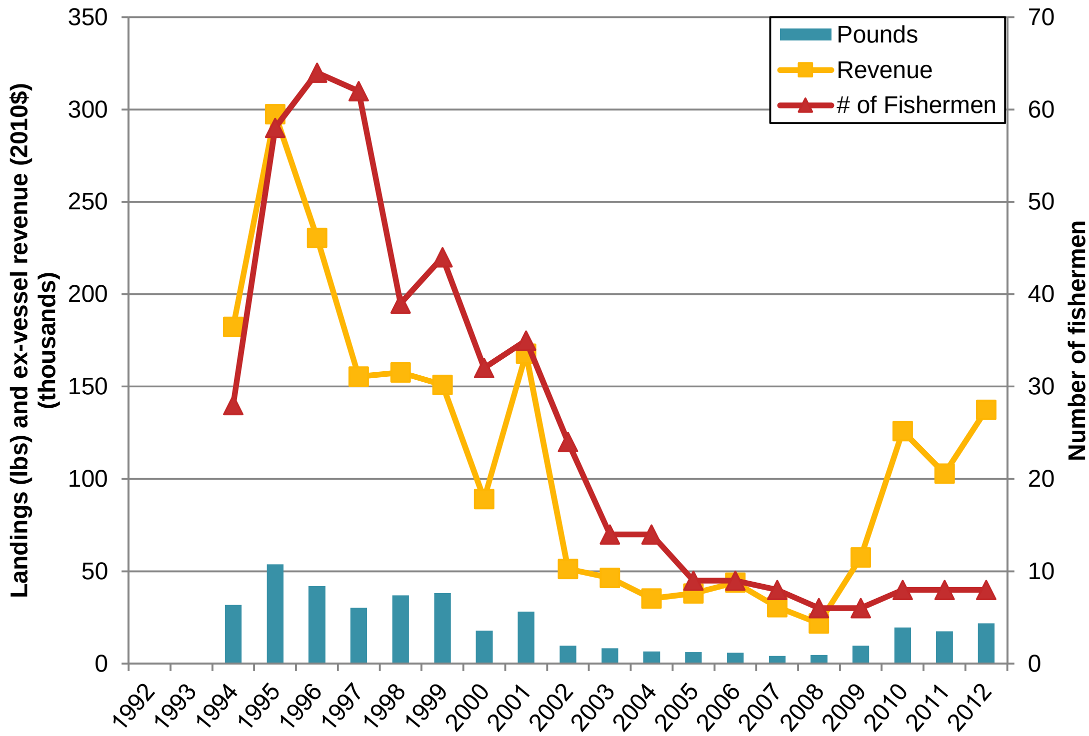
Figure 87 displays the average landings, ex-vessel revenue, and count of landings per fisherman for this fishery; which had increased substantially by the end of the study period. In 1994 the average nearshore finfish–live–longline fisherman landed 1,136 pounds for $6,511 over 5 landings made throughout the year. By 2012, the average fisherman landed 24 times a year, bringing in a total of 2,725 pounds for $17,183, or nearly three times as much the 1994 amounts. Still, less was made during the middle of the study period, when the per fisherman landings declined as low as 408 pounds for $2,139 on average, as seen in 2002.

Figure 88 displays the average ex-vessel price per pound observed in the South Coast region for the nearshore finfish–live–longline fishery over 1992–2012 The lowest price during the study period per pound of product was $3.95 in 1999, the highest was $7.37 in 2006. 2012 prices were on average 9.9 percent lower than 1992 prices; the average annual ex-vessel price per pound for this fishery over the duration of the study period was $5.64.

Figure 89 displays ex-vessel revenue for the nearshore finfish–live–longline commercial fishery across South Coast ports over the study period of 1992–2012. Santa Barbara, on average, represented 74.8 percent of annual ex-vessel revenue across the region. Most remaining ex-vessel revenue were landed in San Pedro/Los Angeles (15.9 percent) and Port Hueneme/Oxnard (15.7 percent), though landings from this latter port were less frequent over the study period.

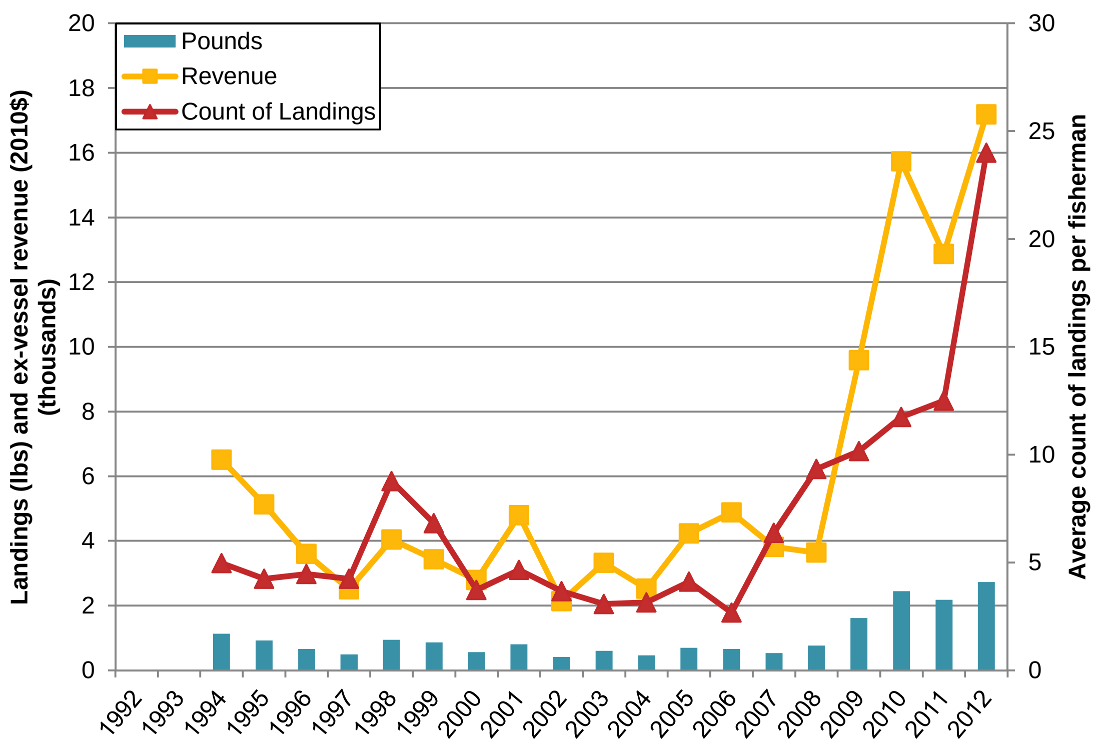
Figure 90 displays the percent change in nearshore finfish–live–longline commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. As ex-vessel revenue picked up regionally towards the end of the study period, regional trends outpaced state trends for this fishery. For example, from 2008 to 2009 regional ex-vessel revenue, both total and for the average fisherman, increased by 163.9 percent; over the same time period, the state fishery actually declined by 40.7 percent overall and by 17.8 percent at the level of the average fisherman. After 2009, the South Coast nearshore finfish–live–longline fishery constituted closer to half of state ex-vessel revenue, during which regional and state trends became more similar.

Figure 86. Nearshore finfish–live–longline commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



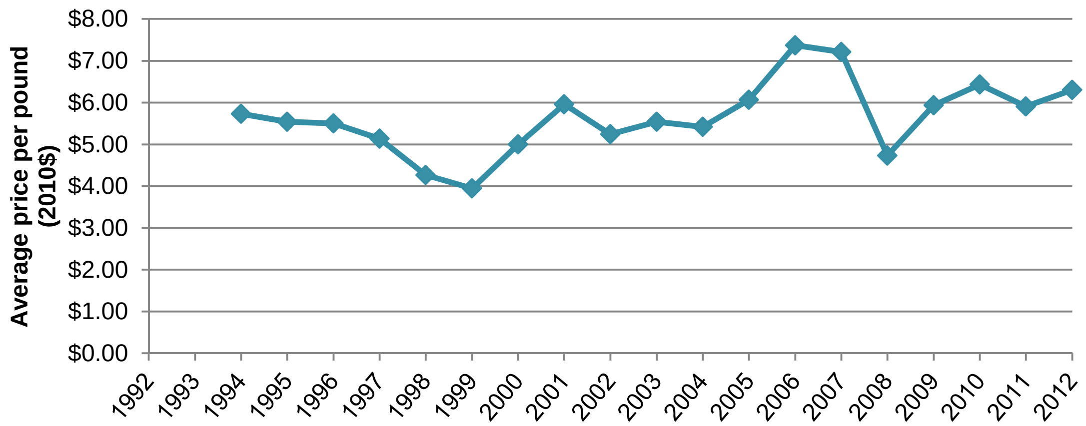
Source: Current study, based off landings data from CDFW.

Figure 87. Nearshore finfish–live–longline: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



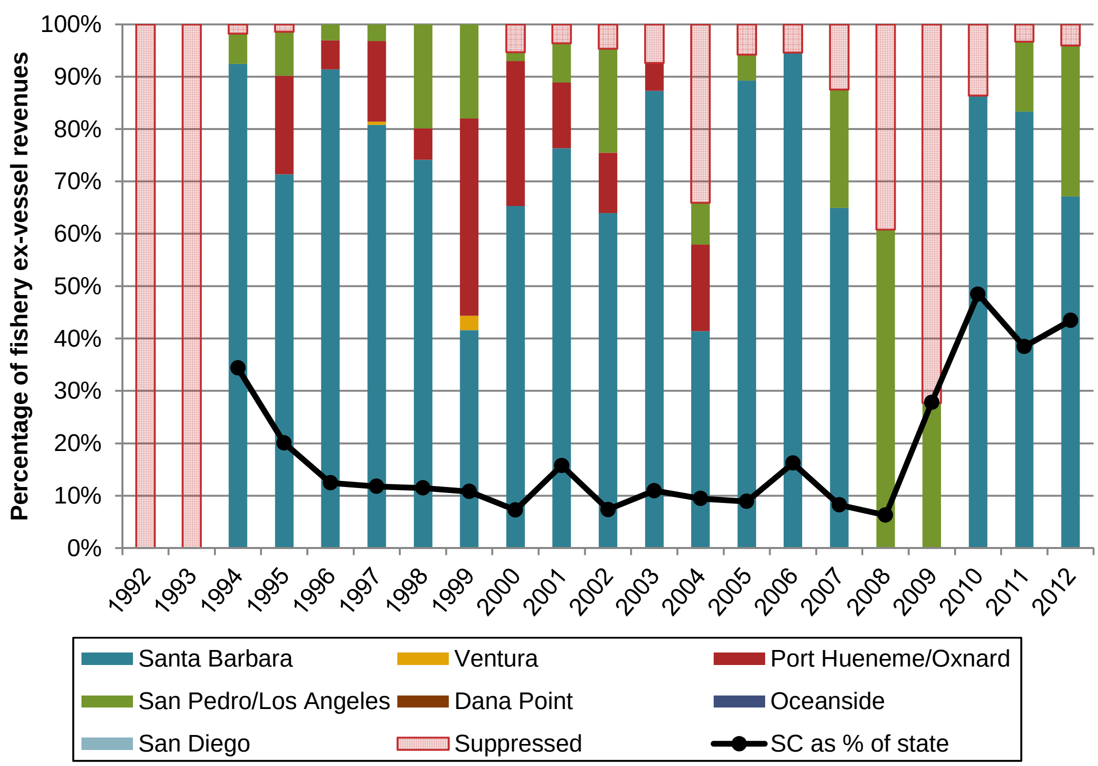
Source: Current study, based off landings data from CDFW.

Figure 88. Nearshore finfish–live–longline commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



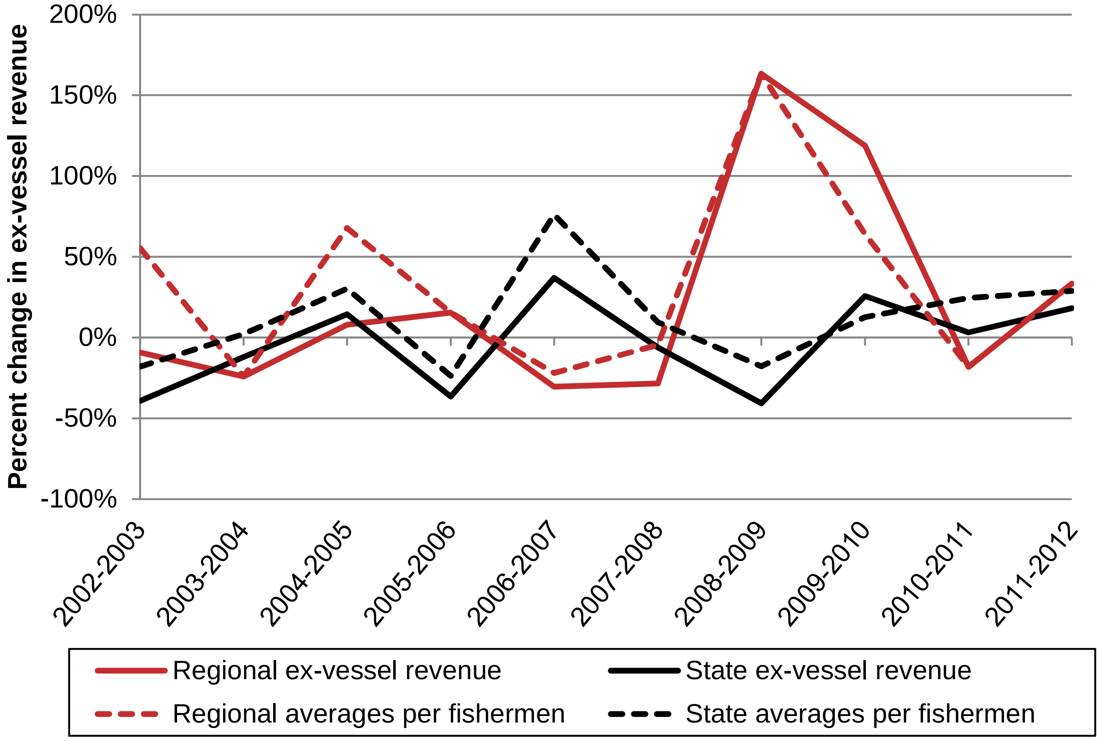
Source: Current study, based off landings data from CDFW.

Figure 89. Nearshore finfish–live–longline commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 90. Nearshore finfish–live–longline: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

Nearshore finfish–live–trap

After 1997, the nearshore finfish–live–trap fishery declined overall during the course of the study period, see Figure 91. Initial increases from the lowest landing amount of the study period in 1992 (33,894 pounds for $162,366) were observed, ending in a peak in 1997 (245,935 pounds for $997,332). By 2012, landings and ex-vessel revenue were at 57,620 pounds for $282,942. The number of fishermen in the nearshore finfish–live–trap fishery decreased significantly over the study period. While 2012 levels of 31 fishermen were close to the 1992 numbers (35), as many as 295 fishermen participated in 1996, but declined ever since.

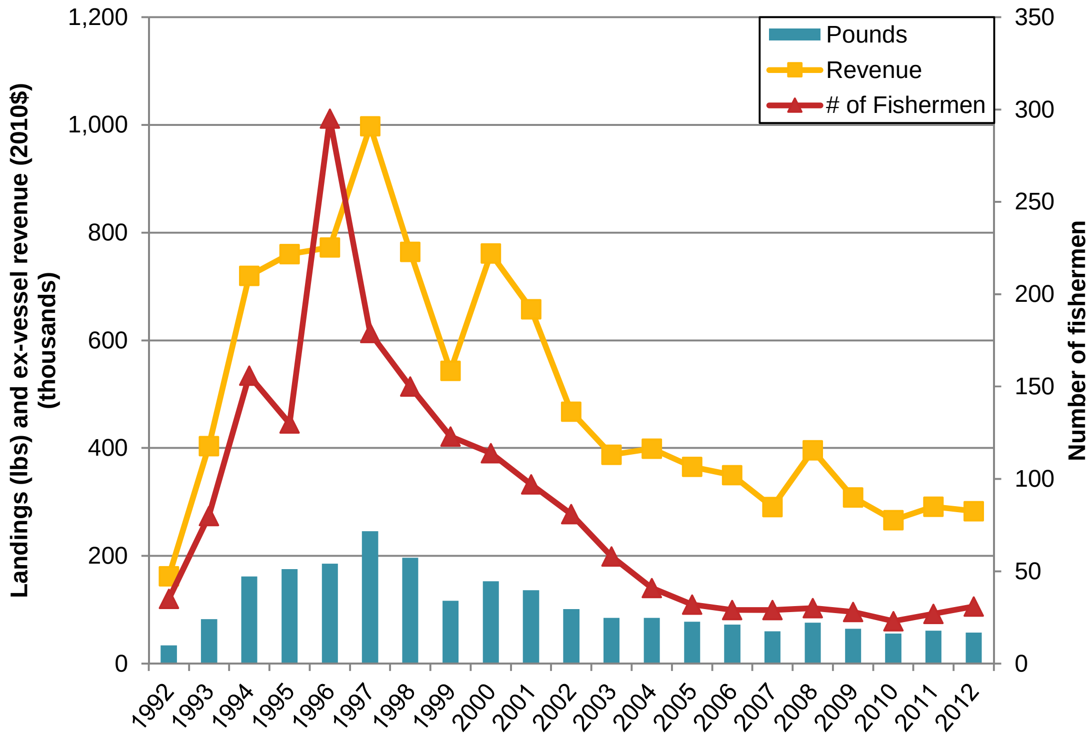
Despite overall declines in landings and ex-vessel revenue, fisherman decline was more significant, resulting in increasing landings and ex-vessel revenue per fisherman over the study period for this fishery, see Figure 92. While both the beginning and end of the study period had equal average numbers of landing trips among fishermen, the annual ex-vessel revenue per fisherman for this fishery increased by 96.7 percent (from $4,639 in 1992 to $9,127 in 2012). Per fisherman lows occurred in 1996 (at 629 pounds for $2,618 per fisherman on average), and highs occurred in 2008 (2,535 pounds for $13,194).

The average ex-vessel price per pound of nearshore finfish–live–trap remained fairly stable over the study period, beginning in 1992 at $4.79 per pound, increasing on 2.5 percent to $4.91 in 2012, see Figure 93. The highest observed price per pound occurred in 2008 at $5.21 per pound on average, the lowest at $3.89 in 1998. Overall, however, the average annual ex-vessel price per pound for the nearshore finfish–live–trap fishery was $4.66 from 1992–2012.

Figure 94 displays ex-vessel revenue for the nearshore finfish–live–trap commercial fishery across South Coast ports over the study period of 1992–2012. The trap fishery was more diversified in terms of participating regional ports than the hook & line or longline nearshore finfish live fisheries. In terms of ex-vessel revenue, the dominant port was San Diego with an annual average of 36.4 percent of regional totals, followed by San Pedro/Los Angeles (22 percent), Port Hueneme/Oxnard (15.4 percent), Ventura (9.5 percent), and Santa Barbara (9 percent).

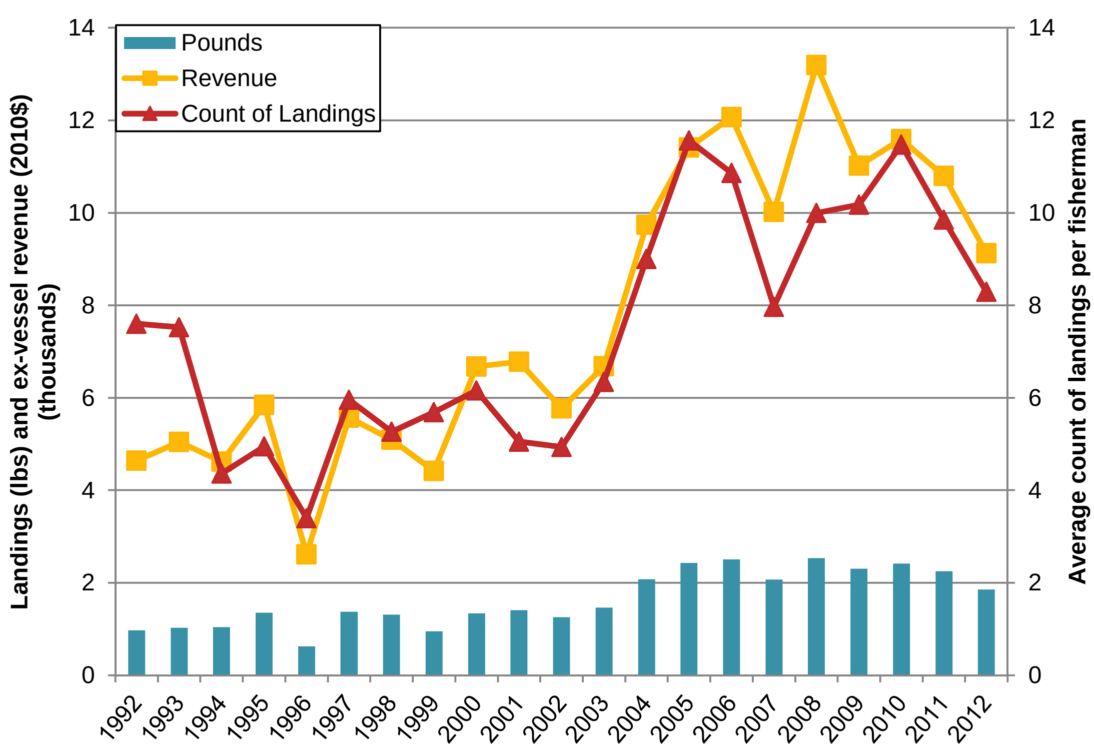
Figure 95 displays the percent change in nearshore finfish–live–trap commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Regional and state ex-vessel revenue trends, as well as total and average per fisherman, for this fishery varied considerably for much of the study period. However, for three years, from 2006–2009, all trends observed merged to be relatively quite similar. In 2007 total and average per fisherman ex-vessel revenue were down from the previous year by approximately 14 percent regionally and throughout the state, the following year saw increases for all by approximately 40 percent, only to decline again by approximately 20 percent from 2008 to 2009. After 2009 trends varied again up to the end of the study period.

Figure 91. Nearshore finfish–live–trap commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



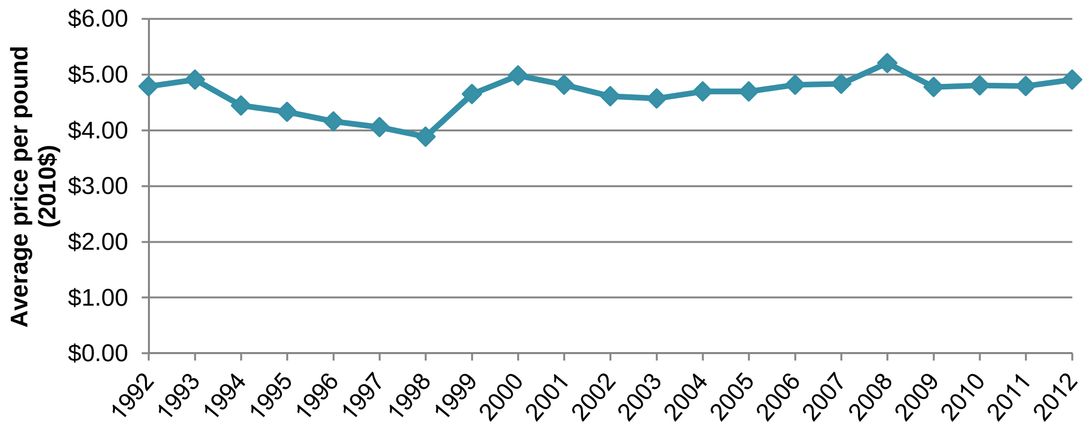
Source: Current study, based off landings data from CDFW.

Figure 92. Nearshore finfish–live–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



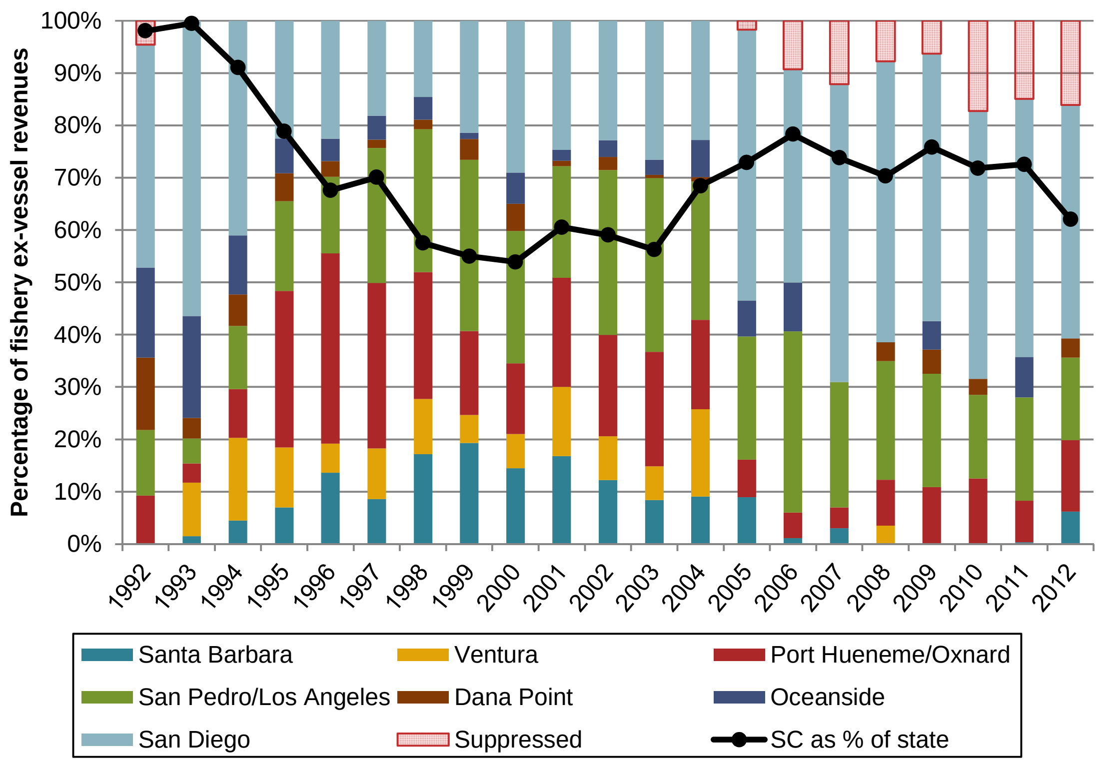
Source: Current study, based off landings data from CDFW.

Figure 93. Nearshore finfish–live–trap commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



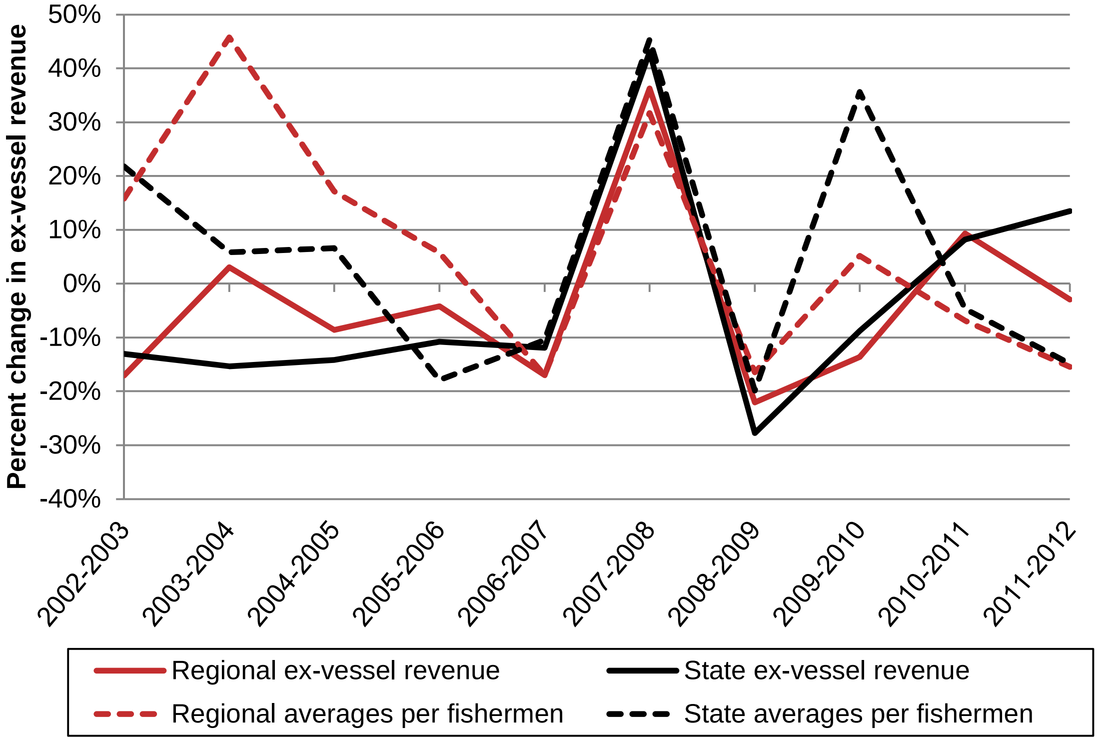
Source: Current study, based off landings data from CDFW.

Figure 94. Nearshore finfish–live–trap commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 95. Nearshore finfish–live–trap: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 45 individuals made landings in the nearshore finfish live—fixed gear fishery. For data collected during fisherman interviews, the nearshore finfish live—fixed gear fishery includes trap, longline, and hook and line gear types catching only live fish. Combined, they generated $401,587 in ex-vessel revenue, which is 0.5 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the nearshore finfish live—fixed gear fishery landings came from San Pedro/Los Angeles (31.8 percent) which is also where most fishermen in the fishery landed their catch (14 fishermen). We interviewed 14 fishermen in in total in the nearshore finfish live—fixed gear fishery (Table 125).

Table 125. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Nearshore finfish live–fixed gear

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	*	4	3
Ventura	*	2	1
Port Hueneme/Oxnard	$55,492	7	1
San Pedro/Los Angeles	$127,632	14	2
Dana Point	$47,057	6	1
Oceanside	$125,930	13	1
San Diego	$20,059	3	5
Source: Current study	$401,587	45	14

** indicates data were collected but cannot be shown due to confidentiality constraints*

The nearshore finfish live–fixed gear fishermen we interviewed on average were slightly younger but had slightly more Years of experience commercial fishing than the average fisherman throughout the South Coast study region. As shown in Table 126, the nearshore finfish live–fixed gear fishermen had an average age of 50.2 years, and 29.5 years of experience. Santa Barbara had the oldest fishermen with an average of 54.7 years, and had the fishermen with the most years of experience commercial fishing, 34.7 years.

Table 126. Average age and years of experience commercial fishing in 2012, Nearshore finfish live–fixed gear

	Age			Years of experience		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	3	54.7	3.8	3	34.7	1.2
Ventura	1	*	*	1	*	*
Port Hueneme/Oxnard	1	*	*	1	*	*
San Pedro/Los Angeles	2	*	*	2	*	*
Dana Point	1	*	*	1	*	*
Oceanside	1	*	*	1	*	*
San Diego	5	47.0	9.0	5	24.6	11.1
All ports (unique individuals)	14	50.2	7.6	14	29.5	8.9

Source: Current study

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 127, across the study region there was a decrease of 4.3 percent in average percent change in reported income from commercial fishing between 2008 and 2012. Despite this small decrease, all of the responding fishermen (100 percent) perceived no change in income (Table 128) between 2008 and 2012, and did not provide any reasons for the change. Again, it is important to note that this question was not asked in regards to nearshore finfish live—fixed gear specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 127. Percent change in income from overall commercial fishing from 2008 - 2012, Nearshore finfish live–fixed gear

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	12	98.2%	5.7%	3	90.0%	17.3%	-8.3%
Ventura	2	*	*	1	*	*	*
Port Hueneme/Oxnard	3	98.3%	2.9%	1	*	*	*
San Pedro/Los Angeles	5	100.0%	—	2	*	*	*
Dana Point	2	100.0%	—	1	*	*	*
Oceanside	2	*	*	1	*	*	*
San Diego	9	100.0%	—	5	96.0%	8.9%	-4.0%
All ports (unique individuals)	35	99.2%	3.5%	14	95.0%	10.2%	-4.3%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 128. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Nearshore finfish live–fixed gear

Ports	Number responding	Percent response				
		Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
Santa Barbara	3	—	—	100.0%	—	—
Ventura	1	*	*	*	*	*
Port Hueneme/Oxnard	1	*	*	*	*	*
San Pedro/Los Angeles	2	*	*	*	*	*
Dana Point	1	*	*	*	*	*
Oceanside	1	*	*	*	*	*
San Diego	5	—	—	100.0%	—	—
All Ports (unique individuals)	14	—	—	100.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 129, there was an increase of 6.3 percent in the overall average percent change in gross economic revenue used for operating costs from 2008 to 2012. This increase is reflected in the respondents' perceptions, 35.7 percent perceived a significantly higher, and 35.7 perceived a somewhat higher increase in gross economic revenue going toward expenses (Table 130). The most commonly cited reason for the increase was the increase in fuel prices (Table 131).

Table 129. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Nearshore finfish live–fixed gear

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	12	40.3%	9.1%	3	40.0%	17.3%	-0.6%
Ventura	1	*	*	1	*	*	*
Port Hueneme/Oxnard	3	66.7%	11.5%	1	*	*	*
San Pedro/Los Angeles	4	40.0%	14.1%	2	*	*	*
Dana Point	1	50.0%	—	1	*	*	*
Oceanside	1	*	*	1	*	*	*
San Diego	8	48.5%	15.9%	5	54.4%	31.0%	12.2%
All ports (unique individuals)	30	47.2%	14.8%	14	50.2%	20.8%	6.3%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 130. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Nearshore finfish live–fixed gear

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	3	33.3%	33.3%	33.3%	—	—
Ventura	1	*	*	*	*	*
Port Hueneme/Oxnard	1	*	*	*	*	*
San Pedro/Los Angeles	2	*	*	*	*	*
Dana Point	1	*	*	*	*	*
Oceanside	1	*	*	*	*	*
San Diego	5	40.0%	20.0%	40.0%	—	—
All Ports (unique individuals)	14	35.7%	35.7%	28.6%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 131. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Nearshore finfish live–fixed gear

Port	Number	Responses indicating increase														Responses indicating decrease		
Fishery	responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	2	2	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Dana Point	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Oceanside	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Diego	3	3	—	—	1	1	—	—	1	—	—	—	—	1	—	—	—	—
All Ports (unique individuals)	10	10	—	2	3	3	—	—	4	—	—	—	—	1	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 132, fishermen in Santa Barbara had the most experience at 22 years in the nearshore finfish live—fixed gear fishery, but fishermen in San Diego spent more time (35 days) in 2012 targeting the fishery. Crew is at times used in the nearshore finfish live–fixed gear fishery. Santa Barbara fishermen employ on average 1 crew member and pay them an average 16 percent of gross economic revenue from the fishery (Table 133).

Table 132. Years of experience and number of days targeting specific fisheries in 2012, Nearshore finfish live–fixed gear

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	3	22.0	14.1	3	4.0	2.8
Ventura	1	*	*	1	*	*
Port Hueneme/Oxnard	1	*	*	1	*	*
San Pedro/Los Angeles	2	*	*	2	*	*
Dana Point	1	*	*	1	*	*
Oceanside	1	*	*	1	*	*
San Diego	5	13.0	9.3	5	35.0	21.8

Source: Current study

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 133. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Nearshore finfish live–fixed gear

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	3	1.0	—	3	16.0%	1.7%	3	16.0%	6.9%
Ventura	1	*	*	1	*	*	1	*	*
Port Hueneme/Oxnard	1	*	*	1	*	*	1	*	*
San Pedro/Los Angeles	2	*	*	2	*	*	2	*	*
Dana Point	1	*	*	1	*	*	1	*	*
Oceanside	1	*	*	1	*	*	1	*	*
San Diego	5	0.6	0.5	5	6.8%	7.7%	5	9.7%	3.6%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

All respondents were asked to compare his/her success in the nearshore finfish live–fixed gear fishery in 2012 to the previous ten years. As shown in Table 134 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 135), economic (no data), regulatory (Table 136), and other factors (Table 137).

The majority of respondents for all ports in the nearshore finfish live–fixed gear fishery indicated that their overall success was the same (54 percent), but in Santa Barbara a majority (66.7 percent) indicated their success was somewhat better in 2012 relative to the preceding 10 years. There were few reasons given for the potential change in success, and even some conflicting reasons from different fishermen like the abundance of fish and lack of fish as noted in Table 135.

Table 134. Overall success in specific commercial fishery, 2012 compared to previous ten years, Nearshore finfish live–fixed gear

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	3	—	—	66.7%	33.3%	—	—
Ventura	1	*	*	*	*	*	*
Port Hueneme/Oxnard	1	*	*	*	*	*	*
San Pedro/Los Angeles	2	*	*	*	*	*	*
Dana Point	1	*	*	*	*	*	*
Oceanside	—	*	*	*	*	*	*
San Diego	5	—	—	—	100.0%	—	—
All ports (unique individuals)	13	—	—	31%	54%	15%	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 135. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Nearshore finfish live–fixed gear

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	1	*	*	*	*	*	*	*	*	*	*
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	2	1	—	—	—	—	1	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 136. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Nearshore finfish live–fixed gear

		Negative					
Ports	Number responding	A	B	C	D	E	F
Santa Barbara	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	*	*	*	*	*	*
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	1	*	*	*	*	*	*

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 137. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, Nearshore finfish live–fixed gear

		Positive						Negative						
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Santa Barbara	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Dana Point	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	3	—	1	—	—	1	—	—	—	1	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

3.5.8. Rock crab–trap: Initial Changes and Baseline Characterization

The rock crab fishery is comprised of three species: the Yellow rock crab, (*Cancer anthonyi),* Brown rock crab (*Cancer antennarius) and* Red rock crab (*Cancer productus).* Between 1928 and 1950 all crab landed south of Santa Barbara were recorded as rock crab while those landed north of Santa Barbara were recorded as Dungeness. After 1950 rock crab landings rose from 20,000 pounds annually to a peak of 1.9 million pounds in 1986 (CDFG 2004). The rock crab fishery was one of the few remaining nearshore open access fisheries, until 2007 when only permit holders from the previous year were allowed to renew. Rock crab can be fished year round and must have a carapace of at least 4.25 inches.

Commercial landings and ex-vessel revenue in the rock crab-trap fishery gradually increased over the course of the study period, while the number of fishermen declined, see Figure 96. A low occurred in the beginning of the study period in 1994 when 598,079 pounds were landed for $867,799 in ex-vessel revenue; a high occurred in 2012 when 1.7 million pounds were landed for $2.3 million in ex-vessel revenue. The number of participating fishermen in this fishery declined by 33.1 percent between 1992 and 2012 numbers, from 148 to 99 fishermen respectively.

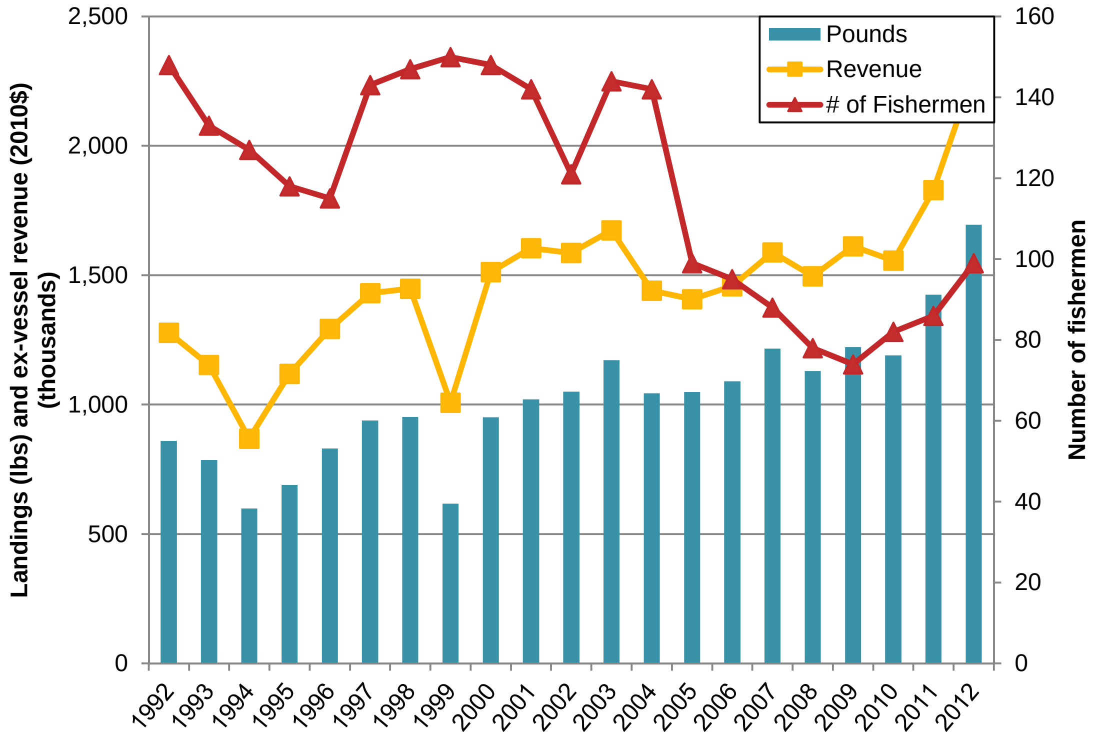
As the overall number of participating fishermen declined, the average fisherman in the rock crab–trap fishery landed more annually over the study period in the South Coast region, see Figure 97. The number of landings per year per fisherman also increased. At a low period, in 1999, the average rock crab–trap fishermen landed 16 times throughout the year landing an annual total of 4,112 pounds of for $6,719 in ex-vessel revenue. In 2012, the average fisherman landed 17,119 pounds for $23,040 in ex-vessel revenue over 29 landings, the maximum observed in the study period.

Figure 98 displays that the average ex-vessel price per pound in the rock crab–trap commercial fishery in the South Coast remained relatively stable overall with minor variations. The highest ex-vessel price during the study period was $1.63 per pound in 1999; the lowest was $1.28 per pound on average in 2011.

Figure 99 displays ex-vessel revenue for the rock crab–trap commercial fishery across South Coast ports over the study period of 1992–2012. The majority of regional ex-vessel revenue in this fishery went to the port of Santa Barbara, who contributed over 50 percent of total ex-vessel revenue every year after 1992. In 2012, this port alone constituted 72.2 percent of South Coast rock crab–trap ex-vessel revenue. Other contributors included San Pedro/Los Angeles (11.6 percent on average annually), San Diego (8.2 percent), and Ventura (8 percent). Ex-vessel revenue from the South Coast constituted approximately 60 percent of state total ex-vessel revenue in the rock crab–trap fishery in 1992, rising steadily to 96.7 percent by 2012.

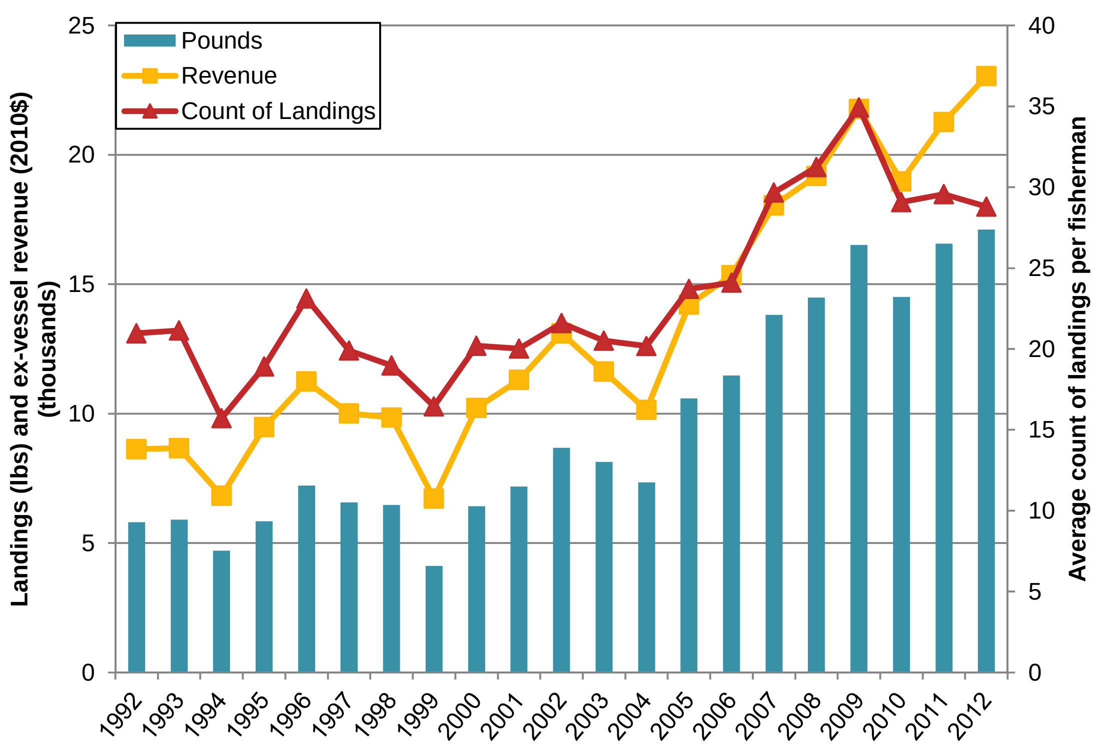
Figure 100 displays the percent change in rock crab–trap commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Trends in this fishery were closely aligned with state trends, and increasingly so as the portion of regional ex-vessel revenue to state totals grew over time. For many years, increases in ex-vessel revenue were more prominent at the average fisherman level, for example, in 2005 regional and state rock crab–trap fishermen saw their ex-vessel revenue increase from 2004 by an average of 40.2 percent and 34.7 percent respectively. At the same time, total ex-vessel revenue in the fishery actually declined by 2.3 percent regionally and 5.8 percent in the state. By the end of the study period, overall state and regional ex-vessel revenue increased by approximately 21 percent and 24.7 percent respectively while average per fisherman ex-vessel revenue increased by 6.5 percent throughout the state and 8.3 percent regionally.

Figure 96. Rock crab–trap commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



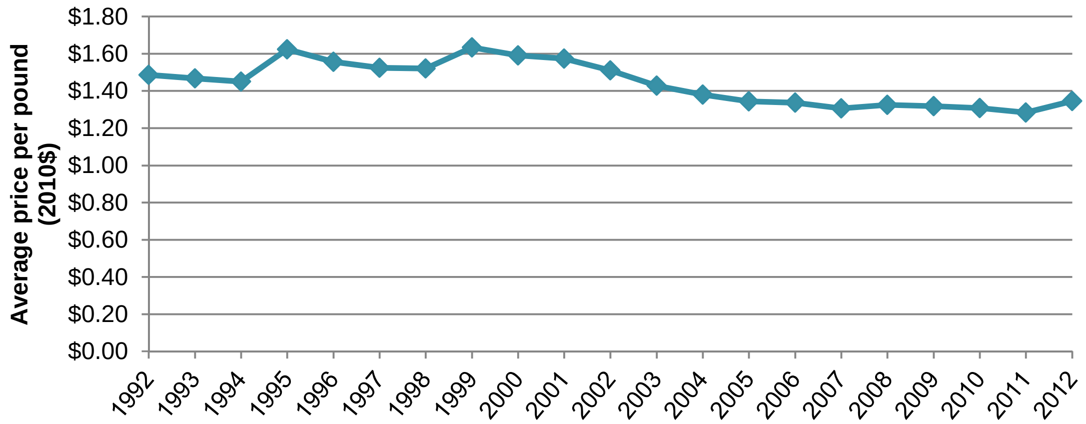
Source: Current study, based off landings data from CDFW.

Figure 97. Rock crab–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



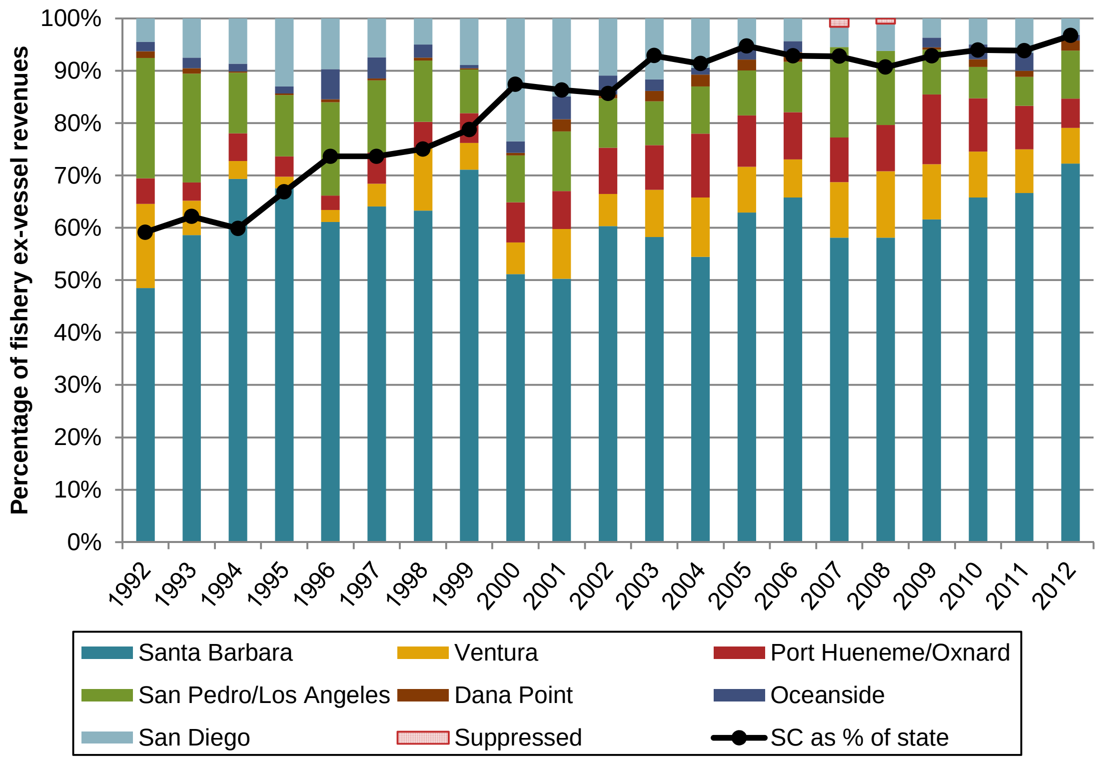
Source: Current study, based off landings data from CDFW.

Figure 98. Rock crab–trap commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



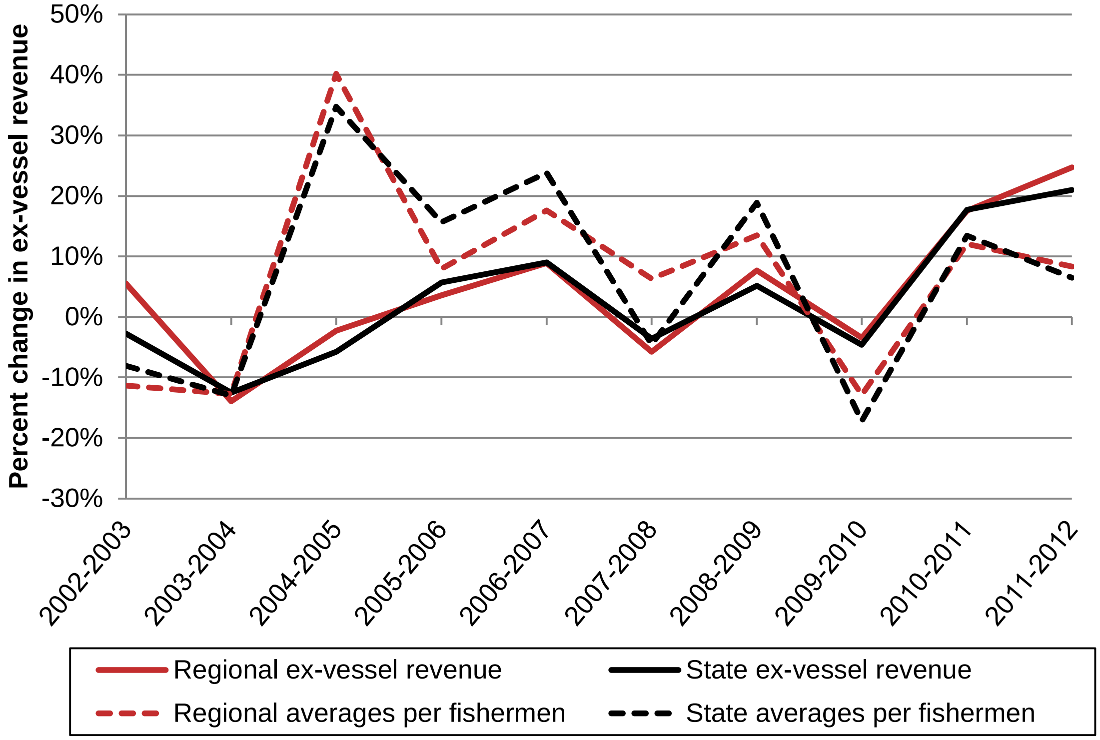
Source: Current study, based off landings data from CDFW.

Figure 99. Rock crab–trap commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 100. Rock crab–trap: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 99 individuals made landings in the rock crab—trap fishery. Combined, they generated $2.3 million in ex-vessel revenue, which is 2.8 percent of the $80.8 million generated by the target interview fisheries over the entire study region. The majority of the rock crab—trap fishery landings came from Santa Barbara (72.2 percent), and this port was also where most fishermen in the fishery made landings (39 individuals). We interviewed 27 fishermen in the rock crab—trap fishery (Table 138).

Table 138. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Rock crab—trap

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	$1,647,655	39	11
Ventura	$155,928	11	5
Port Hueneme/Oxnard	$128,150	18	2
San Pedro/Los Angeles	$208,983	23	3
Dana Point	$43,963	8	1
Oceanside	$25,261	4	2
San Diego	$71,015	13	3
Unique individuals	$2,280,955	99	27

Source: Current study

The rock crab—trap fishermen we interviewed on average were slightly younger and had the same Years of experience as the average fisherman throughout the South Coast study region. As shown in Table 139, the rock crab—trap fishermen had an average age of 50.4 years, and 29.9 years of experience. Santa Barbara had the oldest fishermen with an average of 54 years, but Ventura had fishermen with the most years of experience commercial fishing, 32 years.

Table 139. Average age and years of experience commercial fishing in 2012, Rock crab—trap

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	11	54.0	5.9	11	30.7	8.5
Ventura	5	53.6	5.9	5	35.6	6.6
Port Hueneme/Oxnard	2	*	*	2	*	*
San Pedro/Los Angeles	3	45.3	9.5	3	29.3	11.2
Dana Point	1	*	*	1	*	*
Oceanside	2	*	*	2	*	*
San Diego	3	48.0	5.0	3	23.7	1.5
All ports (unique individuals)	27	50.4	8.7	27	29.9	9.7

Source: Current study

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 140, across the study region there was a slight decrease of 1 percent in reported percent income coming from commercial fishing between 2008 and 2012. A decrease was seen at Santa Barbara (2.3 percent) and Ventura (8.2 percent), but San Diego was the exception where there was on average a 4.2 percent increase in income from commercial fishing. The majority (88.9 percent) of rock crab fishermen in all ports perceived no change in income (Table 141). Few reasons were given for the slight change, but the most commonly cited reason was personal reasons (Table 142). Again, it is important to note that this question was not asked in regards to rock crab—trap specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 140. Percent change in income from overall commercial fishing from 2008 - 2012, Rock crab—trap

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	16	94.4%	11.2%	11	92.3%	15.4%	-2.3%
Ventura	6	100.0%	—	5	91.8%	10.8%	-8.2%
Port Hueneme/Oxnard	1	*	*	2	*	*	*
San Pedro/Los Angeles	6	100.0%	—	3	100.0%	—	—
Dana Point	4	100.0%	—	1	*	*	*
Oceanside	2	*	*	2	*	*	*
San Diego	11	89.5%	26.9%	3	93.3%	11.5%	4.2%
All ports (unique individuals)	46	95.6%	14.8%	27	94.6%	11.5%	-1.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 141. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Rock crab—trap

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	11	—	—	81.8%	9.1%	9.1%
Ventura	5	—	—	100.0%	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*
San Pedro/Los Angeles	3	—	—	100.0%	—	—
Dana Point	1	*	*	*	*	*
Oceanside	2	*	*	*	*	*
San Diego	3	—	33.3%	66.7%	—	—
All Ports (unique individuals)	27	—	3.7%	88.9%	3.7%	3.7%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 142. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Rock crab—trap

Fishery	Number responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Santa Barbara	2	—	—	—	—	—	—	—	—	—	1	1	1	—	1
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/ Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
All Ports (unique individuals)	3	—	—	—	—	—	—	—	—	—	2	1	1	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

As shown in Table 143, there was a slight decrease of 0.7 percent in the overall percent change in gross economic revenue used for operating costs from 2008 to 2012. Despite this decrease, across all ports most respondents perceived a significantly higher (37 percent) or somewhat higher (44.4 percent) increase in gross economic revenue going toward expenses (Table 144). The most commonly cited reasons were the increase in fuel prices and the increase in costs of goods and labor (Table 145).

Table 143. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Rock crab—trap

	2008^			2012			
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
Santa Barbara	16	38.5%	12.6%	11	43.3%	14.9%	12.5%
Ventura	5	44.0%	6.5%	5	42.0%	7.6%	-4.5%
Port Hueneme/Oxnard	1	*	*	2	*	*	*
San Pedro/Los Angeles	4	50.0%	8.2%	3	52.0%	10.1%	4.0%
Dana Point	3	47.7%	13.7%	1	*	*	*
Oceanside	—	—	—	2	*	*	*
San Diego	9	53.9%	14.1%	3	41.0%	16.5%	-23.9%
All ports (unique individuals)	38	45.9%	14.2%	27	45.6%	13.3%	-0.7%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 144. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Rock crab—trap

		Percent response				
Ports	Number responding	Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
Santa Barbara	11	36.4%	54.5%	—	9.1%	—
Ventura	5	80.0%	—	20.0%	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*
San Pedro/Los Angeles	3	33.3%	33.3%	33.3%	—	—
Dana Point	1	*	*	*	*	*
Oceanside	2	*	*	*	*	*
San Diego	3	33.3%	33.3%	33.3%	—	—
All Ports (unique individuals)	27	37.0%	44.4%	11.1%	7.4%	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 145. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Rock crab—trap

		Responses indicating increase														Responses indicating decrease		
Port	**Number responding**	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	11	9	—	1	7	1	—	1	—	1	—	—	—	—	—	—	—	1
Ventura	4	4	1	1	4	—	—	1	—	1	—	1	—	—	—	—	—	—
Port Hueneme/Oxnard	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Pedro/Los Angeles	2	1	—	1	1	—	—	—	2	—	—	—	1	—	—	—	—	—
Dana Point	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Oceanside	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Diego	2	2	—	—	1	1	—	—	2	1	—	—	1	—	—	—	—	—
All Ports (unique individuals)	24	20	1	3	15	3	—	2	5	3	—	1	2	—	—	—	—	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 146, fishermen in Ventura had the most experience at 30.8 years in the rock crab—trap fishery, but those in the Santa Barbara area targeted the fishery more days in 2012, on average 115.8 days. Crew is sometimes used in the rock crab—trap fishery. Both Santa Barbara and Ventura carried on average one crew member, and paid them 13 and 14 percent, respectively (Table 147).

Table 146. Years of experience and number of days targeting specific fisheries in 2012, Rock crab—trap

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	11	25.8	8.2	11	115.8	65.0
Ventura	5	30.8	5.4	5	58.4	43.9
Port Hueneme/Oxnard	2	*	*	2	*	*
San Pedro/Los Angeles	3	21.0	7.9	3	67.0	26.2
Dana Point	1	*	*	1	*	*
Oceanside	2	*	*	2	*	*
San Diego	3	21.7	3.5	3	36.7	5.8

Source: Current study

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 147. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Rock crab—trap

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	11	1.0	0.6	11	13.0%	6.8%	11	17.8%	9.7%
Ventura	5	1.0	0.7	5	14.0%	8.2%	5	10.8%	6.5%
Port Hueneme/Oxnard	2	*	*	2	*	*	2	*	*
San Pedro/Los Angeles	3	0.3	0.6	3	3.3%	5.8%	3	8.7%	4.0%
Dana Point	1	*	*	1	*	*	1	*	*
Oceanside	2	*	*	2	*	*	2	*	*
San Diego	3	—	—	3	—	—	3	4.3%	4.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

All respondents were asked to compare his/her success in the rock crab—trap fishery in 2012 to the previous ten years. As shown in Table 148 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 149), economic (Table 150), regulatory (confidential), and other factors (Table 151).

Most respondents for the rock crab—trap fishery indicated that their overall success was the same (65 percent) in 2012 relative to the preceding 10 years. Most of the reasons cited for this were negative, including lack of fish or product, a bad market, and crowding or compaction on the fishing grounds.

Table 148. Overall success in specific commercial fishery, 2012 compared to previous ten years, Rock crab—trap

		Percent response					
Ports	Number responding	Did not participate in previous seasons	Significantly better	Somewhat better	The same	Somewhat worse	Significantly worse
Santa Barbara	11	—	9.1%	—	81.8%	9.1%	—
Ventura	5	—	—	—	40.0%	40.0%	20.0%
Port Hueneme/Oxnard	2	*	*	*	*	*	*
San Pedro/Los Angeles	3	—	—	—	66.7%	33.3%	—
Dana Point	1	*	*	*	*	*	*
Oceanside	1	*	*	*	*	*	*
San Diego	3	—	—	—	33.3%	33.3%	33.3%
All ports (unique individuals)	26	—	4%	4%	65%	19%	8%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 149. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Rock crab—trap

Ports	Number responding	Positive					Negative				
		A	B	C	D	E	F	G	H	I	J
Santa Barbara	1	—	—	—	—	—	1	—	—	—	—
Ventura	1	—	—	—	—	—	—	—	—	1	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	2	—	—	—	—	—	1	—	—	1	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 150. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Rock crab—trap

		Positive			Negative			
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Santa Barbara	—	—	—	—	—	—	—	—
Ventura	2	—	—	—	1	1	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	—	—	—	—	—	—	1
Dana Point	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—
San Diego	2	—	—	—	—	2	—	—
All ports (unique individuals)	5	—	—	—	1	3	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 151. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, Rock crab—trap

		Positive						Negative						
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Santa Barbara	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	—	—	—	—	—	—	—	—	1	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	2	—	1	—	—	—	—	—	—	1	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

3.5.9. Sea cucumber–dive: Initial Changes and Baseline Characterization

The sea cucumber fishery is comprised of two species, the California (or giant red) sea cucumber (*Parastichopus californicus)* and the warty sea cucumber (*Parastichopus parvimensis).* The warty sea cucumber is usually targeted by divers while the California sea cucumber is primarily targeted by trawlers in southern California and sometimes by divers in northern California. Sea cucumber is a relatively new fishery in California, with the first recorded landings occurring in 1978. For the first 18 years sea cucumber landings were primarily made by trawlers (about 75 percent of total landings) however, in the late 1990s effort from the dive fleet increased due to a moratorium on abalone diving, a bad urchin season, and poor Japanese urchin markets (CDFG 2008).

Commercial landings and ex-vessel revenue in the sea cucumber–dive fishery rose overall over 1992–2012 in the South Coast region, see Figure 101. From a low of 26,778 pounds landed for $13,584 in ex-vessel revenue by 17 fishermen in 1993, participating fishermen maxed out at 84 fishermen in 1998, landings at 658,326 pounds in 2002, and ex-vessel revenue at $2.1 million in 2011. Ex-vessel revenue in this fishery in 2012 was nearly 38 times what it was in 1992 while landings were approximately five times as much respectively. In 2012, sea cucumber–dive landings were 270,538 pounds for $1.1 million by 59 fishermen.

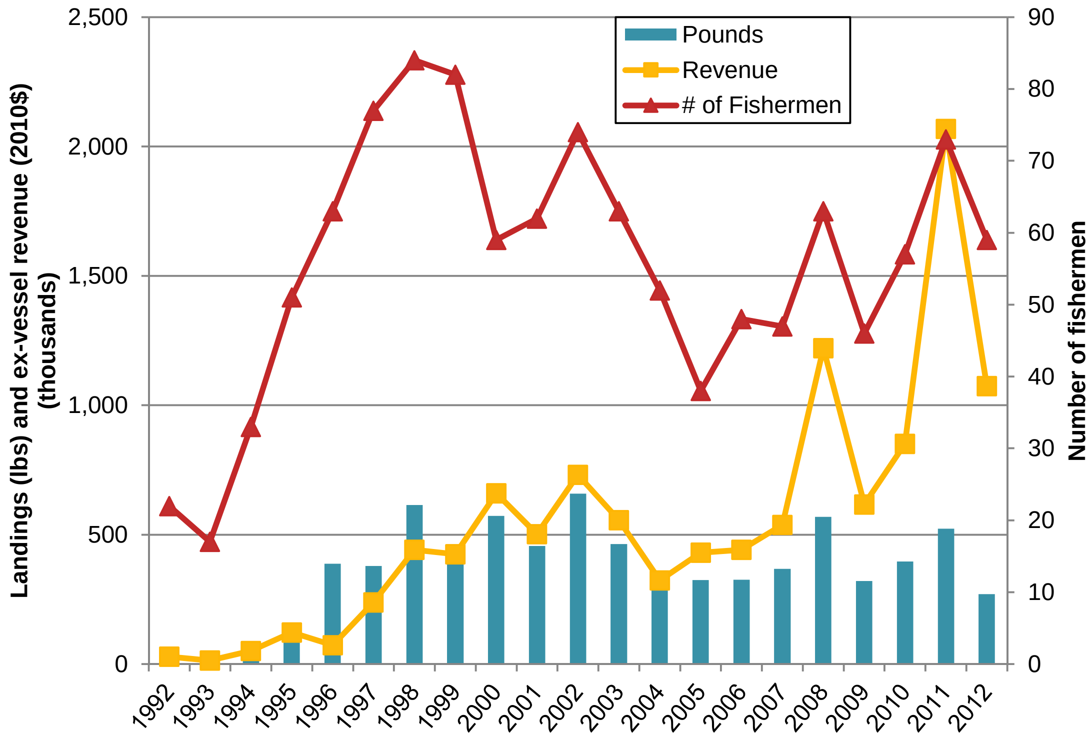
Per fisherman, the sea cucumber–dive fishery also saw significant growth in average ex-vessel revenue, landings, and count of landings, see Figure 102. In 1992, the average sea cucumber–dive fisherman landed four times to bring in a total of 2,727 pounds for $1,298 in ex-vessel revenue. Following overall trends, the ex-vessel revenue per fisherman increased disproportionately to pounds landed from 1992 to 2012. In 2012 the average sea cucumber–dive fisherman landed twelve times to bring in 4,585 pounds for $18,206.

Figure 103 displays the increasing average ex-vessel price per pound for the sea cucumber–dive fishery over the study period. The lowest average ex-vessel price during the study period was $0.48 per pound in 1992, and the highest in 2012 at $3.97 per pound in 2012, or over eight times as much.

Figure 104 displays ex-vessel revenue for the sea cucumber–dive commercial fishery across South Coast ports over the study period of 1992–2012. Over the study period, the portion of ex-vessel revenue among ports varied. In 1993 San Diego represented 50 percent of total ex-vessel revenue, but as total revenue increased to their highest in the early 2000s, Port Hueneme/Oxnard at once (in 2000) represented 81.1 percent of regional totals. By 2012, San Pedro/Los Angeles made the most at 34.2 percent of South Coast sea cucumber–dive ex-vessel revenue. Barring the first two years of the study period, South Coast ex-vessel revenue in this fishery constituted an average of 99 percent of total state sea cucumber–dive ex-vessel revenue annually.

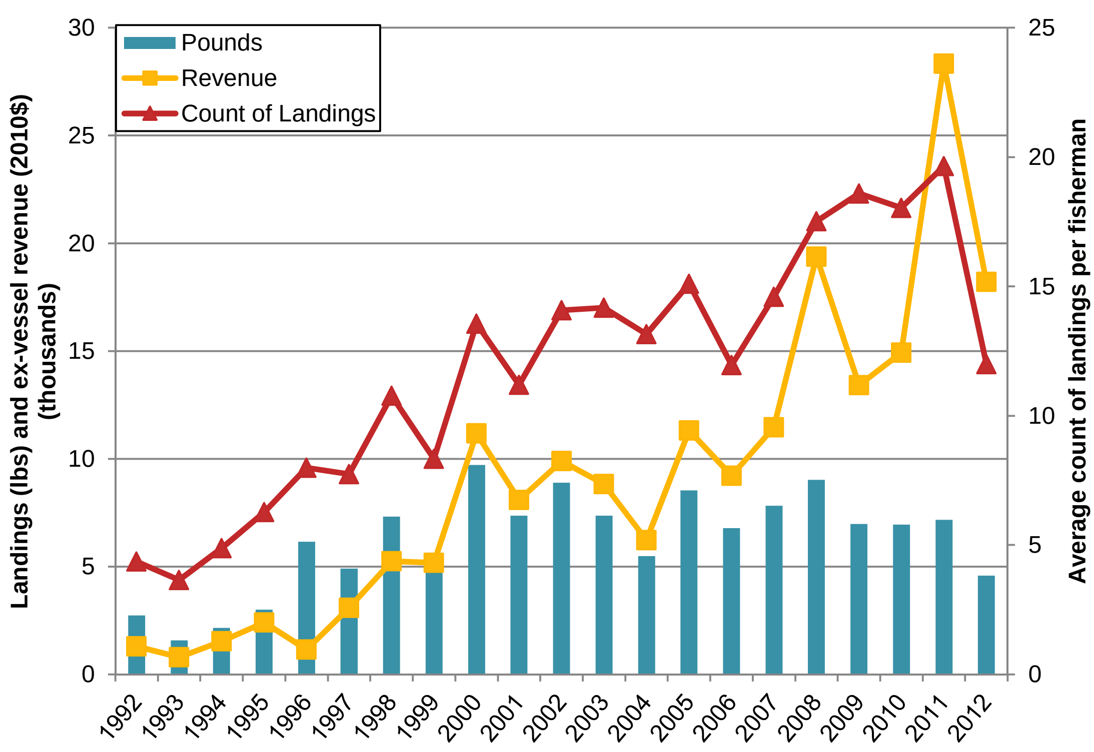
Figure 105 displays the percent change in sea cucumber–dive commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. Given the dominance of the South Coast of state ex-vessel revenue, trends were nearly identical at the regional vs. state level for this fishery. While average per fishermen trends at first outpaced overall ex-vessel revenue trends, increasing by approximately 80 percent from 2004 to 2005 as compared with overall increases of approximately 30 percent over the same time period, overall trends were more significant from 2006–2012. While the fishery oscillated annually between increases or decreases, these became more intense over time.

Figure 101. Sea cucumber–dive commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



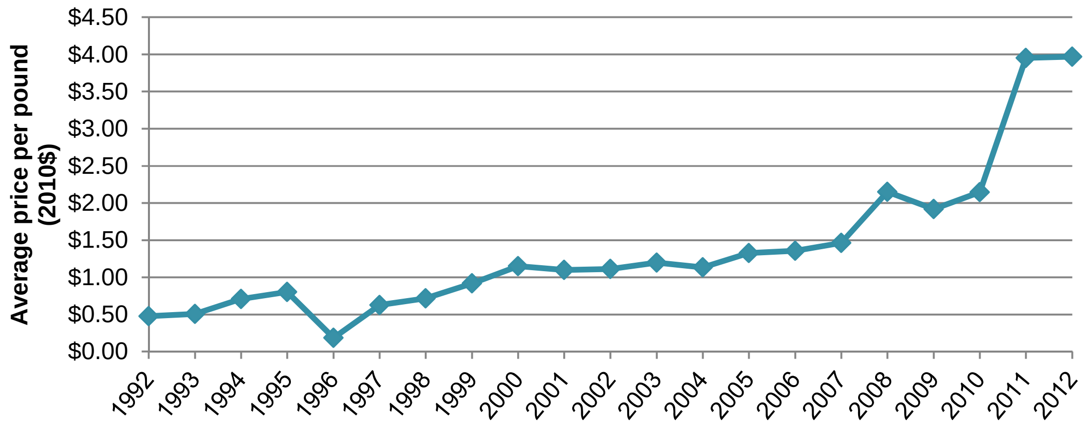
Source: Current study, based off landings data from CDFW.

Figure 102. Sea cucumber–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



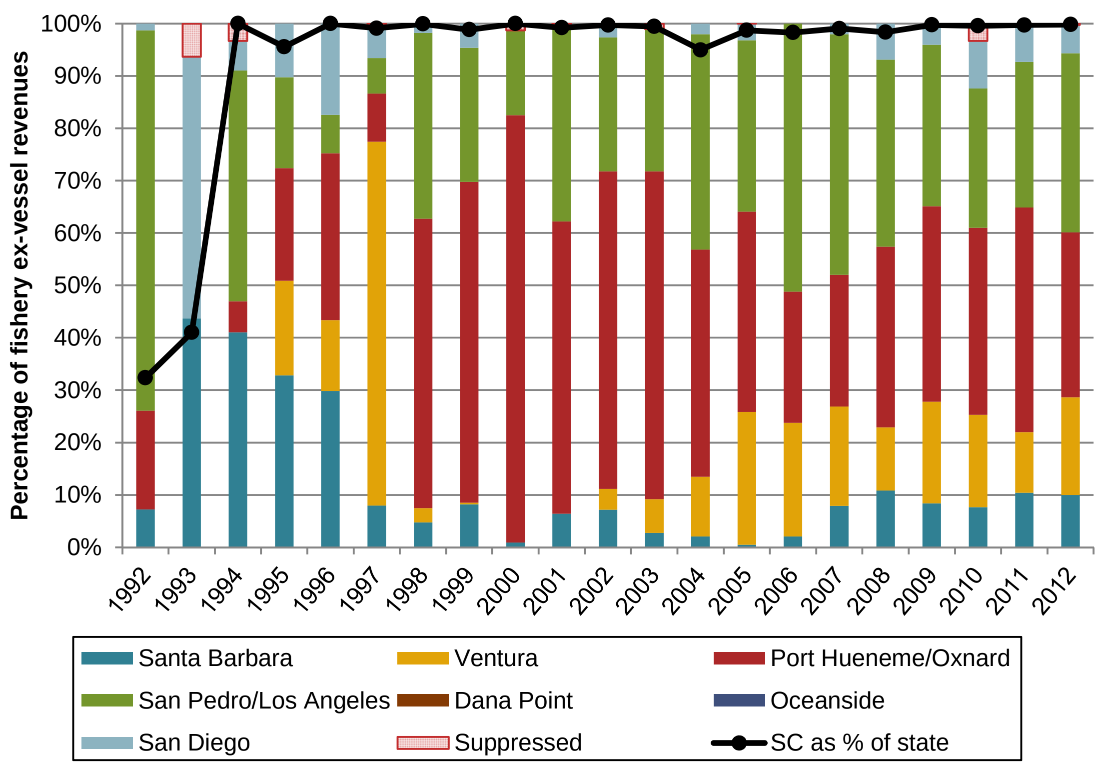
Source: Current study, based off landings data from CDFW.

Figure 103. Sea cucumber–dive commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



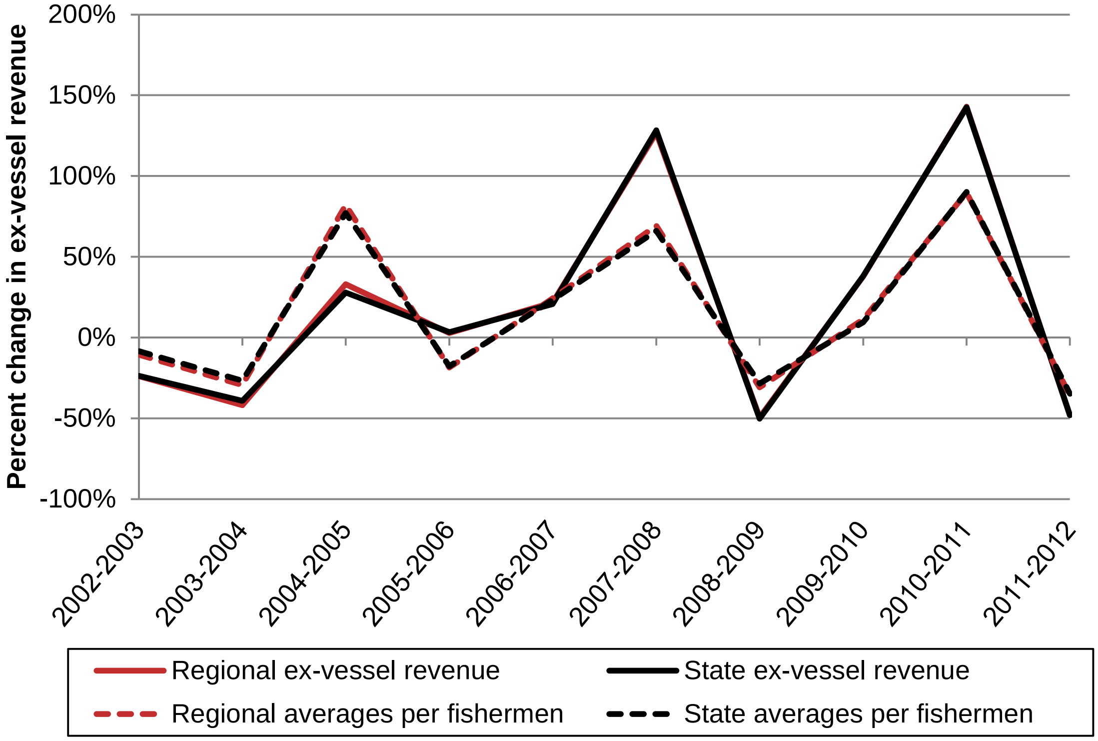
Source: Current study, based off landings data from CDFW.

Figure 104. Sea cucumber–dive commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 105. Sea cucumber–dive: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 99 individuals made landings in the sea cucumber—dive fishery. Combined, they generated $1.1 million in ex-vessel revenue, which is 1.3 percent of the $80.8 million generated by the target interview fisheries over the entire study region. The majority of the sea cucumber—dive fishery landings came from San Pedro/Los Angeles (34.2 percent), however, Santa Barbara had the most number of fishermen making landings (33 individuals). We interviewed 13 fishermen in the sea cucumber—dive fishery (Table 152).

Table 152. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Sea cucumber—dive

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	$106,895	33	2
Ventura	$200,313	8	—
Port Hueneme/Oxnard	$338,718	19	4
San Pedro/Los Angeles	$367,209	21	4
Dana Point	—	—	—
Oceanside	*	1	—
San Diego	$58,179	4	3
Unique individuals	$1,074,175	59	13

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The sea cucumber—dive fishermen we interviewed on average were older and had more years of experience compared to the average fisherman throughout the South Coast study region. As shown in Table 153, the sea cucumber divers had an average age of 57 years, and 33.3 years of experience. San Pedro/Los Angeles had the oldest fishermen with an average of 66.8 years, and also the divers with the most years of experience commercial fishing, 38.5 years.

Table 153. Average age and years of experience commercial fishing in 2012, Sea cucumber—dive

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	2	*	*	2	*	*
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	4	54.8	11.9	4	30.8	8.7
San Pedro/Los Angeles	4	66.8	2.5	4	38.5	10.5
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	3	52.3	2.9	3	31.3	6.0
All ports (unique individuals)	13	57.0	9.5	13	33.3	8.2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 154, across the study region there was a slight decrease of 4.4 percent in reported percent income coming from commercial fishing between 2008 and 2012. The majority (92.3) of sea cucumber divers in all ports perceived no change in income (Table 155), but one diver in Port Hueneme/Oxford did perceive a significantly lower amount of income from commercial fishing. The reasons for this decrease in income are not shown here due to confidentiality constraints. Again, it is important to note that this question was not asked in regards to sea cucumber—dive specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 154. Percent change in income from overall commercial fishing from 2008 - 2012, Sea cucumber—dive

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	6	96.7%	8.2%	2	*	*	*
Ventura	2	*	*	—	—	—	—
Port Hueneme/Oxnard	5	89.0%	12.9%	4	83.3%	33.5%	-6.5%
San Pedro/Los Angeles	6	100.0%	—	4	98.8%	2.5%	-1.3%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	2	*	*	3	96.7%	5.8%	*
All ports (unique individuals)	21	95.5%	8.5%	13	91.3%	19.4%	-4.4%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 155. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Sea cucumber—dive

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	2	*	*	*	*	*
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	4	—	—	75.0%	—	25.0%
San Pedro/Los Angeles	4	—	—	100.0%	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	3	—	—	100.0%	—	—
All Ports (unique individuals)	13	—	—	92.3%	—	7.7%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 156, there was a decrease of 5.5 percent in the overall average percent change in gross economic revenue used for operating costs from 2008 to 2012. Despite this decrease, across all ports most respondents perceived either a significantly higher (33.3 percent), somewhat higher (16.7 percent) increase, or no change (33.3 percent) in gross economic revenue going toward expenses (Table 157). The most commonly cited reason for the perceived increase in gross economic revenue going toward expenses was the increase in fuel prices (Table 158).

Table 156. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Sea cucumber—dive

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	7	43.6%	14.1%	2	*	*	*
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	4	71.3%	15.5%	4	34.3%	25.0%	-51.8%
San Pedro/Los Angeles	6	50.0%	29.5%	4	60.0%	28.6%	20.0%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	2	*	*	3	55.0%	39.7%	*
All ports (unique individuals)	19	51.8%	21.9%	13	49.0%	27.7%	-5.5%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 157. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Sea cucumber—dive

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	2	*	*	*	*	*
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	4	50.0%	—	25.0%	—	25.0%
San Pedro/Los Angeles	3	33.3%	—	33.3%	33.3%	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	3	33.3%	33.3%	33.3%	—	—
All Ports (unique individuals)	12	33.3%	16.7%	33.3%	8.3%	8.3%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 158. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Sea cucumber—dive

Port	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	3	2	—	1	1	—	—	—	1	—	—	—	—	—	—	1	—	—
San Pedro/Los Angeles	2	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	1	1
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	2	2	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	8	5	2	2	2	—	—	1	1	—	—	—	—	—	—	1	1	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 159, fishermen in San Pedro/Los Angeles had the most experience at 24 years in the sea cucumber—dive fishery, but those in the Port Hueneme/Oxford area targeted the fishery more days in 2012, on average 83.5 days. Crew is sometimes used in the sea cucumber—dive fishery. Port Hueneme/Oxford fishermen had the highest average number of crew members (1.7 crew). Relative to other fisheries, the sea cucumber—dive fishery gave a small percentage of gross economic revenue to crew members, at most 5 percent in Port Hueneme/Oxford (Table 160).

Table 159. Years of experience and number of days targeting specific fisheries in 2012, Sea cucumber—dive

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	2	*	*	2	*	*
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	4	19.3	10.1	4	83.5	51.7
San Pedro/Los Angeles	4	24.0	15.0	4	55.5	42.2
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	3	16.7	12.2	3	63.3	47.3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 160. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Sea cucumber—dive

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	2	*	*	2	*	*	2	*	*
Ventura	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	4	1.7	1.5	4	5.0%	5.8%	4	23.3%	7.7%
San Pedro/Los Angeles	4	—	—	4	—	—	4	13.5%	5.4%
Dana Point	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—
San Diego	3	0.3	0.6	3	3.3%	5.8%	3	15.7%	5.1%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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All respondents were asked to compare his/her success in the sea cucumber—dive fishery in 2012 to the previous ten years. As shown in Table 161 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 162), economic (Table 163), regulatory (Table 164), and other factors (Table 165).

In the sea cucumber—dive fishery, respondents across all ports, and in specific ports, indicated a wide variety of answers for their level of success in the fishery in 2012 relative to the previous ten years. No clear trend was shown in the data with some divers indicating significantly better success and some significantly worse. One common negative influence on success cited was MPAs or other closures.

Table 161. Overall success in specific commercial fishery, 2012 compared to previous ten years, Sea cucumber—dive

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	2	*	*	*	*	*	*
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	4	—	25.0%	—	25.0%	—	50.0%
San Pedro/Los Angeles	4	—	25.0%	—	—	25.0%	50.0%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	3	—	33.3%	—	—	66.7%	—
All ports (unique individuals)	13	—	23%	8%	15%	23%	31%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 162. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Sea cucumber—dive

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	—	—	—	—	—	1	—	—	—	—
San Pedro/Los Angeles	2	—	—	—	—	—	2	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	2	1	—	—	—	—	—	—	1	—	—
All ports (unique individuals)	5	1	—	—	—	—	3	—	1	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 163. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Sea cucumber—dive

Ports	Number responding	Positive			Negative			
		A	B	C	D	E	F	G
Santa Barbara	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	2	1	—	—	1	—	—	—
San Pedro/Los Angeles	2	1	—	—	—	1	—	—
Dana Point	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—
San Diego	1	—	—	—	—	—	1	—
All ports (unique individuals)	5	2	—	—	1	1	1	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 164. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Sea cucumber–dive

Ports	Number responding	Negative					
		A	B	C	D	E	F
Santa Barbara	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	2	—	—	2	—	—	—
San Pedro/Los Angeles	2	—	—	2	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	1	—	—	1	—	—	—
All ports (unique individuals)	5	—	—	5	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 165. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, Sea cucumber—dive

		Positive						Negative						
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Santa Barbara	1	*	*	*	*	*	*	*	*	*	*	*	*	*
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	—	—	—	—	—	—	—	—	1	—	—	—	—
San Pedro/Los Angeles	2	1	—	—	—	—	—	—	—	—	1	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	4	2	—	—	—	—	—	—	—	1	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

3.5.10. Sea cucumber–trawl: Initial Changes and Baseline Characterization

The sea cucumber fishery is comprised of two species, the California (or giant red) sea cucumber (*Parastichopus californicus)* and the warty sea cucumber (*Parastichopus parvimensis*). The warty sea cucumber is usually targeted by divers while the California sea cucumber is primarily targeted by trawlers in southern California and sometimes by divers in northern California. Sea cucumber is a relatively new fishery in California, with the first recorded landings occurring in 1978. For the first 18 years sea cucumber landings were primarily made by trawlers (about 75 percent of total landings) however, in the late 1990s effort from the dive fleet increased due to a moratorium on abalone diving, a bad urchin season, and poor Japanese urchin markets (CDFG 2008).

Figure 106 displays commercial landings, ex-vessel revenue, and number of fishermen in the sea cucumber–trawl fishery over 1992–2012 in the South Coast region. Ex-vessel revenue increased overall, peaking at $1.3 million in 2011, more than doubling levels observed in all prior years. Landings in this fishery, however, decreased over the study period, with the most pounds caught occurring in 1993 at 594,292; in 2012 landings were 196,215 pounds. The number of fishermen participating varied in relation to landings and ex-vessel revenue in this fishery, ranging from 11 to 61, with an annual average of 25 fishermen over the study period.

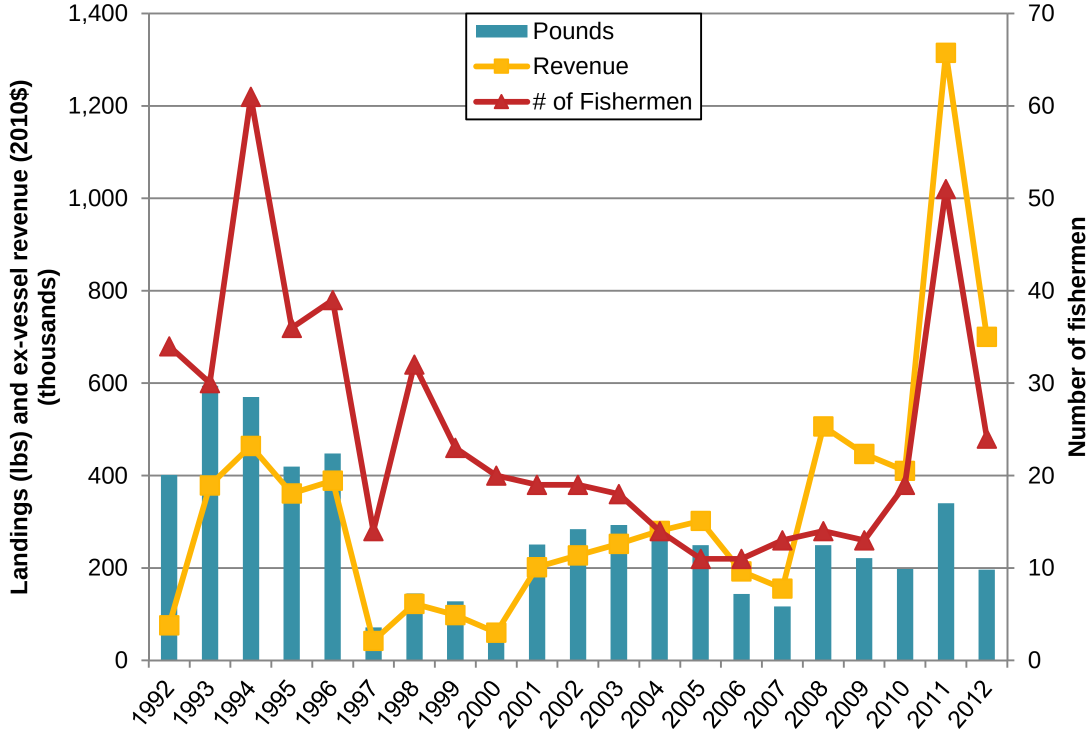
Average landings and ex-vessel revenue per fisherman in the sea cucumber–trawl commercial fishery varied over the study period, see Figure 107. While landings per fisherman declined, ex-vessel revenue increased, on average. In 1992 the average sea cucumber–trawl fisherman made 17 landings throughout the year and landed a total of 11,800 pounds for $2,235 in ex-vessel revenue. In 2012, the average fisherman in this fishery landed 24 times to bring a lower about of landings (8,176 pounds) for substantially higher ex-vessel revenue ($29,193).

In the South Coast region of California, the sea cucumber–trawl fishery experienced the most significant increase in average ex-vessel prices observed among fisheries of interest over the study period. Beginning at its minimum value in 1992 at $0.19 per pound, the average ex-vessel price per pound grew almost every year to a high of $3.87 per pound by 2011, see Figure 108. In 2012 the average ex-vessel price per pound ($3.57) was still significantly higher that it was at the beginning of the study period.

Figure 109 displays ex-vessel revenue for the sea cucumber–trawl commercial fishery across South Coast ports over the study period of 1992–2012. For the first half of the study period, San Pedro/Los Angeles was the largest port contributing 42.4 percent on average annually over 1992–2001. Over 2002–2012, however, Santa Barbara's portion of ex-vessel revenue increased to represent an average of 76.9 percent of total ex-vessel revenue in the region annually. Like the sea cucumber–dive fishery, the trawl fishery in the South Coast constituted an even greater portion of the state fishery, constituting the entirety of it for most years.

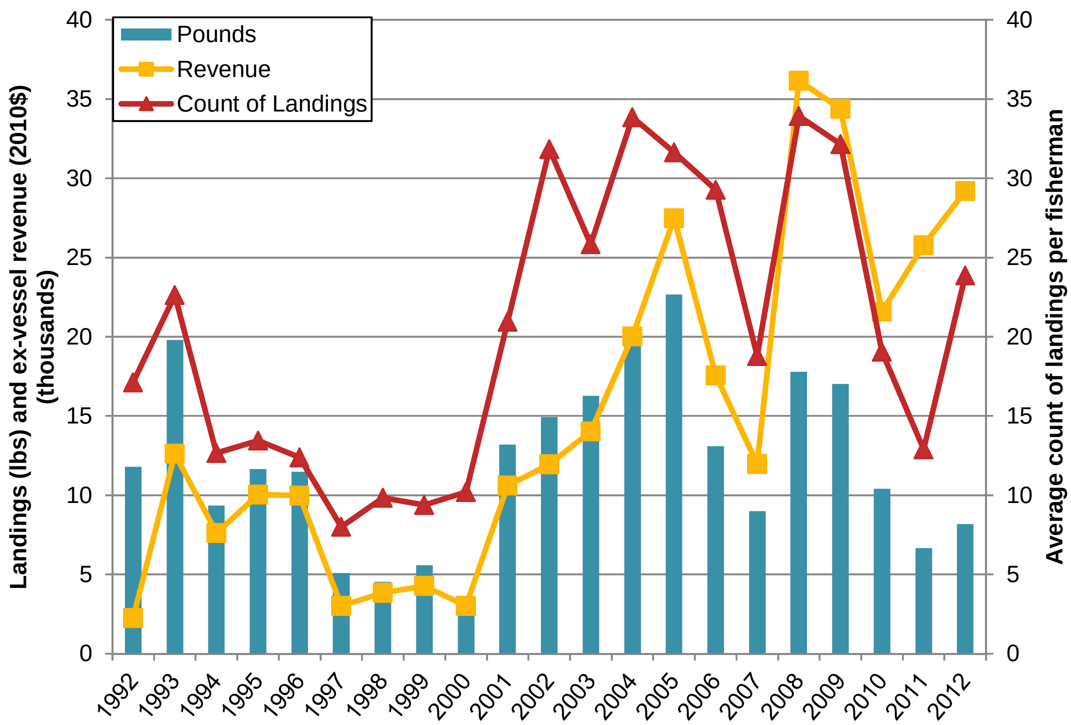
Figure 110 displays the percent change in sea cucumber–trawl commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. As stated above, regional trends equated to state trends for this fishery. Huge increases in ex-vessel revenue totals occurred from 2007 to 2008 and from 2010 to 2011, growing by over 200 percent in each instance. For the first, average ex-vessel revenue per fisherman increased by approximately the same amount, while in 2011 only increased by approximately 20 percent. As average per fisherman trends usually followed overall trends, this variance can likely be attributed to the more than doubling of the number of participating fishermen that occurred in 2011. From 2001 to 2012, trends returned to previously observed patterns of similarity.

Figure 106. Sea cucumber–trawl commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



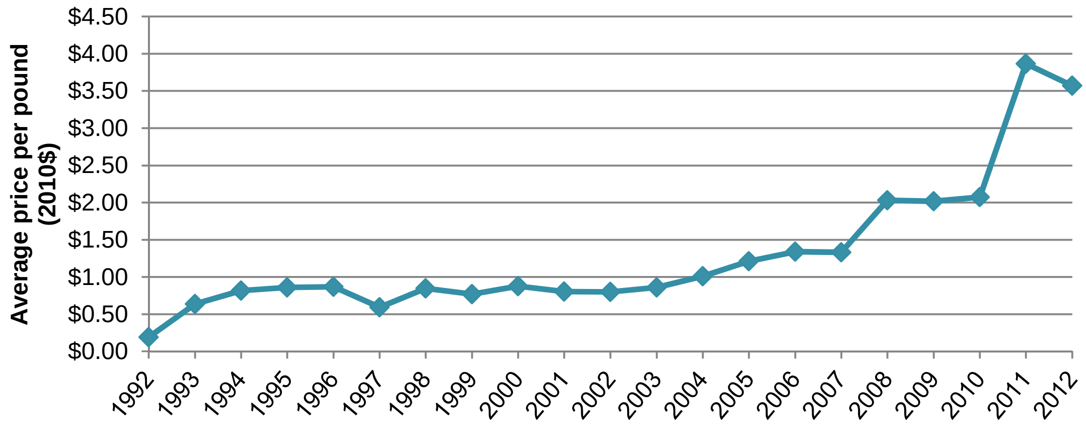
Source: Current study, based off landings data from CDFW.

Figure 107. Sea cucumber–trawl: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



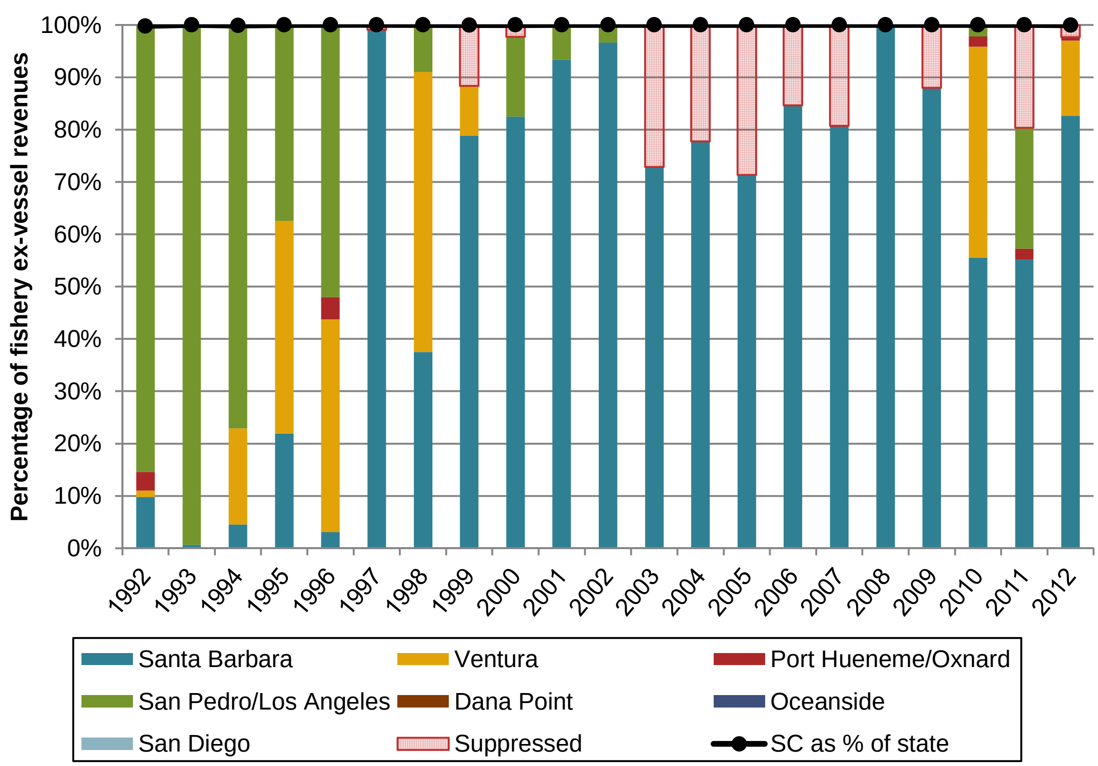
Source: Current study, based off landings data from CDFW.

Figure 108. Sea cucumber–trawl commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



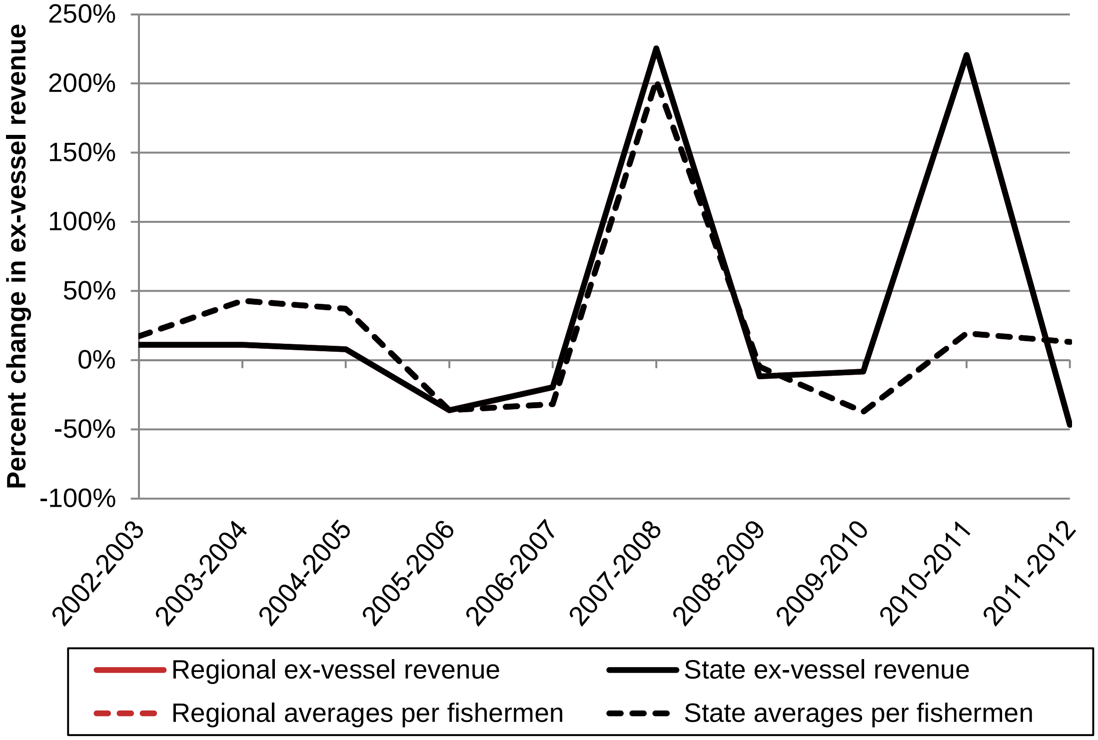
Source: Current study, based off landings data from CDFW.

Figure 109. Sea cucumber–trawl commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 110. Sea cucumber–trawl: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 24 individuals made landings in the sea cucumber—trawl fishery. Combined, they generated $700,625 in ex-vessel revenue, which is 0.9 percent of the $80.8 million generated by the target interview fisheries over the entire study region. The majority of the sea cucumber—dive fishery landings came from Santa Barbara (82.6 percent), which was also where the most number of individuals made landings (14 individuals). We interviewed 4 fishermen in the sea cucumber—trawl fishery, all from Santa Barbara (Table 166).

Table 166. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Sea cucumber—trawl

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	$578,892	14	4
Ventura	$100,872	6	—
Port Hueneme/Oxnard	$4,458	3	—
San Pedro/Los Angeles	*	2	—
Dana Point	—	—	—
Oceanside	—	—	—
San Diego	—	—	—
Unique individuals	$700,625	24	4

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The sea cucumber—trawl fishermen we interviewed on average were older and had more years of experience compared to the average fisherman throughout the South Coast study region. As shown in

Table 167, the sea cucumber trawlers had an average age of 61.5 years, and 45 years of experience commercial fishing.

Table 167. Average age and years of experience commercial fishing in 2012, Sea cucumber—trawl

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	4	61.5	13.4	4	45.0	14.7
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All ports (unique individuals)	4	61.5	13.4	4	45.0	14.7

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

As shown in Table 168, across the study region there was a slight decrease of 3.8 percent in reported percent income coming from commercial fishing between 2008 and 2012. Half of the sea cucumber trawlers in Santa Barbara perceived no change, while the other half perceived a significantly lower personal income coming from commercial fishing in 2012 relative to 2008 (Table 207). Among the reasons cited for this decrease were a decrease in fish abundance, less revenue from fishing, and changes in regulations. Again, it is important to note that this question was not asked in regards to sea cucumber—trawl specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 168. Percent change in income from overall commercial fishing from 2008 - 2012, Sea cucumber—trawl

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	3	98.3%	2.9%	4	95.0%	10.0%	-3.4%
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	1	*	*	—	—	—	—
All ports (unique individuals)	4	98.8%	2.5%	4	95.0%	10.0%	-3.8%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 169. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Sea cucumber—trawl

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	4	—	—	50.0%	—	50.0%
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All Ports (unique individuals)	4	—	—	50.0%	—	50.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 170. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Sea cucumber–trawl

Fishery	Number responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Santa Barbara	2	—	—	—	—	—	—	—	—	1	—	—	—	2	1
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/ Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	2	—	—	—	—	—	—	—	—	1	—	—	—	2	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

As shown in Table 171, there was a slight increase of 2.9 percent in the overall average percent change in gross economic revenue used for operating costs from 2008 to 2012. Respondents in Santa Barbara perceived this increase, and half felt the amount of gross economic revenue going toward operating costs was significantly higher, and the other half felt it was somewhat higher (Table 172). The most commonly cited reasons for the perceived increase in gross economic revenue going toward expenses were the increase in fuel prices and price of goods and labor (Table 173).

Table 171. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Sea cucumber—trawl

	2008^			2012			
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
Santa Barbara	3	48.3%	22.5%	4	45.0%	29.2%	-6.9%
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	1	*	*	—	—	—	—
All ports (unique individuals)	4	43.8%	20.6%	4	45.0%	29.2%	2.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 172. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Sea cucumber—trawl

		Percent response				
Ports	Number responding	Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
Santa Barbara	4	50.0%	50.0%	—	—	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—
All Ports (unique individuals)	4	50.0%	50.0%	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 173. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Sea cucumber—trawl

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	4	4	—	1	3	—	—	1	1	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	4	4	—	1	3	—	—	1	1	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 174, the Santa Barbara sea cucumber trawlers had an average age of 27.3 years, and spent an average of 106.3 days targeting that fishery in 2012. Some sea cucumber trawlers in Santa Barbara indicated using crew members, with an average 0.5 crew members, and paid them an average of 10 percent of gross economic revenue (Table 175).

Table 174. Years of experience and number of days targeting specific fisheries in 2012, Sea cucumber—trawl

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	4	27.3	14.4	4	106.3	71.1
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 175. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Sea cucumber—trawl

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	4	0.5	0.6	4	10.0%	11.5%	4	18.0%	7.7%
Ventura	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

All respondents were asked to compare his/her success in the sea cucumber—trawl fishery in 2012 to the previous ten years. As shown in Table 176, below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 177), economic (Table 178), regulatory (Table 179), and other factors (no data).

In the sea cucumber—trawl fishery, all respondents in Santa Barbara indicated they had done either significantly worse (50 percent) or somewhat worse (50 percent) in the fishery in 2012 relative to the previous ten years. The negative influence on success cited were lack of fish or product, increase prices in fuel or other item, and MPAs or other closures.

Table 176. Overall success in specific commercial fishery, 2012 compared to previous ten years, Sea cucumber—trawl

		Percent response					
Ports	Number responding	Did not participate in previous seasons	Significantly better	Somewhat better	The same	Somewhat worse	Significantly worse
Santa Barbara	4	—	—	—	—	50.0%	50.0%
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	4	—	—	—	—	50%	50%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 177. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Sea cucumber—trawl

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	1	—	—	—	—	—	1	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	1	—	—	—	—	—	1	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 178. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Sea cucumber—trawl

		Positive			Negative			
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
Santa Barbara	1	—	—	—	—	—	—	1
Ventura	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—
All ports (unique individuals)	1	—	—	—	—	—	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 179. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Sea cucumber–trawl

Ports	Number responding	Negative					
		A	B	C	D	E	F
Santa Barbara	2	—	—	2	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	2	—	—	2	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

3.5.11. Spot prawn–trap: Initial Changes and Baseline Characterization

Spot prawn (*Pandalus platyceros*) is a large coldwater shrimp and is targeted commercially in central and southern California. Originally a trawl fishery, it reached a peak of over 375,000 pounds landed in 1981 using this gear type. However, restrictions in the use of trawl gear to harvest spot prawn during certain months of the year lead to the emergence of the trap fishery in 1985 (CDFG 2004). In particular, trap gear was used in areas that trawlers were no longer able to access due to the ban on trawl gear within 3 miles of shore. The spot prawn trap fishery quickly became a live fishery as traps allowed spot prawn to be caught in excellent condition and were then kept alive in holding tanks. In 1991 live spot prawns were sold for $6-$10 per pound and dead for $4.50 to $5.50 per pound. Between 1985 and 1991 the trap fishery made up 75 percent of landings and trawl made up only 25 percent as interests increased in other trawl fisheries (CDFG 2008). Now, the spot prawn fishery has transitioned completely to a trap fishery as the use of trawl gear has been banned in this fishery.

Figure 111 displays the commercial landings, ex-vessel revenue, and participating fishermen in the spot prawn–trap fishery in the study region over the study period. Landings and ex-vessel revenue were lowest in 1995 at 79,708 pounds for $787,666, and increased overall to reach a maximum value in the final year of the study period, 2012, at 276,575 pounds for $3 million in ex-vessel revenue. Simultaneously, the number of spot prawn–trap fishermen decreased by 69.6 percent over the course of the study period, from a peak of 68 in 1994 to a low of 15 later on in the study, finishing 2012 at 17 fishermen.

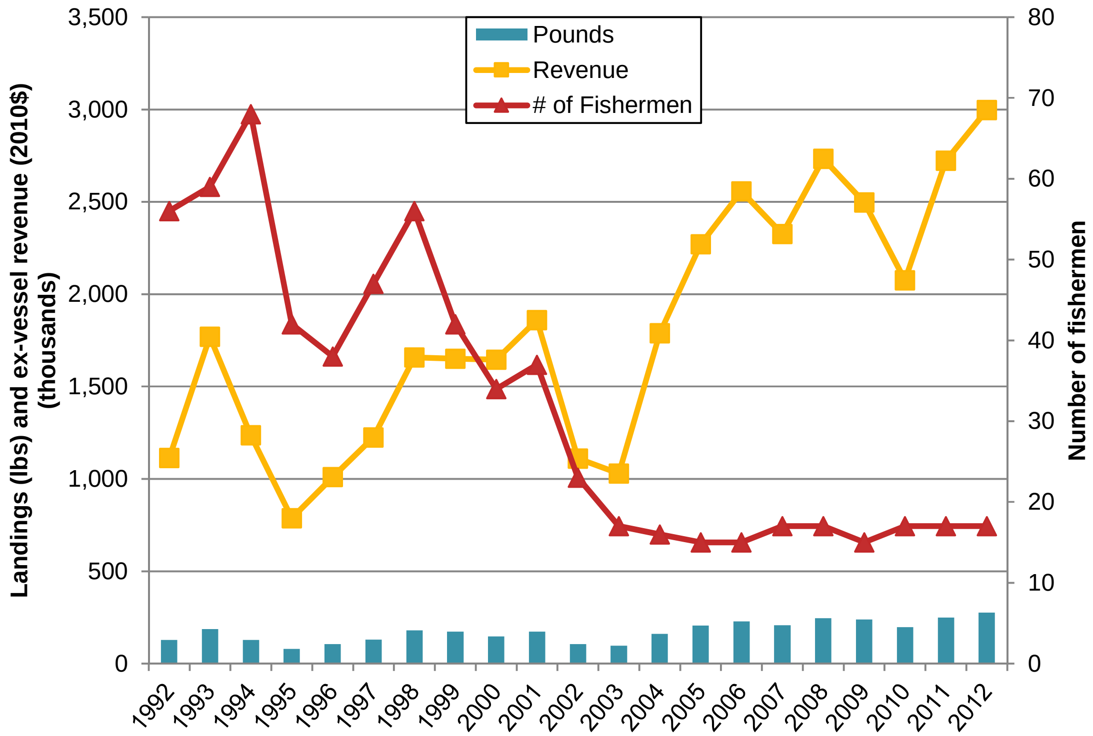
As landings and ex-vessel revenue increased and the number of overall fishermen decreased, increases in the average landings and ex-vessel revenue per fisherman of those remaining were substantial, see Figure 112. Average annual landings per fisherman increased by more than seven times from 1992 levels by 2012, from 2,291 pounds to 16,269 pounds respectively. Similarly, ex-vessel revenue also increased nearly eight-fold from 1992 to 2012 levels, from $19,897 to $176,274 respectively. Spot prawn–trap fishermen also made many more landings on average annually since 1992, increasing 83 percent from 24 to 44 landings made over the course of a year in 2012.

One of the most highly priced fisheries in the South Coast region among fisheries of interest, the average spot prawn–trap ex-vessel price per pound 24.8 percent over the course of the study period, see Figure 113. In 1992 the minimum ex-vessel price was observed at $8.68 per pound, rising to a peak of $11.25 per pound in 2000, and finishing the study period in 2012 with at $10.83 per pound.

Figure 114 displays ex-vessel revenue for the spot prawn–trap commercial fishery across South Coast ports over the study period of 1992–2012. Over the study period, the top contributing ports were San Pedro/Los Angeles (an annual average of 32.2 percent of regional ex-vessel revenue), Port Hueneme/Oxnard (29.4 percent), and San Diego (13.6 percent). As less fishermen participated over time, more data was subsequently surprised in the latter half of the study period.

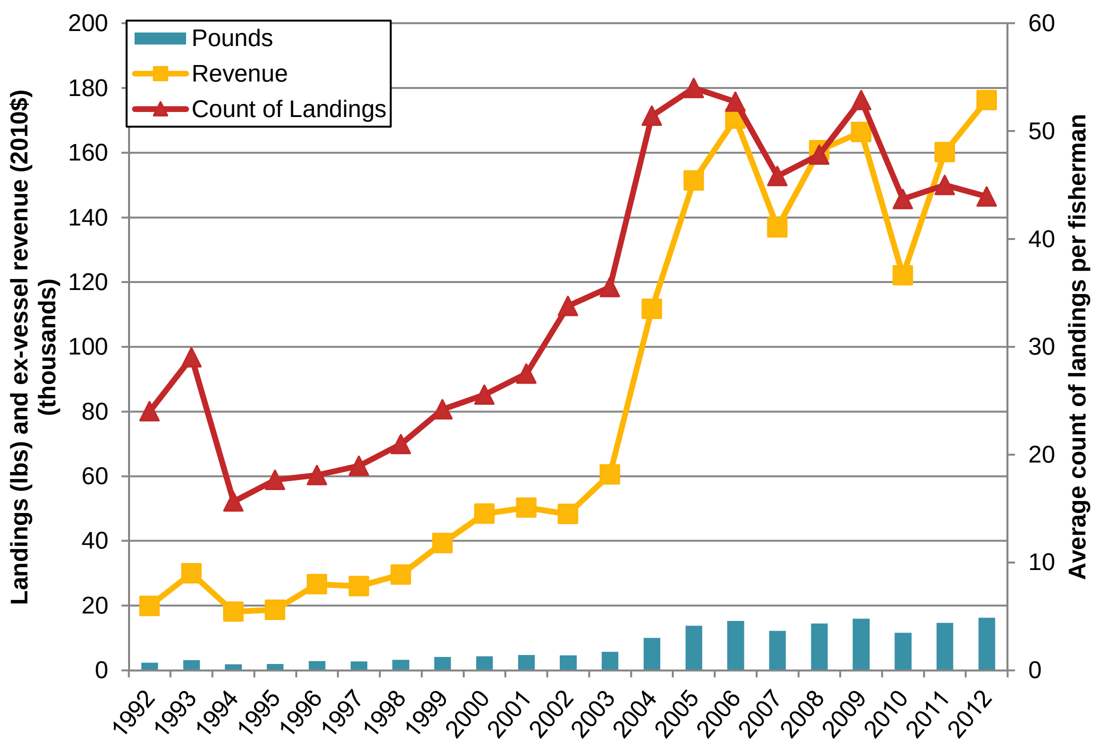
Figure 115 displays the percent change in spot prawn–trap commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. While regional trends were very similar to state trends for many years over the study period, variances occurred in 2004 and 2011. From 2003 to 2004 the regional fishery saw larger increases in total (73.8 percent vs. 42 percent respectively) and average per fisherman (84.7 percent vs. 35.5 percent) ex-vessel revenue. From 2010 to 2011, however, the trend had reversed with the state fishery outperforming the regional fishery both overall (79.8 percent vs. 31.2 percent respectively) and at the average fisherman level (71.6 percent vs. 31.2 percent).

Figure 111. Spot prawn–trap commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



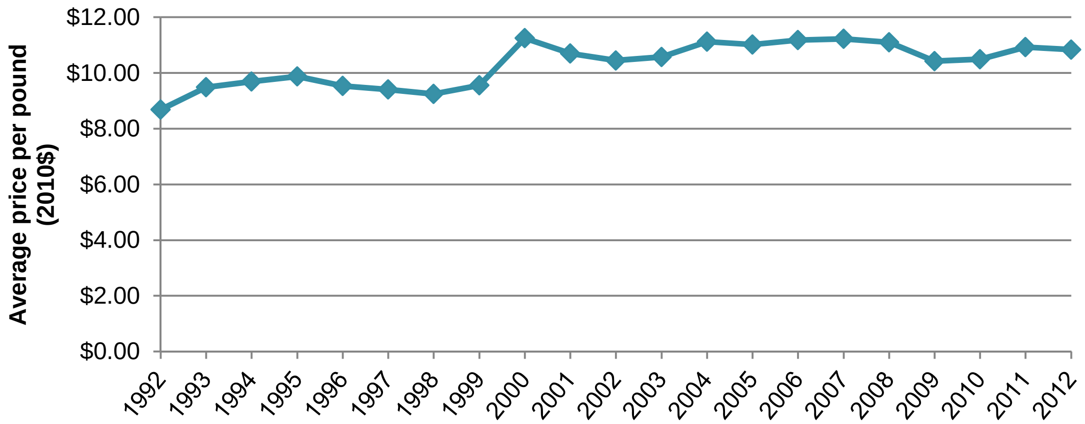
Source: Current study, based off landings data from CDFW.

Figure 112. Spot prawn–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



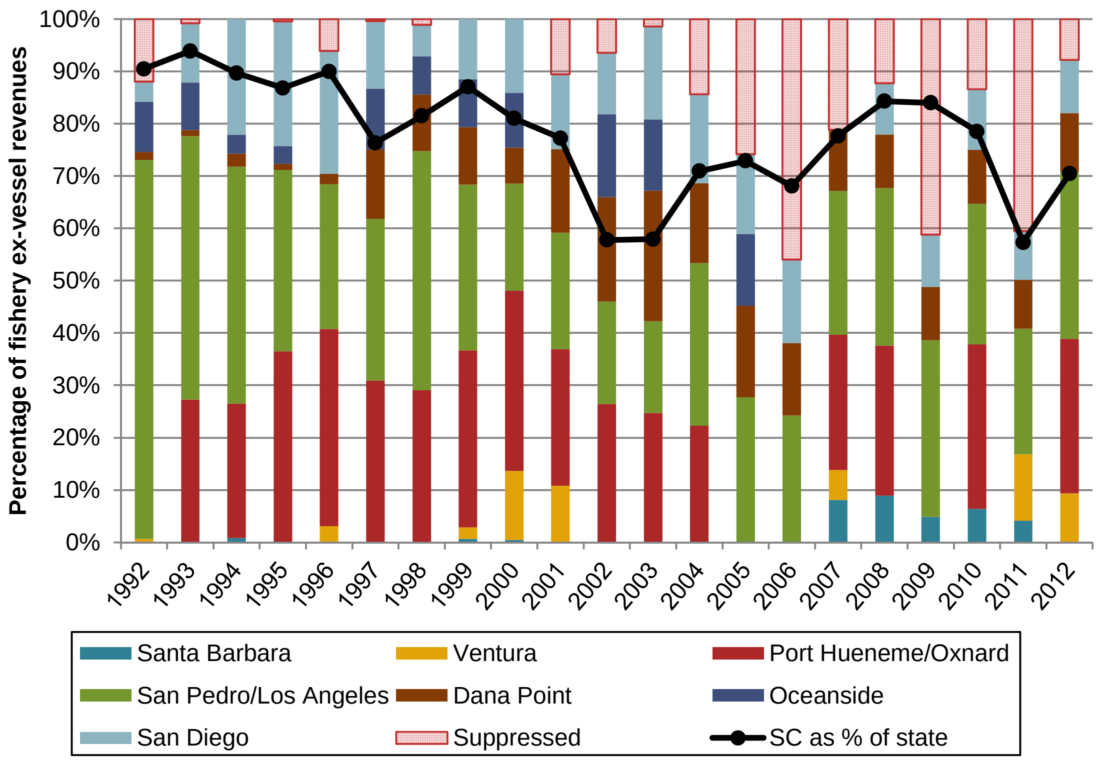
Source: Current study, based off landings data from CDFW.

Figure 113. Spot prawn–trap commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



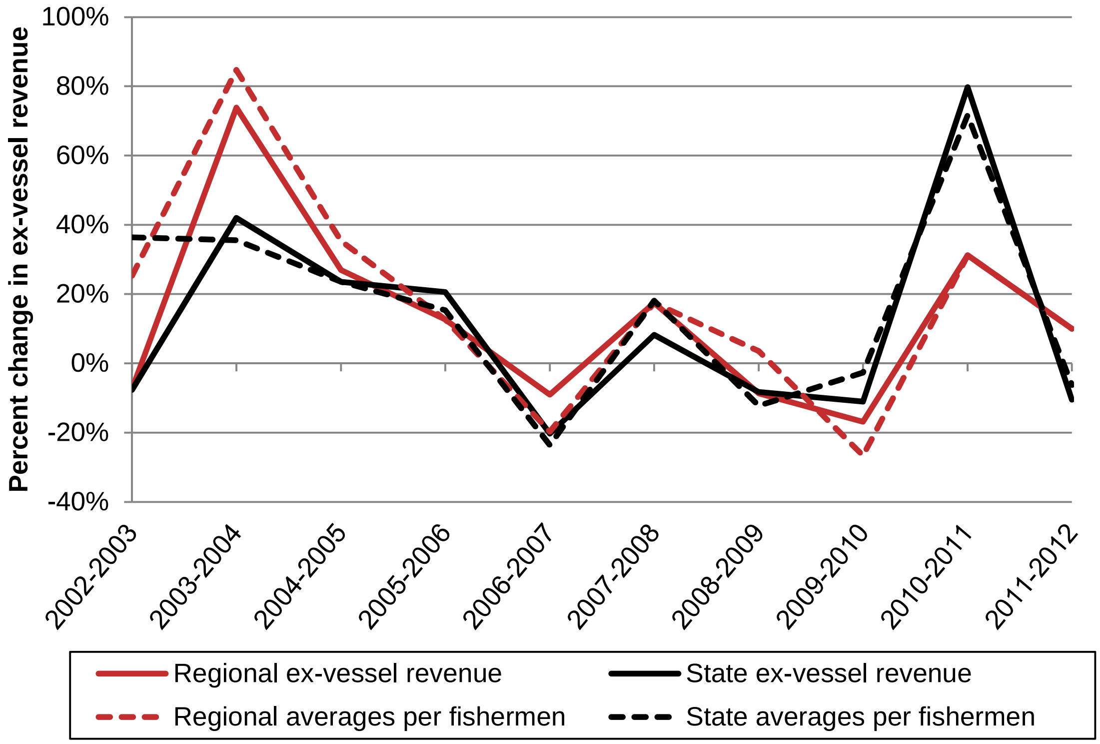
Source: Current study, based off landings data from CDFW.

Figure 114. Spot prawn–trap commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 115. Spot prawn–trap: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 17 individuals made landings in the spot prawn—trap fishery. Combined, they generated $3.0 million in ex-vessel revenue, which is 3.7 percent of the $80.8 million generated by target fisheries over the entire study region. The majority of the spot prawn—trap fishery landings came from San Pedro/Los Angeles (32.0 percent), which was also where the most number of individuals made landings (6 individuals). We interviewed 4 fishermen in the spot prawn—trap fishery (Table 180).

Table 180. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Spot prawn—trap

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	*	3	—
Ventura	$280,412	3	1
Port Hueneme/Oxnard	$883,643	3	—
San Pedro/Los Angeles	$958,114	6	1
Dana Point	$334,924	3	—
Oceanside	*	2	1
San Diego	$305,166	4	1
Unique individuals	$2,996,653	17	4

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The spot prawn—trap fishermen we interviewed on average were older and but had less years of commercial fishing experience compared to the average fisherman throughout the South Coast study region. As shown in

Table 181, the fishermen had an average age of 53.7 years, and 24.8 years of experience.

Table 181. Average age and years of experience commercial fishing in 2012, Spot prawn—trap

	Age			Years of experience		
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
Santa Barbara	—	—	—	—	—	—
Ventura	1	*	*	1	*	*
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	1	*	*
Dana Point	—	—	—	—	—	—
Oceanside	1	*	*	1	*	*
San Diego	1	*	*	1	*	*
All ports (unique individuals)	4	53.7	7.6	4	24.8	15.3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 182, across the study region there was a slight decrease of -1.9 percent in percent income coming from commercial fishing between 2008 and 2012. The majority of fishermen in the spot prawn—trap fishery perceived no change (75 percent), while a small portion perceived somewhat higher (25 percent) amount of income coming from commercial fishing in 2012 relative to 2008 (Table 183). Data regarding the causes for the changes to income was collected but cannot be shown due confidentiality constraints. Again, it is important to note that this question was not asked in regards to spot prawn—trap specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 182. Percent change in income from overall commercial fishing from 2008 - 2012, Spot prawn—trap

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	1	*	*	—	—	—	—
Ventura	1	*	*	1	*	*	*
Port Hueneme/Oxnard	1	*	*	—	—	—	—
San Pedro/Los Angeles	4	97.5%	5.0%	1	*	*	*
Dana Point	4	100.0%	—	—	—	—	—
Oceanside	1	*	*	1	*	*	*
San Diego	4	100.0%	—	1	*	*	*
All ports (unique individuals)	16	99.4%	2.5%	4	97.5%	5.0%	-1.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 183. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Spot prawn—trap

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	—	—	—	—	—	—
Ventura	1	*	*	*	*	*
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	*	*	*
Dana Point	—	—	—	—	—	—
Oceanside	1	*	*	*	*	*
San Diego	1	*	*	*	*	*
All Ports (unique individuals)	4	—	25.0%	75.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

As shown in Table 207, there was an increase of 8.3 percent in the overall percent change in gross economic revenue used for operating costs from 2008 to 2012. This increase is reflected well in how respondents perceived the changes to gross economic revenue going toward operating costs. Half felt the amount of gross economic revenue going toward operating costs was somewhat higher, and the other half felt it had not changed (Table 185). The most commonly cited reasons for the perceived increase in gross economic revenue going toward expenses were the increase in fuel prices, the price of goods and labor, and more crew (Table 186).

Table 184. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Spot prawn—trap

	2008^			2012			
Port	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
Santa Barbara	1	*	*	—	—	—	—
Ventura	1	*	*	1	*	*	*
Port Hueneme/Oxnard	1	*	*	—	—	—	—
San Pedro/Los Angeles	3	51.7%	17.6%	1	*	*	*
Dana Point	3	44.3%	9.8%	—	—	—	—
Oceanside	1	*	*	1	*	*	*
San Diego	3	35.0%	13.2%	1	*	*	—
All ports (unique individuals)	13	46.8%	16.1%	4	50.8%	11.4%	8.3%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 185. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Spot prawn—trap

		Percent response				
Ports	Number responding	Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
Santa Barbara	—	—	—	—	—	—
Ventura	1	*	*	*	*	*
Port Hueneme/Oxnard	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	*	*	*
Dana Point	—	—	—	—	—	—
Oceanside	1	*	*	*	*	*
San Diego	1	*	*	*	*	*
All Ports (unique individuals)	3	—	50.0%	50.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 186. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Spot prawn--trap

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ventura	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	—	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	2	2	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

Data were collected regarding the years of experience, number of days targeting the fishery in 2012, number of crew, and the percent of gross economic revenue going to crew and fuel for the spot prawn—trap fishery, but is not reported here due to confidentiality constraints.

All respondents were asked to compare his/her success in the spot prawn—trap fishery in 2012 to the previous ten years. As shown in Table 187, below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 188), economic (no data), regulatory (no data), and other factors (no data).

In the spot prawn—trap fishery, the majority of respondents indicated they had done better, either significantly better (33 percent) or somewhat better (33 percent) in the fishery in 2012 relative to the previous ten years. An additional 33 percent perceived no change in their success. The positive influences on success cited were the abundance of fish and good oceanic conditions.

Table 187. Overall success in specific commercial fishery, 2012 compared to previous ten years, Spot prawn—trap

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	—	—	—	—	—	—	—
Ventura	1	*	*	*	*	*	*
Port Hueneme/Oxnard	—	—	—	—	—	—	—
San Pedro/Los Angeles	1	*	*	*	*	*	*
Dana Point	—	—	—	—	—	—	—
Oceanside	1	*	*	*	*	*	*
San Diego	—	—	—	—	—	—	—
All ports (unique individuals)	3	—	33%	33%	33%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 188. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Spot prawn—trap

Ports	Number responding	Positive A	B	C	D	E	Negative F	G	H	I	J
Santa Barbara	—	—	—	—	—	—	—	—	—	—	—
Ventura	*	*	*	*	*	*	*	*	*	*	*
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	*	*	*	*	*	*	*	*	*	*	*
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	2	2	—	1	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

3.5.12. Urchin–dive: Initial Changes and Baseline Characterization

The California fishery for red sea urchin *(Strongylocentritus franciscanus)* developed in the early 1970s in southern California. The fishery was developed as part of a program by the National Marine Fisheries Service to target underutilized fisheries as well as to protect kelp from urchin grazing. The fishery expanded into the north coast in the late 1970s and early 1980s from Half Moon Bay up to Crescent City. Landings in this region peaked in 1988 at 30.5 million pounds, but then began to quickly decline the following year (CDFG 2004). During the early years of the urchin–dive fishery it was largely unregulated; however, in 1987 the Director's Sea Urchin Advisory Committee (later the California Sea Urchin Commission) was established. In 1987 the committee created a moratorium on new permits, in 1988 they created a minimum size limit, in 1990 they restricted fishing to certain days within the calendar year, and also in 1900 they introduced a method to reduce effort by requiring new permit holders to acquire 10 permits in order to enter the fishery (CDFG 2004).

Figure 116 displays the steady decline observed in the urchin–dive commercial fishery in terms of landings, ex-vessel revenue, and number of participating fishermen in the South Coast region over 1992–2012. Landings started at a high of 20.3 million pounds in 1992, and fell to a low of 7.2 million pounds by 1998. In review meetings, fishermen recalled that El Niño conditions in 1998 had a large impact on the fishery and were responsible for the decreased landings. Landings by the end of the study period remained depressed, though with some variation; in 2012, 8.2 million pounds of urchin–dive were landed. Similar trends were found in urchin–dive ex-vessel revenue, peaking in 1994 at $25.8 million and falling to a low of $4.7 by 2007, finishing 2012 at $5.6 million. The number of participating fishermen fell by 77.2 percent from 1992 (768) and 2012 (175).

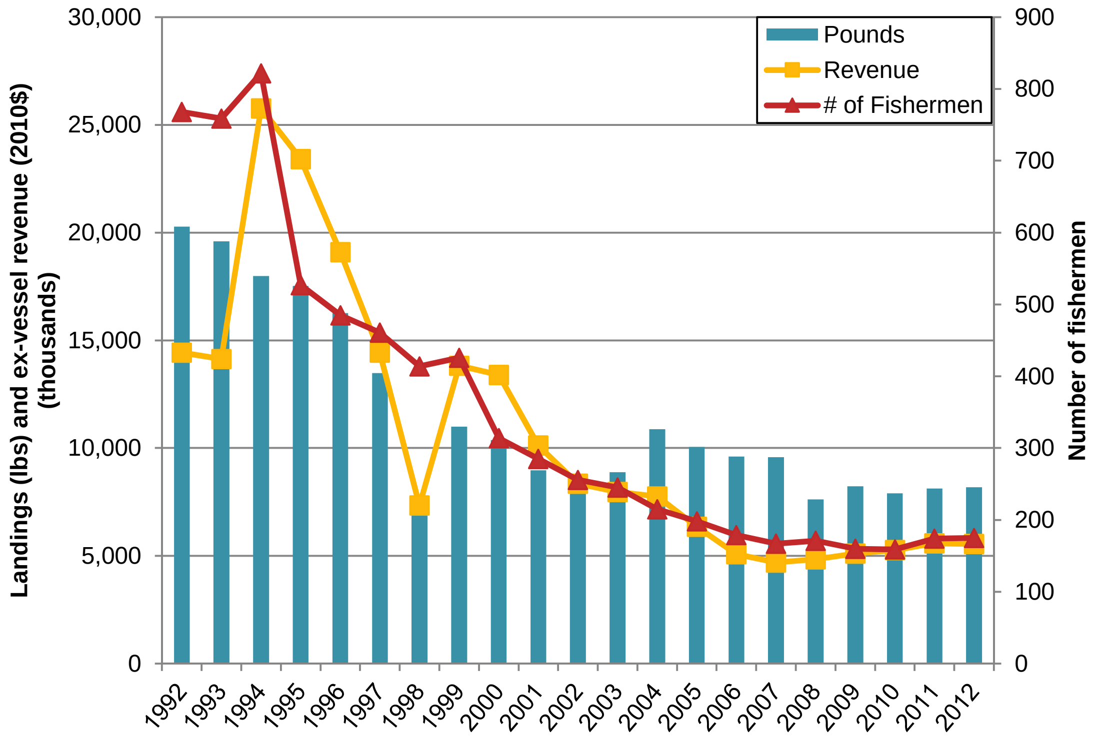
On average, the pounds landed, ex-vessel revenue, and number of landing trips made by individual fisherman increased in this fishery over the study period, see Figure 117, despite overall declines in the fishery in total. Fishermen in 2012 landed 77.1 percent more pounds (46,776 vs. 26,409) for 69.1 percent high ex-vessel revenue ($31,768 vs. $18,783) than they did in 1992, making almost twice as many landings throughout the year to do so.

Figure 118 demonstrates the average ex-vessel price per pound in the South Coast urchin-dive fishery in the South Coast region over 1992–2012. Though the 2012 average ex-vessel price per pound ($0.68) was only 4.5 percent lower than the 1992 price ($0.71), ex-vessel prices varied in between, with a high of $1.43 per pound observed in 1994 and a low of $0.49 per pound observed in 2007. Fishermen felt the prices reflected in the landings data seems low, especially in recent years, but commented that often times processors record a low base price on fish tickets and later update that prices to reflect the quality of the urchin. Also, fishermen noted that in the urchin fishery, prices are heavily dependent upon processors. In particular, fishermen in San Diego and San Pedro/Los Angeles noted that there are a limited number of processing options available to them and they feel processors heavily control pricing and profit.

Figure 119 displays ex-vessel revenue for the urchin–dive commercial fishery across South Coast ports over the study period of 1992–2012. The ports with the largest contributions of ex-vessel revenue over time in this fishery were Santa Barbara (42.4 percent on average annually), Port Hueneme/Oxnard (24.1 percent), and San Pedro/Los Angeles (20.2 percent).

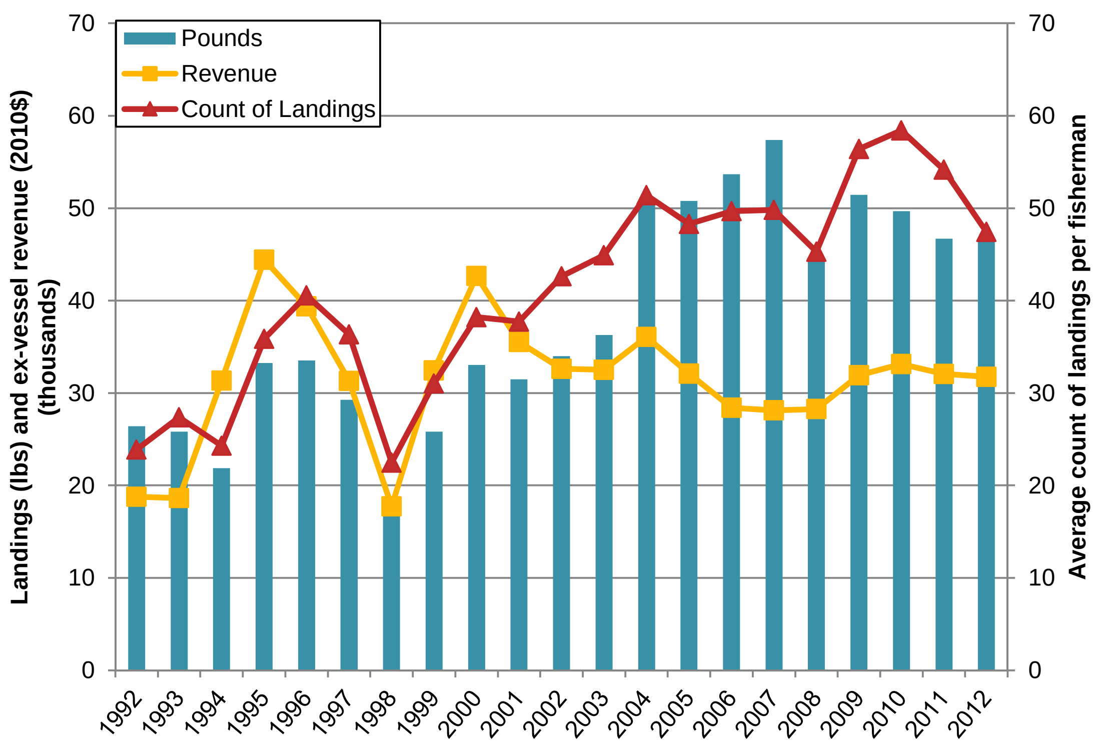
Figure 120 displays the percent change in urchin–dive commercial ex-vessel revenue and average ex-vessel revenue per fisherman annually for the last ten years of the study period, regionally in the South Coast as well as state-wide. From 2003–2008 the regional fishery constituted 86.4 percent of state ex-vessel revenue on average annually – during which regional and state trends were similar. From 2009–2012 this portion had dropped to an average of 68.6 percent annually, and trends became more dissimilar. The final year of the study period saw little change in the regional urchin–dive fishery from 2011 levels.

Figure 116. Urchin–dive commercial landings, ex-vessel revenue, and number of fishermen in the South Coast region, 1992–2012



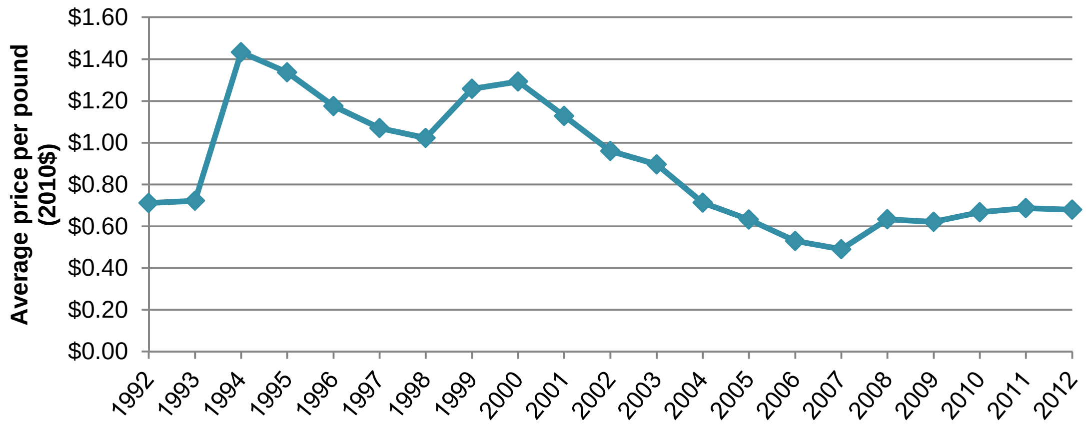
Source: Current study, based off landings data from CDFW.

Figure 117. Urchin–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, 1992–2012



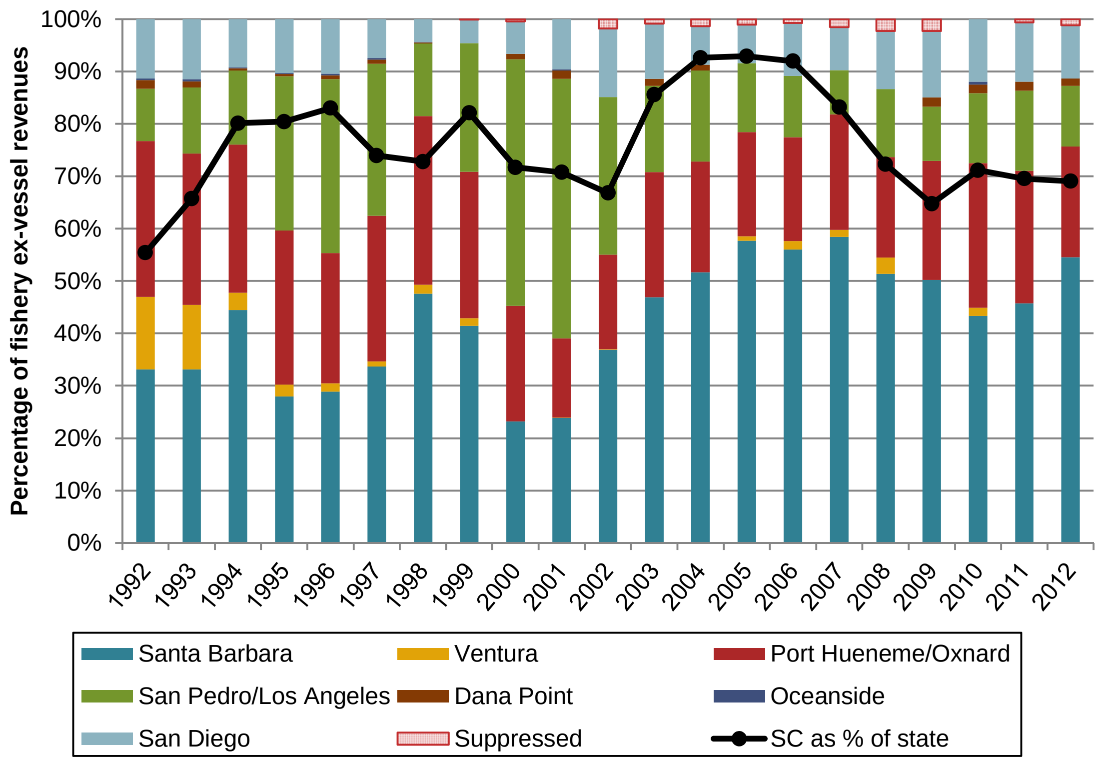
Source: Current study, based off landings data from CDFW.

Figure 118. Urchin–dive commercial fishery average ex-vessel price per pound in the South Coast region, 1992–2012



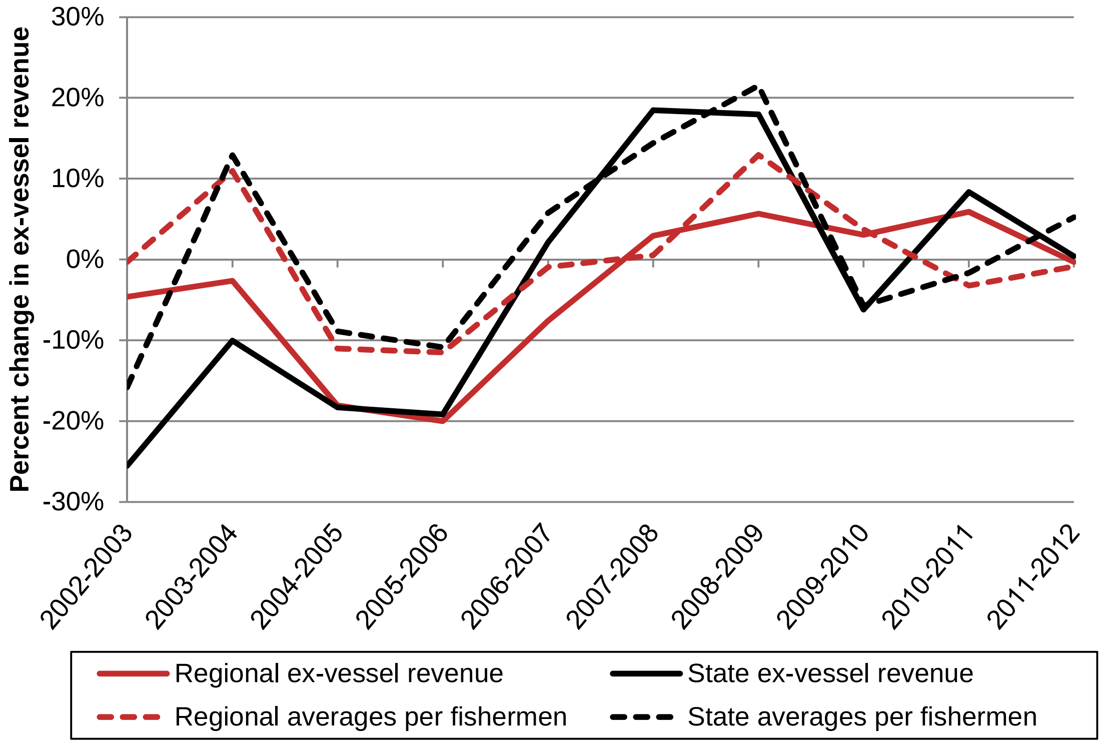
Source: Current study, based off landings data from CDFW.

Figure 119. Urchin–dive commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 120. Urchin–dive: Annual percent change in commercial ex-vessel revenue and average ex-vessel revenue per fisherman, 2003–2012



Source: Current study, based off landings data from CDFW.

In 2012, 175 individuals made landings in the urchin—dive fishery. Combined, they generated $5.6 in ex-vessel revenue, which is 6.9 percent of the $80.8 million generated by the target interview fisheries over the entire study region. The majority of the urchin—dive fishery landings came from Santa Barbara (54.5 percent), which was also where the most number of fishermen in the fishery made landings (101 individuals). We interviewed 34 fishermen in the urchin—dive fishery (Table 189).

Table 189. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Urchin—dive

Port	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
Santa Barbara	$3,030,518	101	14
Ventura	$64,503	11	—
Port Hueneme/Oxnard	$1,175,691	38	6
San Pedro/Los Angeles	$642,857	42	8
Dana Point	$78,028	11	—
Oceanside	—	—	—
San Diego	$567,861	22	6
Unique individuals	$5,559,458	175	34

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

The urchin—dive fishermen we interviewed on average were slightly older and had more years of experience commercial fishing compared to the average fisherman throughout the South Coast study region. As shown in Table 190, the urchin divers had an average age of 55.5 years, and 31.1 years of experience. The divers in the San Pedro/Los Angeles port complex were on average the oldest (61 years old) and had the most experience commercial fishing (34.4 years).

Table 190. Average age and years of experience commercial fishing in 2012, Urchin—dive

	Age			Years of experience		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	14	53.4	8.4	14	29.6	11.2
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	6	54.3	9.4	6	29.8	7.1
San Pedro/Los Angeles	8	61.0	7.9	8	34.4	8.9
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	6	54.3	4.6	6	31.3	3.9
All ports (unique individuals)	34	55.5	8.2	34	31.1	8.9

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

As shown in Table 191, across the study region there was a slight decrease of 2 percent in average percent income coming from commercial fishing between 2008 and 2012. The largest average decline occurred at Port Hueneme/Oxford, where a drop of 6.9 percent occurred between 2008 and 2012. The majority of urchin divers across all ports perceived no change (88.2 percent) in the percent of income coming from commercial (Table 192). Few reasons were cited for this decrease, but included personal reasons, and more revenue from other income sources (Table 193). Again, it is important to note that this question was not asked in regards to urchin—dive specifically, but generally about someone's overall commercial fishing experience. Additionally, 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust to inform the MPA planning process.

Table 191. Percent change in income from overall commercial fishing from 2008 - 2012, Urchin—dive

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	30	92.6%	12.0%	14	90.6%	19.9%	-2.1%
Ventura	3	96.7%	5.8%	—	—	—	—
Port Hueneme/Oxnard	10	94.5%	10.4%	6	88.0%	27.0%	-6.9%
San Pedro/Los Angeles	18	98.6%	5.9%	8	96.9%	7.0%	-1.8%
Dana Point	3	93.3%	11.5%	—	—	—	—
Oceanside	1	*	*	—	—	—	—
San Diego	10	99.0%	3.2%	6	98.3%	4.1%	-0.7%
All ports (unique individuals)	75	94.9%	10.4%	34	93.0%	17.2%	-2.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 192. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Urchin—dive

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	14	7.1%	—	85.7%	7.1%	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	6	—	16.7%	66.7%	—	16.7%
San Pedro/Los Angeles	8	—	—	100.0%	—	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	6	—	—	100.0%	—	—
All Ports (unique individuals)	34	2.9%	2.9%	88.2%	2.9%	2.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 193. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Urchin—dive

Fishery	Number responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
Santa Barbara	2	—	1	1	—	—	—	—	—	—	1	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/ Oxnard	2	1	—	—	—	1	1	—	—	—	1	—	1	—	—
San Pedro/Los Angeles	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	4	1	1	1	—	1	1	—	—	—	2	—	1	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

As shown in Table 194, there was a decrease of 8.9 percent in the overall percent change in average gross economic revenue used for operating costs from 2008 to 2012. Urchin divers in Port Hueneme/Oxford experienced the largest drop of 45.6 percent, while those in San Diego experienced an increase of 31.9 percent. Given the wide range of average changes, perceived changes also had a wide variety, but the largest number of respondents in all ports indicating that the percent gross economic revenue going toward operating costs was somewhat higher, 32.3 percent (Table 195). The most commonly cited reasons for the perceived increase in gross economic revenue going toward expenses were the increase in fuel prices and price of goods and labor (Table 196).

Table 194. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Urchin—dive

	2008^			2012			
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
Santa Barbara	31	43.8%	17.1%	14	35.7%	11.4%	-18.4%
Ventura	1	95.0%	—	—	—	—	—
Port Hueneme/Oxnard	8	61.1%	24.4%	6	33.3%	20.5%	-45.6%
San Pedro/Los Angeles	18	43.2%	23.3%	8	50.7%	23.5%	17.4%
Dana Point	3	44.0%	15.1%	—	—	—	—
Oceanside	1	*	*	—	—	—	—
San Diego	10	36.0%	9.7%	6	47.5%	29.8%	31.9%
All ports (unique individuals)	72	45.1%	20.2%	34	41.1%	20.2%	-8.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 195. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Urchin—dive

		Percent response				
Ports	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
Santa Barbara	13	15.4%	46.2%	23.1%	15.4%	—
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	5	40.0%	—	20.0%	—	40.0%
San Pedro/Los Angeles	7	14.3%	14.3%	42.9%	28.6%	—
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	6	33.3%	50.0%	16.7%	—	—
All Ports (unique individuals)	31	22.6%	32.3%	25.8%	12.9%	6.5%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 196. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Urchin—dive

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Santa Barbara	10	6	2	3	3	—	1	1	1	1	—	—	—	—	—	—	2	1
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	4	2	—	1	1	—	—	—	1	—	—	—	—	—	—	2	—	—
San Pedro/Los Angeles	4	—	1	—	—	—	—	2	—	—	—	1	—	—	1	—	1	2
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	5	5	2	2	3	—	—	—	—	—	—	—	—	—	—	—	—	—
All Ports (unique individuals)	23	13	5	6	7	—	1	3	2	1	—	1	—	—	1	2	3	3

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

As shown below in Table 197, the San Diego fishermen were the most experienced urchin divers with an average age of 33 years, and spent the most time targeting the fishery in 2012, with an average of 128.8 days. Some urchin divers employ crew members, and Port Hueneme/Oxford indicated using the most crew members, on average 2.2 crew members, and paid the largest percent of gross economic revenue, on average 15.8 percent (Table 198).

Table 197. Years of experience and number of days targeting specific fisheries in 2012, Urchin—dive

	Years of experience in fishery			Number of days targeting fishery in 2012		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	14	28.2	10.4	14	103.4	29.2
Ventura	—	—	—	—	—	—
Port Hueneme/Oxnard	6	27.7	9.5	6	107.5	51.0
San Pedro/Los Angeles	8	32.5	5.9	8	89.9	72.5
Dana Point	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—
San Diego	6	33.0	2.5	6	128.8	68.1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 198. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Urchin—dive

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Port	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
Santa Barbara	14	1.4	0.9	14	7.5%	6.7%	14	17.5%	8.9%
Ventura	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	6	2.2	1.3	6	15.8%	24.6%	6	23.6%	6.7%
San Pedro/Los Angeles	8	0.3	0.7	8	—	—	8	15.6%	4.3%
Dana Point	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—
San Diego	6	0.3	0.5	6	3.0%	6.7%	6	18.3%	6.7%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

All respondents were asked to compare his/her success in the urchin--dive fishery in 2012 to the previous ten years. As shown in Table 199 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishing. This question was asked as an open ended question and responses were later coded, categorized, and divided into four categories: environmental (Table 200), economic (Table 201), regulatory (Table 202), and other factors (Table 203).

Across all ports in the urchin—dive fishery, respondents indicated a wide range of success levels in 2012 compared to the previous ten years. Most commonly, 35 percent of the respondents indicated that their overall success was somewhat better. Among the most common positive influences reported for this change were high quality fish or product, good price, and working harder or putting in more effort. The common negative influence cited included bad oceanic conditions and bad price.

Table 199. Overall success in specific commercial fishery, 2012 compared to previous ten years, Urchin—dive

		Percent response					
Ports	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
Santa Barbara	14	—	14.3%	50.0%	21.4%	14.3%	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	6	—	16.7%	33.3%	33.3%	16.7%	—
San Pedro/Los Angeles	8	—	25.0%	37.5%	12.5%	12.5%	12.5%
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	6	—	16.7%	—	—	16.7%	66.7%
All ports (unique individuals)	34	—	18%	35%	18%	15%	15%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Table 200. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Urchin—dive

		Positive					Negative				
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
Santa Barbara	6	1	2	2	3	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	—	—	—	—	—	—	—	—	—	—	—
San Pedro/Los Angeles	3	—	—	1	2	—	—	—	1	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—
San Diego	3	—	—	—	1	1	—	1	1	—	—
All ports (unique individuals)	12	1	2	3	6	1	—	1	2	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 201. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Urchin—dive

Ports	Number responding	Positive A	Positive B	Positive C	Negative D	Negative E	Negative F	Negative G
Santa Barbara	4	3	—	—	—	—	—	1
Ventura	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	3	2	—	—	1	—	—	—
San Pedro/Los Angeles	3	—	1	—	1	—	—	1
Dana Point	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—
San Diego	4	—	1	—	3	—	—	—
All ports (unique individuals)	14	5	2	—	5	—	—	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 202. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Urchin--dive

Ports	Number responding	Negative					
		A	B	C	D	E	F
Santa Barbara	1	—	—	1	—	—	—
Ventura	—	—	—	—	—	—	—
Port Hueneme/Oxnard	1	—	—	1	—	—	—
San Pedro/Los Angeles	2	1	1	1	—	—	—
Dana Point	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—
San Diego	4	1	—	3	—	—	—
All ports (unique individuals)	8	2	1	6	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 203. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, Urchin–dive

		Positive						Negative						
Ports	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
Santa Barbara	4	3	1	—	—	—	—	—	—	—	—	—	—	—
Ventura	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Port Hueneme/Oxnard	3	—	1	—	1	1	1	—	—	—	—	—	—	—
San Pedro/Los Angeles	4	3	—	—	—	1	—	—	—	—	1	—	—	—
Dana Point	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Oceanside	—	—	—	—	—	—	—	—	—	—	—	—	—	—
San Diego	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All ports (unique individuals)	11	6	2	—	1	2	1	—	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

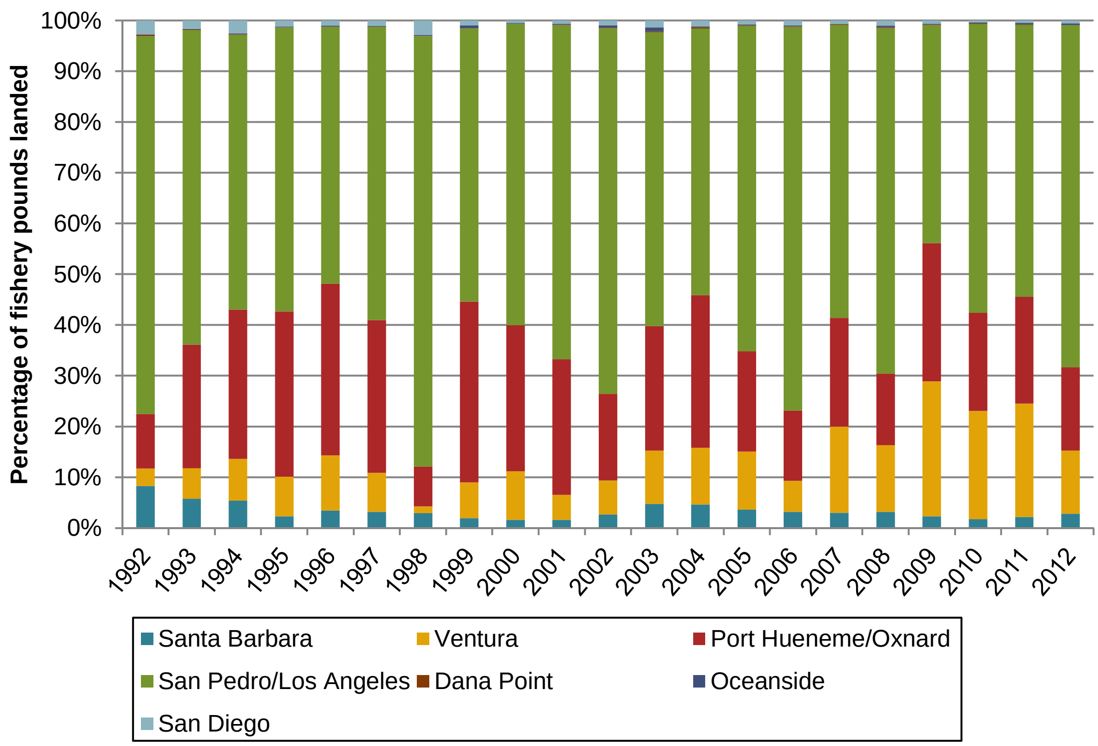
Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

4. SOUTH COAST REGION PORT PROFILES

Overall, the most significant port, in terms of the largest contribution to total landings and ex-vessel revenue from all fisheries in the study region over the study period, was San Pedro/Los Angeles. In 1998, this port alone represented 84.8 percent of total pounds landed in the South Coast and 55.7 percent of total regional ex-vessel revenue. On average, San Pedro/Los Angeles constituted 61.3 percent of total landings and 43.9 percent of total ex-vessel revenue annually in the South Coast. Port Hueneme/Oxnard constituted 23.1 percent of total landings and 19.4 percent of total ex-vessel revenue on average annually. Santa Barbara constituted an average of 13 percent of total regional ex-vessel revenue annually, while only contributing 3.4 percent of total landings on average annually. Similarly, San Diego, while representing only 1.2 percent of total landings in the study region on average annually, constituted an annual average of 8 percent of total ex-vessel revenue. This is due to these ports specializing in the urchin fishery which has a relatively lower price per pound.

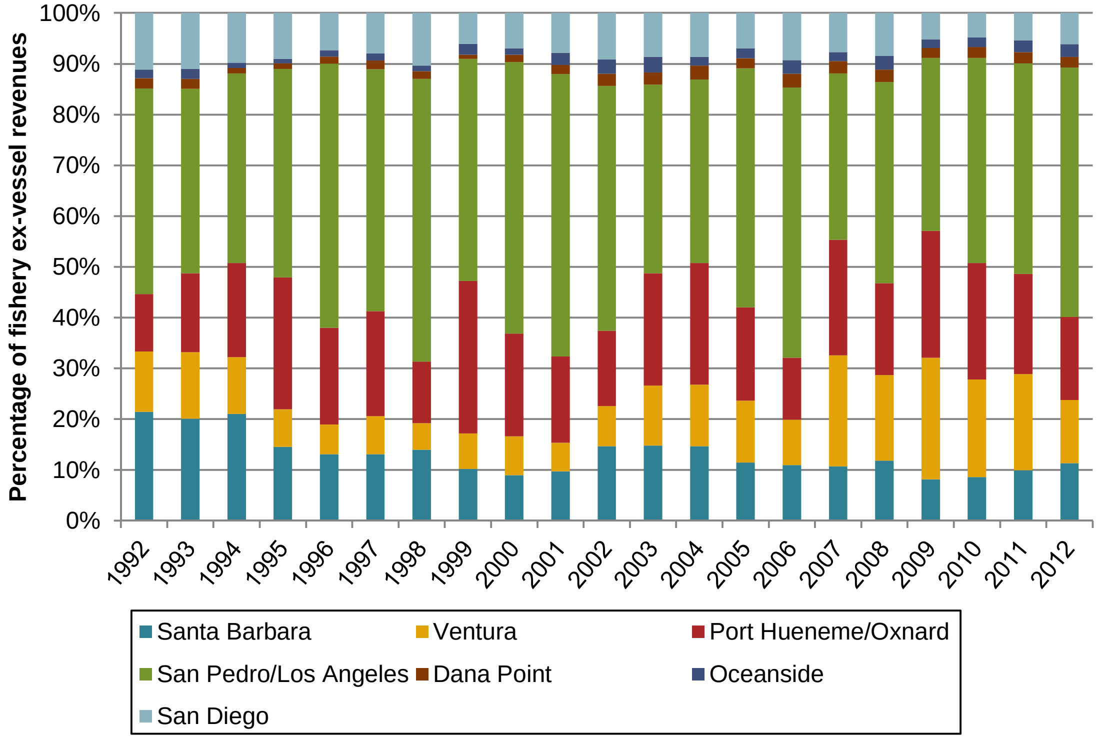
Potions of landings and ex-vessel revenue remained relatively consistent across ports over the study period. Ventura's percentage of regional landings increased, however, from 3.5 percent of total landings in 1992 to as high as 26.5 percent closer to the end of the study period in 2009.Ventura's share of ex-vessel revenue also increased over the study period, but not by as much. Only smaller changes were observed for the other South Coast ports.

Figure 121. All fisheries, commercial landings by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 122. All fisheries, commercial ex-vessel revenue by South Coast region ports, 1992–2012



Source: Current study, based off landings data from CDFW.

4.1. Santa Barbara

Santa Barbara is the northernmost port in the South Coast Study Region and is located 95 miles northwest of Los Angeles. According to the 2010 Census, the population of Santa Barbara was 88,410 with a median age of 36.8 years. The estimated per capita income (2007-2011) was $37,087 with a mean household income of $89,945 (US Census Bureau 2010).

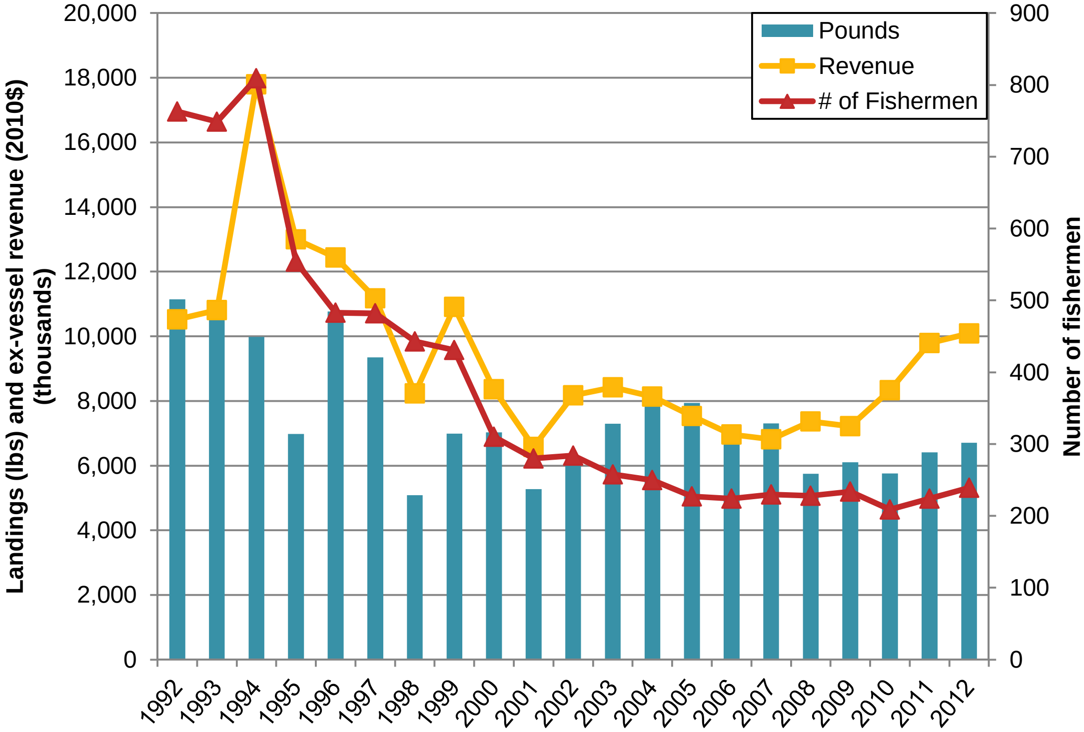
Facilities at Santa Barbara Harbor include a breakwater, marina, loading dock, hoist, fueling dock, ice machine, and space for 1,100 recreational and commercial vessels (Norman et al. 2007; Pomeroy et al. 2007). The ice machine was installed in 1992 through a grant from the Fisheries Enhancement Fund and produced an average of 40 tons of ice per month (County of Santa Barbara, 2013). As of 2000, there were three processing facilities in Santa Barbara; Kanoloa Imports, Mu's Seafood Company, and Sovereign Seafoods Inc. and they employed an average of 63 employees each. In a study completed in 2007 by Culver, Richards and Pomeroy, fishermen reported that they were generally happy with facilities available at the harbor, however they did identify some services as inadequate, such as bait availability, storage space, cold storages, and scales (Pomeroy et al. 2007).

4.1.1. Santa Barbara Commercial Fisheries Initial Changes

Figure 123 displays the commercial landings, ex-vessel revenue, and number of fishermen for all fisheries in the South Coast port of Santa Barbara over the study period 1992–2012. On average, ex-vessel revenue from Santa Barbara constituted 13 percent annually of total regional ex-vessel revenue in the study region, and an average of 3.4 percent of total landings annually. Landings declined 39.8 percent over the study period in this port, from a high of 11.1 million pounds to 6.7 million pounds by 2012. Ex-vessel revenue and number of participating fishermen also declined, from a high of $17.8 million and 809 fishermen in 1994 to a low of $6.6 million in 2001; while ex-revenue increased again towards the end of the study period ($10.1 million by 2012), Santa Barbara fishermen did not, with the lowest year of participation occurring in 2010 with 209 fishermen.

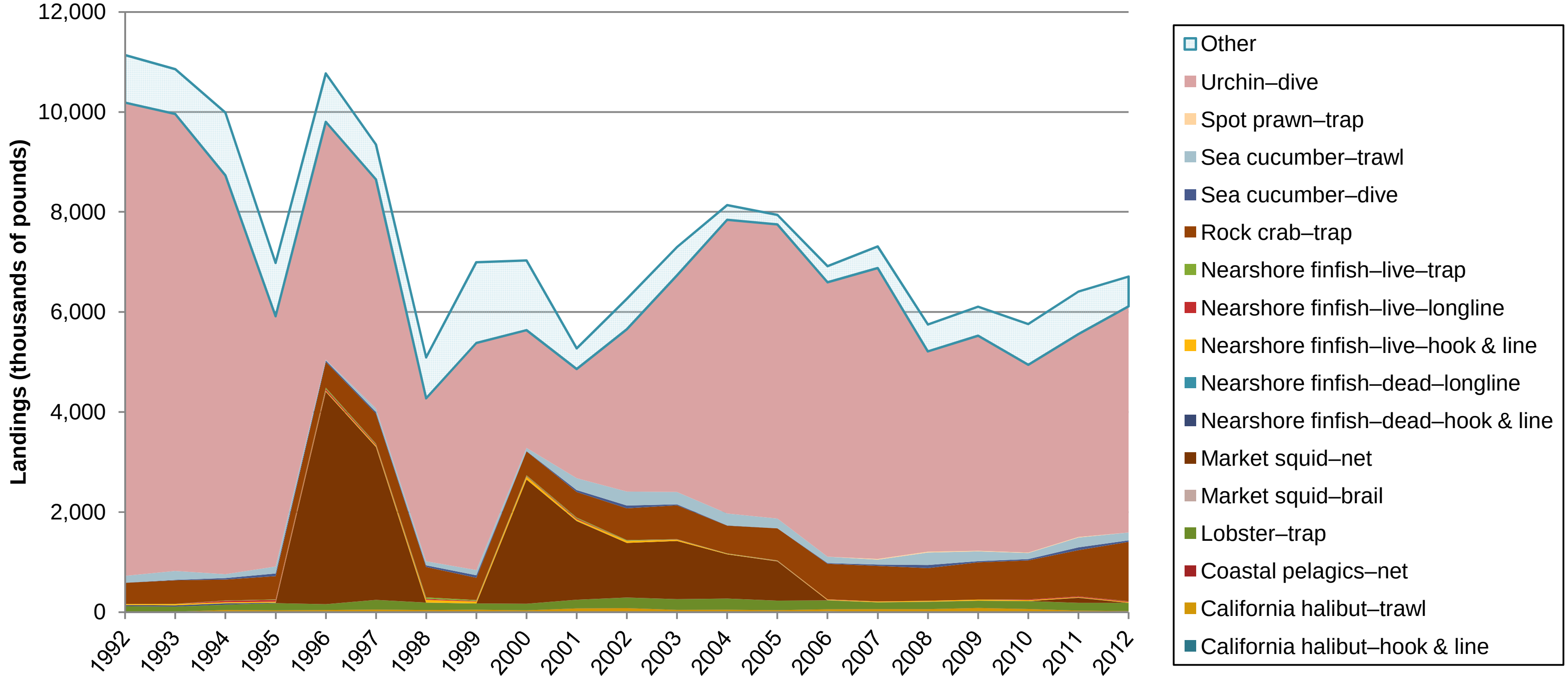
Figure 124 displays the landings and Figure 125 displays the ex-vessel revenue from fisheries of interest in the port of Santa Barbara over the study period of 1992–2012. In terms of pounds landed, the urchin–dive fishery was the most significant in the port over the study period, constituting 65.2 percent of total pounds landed on average annually. In terms of ex-vessel revenue, the urchin–dive fishery contributed an annual average of 41.6 percent of total ex-vessel revenue in Santa Barbara, followed in significance by the lobster–trap fishery which averaged 18.6 percent annually over the study period, increasing to just over a 25 percent by 2012. The rock crab–trap fishery was also a fishery of increasing significance over the study period, constituting 5.9 percent in 1992 and 16.3 percent by 2012 of total ex-vessel revenue in the port.

Figure 123. Santa Barbara total commercial landings, ex-vessel revenue, and number of fishermen, all fisheries, 1992–2012



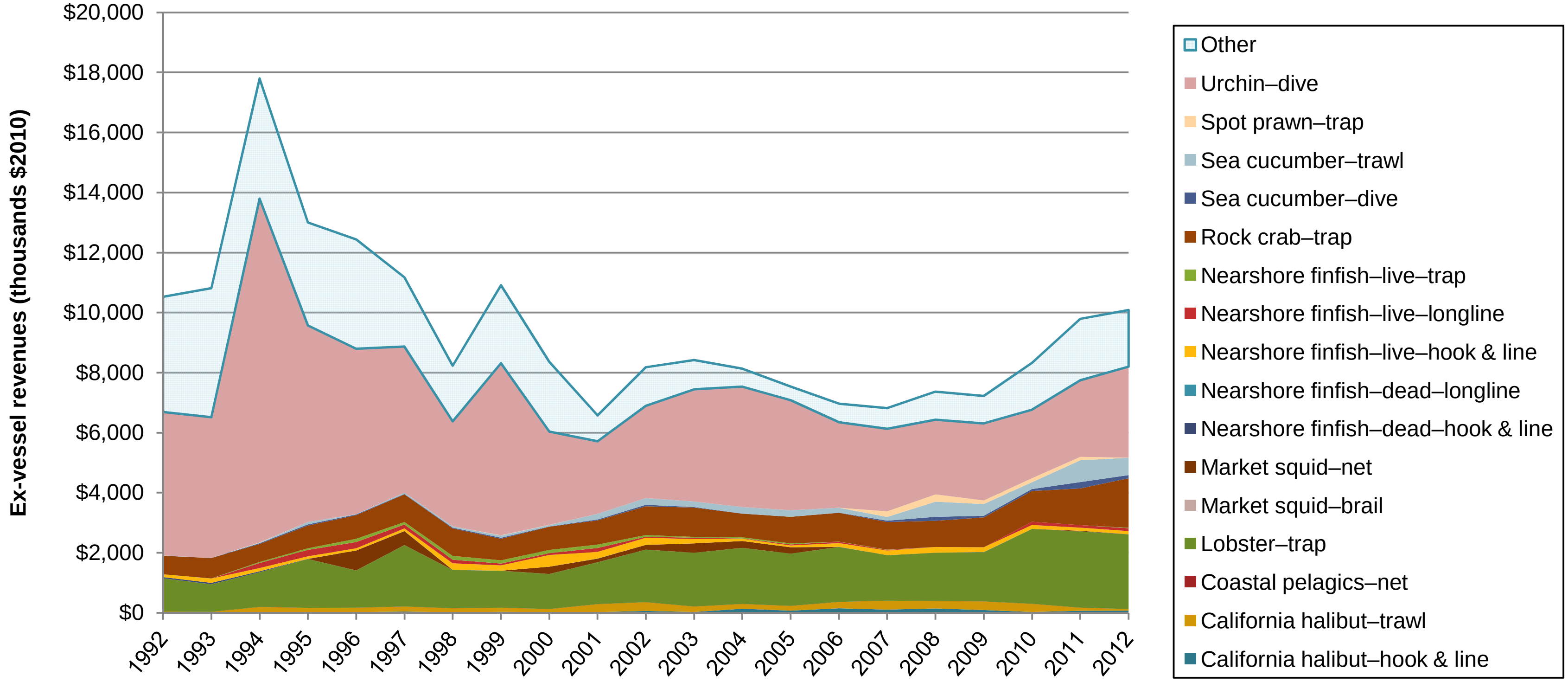
Source: Current study, based off landings data from CDFW.

Figure 124. Santa Barbara commercial landings for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

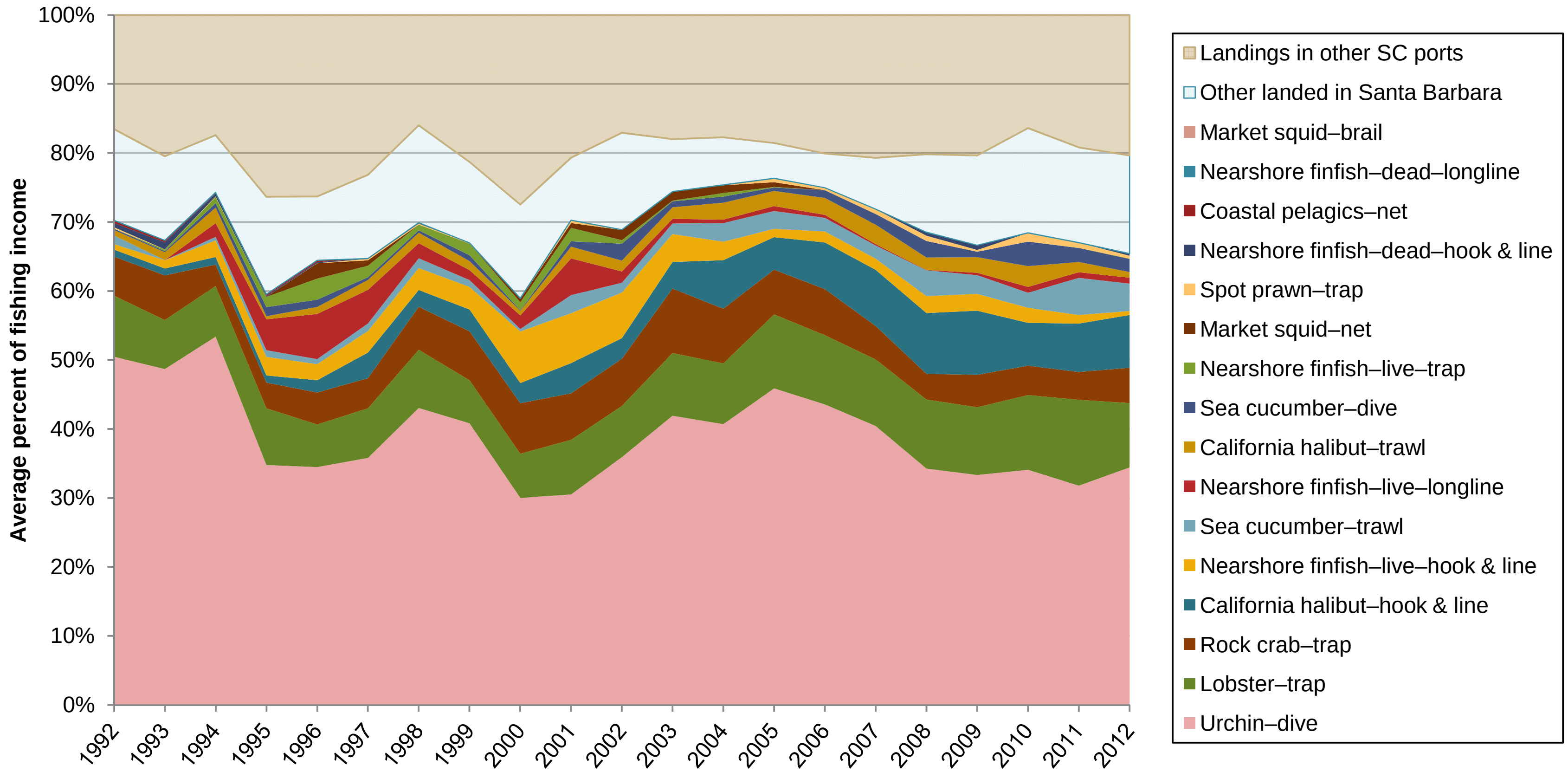
Figure 125. Santa Barbara commercial ex-vessel revenue for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 126 displays the average percent contribution to fishing income for those fishermen who made landings in Santa Barbara over the study period from the sixteen fisheries of interest, from other fisheries landed in Santa Barbara, and from landings made from all fisheries landed in other South Coast region ports. This figure shows reliance on a fishery but also on a given port. Given the significance of the urchin–dive fishery to this port, it is not a surprise that the majority of Santa Barbara fishermen are reliant on income from that fishery to their total fishing income, even as reliance on urchin–dive income declines over time. Also notable in Figure 126 is the increasing significance of the California halibut–hook & line fishery to Santa Barbara fishing incomes. Fishermen in Santa Barbara relied upon this port to account for approximately 80 percent of their average annual fishing income, which is one of the higher amounts relative to other South Coast ports.

Figure 126. Average percent of individual fishing income from commercial fisheries of interest, Santa Barbara, 1992–2012



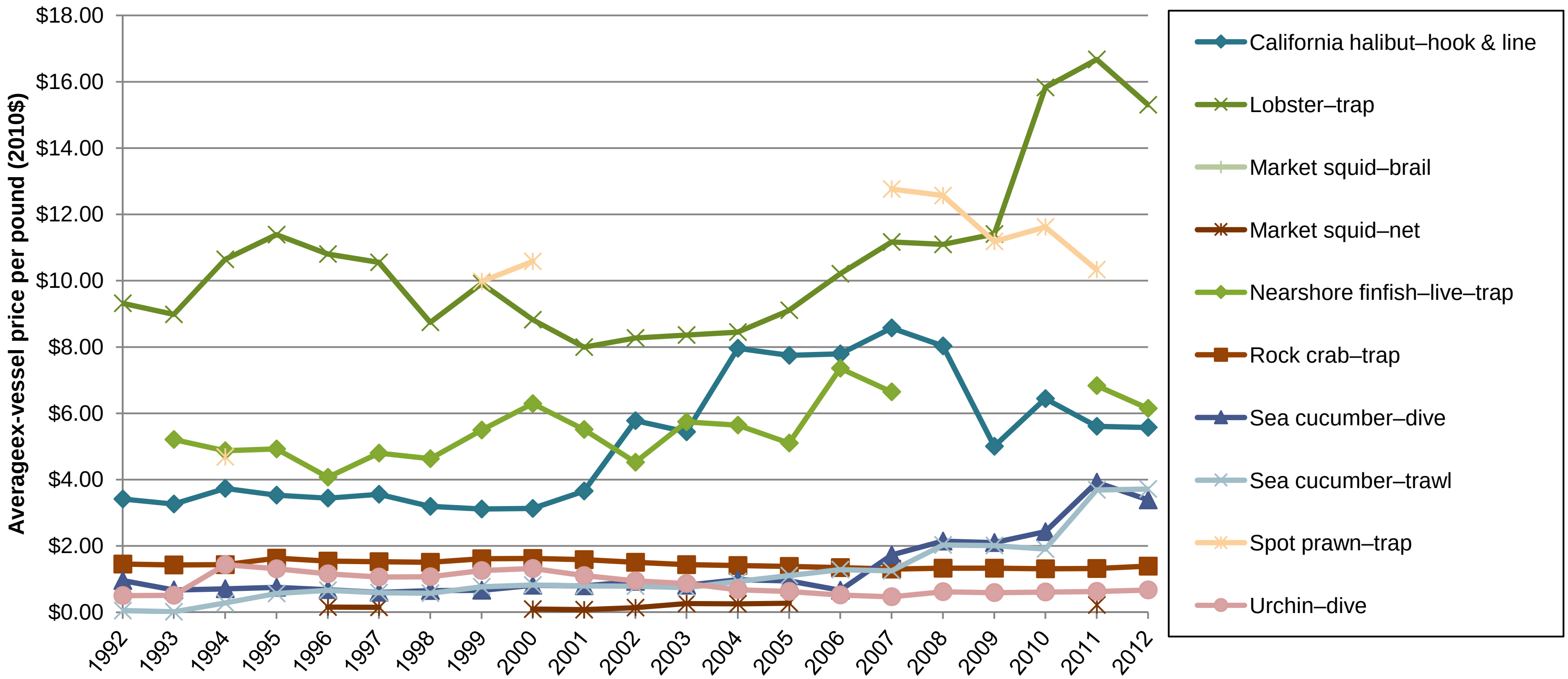
Source: Current study, based off landings data from CDFW.

Figure 127 displays the average ex-vessel prices over time for select fisheries of interest in Santa Barbara over the 1992–2012 study period. The highest average ex-vessel price per pound in Santa Barbara over the study period was $16.68 for the lobster–trap fishery in 2011. As in most South Coast ports, the lobster–trap fishery consistently held some of the highest ex-vessel prices over the study period. In Santa Barbara, the average ex-vessel price per pound increased in value 64.2 percent from 1992 to 2012. The sea cucumber fisheries (both dive and trawl) saw huge increases in average ex-vessel price per pound, from $0.95 for dive and $0.05 for trawl in 1992 to $3.39 and $3.72 by 2012 respectively. Most fisheries of interest experience an increase in value over the study period, although the rock crab–trap fishery remained relatively consistent, as did the nearshore finfish–dead–hook & line fishery, which varied year to year.

Figure 128 through Figure 147 display study period landings, ex-vessel revenue, and number of fishermen for select fisheries of interest in Santa Barbara, as well as averaged trends on the level of the individual fisherman. Some notable summary trends include the following:

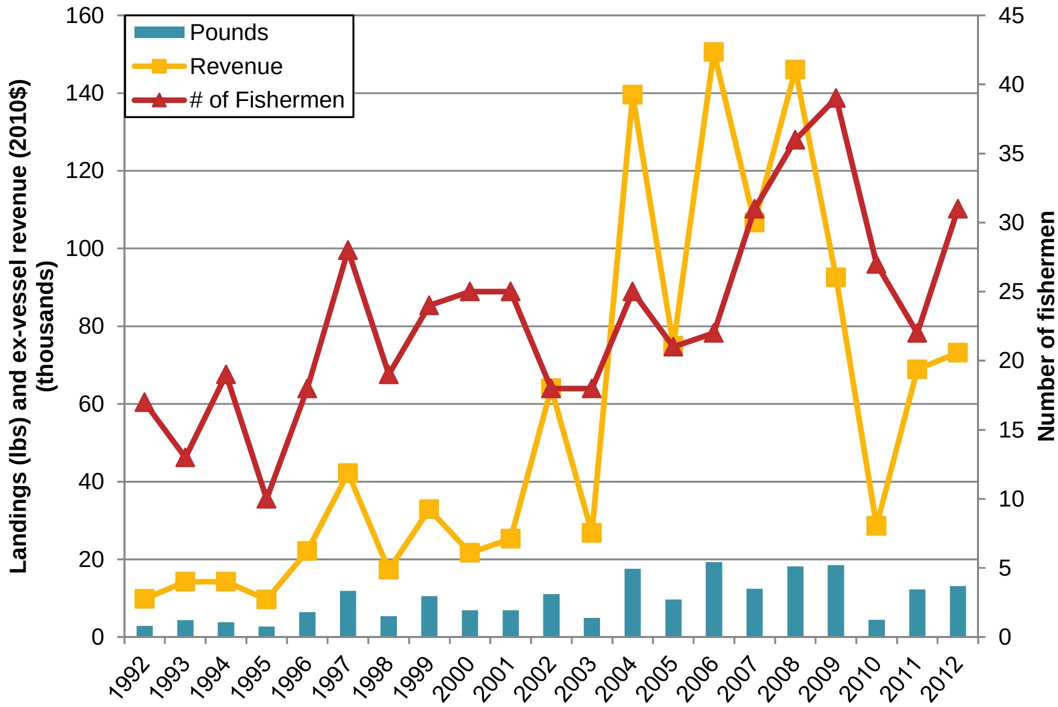
- Average ex-vessel revenue increased per fishermen in most fisheries of interest over the study period.
- An increase in pounds and ex-vessel revenue from 1992 to 2012 in the California halibut–hook & line fishery from 2,876 pounds landed for $9,828 in ex-vessel revenue to 13,140 pounds landed for $73,213 in ex-vessel revenue. The average fishermen made 2.5 times more landings and 4.1 times more ex-vessel revenue in 2012 than the average fisherman in 1992 in this fishery.
- California halibut–trawl landings and ex-vessel revenue also increased, but fell nearly back to early levels in the last couple years of the study period.
- Lobster–trap ex-vessel revenue increased significantly in Santa Barbara by 2012, peaking in 2011 at $2.5 million; lobster–trap fishermen made 3.7 times more than their 1992 counterparts by 2012 on average.
- Large declines in the overall nearshore finfish–live fisheries and the urchin–dive fishery led to considerable gains in average landings and ex-vessel revenue per fishermen on average of whom remained in the fishery.

Figure 127. Average ex-vessel prices over time, select commercial fisheries of interest, Santa Barbara, 1992–2012



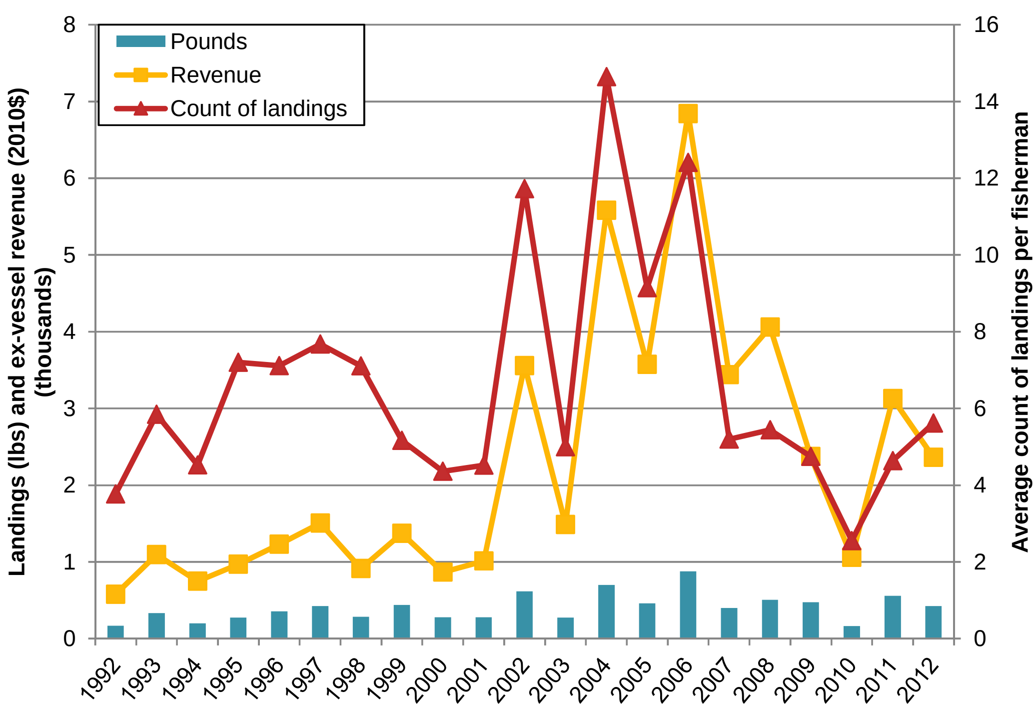
Source: Current study, based off landings data from CDFW.

Figure 128. California halibut–hook & line: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



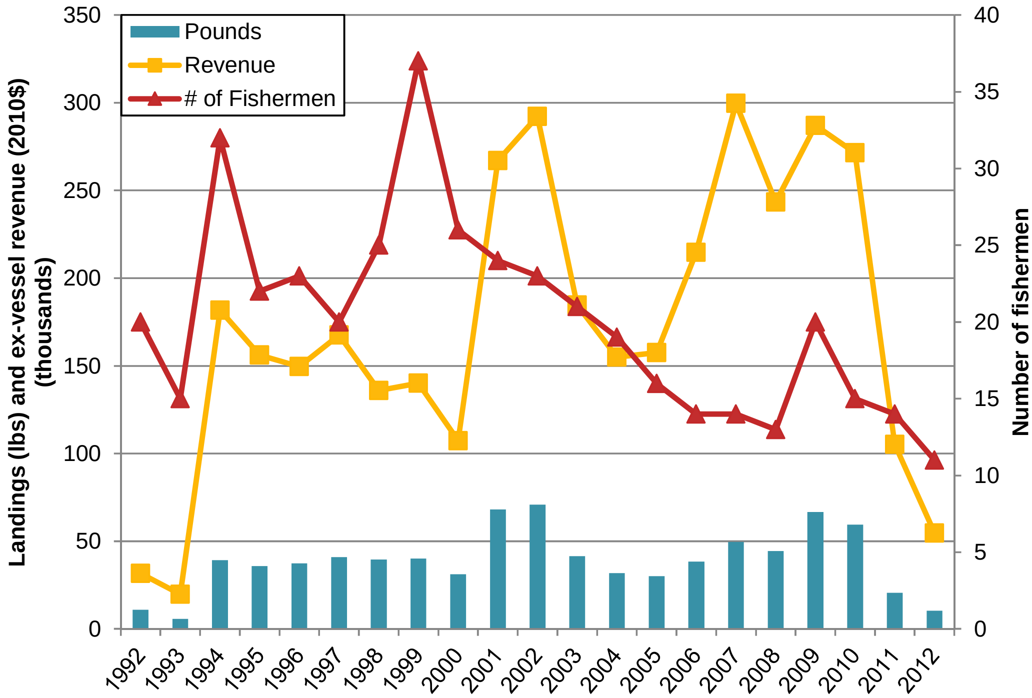
Source: Current study, based off landings data from CDFW.

Figure 129. California halibut–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



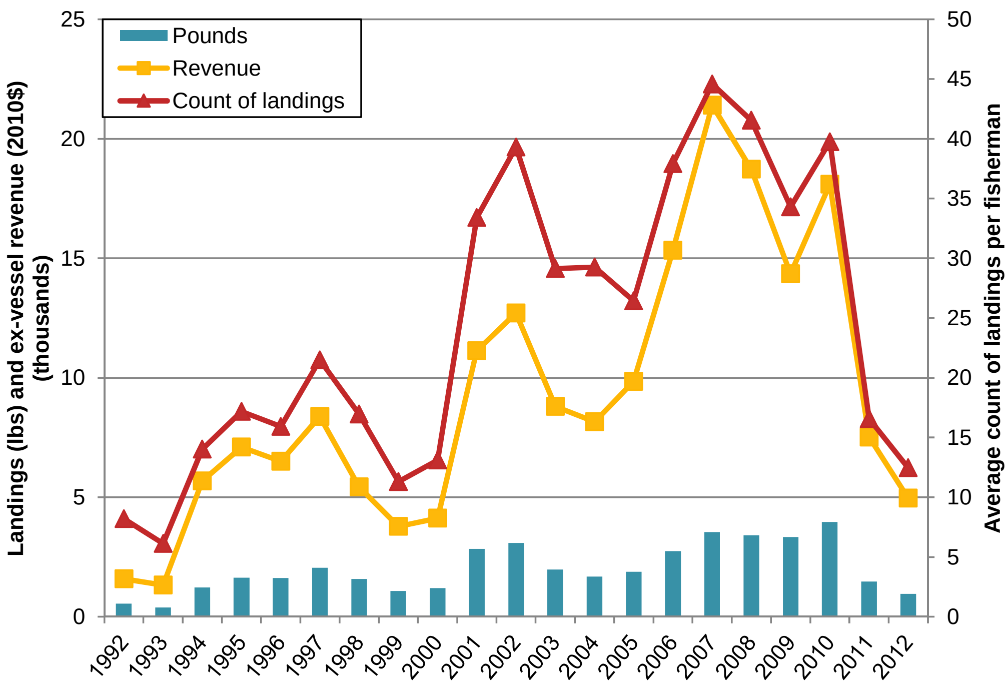
Source: Current study, based off landings data from CDFW.

Figure 130. California halibut–trawl: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



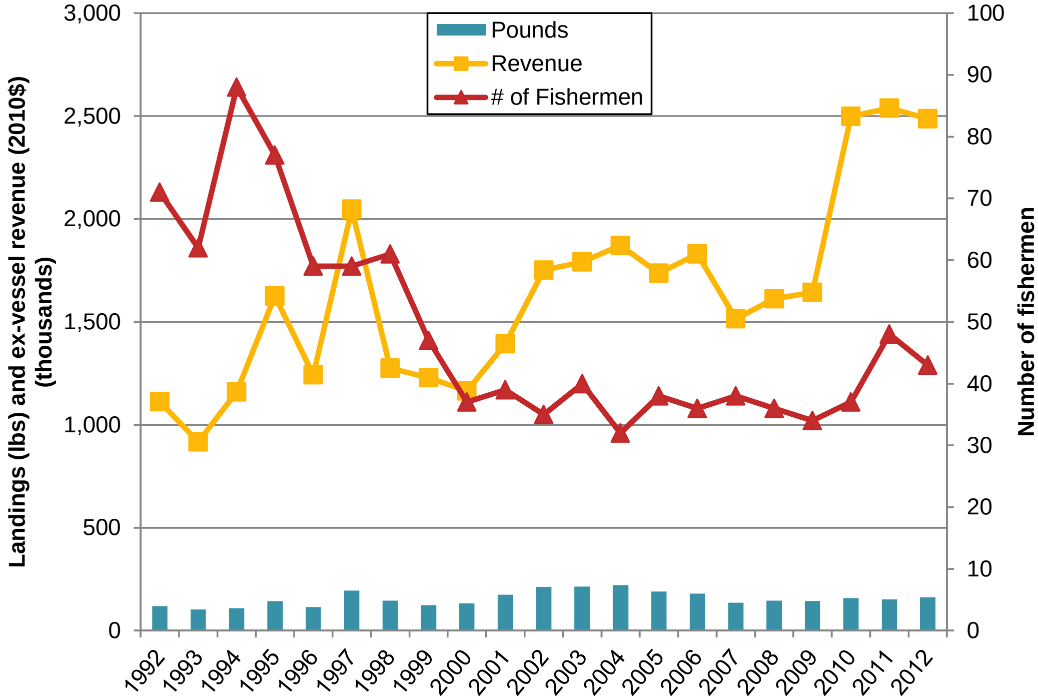
Source: Current study, based off landings data from CDFW.

Figure 131. California halibut–trawl: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



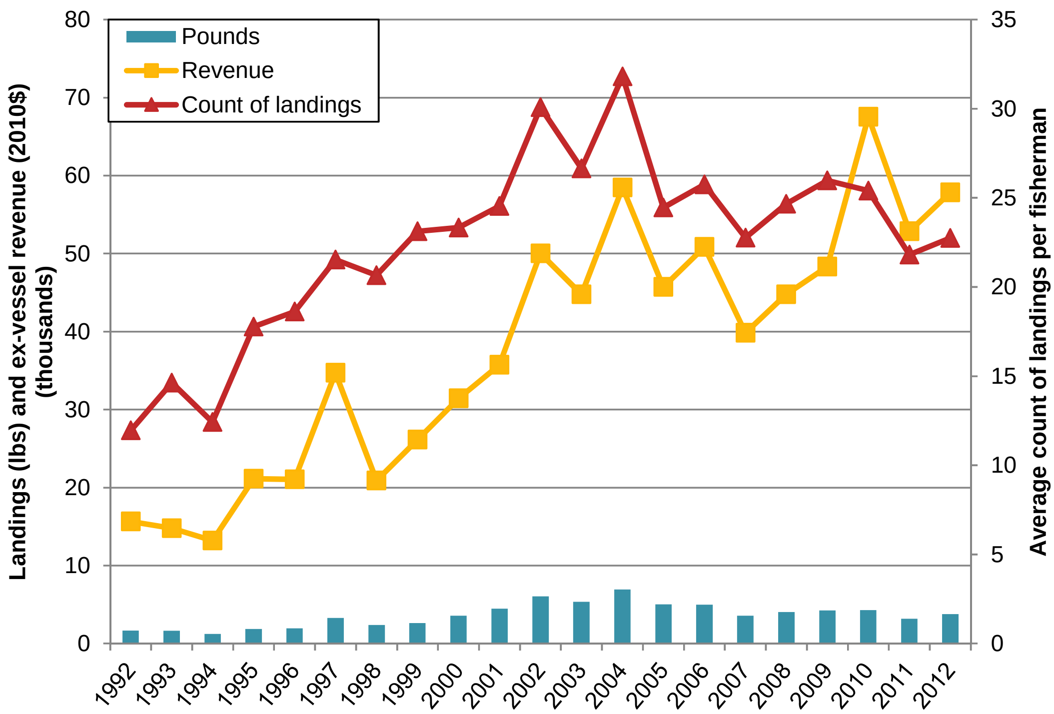
Source: Current study, based off landings data from CDFW.

Figure 132. Lobster–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



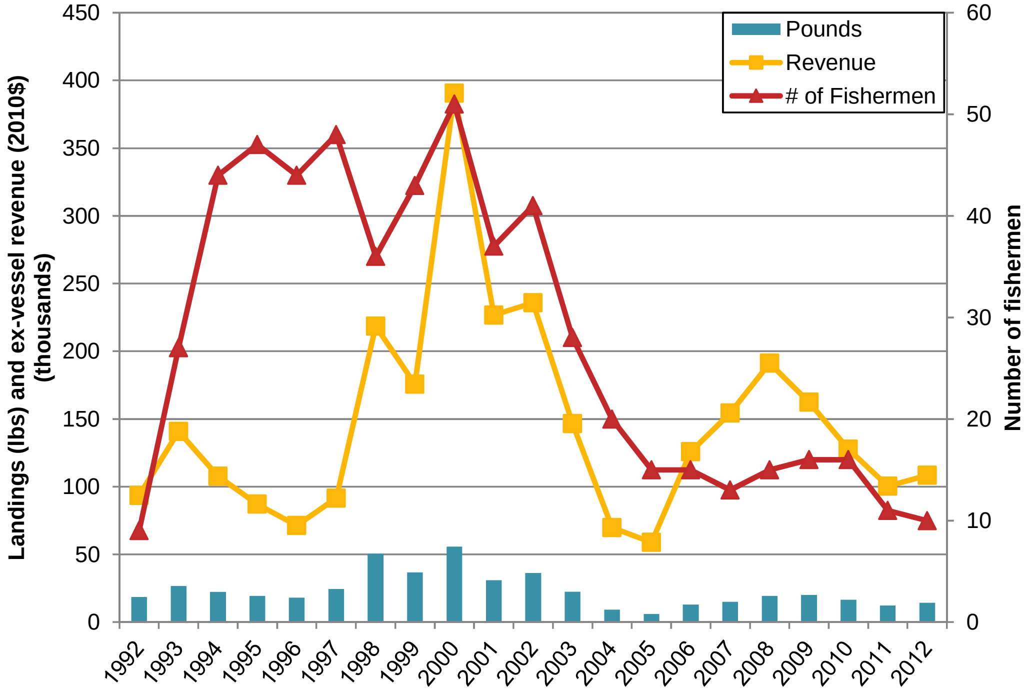
Source: Current study, based off landings data from CDFW.

Figure 133. Lobster–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



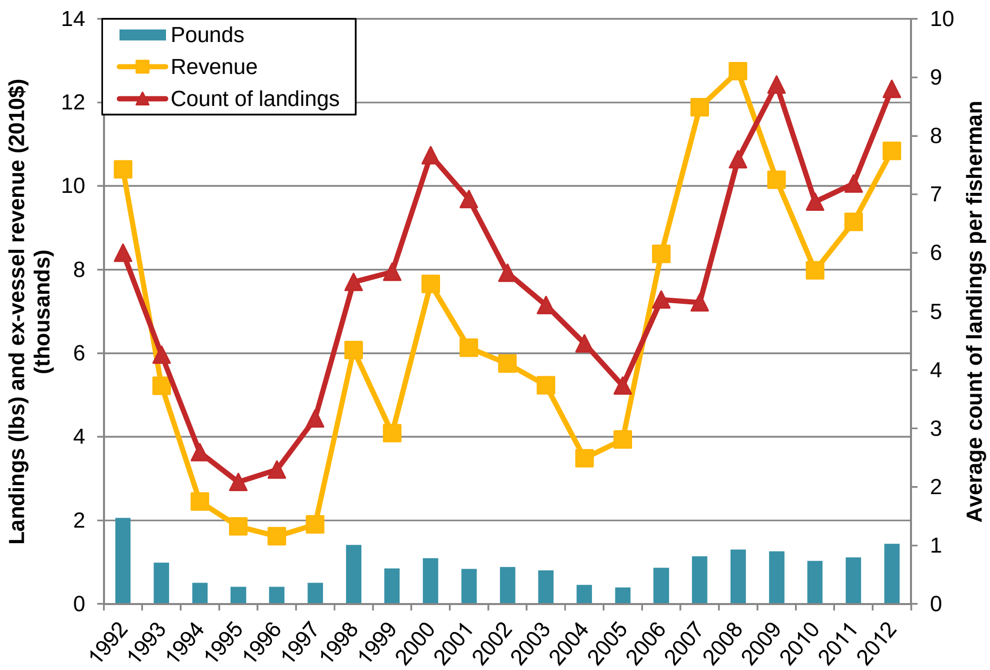
Source: Current study, based off landings data from CDFW.

Figure 134. Nearshore finfish–live–hook & line: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



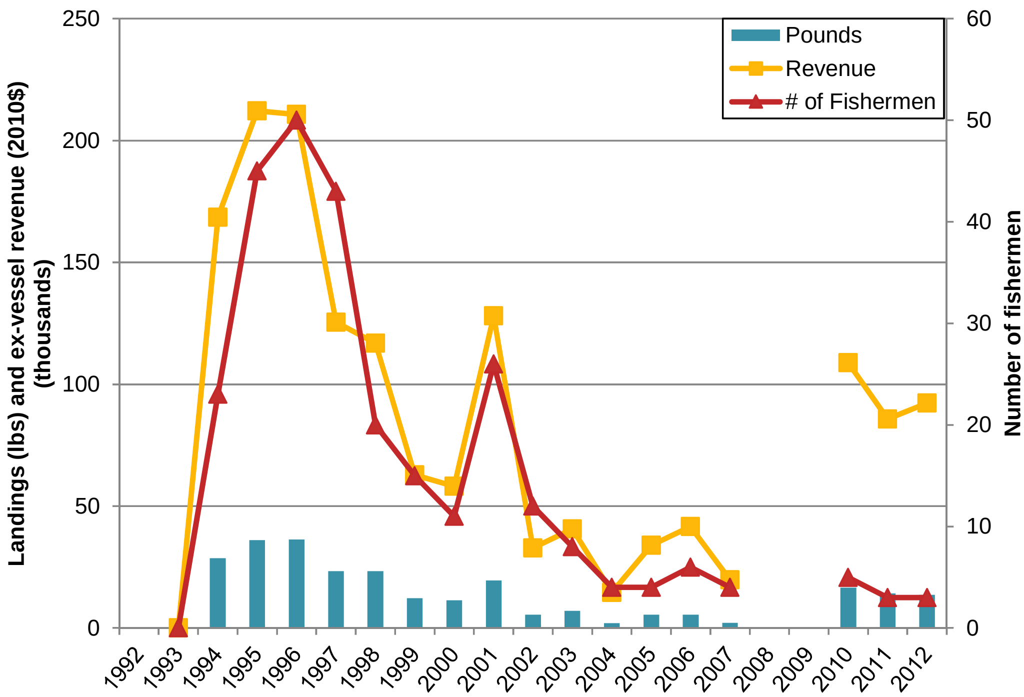
Source: Current study, based off landings data from CDFW.

Figure 135. Nearshore finfish–live–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



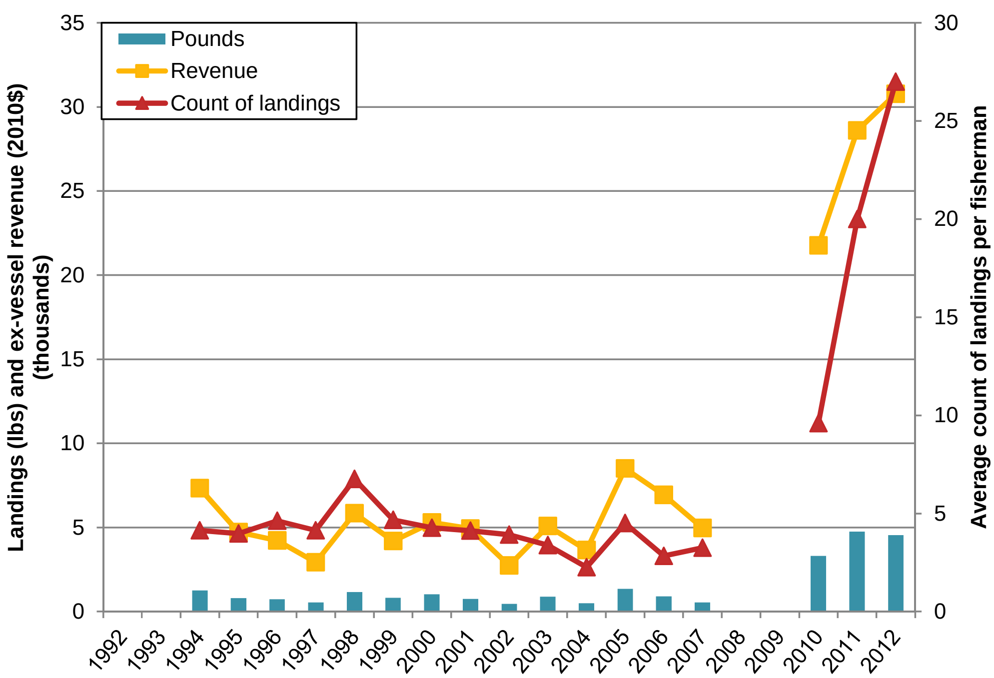
Source: Current study, based off landings data from CDFW.

Figure 136. Nearshore finfish–live–longline: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



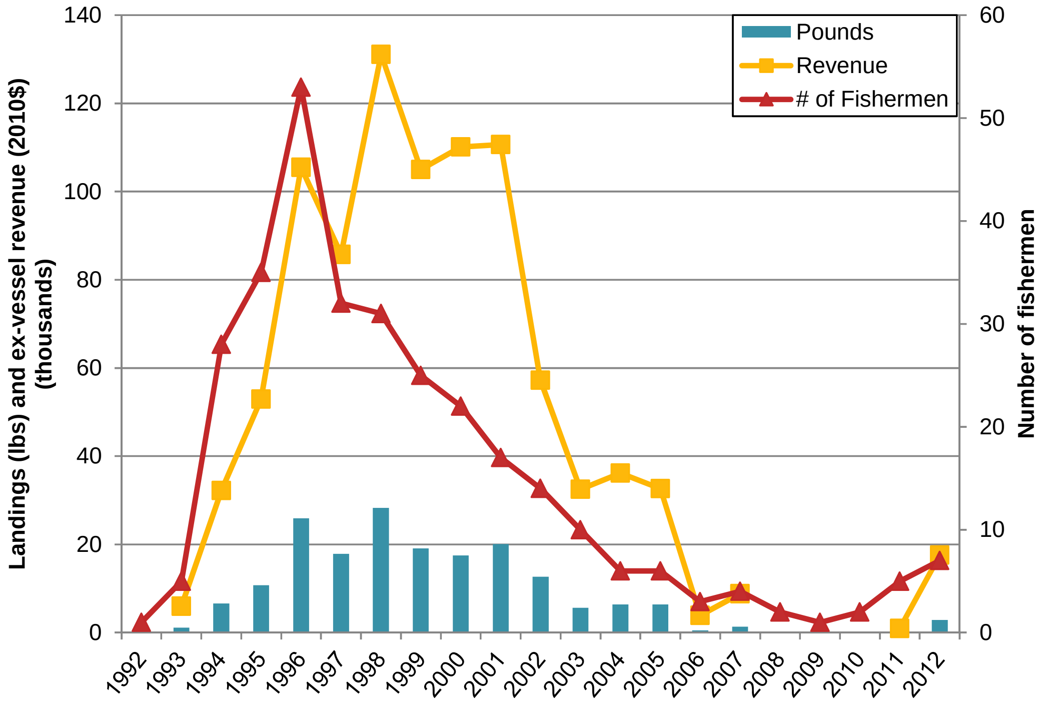
Source: Current study, based off landings data from CDFW.

Figure 137. Nearshore finfish–live–longline: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



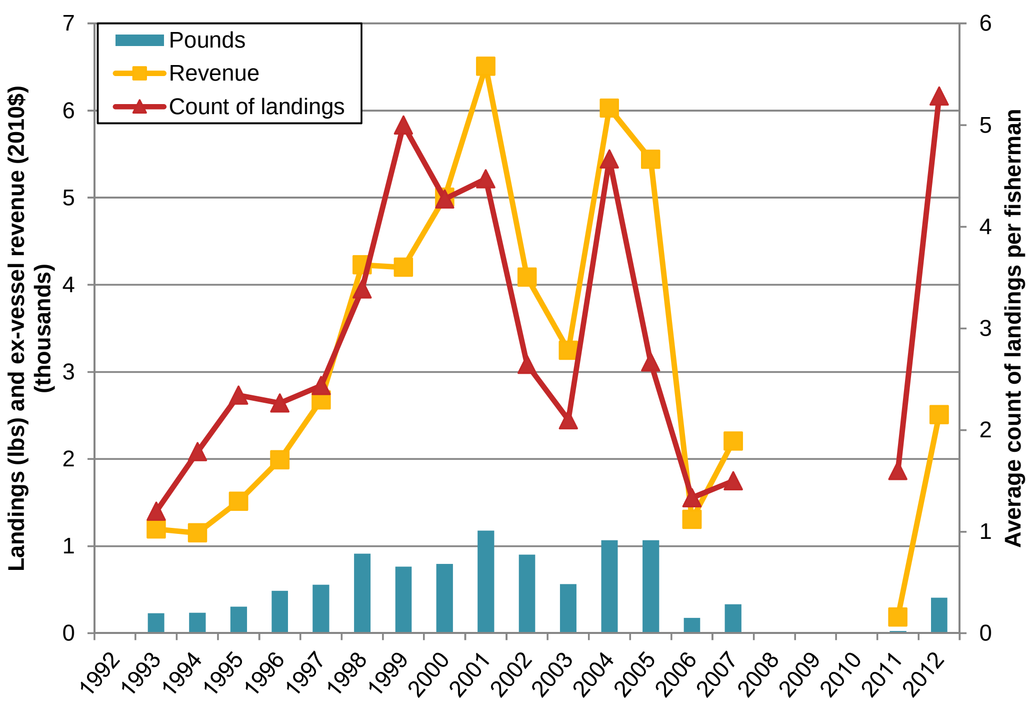
Source: Current study, based off landings data from CDFW.

Figure 138. Nearshore finfish–live–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



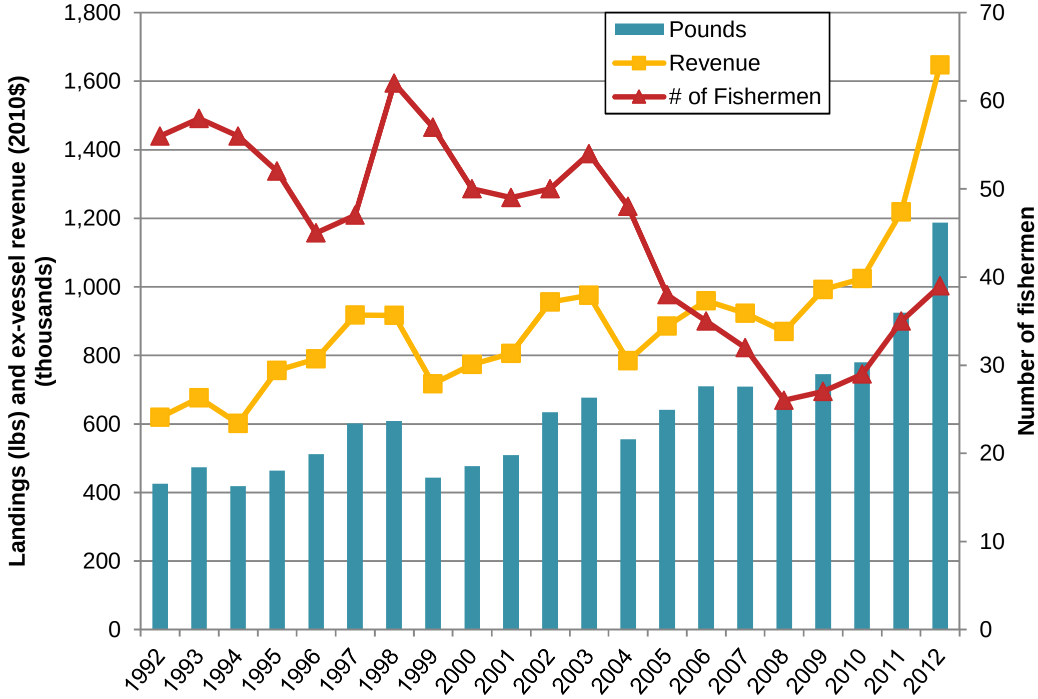
Source: Current study, based off landings data from CDFW.

Figure 139. Nearshore finfish–live–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



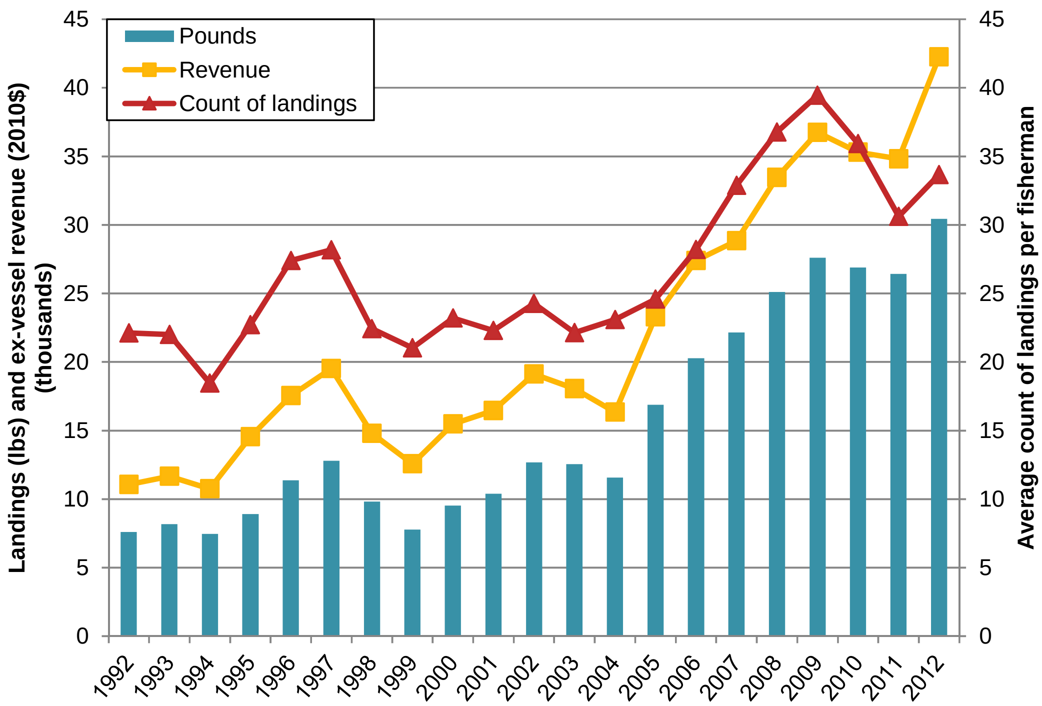
Source: Current study, based off landings data from CDFW.

Figure 140. Rock crab–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



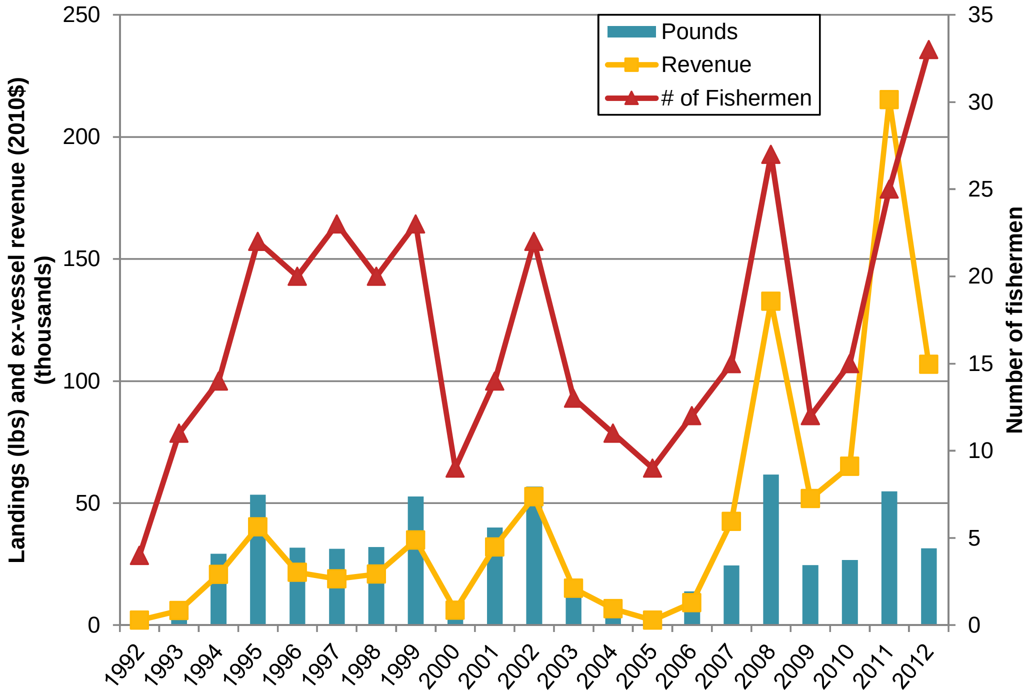
Source: Current study, based off landings data from CDFW.

Figure 141. Rock crab–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



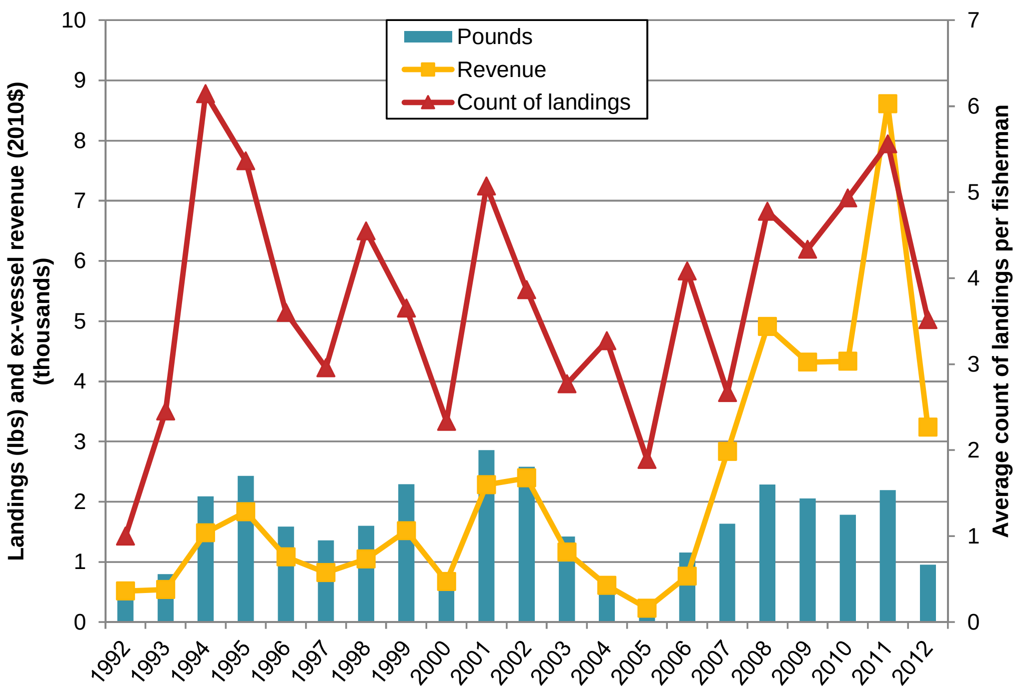
Source: Current study, based off landings data from CDFW.

Figure 142. Sea cucumber–dive: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



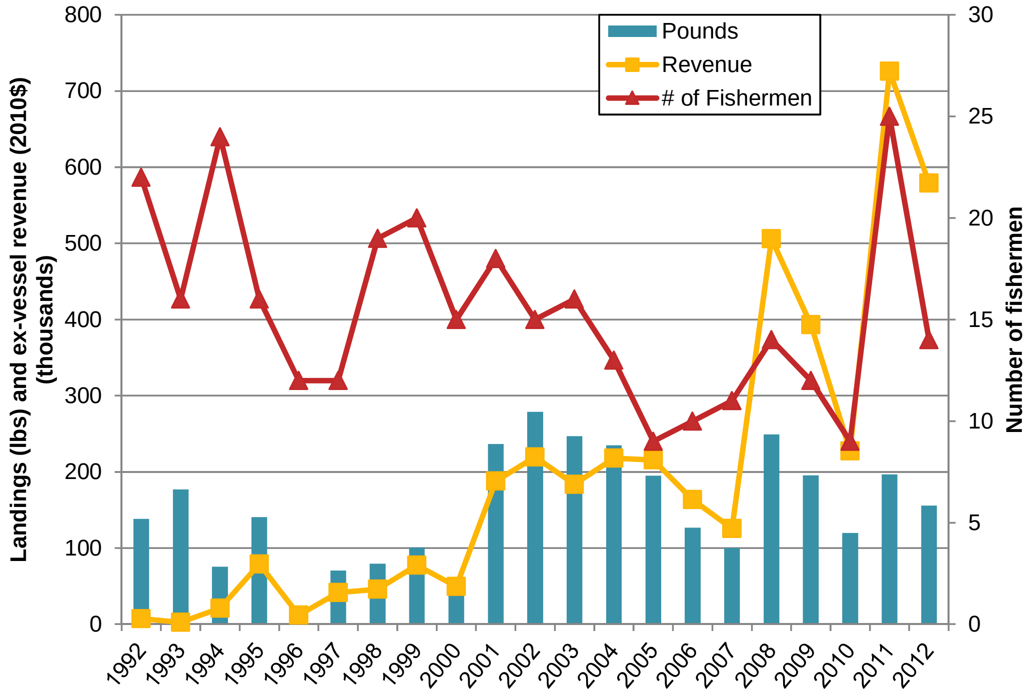
Source: Current study, based off landings data from CDFW.

Figure 143. Sea cucumber–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



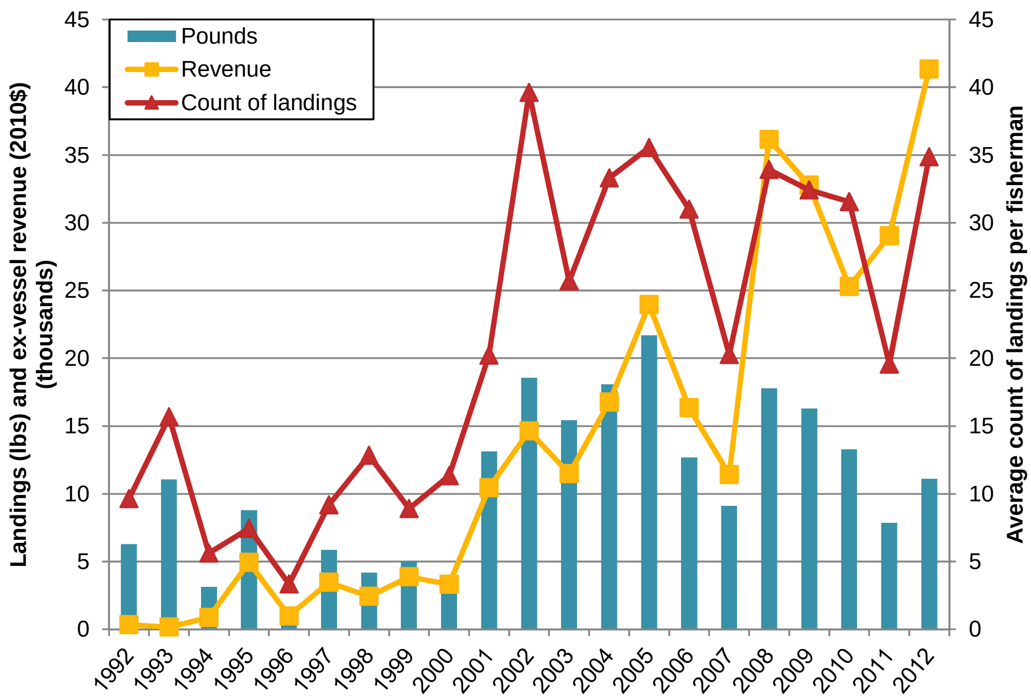
Source: Current study, based off landings data from CDFW.

Figure 144. Sea cucumber–trawl: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



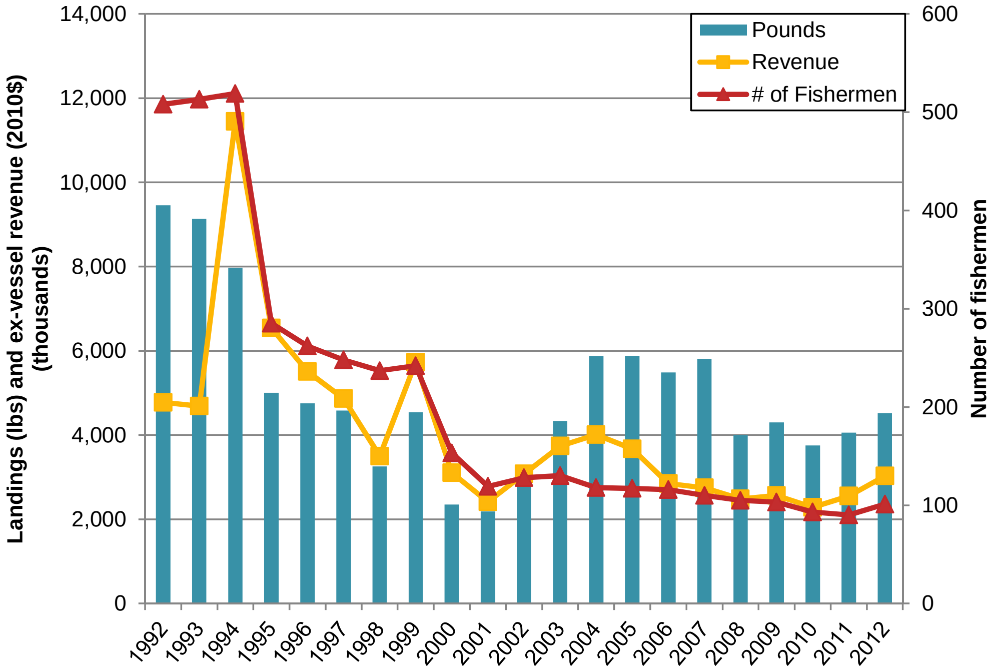
Source: Current study, based off landings data from CDFW.

Figure 145. Sea cucumber–trawl: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



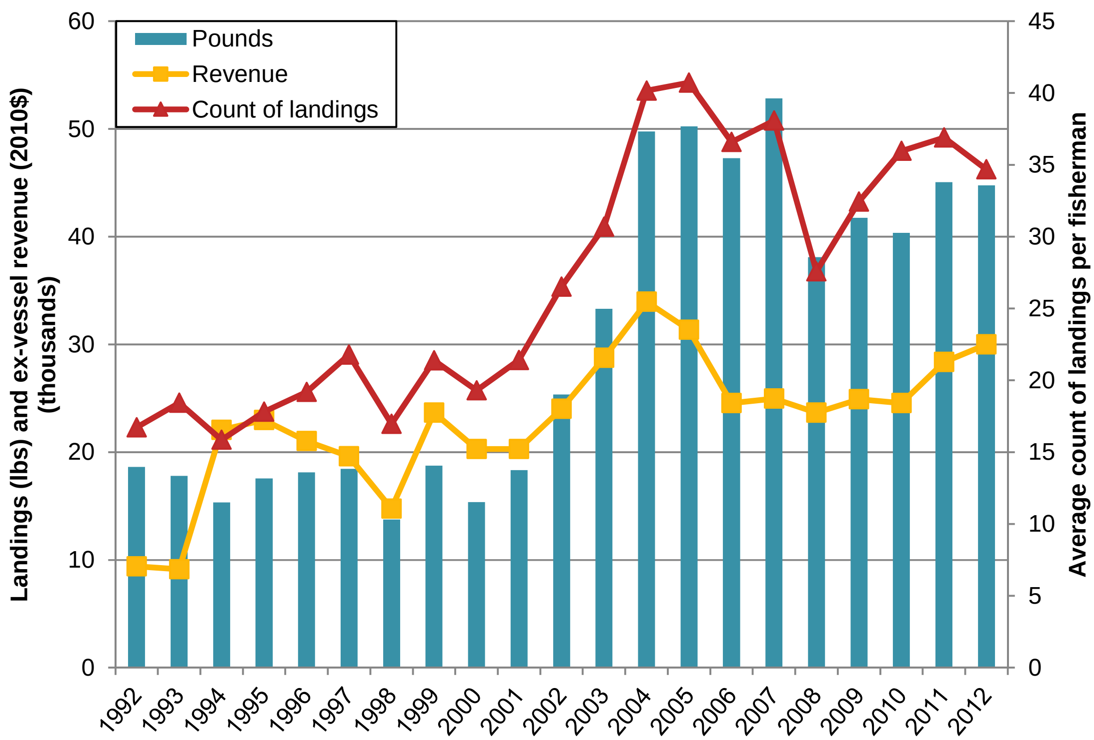
Source: Current study, based off landings data from CDFW.

Figure 146. Urchin–dive: Commercial landings, ex-vessel revenue, and number of fishermen, Santa Barbara, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 147. Urchin–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Santa Barbara, 1992–2012



Source: Current study, based off landings data from CDFW.

4.1.2 Santa Barbara Commercial Baseline Characterization

In 2012, 202 individuals made landings in one or more of the target interview fisheries in Santa Barbara. Combined, they generated $8,154,326 in ex-vessel revenue, which is 10 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the landings came from the urchin–dive fishery (37.2 percent). We interviewed 35 fishermen from Santa Barbara (Table 204).

Table 204. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Santa Barbara

Fishery	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
California halibut–hook & line	$73,213	31	2
California halibut–trawl	$54,647	11	5
Coastal pelagics–net	—	—	—
Lobster–trap	$2,487,332	43	13
Market squid–brail	*	1	—
Market squid–net	—	—	—
Nearshore finfish live–fixed gear	$125,930	13	3
Rock crab–trap	$1,647,655	39	11
Sea cucumber–dive	$106,895	33	2
Sea cucumber–trawl	$578,892	14	4
Spot prawn–trap	$49,244	3	—
Urchin–dive	$3,030,518	101	14
Unique individuals	$8,154,326	202	35

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The average Santa Barbara fisherman that we interviewed was 54.9 years old and had an average of 31.9 years of experience as a commercial fisherman (Table 205). Both of these averages were roughly three years greater than the regional average. It should be noted that this question inquired about the number of years of experience an individual had commercial fishing as a whole, not the number of years of experience they had in a specific fishery. Additionally, Santa Barbara fishermen on average made 89.7 percent of their total personal income from commercial fishing in 2012, a decrease of 1.8 percent since 2008. The decrease brought Santa Barbara fishermen below the regional average change in income from commercial fishing for 2012, relative to 2008 when they were above the regional average. It should be noted that 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust. As shown in Table 206, all fisheries displayed or calculated experienced a decrease in average percent income from 2008 to 2012, except the California halibut—hook and line fishery (increase of 18.1 percent).

Table 205. Average age and years of experience commercial fishing in 2012, Santa Barbara

	Age			Years of experience		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	2	*	*	2	*	*
California halibut–trawl	5	62.4	11.8	5	44.0	12.9
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	13	53.5	5.6	13	30.2	10.3
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	3	54.7	3.8	3	34.7	1.2
Rock crab–trap	11	54.0	5.9	11	30.7	8.5
Sea cucumber–dive	2	*	*	2	*	*
Sea cucumber–trawl	4	61.5	13.4	4	45.0	14.7
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	14	53.4	8.4	14	29.6	11.2
All target fisheries (unique individuals)	35	54.9	8.3	35	31.9	11.7

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 206. Percent change in income from overall commercial fishing from 2008-2012, Santa Barbara

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	6	84.7%	26.2%	2	*	*	18.1%
California halibut–trawl	2	*	*	5	96.0%	8.9%	*
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	20	90.0%	16.6%	13	84.2%	28.4%	-6.4%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	12	98.2%	5.7%	3	90.0%	17.3%	-8.3%
Rock crab–trap	16	94.4%	11.2%	11	92.3%	15.4%	-2.3%
Sea cucumber–dive	6	96.7%	8.2%	2	*	*	-12.6%
Sea cucumber–trawl	3	98.3%	2.9%	4	95.0%	10.0%	-3.4%
Spot prawn–trap	1	*	*	—	—	—	—
Urchin–dive	30	92.6%	12.0%	14	90.6%	19.9%	-2.1%
All target fisheries (unique individuals)	54	91.3%	15.4%	35	89.7%	21.7%	-1.8%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher. As shown below in Table 207, the majority of respondents in all fisheries, except the sea cucumber–trawl fishery, perceived no change. In the sea cucumber–trawl fishery, two of the respondents stated they perceived no change, while two stated that a significantly lower percent of the income came from commercial fishing in 2012 relative to 2008. Only the lobster—trap fishery and urchin—dive fishery had some respondents that indicated they perceived an increase in their income from commercial fishing, and both were “significantly higher” in 2012 than in 2008.

Table 207. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Santa Barbara

		Percent response				
Fisheries	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
California halibut–hook & line	2	*	*	*	*	*
California halibut–trawl	5	—	—	60.0%	—	40.0%
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	12	8.3%	—	66.7%	8.3%	16.7%
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	3	—	—	100.0%	—	—
Rock crab–trap	11	—	—	81.8%	9.1%	9.1%
Sea cucumber–dive	2	*	*	*	*	*
Sea cucumber–trawl	4	—	—	50.0%	—	50.0%
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	14	7.1%	—	85.7%	7.1%	—
All fisheries (unique individuals)	34	5.9%	—	76.5%	5.9%	11.8%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their income coming from commercial fishing. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Table 208 lists the reason for the change as well as the number for each fishery. Respondents indicated a variety of reasons for experiencing a decrease, but most common was “less revenue from fishing”. Fishermen in the lobster—trap and urchin—dive fisheries in Santa Barbara indicated that the perceived increases were due to “personal reasons” and “spending more time fishing”.

Table 208. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Santa Barbara

		Responses indicating increase								Responses indicating decrease					
Fishery	**Number of individuals responding**	A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	2	—	—	—	—	—	—	—	—	1	—	—	—	2	1
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	4	—	1	1	—	—	—	—	—	—	1	1	1	1	1
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	2	—	—	—	—	—	—	—	—	—	1	1	1	—	1
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	2	—	—	—	—	—	—	—	—	1	—	—	—	2	1
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	2	—	1	1	—	—	—	—	—	—	1	—	—	—	—
All fisheries (unique individuals)	8	—	2	2	—	—	—	—	—	1	2	1	1	3	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

In interviews, fishermen were asked what percent of their gross economic revenue (GER) went towards their overall commercial fishing operating costs. In Table 209 below, we compare the average responses that were given in a 2008 study conducted by Point 97/Ecotrust (Scholz et al. 2010) to that gathered in this study (2012). As noted previously the responses given in the 2008 study were based on fishermen's cumulative fishing experience—not necessarily specific to the year they were interviewed. Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years. Overall, Santa Barbara fishermen reported that in 2012 on average 41.4 percent of their gross economic revenue was spent on operating costs, which is 2.8 percent less than the number reported in 2008, and 3.4 percent less than the South Coast regional average in 2012. Again we emphasize that this question is asked about overall commercial fishing operating costs across all fisheries for a particular fisherman.

When asked in interviews, most fishermen perceived an increase in the percent of gross revenue that went towards operating expenses, as shown above in Table 210. In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their gross economic revenue going towards operating costs. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Similar to the region, in Santa Barbara, the most frequently reported reason for increasing operating costs was the increased cost of fuel, followed by general increases in costs of goods and labor (Table 211).

Table 209. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Santa Barbara

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	6	40.0%	12.6%	2	*	*	*
California halibut–trawl	2	*	*	5	56.0%	35.2%	*
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	21	39.6%	12.6%	13	42.5%	14.2%	7.5%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	12	40.3%	9.1%	3	40.0%	17.3%	-0.6%
Rock crab–trap	16	38.5%	12.6%	11	43.3%	14.9%	12.5%
Sea cucumber–dive	7	43.6%	14.1%	2	*	*	*
Sea cucumber–trawl	3	48.3%	22.5%	4	45.0%	29.2%	-6.9%
Spot prawn–trap	1	*	*	—	—	—	—
Urchin–dive	31	43.8%	17.1%	14	35.7%	11.4%	-18.4%
All target fisheries (unique individuals)	55	42.6%	15.8%	35	41.4%	18.1%	-2.8%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 210. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Santa Barbara

Fisheries	Number responding	Percent response: Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	2	*	*	*	*	*
California halibut–trawl	5	60.0%	40.0%	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	13	15.4%	46.2%	23.1%	15.4%	—
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	3	33.3%	33.3%	33.3%	—	—
Rock crab–trap	11	36.4%	54.5%	—	9.1%	—
Sea cucumber–dive	2	*	*	*	*	*
Sea cucumber–trawl	4	50.0%	50.0%	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	13	15.4%	46.2%	23.1%	15.4%	—
All fisheries (unique individuals)	34	29.4%	41.2%	17.6%	11.8%	—

Source: Current study

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^2008 data were taken from Scholz et al. 2010.

Table 211. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Santa Barbara

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
California halibut–trawl	5	4	—	1	3	—	—	2	1	—	1	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	9	6	—	1	4	—	—	2	—	2	—	—	—	—	—	—	—	1
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	2	2	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	11	9	—	1	7	1	—	1	—	1	—	—	—	—	—	—	—	1
Sea cucumber–dive	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–trawl	4	4	—	1	3	—	—	1	1	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	10	6	2	3	3	—	1	1	1	1	—	—	—	—	—	—	2	1
All fisheries (unique individuals)	27	19	2	5	13	1	1	5	2	3	1	—	—	—	—	—	2	2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

We asked fishermen how many years of experience and how many days they spent targeting each of the fisheries in which they participated. As indicated in Table 212, California halibut—trawl fishermen have been fishing the longest, on average 29.8 years. Fishermen in the nearshore finfish—live fixed gear had the fewest number of years of experience of all the target fisheries, 22 years. Fishermen spent the fewest number of days targeting nearshore finfish live—fixed gear in 2012, an average of just 4 days. The most frequently targeted fishery was rock crab–trap, which was targeted an average of 115.8 days in 2012.

Table 212. Years of experience and number of days targeting specific fisheries in 2012, Santa Barbara

	Years of experience in fishery			Number of days targeting fishery in 2012		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	2	*	*	2	*	*
California halibut–trawl	5	29.8	8.0	5	36.2	38.2
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	13	25.0	10.5	13	89.8	36.3
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	3	22.0	14.1	3	4.0	2.8
Rock crab–trap	11	25.8	8.2	11	115.8	65.0
Sea cucumber–dive	2	*	*	2	*	*
Sea cucumber–trawl	4	27.3	14.4	4	106.3	71.1
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	14	28.2	10.4	14	103.4	29.2

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were also asked how many crew they used for each fishery and what percent of their gross economic revenue was spent on their crew. All Santa Barbara respondents reported using an average of one crew member, as seen in Table 213 below. The nearshore finfish live—fixed gear fishery reported the highest percent of gross economic revenue spent on crew, 16 percent. The average percent of fishery specific gross economic revenue spent on fuel was the highest in the California halibut–trawl fishery (20 percent) and the lowest for the lobster—trap fishery (14.2 percent).

Table 213. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, South Coast Region

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	2	*	*	2	*	*	2	*	*
California halibut–trawl	5	1	1	5	12.0%	11.0%	5	20.0%	7.4%
Coastal pelagics–net	—	—	—	—	—	—	—	—	—
Lobster–trap	13	1	1	13	13.9%	10.5%	13	14.2%	8.3%
Market squid–brail	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	3	1	0	3	16.0%	1.7%	3	16.0%	6.9%
Rock crab–trap	11	1	1	11	13.0%	6.8%	11	17.8%	9.7%
Sea cucumber–dive	2	*	*	2	*	*	2	*	*
Sea cucumber–trawl	4	1	1	4	10.0%	11.5%	4	18.0%	7.7%
Spot prawn–trap	—	—	—	—	—	—	—	—	—
Urchin–dive	14	1	1	14	7.5%	6.7%	14	17.5%	8.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Fishermen were asked separately for each fishery they participated in to compare his/her success in the fishery in 2012 to that of the last ten years. As shown in Table 214 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishery. This question was asked as an open ended question and responses were later coded and categorized into positive and negative environmental factors (Table 215), economic factors (Table 216), regulatory factors (Table 217), and other factors (Table 218).

Some target fisheries saw a greater variety of responses than others. For example, in the lobster—trap fishery at least one respondent indicated each of the response options, although the majority of respondents indicated the fishery was somewhat worse (38.5 percent). The primary negative influences where lack of available product (Table 215), MPAs (Table 217), and general crowding and compaction (Table 218). One positive factor that several participants in the lobster–trap fishery mentioned was the high ex-vessel price (Table 216). In fact, in review, some fishermen indicated they felt that without the high price they would not have been successful in the fishery in 2012.

Other fisheries had less variance in terms of responses regarding the overall success of their fishery. For example, all fishermen in both the California halibut–trawl and sea cucumber–trawl fisheries reported their fishery was either somewhat or significantly worse. Despite the negative perception of overall success in the urchin–dive fishery, respondents indicated that high quality of the urchin product (Table 215), and good price (Table 216) as two positive influences on overall success. In terms of negative factors influencing the urchin–dive fishery, the only reported negative influences were the price of fuel (Table 216) and MPAs or other closures (Table 217). A majority of respondents in the nearshore finfish live—fixed gear indicated they experienced a somewhat better year in 2012 than in the previous ten. One respondent expressed he/she had become a better fisherman and/or businessman (Table 218).

The most commonly cited positive economic factor was the good price. The largest number of people indicated that the absence of fish/product as the most common negative environmental factor influencing their success. Lastly, respondents indicated that MPAs or other closures were the leading negative regulatory factor influencing the success of their fishery.

Table 214. Overall success in specific commercial fishery, 2012 compared to previous ten years, Santa Barbara

		Percent response				
Fisheries	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
California halibut–hook & line	2	*	*	*	*	*
California halibut–trawl	5	60.0%	40.0%	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	13	15.4%	46.2%	23.1%	15.4%	—
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	3	33.3%	33.3%	33.3%	—	—
Rock crab–trap	11	36.4%	54.5%	—	9.1%	—
Sea cucumber–dive	2	*	*	*	*	*
Sea cucumber–trawl	4	50.0%	50.0%	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	13	15.4%	46.2%	23.1%	15.4%	—
All fisheries (unique individuals)	34	29.4%	41.2%	17.6%	11.8%	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 215. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, South Coast Region

		Positive					Negative				
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	1	—	—	—	—	—	1	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	2	—	—	—	—	—	2	—	1	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	1	—	—	—	—	—	1	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	1	—	—	—	—	—	1	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	6	1	2	2	3	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 216. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Santa Barbara

		Positive			Negative			
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
California halibut–hook & line	—	—	—	—	—	—	—	—
California halibut–trawl	1	—	—	—	—	1	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—
Lobster–trap	6	6	—	2	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—
Sea cucumber–trawl	1	—	—	—	—	—	—	1
Spot prawn—trap	—	—	—	—	—	—	—	—
Urchin–dive	4	3	—	—	—	—	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 217. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Santa Barbara

		Negative					
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	1	—	—	1	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	2	—	—	1	—	1	—
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	2	—	—	2	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—
Urchin–dive	1	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 218. Other changes/factors influencing success in a specific commercial fishery in 2012 as compared to previous ten years, Santa Barbara

		Positive						Negative						
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	2	—	—	—	—	—	—	—	—	—	—	—	2	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	2	—	—	—	—	—	—	—	—	2	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	1	—	1	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	1	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	4	3	1	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

4.2. Ventura

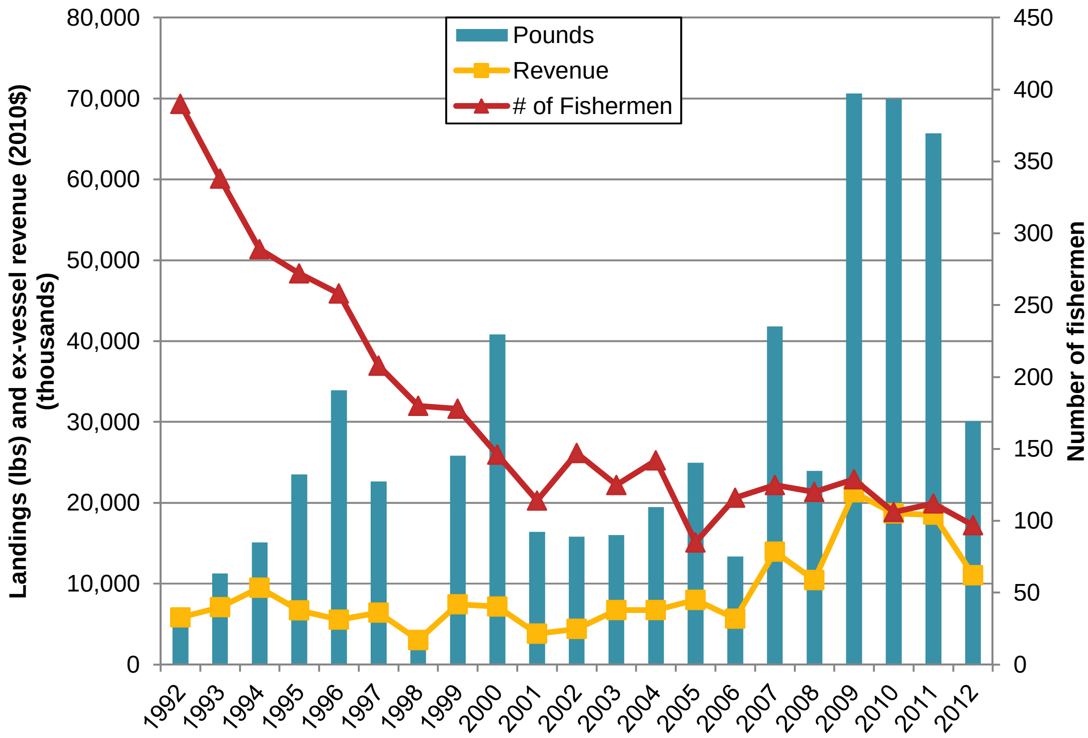
Ventura is in the northern part of the Los Angeles metro region, just 27 miles south of Santa Barbara. According to the 2010 Census, the population of Ventura was 106,433 with a median age of 39.0 years. The estimated per capita income (2007-2011) was $31,775 with a mean household income of $ 81,254 (US Census Bureau 2010). The Ventura Harbor was not developed until the 1950s when the state excavated the harbor to acquire fill material for highway construction. The city of Ventura maintained the harbor until 1968 when the Army Corps of Engineers took over this responsibility. The harbor is currently owned and operated by the Ventura Port District (Ventura Harbor). The harbor offers berths for about 200 commercial vessels and 1,600 recreational vessels. In addition, the harbor has a marina, resort, boat yard, and a commercial fish processing facility. In a study completed in 2007 by Culver, Richards, and Pomeroy fishermen reported that there were several areas in need of improvement including gear repair areas, bait availability and storage, cold storage and live holding tanks, and scales.

4.2.1. Ventura Commercial Fisheries Initial Changes

Figure 148 displays the commercial landings, ex-vessel revenue, and number of fishermen for all fisheries in the South Coast port of Ventura over the study period 1992–2012. Ventura's contributions to the entire South Coast region increased from the first half of the study period to the second, from an annual average of 6.7 percent to 14.4 percent of commercial landings, and from 8.3 percent to 15.1 percent of ex-vessel revenue. Landings in Ventura increased significantly from 1992 (4.7 million pounds) to 2012 (30.1 million pounds); ex-vessel revenue also increased, but less significantly over the same time (from $5.8 million to $11 million). Despite these gains, fishermen out of Ventura decreased 75.1 percent from a high of 390 in 1992 to 97 by 2012. The year of 2009 saw both the highest landings and ex-vessel revenue in this port, recording 70.1 million pounds landed for $21.3 in ex-vessel revenue.

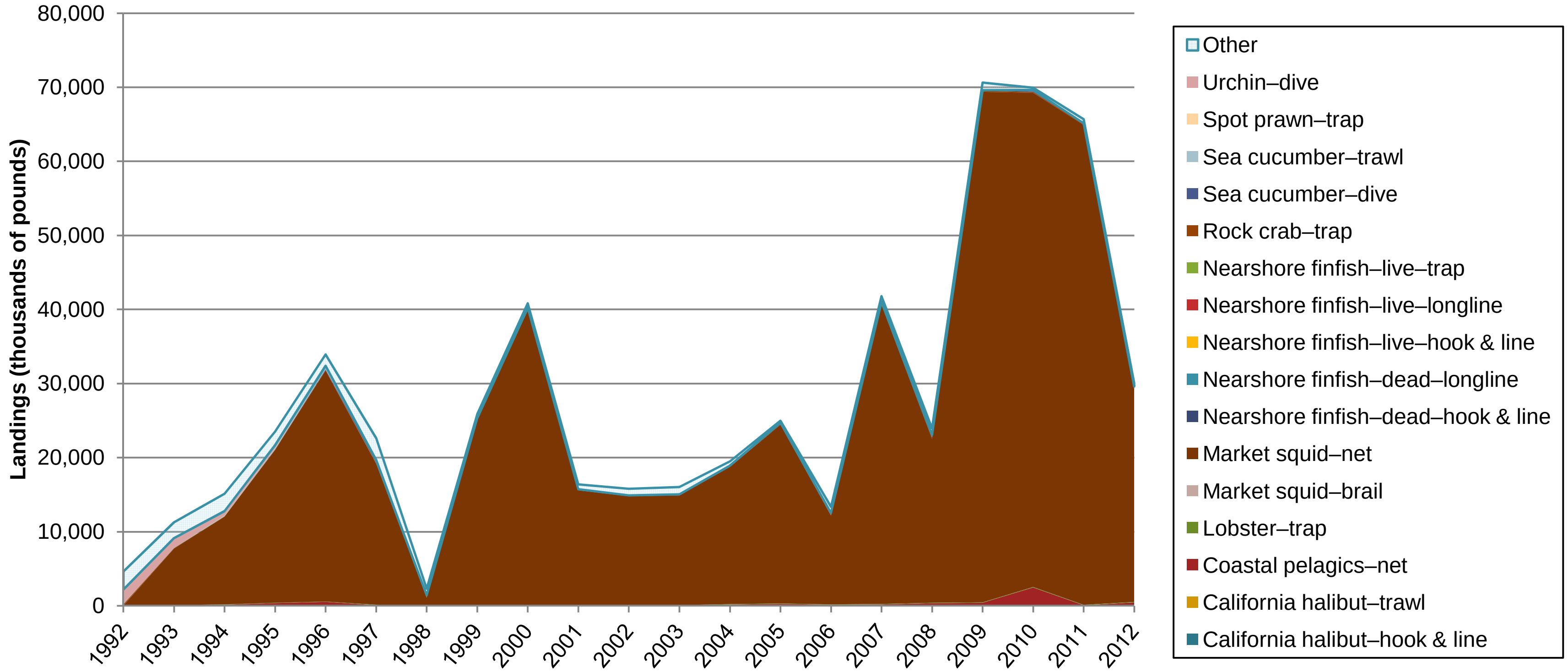
Figure 149 displays the landings and Figure 150 displays the ex-vessel revenue from fisheries of interest in the port of Ventura over the study period of 1992–2012. At the beginning of the study period, the swordfish fishery constituted the majority of 'other' landings in Ventura, though less of after the mid-2000s; the tuna fishery was also notable among 'other' fisheries. Landings and ex-vessel revenue dropped significantly in 1998 from the previous year (by 89.8 percent and 52.4 percent respectively), due to the exceptionally poor season of market squid–net that year. Of all fisheries of interest, the market squid–net fishery was the largest fishery in Ventura over the study period, constituting an average of 89.4 percent of landings and 55 percent of ex-vessel revenue annually.

Figure 148. Ventura total commercial landings, ex-vessel revenue, and number of fishermen, all fisheries, 1992–2012



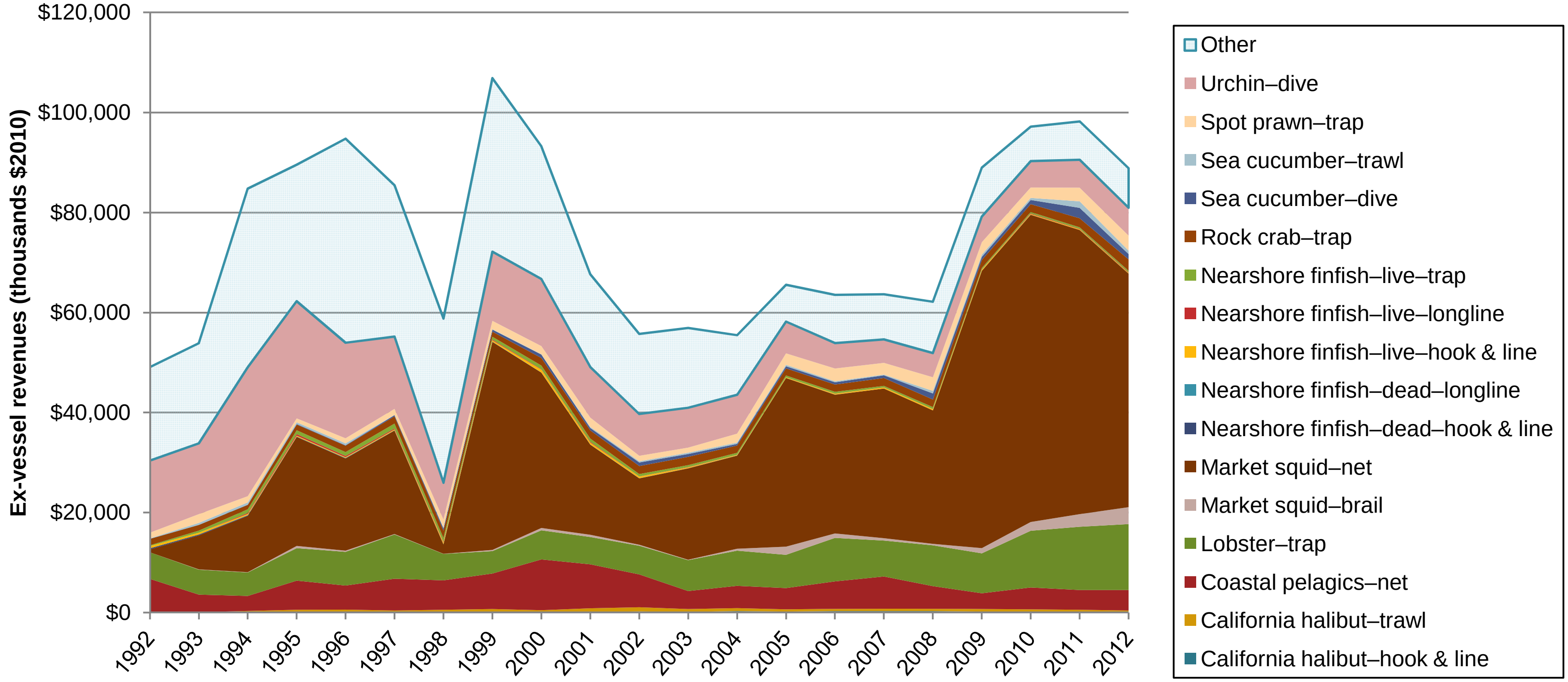
Source: Current study, based off landings data from CDFW.

Figure 149. Ventura commercial landings for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

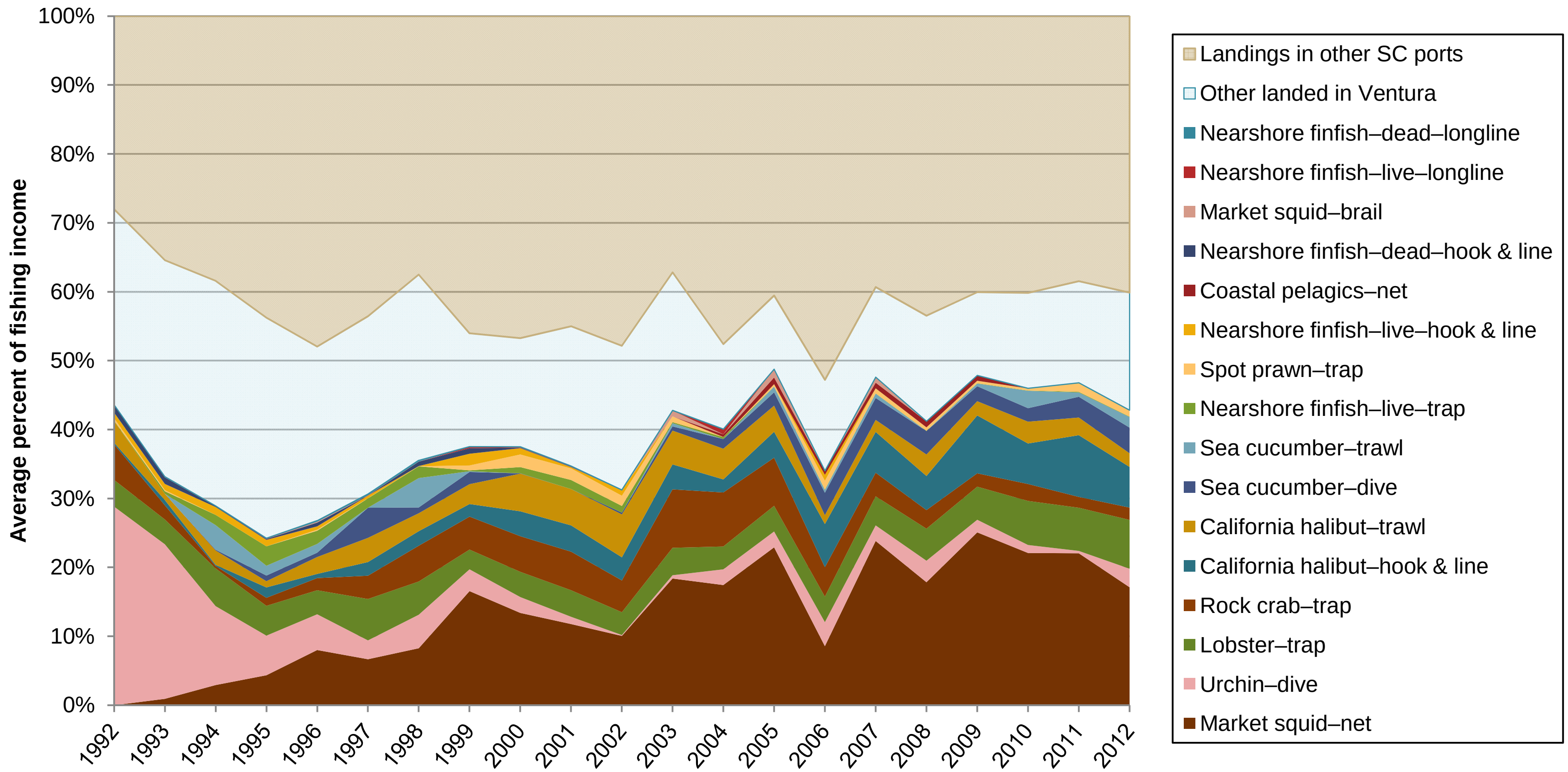
Figure 150. Ventura commercial ex-vessel revenue for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 151 displays the average percent contribution to fishing income for those fishermen who made landings in Ventura over the study period from the sixteen fisheries of interest, from other fisheries landed in Ventura, and from landings made from all fisheries landed in other South Coast region ports. This figure shows reliance on a fishery but also on a given port. Fishermen who landed in Ventura received approximately 58.1 percent of their total annual fishing income from ex-vessel revenue made in this port among all South Coast ports. The market squid–fishery was among the most significant in Ventura for its contribution to fishermen's incomes, and increasingly so over the study period, while ex-vessel revenue form urchin–dive became simultaneously less significant to Ventra fishermen. Again, growth was noted in reliance on the California halibut–hook & line fishery among participating fishermen.

Figure 151. Average percent of individual fishing income from commercial fisheries of interest, Ventura, 1992–2012



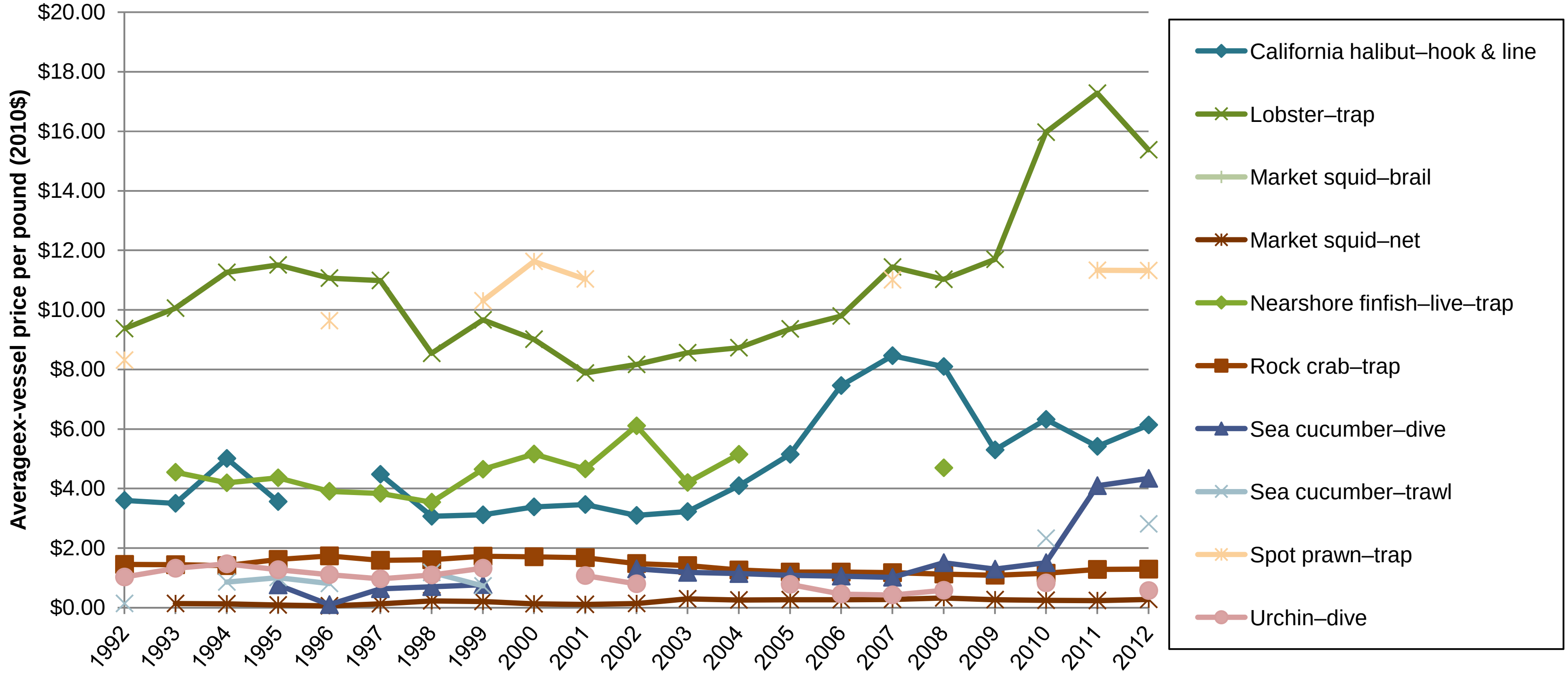
Source: Current study, based off landings data from CDFW.

Figure 152 displays the average ex-vessel prices over time for select fisheries of interest in Ventura over the 1992–2012 study period. Again, the lobster–trap and spot prawn–trap fisheries maintained the highest average ex-vessel prices throughout the study period, with the former reaching as high as $17.29 in 2011. Large increases were seen in the sea cucumber fisheries, dive increased from $0.76 in 1994 to $4.34 per pound by 2012 and trawl increased from $0.14 in 1992 to $2.81 per pound by 2012. The California halibut–hook & line fishery and the lobster–trap fisheries also saw increases, by 50.9 percent and 64.1 percent respectively.

Figure 153 through Figure 170 display study period landings, ex-vessel revenue, and number of fishermen for select fisheries of interest in Ventura, as well as averaged trends on the level of the individual fisherman. Some notable summary trends include the following:

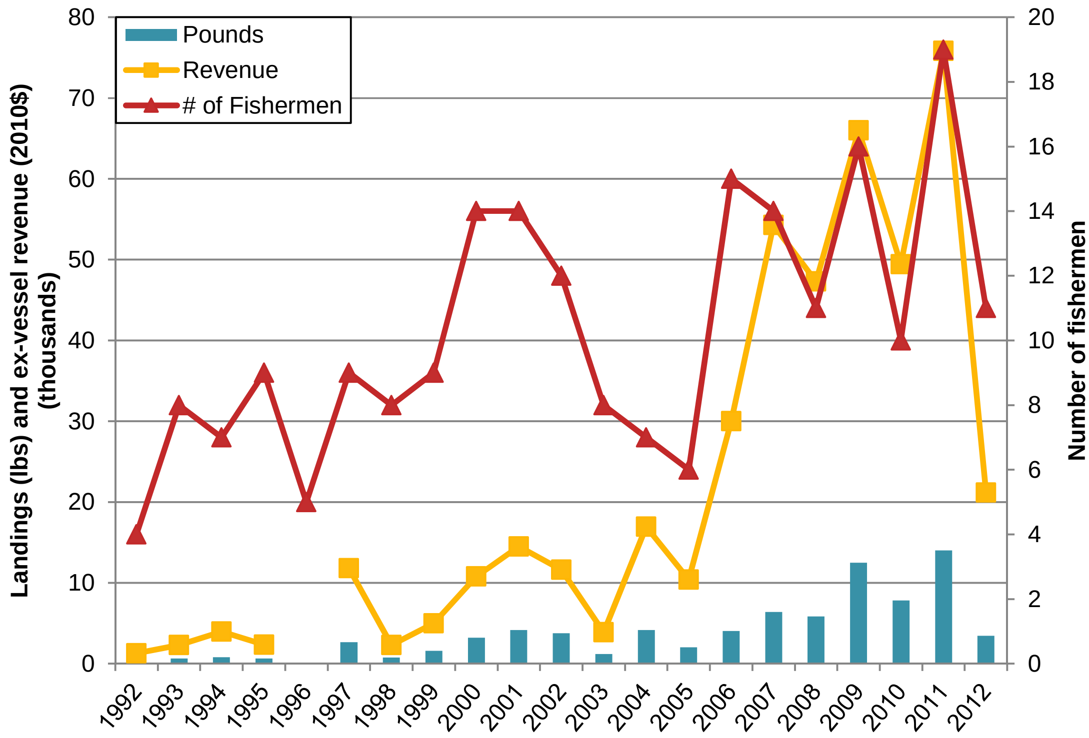
- For most fisheries the average landings and ex-vessel revenue per fishermen increased over the study period.
- California halibut–hook & line fishery experienced large increases in this port with lows occurring at the beginning of the study period, at 353 pounds landed for $1,272 in ex-vessel revenue, and highs towards the end, with 14,019 pounds landed for $75,839 in ex-vessel revenue in 2011. As a result, the average fisherman in 2012 landed 3.6 times more pounds and 6.1 times more pounds in 2012 than his 1992 counterpart.
- California halibut–trawl and urchin–diver fisheries declined overall, while average per fishermen pounds and ex-vessel revenue increased as more fishermen stopped participating over the study period.
- Coastal pelagics experienced a record year in 2010 in Ventura, landing 2.4 million pounds despite the annual average of 299,136 pounds over the study period.
- Lobster–trap landings and ex-vessel revenue increased significantly in Ventura by 59.7 percent and 162.1 percent respectively from 1992 to 2012. Average per fishermen landings and ex-vessel revenue increased even more, by 2.7 and 4.4 times their 1992 levels (up to 5,660 pounds for $87,018 on average by 2012).
- Despite a favorable year in 1997, sea cucumber–dive landings and ex-vessel revenue in Ventura dropped before increasing again to record high levels by the end of the study period.

Figure 152. Average ex-vessel prices over time, select commercial fisheries of interest, Ventura, 1992–2012



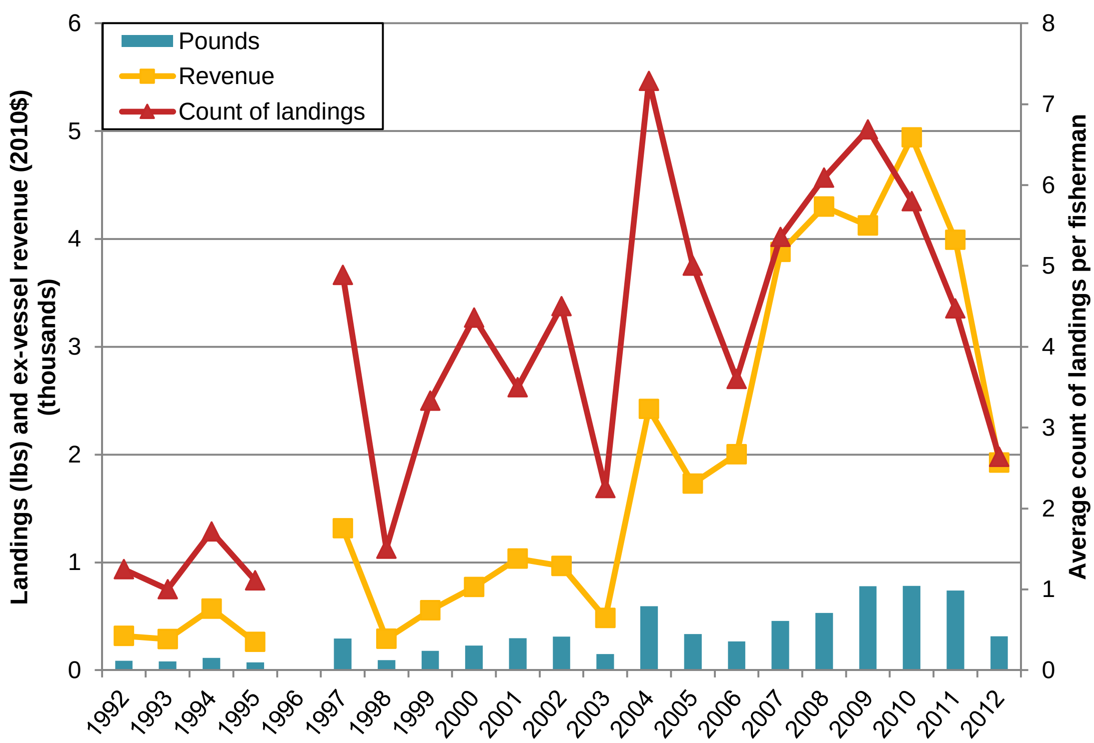
Source: Current study, based off landings data from CDFW.

Figure 153. California halibut–hook & line: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



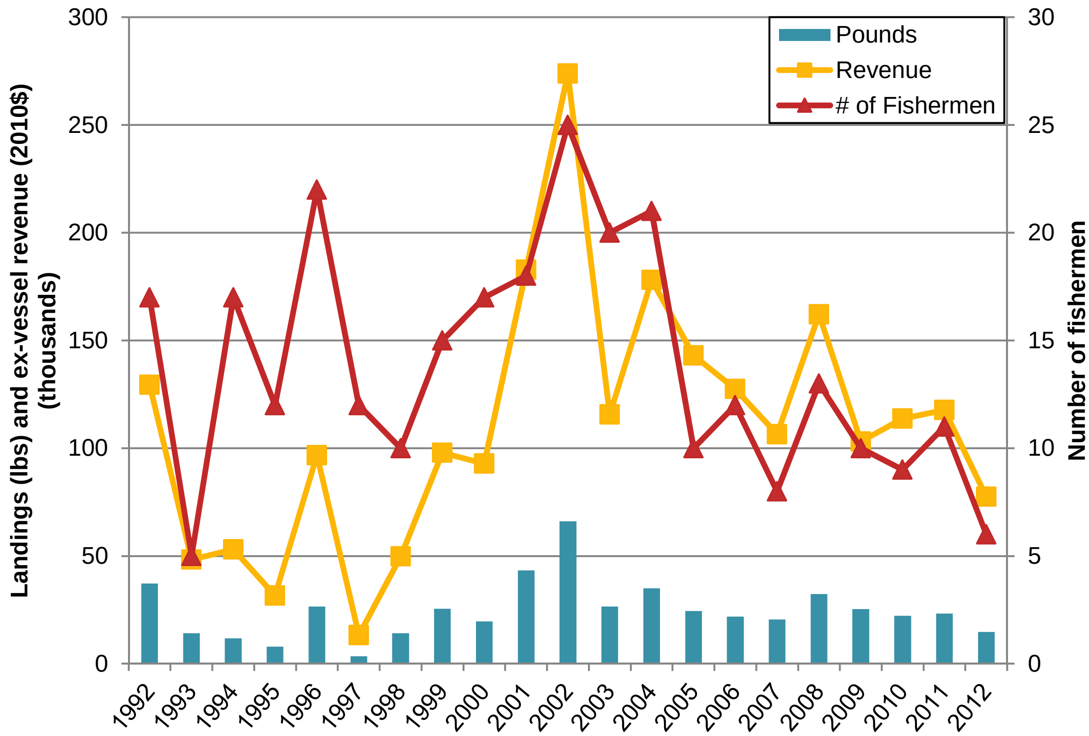
Source: Current study, based off landings data from CDFW.

Figure 154. California halibut–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



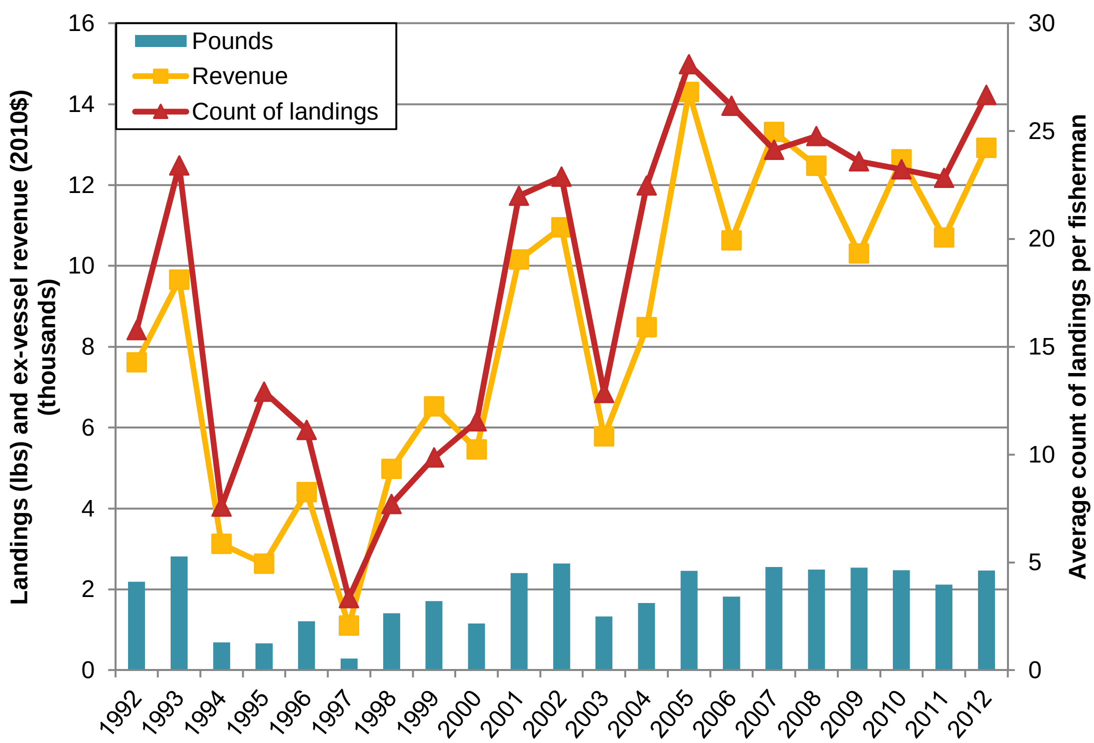
Source: Current study, based off landings data from CDFW.

Figure 155. California halibut–trawl: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



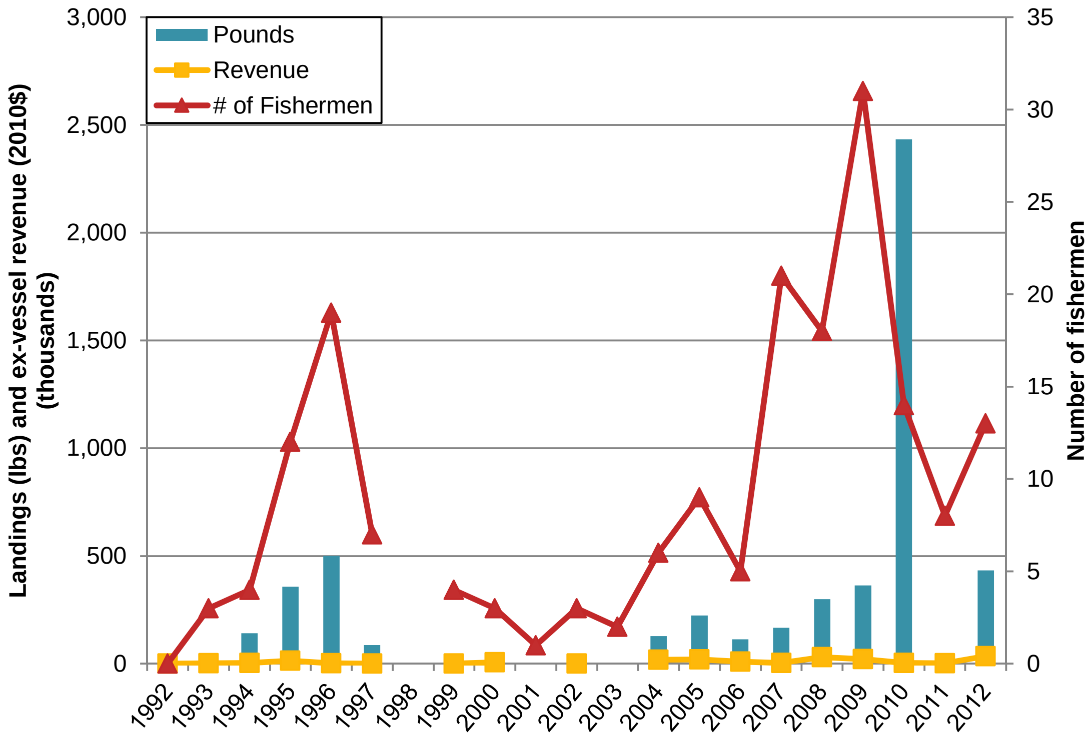
Source: Current study, based off landings data from CDFW.

Figure 156. California halibut–trawl: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



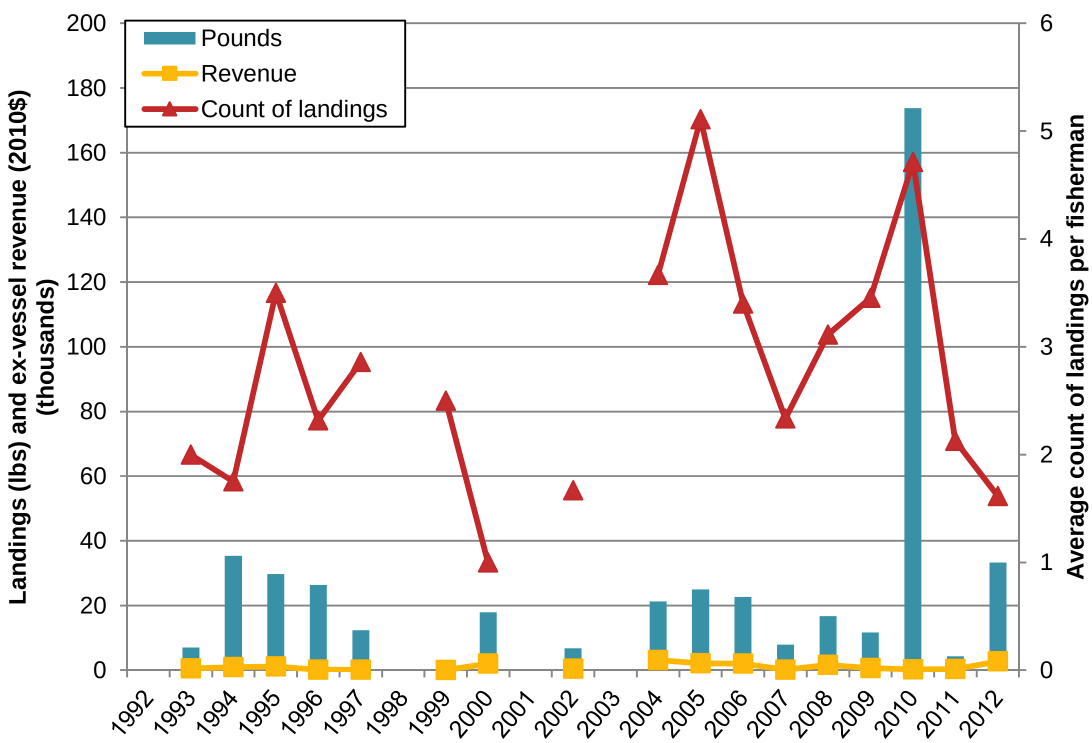
Source: Current study, based off landings data from CDFW.

Figure 157. Coastal pelagics–net: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



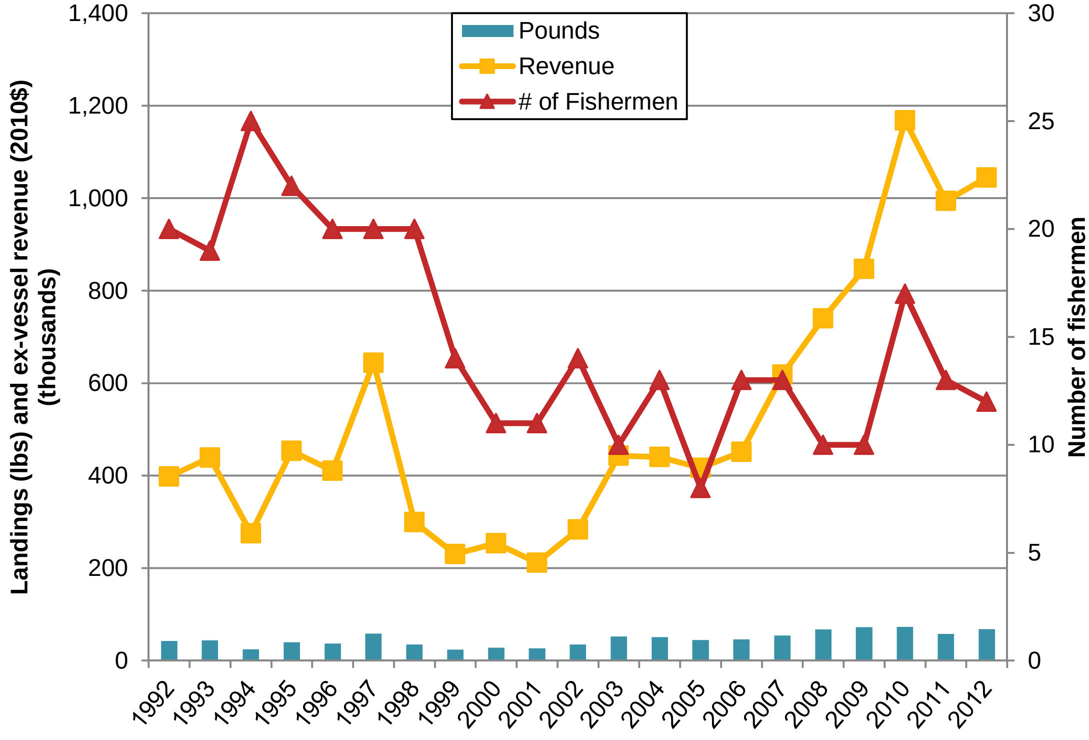
Source: Current study, based off landings data from CDFW.

Figure 158. Coastal pelagics–net: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



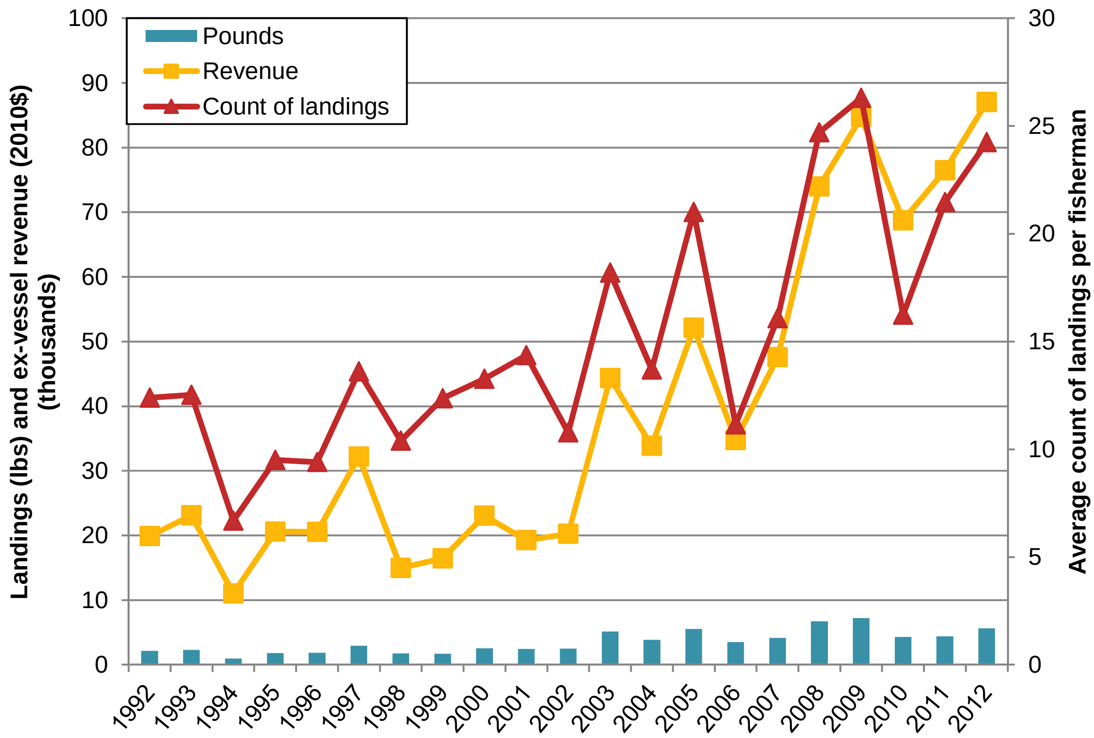
Source: Current study, based off landings data from CDFW.

Figure 159. Lobster–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



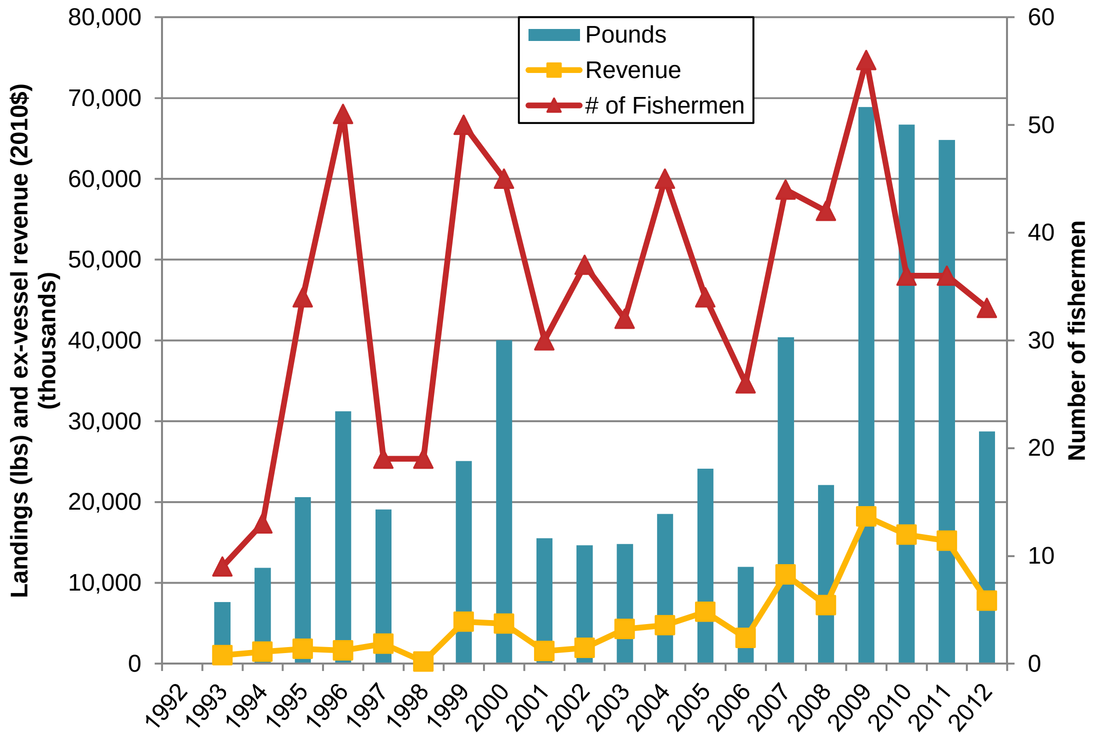
Source: Current study, based off landings data from CDFW.

Figure 160. Lobster–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



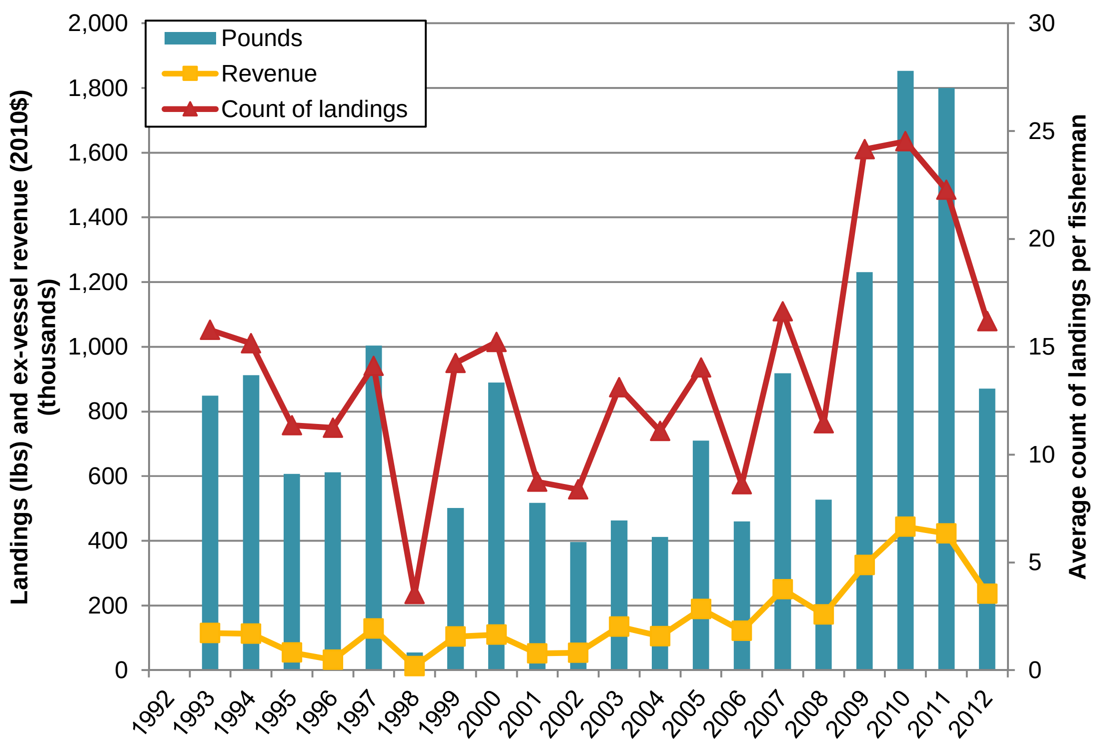
Source: Current study, based off landings data from CDFW.

Figure 161. Market squid–net: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



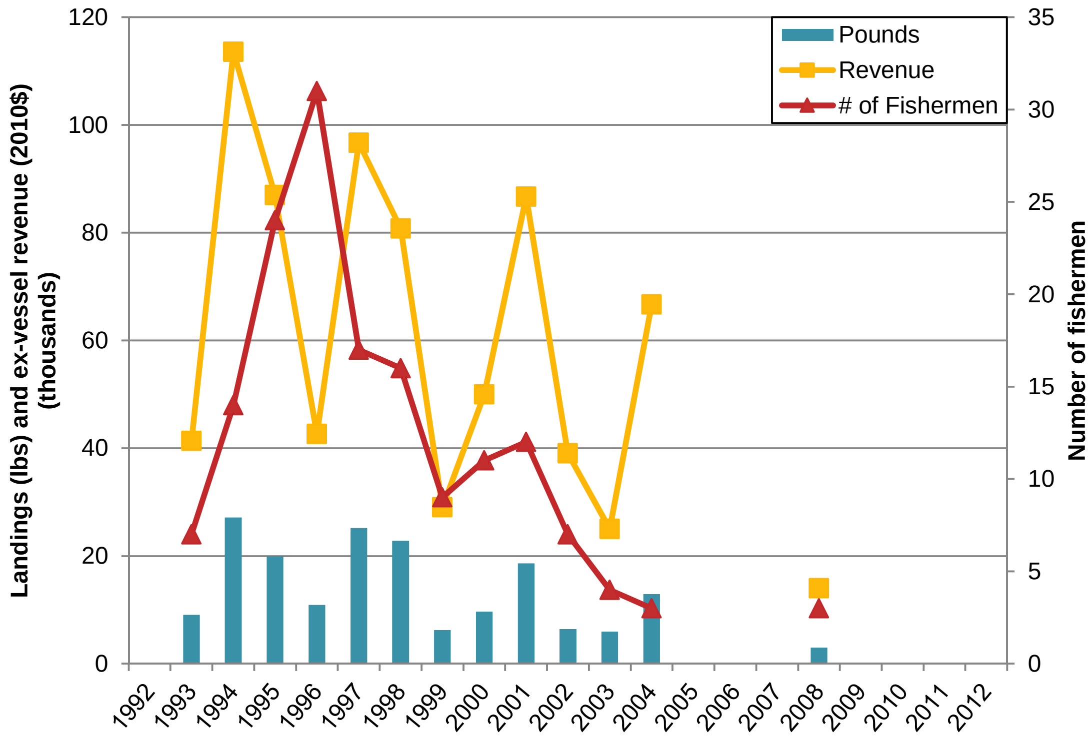
Source: Current study, based off landings data from CDFW.

Figure 162. Market squid–net: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



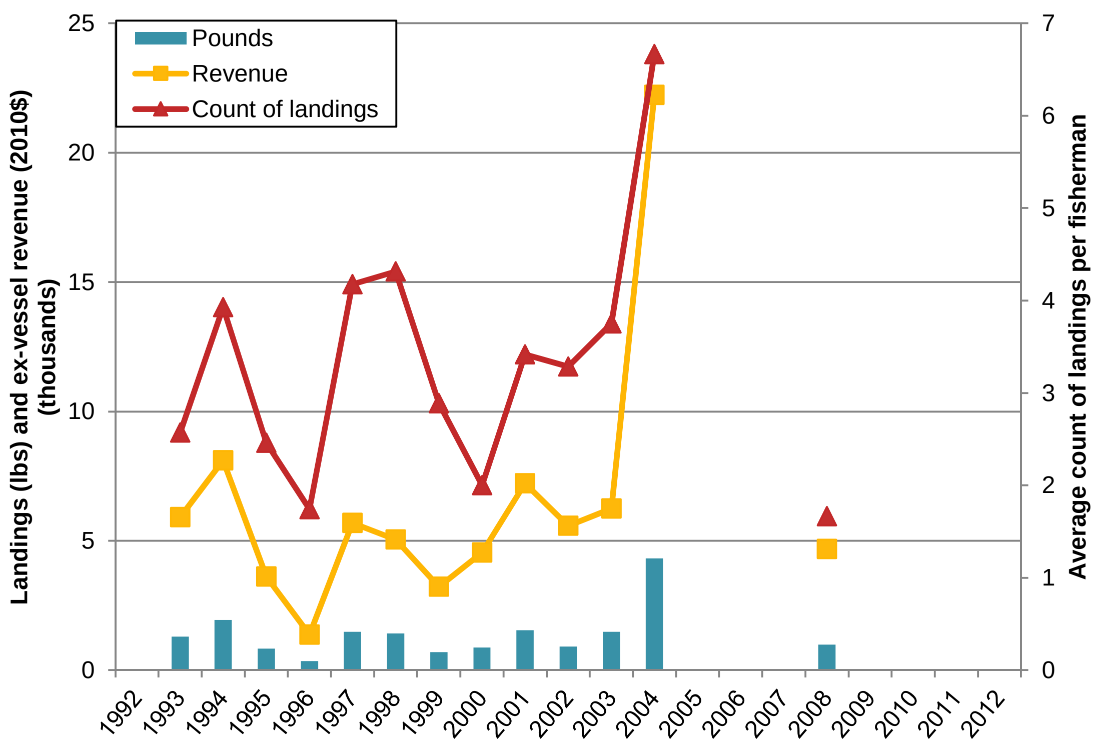
Source: Current study, based off landings data from CDFW.

Figure 163. Nearshore finfish–live–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



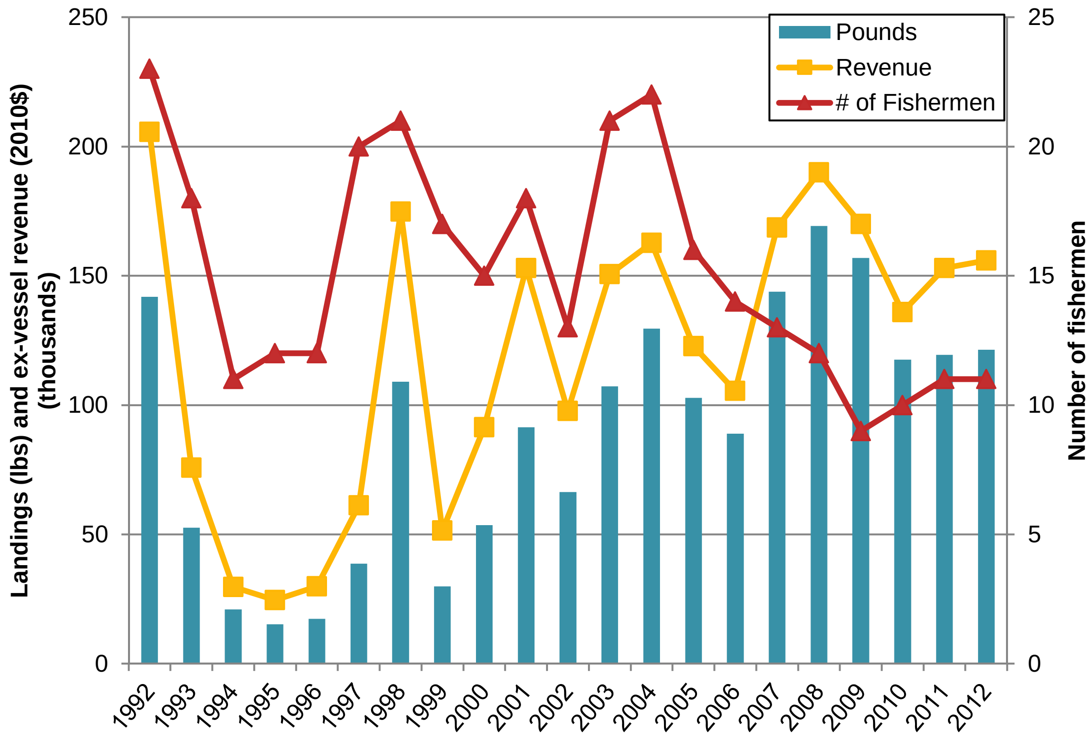
Source: Current study, based off landings data from CDFW.

Figure 164. Nearshore finfish–live–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



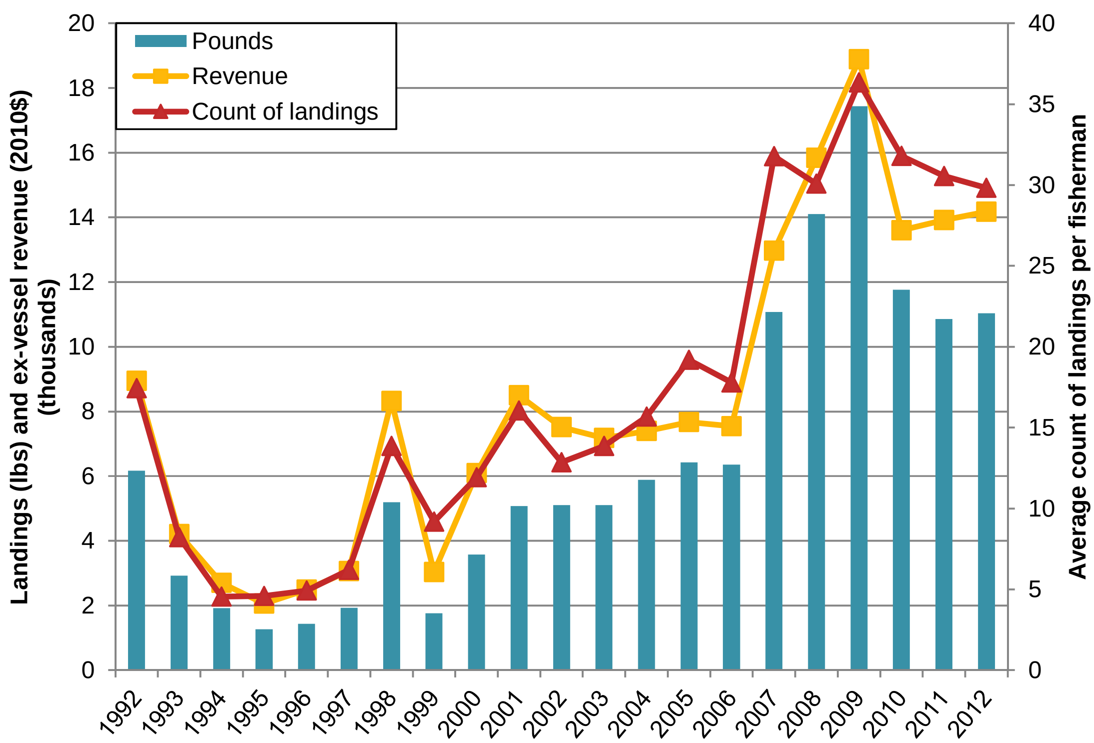
Source: Current study, based off landings data from CDFW.

Figure 165. Rock crab–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



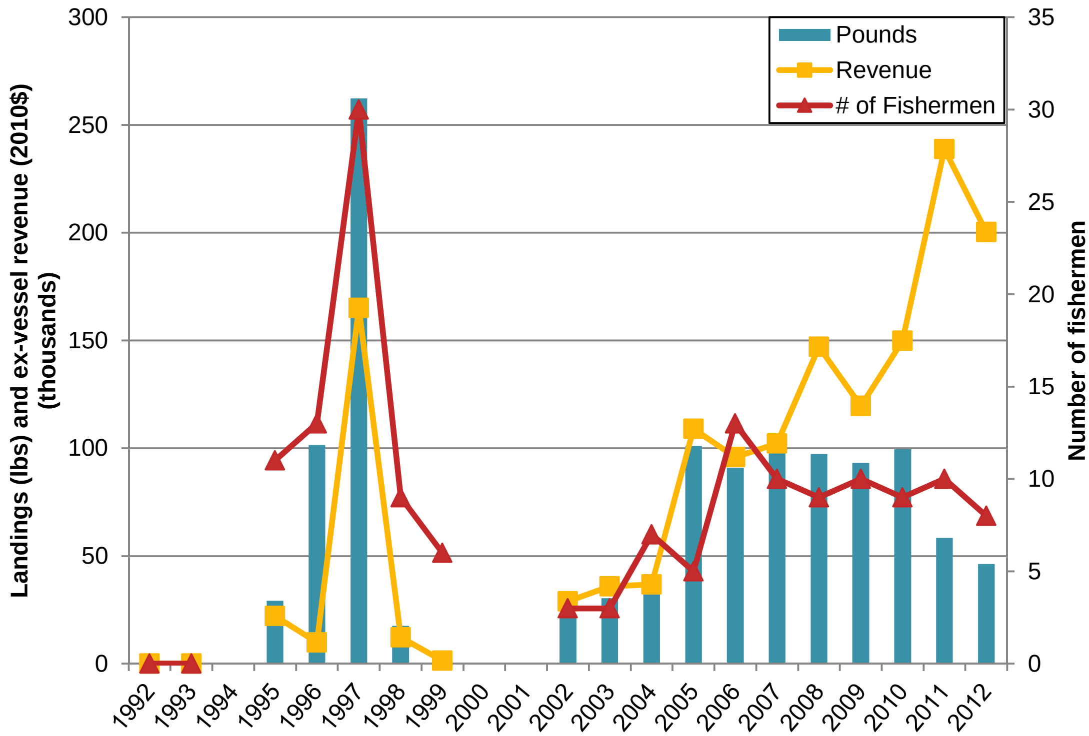
Source: Current study, based off landings data from CDFW.

Figure 166. Rock crab–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



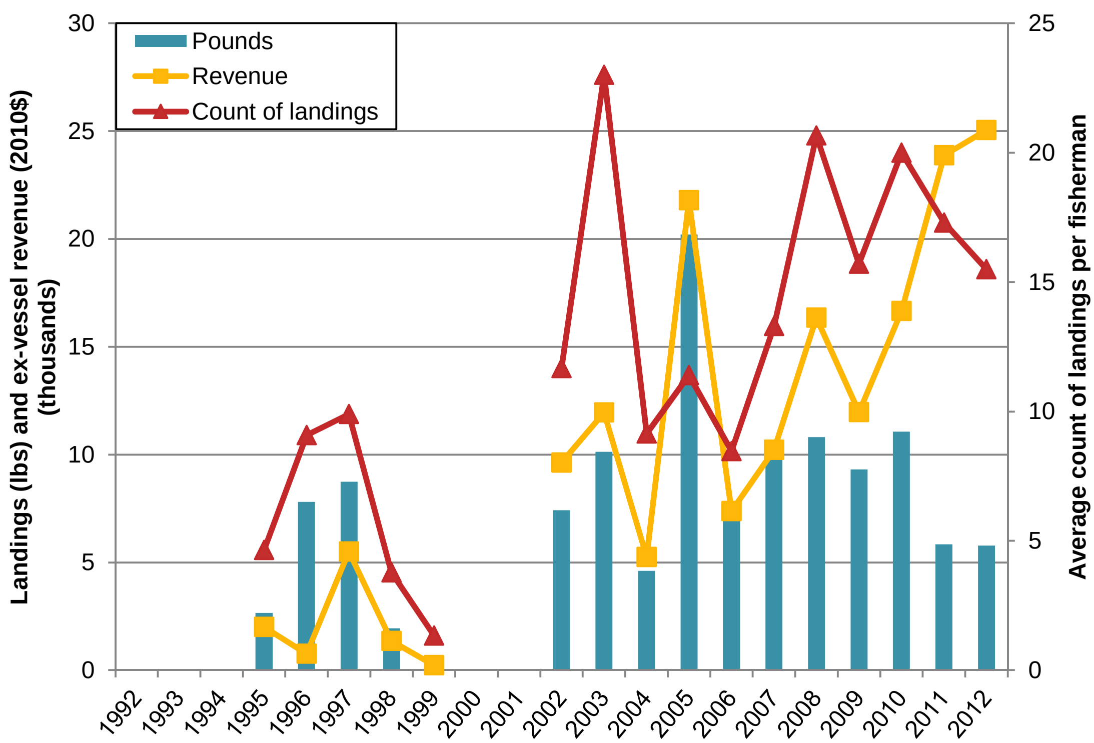
Source: Current study, based off landings data from CDFW.

Figure 167. Sea cucumber–dive: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



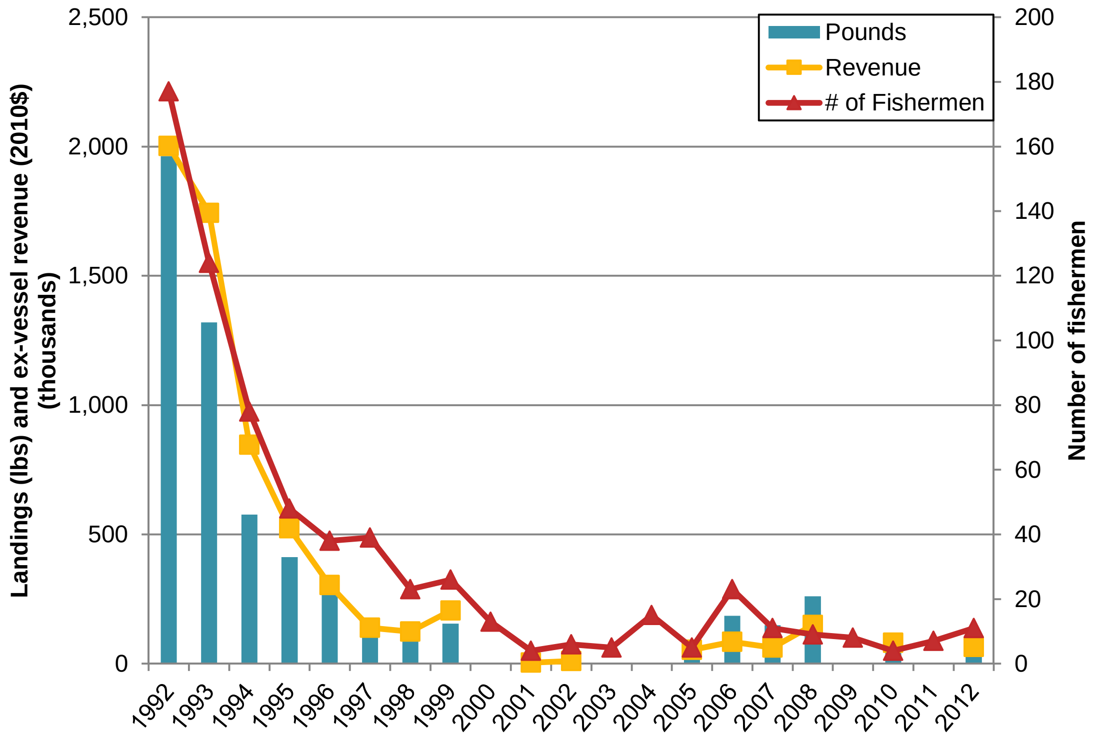
Source: Current study, based off landings data from CDFW.

Figure 168. Sea cucumber–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



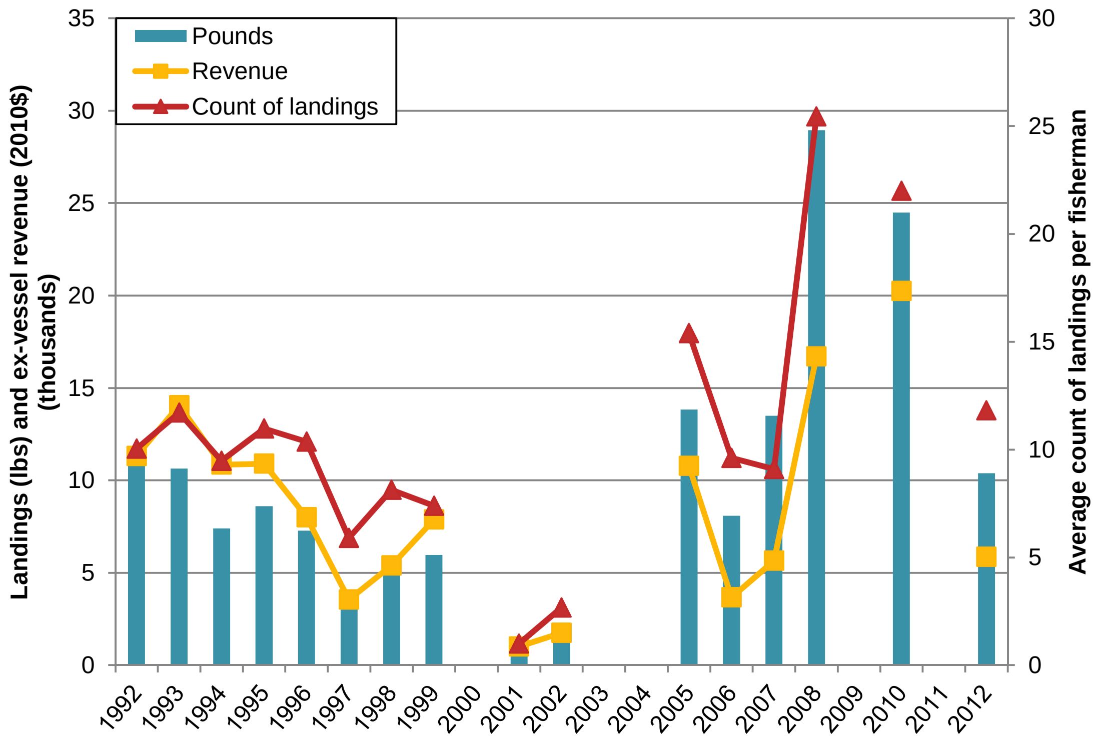
Source: Current study, based off landings data from CDFW.

Figure 169. Urchin–dive: Commercial landings, ex-vessel revenue, and number of fishermen, Ventura, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 170. Urchin–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Ventura, 1992–2012



Source: Current study, based off landings data from CDFW.

4.2.2. Ventura Commercial Baseline Characterization

In 2012, 84 individuals made landings in one or more of the target interview fisheries in Ventura. Combined, they generated $9,798,231 in ex-vessel revenue, which is 12 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the landings came from the market squid—net fishery (79.6 percent). We interviewed 12 fishermen from Ventura (Table 219).

Table 219. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Ventura

Fishery	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
California halibut–hook & line	$21,161	11	—
California halibut–trawl	$77,487	6	—
Coastal pelagics–net	$34,598	13	2
Lobster–trap	$1,044,215	12	6
Market squid–brail	—	—	—
Market squid–net	$7,798,682	33	5
Nearshore finfish live–fixed gear	$20,059	3	1
Rock crab–trap	$155,928	11	5
Sea cucumber–dive	$200,313	8	—
Sea cucumber–trawl	$100,872	6	—
Spot prawn–trap	$280,412	3	1
Urchin–dive	$64,503	11	—
Unique individuals	$9,798,231	84	12

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

The average Ventura fisherman that we interviewed was 50.2 years old and had an average of 31.1 years of experience as a commercial fisherman (Table 220). It should be noted that this question inquired about the number of years of experience an individual had commercial fishing as a whole, not the number of years of experience they had in a specific fishery. Additionally, Ventura fishermen on average made 91.6 percent of their total personal income from commercial fishing in 2012, an average decrease of 7 percent since 2008. Despite the decrease, Ventura fishermen remained above the regional average change in income from commercial fishing for 2012. It should be noted that 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust (Scholz et al. 2010). As shown in Table 221, all fisheries displayed or calculated experienced a decrease in average percent income from 2008 to 2012, except the market squid--net fishery (increase of 2.6 percent).

Table 220. Average age and years of experience commercial fishing in 2012, Ventura

	Age			Years of experience		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	2	*	*	2	*	*
Lobster–trap	6	48.8	12.8	6	32.0	10.6
Market squid–brail	—	—	—	—	—	—
Market squid–net	5	51.2	13.1	5	32.0	16.2
Nearshore finfish live–fixed gear	1	*	*	1	*	*
Rock crab–trap	5	53.6	5.9	5	35.6	6.6
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*
Urchin–dive	—	—	—	—	—	—
All target fisheries (unique individuals)	12	50.2	11.8	12	31.1	12.5

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 221. Percent change in income from overall commercial fishing from 2008 - 2012, Ventura

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	1	*	*	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	2	*	*	*
Lobster–trap	6	100.0%	0.0%	6	83.2%	23.2%	-16.8%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	4	97.5%	5.0%	5	100.0%	0.0%	2.6%
Nearshore finfish live–fixed gear	2	*	*	1	*	*	*
Rock crab–trap	6	100.0%	0.0%	5	91.8%	10.8%	-8.2%
Sea cucumber–dive	2	95.0%	7.1%	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*	*
Urchin–dive	3	96.7%	5.8%	—	—	—	—
All target fisheries (unique individuals)	13	98.5%	3.8%	12	91.6%	18.0%	-7.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher. As shown below in Table 222, the majority of respondents in all fisheries perceived no change. Only in the market squid—net fishery did one respondent indicate that they perceived a significantly higher increase in personal income coming from commercial fishing between 2008 and 2012.

Table 222. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Ventura

Fisheries	Number responding	Percent response: Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	2	*	*	*	*	*
Lobster–trap	6	—	—	100.0%	—	—
Market squid–brail	—	—	—	—	—	—
Market squid–net	5	20.0%	—	80.0%	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*
Rock crab–trap	5	—	—	100.0%	—	—
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—
All fisheries (unique individuals)	12	8.3%	—	91.7%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their income coming from commercial fishing. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Table 223 lists the reason for the change as well as the number for each fishery. Only one respondent from the market squid—net fishery indicated that the perceived increase in personal income was due to spending more time fishing.

Table 223. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Ventura

	Number of individuals responding	Responses indicating increase								Responses indicating decrease					
Fishery		A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

In interviews, fishermen were asked what percent of their gross economic revenue (GER) went towards their overall commercial fishing operating costs. In Table 224 below, we compare the average responses that were given in a 2008 study conducted by Point 97/Ecotrust (Scholz et al. 2010) to that gathered in this study (2012). As noted previously the responses given in the 2008 study were based on fishermen's cumulative fishing experience—not necessarily specific to the year they were interviewed. Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years. Overall, Ventura fishermen reported that in 2012 on average 43.6 percent of their gross economic revenue was spent on operating costs, which is 25.1 percent less than the number reported in 2008, and 3.4 percent less than the South Coast regional average. Again we emphasize that this question is asked about overall commercial fishing operating costs across all fisheries for a particular fisherman.

Despite the overall reported decrease between 2008 and 2012, most respondents perceived an increase in expenses, as shown above in Table 225. In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their gross economic revenue going towards operating costs. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Similar to the region, in Ventura, the most frequently reported reason for increasing operating costs was the increased cost of fuel, followed by general increases in costs of goods and labor (Table 226).

Table 224. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Ventura

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	2	*	*	*
Lobster–trap	6	47.7%	10.7%	6	37.5%	12.9%	-21.3%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	4	65.0%	5.8%	5	48.8%	24.6%	-25.0%
Nearshore finfish live–fixed gear	1	*	*	1	*	*	*
Rock crab–trap	5	44.0%	6.5%	5	42.0%	7.6%	-4.5%
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*	*
Urchin–dive	1	95.0%	—	—	—	—	—
All target fisheries (unique individuals)	11	58.3%	17.0%	12	43.6%	18.0%	-25.1%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 225. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Ventura

		Percent response				
Fisheries	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	2	*	*	*	*	*
Lobster–trap	6	66.7%	16.7%	16.7%	—	—
Market squid–brail	—	—	—	—	—	—
Market squid–net	4	—	25.0%	75.0%	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*
Rock crab–trap	5	80.0%	—	20.0%	—	—
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—
All fisheries (unique individuals)	11	36.4%	27.3%	36.4%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Table 226. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Ventura

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	5	5	1	1	5	—	—	1	—	1	—	1	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	1	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	4	4	1	1	4	—	—	1	—	1	—	1	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	7	7	1	1	7	—	—	1	—	1	—	1	—	—	—	—	—	—

Source: Current study

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Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

We asked fishermen how many years of experience and how many days they spent targeting each of the fisheries in which they participated. As indicated in Table 227, rock crab—trap fishermen have been fishing the longest, on average 30.8 years. Fishermen in the market squid—net fishery had the fewest number of years of experience of all the target fisheries, 20.4 years. Fishermen spent the fewest number of days targeting rock crab—trap in 2012, an average of just 58.4 days. The most frequently targeted fishery was lobster—trap, which was targeted an average of 131.7 days in 2012.

Table 227. Years of experience and number of days targeting specific fisheries in 2012, Ventura

	Years of experience in fishery			Number of days targeting fishery in 2012		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	2	*	*	2	*	*
Lobster–trap	6	27.7	11.8	6	131.7	32.0
Market squid–brail	—	—	—	—	—	—
Market squid–net	5	20.4	13.7	5	81.0	36.1
Nearshore finfish live–fixed gear	1	*	*	1	*	*
Rock crab–trap	5	30.8	5.4	5	58.4	43.9
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*
Urchin–dive	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were also asked how many crew they used for each fishery and what percent of their gross economic revenue was spent on their crew. Ventura respondents reported using an average of one crew member, except the market squid—net fishery which used an average of 4 crew members (Table 228). The market squid—net fishery reported the highest percent of gross economic revenue spent on crew, 38.2 percent. The average percent of fishery specific gross economic revenue spent on fuel was the highest in the lobster—trap (16.6 percent) and the lowest for the market squid—net fishery (7.5 percent).

Table 228. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Ventura

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	2	*	*	2	*	*	2	*	*
Lobster–trap	6	1	1	6	15.3%	9.8%	6	16.6%	7.3%
Market squid–brail	—	—	—	—	—	—	—	—	—
Market squid–net	5	4	0	5	38.2%	8.9%	5	7.5%	3.3%
Nearshore finfish live–fixed gear	1	*	*	1	*	*	1	*	*
Rock crab–trap	5	1	1	5	14.0%	8.2%	5	10.8%	6.5%
Sea cucumber–dive	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*	1	*	*
Urchin–dive	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were asked separately for each fishery they participated in to compare his/her success in the fishery in 2012 to that of the last ten years. As shown in Table 229 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishery. This question was asked as an open ended question and responses were later coded and categorized into positive and negative environmental factors (Table 230), economic factors (Table 231), regulatory factors (Table 232), and other factors (Table 233).

Some target fisheries saw a greater variety of responses than others. For example, in the lobster—trap fishery the majority of respondents indicated the fishery was significantly better (50 percent), or somewhat better (33.3 percent), but one respondent indicated that his success was significantly worse in 2012 compared to the last ten years. The primary negative influences where lack of available product (Table 230) and MPAs or other closures (Table 232). One positive factor that all respondents in the lobster–trap fishery mentioned was the high ex-vessel price (Table 231). In fact, in review, some fishermen indicated they felt that without the high price they would not have been successful in the fishery in 2012.

Other fisheries had less variance in terms of responses regarding the overall success of their fishery. For example, a majority of fishermen in the market squid—net fishery reported their success in the fishery was significantly better (50 percent). Success in the market squid –net fishery was attributed to abundance of product, good oceanic conditions (Table 230), and good prices (Table 231). The majority of respondents in the rock crab—trap fishery indicated their overall success was somewhat worse (40 percent) or significantly worse (20 percent) in 2012. The negative factors influencing the success in the rock crab—trap fishery were poor quality of product (Table 230), bad price and bad market (Table 231), and MPAs and other closures (Table 232).

In Ventura, the most commonly cited positive economic factor was the good price. Lastly, respondents indicated that MPAs or other closures were the leading negative regulatory factor influencing the success of their fishery.

Table 229. Overall success in specific commercial fishery, 2012 compared to previous ten years, Ventura

		Percent response						
Fisheries	Number responding	Did not participate in previous seasons	Significantly better	Somewhat better	The same	Somewhat worse	Significantly worse
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	2	*	*	*	*	*	*
Lobster–trap	6	—	50.0%	33.3%	—	—	16.7%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	4	—	50.0%	25.0%	25.0%	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*
Rock crab–trap	5	—	—	—	40.0%	40.0%	20.0%
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 230. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Ventura

		Positive					Negative				
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	*	*	*	*	*	*	*	*
Lobster–trap	3	1	1	1	—	—	1	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	2	1	—	1	—	—	—	—	—	—	—
Nearshore finfish–live–fixed gear	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	1	—	—	—	—	—	—	—	—	1	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	1	*	*	*	*	*	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 231. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Ventura

		Positive			Negative			
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
California halibut–hook & line	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—
Lobster–trap	4	4	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—
Market squid–net	2	2	—	—	—	—	—	—
Nearshore finfish–live–fixed gear	—	—	—	—	—	—	—	—
Rock crab–trap	2	—	—	—	1	1	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 232. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Ventura

		Negative					
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	1	—	—	1	—	—	—
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish–live–fixed gear	—	—	—	—	—	—	—
Rock crab–trap	2	—	—	2	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 233. Other changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Ventura

		Positive						Negative						
Fishery	Number responding	A	B	C	D	E	F	G	H	I	J	K	L	M
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	*	*	*	*	*	*	*	*	*	*	*
Lobster–trap	2	—	1	1	—	1	—	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish–live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

4.3. Port Hueneme/Oxnard

The Channel Islands Harbor in Oxnard and Port Hueneme Harbor in Port Hueneme are located a short distance from each other in Ventura County, about 60 miles north west of Los Angeles and 40 miles south of Santa Barbara (Norman et al. 2007). According to the 2010 Census, the population of Oxnard was much larger than that in Port Hueneme, 197,899 as compared to 21,723, respectively. Both cities had a relatively young population with the median age of 29.9 in Oxnard and 31.3 in Port Hueneme. The estimated per capita income (2007-2011) in Oxnard was $20,612 with a mean household income of $74,230 (US Census Bureau 2010). In Port Hueneme the reported per capita income was $23,391 with a mean household income of $69,237.

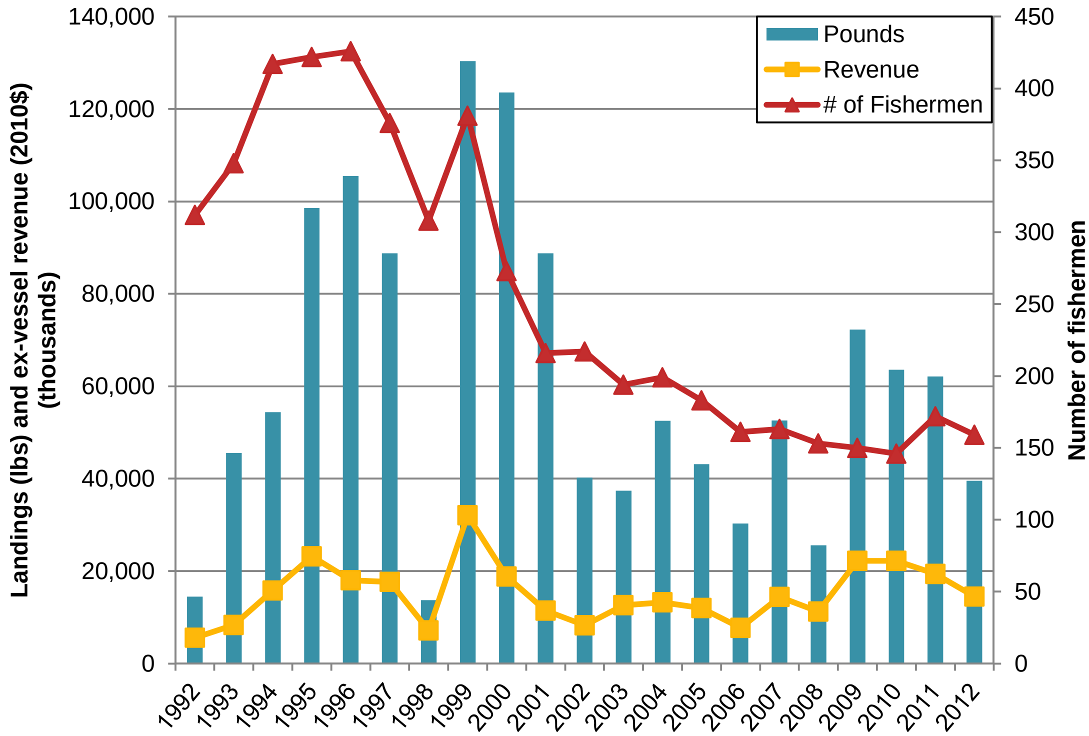
The Channel Islands Harbor is owned by Ventura County while the Port Hueneme Harbor is owned and operated by the Oxnard Harbor District. Port Hueneme is the largest deepwater water harbor between San Francisco and Los Angeles and does not offer any berthing for recreational or small boats (Norman et al. 2007). In terms of the commercial fishing industry, the port is primarily used for offloading wetfish by transient fishermen from all over the west coast (Norman et al. 2007). Channel Islands Harbor offers 2,400 berths, marinas, and marine repair yards. In a study completed in 2007 by Culver, Richards, and Pomeroy fishermen reported that there were several areas in need of improvement including gear storage, gear repair areas, cost of fuel and bait, ice, fish buyers, an information center/meeting hall, bait availability and storage, cold storage and live holding tanks, telecommunications equipment and scales.

4.3.1. Port Hueneme/Oxnard Commercial Fisheries Initial Changes

Figure 171 displays the commercial landings, ex-vessel revenue, and number of fishermen for all fisheries in the South Coast port of Port Hueneme/Oxnard over the study period 1992–2012. This port saw an initial growth in commercial fishing in the first half of the study period, despite a poor market squid–net season in 1998, but experienced an overall decline in the latter half until 2012. Landings and ex-vessel revenue (recovered and) peaked in 1999 at 130.4 million pounds for $32.1 million; the number of fishermen landing at Port Hueneme/Oxnard peaked earlier in 1996 at 426. By 2012, a significantly lower number of fishermen, 159, landed a total of 39.6 million pounds for $14.5 million in ex-vessel revenue. Despite these overall declines, this port relatively consistently contributed approximately 20 percent of the region's total landings and ex-vessel revenue per year over the study period.

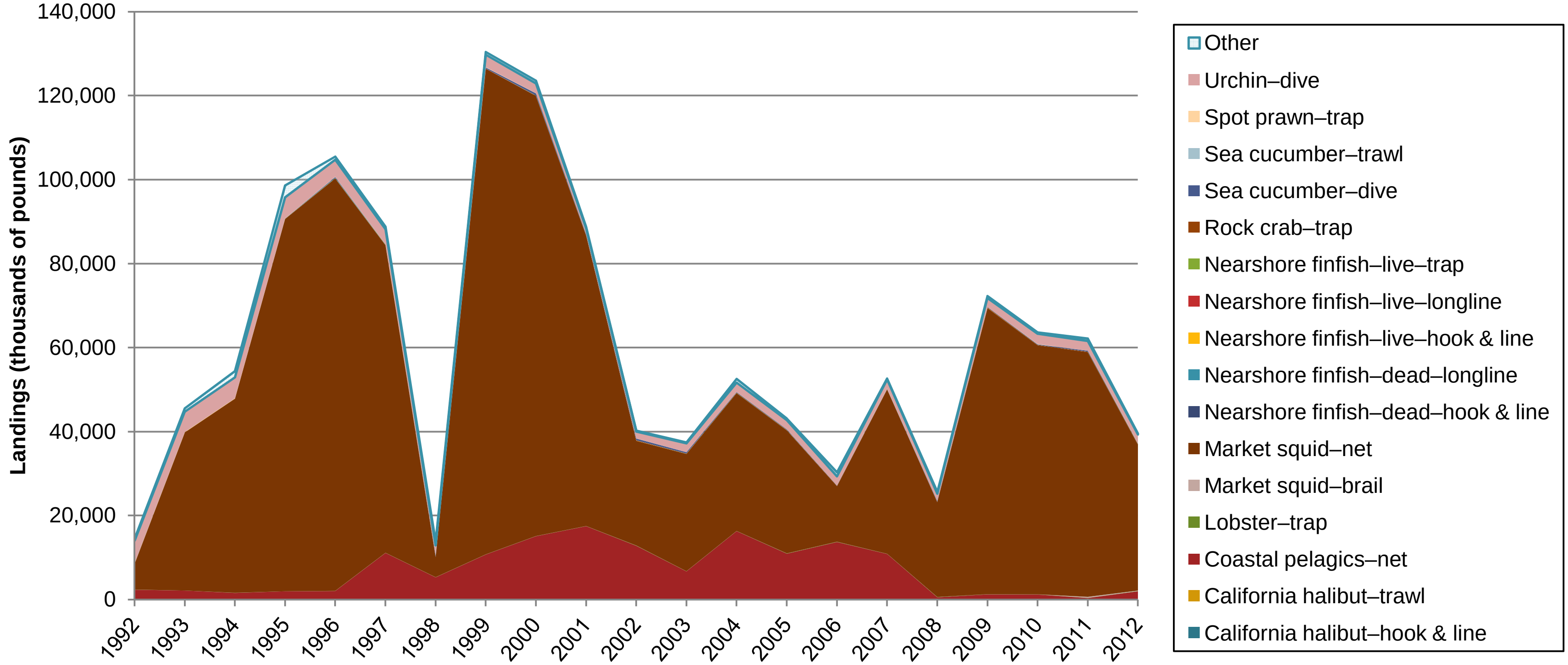
Figure 172 displays the landings and Figure 173 displays the ex-vessel revenue from fisheries of interest in the port of Port Hueneme/Oxnard over the study period of 1992–2012. The market squid–net fishery was the largest contributor to port total landings and ex-vessel revenue, averaging 76.3 percent of annual landings and 57.4 percent of annual ex-vessel revenue on average. The coastal pelagic–net fishery contributed approximately 14.4 percent of average annual landings, though less to ex-vessel revenue (3.4 percent). The urchin–dive fishery constituted the second largest contributor to Port Hueneme/Oxnard ex-vessel revenue, accounting for approximately 20.8 percent on average annually over 1992–2012. Among all South Coast ports, this port had the smallest percentage of landings and ex-vessel revenue from other fisheries outside the scope of the fisheries of interest listed in this report, constituting an average of only 1.5 percent of total landings and 7.6 percent of total ex-vessel revenue annually over the study period.

Figure 171. Port Hueneme/Oxnard total commercial landings, ex-vessel revenue, and number of fishermen, all fisheries, 1992–2012



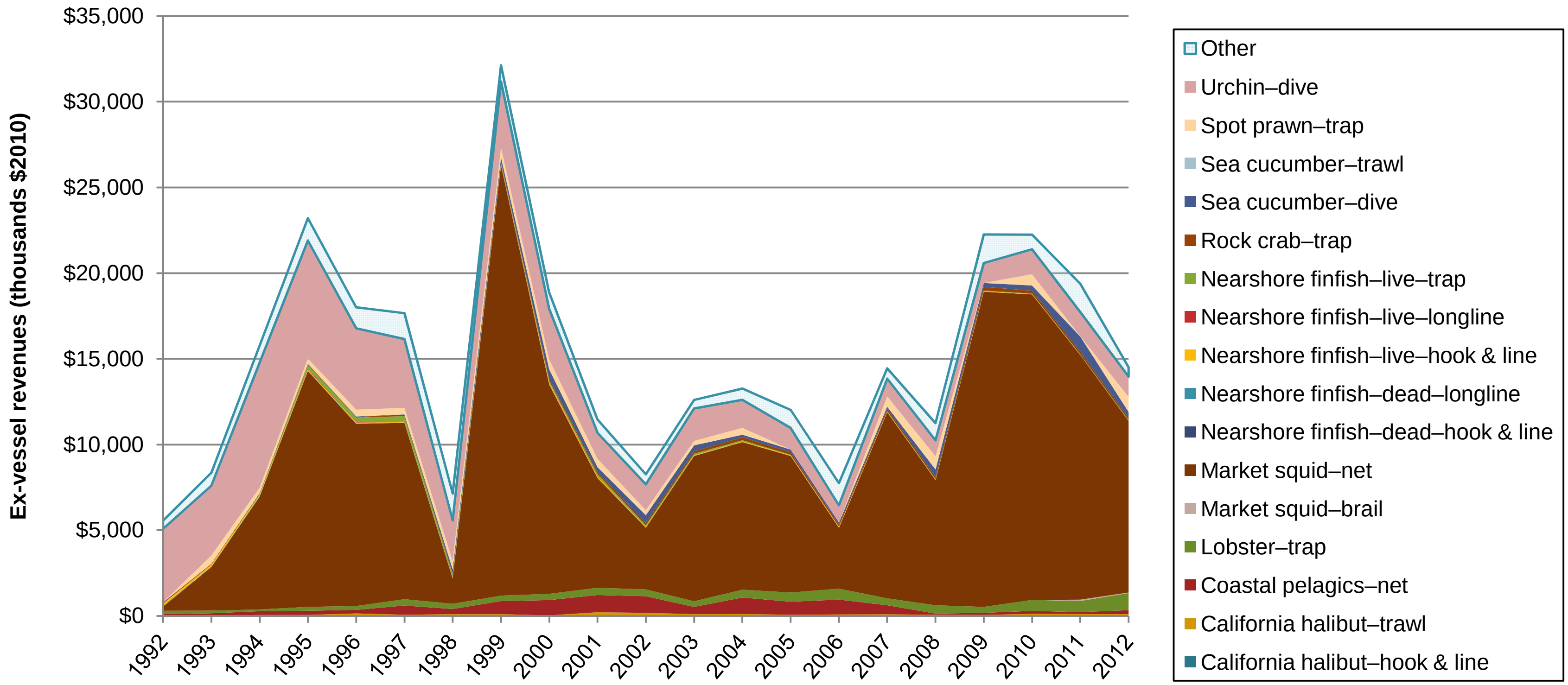
Source: Current study, based off landings data from CDFW.

Figure 172. Port Hueneme/Oxnard commercial landings for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

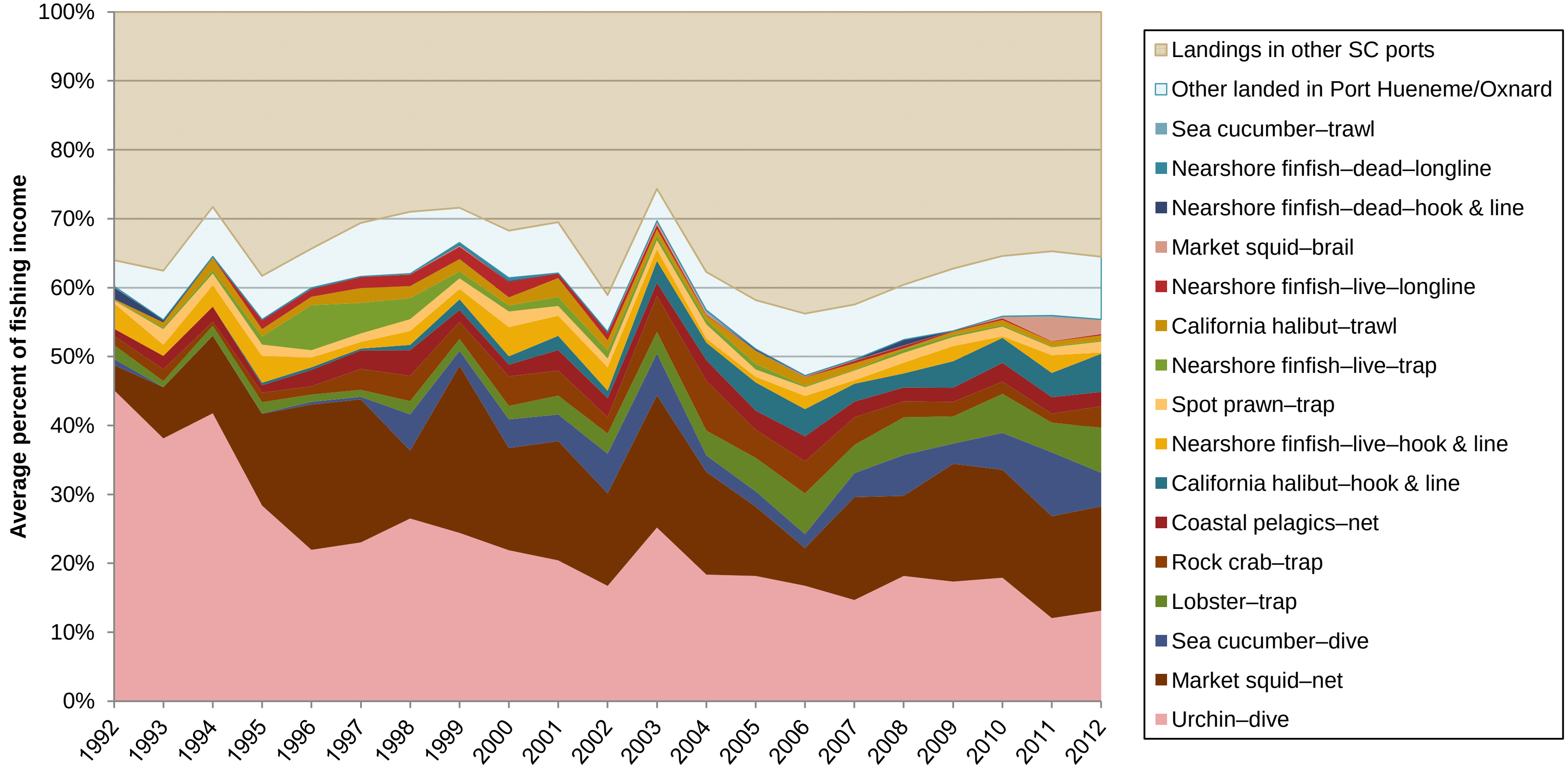
Figure 173. Port Hueneme/Oxnard commercial ex-vessel revenue for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 174 displays the average percent contribution to fishing income for those fishermen who made landings in Port Hueneme/Oxnard over the study period from the sixteen fisheries of interest, from other fisheries landed in Port Hueneme/Oxnard, and from landings made from all fisheries landed in other South Coast region ports. This figure shows reliance on a fishery but also on a given port. Fishermen making landings in this port received an average of 64.8 percent of their total income from Port Hueneme/Oxnard ex-vessel revenue to their total South Coast fishing income annually. The decline of urchin–dive and market–squid ex-vessel revenue is notable also in this port over the study period. More than fishermen in any other port, ex-vessel revenue from the sea cucumber–dove fisher was more significant to Port Hueneme/Oxnard fishermen than elsewhere in the region, while still only constituting an average of 3.2 percent annually.

Figure 174. Average percent of individual fishing income from commercial fisheries of interest, Port Hueneme/Oxnard, 1992–2012



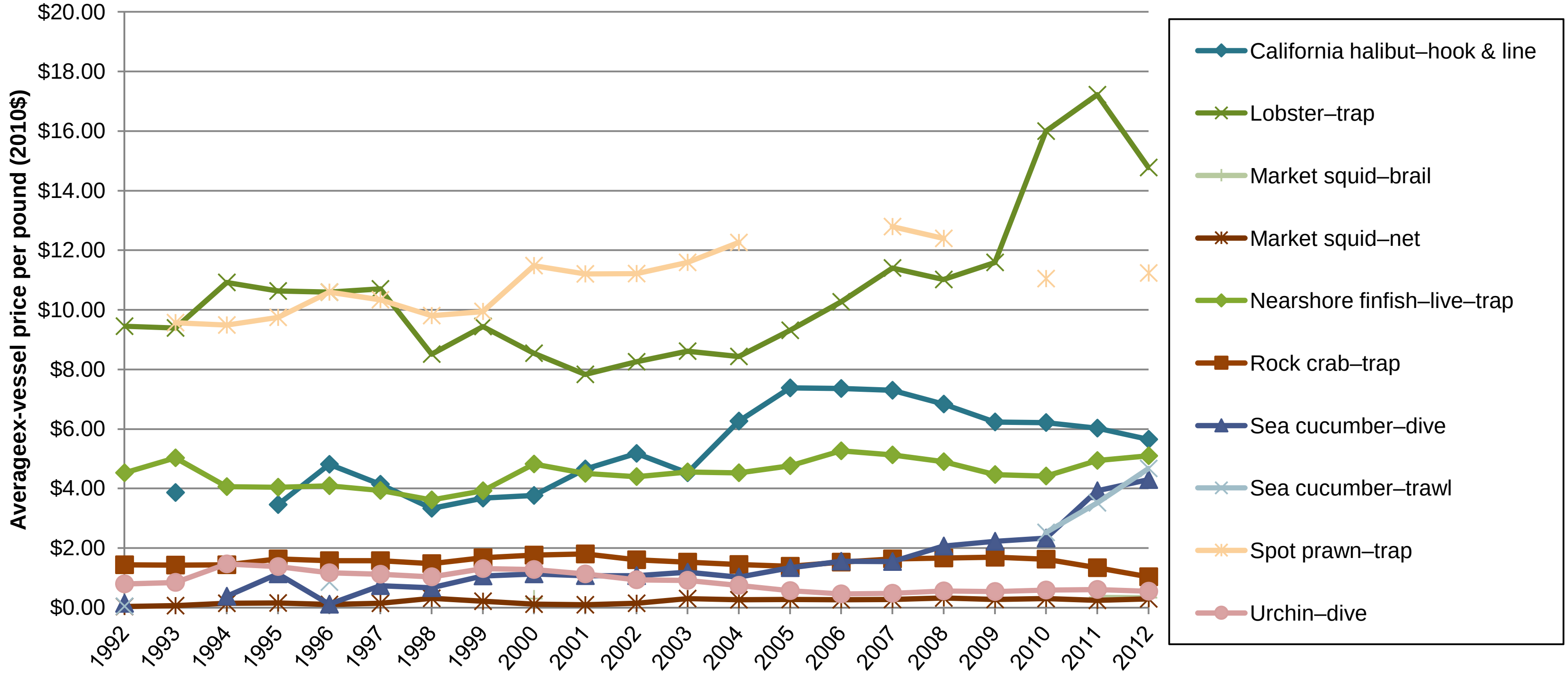
Source: Current study, based off landings data from CDFW.

Figure 175 displays the average ex-vessel prices over time for select fisheries of interest in Port Hueneme/Oxnard over the 1992–2012 study period. Similar to other South Coast ports, the trap fisheries of lobster and spot prawn maintained the highest average ex-vessel price per pounds over the study period, and the sea cucumber drive and trawl fisheries saw large average ex-vessel price increases from 1992 to 2012. Lobster–trap peaked in 2011 at $17.22 per pound, and sea cucumber ended 2012 at $4.30 for dive and $4.68 for trawl per pound on average in Port Hueneme/Oxnard. Rock crab–trap and urchin–dive saw small declines of 28 percent and 31.2 percent respectively from 1992 to 2012 average ex-vessel prices.

Figure 176 through Figure 197 display study period landings, ex-vessel revenue, and number of fishermen for select fisheries of interest in Port Hueneme/Oxnard, as well as averaged trends on the level of the individual fisherman.
Some notable summary trends include the following:

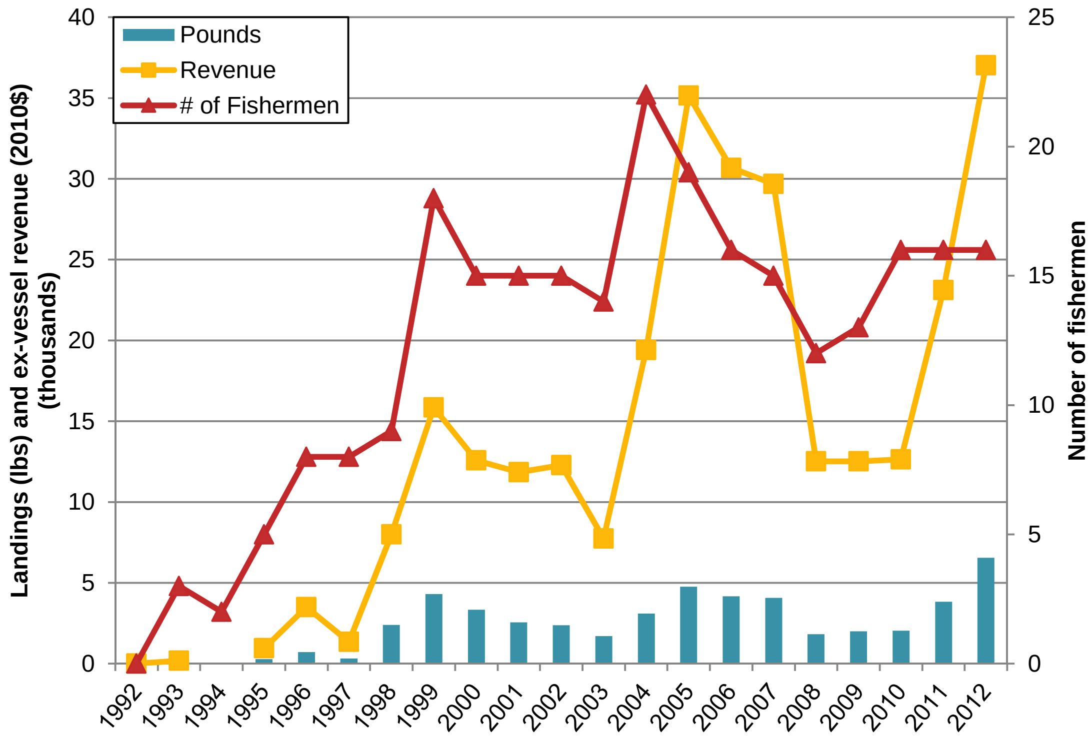
- Like most ports in the South Coast, Port Hueneme/Oxnard's California halibut–hook & line fishery saw considerable increases over the study period, peak years occurring in 2012 both overall and at the individual fishermen level.
- This port's coastal pelagics–net fishery saw initial increases into a sizeable amount of landings over 1997–2007, averaging 11.9 million pounds over that time, before dropping at the end of the study period to 2 million pounds landed in 2012.
- Lobster–trap fishermen in Port Hueneme/Oxnard landed on average 2.2 more pounds for 3.5 more in ex-vessel revenue from 1992 to 2012, bringing in a record total for the port of 67,361 pounds for just under $1 million by 2012.
- Nearshore finfish–live–hook & line fishery saw declines overall, which translated into sizeable increases at the average fisherman level by the end of the study period, there were four fishermen left in this fishery by 2012. The same is true for the nearshore finfish–live–trap fishery.
- Large increases of ex-vessel revenue in the spot prawn–trap fishery, and especially the sea cucumber–dive fishery - 63 times the amount made in 2012 ($338,718) than in 1992 ($5,377).

Figure 175. Average ex-vessel prices over time, select commercial fisheries of interest, Port Hueneme/Oxnard, 1992–2012



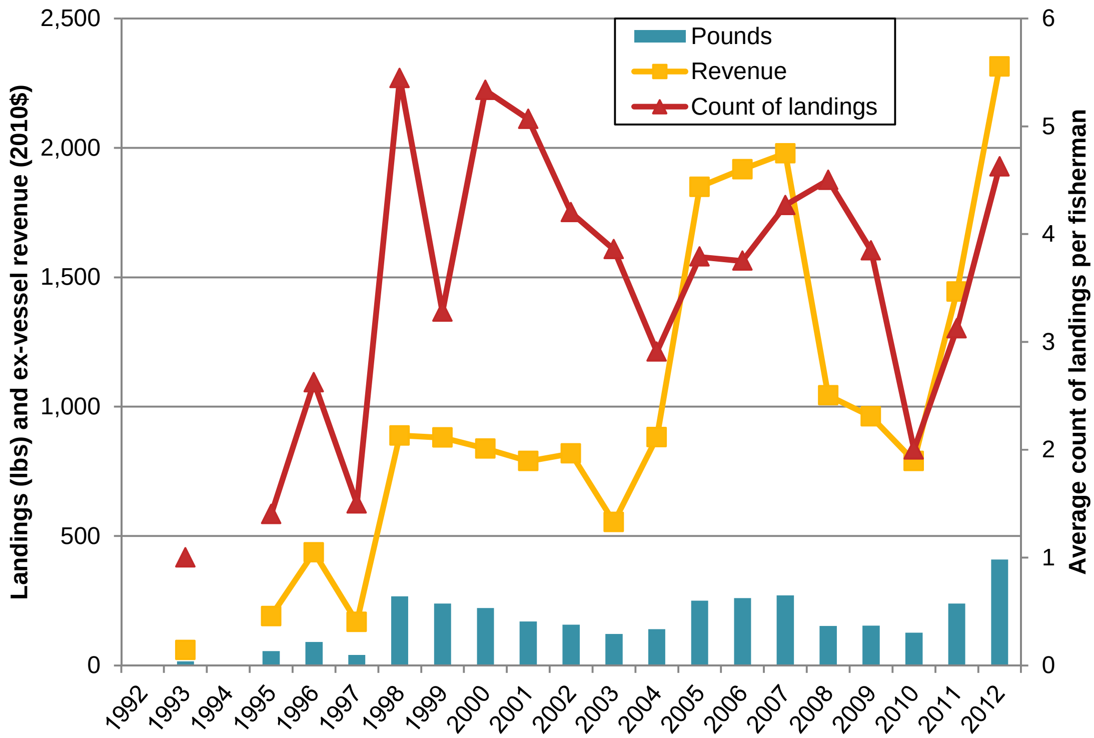
Source: Current study, based off landings data from CDFW.

Figure 176. California halibut–hook & line: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



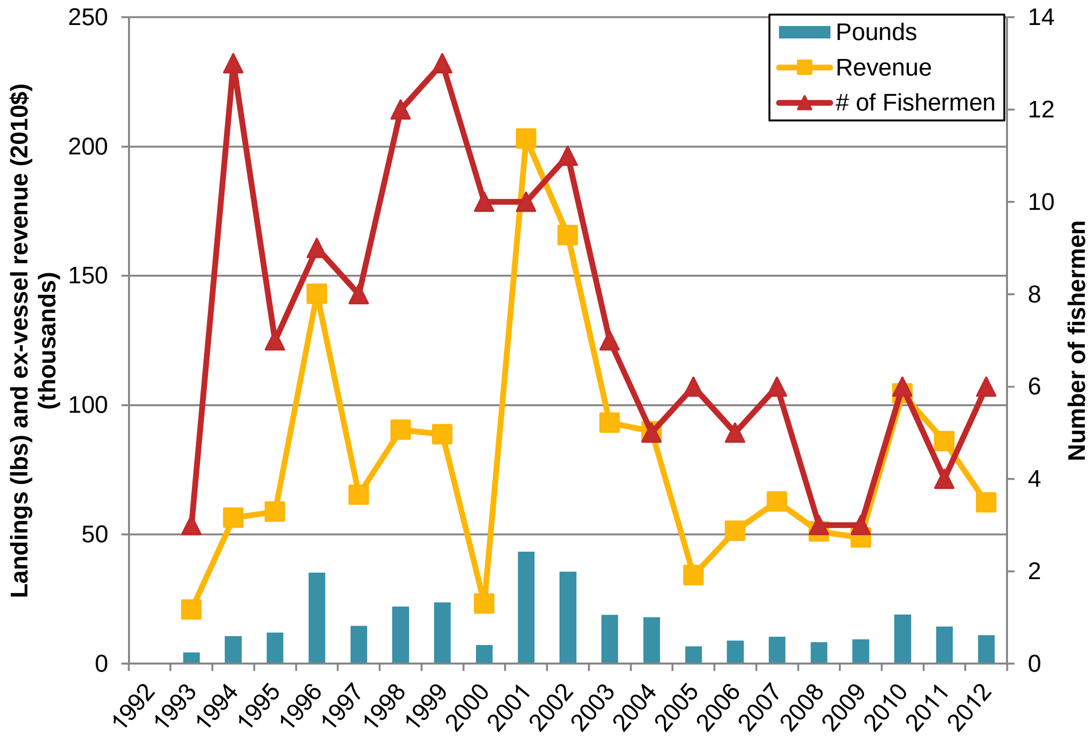
Source: Current study, based off landings data from CDFW.

Figure 177. California halibut–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



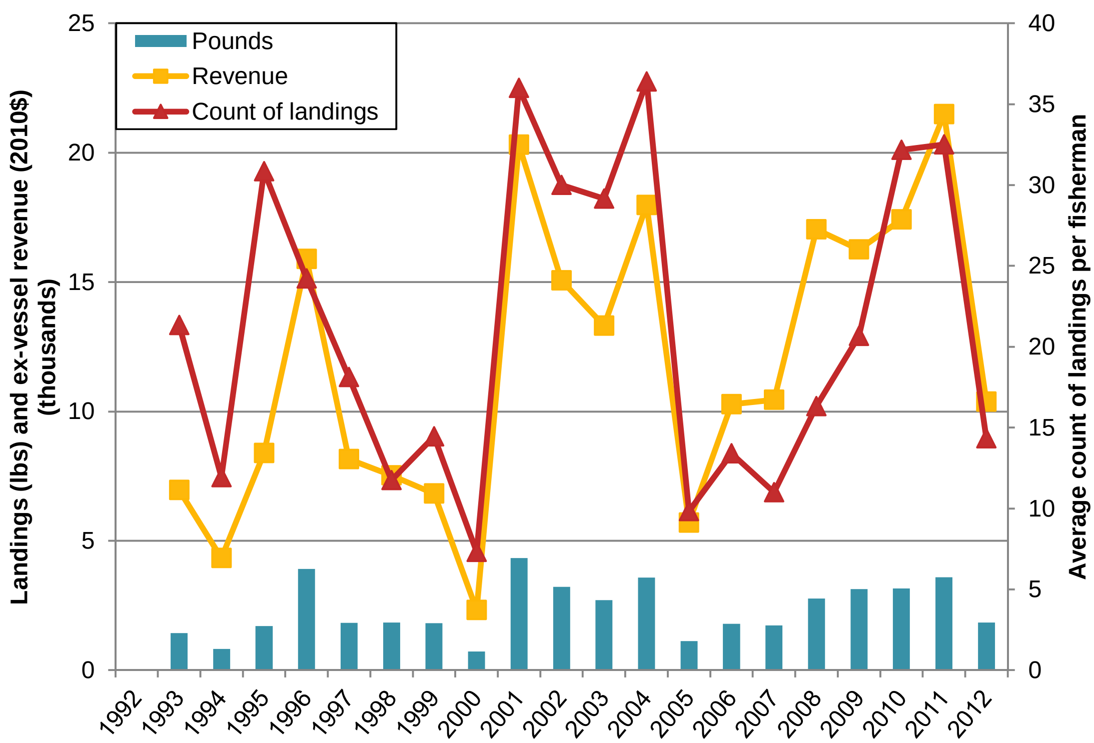
Source: Current study, based off landings data from CDFW.

Figure 178. California halibut–trawl: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



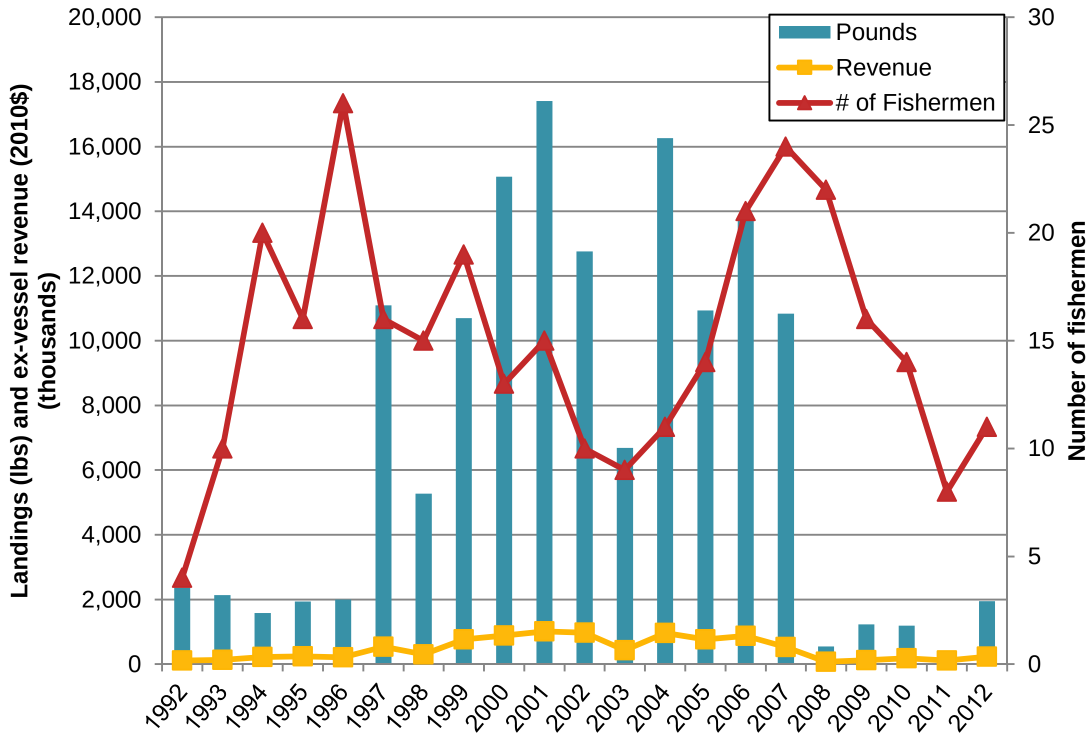
Source: Current study, based off landings data from CDFW.

Figure 179. California halibut–trawl: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



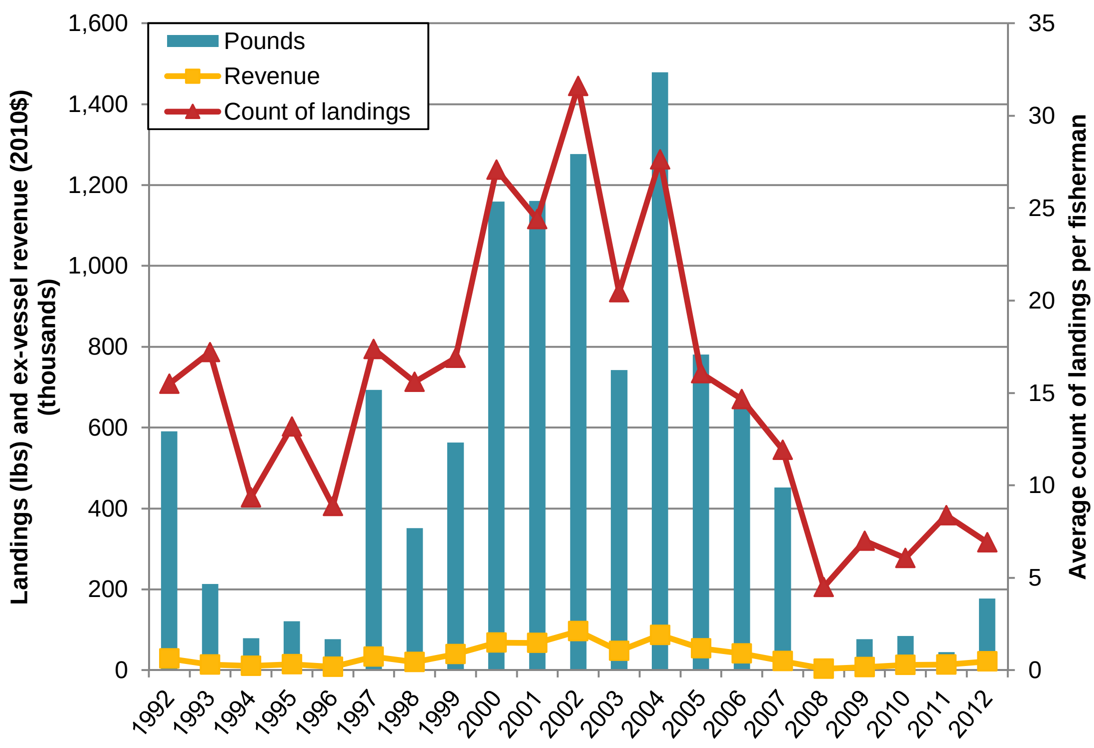
Source: Current study, based off landings data from CDFW.

Figure 180. Coastal pelagics–net: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



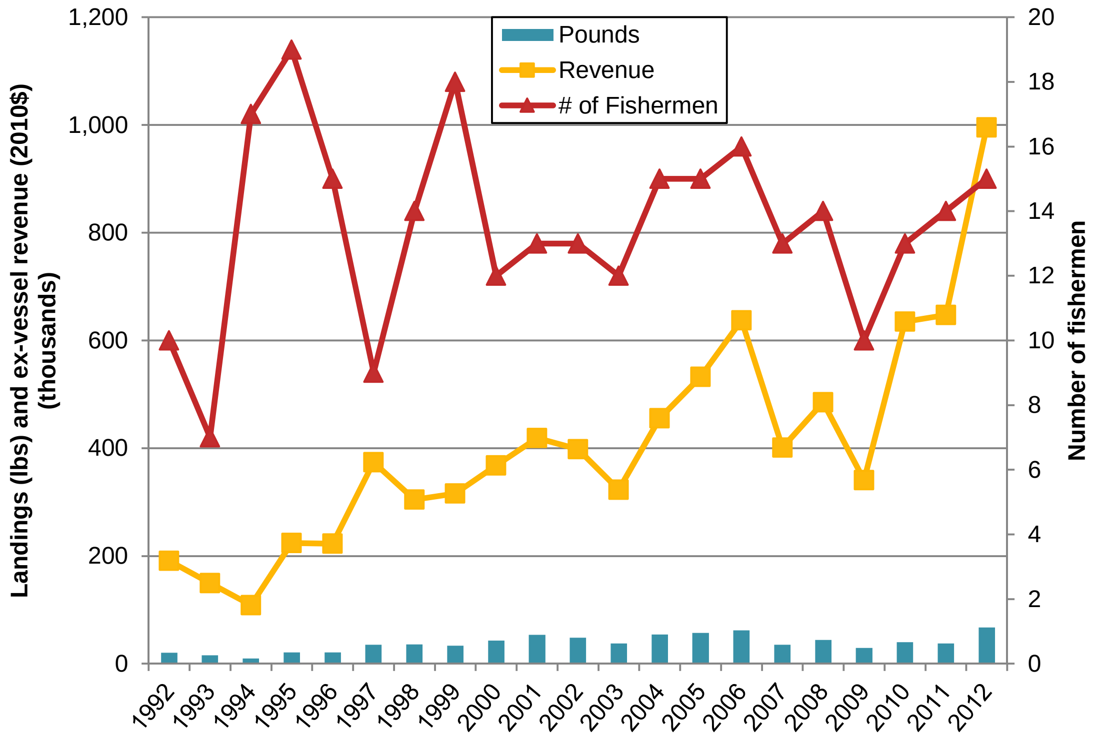
Source: Current study, based off landings data from CDFW.

Figure 181. Coastal pelagics–net: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



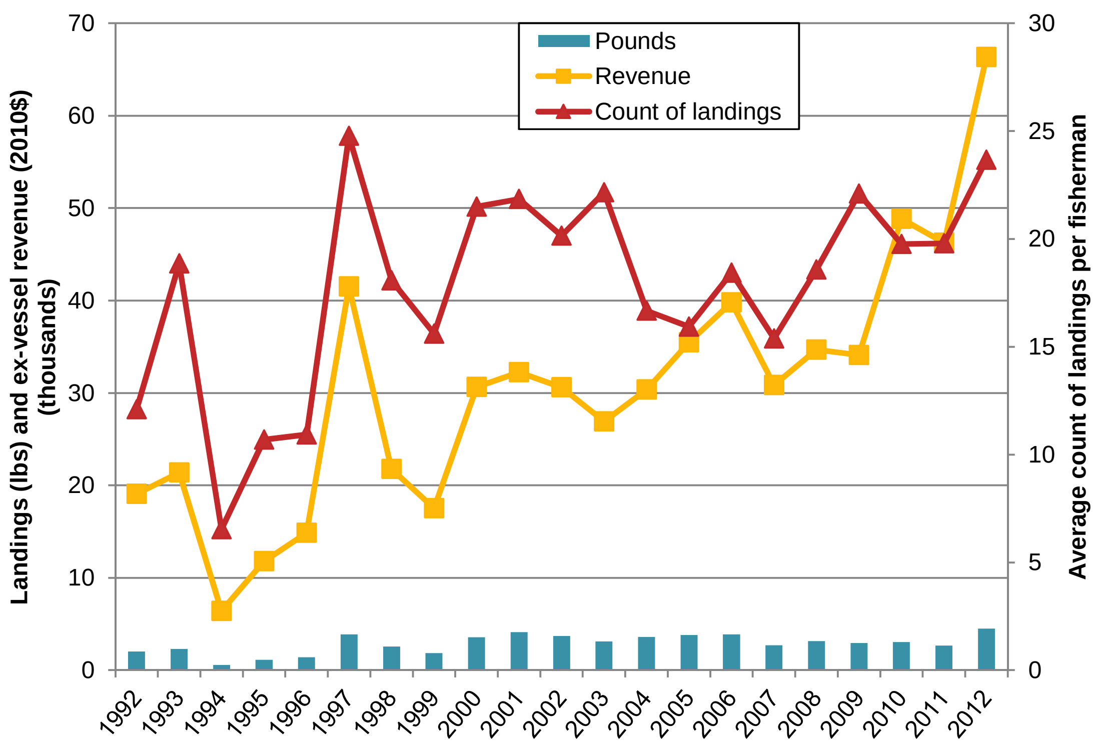
Source: Current study, based off landings data from CDFW.

Figure 182. Lobster–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



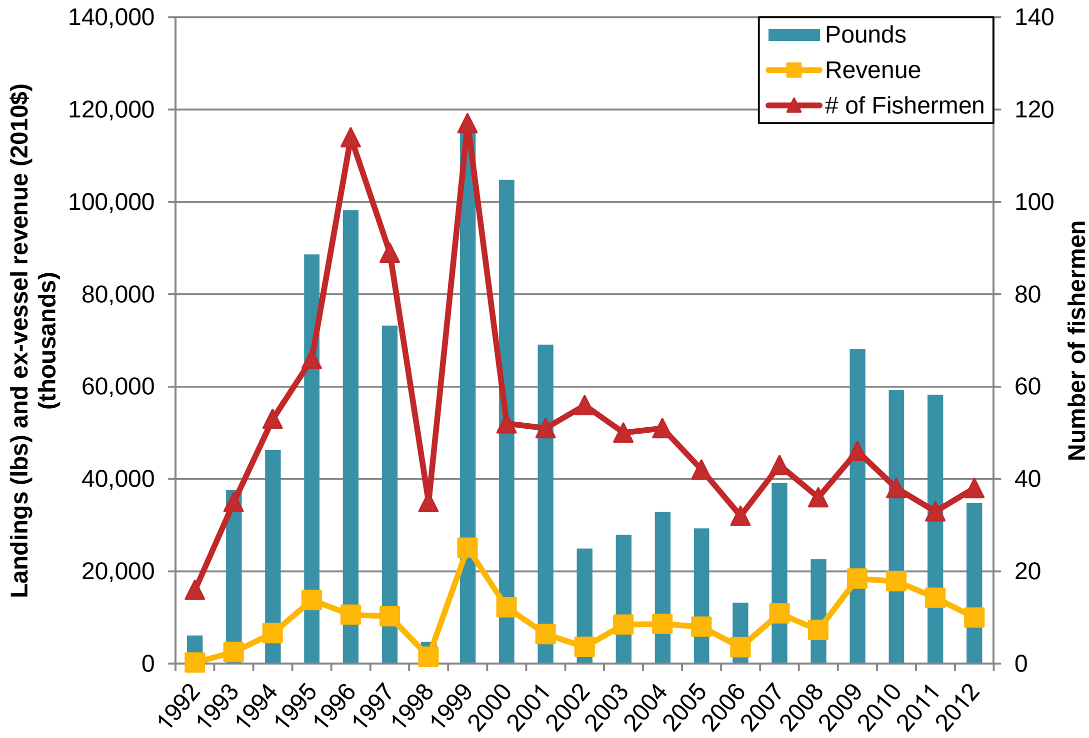
Source: Current study, based off landings data from CDFW.

Figure 183. Lobster–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



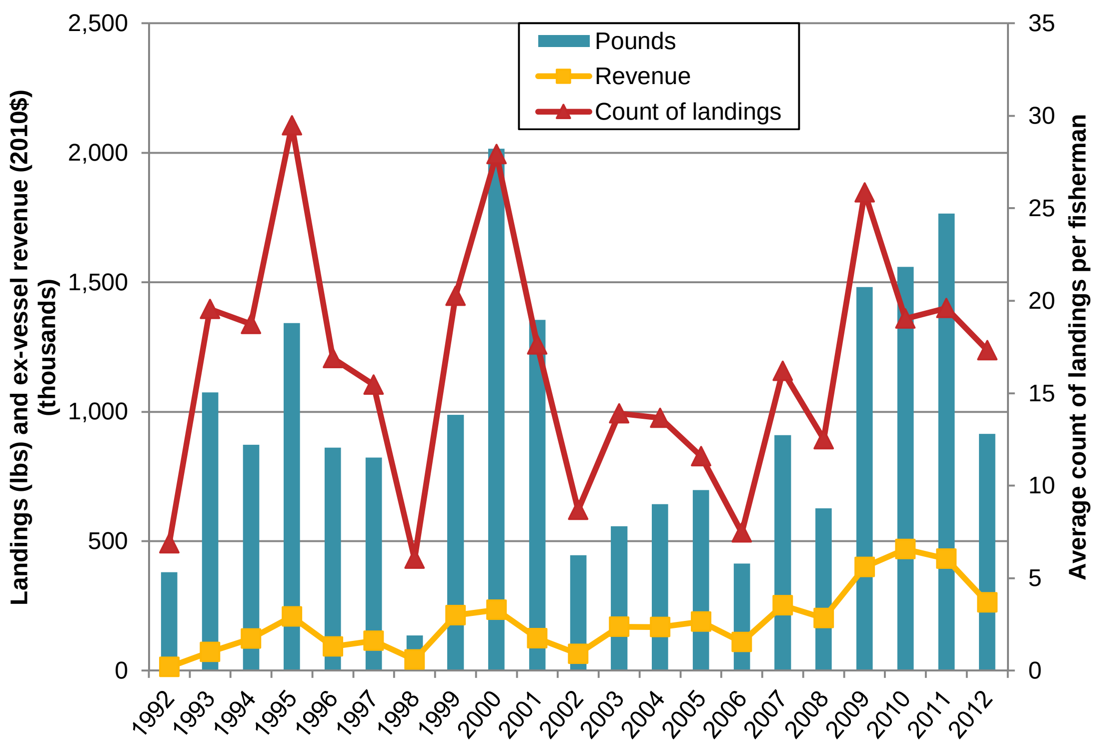
Source: Current study, based off landings data from CDFW.

Figure 184. Market squid–net: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



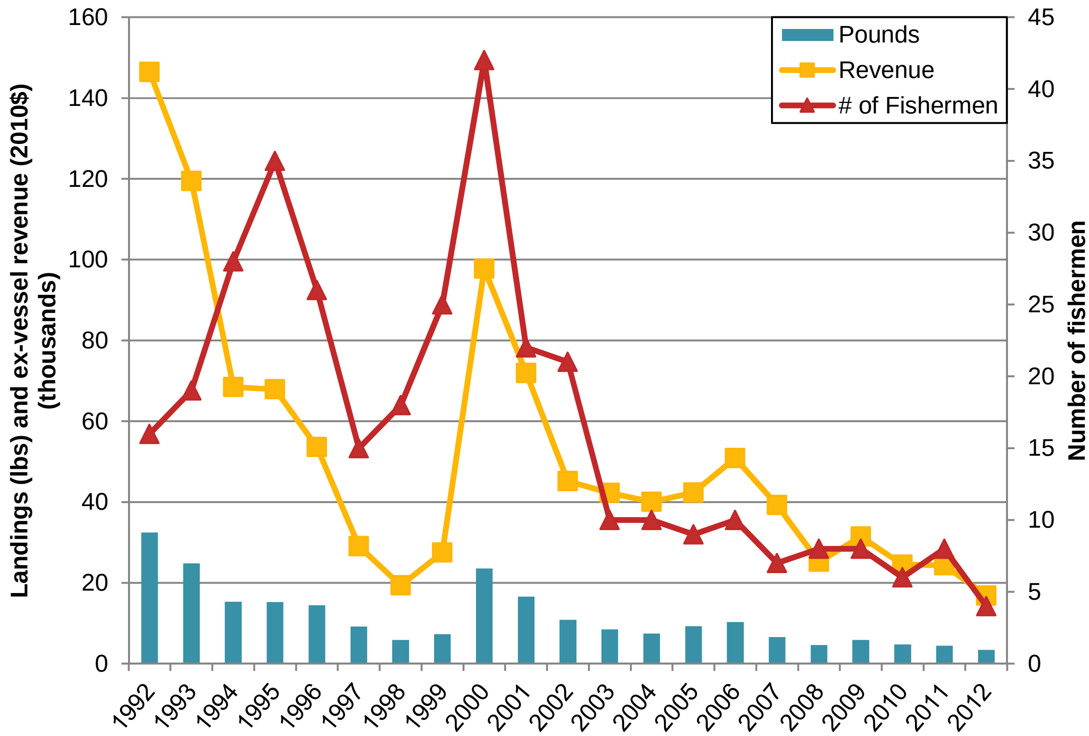
Source: Current study, based off landings data from CDFW.

Figure 185. Market squid–net: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



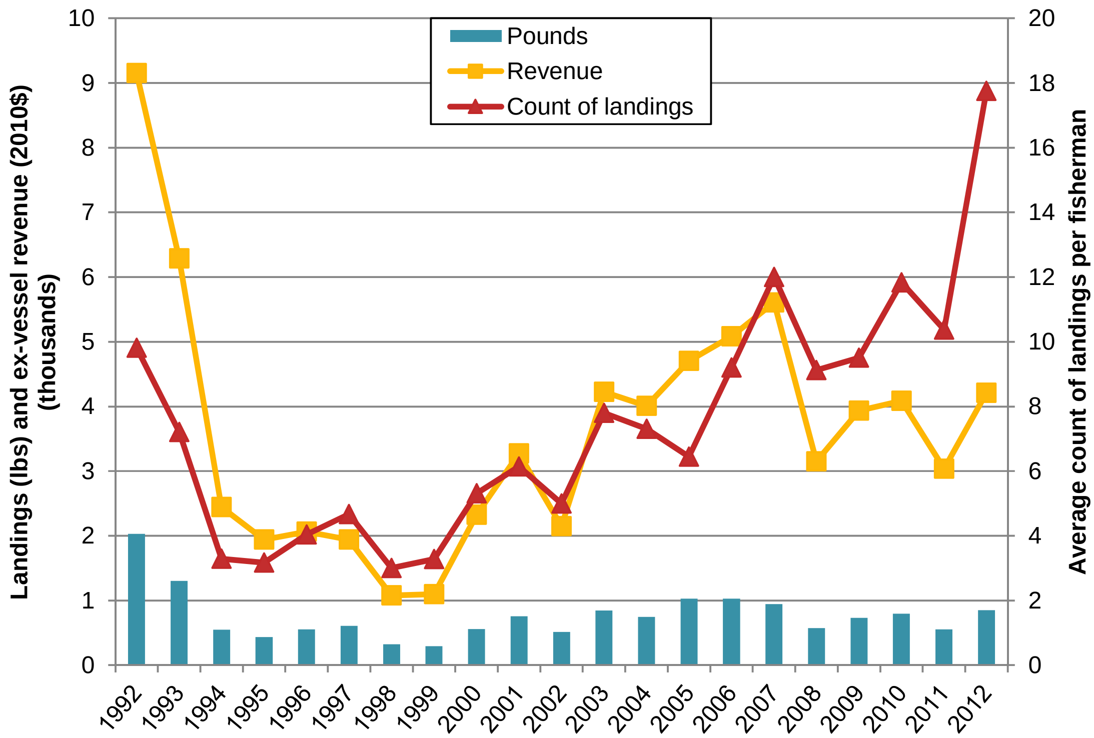
Source: Current study, based off landings data from CDFW.

Figure 186. Nearshore finfish–live–hook & line: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



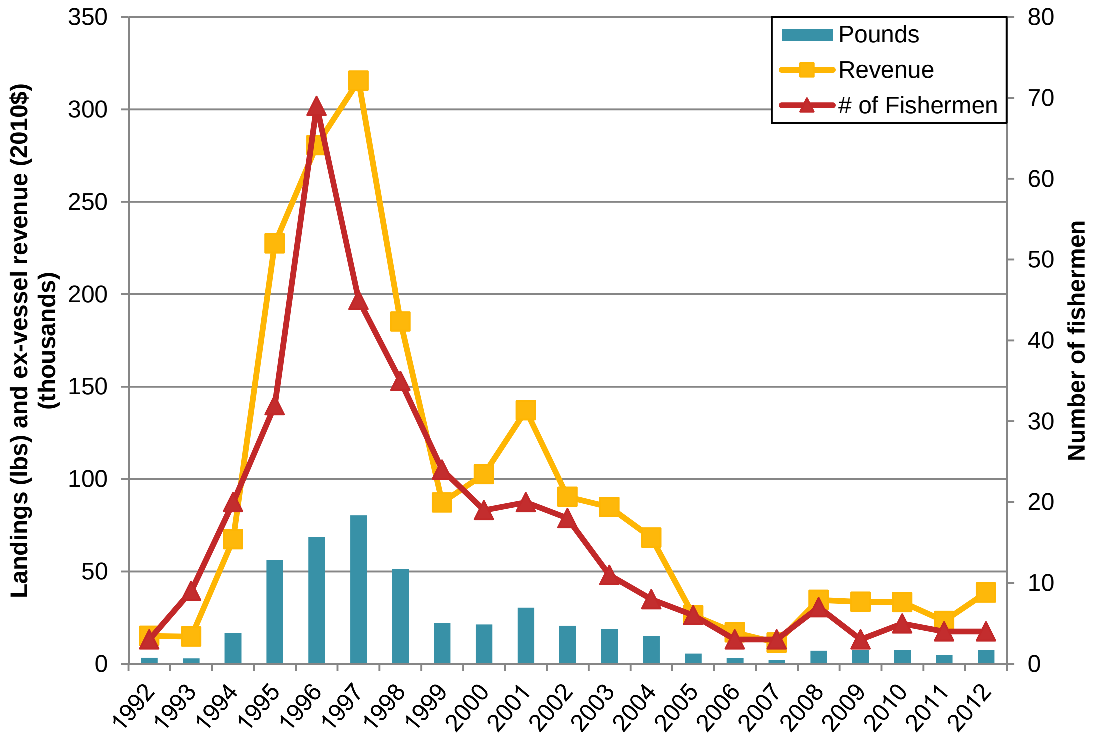
Source: Current study, based off landings data from CDFW.

Figure 187. Nearshore finfish–live–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



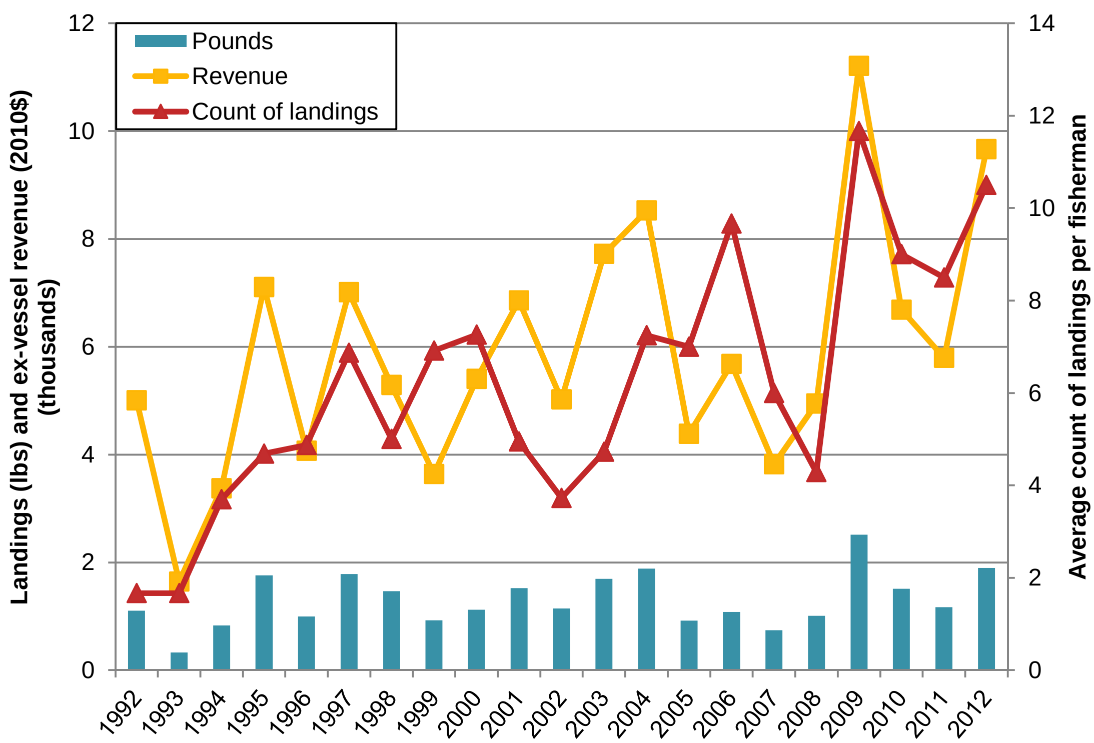
Source: Current study, based off landings data from CDFW.

Figure 188. Nearshore finfish–live–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



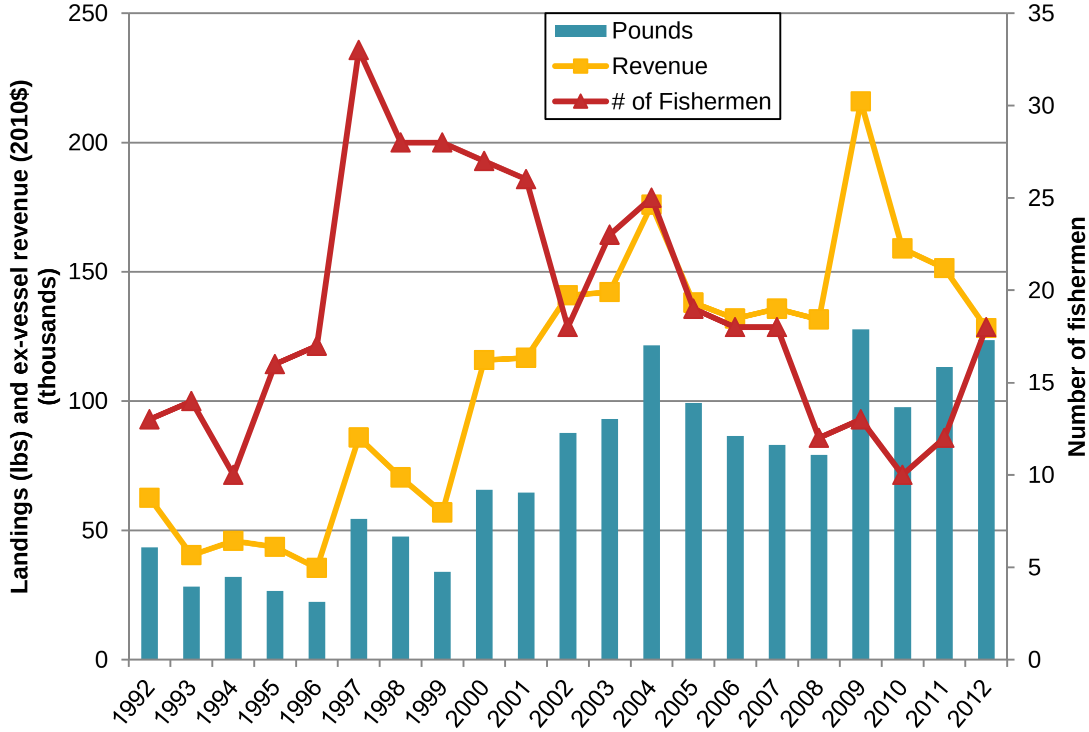
Source: Current study, based off landings data from CDFW.

Figure 189. Nearshore finfish–live–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



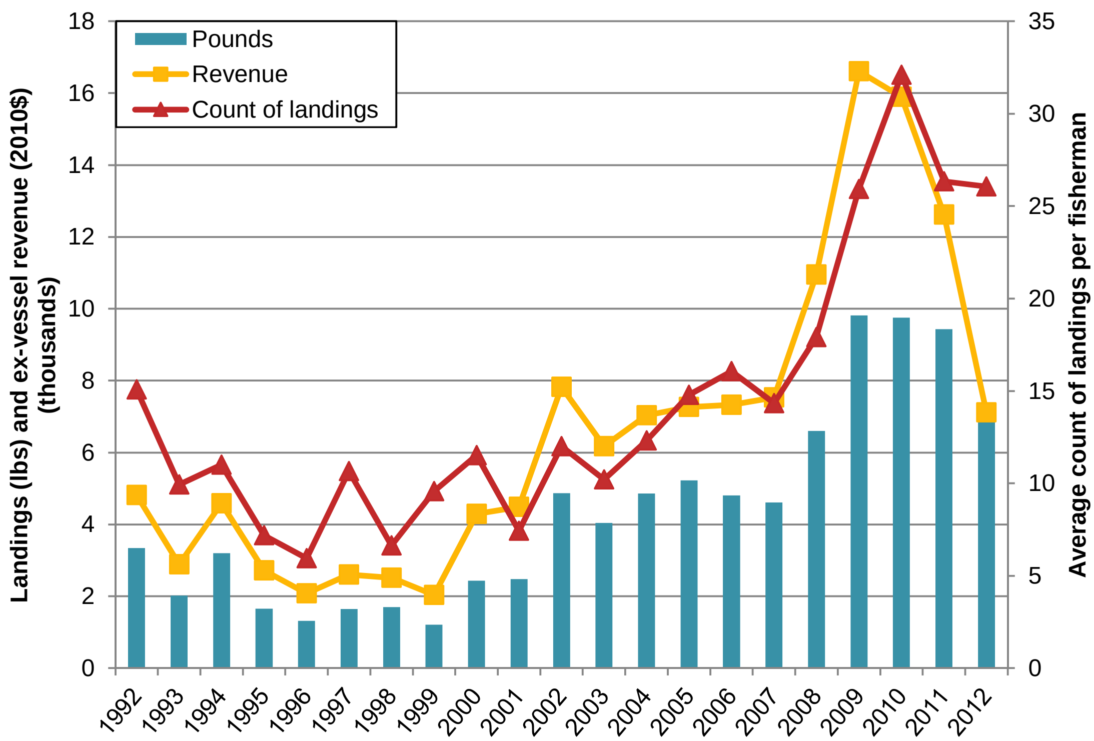
Source: Current study, based off landings data from CDFW.

Figure 190. Rock crab–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



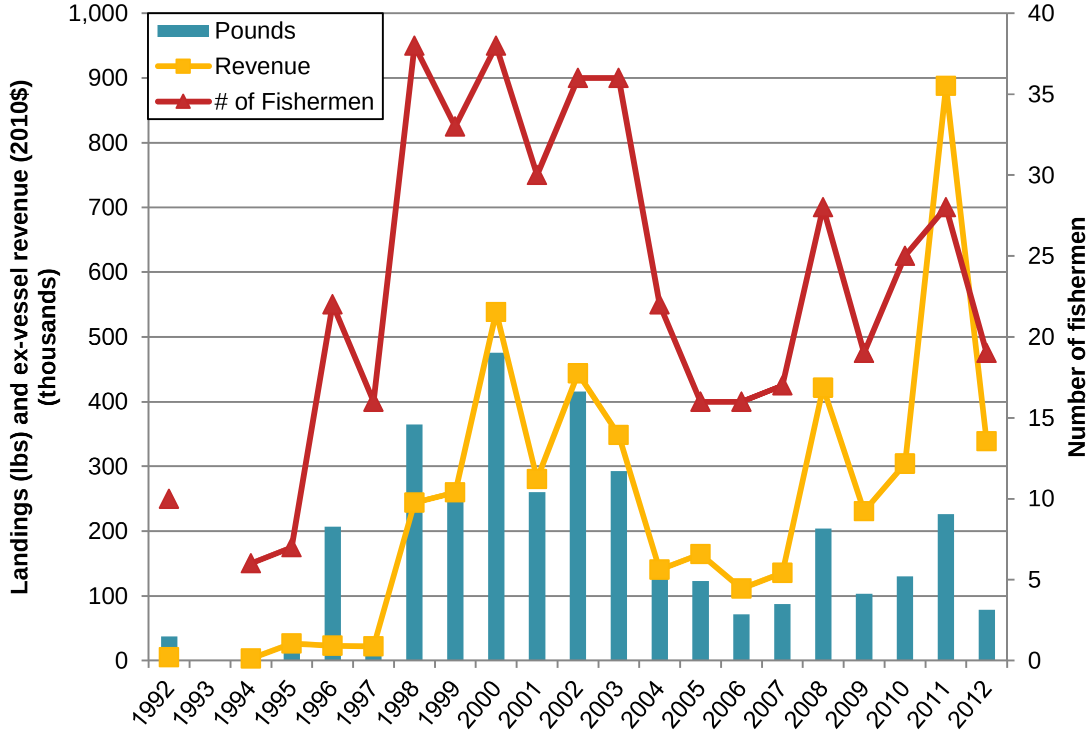
Source: Current study, based off landings data from CDFW.

Figure 191. Rock crab–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



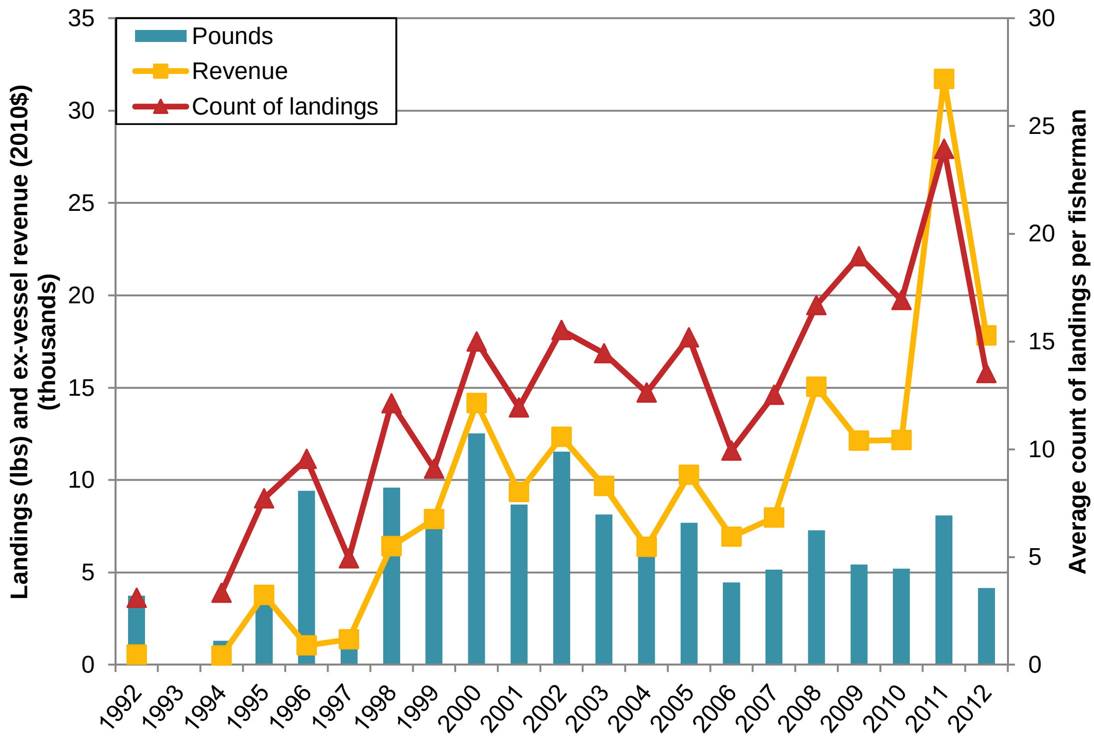
Source: Current study, based off landings data from CDFW.

Figure 192. Sea cucumber–dive: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



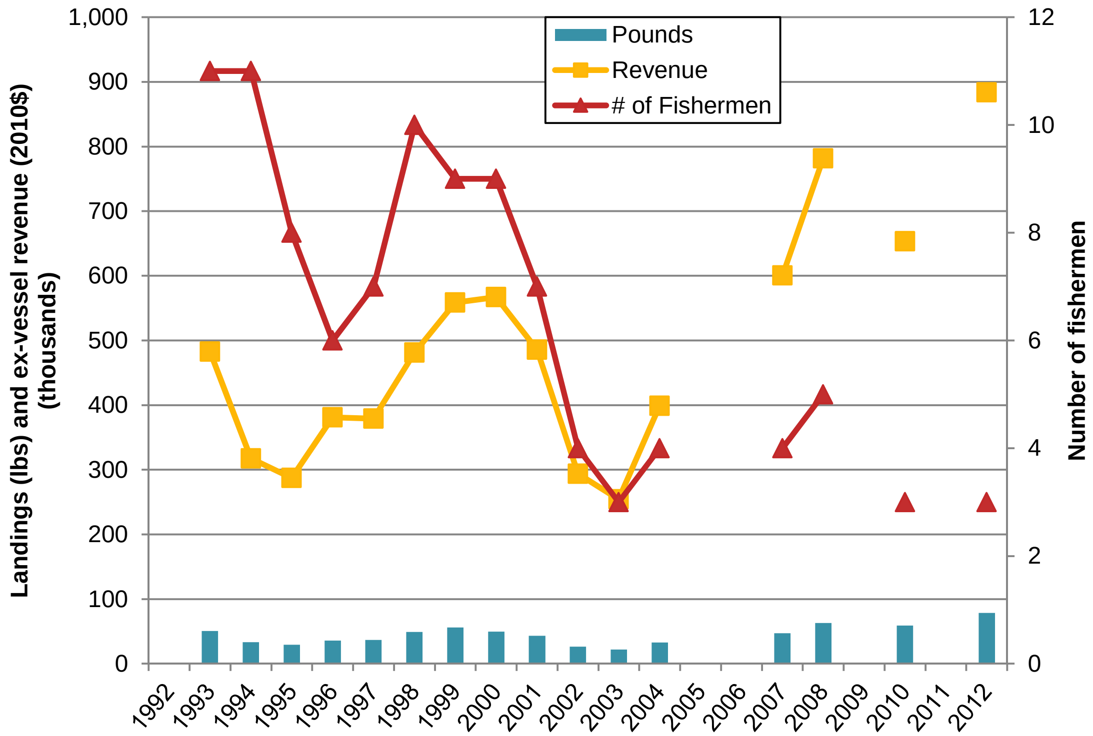
Source: Current study, based off landings data from CDFW.

Figure 193. Sea cucumber–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



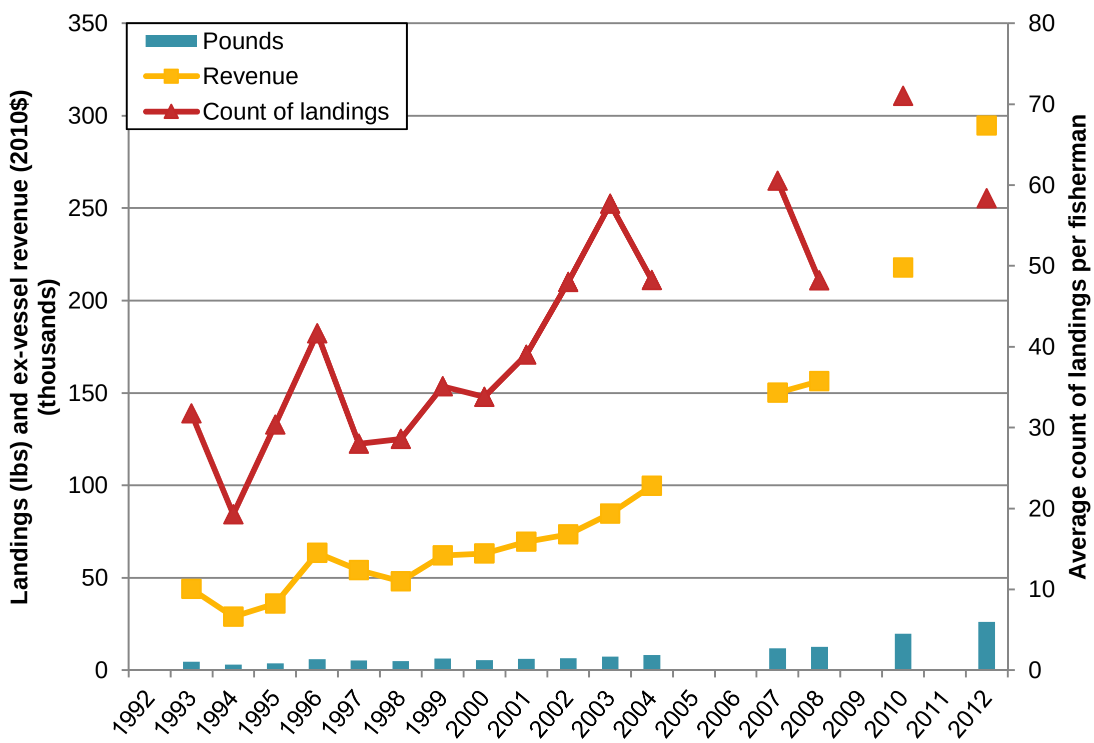
Source: Current study, based off landings data from CDFW.

Figure 194. Spot prawn–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



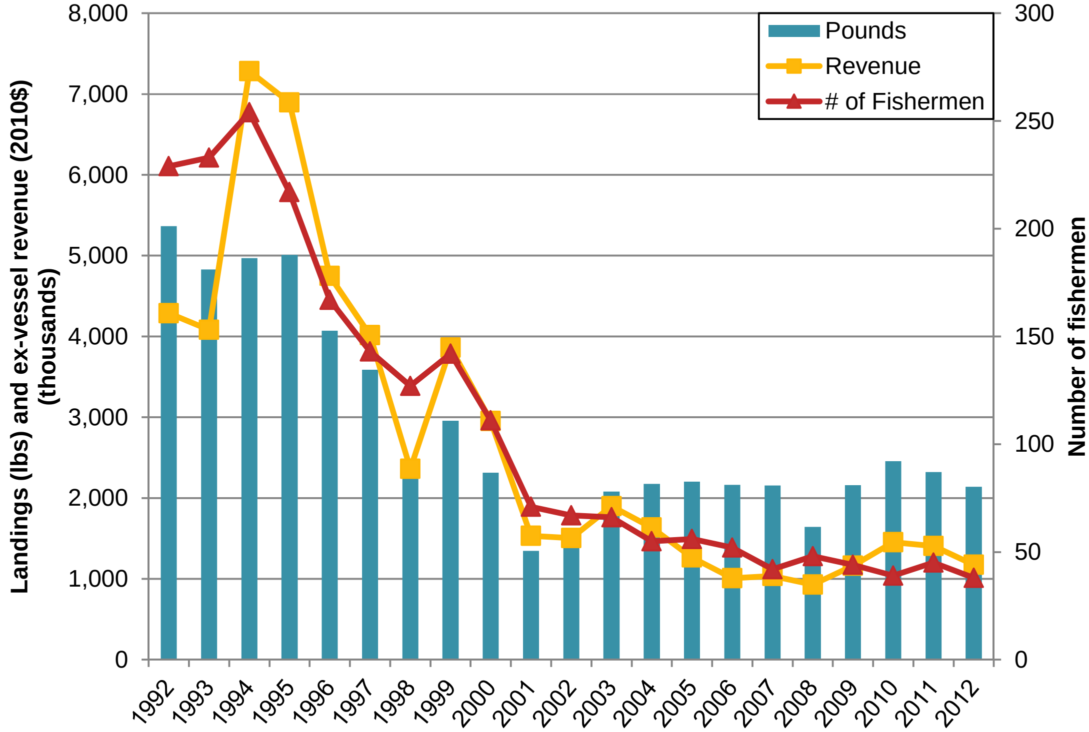
Source: Current study, based off landings data from CDFW.

Figure 195. Spot prawn–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



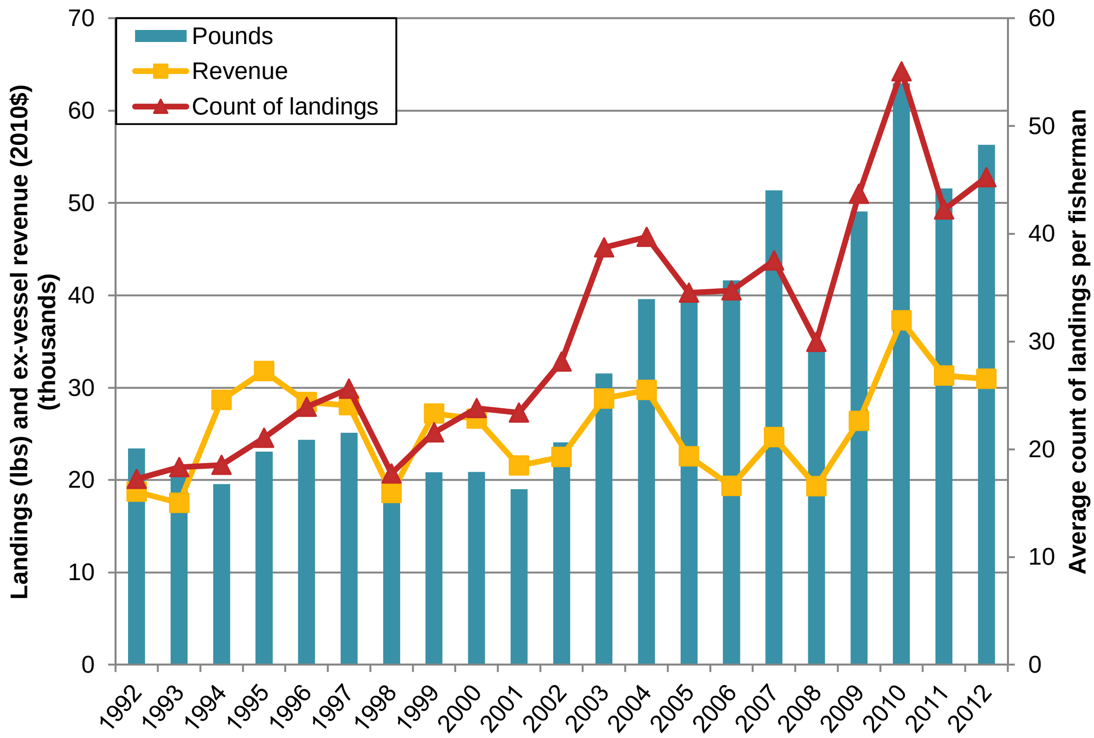
Source: Current study, based off landings data from CDFW.

Figure 196. Urchin–dive: Commercial landings, ex-vessel revenue, and number of fishermen, Port Hueneme/Oxnard, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 197. Urchin–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Port Hueneme/Oxnard, 1992–2012



Source: Current study, based off landings data from CDFW.

4.3.2. Port Hueneme/Oxnard Commercial Baseline Characterization

In 2012, 136 individuals made landings in one or more of the target interview fisheries in Port Hueneme/Oxnard. Combined, they generated $13,957,033 in ex-vessel revenue, which is 17 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the landings came from the market squid—net fishery (71.6 percent). We interviewed 10 fishermen from Port Hueneme/Oxnard (Table 234).

Table 234. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Port Hueneme/ Oxnard

Fishery	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
California halibut–hook & line	$37,020	16	—
California halibut–trawl	$62,280	6	—
Coastal pelagics–net	$235,745	11	1
Lobster–trap	$995,264	15	2
Market squid–brail	$35,007	5	—
Market squid–net	$10,005,565	38	2
Nearshore finfish live–fixed gear	$55,492	7	1
Rock crab–trap	$128,150	18	2
Sea cucumber–dive	$338,718	19	4
Sea cucumber–trawl	$4,458	3	—
Spot prawn–trap	$883,643	3	—
Urchin–dive	$1,175,691	38	6
Unique individuals	$13,957,033	136	10

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The average Port Hueneme/Oxnard fisherman that we interviewed was 53.5 years old and had an average of 32.3 years of experience as a commercial fisherman (Table 235). It should be noted that this question inquired about the number of years of experience an individual had commercial fishing as a whole, not the number of years of experience they had in a specific fishery. Additionally, Port Hueneme/Oxnard fishermen on average made 92.3 percent of their total personal income from commercial fishing in 2012, an average decrease of 1.3 percent since 2008. Despite the decrease, Port Hueneme/Oxnard fishermen remained above the regional average for percent income from commercial fishing for 2012. It should be noted that 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust. As shown in Table 236, all fisheries displayed or calculated experienced a decrease in average percent income from 2008 to 2012.

Table 235. Average age and years of experience commercial fishing in 2012, Port Hueneme/ Oxnard

	Age			Years of experience		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	1	*	*
Lobster–trap	2	*	*	2	*	*
Market squid–brail	—	*	*	—	*	*
Market squid–net	2	*	*	2	*	*
Nearshore finfish live–fixed gear	1	*	*	1	*	*
Rock crab–trap	2	*	*	2	*	*
Sea cucumber–dive	4	54.8	11.9	4	30.8	8.7
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	6	54.3	9.4	6	29.8	7.1
All target fisheries (unique individuals)	10	53.5	12.8	10	32.3	13.6

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 236. Percent change in income from overall commercial fishing from 2008 - 2012, Port Hueneme/ Oxnard

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	1	*	*	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	3	100.0%	0.0%	1	*	*	*
Lobster–trap	3	100.0%	0.0%	2	*	*	*
Market squid–brail	1	*	*	—	—	—	—
Market squid–net	2	*	*	2	*	*	*
Nearshore finfish live–fixed gear	3	98.3%	2.9%	1	*	*	*
Rock crab–trap	1	*	*	2	*	*	*
Sea cucumber–dive	5	89.0%	12.9%	4	83.3%	33.5%	-6.5%
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	—	—	—	—
Urchin–dive	10	94.5%	10.4%	6	88.0%	27.0%	-6.9%
All target fisheries (unique individuals)	20	93.5%	17.9%	10	92.3%	20.9%	-1.3%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher. As shown below in Table 237, the majority of respondents in all fisheries perceived no change. A quarter of the respondents in the sea cucumber—dive fishery reported a significantly lower change in personal income from commercial fishing between 2008 and 2012.

Table 237. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Port Hueneme/ Oxnard

		Percent response				
Fisheries	Number responding	Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	*	*	*
Lobster–trap	2	*	*	*	*	*
Market squid–brail	—	—	—	—	—	—
Market squid–net	2	*	*	*	*	*
Nearshore finfish live–fixed gear	1	*	*	*	*	*
Rock crab–trap	2	*	*	*	*	*
Sea cucumber–dive	4	—	—	75.0%	—	25.0%
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	6	—	16.7%	66.7%	—	16.7%
All fisheries (unique individuals)	10	—	10.0%	80.0%	—	10.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their income coming from commercial fishing. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Table 238 lists the reason for the change as well as the number for each fishery. The one respondent from the sea cucumber—dive fishery indicated that the perceived decrease in personal income was due to personal reasons and more revenue from other income sources.

Table 238. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Port Hueneme/Oxnard

Fishery	Number of individuals responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	1	—	—	—	—	—	—	—	—	—	1	—	1	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	2	1	—	—	—	1	1	—	—	—	1	—	1	—	—
All fisheries (unique individuals)	2	1	—	—	—	1	1	—	—	—	1	—	1	—	—

Source: Current study
— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

In interviews, fishermen were asked what percent of their gross economic revenue (GER) went towards their overall commercial fishing operating costs. In Table 239 below, we compare the average responses that were given in a 2008 study conducted by Point 97/Ecotrust (Scholz et al. 2010) to that gathered in this study (2012). As noted previously the responses given in the 2008 study were based on fishermen's cumulative fishing experience—not necessarily specific to the year they were interviewed. Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years. Overall, Port Hueneme/Oxnard fishermen reported that in 2012 on average 33.3 percent of their gross economic revenue was spent on operating costs, which is 45 percent less than the number reported in 2008, and 11.5 percent less than the South Coast regional average. Again we emphasize that this question is asked about overall commercial fishing operating costs across all fisheries for a particular fisherman.

Table 239. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Port Hueneme/ Oxnard

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	1	*	*	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	3	58.3%	29.3%	1	*	*	*
Lobster–trap	2	57.5%	3.5%	2	*	*	*
Market squid–brail	1	*	*	—	—	—	—
Market squid–net	2	*	*	2	*	*	*
Nearshore finfish live–fixed gear	3	66.7%	11.5%	1	—	—	—
Rock crab–trap	1	*	*	2	*	*	*
Sea cucumber–dive	4	71.3%	15.5%	4	34.3%	25.0%	-51.8%
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	—	—	—	—
Urchin–dive	8	61.1%	24.4%	6	33.3%	20.5%	-45.6%
All target fisheries (unique individuals)	17	60.5%	20.1%	10	33.3%	16.0%	-45.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 240. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Port Hueneme/ Oxnard

Fisheries	Number responding	Percent response				
		Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	*	*	*
Lobster–trap	2	*	*	*	*	*
Market squid–brail	—	—	—	—	—	—
Market squid–net	2	*	*	*	*	*
Nearshore finfish live–fixed gear	1	*	*	*	*	*
Rock crab–trap	2	*	*	*	*	*
Sea cucumber–dive	4	50.0%	—	25.0%	—	25.0%
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	5	40.0%	—	20.0%	—	40.0%
All fisheries (unique individuals)	9	44.4%	22.2%	11.1%	—	22.2%

Source: Current study

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Despite the overall reported decrease between 2008 and 2012, 44.4 percent of respondents overall perceived a significantly higher increase in expenses, as shown above in Table 240. In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their gross economic revenue going towards operating costs. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Similar to the region, in Port Hueneme/Oxnard, the most frequently reported reason for increasing operating costs was the increased cost of fuel, followed by general increases in costs of goods and labor (Table 241).

Table 241. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Port Hueneme/ Oxnard

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lobster–trap	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–dive	3	2	—	1	1	—	—	—	1	—	—	—	—	—	—	1	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	4	2	—	1	1	—	—	—	1	—	—	—	—	—	—	2	—	—
All fisheries (unique individuals)	8	6	—	2	5	—	—	—	1	—	—	—	—	—	—	2	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point
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Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

We asked fishermen how many years of experience and how many days they spent targeting each of the fisheries in which they participated. As indicated in Table 242, urchin—dive fishermen have been fishing the longest, on average 27.7years, and spent the most days targeting the fishery in 2012, 107.5 days. Fishermen in the sea cucumber—dive fishery had an average of 19.3 years of experience, and 83.5 days targeting the fishery in 2012.

Table 242. Years of experience and number of days targeting specific fisheries in 2012, Port Hueneme/ Oxnard

	Years of experience in fishery			Number of days targeting fishery in 2012		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	1	*	*
Lobster–trap	2	*	*	2	*	*
Market squid–brail	—	—	—	—	—	—
Market squid–net	2	*	*	2	*	*
Nearshore finfish live–fixed gear	1	*	*	1	*	*
Rock crab–trap	2	*	*	2	*	*
Sea cucumber–dive	4	19.3	10.1	4	83.5	51.7
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	6	27.7	9.5	6	107.5	51.0

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were also asked how many crew they used for each fishery and what percent of their gross economic revenue was spent on their crew. Port Hueneme/Oxnard respondents in both the sea cucumber—dive and urchin—dive fisheries reported using an average of two crew members (Table 243). The urchin—dive fishery reported the highest percent of gross economic revenue spent on crew, 15.8 percent, and the highest average percent of gross economic revenue spent on fuel 23.6 percent.

Table 243. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Port Hueneme/Oxnard

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
California halibut–hook & line	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	1	*	*	1	*	*
Lobster–trap	2	*	*	2	*	*	2	*	*
Market squid–brail	—	—	—	—	—	—	—	—	—
Market squid–net	2	*	*	2	*	*	2	*	*
Nearshore finfish live–fixed gear	1	*	*	1	*	*	1	*	*
Rock crab–trap	2	*	*	2	*	*	2	*	*
Sea cucumber–dive	4	2	2	4	5.0%	5.8%	4	23.3%	7.7%
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—
Urchin–dive	6	2	1	6	15.8%	24.6%	6	23.6%	6.7%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were asked separately for each fishery they participated in to compare his/her success in the fishery in 2012 to that of the last ten years. As shown in Table 244 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishery. This question was asked as an open ended question and responses were later coded and categorized into positive and negative environmental factors (Table 245), economic factors (Table 246), regulatory factors (Table 247), and other factors (Table 248).

In the sea cucumber—dive fishery the majority of respondents indicated the fishery was significantly worse (50 percent) in 2012 compared to the last ten years. The primary negative influences where lack of available product (Table 245), bad prices (Table 246), and MPAs or other closures (Table 247). The urchin—dive fishery had more variety of responses, with a majority indicating that their success was significantly better (16.7 percent), somewhat better (33.3 percent), or the same (33.3 percent). One positive factor in both sea cucumber—dive and urchin—dive fisheries mentioned was the high ex-vessel price (Table 246).

Table 244. Overall success in specific commercial fishery, 2012 compared to previous ten years, Port Hueneme/Oxnard

Fisheries	Number responding	Percent response: Did not participate in previous seasons	Significantly better	Somewhat better	The same	Somewhat worse	Significantly worse
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	1	*	*	*	*	*	*
Lobster–trap	2	*	*	*	*	*	*
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	2	*	*	*	*	*	*
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*
Rock crab–trap	2	*	*	*	*	*	*
Sea cucumber–dive	4	—	25.0%	—	25.0%	—	50.0%
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—
Urchin–dive	6	—	16.7%	33.3%	33.3%	16.7%	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 245. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Port Hueneme/Oxnard

		Positive					Negative				
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	2	*	*	*	*	*	*	*	*	*	*
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	2	*	*	*	*	*	*	*	*	*	*
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	1	—	—	—	—	—	1	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 246. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Port Hueneme/Oxnard

		Positive			Negative			
Fishery	Number responding	A	B	C	D	E	F	G
California halibut–hook & line	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—
Lobster–trap	—	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—
Market squid–net	1	*	*	*	*	*	*	*
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—
Sea cucumber–dive	2	1	—	—	1	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—
Urchin–dive	3	2	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 247. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Port Hueneme/Oxnard

		Negative					
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	1	*	*	*	*	*	—
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*
Rock crab–trap	—	—	—	—	—	—	—
Sea cucumber–dive	2	—	—	2	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—
Urchin–dive	1	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. lack of management
	F. Quota met early

Table 248. Other changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Port Hueneme/Oxnard

		Positive						Negative						
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	2	*	*	*	*	*	*	*	*	*	*	*	*	*
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	1	—	—	—	—	—	—	—	—	1	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	3	—	1	—	1	1	1	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

4.4. San Pedro/Los Angeles

The city of Los Angeles is the 2nd largest city in the United States and is located 121 miles north of San Diego and 368 miles South of San Francisco. According to the 2010 Census, the population of Los Angeles was 3.8 million with a median age of 34.1 years. The estimated per capita income (2007-2011) was $28,222 with a mean household income of $77,982 (US Census Bureau 2010).

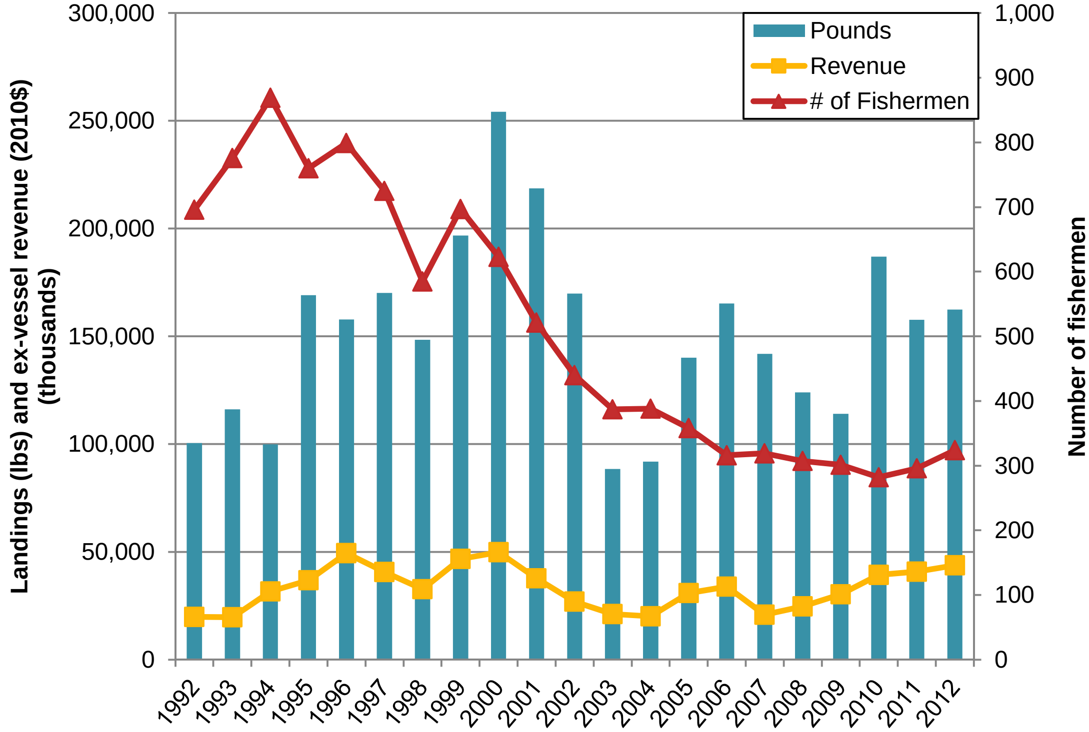
Los Angeles Harbor is ranked as the busiest port in the United States and the fifth busiest in the world. The majority of the commercial fishing industry is located at San Pedro Harbor and Fish Harbor on Terminal Island (Norman et al. 2007). In a 2002 study by Pomeroy et al., San Pedro Harbor is noted as having a fish market, five receiver/processors, loading docks, cold storage, a fuel dock, boat yards, marine repair facilities, and chandleries. At the time, Fish Harbor is noted to have at least two receiver/processors and a boatyard. In the larger Los Angeles area the wetfish fleet is primarily located at San Pedro Harbor, which is equipped to receive up to 300 tons of wetfish per day (Pomeroy et al. 2002).

4.4.1. San Pedro/Los Angeles Commercial Fisheries Initial Changes

Over 1992–2012, San Pedro was the most significant port in the study region in terms of the largest contribution to total landings and ex-vessel revenue from all fisheries, bringing in an average of 61.3 percent of South Coast landings and 43.9 percent of regional ex-vessel revenue annually. Peak landings and ex-vessel revenue were achieved in 2000 at 254.2 million pounds and $49.9 million, see Figure 198. While landings and ex-vessel revenue varied over the study period, landings in 2012 were 61.6 percent higher than they were in 1992, ex-vessel revenue almost twice that. This port also had the highest number of participating fishermen for every single year in the study period except for in 1992 when Santa Barbara had 763 as compared with 696 in San Pedro/Los Angeles. The number of fishermen declined in this port, as it did in every port in the region, from a high of 869 in 1994 to 324 in 2012.

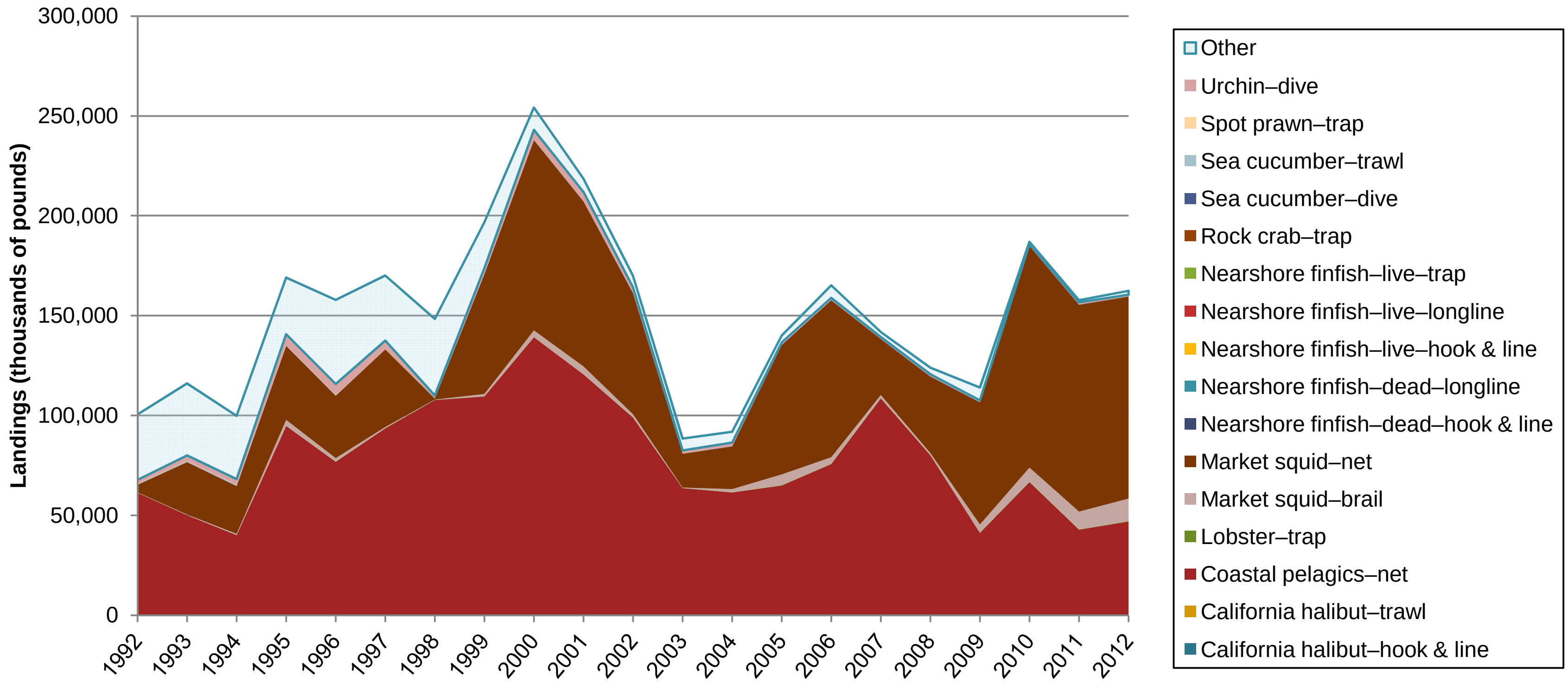
Figure 199 displays the landings and Figure 200 displays the ex-vessel revenue from fisheries of interest in the port of San Pedro/Los Angeles over the study period of 1992–2012. The coastal pelagics–net fishery contributed the bulk of the annual pounds landed in this port over the study period, 78.3 million pounds or 52.4 percent on average annually. The market squid–net fishery was the second largest contributor to pounds landed, with average annual landings of 51.6 million pounds, or 32.5 percent of total port landings. Earlier on in the study period, the swordfish and tuna fisheries constituted the greatest portion of 'other' landings and ex-vessel revenue, tapering off towards the latter half. In terms of ex-vessel revenue, coastal pelagics–net influence was of lesser significance, constituting approximately 15.6 percent on average annually over the study period. Instead, market squid–net was more considerable, constituting 33.7 percent of average annual landings throughout the study period, reaching higher in the later years to approximately double, or 66.4 percent on average of total ex-vessel revenue for San Pedro/Los Angeles over 2009–2012 annually.

Figure 198. San Pedro/Los Angeles total commercial landings, ex-vessel revenue, and number of fishermen, all fisheries, 1992–2012



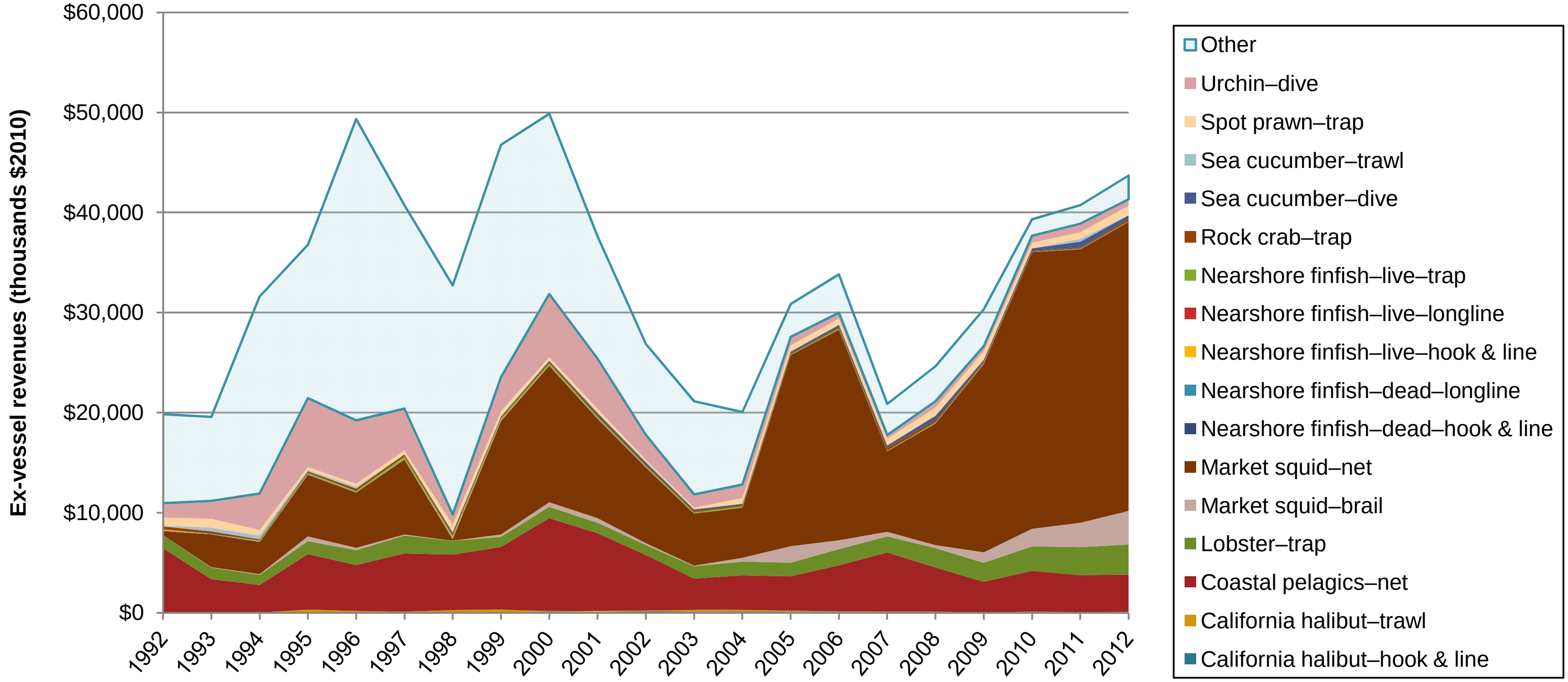
Source: Current study, based off landings data from CDFW.

Figure 199. San Pedro/Los Angeles commercial landings for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

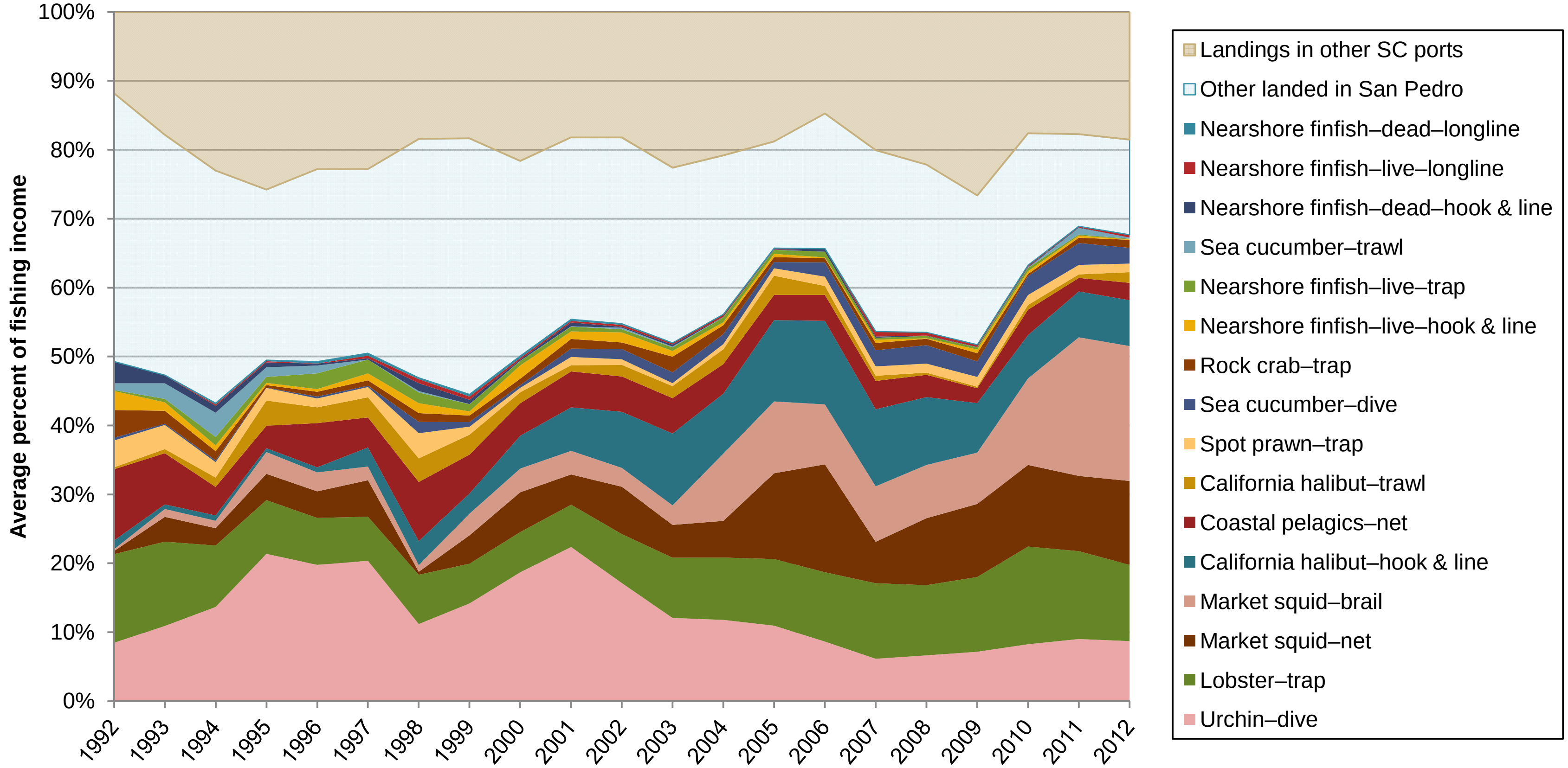
Figure 200. San Pedro/Los Angeles commercial ex-vessel revenue for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 201 displays the average percent contribution to fishing income for those fishermen who made landings in San Pedro/Los Angeles over the study period from the sixteen fisheries of interest, from other fisheries landed in San Pedro/Los Angeles, and from landings made from all fisheries landed in other South Coast region ports. This figure shows reliance on a fishery but also on a given port. Fishermen in San Pedro/Los Angeles made approximately 80.1 percent of their income form landings made in this port; the highest percentage across South Coast ports. The variety of significant fisheries is notable in this port, for example, notable annual average contributions from fisheries of interest include the urchin–dive (12.7 percent), lobster–trap (9.3 percent), market squid–net (6.7 percent), market squid–braid (6.3 percent); and California halibut–hook & line (5.9 percent).

Figure 201. Average percent of individual fishing income from commercial fisheries of interest, San Pedro/Los Angeles, 1992–2012



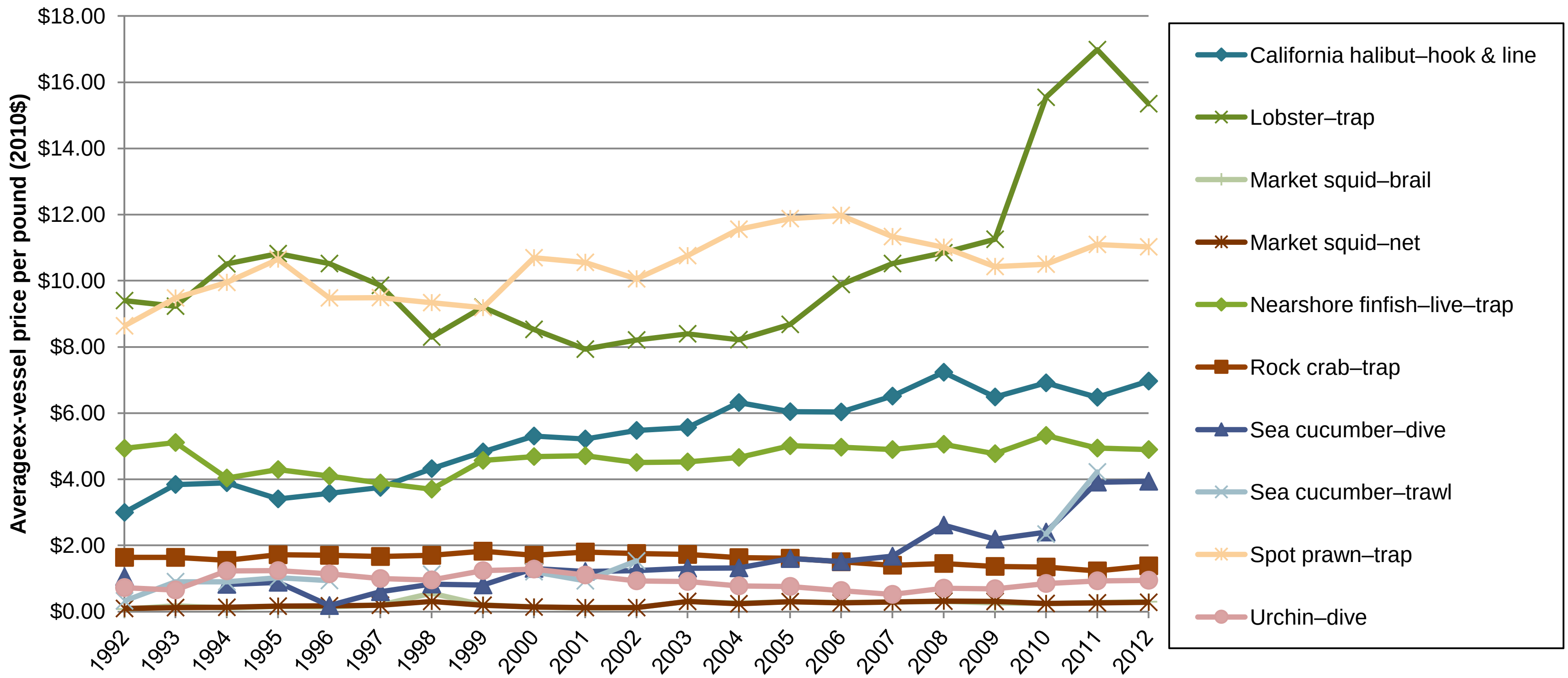
Source: Current study, based off landings data from CDFW.

Figure 202 displays the average ex-vessel prices over time for select fisheries of interest in San Pedro/Los Angeles over the 1992–2012 study period. Due to the size of this port, data was available for most years for this port (i.e. not confidential and thus suppressed), providing a good comparison across fisheries of interest over the entirety of the study period. Increases in the average ex-vessel price per pound for the lobster–trap (63.3 percent from 1992 to 2012), spot prawn–trap (27.6 percent), California halibut–hook & line (132.2 percent), and sea cucumber dive (273.5 percent) fisheries is evident in Figure 202.

Figure 203 through Figure 224 display study period landings, ex-vessel revenue, and number of fishermen for select fisheries of interest in San Pedro/Los Angeles, as well as averaged trends on the level of the individual fisherman. Some notable summary trends include the following:

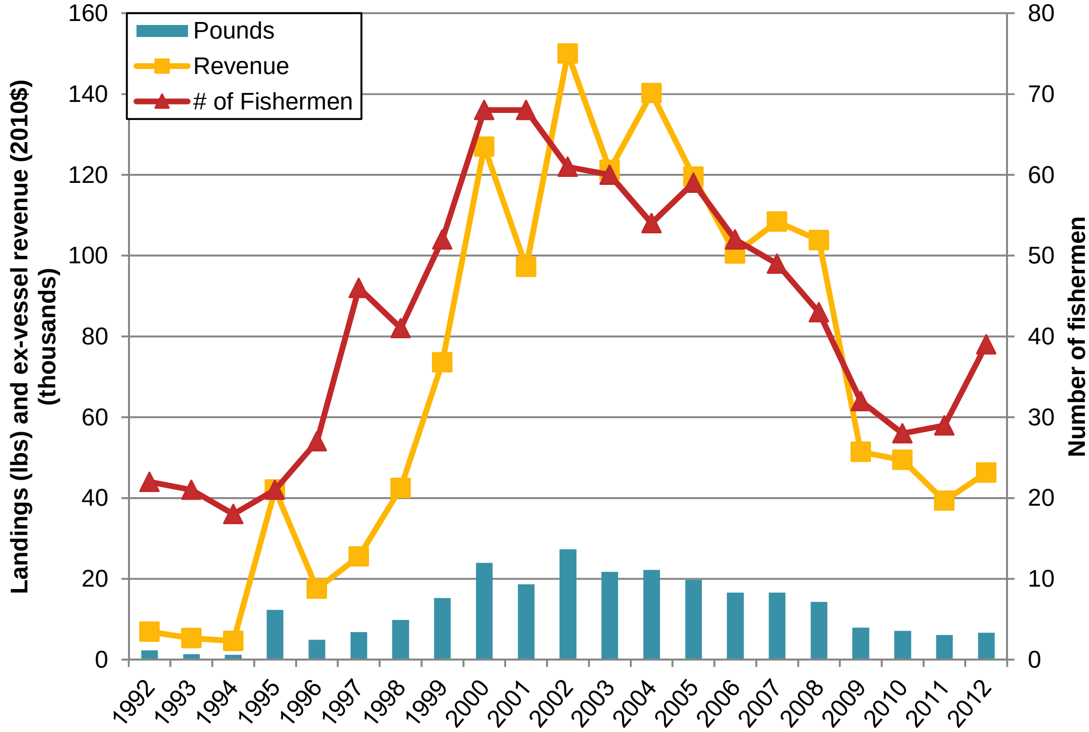
- Overall declines in ex-vessel revenue were observed from 1992 to 2012 for the California halibut–hook & line, California halibut–trawl, coastal pelagics–seine, nearshore finfish–live–trap, and urchin–dive fisheries in this port.
- Overall increases in landings and ex-vessel revenue were observed for the lobster–trap, market squid–net, and sea cucumber–dive fisheries.
- The study period observed overall declines in the California halibut–trawl fishery in San Pedro/Los Angeles; however, in 2011, the remaining 4 fishermen made record landings, 2,046 pounds for $12,525 over a total count of 33 landings made over that year.
- While total declines were observed for the nearshore finfish–live–trap fishery, the number of participating fishermen decreased at a faster pace than the landings and ex-vessel revenue, resulting in increases for the average fisherman's landings and ex-vessel revenue over time. For example, the nearshore finish–live–trap fisherman in 2012 made approximately 7 times more on average in landings and ex-vessel revenue in 2012 than the average 1992 fisherman in San Pedro/Los Angeles.
- Increases in the market squid–net fishery were substantial in this port, in 1992 3.7 million pounds were landed for $368,250; in 2012, 101.6 million pounds were landed for a period high of $28.9 million in ex-vessel revenue. This also resulted in significant gains for the average San Pedro/Los Angeles market squid–net fishermen.
- Like in most South Coast ports, the sea cucumber–dive fishery significantly increased in value over the study period in San Pedro/Los Angeles. The highest ex-vessel revenue occurred in 2011 at $575,164 across 24 fishermen.

Figure 202. Average ex-vessel prices over time, select commercial fisheries of interest, San Pedro/Los Angeles, 1992–2012



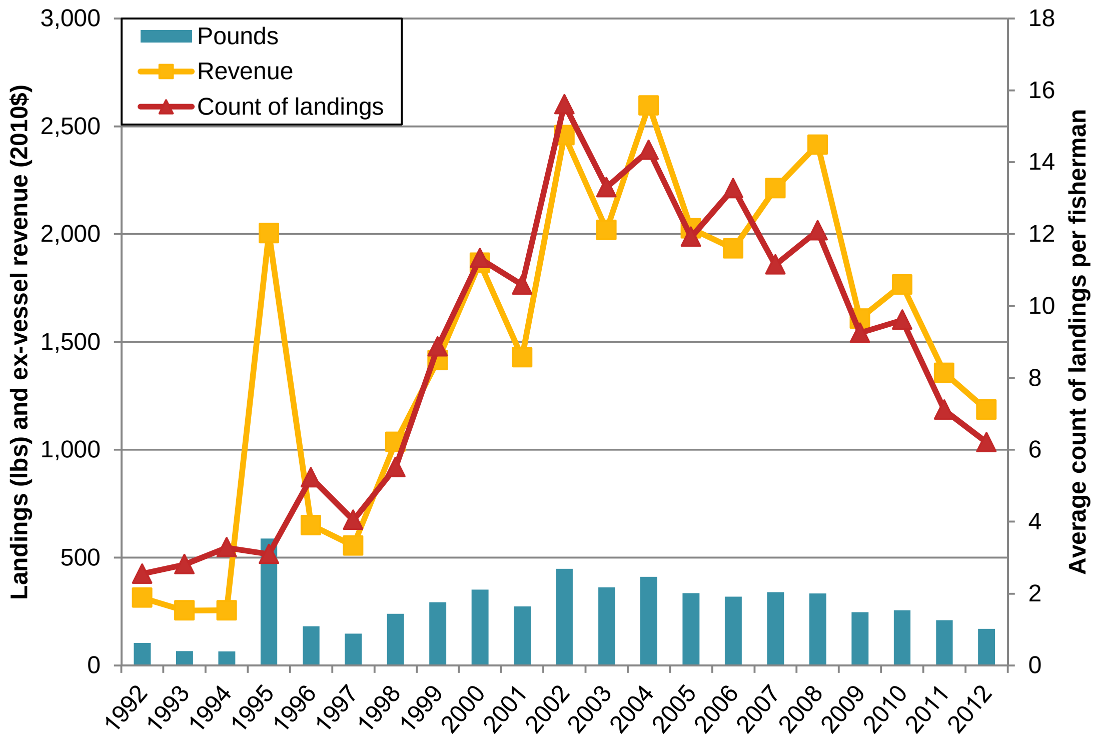
Source: Current study, based off landings data from CDFW.

Figure 203. California halibut–hook & line: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



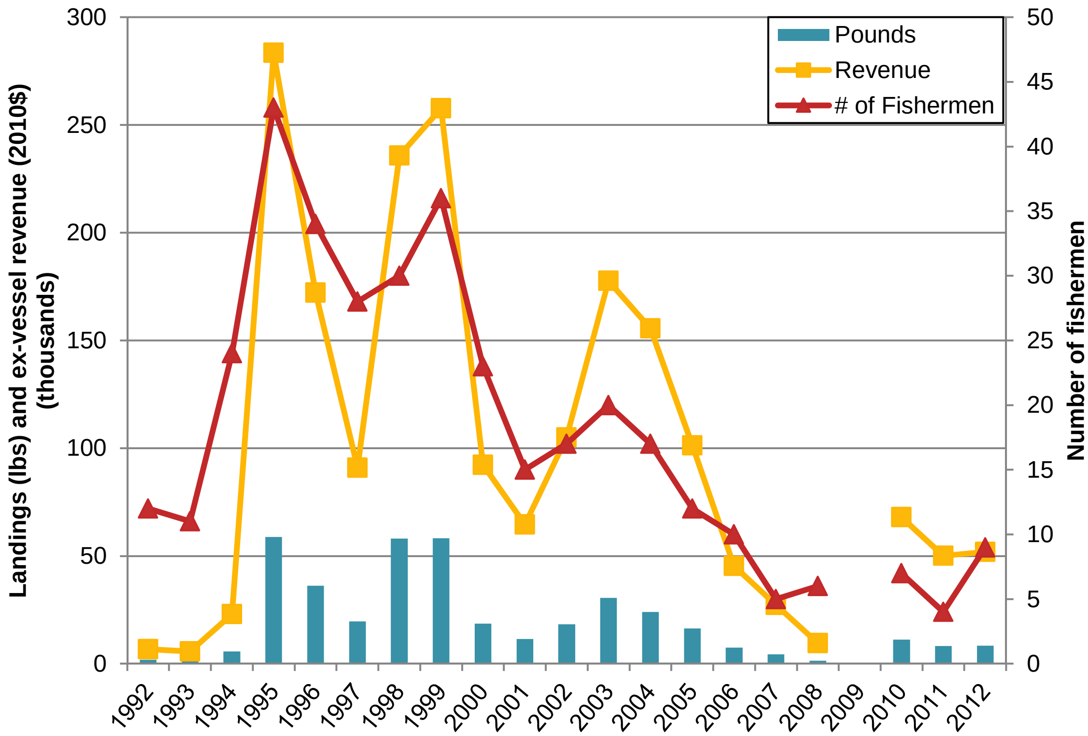
Source: Current study, based off landings data from CDFW.

Figure 204. California halibut–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



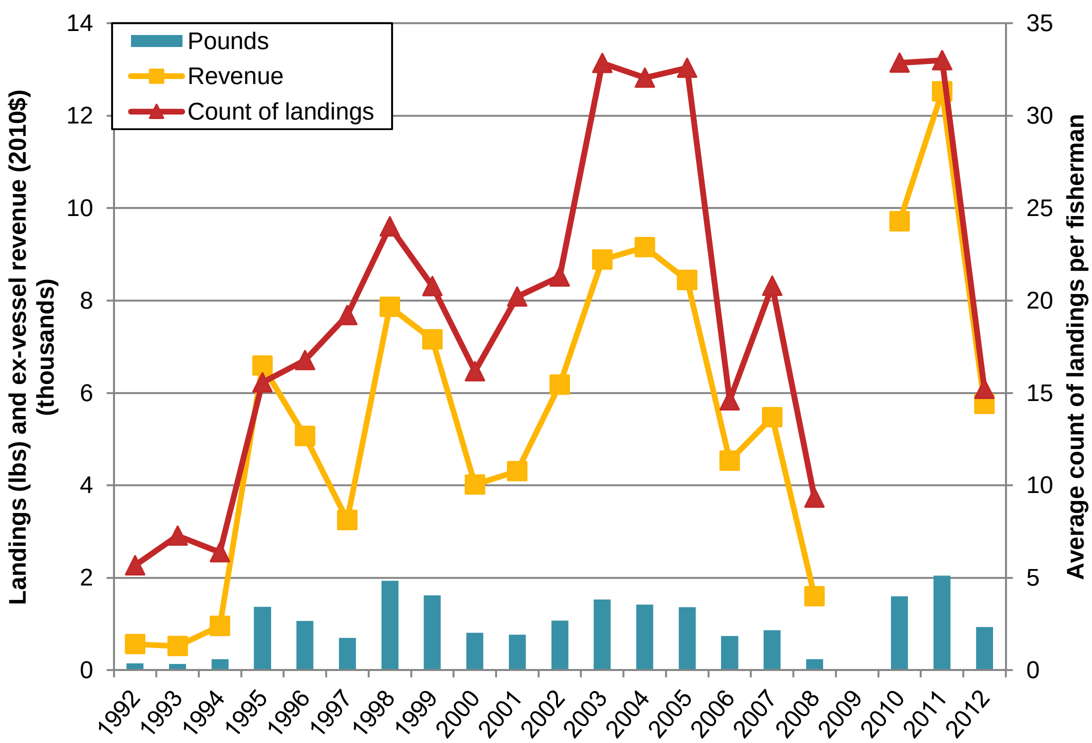
Source: Current study, based off landings data from CDFW.

Figure 205. California halibut–trawl: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



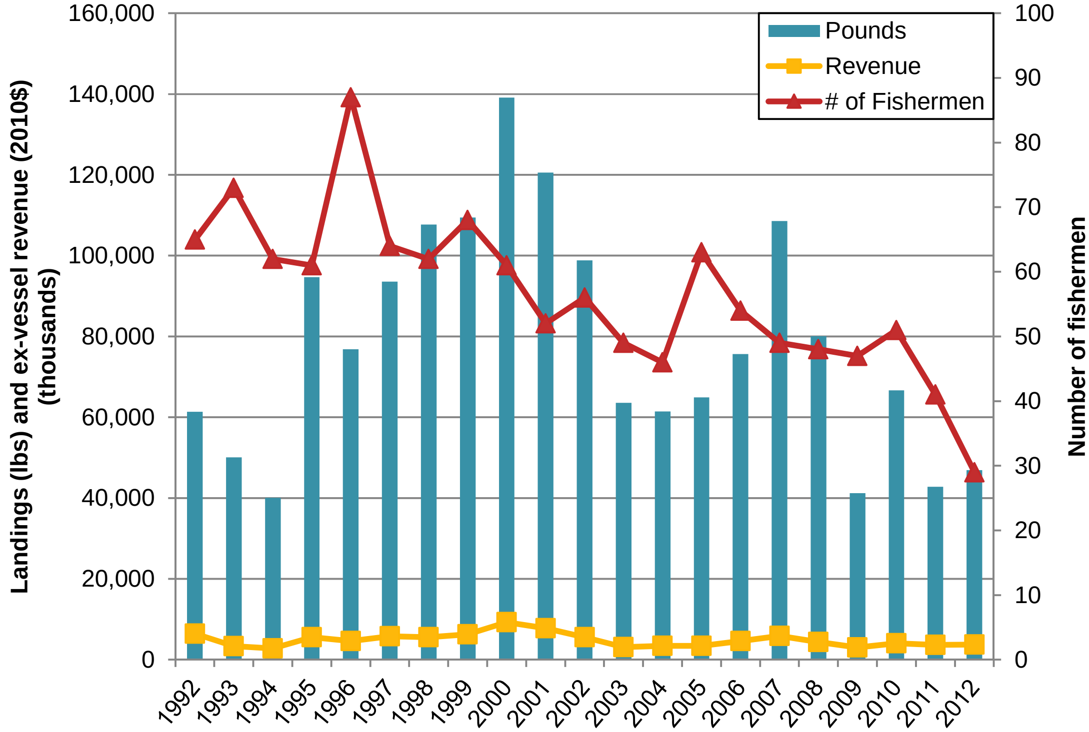
Source: Current study, based off landings data from CDFW.

Figure 206. California halibut–trawl: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



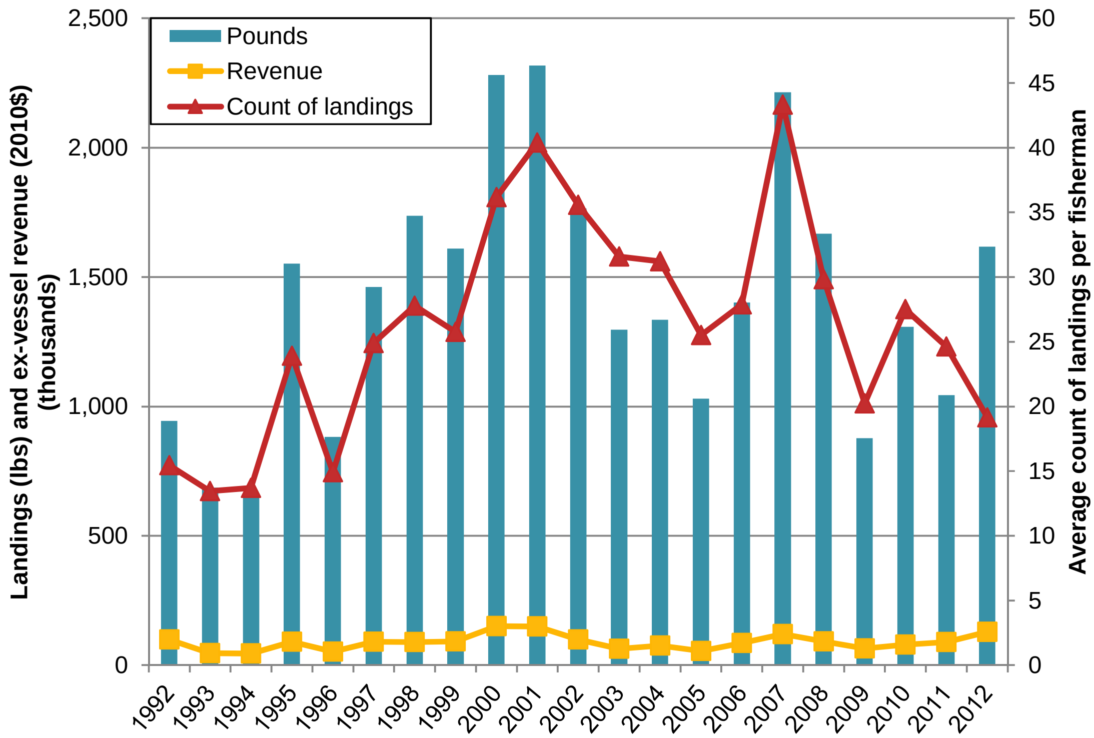
Source: Current study, based off landings data from CDFW.

Figure 207. Coastal pelagics–net: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



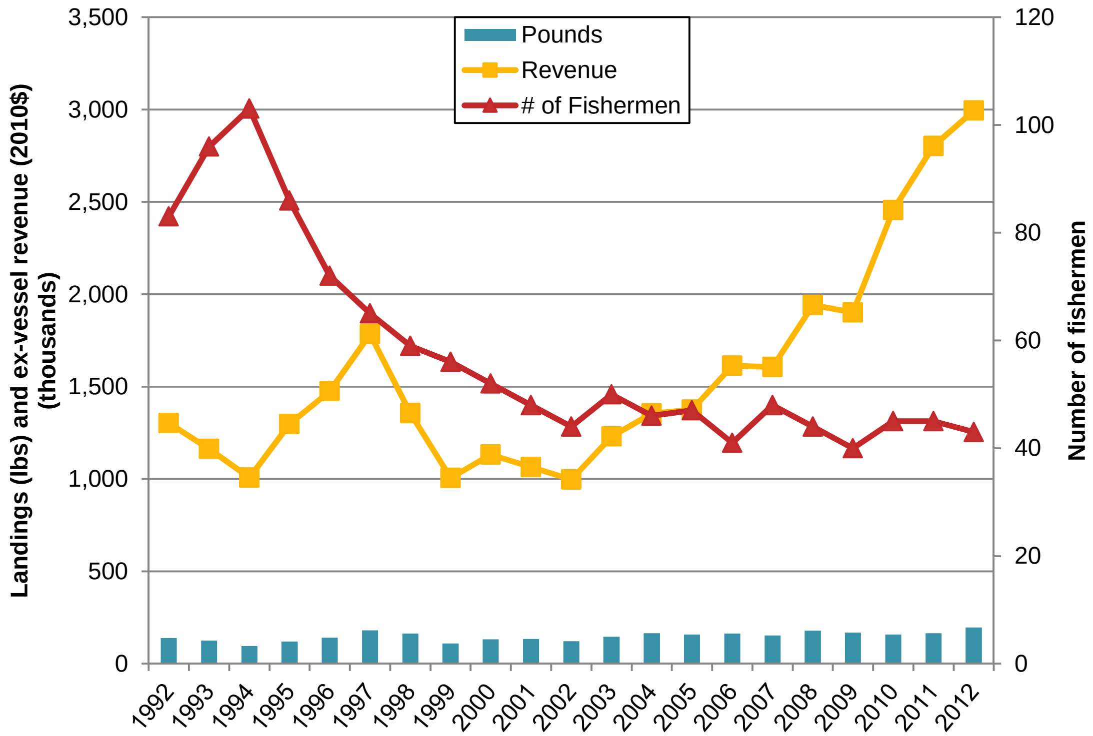
Source: Current study, based off landings data from CDFW.

Figure 208. Coastal pelagics–net: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



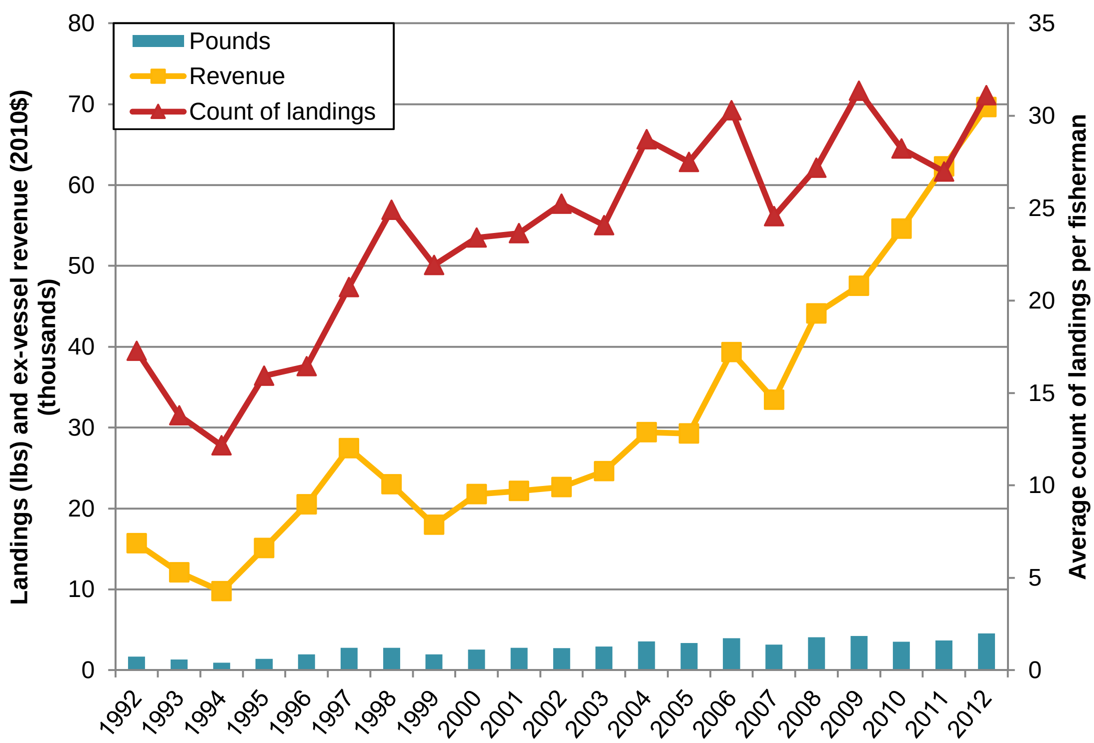
Source: Current study, based off landings data from CDFW.

Figure 209. Lobster–trap: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



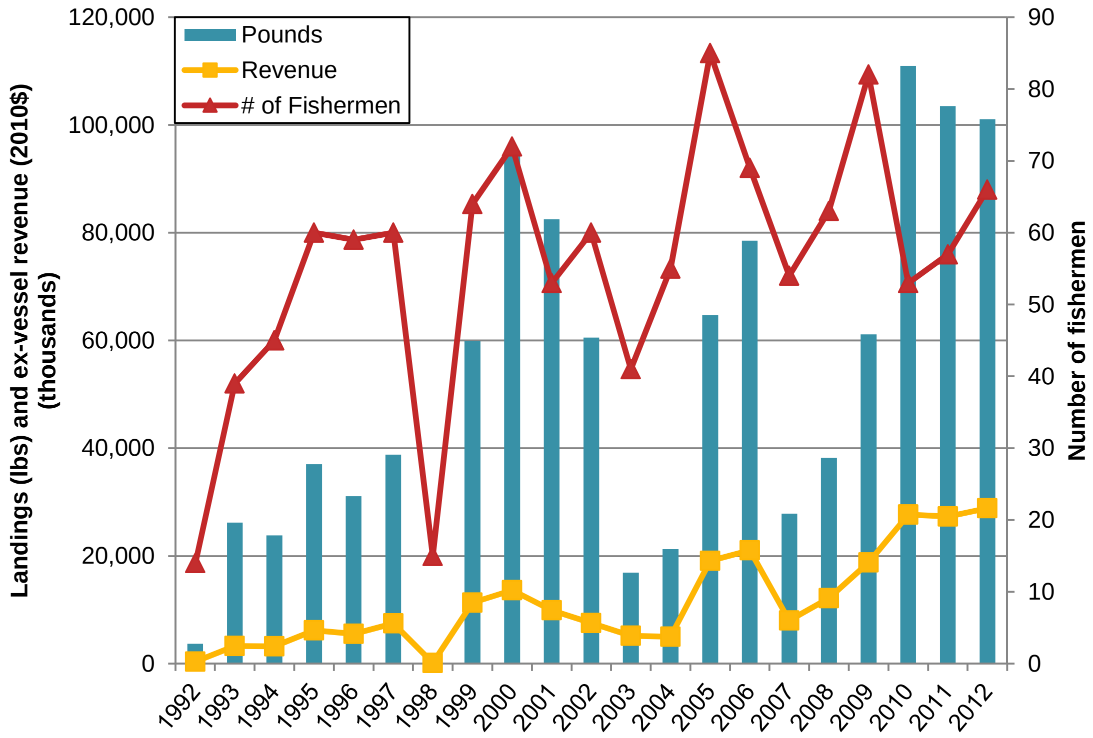
Source: Current study, based off landings data from CDFW.

Figure 210. Lobster–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



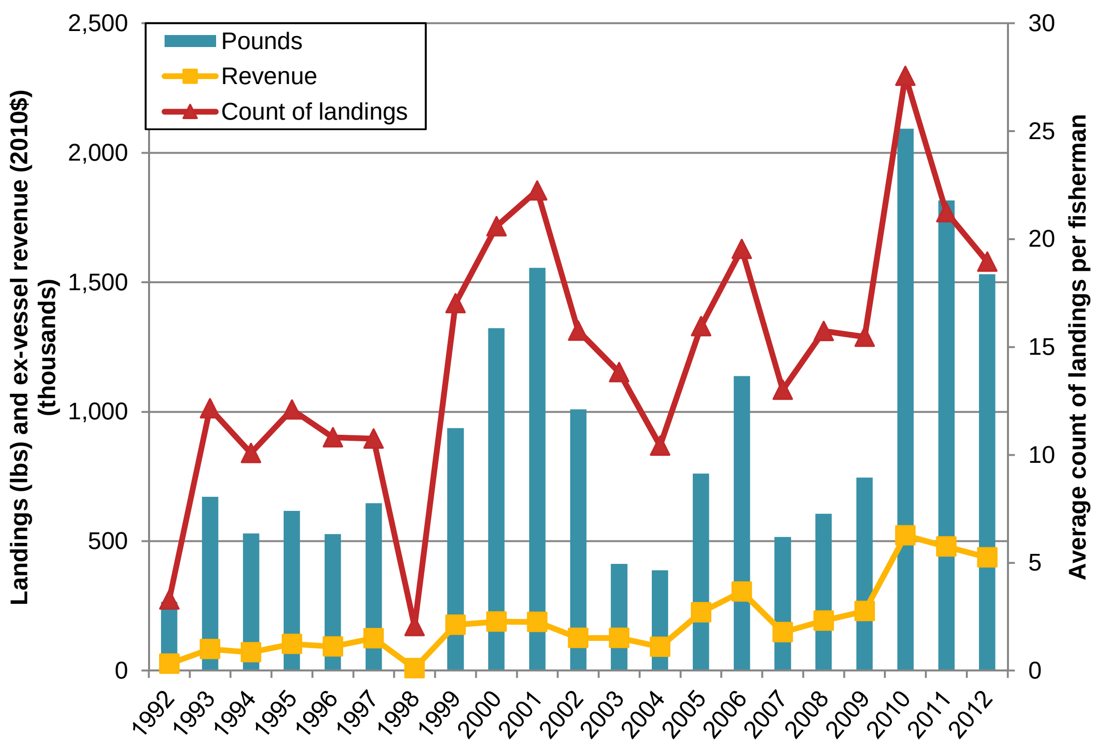
Source: Current study, based off landings data from CDFW.

Figure 211. Market squid–net: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



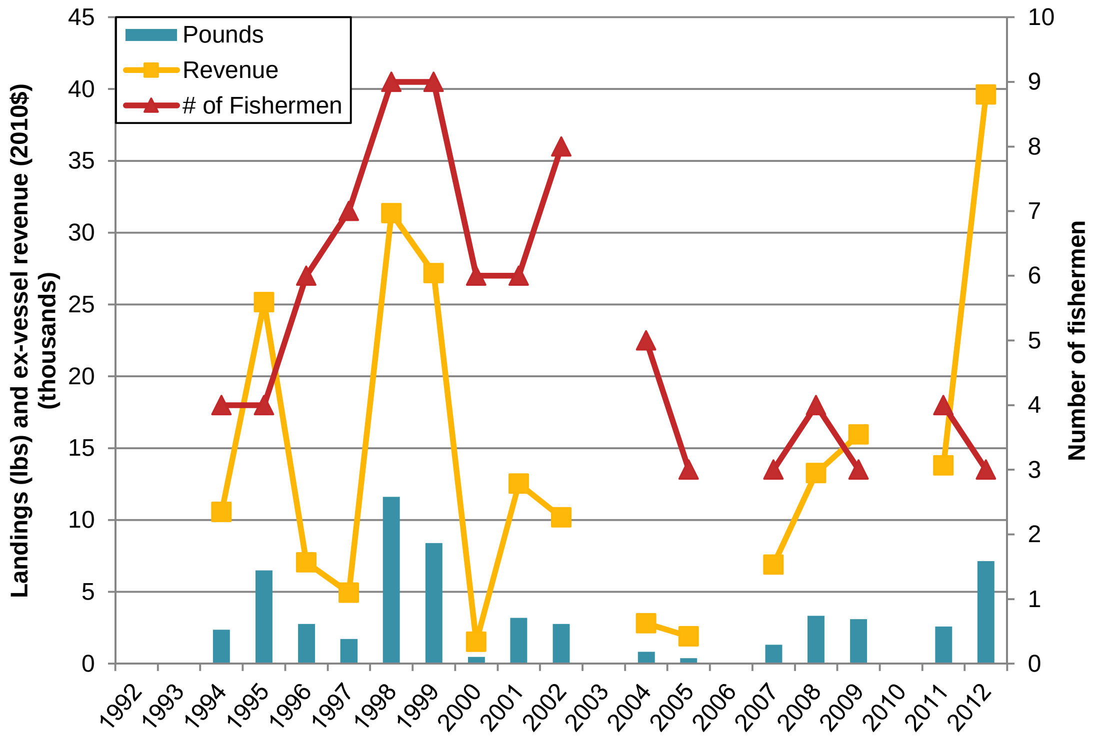
Source: Current study, based off landings data from CDFW.

Figure 212. Market squid–net: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



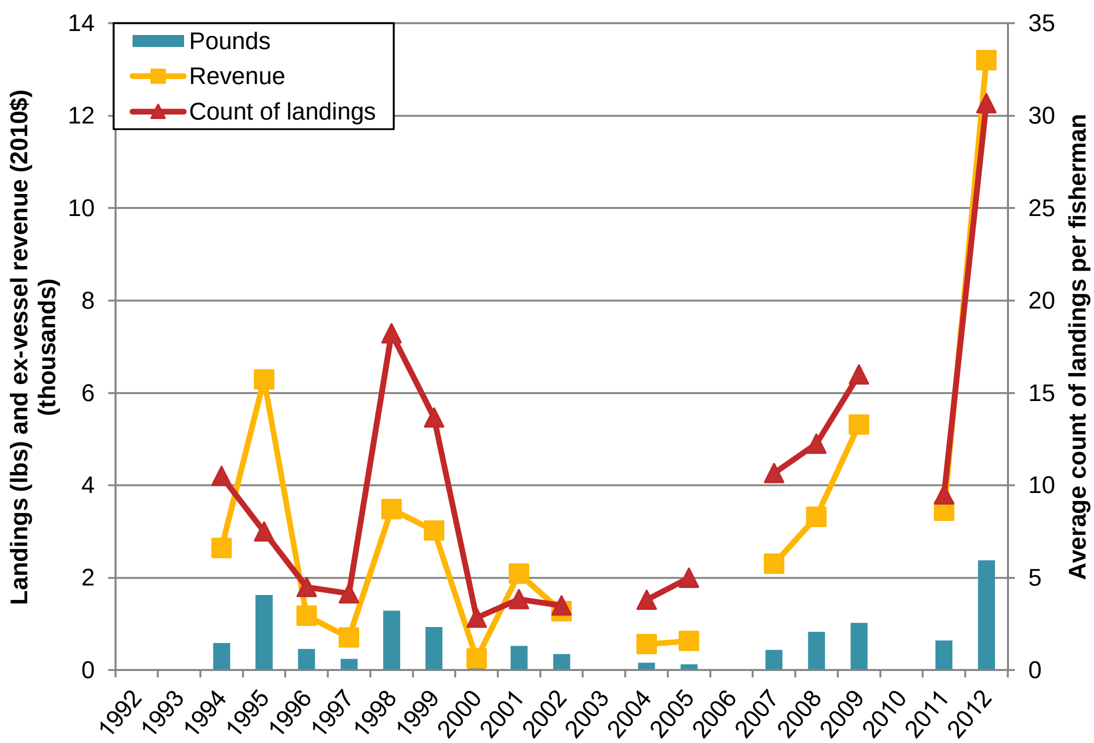
Source: Current study, based off landings data from CDFW.

Figure 213. Nearshore finfish–live–longline: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



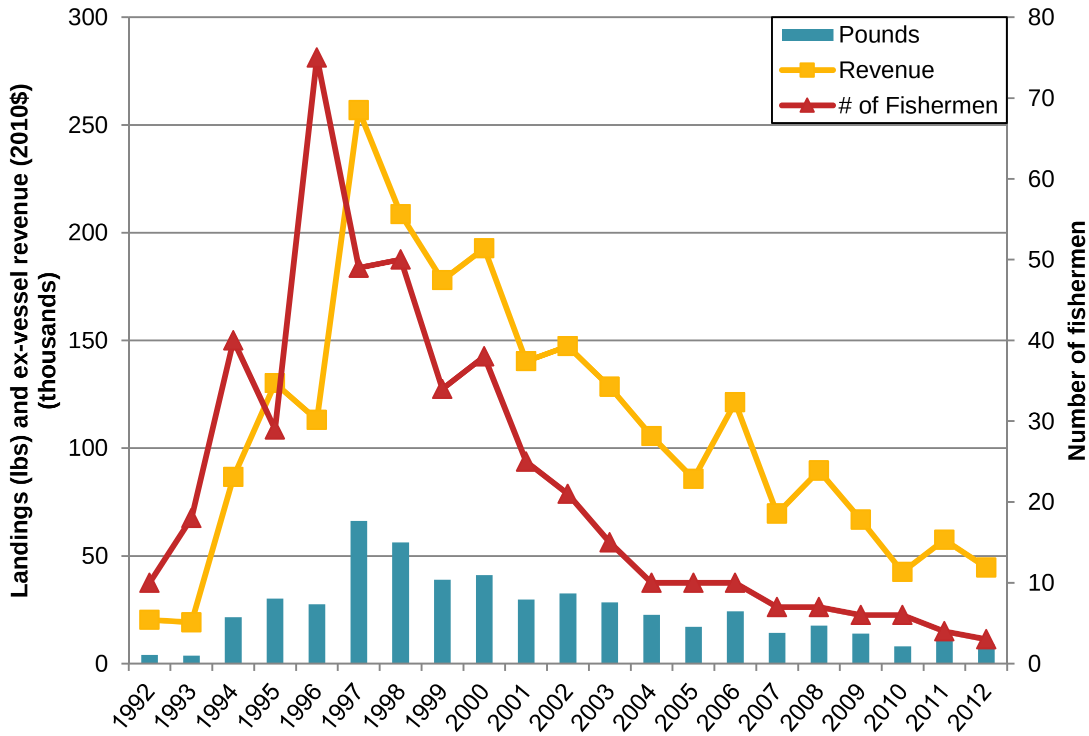
Source: Current study, based off landings data from CDFW.

Figure 214. Nearshore finfish–live–longline: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



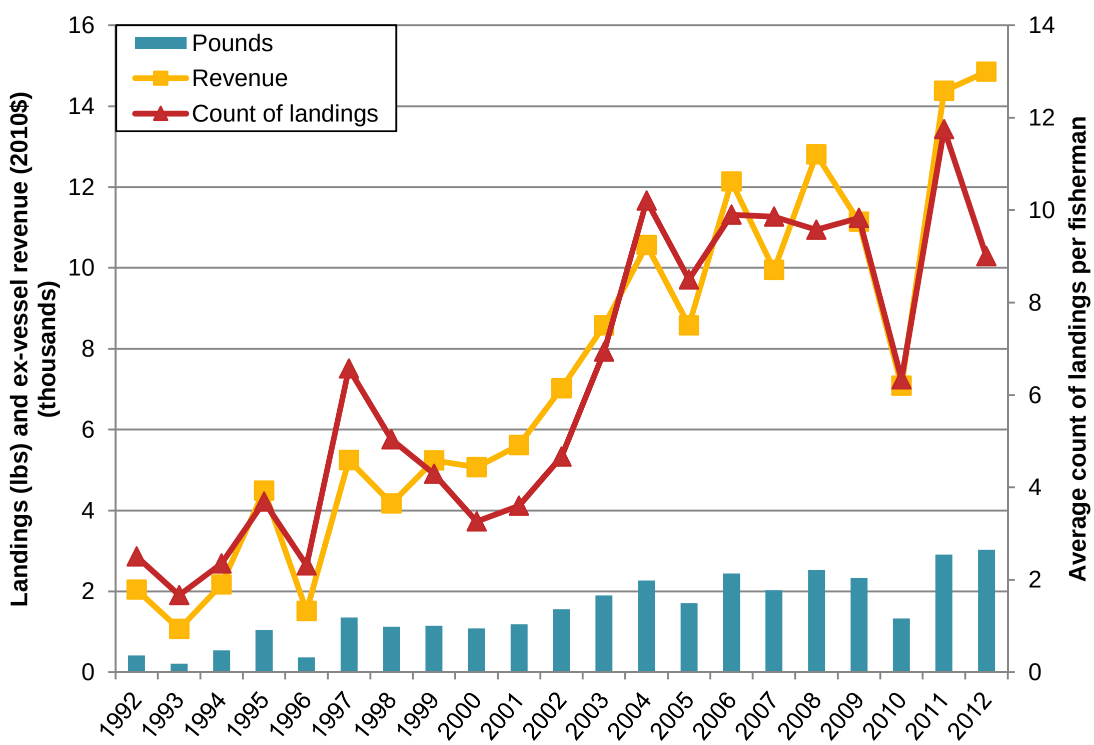
Source: Current study, based off landings data from CDFW.

Figure 215. Nearshore finfish–live–trap: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



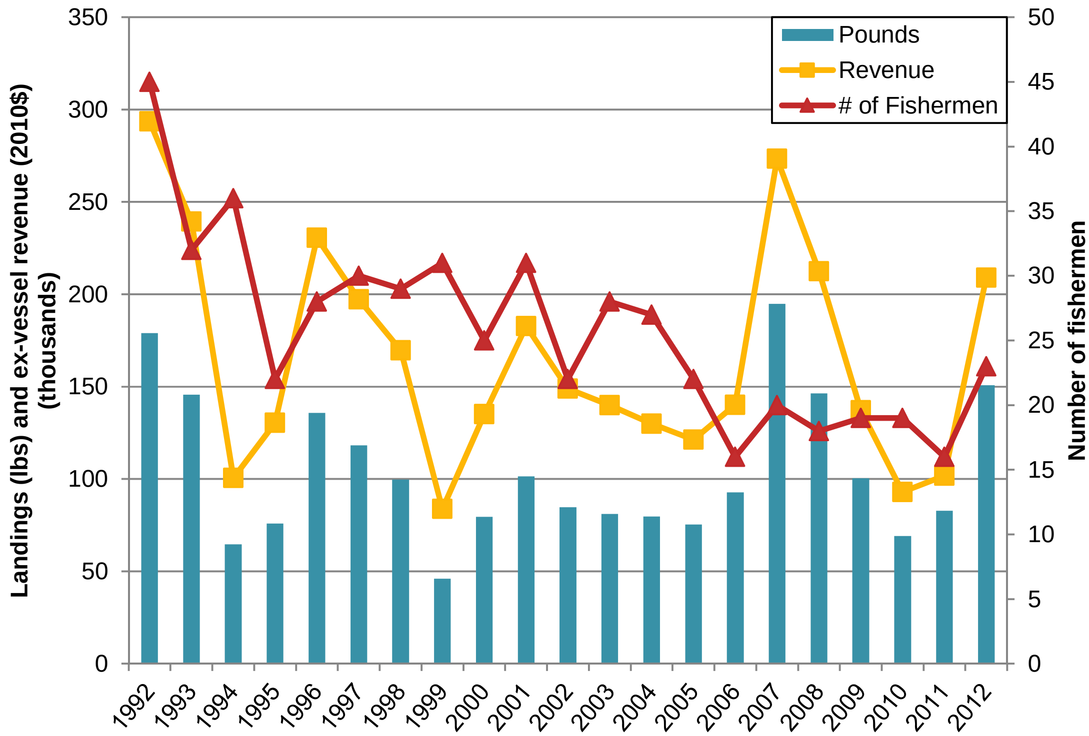
Source: Current study, based off landings data from CDFW.

Figure 216. Nearshore finfish–live–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



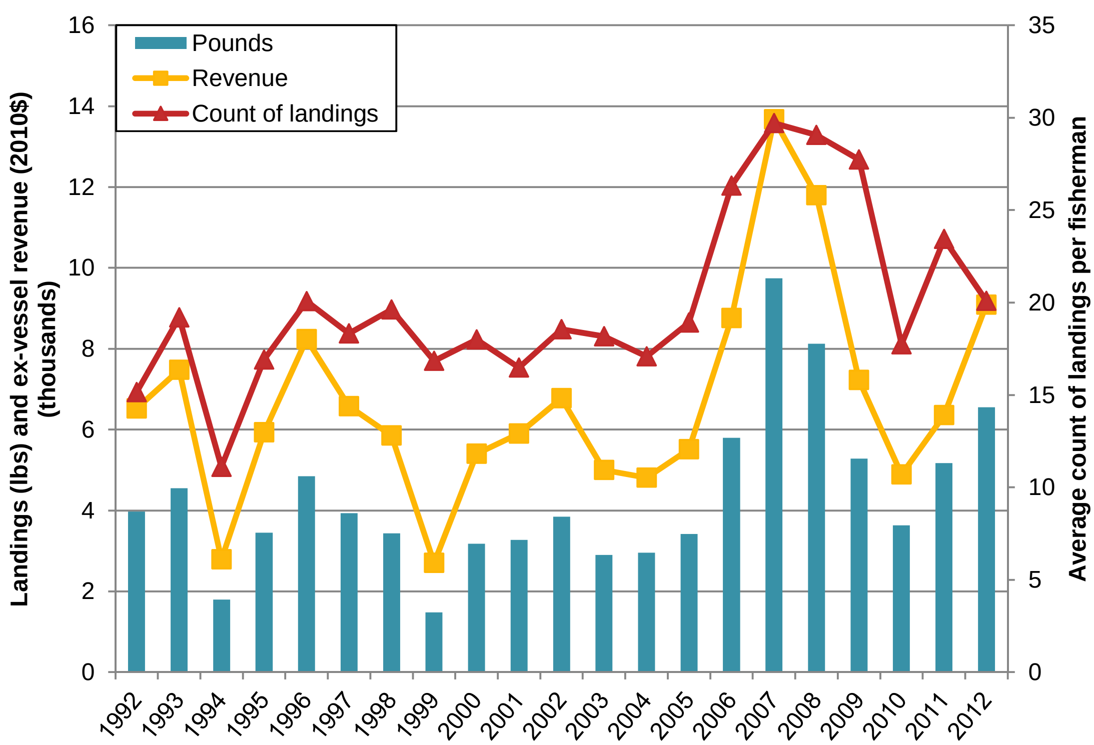
Source: Current study, based off landings data from CDFW.

Figure 217. Rock crab–trap: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



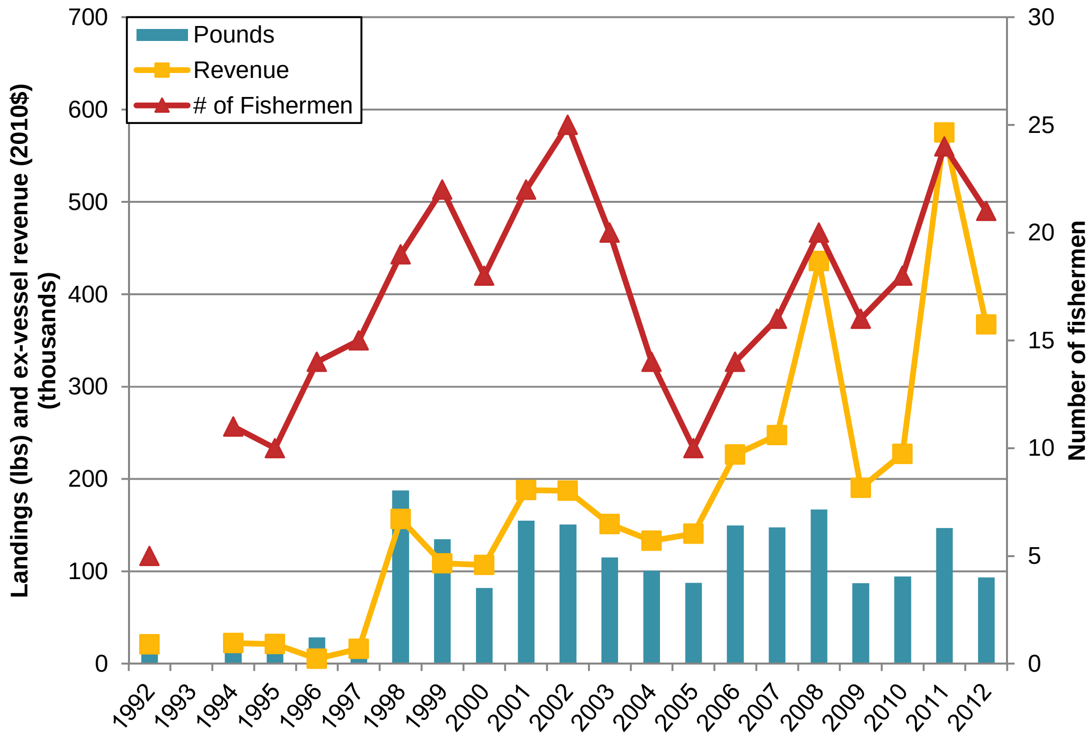
Source: Current study, based off landings data from CDFW.

Figure 218. Rock crab–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



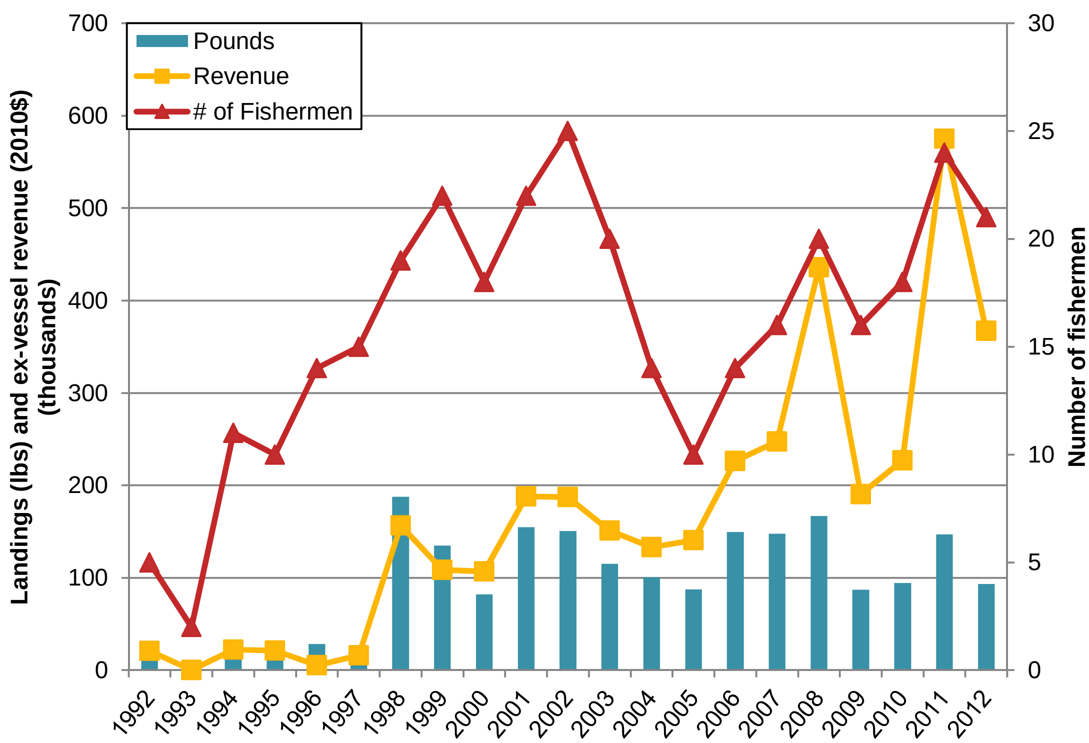
Source: Current study, based off landings data from CDFW.

Figure 219. Sea cucumber–dive: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



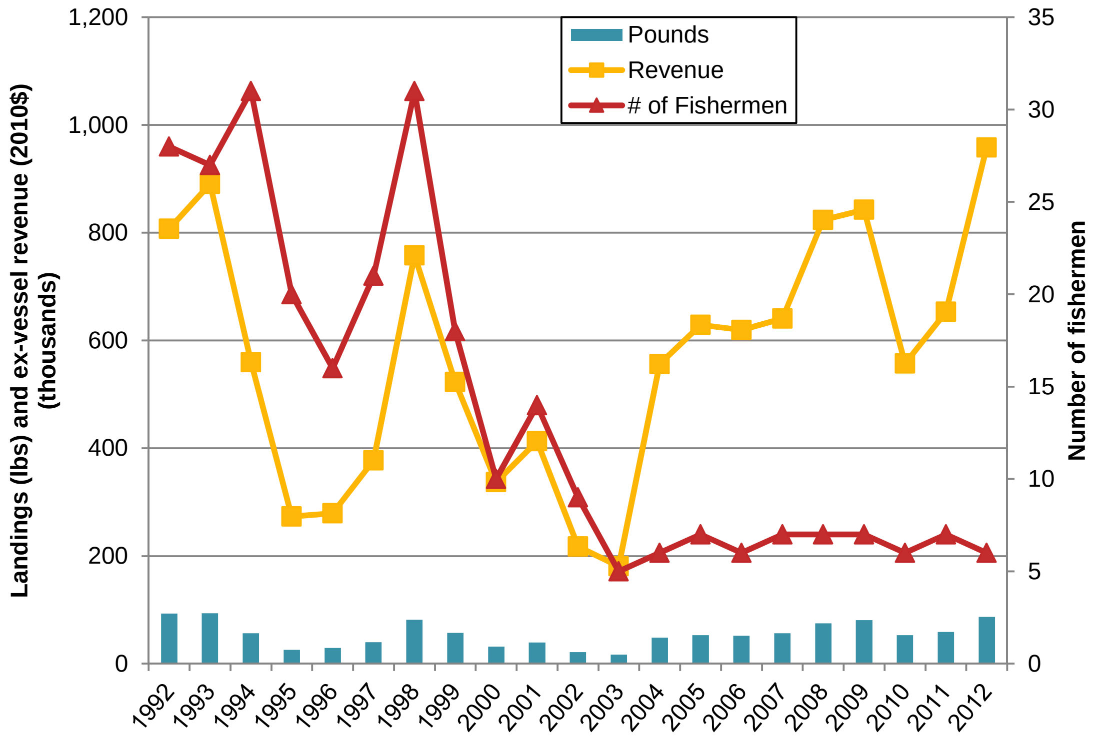
Source: Current study, based off landings data from CDFW.

Figure 220. Sea cucumber–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



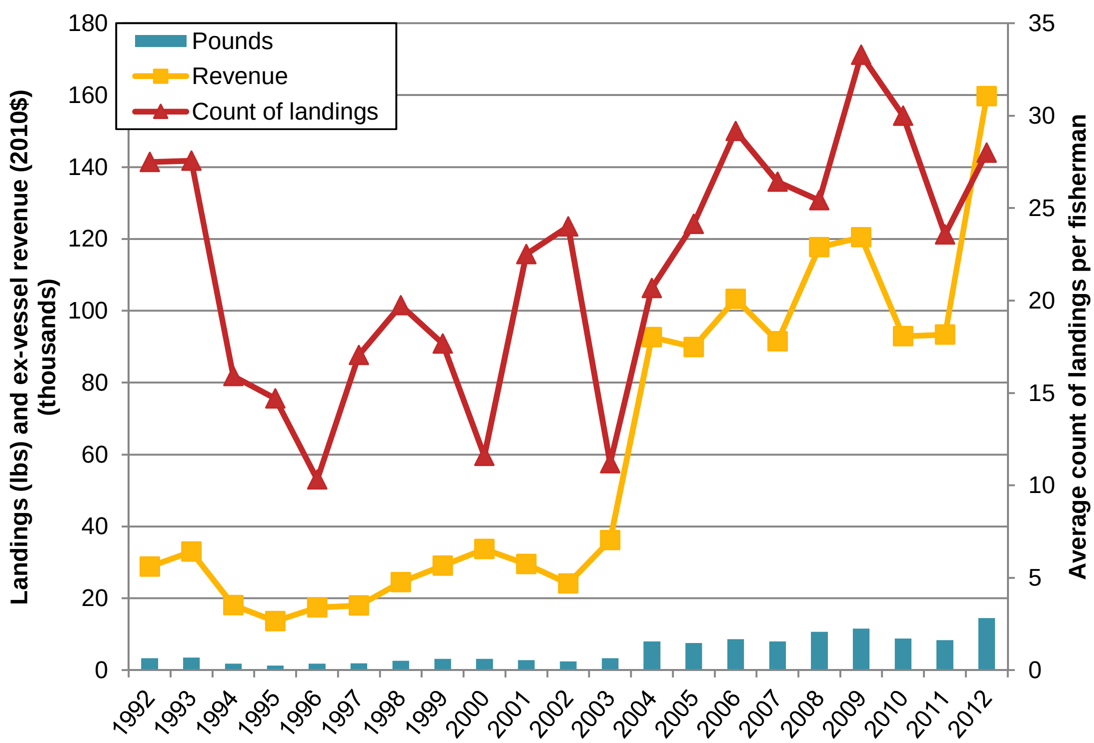
Source: Current study, based off landings data from CDFW.

Figure 221. Spot prawn–trap: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



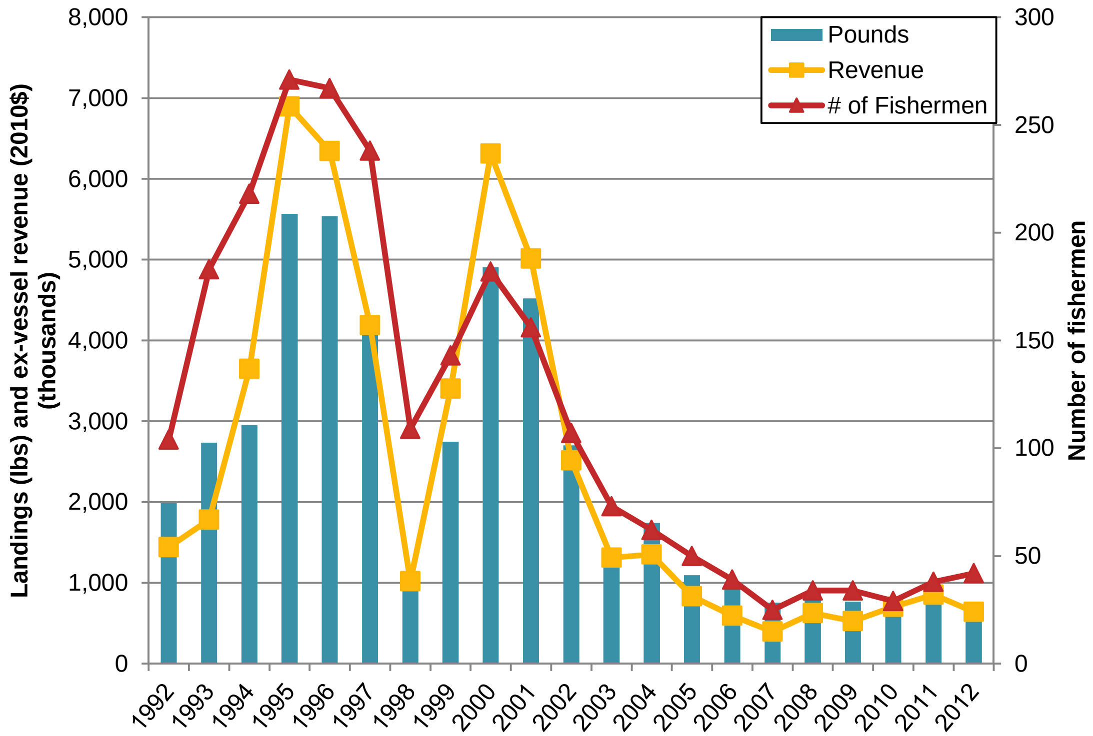
Source: Current study, based off landings data from CDFW.

Figure 222. Spot prawn–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



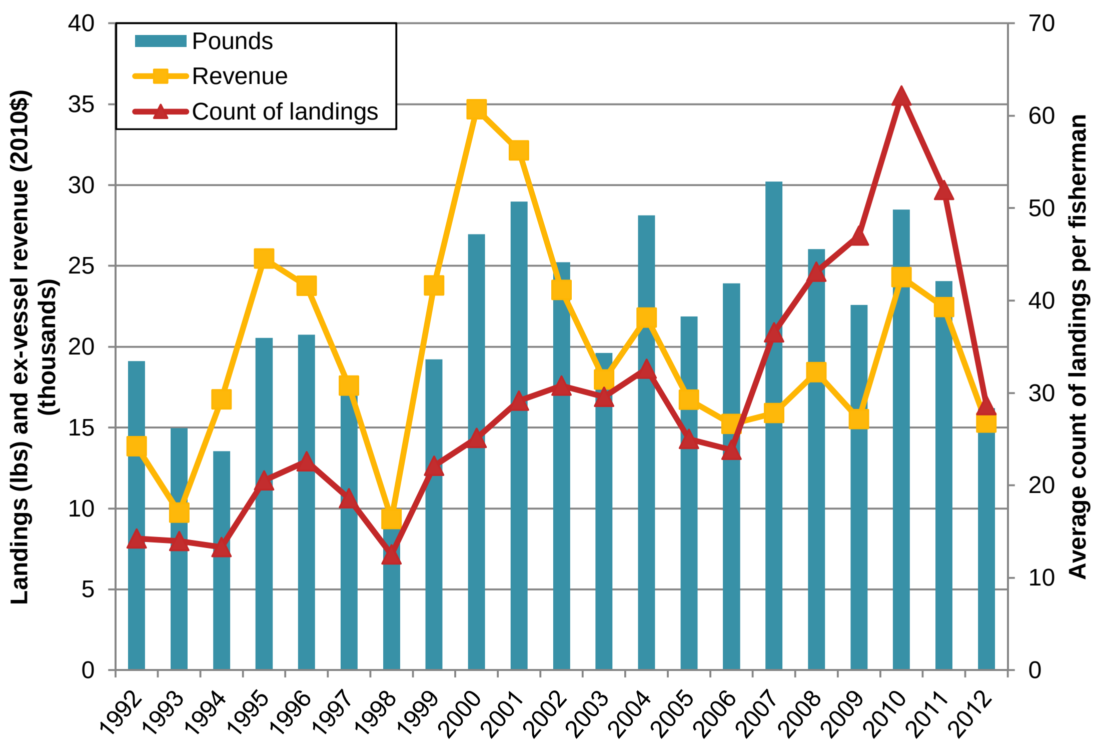
Source: Current study, based off landings data from CDFW.

Figure 223. Urchin–dive: Commercial landings, ex-vessel revenue, and number of fishermen, San Pedro/Los Angeles, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 224. Urchin–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Pedro/Los Angeles, 1992–2012



Source: Current study, based off landings data from CDFW.

4.4.2. San Pedro/ Los Angeles Commercial Baseline Characterization

In 2012, 259 individuals made landings in one or more of the target interview fisheries in San Pedro/Los Angeles. Combined, they generated $41,296,409 in ex-vessel revenue, which is 51 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the landings came from the market squid—net fishery (69.9 percent). We interviewed 23 fishermen from San Pedro/Los Angeles (Table 249).

Table 249. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, San Pedro/Los Angeles

Fishery	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
California halibut–hook & line	$46,246	39	1
California halibut–trawl	$51,838	9	—
Coastal pelagics–net	$3,732,970	29	3
Lobster–trap	$2,994,398	43	8
Market squid–brail	$3,357,870	67	3
Market squid–net	$28,872,465	66	4
Nearshore finfish live–fixed gear	$47,057	6	2
Rock crab–trap	$208,983	23	3
Sea cucumber–dive	$367,209	21	4
Sea cucumber–trawl	$16,404	2	—
Spot prawn–trap	$958,114	6	1
Urchin–dive	$642,857	42	8
Unique individuals	$41,296,409	259	23

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The average Port Hueneme/Oxnard fisherman that we interviewed was 50.1 years old and had an average of 25.3 years of experience as a commercial fisherman (Table 250). It should be noted that this question inquired about the number of years of experience an individual had commercial fishing as a whole, not the number of years of experience they had in a specific fishery. Additionally, San Pedro/Los Angeles fishermen on average made 94.1 percent of their total personal income from commercial fishing in 2012, an average increase of 5.4 percent since 2008. San Pedro/Los Angeles fishermen remained above the regional average for percent income from commercial fishing for 2012. It should be noted that 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust. As shown in Table 251, all fisheries displayed or calculated experienced a decrease in average percent income from 2008 to 2012.

Table 250. Average age and years of experience commercial fishing in 2012, San Pedro/ Los Angeles

	Age			Years of experience		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	1	*	*	1	*	*
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	3	37.7	12.7	3	12.7	15.9
Lobster–trap	8	44.9	8.0	8	22.6	10.5
Market squid–brail	3	47.0	18.7	3	27.3	16.0
Market squid–net	4	35.8	11.0	4	12.3	13.0
Nearshore finfish live–fixed gear	2	*	*	2	*	*
Rock crab–trap	3	45.3	9.5	3	29.3	11.2
Sea cucumber–dive	4	66.8	2.5	4	38.5	10.5
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*
Urchin–dive	8	61.0	7.9	8	34.4	8.9
All target fisheries (unique individuals)	23	50.1	12.7	23	25.3	13.4

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 251. Percent change in income from overall commercial fishing from 2008 - 2012, San Pedro/Los Angeles

	2008^			2012			
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
California halibut–hook & line	—	—	—	1	*	*	*
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	22	93.6%	17.5%	3	100.0%	0.0%	6.8%
Lobster–trap	16	88.1%	25.0%	8	90.0%	19.3%	2.1%
Market squid–brail	2	*	*	3	93.3%	11.5%	16.7%
Market squid–net	33	84.1%	29.1%	4	100.0%	0.0%	18.9%
Nearshore finfish live–fixed gear	5	100.0%	0.0%	2	*	*	*
Rock crab–trap	6	100.0%	0.0%	3	100.0%	0.0%	0.0%
Sea cucumber–dive	6	100.0%	0.0%	4	98.8%	2.5%	-1.3%
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	4	97.5%	5.0%	1	*	*	*
Urchin–dive	18	98.6%	5.9%	8	96.9%	7.0%	-1.8%
All target fisheries (unique individuals)	70	89.3%	24.0%	23	94.1%	12.7%	5.4%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

^2008 data were taken from Scholz et al. 2010.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher. As shown below in Table 252, the majority of respondents perceived no change. Some respondents in the lobster—trap, market squid—brail, and market squid—net fisheries indicated that personal income from commercial fishing was somewhat or significantly higher in 2012.

Table 252. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, San Pedro/Los Angeles

		Percent response				
Fisheries	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
California halibut–hook & line	1	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	3	—	—	100.0%	—	—
Lobster–trap	8	—	25.0%	75.0%	—	—
Market squid–brail	3	33.3%	33.3%	33.3%	—	—
Market squid–net	4	—	25.0%	75.0%	—	—
Nearshore finfish live–fixed gear	2	*	*	*	*	*
Rock crab–trap	3	—	—	100.0%	—	—
Sea cucumber–dive	4	—	—	100.0%	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*
Urchin–dive	8	—	—	100.0%	—	—
All fisheries (unique individuals)	23	4.3%	17.4%	78.3%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their income coming from commercial fishing. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Table 253 lists the reason for the change as well as the number for each fishery. The most common reason for an increase in percent personal income from commercial fishing was due to less revenue from other income sources.

Table 253. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, San Pedro/ Los Angeles

Fishery	Number of individuals responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	2	—	—	—	1	—	—	—	1	—	—	—	—	—	—
Market squid–brail	2	1	—	—	1	—	—	—	—	—	—	—	—	—	—
Market squid–net	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	5	1	—	—	3	—	—	—	1	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

In interviews, fishermen were asked what percent of their gross economic revenue (GER) went towards their overall commercial fishing operating costs. In Table 254 below, we compare the average responses that were given in a 2008 study conducted by Point 97/Ecotrust (Scholz et al. 2010) to that gathered in this study (2012). As noted previously the responses given in the 2008 study were based on fishermen's cumulative fishing experience—not necessarily specific to the year they were interviewed. Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years. Overall, San Pedro/Los Angeles fishermen reported that in 2012 on average 47.9 percent of their gross economic revenue was spent on operating costs, which is 1.9 percent more than the average reported in 2008. We emphasize that this question is asked about overall commercial fishing operating costs across all fisheries for a particular fisherman.

Table 254. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, San Pedro/Los Angeles

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	—	—	—	1	*	*	*
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	20	53.6%	18.3%	3	48.3%	36.9%	-9.9%
Lobster–trap	13	41.0%	11.3%	8	46.6%	11.7%	13.8%
Market squid–brail	1	*	*	3	43.3%	11.5%	*
Market squid–net	29	50.8%	20.0%	4	48.8%	30.1%	-4.0%
Nearshore finfish live–fixed gear	4	40.0%	14.1%	2	*	*	*
Rock crab–trap	4	50.0%	8.2%	3	52.0%	10.1%	4.0%
Sea cucumber–dive	6	50.0%	29.5%	4	60.0%	28.6%	20.0%
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	3	51.7%	17.6%	1	*	*	*
Urchin–dive	18	43.2%	23.3%	8	50.7%	23.5%	17.4%
All target fisheries (unique individuals)	62	47.0%	19.7%	23	47.9%	18.8%	1.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 255. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, San Pedro/Los Angeles

Fisheries	Number responding	Percent response: Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	1	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	3	33.3%	—	66.7%	—	—
Lobster–trap	8	25.0%	25.0%	37.5%	12.5%	—
Market squid–brail	3	—	33.3%	66.7%	—	—
Market squid–net	4	25.0%	—	75.0%	—	—
Nearshore finfish live–fixed gear	2	*	*	*	*	*
Rock crab–trap	3	33.3%	33.3%	33.3%	—	—
Sea cucumber–dive	3	33.3%	—	33.3%	33.3%	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*
Urchin–dive	7	14.3%	14.3%	42.9%	28.6%	—
All fisheries (unique individuals)	22	18.2%	18.2%	50.0%	13.6%	—

Source: Current study

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** indicates data were collected but cannot be shown due to confidentiality constraints*

Fishermen were asked their perceptions of if the percent of their overall commercial fishing gross economic revenue that went toward overall operating costs has changed since 2008, which is shown in Table 255. Overall most fishermen indicated there were not significant changes, which generally aligns with the results in the previous table. In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their gross economic revenue going towards operating costs. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Similar to the region, in San Pedro/Los Angeles, the most frequently reported reason for increasing operating costs was the increased cost of fuel, followed by general increases in costs of goods and labor (Table 256).

Table 256. Cause of change in percent income going towards overall operating costs from 2008 – 2012, San Pedro/Los Angeles

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	5	3	—	2	2	—	—	—	2	—	—	—	1	—	—	—	1	—
Market squid–brail	1	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	2	1	—	1	1	—	—	—	2	—	—	—	1	—	—	—	—	—
Sea cucumber–dive	2	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	1	1
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Urchin–dive	4	—	1	—	—	—	—	2	—	—	—	1	—	—	1	—	1	2
All fisheries (unique individuals)	11	5	2	2	3	—	—	2	2	—	—	1	1	—	1	—	2	2

Source: Current study

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Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

We asked fishermen how many years of experience and how many days they spent targeting each of the fisheries in which they participated. As indicated in Table 257, urchin—dive fishermen have been fishing the longest, on average 32.5 years, and fishermen in the market squid—net fishery had the least experience with 12.5 years. Fishermen in the coastal pelagics—nets fishery spent the most number of days, 120 days, targeting their fishery, while the market squid—brail fishermen spent the least 20.7 days.

Table 257. Years of experience and number of days targeting specific fisheries in 2012, San Pedro/Los Angeles

	Years of experience in fishery			Number of days targeting fishery in 2012		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	1	*	*	1	*	*
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	3	16.0	9.9	3	120.0	113.1
Lobster–trap	8	20.9	8.8	8	96.1	20.8
Market squid–brail	3	14.3	9.3	3	20.7	19.0
Market squid–net	4	12.5	5.9	4	106.0	35.6
Nearshore finfish live–fixed gear	2	*	*	2	*	*
Rock crab–trap	3	21.0	7.9	3	67.0	26.2
Sea cucumber–dive	4	24.0	15.0	4	55.5	42.2
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*
Urchin–dive	8	32.5	5.9	8	89.9	72.5

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Fishermen were also asked how many crew they used for each fishery and what percent of their gross economic revenue was spent on their crew. San Pedro/Los Angeles respondents in the coastal pelagics—net fishery used the largest number of crew members (5), spent the most revenue on crew (54 percent), and spend the most revenue on fuel (17.5 percent) as reported in Table 243.

Table 258. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, San Pedro/Los Angeles

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
California halibut–hook & line	1	*	*	1	*	*	1	*	*
California halibut–trawl	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	3	5	1	3	54.0%	1.4%	3	17.5%	17.7%
Lobster–trap	8	1	1	8	6.1%	5.4%	8	14.0%	9.1%
Market squid–brail	3	2	1	3	40.0%	0.0%	3	16.7%	5.8%
Market squid–net	4	4	2	4	43.3%	8.5%	4	12.7%	6.4%
Nearshore finfish live–fixed gear	2	*	*	2	*	*	2	*	*
Rock crab–trap	3	0	1	3	3.3%	5.8%	3	8.7%	4.0%
Sea cucumber–dive	4	0	0	4	0.0%	0.0%	4	13.5%	5.4%
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*	1	*	*
Urchin–dive	8	0	1	8	0.0%	0.0%	8	15.6%	4.3%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were asked separately for each fishery they participated in to compare his/her success in the fishery in 2012 to that of the last ten years. As shown in Table 259 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishery. This question was asked as an open ended question and responses were later coded and categorized into positive and negative environmental factors (Table 260), economic factors (Table 261), regulatory factors (Table 262), and other factors (Table 263).

Some target fisheries saw a greater variety of responses than others. For example, in the urchin—dive fishery at least one respondent indicated each response category, and the reasons influencing success in the fishery were also varied. The primary negative influences were bad oceanic conditions (Table 260), bad prices or increased cost of fuel (Table 261), and MPAs or other closures (Table 232). One positive factor that most respondents in the urchin—dive fishery mentioned was working harder/putting in more effort (Table 263).

Other fisheries had less variance in terms of responses regarding the overall success of their fishery. For example, all respondents in the coastal pelagics—net fishery reported their success in the fishery was somewhat worse. The primary negative factors given for this were lack of fish/product (Table 260), and MPAs or other closures (Table 262). The majority of respondents in the market squid –net fishery indicated significantly higher (25 percent) or somewhat higher (75 percent) success in 2012 (Table 259). The positive factors given for this success were abundance of fish/product (Table 260) and good ex-vessel prices for the product (Table 261).

In San Pedro/Los Angeles, the most commonly cited positive factor was fishermen were working harder and putting in more effort. Lastly, respondents indicated that MPAs or other closures were the leading negative regulatory factor influencing the success of their fishery.

Table 259. Overall success in specific commercial fishery, 2012 compared to previous ten years, San Pedro/Los Angeles

		Percent response					
Fisheries	Number responding	Did not participate in previous seasons	Significantly better	Somewhat better	The same	Somewhat worse	Significantly worse
California halibut–hook & line	1	*	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	2	—	—	—	—	100.0%	—
Lobster–trap	8	—	—	—	37.5%	50.0%	12.5%
Market squid–brail	3	—	—	33.3%	—	—	66.7%
Market squid–net	4	—	25.0%	75.0%	—	—	—
Nearshore finfish live–fixed gear	2	*	*	*	*	*	*
Rock crab–trap	3	—	—	—	66.7%	33.3%	—
Sea cucumber–dive	4	—	25.0%	—	—	25.0%	50.0%
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*	*
Urchin–dive	8	—	25.0%	37.5%	12.5%	12.5%	12.5%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 260. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, San Pedro/Los Angeles

		Positive					Negative				
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	—	—	—	—	—	1	—	—	—	—
Lobster–trap	1	—	—	—	—	—	1	—	1	—	—
Market squid–brail	1	—	—	1	—	—	—	—	—	—	—
Market squid–net	4	4	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	2	—	—	—	—	—	2	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	1	*	*	*	*	*	*	*	*	*	*
Urchin–dive	3	—	—	1	2	—	—	—	1	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 261. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, San Pedro/Los Angeles

		Positive			Negative			
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
California halibut–hook & line	1	*	*	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—
Lobster–trap	—	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—
Market squid–net	3	3	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—
Rock crab–trap	1	—	—	—	—	—	—	1
Sea cucumber–dive	2	1	—	—	—	1	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—
Urchin–dive	3	—	1	—	1	—	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 262. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, San Pedro/Los Angeles

		Negative					
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	1	—	—	1	—	—	—
Lobster–trap	2	—	—	2	—	—	—
Market squid–brail	1	—	—	—	—	—	1
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—
Sea cucumber–dive	2	—	—	2	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—
Urchin–dive	2	1	1	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. Lack of management
	F. Quota met early

Table 263. Other changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, San Pedro/Los Angeles

		Positive						Negative						
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
California halibut–hook & line	1	*	*	*	*	*	*	*	*	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	1	—	—	—	—	—	—	—	—	—	—	—	—	1
Lobster–trap	1	—	—	—	—	—	—	—	—	1	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	1	1	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	1	—	—	—	—	—	—	—	—	1	—	—	—	—
Sea cucumber–dive	2	1	—	—	—	—	—	—	—	—	1	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	4	3	—	—	—	1	—	—	—	—	1	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

4.5. Dana Point

Dana Pont is located in Orange County, 65 miles north of San Diego and 59 miles south of Los Angeles (Norman et al. 2007). According to the 2010 U.S. Census, the population of Dana Point was 33,351 with a median age of 44.8 years. The estimated per capita income (2007-2011) was $51,431 with a mean household income of $119,230 (US Census Bureau 2010). Dana Point was later names after Richard Henry Dana Jr., a Boston lawyer who traveled to California via Cape Horn. In 1840 he published *Two Years before the Mast*, a journal of his voyage west. In this book he describes the Dana Point area as “the most romantic spot in the California coast” (Norman et al. 2007).

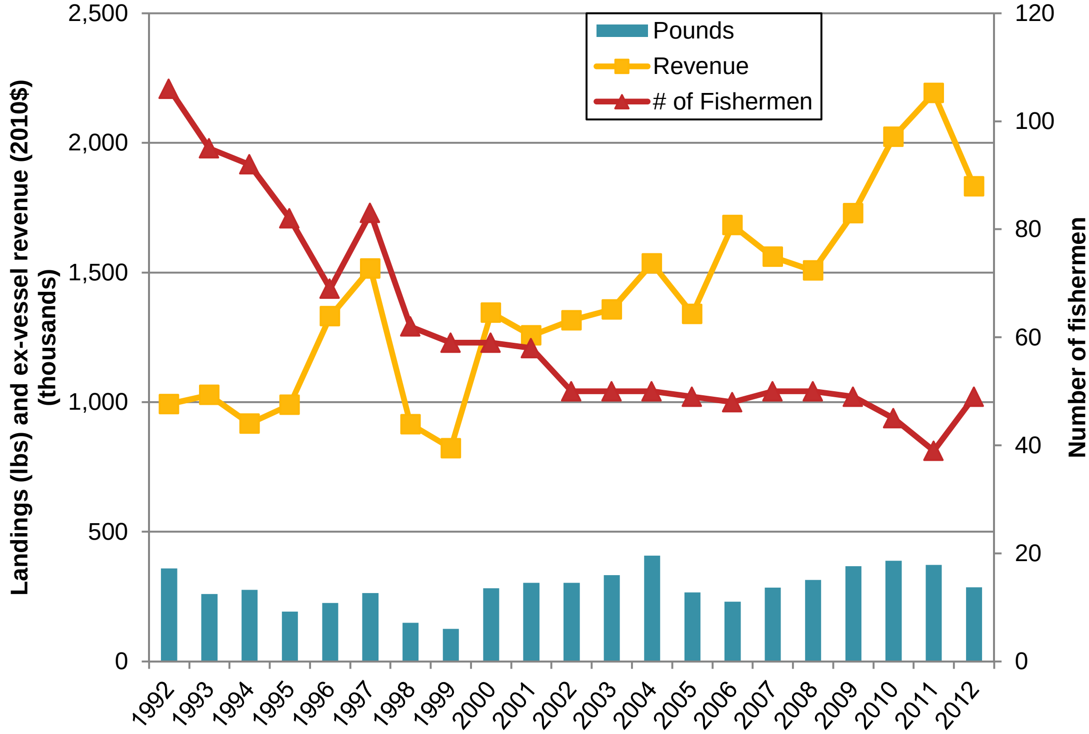
Modern day Dana Point is a tourist destination well known for its beaches and recreational activities. The Dana Point Harbor has two marinas with 2,500 slips the majority which are filled by recreational vessels Additional facilities include a fuel dock, shipyard, and launch ramp (Norman et al. 2007).

4.5.1. Dana Point Commercial Fisheries Initial Changes

Figure 225 displays the commercial landings, ex-vessel revenue, and number of fishermen for all fisheries in the South Coast port of Dana Point over the study period 1992–2012. Along with Oceanside, Dana Point was perhaps the smallest port in the South Coast region, in terms of contribution to total regional landings (0.1 percent on average annually) and ex-vessel revenue (1.9 percent). Total landings in the port remained relatively consistent over the study period, while ex-vessel revenue experienced an increase, from $992,603 in 1992, fishermen made nearly $2.2 million in 2011. The number of fishermen declined 53.8 percent overall, from a higher of106 in 1992 to a low of 39 by 2011; 2012 ended with 49 individual fishermen making landings at the port. The trend of declining numbers of fishermen simultaneous with increases in overall ex-vessel revenue indicate significant growth in the average ex-vessel revenue per fishermen overtime.

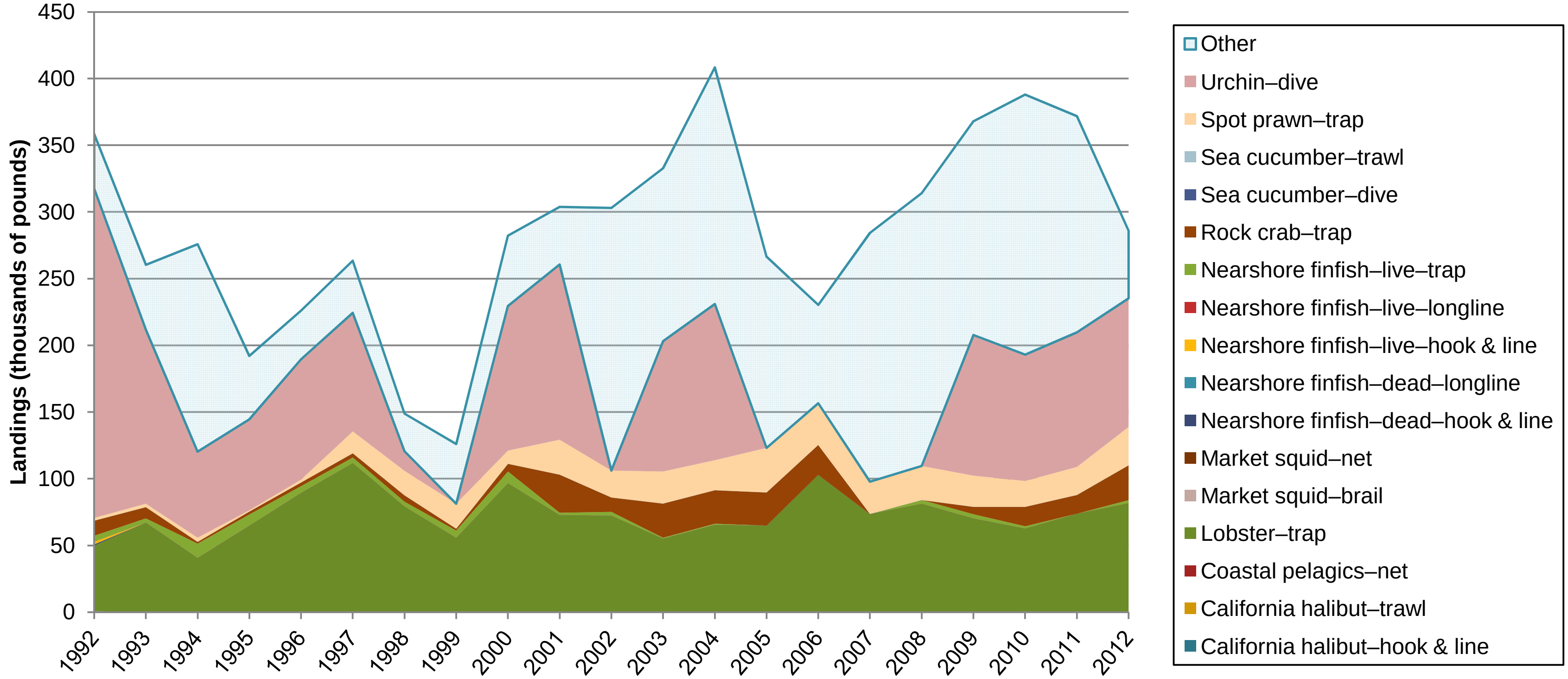
Figure 226 displays the landings and Figure 227 displays the ex-vessel revenue from fisheries of interest in the port of Dana Point over the study period of 1992–2012. While landings are relatively small in Dana Point as compared with other regional ports, commercial fishing in Dana Point tends to consist of the higher value fisheries: lobster–trap and spot prawn–trap specifically. While large amounts of urchin–dive were landed in Dana Point, 34.3 percent of total landings on average annually over the study period, ex-vessel revenue from that fishery constituted only 9.1 percent on average of port ex-vessel landings annually over time. Lobster–trap ex-vessel revenue, on the other hand, represented 54.9 percent of port totals, growing over time, and in 2012 accounted for 66.5 percent of total ex-vessel revenue in Dana Point. While other ports general saw a decline in contributions to landings and ex-vessel revenue from other fisheries outside the scope of the fisheries of interest of this report, the swordfish fishery in Dana Point remained relatively significant over time.

Figure 225. Dana Point total commercial landings, ex-vessel revenue, and number of fishermen, all fisheries, 1992–2012



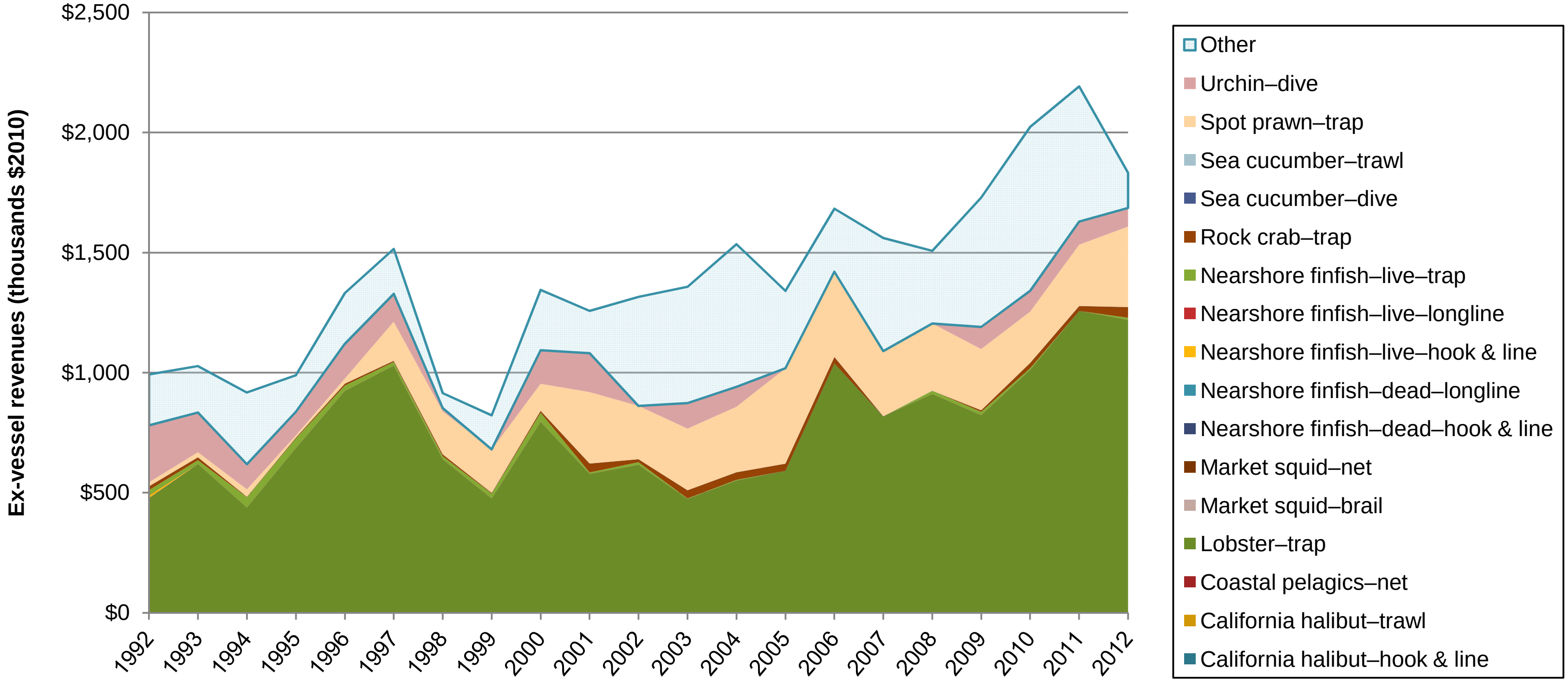
Source: Current study, based off landings data from CDFW.

Figure 226. Dana Point commercial landings for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

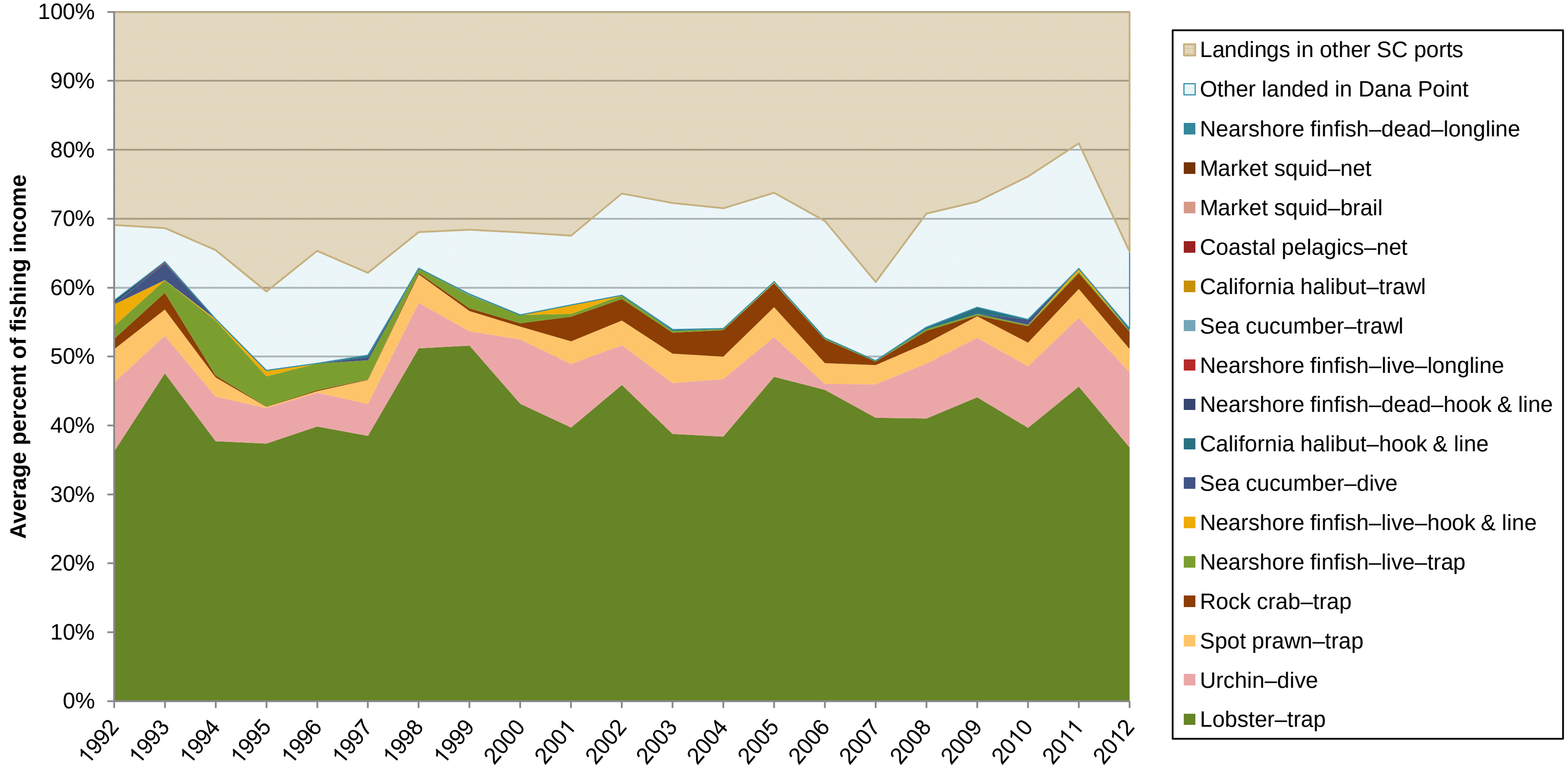
Figure 227. Dana Point commercial ex-vessel revenue for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 228 displays the average percent contribution to fishing income for those fishermen who made landings in Dana Point over the study period from the sixteen fisheries of interest, from other fisheries landed in Dana Point, and from landings made from all fisheries landed in other South Coast region ports. This figure shows reliance on a fishery but also on a given port. Fishermen making landings in Dana Point counted on the port for an annual average of 69 percent of their total fishing income from the South Coast over the study period. More notable in this port than any other was the reliance on the lobster–trap fishery, which constituted the vast majority of the average Dana Point fisherman’s fishing income, or 42.2 percent on average annually. Urchin–dive and spot prawn–trap ex-vessel revenue were significant as well to Dana Point fishermen.

Figure 228. Average percent of individual fishing income from commercial fisheries of interest, Dana Point, 1992–2012



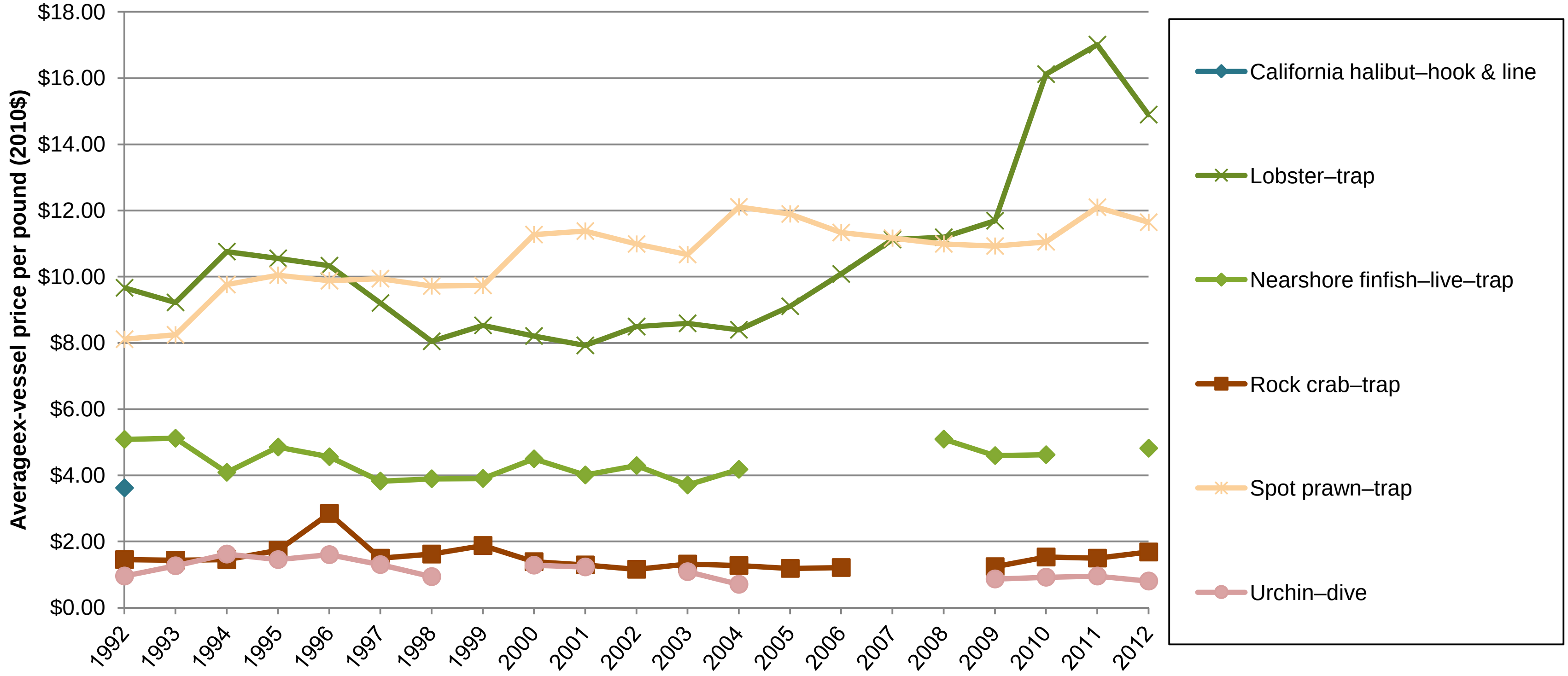
Source: Current study, based off landings data from CDFW.

Figure 229 displays the average ex-vessel prices over time for select fisheries of interest in Dana Point over the 1992–2012 study period. Due to the small size of this port, only a handful of select fisheries of interest are able to be displayed. Interestingly, spot prawn–trap, is one of the displayable fisheries, due to its significance Dana Point, despite being suppressed for confidentiality reasons in several larger South Coast ports. The spot prawn–trap average ex-vessel price started the study period at $8.11 per pound in 1992, peaked in 2004 at $12.11 per pound, and ended 2012 at $11.65 per pound, increasing by 43.6 percent overall. Lobster–trap peaked at $17.01 in this port in 2011. Nearshore finfish–live–trap remained relatively consistent, beginning at $5.08 in 1992 and finishing 2012 at $4.82 per pound on average. Rock crab–trap and urchin–dive fisheries both changed by approximately 15 percent from 1992 to 2012 in Dana Point, although an increase for the former and a decrease for the latter.

Figure 230 through Figure 237 display study period landings, ex-vessel revenue, and number of fishermen for select fisheries of interest in Dana Point, as well as averaged trends on the level of the individual fisherman. Some notable summary trends include the following:

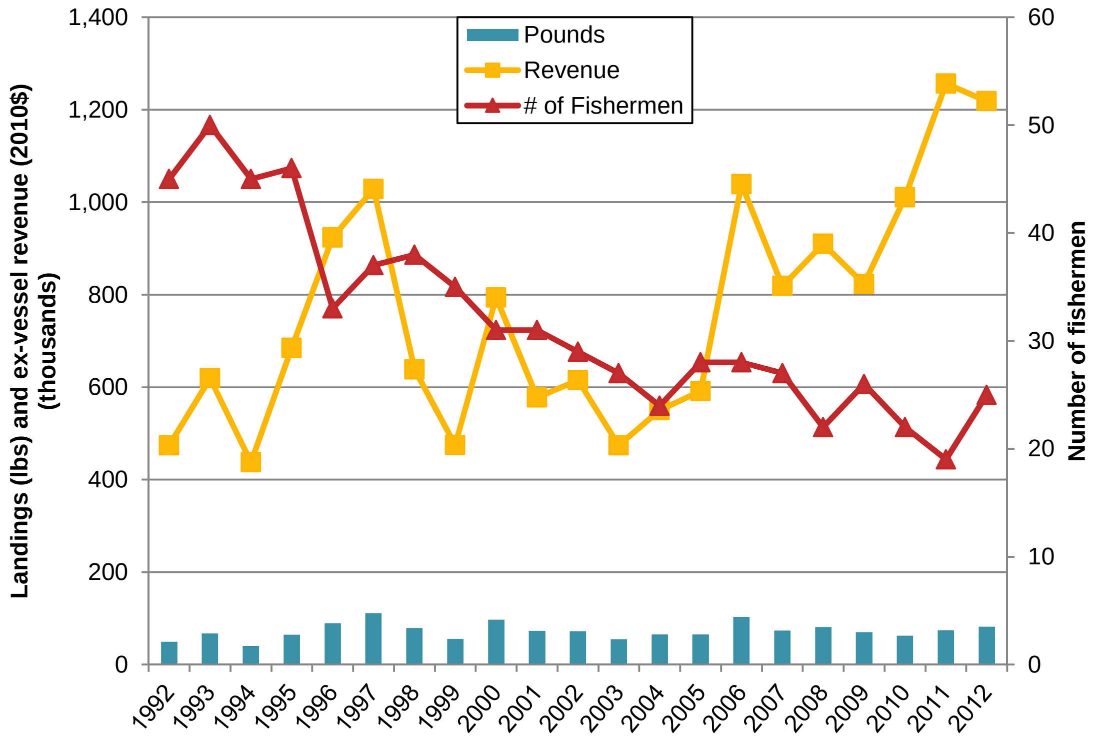
- Most select fisheries of interest for Dana Point experienced an overall increase in landings and ex-vessel revenue over the study period, 1992–2012, except for, notably, the urchin–dive fishery.
- Ex-vessel revenue from the lobster–trap fishery in Dana Point increased by 157 percent from 1992–2012 ($474,052 to $1.2 million), while landings increased 66.8 percent (from 49,031 pounds to 81,793 pounds). Peak landings occurred in 1997 at 111,756 pounds, and peak ex-vessel revenue occurred in 2011 at $1.3 million. The number of fishermen dropped by 44.4 percent in this fishery in this port over the study period, from 45 in 1992 to 25 by 2012.
- Peak landings, ex-vessel revenue, and number of fishermen occurred in the urchin–dive fishery in Dana Point at the beginning of the study period in 1992 at 247,031 pounds landed by 23 fishermen for a total of $236,384. Landings declined, increased again, but still ended the study period in 2012 lower than at the beginning, at 96,430 pounds for $78,028 in ex-vessel revenue landed by a total of 11 fishermen.
- The largest increase by far observed throughout fisheries of interest in Dana Point was in the spot prawn–trap fishery. These increases were observed despite the fact that the number of participating fishermen was highest at the beginning the study period in 1992 at 10 total and lowest in the last few years at about three total. Landings and ex-vessel revenue didn’t significantly start increasing until after a low occurring in 1995, when only 921 pounds were landed for $9,250 in ex-vessel revenue. Increases happened relatively quickly after that, peaking at 33,376 pounds landed for $397,047 in ex-vessel revenue by 2005, and have remained high until the end of the study period.

Figure 229. Average ex-vessel prices over time, select commercial fisheries of interest, Dana Point, 1992–2012



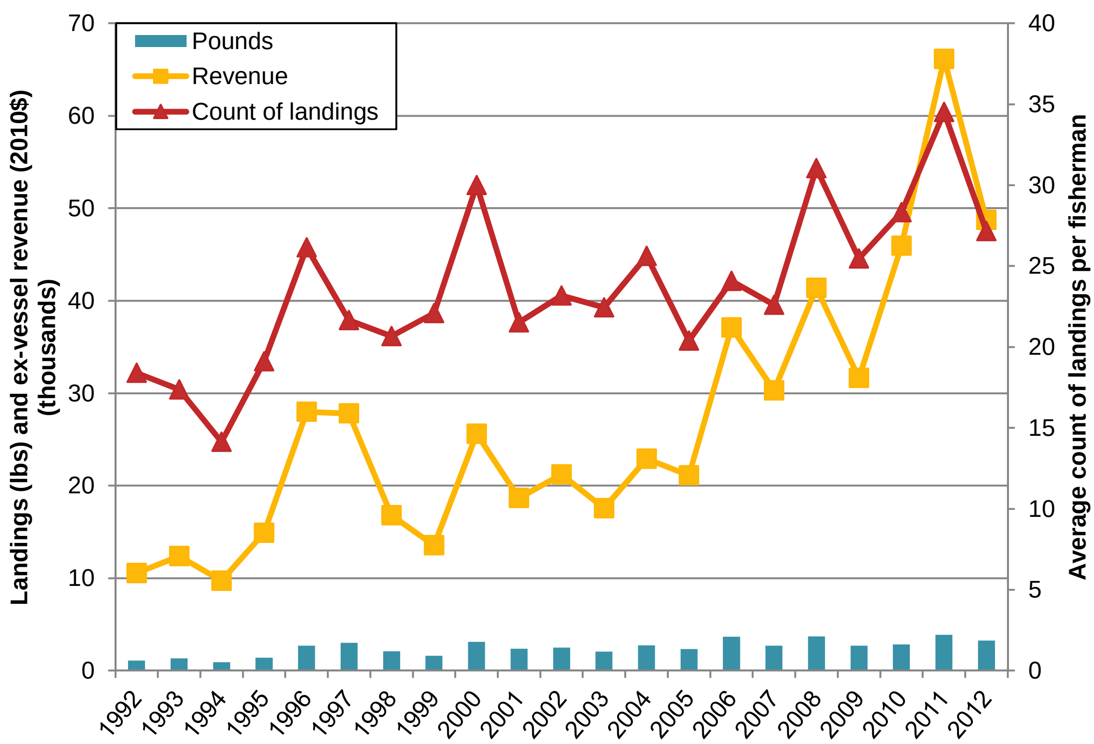
Source: Current study, based off landings data from CDFW.

Figure 230. Lobster–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Dana Point, 1992–2012



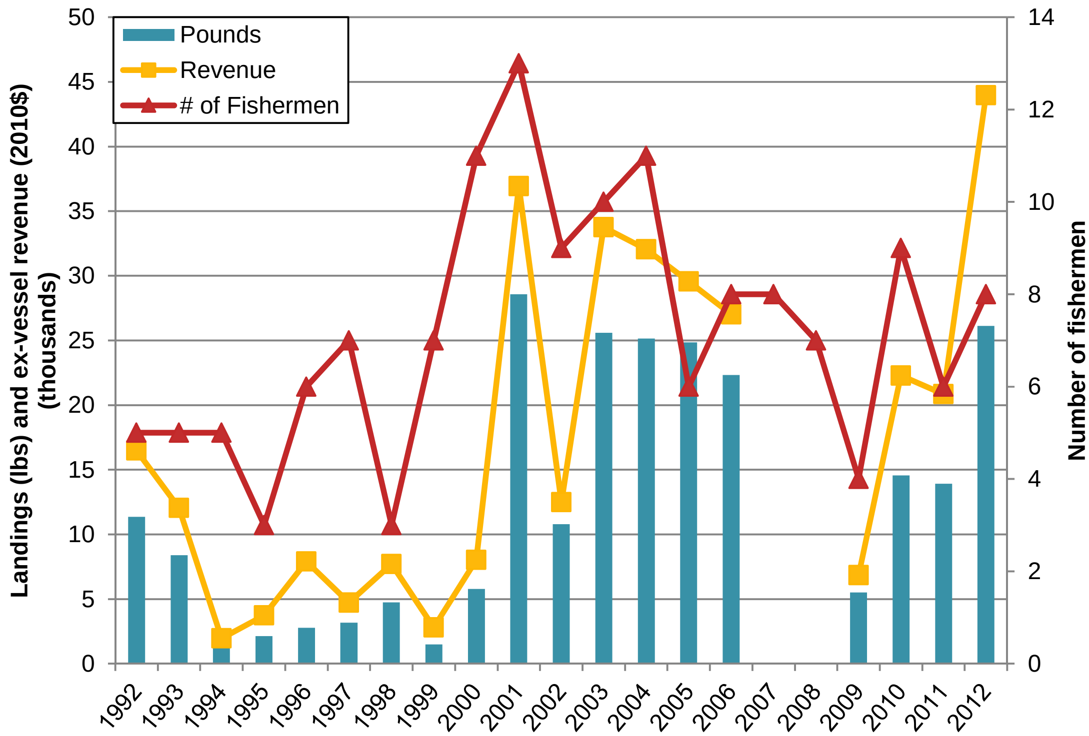
Source: Current study, based off landings data from CDFW.

Figure 231. Lobster–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Dana Point, 1992–2012



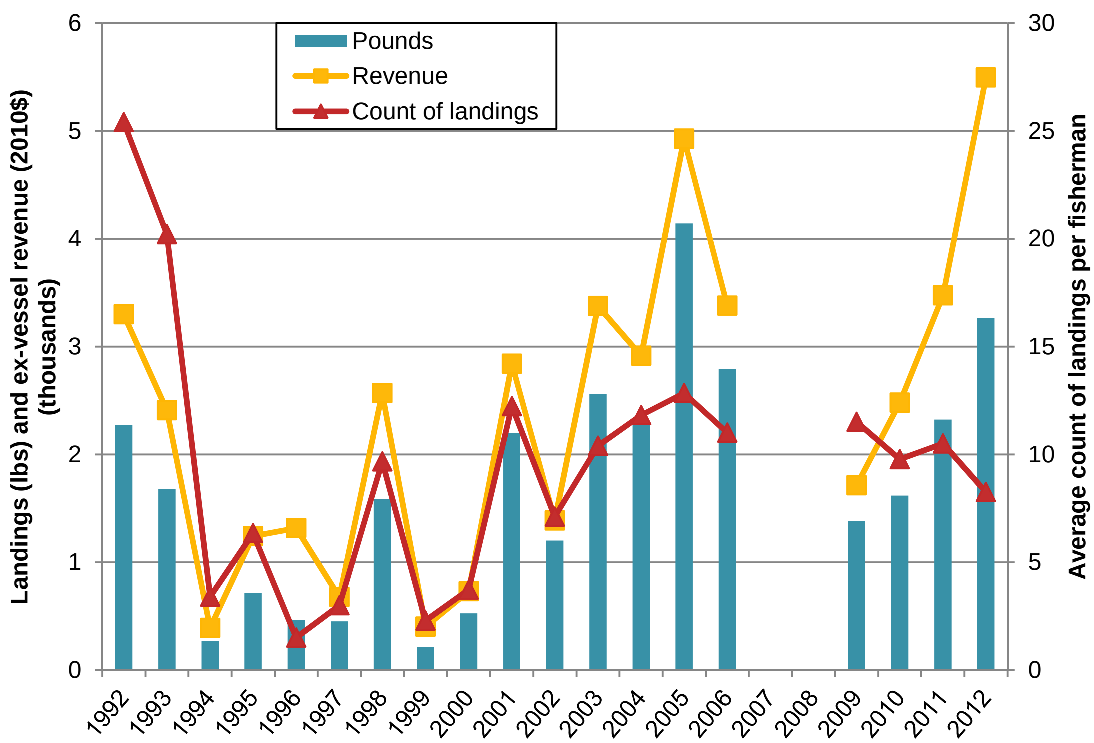
Source: Current study, based off landings data from CDFW.

Figure 232. Rock crab–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Dana Point, 1992–2012



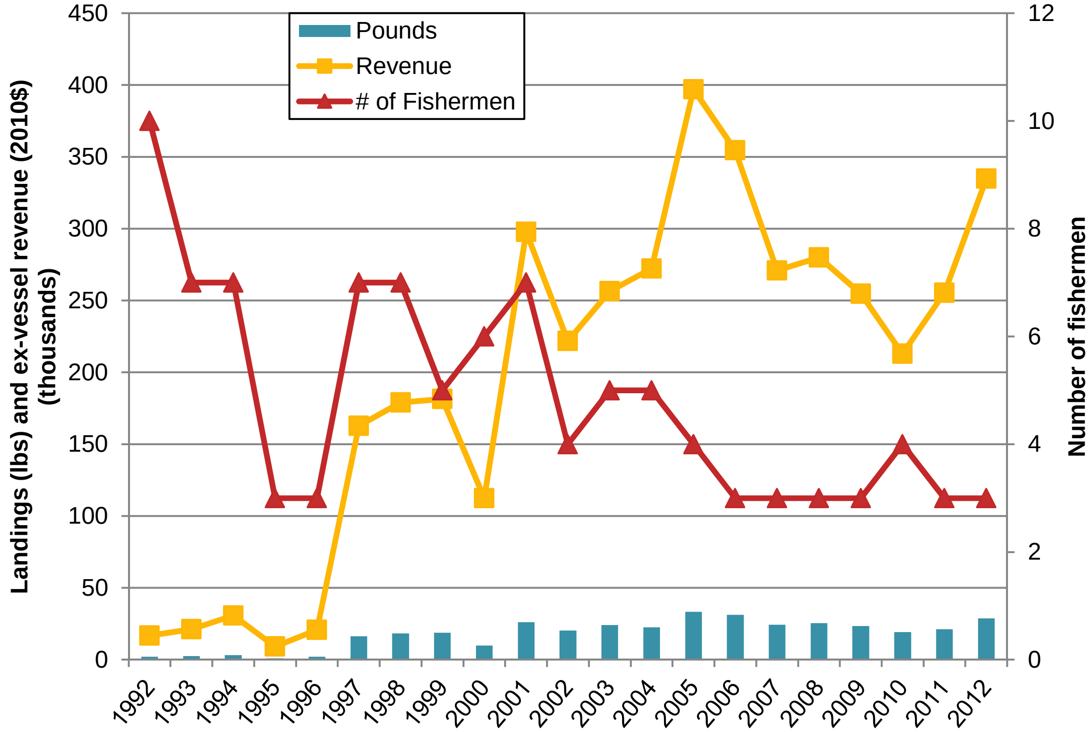
Source: Current study, based off landings data from CDFW.

Figure 233. Rock crab–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Dana Point, 1992–2012



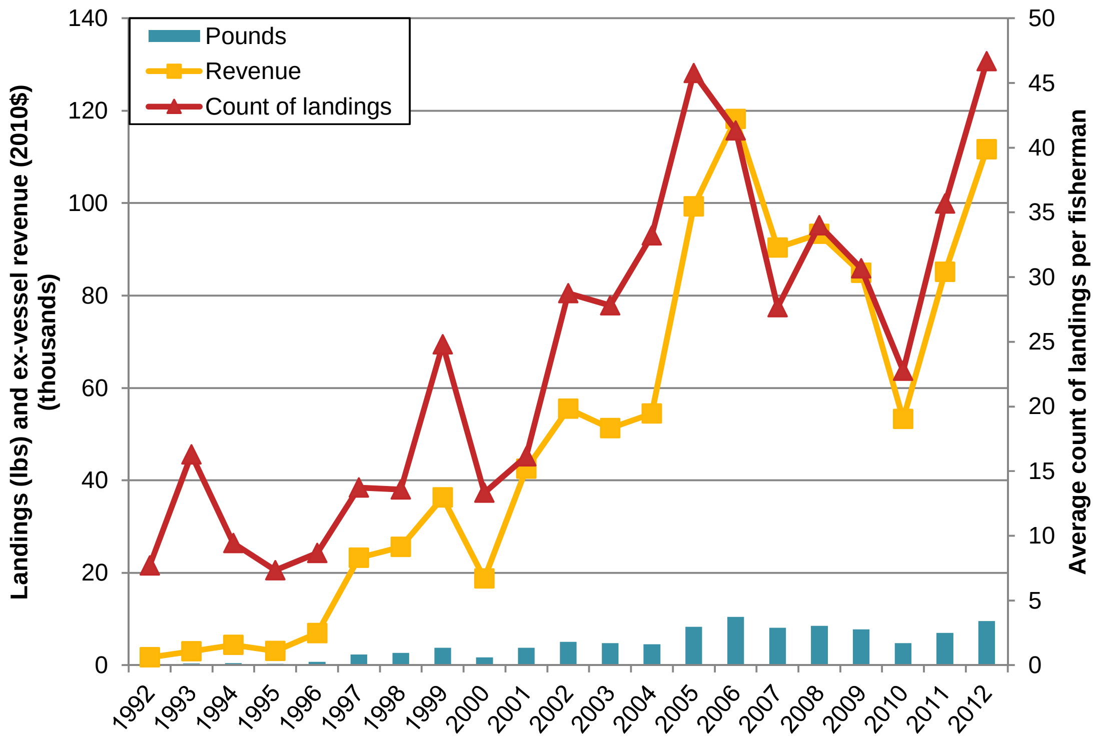
Source: Current study, based off landings data from CDFW.

Figure 234. Spot prawn–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Dana Point, 1992–2012



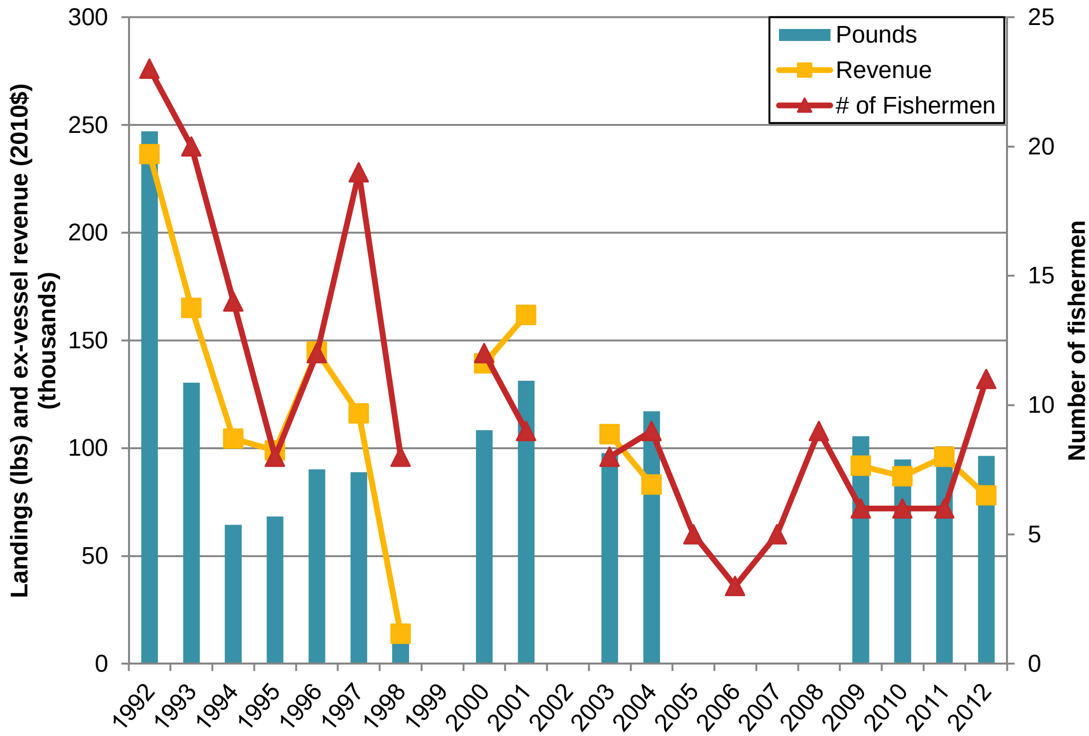
Source: Current study, based off landings data from CDFW.

Figure 235. Spot prawn–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Dana Point, 1992–2012



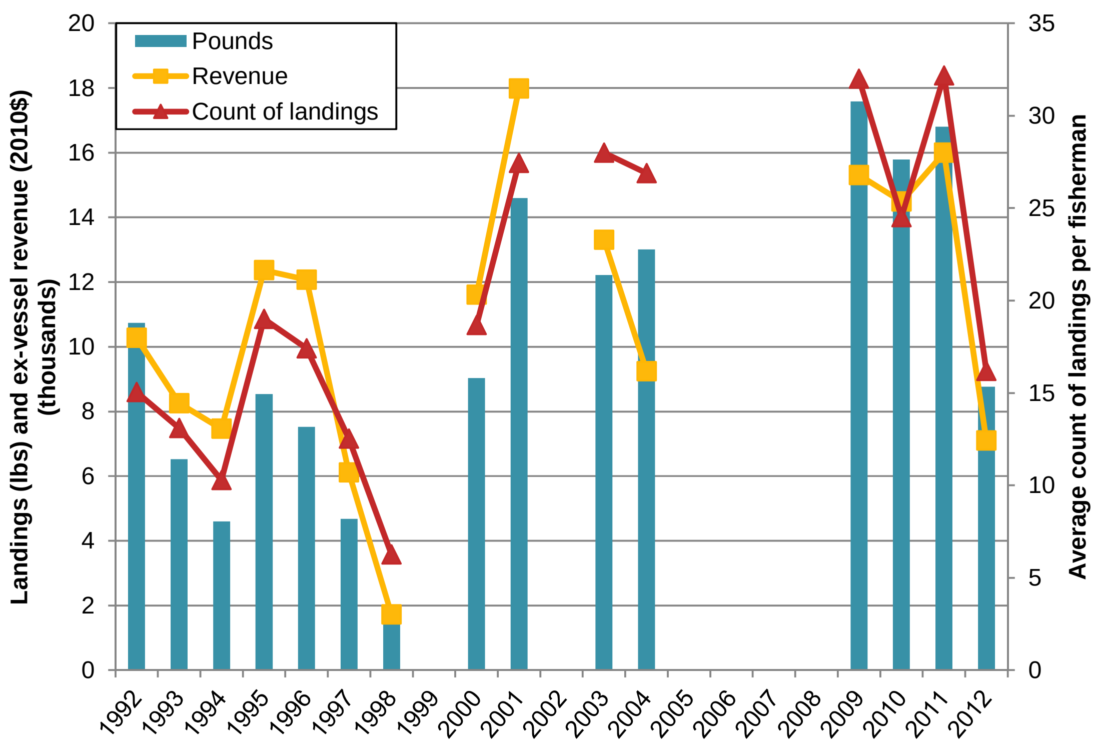
Source: Current study, based off landings data from CDFW.

Figure 236. Urchin–dive: Commercial landings, ex-vessel revenue, and number of fishermen, Dana Point, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 237. Urchin–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Dana Point, 1992–2012



Source: Current study, based off landings data from CDFW.

4.5.2. Dana Point Commercial Baseline Characterization

In 2012, 40 individuals made landings in one or more of the target interview fisheries in Dana Point. Combined, they generated $1,675,572 in ex-vessel revenue, which is 2.1 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the landings in this port in 2012 came from the lobster—trap fishery (72.7 percent). We interviewed 9 fishermen from Dana Point (Table 264).

Table 264. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Dana Point

Fishery	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
California halibut–hook & line	$146	1	—
California halibut–trawl	$0	0	—
Coastal pelagics–net	$0	0	—
Lobster–trap	$1,218,510	25	9
Market squid–brail	$0	0	—
Market squid–net	$0	0	—
Nearshore finfish live–fixed gear	$0	0	1
Rock crab–trap	$43,963	8	1
Sea cucumber–dive	$0	0	—
Sea cucumber–trawl	$0	0	—
Spot prawn–trap	$334,924	3	—
Urchin–dive	$78,028	11	—
Unique individuals	$1,675,572	40	9

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The average Dana Point fisherman that we interviewed was 54.1 years old and had an average of 28.4 years of experience as a commercial fisherman (Table 265). It should be noted that this question inquired about the number of years of experience an individual had commercial fishing as a whole, not the number of years of experience they had in a specific fishery. Additionally, Dana Point fishermen on average made 76.1 percent of their total personal income from commercial fishing in 2012, an average decrease of 10 percent since 2008. Dana Point fishermen remained below the regional average for percent income from commercial fishing for 2012, as they were in 2008. It should be noted that 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust. As shown in Table 266, all fisheries displayed or calculated experienced a decrease in average percent income from 2008 to 2012.

Table 265. Average age and years of experience commercial fishing in 2012, Dana Point

	Age			Years of experience		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	9	54.1	14.8	9	28.4	15.4
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	1	*	*
Rock crab–trap	1	*	*	1	*	*
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—
All target fisheries (unique individuals)	9	54.1	14.8	9	28.4	15.4

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 266. Percent change in income from overall commercial fishing from 2008 - 2012, Dana Point

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	10	83.0%	31.2%	9	76.1%	29.3%	-8.3%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	2	100.0%	0.0%	1	*	*	*
Rock crab–trap	4	100.0%	0.0%	1	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	4	100.0%	0.0%	—	—	—	—
Urchin–dive	3	93.3%	11.5%	—	—	—	—
All target fisheries (unique individuals)	11	84.5%	30.0%	9	76.1%	29.3%	-10.0%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher. As shown below in Table 267, the majority of respondents in the lobster—trap fishery perceived no change (62.5 percent), and a few perceived a somewhat lower percent (37.5 percent) of personal income coming from commercial fishing between 2008 and 2012.

Table 267. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Dana Point

		Percent response				
Fisheries	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	8	—	—	62.5%	37.5%	—
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*
Rock crab–trap	1	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—
All fisheries (unique individuals)	8	—	—	62.5%	37.5%	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their income coming from commercial fishing. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Table 268 lists the reason for the change as well as the number for each fishery. The most common reason for the perceived decrease in percent personal income from commercial fishing was more revenue from other income sources.

Table 268. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Dana Point

		Responses indicating increase								Responses indicating decrease					
Fishery	**Number of individuals responding**	A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	3	—	—	—	—	—	—	—	—	—	1	—	2	—	1
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	3	—	—	—	—	—	—	—	—	—	1	—	2	—	1

Source: Current study
— indicates that the port/fishery was not sampled or a zero value data point
** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

In interviews, fishermen were asked what percent of their gross economic revenue (GER) went towards their overall commercial fishing operating costs. In Table 269 below, we compare the average responses that were given in a 2008 study conducted by Point 97/Ecotrust (Scholz et al. 2010) to that gathered in this study (2012). As noted previously the responses given in the 2008 study were based on fishermen's cumulative fishing experience—not necessarily specific to the year they were interviewed. Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years. Overall, Dana Point fishermen reported that in 2012 on average 48.4 percent of their gross economic revenue was spent on operating costs, which is 3.1 percent more than the average reported in 2008. We emphasize that this question is asked about overall commercial fishing operating costs across all fisheries for a particular fisherman.

Table 269. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Dana Point

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	9	47.6%	15.2%	9	48.4%	17.0%	1.9%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	50.0%	—	1	*	*	*
Rock crab–trap	3	47.7%	13.7%	1	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	3	44.3%	9.8%	—	—	—	—
Urchin–dive	3	44.0%	15.1%	—	—	—	—
All target fisheries (unique individuals)	10	47.0%	14.5%	9	48.4%	17.0%	3.1%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 270. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, Dana Point

		Percent response				
Fisheries	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	9	22.2%	55.6%	11.1%	11.1%	—
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*
Rock crab–trap	1	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—
All fisheries (unique individuals)	9	22.2%	55.6%	11.1%	11.1%	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were asked their perceptions of if the percent of their overall commercial fishing gross economic revenue that went toward overall operating costs has changed since 2008, which is shown in Table 270. Generally between 2008 and 2012 there was a slight increase in 3.1% in the percent of gross revenue used for operating cost, which generally aligns with fisherman perceptions in which 55.6% responded that the percent of gross revenue to operating costs are somewhat higher. In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their gross economic revenue going towards operating costs. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Similar to the region, in San Pedro/Los Angeles, the most frequently reported reason for increasing operating costs was the increased cost of fuel, followed by general increases in costs of goods and labor (Table 271).

Table 271. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Dana Point

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	8	6	3	—	4	—	—	—	2	—	—	—	1	—	—	—	—	1
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	8	6	3	—	4	—	—	—	2	—	—	—	1	—	—	—	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

We asked fishermen how many years of experience and how many days they spent targeting each of the fisheries in which they participated. As indicated in Table 272, lobster—trap fishermen have been fishing the longest, on average 28.1 years, and spent 115.6 days targeting their fishery.

Table 272. Years of experience and number of days targeting specific fisheries in 2012, Dana Point

	Years of experience in fishery			Number of days targeting fishery in 2012		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	9	28.1	13.8	9	115.6	34.0
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	1	*	*
Rock crab–trap	1	*	*	1	*	*
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Fishermen were also asked how many crew they used for each fishery and what percent of their gross economic revenue was spent on their crew. Dana Point respondents in the lobster—trap fishery used on average one crew member, and spent on average 10.2 percent of revenue on crew. The lobster—trap fishermen also spent 16.4 percent of gross economic revenue on fuel, as reported in Table 273.

Table 273. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Dana Point

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation
California halibut–hook & line	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—
Lobster–trap	9	1	1	9	10.2%	10.6%	9	16.4%	13.6%
Market squid–brail	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	1	*	*	1	*	*
Rock crab–trap	1	*	*	1	*	*	1	*	*
Sea cucumber–dive	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Fishermen were asked separately for each fishery they participated in to compare his/her success in the fishery in 2012 to that of the last ten years. As shown in Table 274 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishery. This question was asked as an open ended question and responses were later coded and categorized into positive and negative environmental factors (Table 275), economic factors (Table 276), regulatory factors (Table 277), and other factors (Table 278).

In the lobster—trap fishery of Dana Point, the majority of respondents thought that their overall success in the fishery was somewhat worse (37.5 percent) or significantly worse (37.5 percent) in 2012 when compared to 2008. The most commonly cited negative influence was MPAs or other closures (Table 277).

Table 274. Overall success in specific commercial fishery, 2012 compared to previous ten years, Dana Point

		Percent response					
Fisheries	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	8	—	12.5%	—	12.5%	37.5%	37.5%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*
Rock crab–trap	1	*	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 275. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Dana Point

		Positive					Negative				
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	4	1	—	—	—	—	1	—	1	—	1
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 276. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Dana Point

		Positive			Negative			
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
California halibut–hook & line	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—
Lobster–trap	1	1	—	1	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 277. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Dana Point

		Negative					
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	4	—	—	3	1	—	—
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. lack of management
	F. Quota met early

Table 278. Other changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Dana Point

		Positive						Negative						
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	2	—	—	—	—	—	—	—	1	2	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

4.6. Oceanside

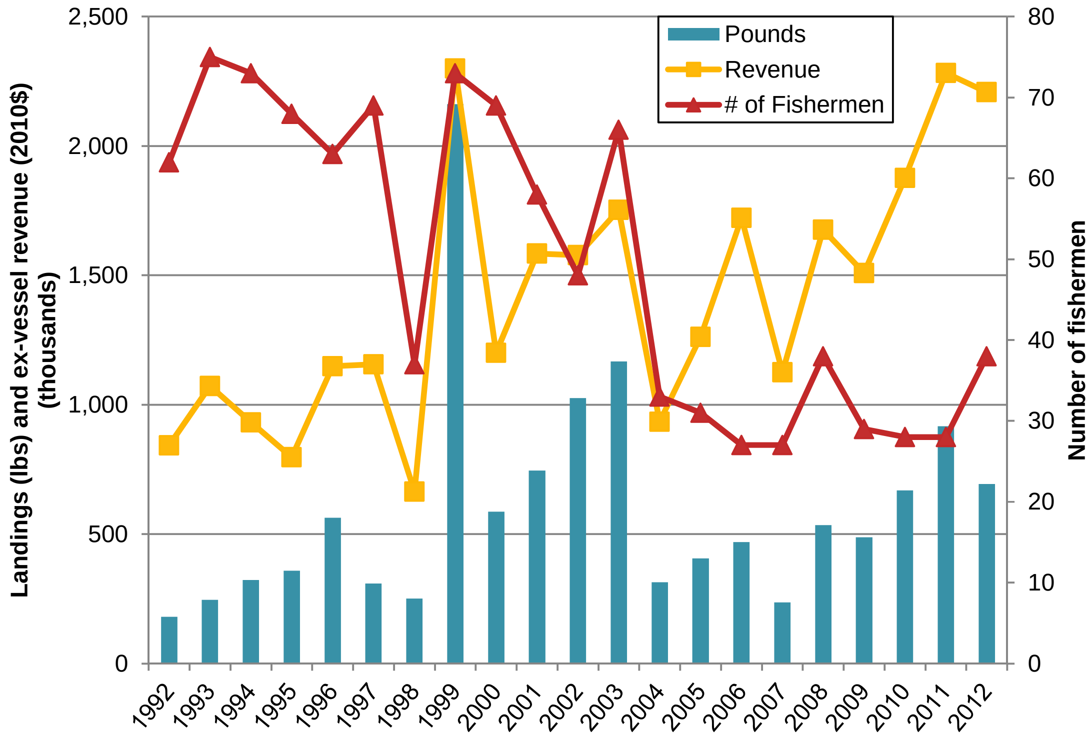
Oceanside is the northernmost city in San Diego County, located roughly 35 miles north of San Diego and 83 miles South of Los Angeles (City of Oceanside, 2013). According to the 2010 Census, the population of Oceanside was 167,086 with a median age of 35.2 years. The estimated per capita income (2007-2011) was $27,674 with a mean household income of $ 76,492 (US Census Bureau, 2010). Oceanside has a small commercial fishing fleet but is still one of the four main commercial harbors in the San Diego area. Oceanside has over 900 permanent slips and 50 transient slip, all of which maintain a high occupancy rate. Additional facilities at Oceanside Harbor include a fuel dock, launch ramp and bait receiver (San Diego Coast Life, 2013).

4.6.1. Oceanside Commercial Fisheries Initial Changes

Figure 238 displays the commercial landings, ex-vessel revenue, and number of fishermen for all fisheries in the South Coast port of Oceanside over the study period 1992–2012. Alongside Dana Point, this port was one of the smallest in the South Coast region in terms of total contributions to regional landings (0.2 percent on average annually) and ex-vessel revenue (1.9 percent). Oceanside, however, experienced larger increases in the port's total landings and ex-vessel revenue over the study period. Landings in 1992 were at their lowest observed level, 181,456 pounds, and increased 282.1 percent by 2012 to 693,333. Ex-vessel revenue increased also, by slightly less though, from $843,089 in 1992 to upwards of $2.2 million by 2012. In 1999 landings and ex-vessel revenue were exceptionally high, peaking at 2.2 million pounds for $2.3 in ex-vessel revenue.

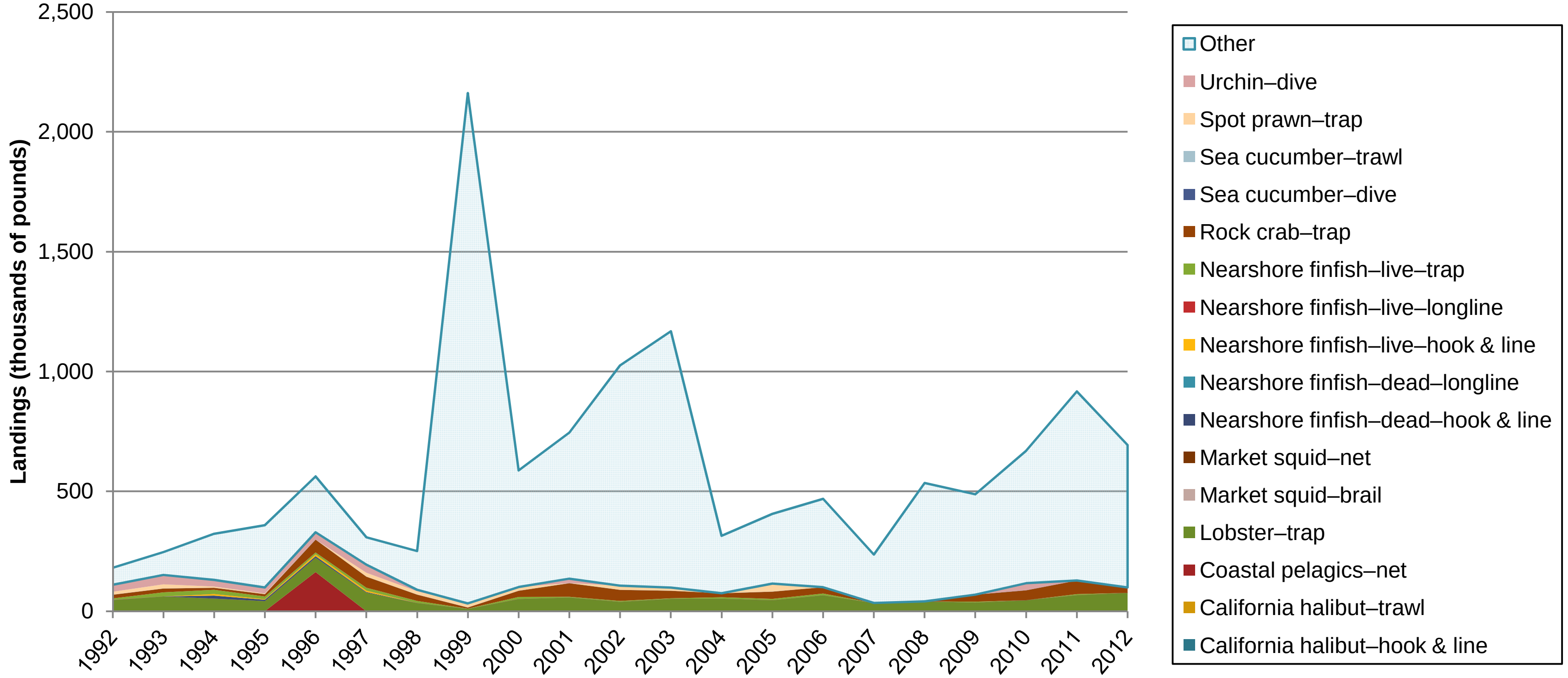
Figure 239 displays the landings and Figure 240 displays the ex-vessel revenue from fisheries of interest in the port of Oceanside over the study period of 1992–2012. Landings and ex-vessel revenue made in 'other' fisheries outside the fisheries of interest noted for this report were prevalent in Oceanside, the swordfish and tuna fisheries were constant contributors, but also small landings made across a variety of distinct fisheries were common in this port. The tuna fishery, hook & line and then longline, was specifically responsible for the major increases in landings and ex-vessel revenue observed in Oceanside in 1999. Of fisheries of interest, the lobster–trap fisher accounted for approximately 11.9 percent of landings and 38.4 percent of ex-vessel revenue on average annually. While information for the last seven years from the spot prawn–trap fisher was confidentially suppressed due to declining numbers of fishermen in that fishery were also notable, reaching as high as 24.7 percent of total port ex-vessel revenue in 2005.

Figure 238. Oceanside total commercial landings, ex-vessel revenue, and number of fishermen, all fisheries, 1992–2012



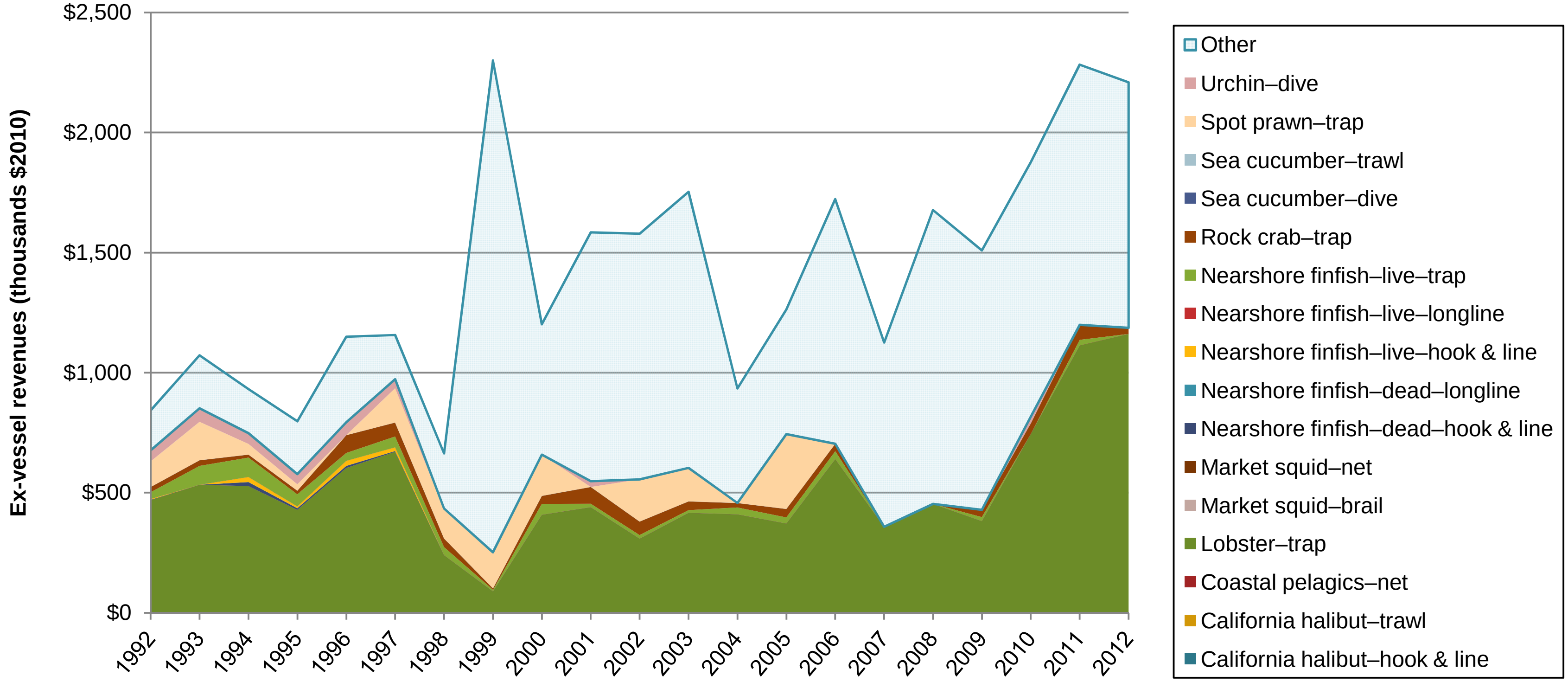
Source: Current study, based off landings data from CDFW.

Figure 239. Oceanside commercial landings for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

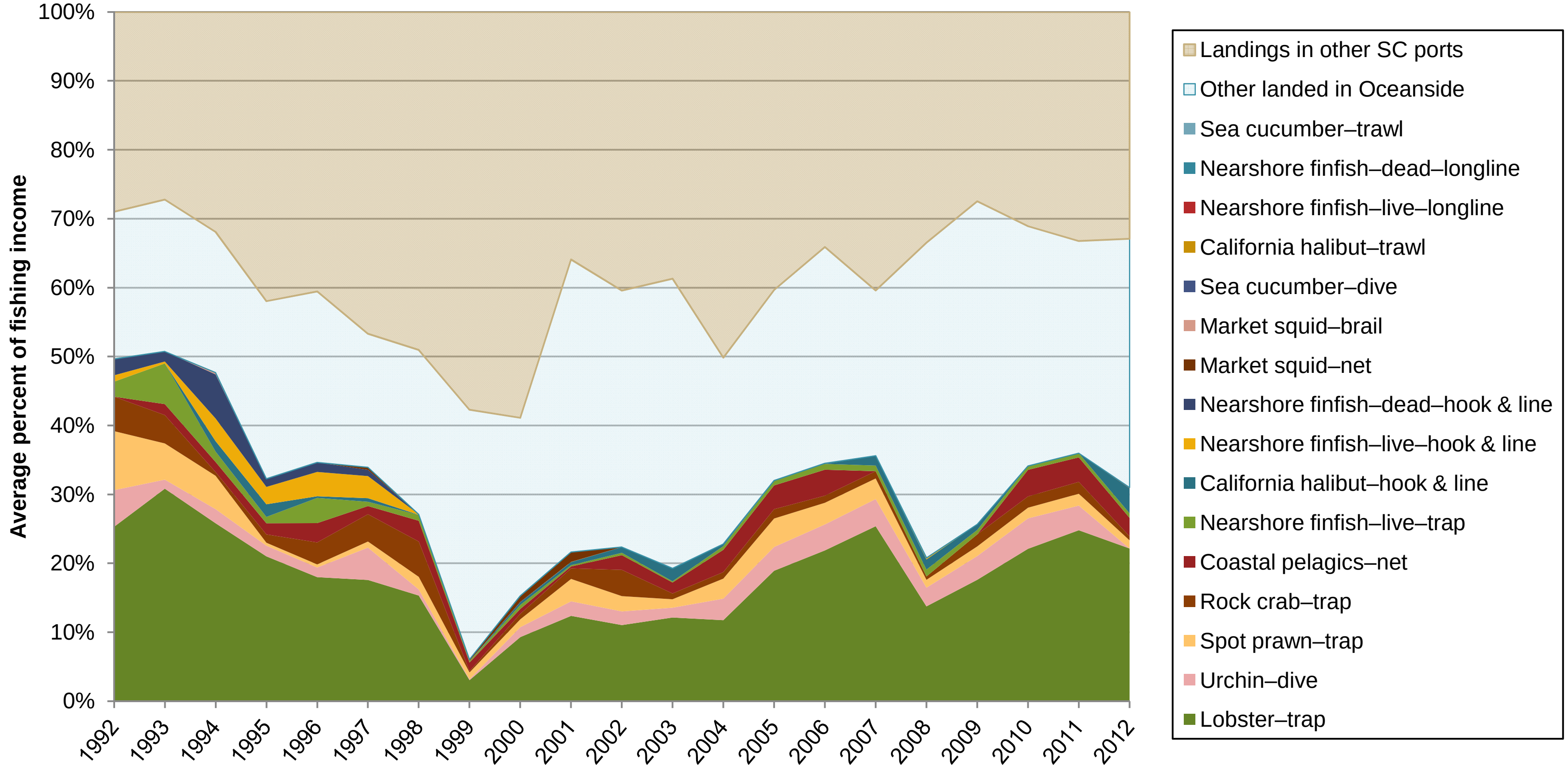
Figure 240. Oceanside commercial ex-vessel revenue for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 241 displays the average percent contribution to fishing income for those fishermen who made landings in Oceanside over the study period from the sixteen fisheries of interest, from other fisheries landed in Oceanside, and from landings made from all fisheries landed in other South Coast region ports. This figure shows reliance on a fishery but also on a given port. Fishermen landing in Oceanside made approximately 60.9 percent of their total South Coast fishing income from Oceanside ex-vessel revenue on average. The lobster–trap fishery was significant here too, like Dana Point, but not by as much – constituting 18.1 percent of the average fisherman's total South Coast fishing income. Notable is the lack of significance from ex-vessel revenue made in the urchin–dive fishery to Oceanside fishermen, the lowest in the region despite the regional significance of this fishery. Indeed, this port had the lowest participation in the urchin–dive fishery across the region.

Figure 241. Average percent of individual fishing income from commercial fisheries of interest, Oceanside, 1992–2012



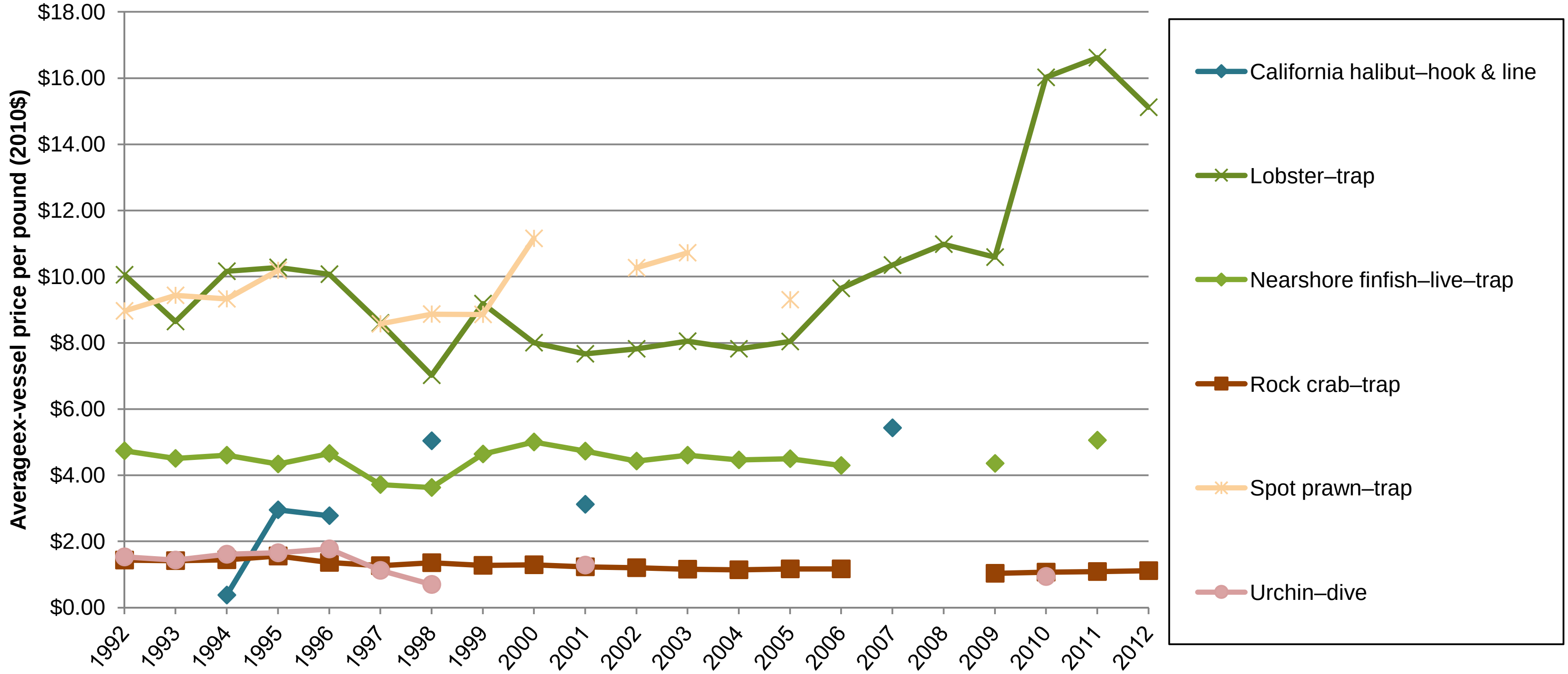
Source: Current study, based off landings data from CDFW.

Figure 242 displays the average ex-vessel prices over time for select fisheries of interest in Oceanside over the 1992–2012 study period. In Oceanside, the lobster–trap fishery was again the highest average ex-vessel price per pound, alongside spot prawn–trap, peaking slightly lower than in other South Coast ports though, at $16.62 in 2011. Like Dana Point, only a handful of select fisheries of interest are able to be displayed due to the small size of this port. From the available landings data for the California halibut–hook & line fishery in this port, the average ex-vessel price appears to have been increasing over the study period, beginning 1994 at $0.38 per pound and ending at $5.43 in 2007, the last year with available data. The average ex-vessel price per pound in the rock crab–trap fishery declined 22.5 percent from $1.44 in 1992 to $1.12 by 2012; the urchin–dive fisher also declined over this time.

Figure 243 through Figure 250 display study period landings, ex-vessel revenue, and number of fishermen for select fisheries of interest in Oceanside, as well as averaged trends on the level of the individual fisherman.
Although, due to the small size of this port, much data has been confidentially suppressed, some notable summary trends include the following:

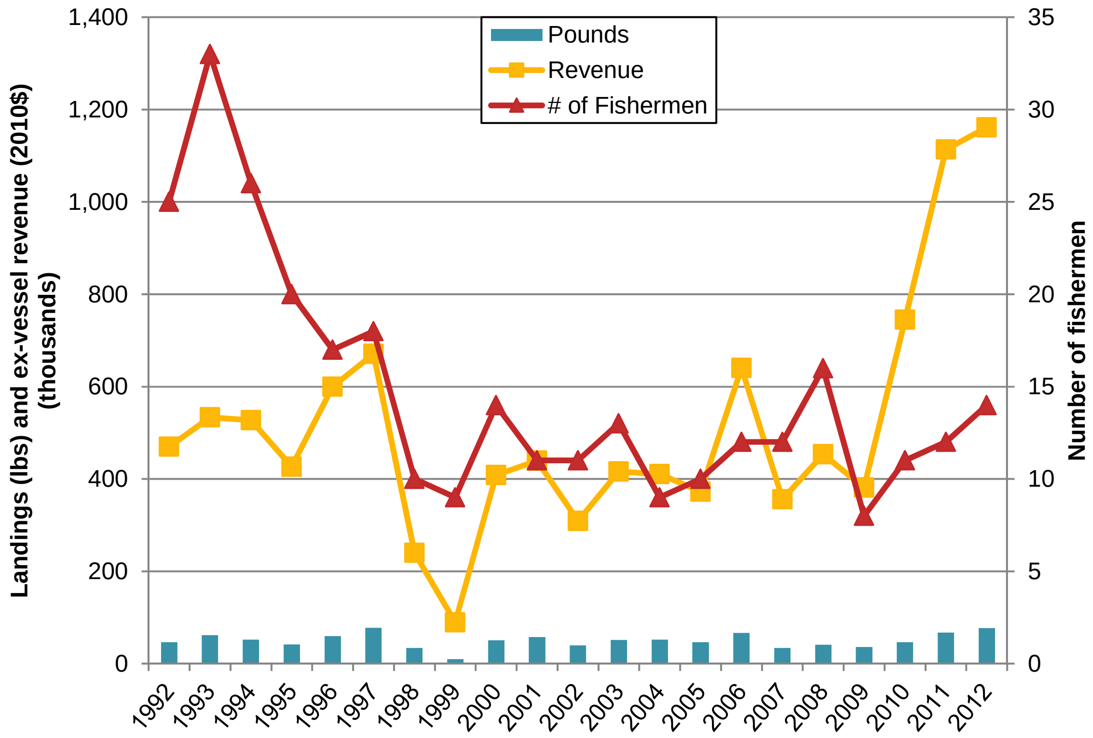
- Ex-vessel revenue in Oceanside's lobster–trap fishery have increased by 147.2 percent over the study period, from $469,788 to $1.2 million by 2012. Landings increased by 64.4 percent, while the number of fishermen dropped by 44 percent over the same time period.
- Aside from 1999, when large tuna landings were achieved in Oceanside, the lobster–trap fishery has steadily constituted approximately a quarter to over a half of this port's total ex-vessel revenue. The average Oceanside lobster–trap fisherman landed 33 times over the year of 2012, landing a total of 5,487 pounds for a total of $82,959 in ex-vessel revenue for that year.

Figure 242. Average ex-vessel prices over time, select commercial fisheries of interest, Oceanside, 1992–2012



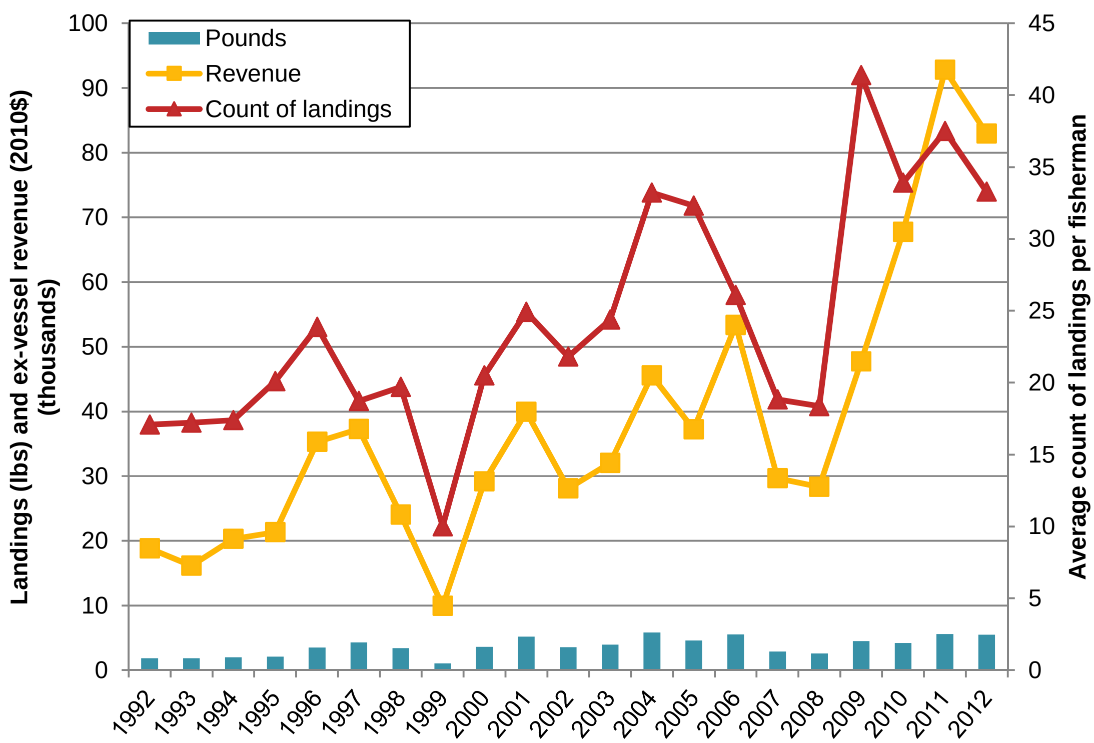
Source: Current study, based off landings data from CDFW.

Figure 243. Lobster–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Oceanside, 1992–2012



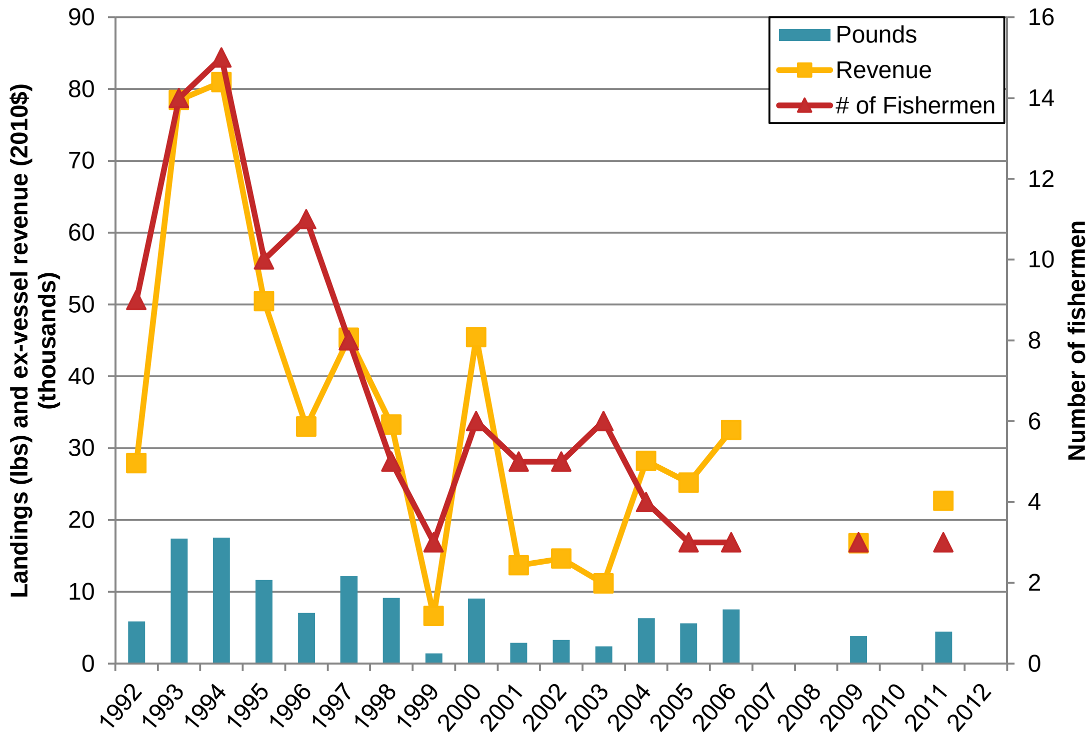
Source: Current study, based off landings data from CDFW.

Figure 244. Lobster–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Oceanside, 1992–2012



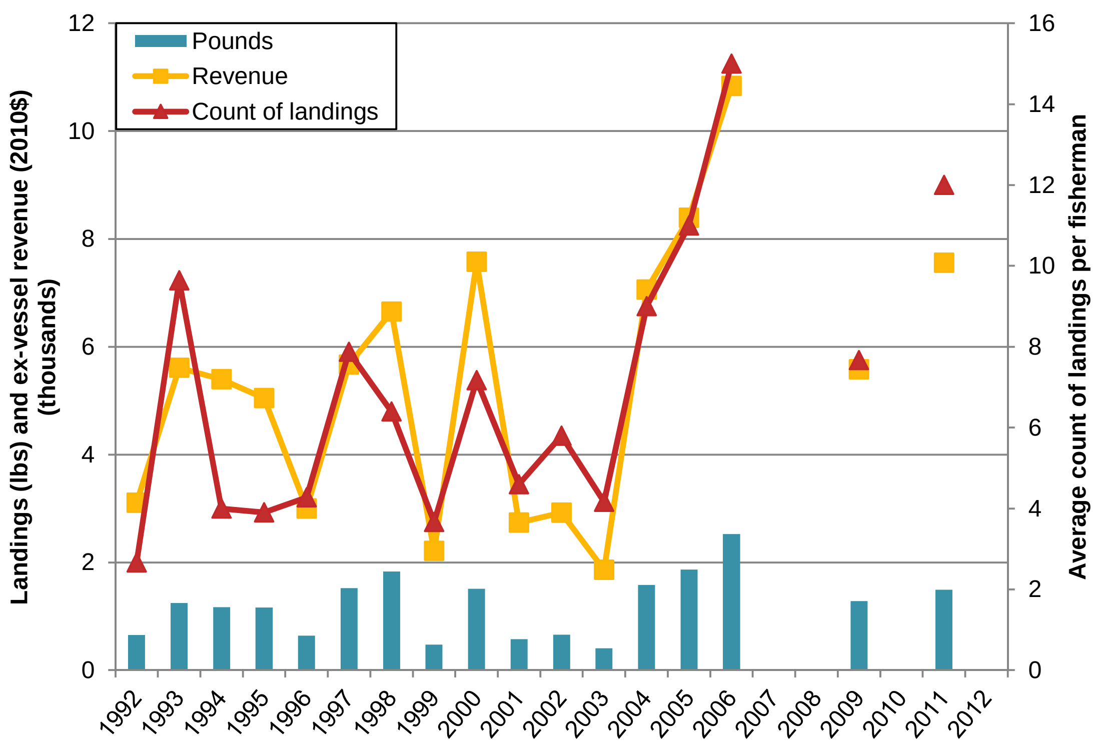
Source: Current study, based off landings data from CDFW.

Figure 245. Nearshore finfish–live–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Oceanside, 1992–2012



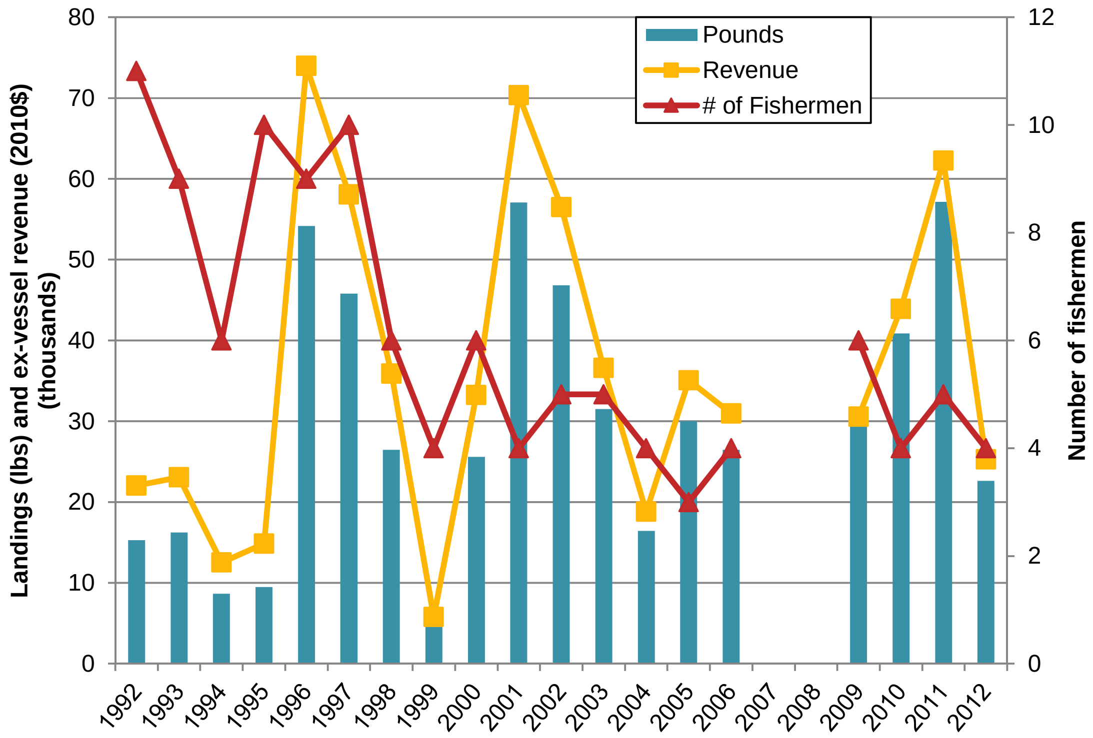
Source: Current study, based off landings data from CDFW.

Figure 246. Nearshore finfish–live–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Oceanside, 1992–2012



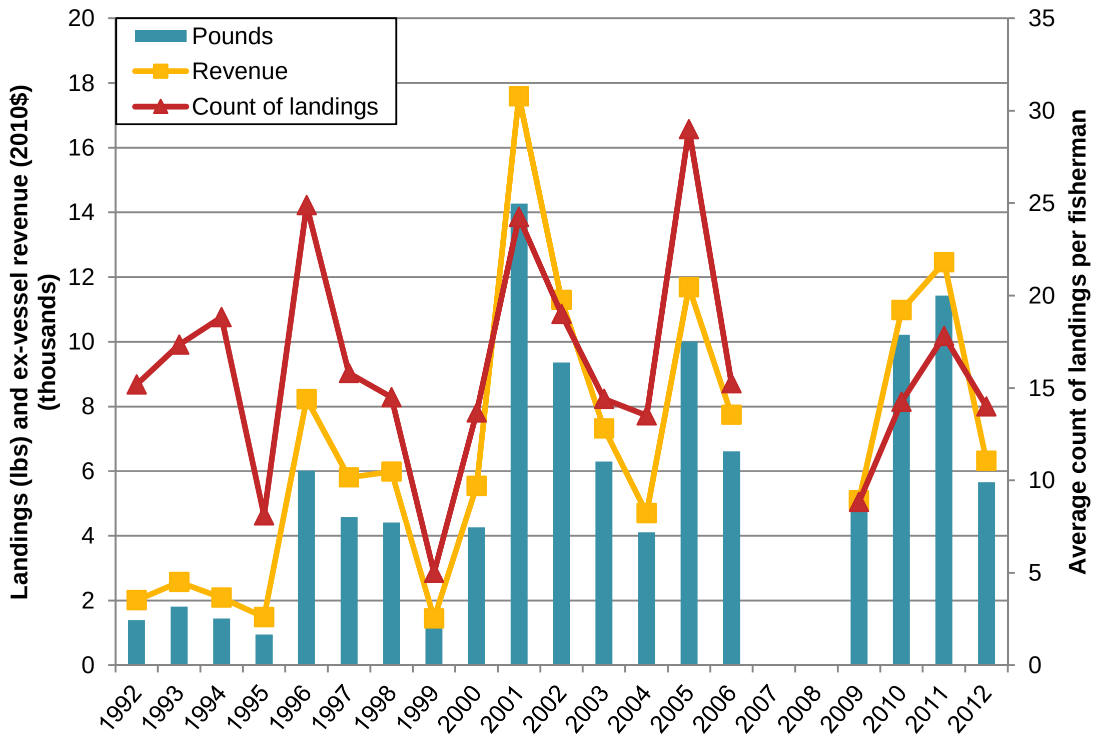
Source: Current study, based off landings data from CDFW.

Figure 247. Rock crab–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Oceanside, 1992–2012



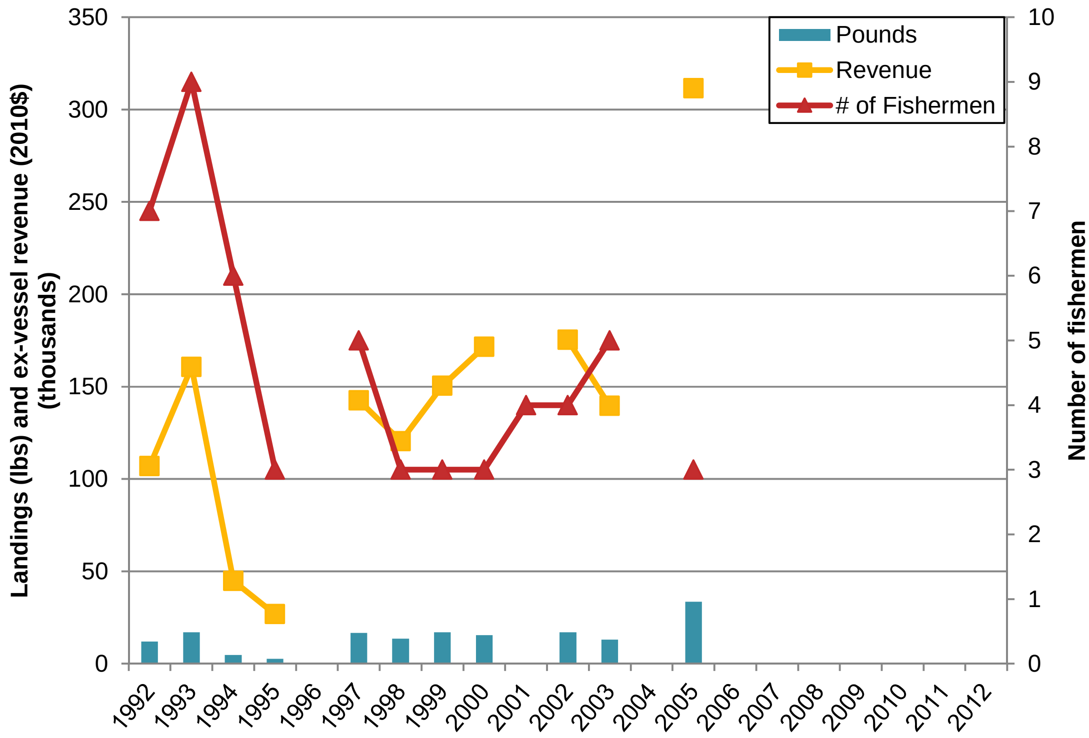
Source: Current study, based off landings data from CDFW.

Figure 248. Rock crab–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Oceanside, 1992–2012



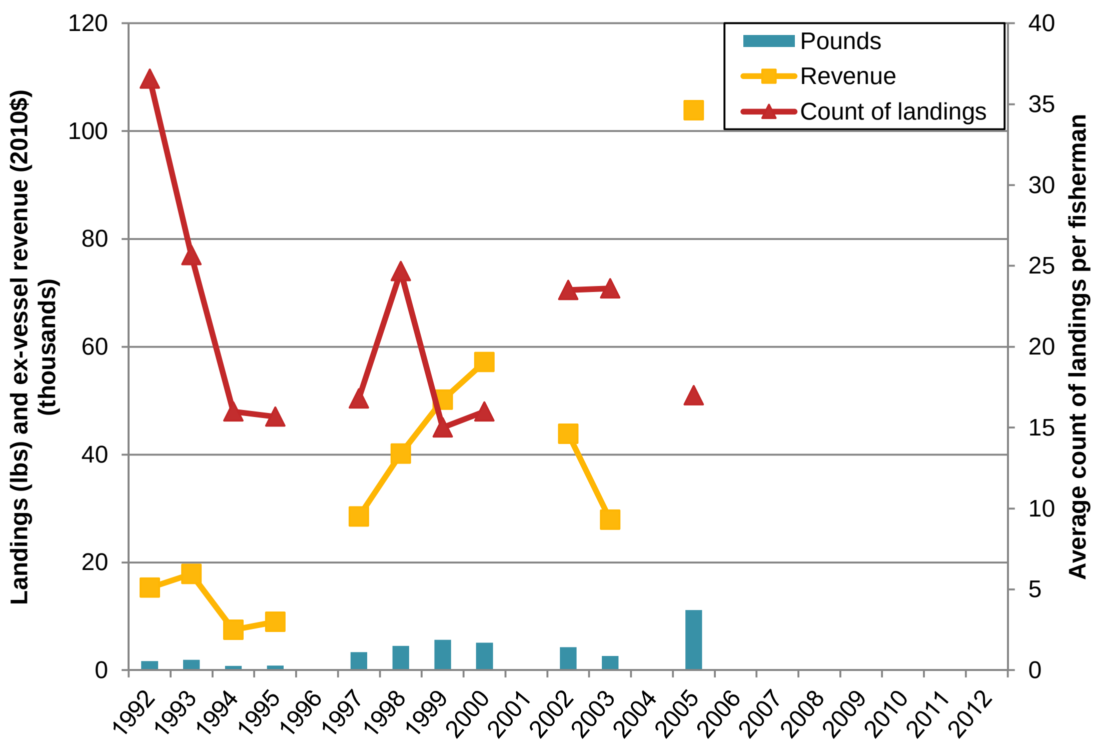
Source: Current study, based off landings data from CDFW.

Figure 249. Spot prawn–trap: Commercial landings, ex-vessel revenue, and number of fishermen, Oceanside, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 250. Spot prawn–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, Oceanside, 1992–2012



Source: Current study, based off landings data from CDFW.

4.6.2. Oceanside Commercial Baseline Characterization

In 2012, 20 individuals made landings in one or more of the target interview fisheries in Oceanside. Combined, they generated $1,188,706 in ex-vessel revenue, which is 1.5 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the landings in 2012 came from the lobster—trap fishery (97.7 percent). We interviewed 6 fishermen from Oceanside (Table 279).

Table 279. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, Oceanside

Fishery	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
California halibut–hook & line	$2,026	3	—
California halibut–trawl	*	1	—
Coastal pelagics–net	*	1	—
Lobster–trap	$1,161,419	14	5
Market squid–brail	—	—	—
Market squid–net	*	1	—
Nearshore finfish live–fixed gear	*	2	1
Rock crab–trap	$25,261	4	2
Sea cucumber–dive	*	1	—
Sea cucumber–trawl	—	—	—
Spot prawn–trap	*	2	1
Urchin–dive	—	—	—
Unique individuals	$1,188,706	20	6

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The average Oceanside fisherman that we interviewed was 37 years old and had an average of 14.5 years of experience as a commercial fisherman (Table 280). It should be noted that this question inquired about the number of years of experience an individual had commercial fishing as a whole, not the number of years of experience they had in a specific fishery. Additionally, Oceanside fishermen on average made 89.2 percent of their total personal income from commercial fishing in 2012, an average decrease of 3.1 percent since 2008. Oceanside fishermen fell below the regional average for percent income from commercial fishing for 2012, relative to 2008. It should be noted that 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust. As shown in Table 281, the lobster—trap fishery experienced a decrease of 10 percent in average percent income from 2008 to 2012.

Table 280. Average age and years of experience commercial fishing in 2012, Oceanside

	Age			Years of experience		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	5	38.4	11.2	5	16.4	10.0
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	1	*	*
Rock crab–trap	2	*	*	2	*	*
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*
Urchin–dive	—	—	—	—	—	—
All target fisheries (unique individuals)	6	37.0	10.6	6	14.5	10.1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 281. Percent change in income from overall commercial fishing from 2008 - 2012, Oceanside

	2008^			2012			
Fishery	Number responding	Average	Standard deviation	Number responding	Average	Standard deviation	Average percent change
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	4	100.0%	0.0%	5	90.0%	17.3%	-10.0%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	2	*	*	1	*	*	*
Rock crab–trap	2	*	*	2	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*	*
Urchin–dive	1	*	*	—	—	—	*
All target fisheries (unique individuals)	5	92.0%	17.9%	6	89.2%	15.6%	-3.1%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher. As shown below in Table 282, the majority of all respondents in all fisheries perceived no change (60 percent). Half of the respondents in the lobster—trap fishery perceived no change, but half reported that they perceived a significantly higher percent of their personal income coming from commercial fishing in 2012.

Table 282. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, Oceanside

Fisheries	Number responding	Percent response: Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	4	50.0%	—	50.0%	—	—
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*
Rock crab–trap	2	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—
All fisheries (unique individuals)	5	40.0%	—	60.0%	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their income coming from commercial fishing. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Table 283 lists the reason for the change as well as the number for each fishery. The only reasons reported for an increase in percent personal income from commercial fishing was due to less revenue from other income sources and fishing with a new permit.

Table 283. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, Oceanside

	Number of individuals	Responses indicating increase								Responses indicating decrease					
Fishery	responding	A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	2	—	—	—	1	—	—	1	—	—	—	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	2	—	—	—	1	—	—	1	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

In interviews, fishermen were asked what percent of their gross economic revenue (GER) went towards their overall commercial fishing operating costs. In Table 284 below, we compare the average responses that were given in a 2008 study conducted by Point 97/Ecotrust (Scholz et al. 2010) to that gathered in this study (2012). As noted previously the responses given in the 2008 study were based on fishermen's cumulative fishing experience—not necessarily specific to the year they were interviewed. Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years. Overall, Oceanside fishermen reported that in 2012 on average 63.0 percent of their gross economic revenue was spent on operating costs, which is an increase of 21.9 percent from 2008. We emphasize that this question is asked about overall commercial fishing operating costs across all fisheries for a particular fisherman.

Table 284. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, Oceanside

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	2	60.0%	14.1%	5	61.6%	14.5%	2.7%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	1	*	*	*
Rock crab–trap	—	—	—	2	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*	*
Urchin–dive	1	*	*	—	—	—	—
All target fisheries (unique individuals)	3	51.7%	17.6%	6	63.0%	13.4%	21.9%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 285. Perceived change in percent of gross revenue going towards overall operating costs from 2008 – 2012, Oceanside

		Percent response				
Fisheries	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	5	20.0%	40.0%	20.0%	20.0%	—
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*
Rock crab–trap	2	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	—	100.0%	—	—	—
Urchin–dive	—	—	—	—	—	—
All fisheries (unique individuals)	6	33.3%	33.3%	16.7%	16.7%	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Fishermen were asked their perceptions of if the percent off their overall commercial fishing gross economic revenue that went toward overall operating costs has changed since 2008, which is shown in Table 285. Generally, the reported percent changes in operating costs (21.9% change) reflects that of fisherman perceived change in operating cost in which 66.6% of fishermen interviewed indicated that the percent of gross revenue going toward operating costs have increased since 2008.

In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their gross economic revenue going towards operating costs. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. In Oceanside the most frequently reported reason for increasing operating costs was the increased cost of fuel and an overhaul/large maintenance of equipment (Table 286).

Table 286. Cause of change in percent income going towards overall operating costs from 2008 – 2012, Oceanside

		Responses indicating increase														Responses indicating decrease		
Fishery	**Number responding**	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	4	2	1	1	—	1	—	—	—	—	—	—	—	1	—	—	—	1
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Rock crab–trap	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	5	2	1	2	—	1	—	—	1	—	—	—	—	1	—	—	—	1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

We asked fishermen how many years of experience and how many days they spent targeting each of the fisheries in which they participated. As indicated in Table 287, lobster—trap fishermen have been fishing on average 9.4 years, and targeted their fishery an average of 88.8 days in 2012.

Table 287. Years of experience and number of days targeting specific fisheries in 2012, Oceanside

	Years of experience in fishery			Number of days targeting fishery in 2012		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	5	9.4	13.3	5	88.8	28.5
Market squid–brail	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	1	*	*
Rock crab–trap	2	*	*	2	*	*
Sea cucumber–dive	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*
Urchin–dive	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Fishermen were also asked how many crew they used for each fishery and what percent of their gross economic revenue was spent on their crew. Oceanside respondents in the lobster—trap fishery reported using on average one crew member, spent 15 percent of revenue on crew, and spent 14.6 percent of revenue on fuel, as reported in Table 288.

Table 288. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, Oceanside

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—
Lobster–trap	5	1	—	5	15.0%	7.1%	5	14.6%	5.5%
Market squid–brail	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	1	*	*	1	*	*	1	*	*
Rock crab–trap	2	*	*	2	*	*	2	*	*
Sea cucumber–dive	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*	1	*	*
Urchin–dive	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Fishermen were asked separately for each fishery they participated in to compare his/her success in the fishery in 2012 to that of the last ten years. As shown in Table 289 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishery. This question was asked as an open ended question and responses were later coded and categorized into negative regulatory factors (Table 290), and other factors (Table 291).

In the lobster—trap fishery of Oceanside, the majority of respondents thought that their overall success in the fishery was the same (60 percent), with some respondents indicating somewhat worse (20 percent) in 2012, when compared to 2008. The most commonly cited negative influences were MPAs or other closures (Table 290), and crowding, compactions, and increased effort (Table 291).

Table 289. Overall success in specific commercial fishery, 2012 compared to previous ten years, Oceanside

		Percent response					
Fisheries	**Number responding**	**Did not participate in previous seasons**	**Significantly better**	**Somewhat better**	**The same**	**Somewhat worse**	**Significantly worse**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	5	20.0%	—	—	60.0%	20.0%	—
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—
Rock crab–trap	1	*	*	*	*	*	*
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*	*
Urchin–dive	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 290. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Oceanside

		Negative					
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	1	—	—	1	—	—	—
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. lack of management
	F. Quota met early

Table 291. Other changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, Oceanside

		Positive						Negative						
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	1	—	—	—	—	—	—	—	—	1	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

4.7. San Diego

The city of San Diego is the 8th largest city in the United States and is located just north of the US/Mexico border and is the southernmost port in the South Coast study region. According to the 2010 U.S. Census, the population of San Diego was 1.3 million with a median age of 33.6 years. The estimated per capita income (2007-2011) was $33,135 with a mean household income of $86,305 (US Census Bureau, 2010).

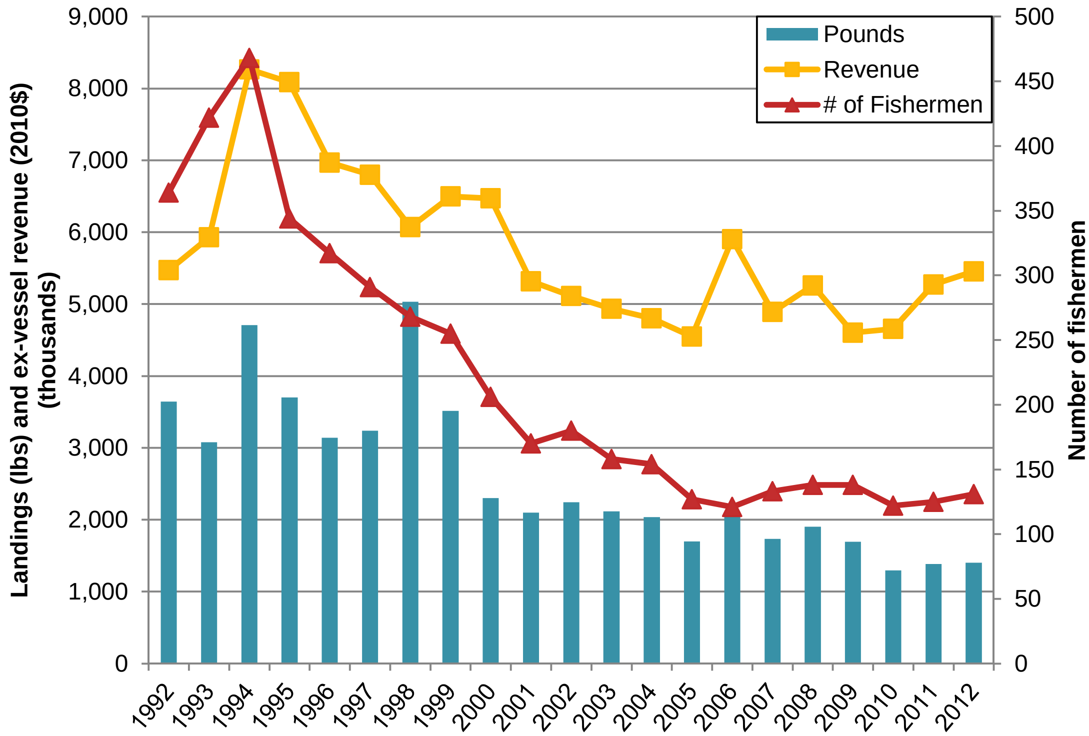
In San Diego there are three central hubs of commercial fishing activity: Driscoll's Wharf, Tuna Harbor (also known as G Street), and Mission Bay.. In 2008 Tuna Harbor accounted for 34 percent of San Diego landings, Mission Bay accounted for 26 percent, Oceanside accounted for 22 percent, and finally Driscoll's Wharf accounted for 18 percent (Port of San Diego, 2009). As of 2000 there were at least six seafood processors operating out of San Diego with 296 employees. At that time the top three processed products in terms of pounds were kelp, salmon, and swordfish (Norman et al. 2007).

4.7.1. San Diego Commercial Fisheries Initial Changes

Figure 251 the commercial landings, ex-vessel revenue, and number of fishermen for all fisheries in the South Coast port of San Diego over the study period 1992–2012. In terms of regional contributions, San Diego contributed approximately 1.2 percent of South Coast landings and 8 percent of South Coast ex-vessel revenue on average annually over the study period. All declined over time, with highs occurring early on ($8.3 million in ex-vessel revenue made in 1994 by 468 fishermen; 5 million pounds landed in 1998) and lows later on ($4.5 million in ex-vessel revenue made in 2005; 121 fishermen in 2006; and 1.3 million pounds landed in 2010). In the last year of the study period, 2012, a total of 131 individual fishermen made landings in San Diego of 1.4 million pounds for $5.4 million in ex-vessel revenue.

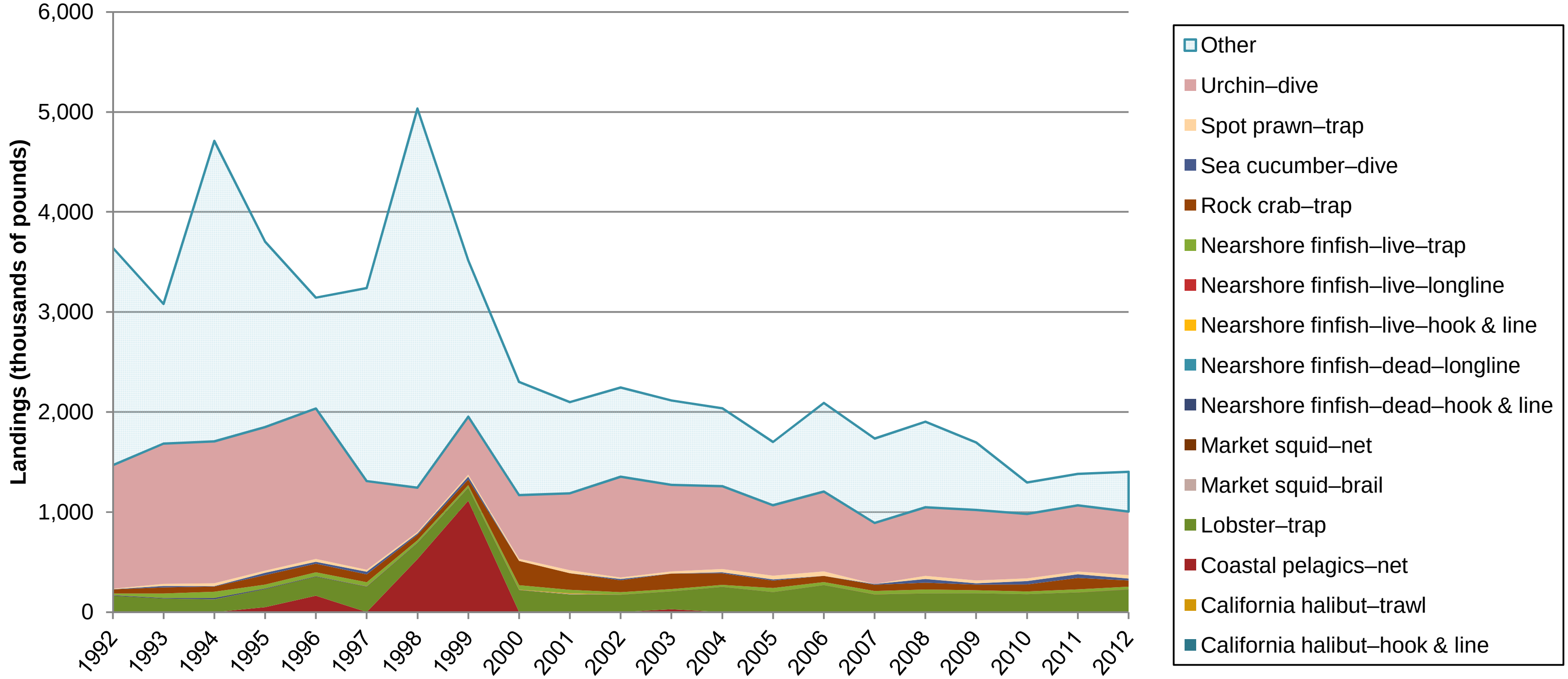
Figure 252 displays the landings and Figure 253 displays the ex-vessel revenue from fisheries of interest in the port of San Diego over the study period of 1992–2012. Landings from 'other' fisheries beyond the fisheries of interest were prevalent in this port, again primarily from the swordfish and tuna fisheries, though declined overtime. Though San Diego was responsible for only an annual average of 7.8 percent and 9.5 percent of regional urchin–dive landings and ex-vessel revenue in the South Coast region, this fishery constituted approximately 36.9 percent of total port landings and 16.4 percent of total port ex-vessel revenue on average annually over 1992–2012. Other significant fisheries of interest in this port include the lobster–trap fishery, which average 61 percent of total port ex-vessel revenue, $3.1 million, in the last three years of the study period.

Figure 251. San Diego total commercial landings, ex-vessel revenue, and number of fishermen, all fisheries, 1992–2012



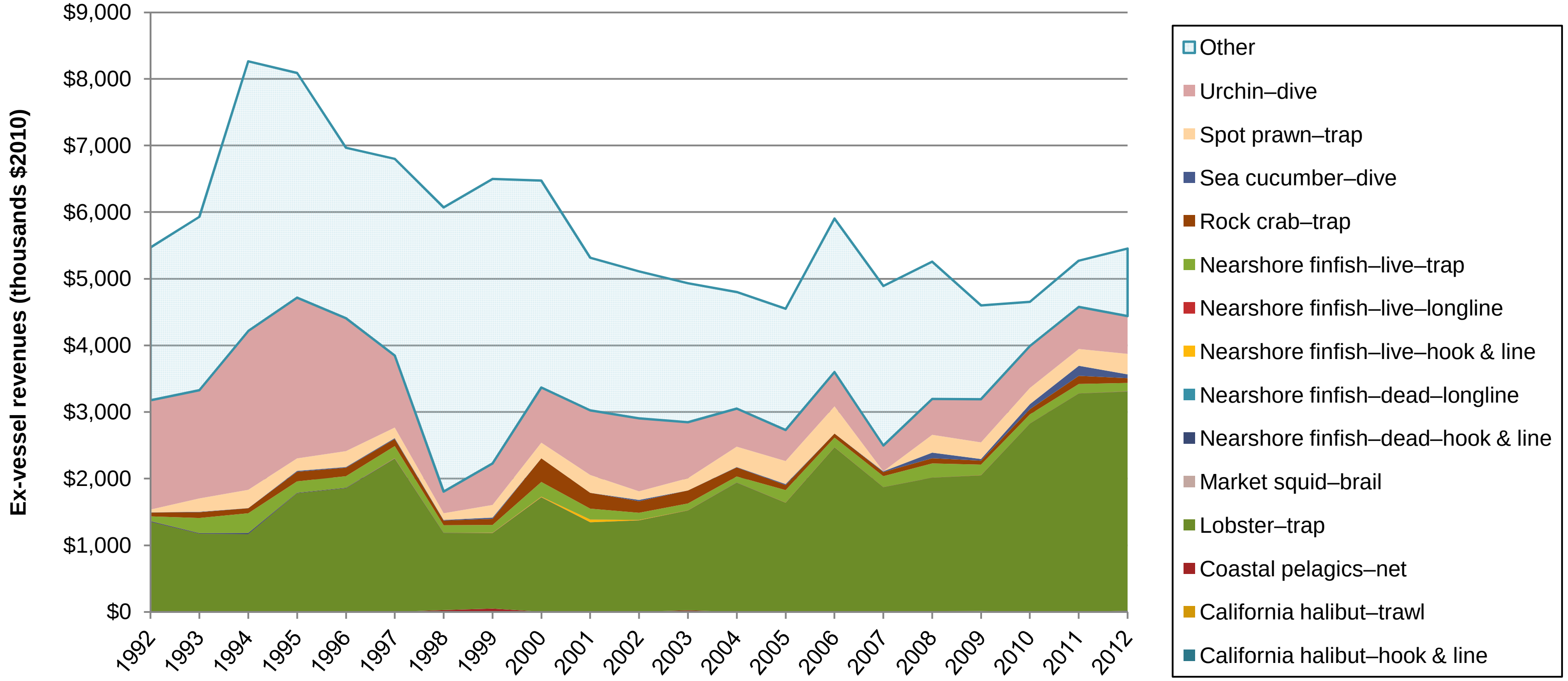
Source: Current study, based off landings data from CDFW.

Figure 252. San Diego commercial landings for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

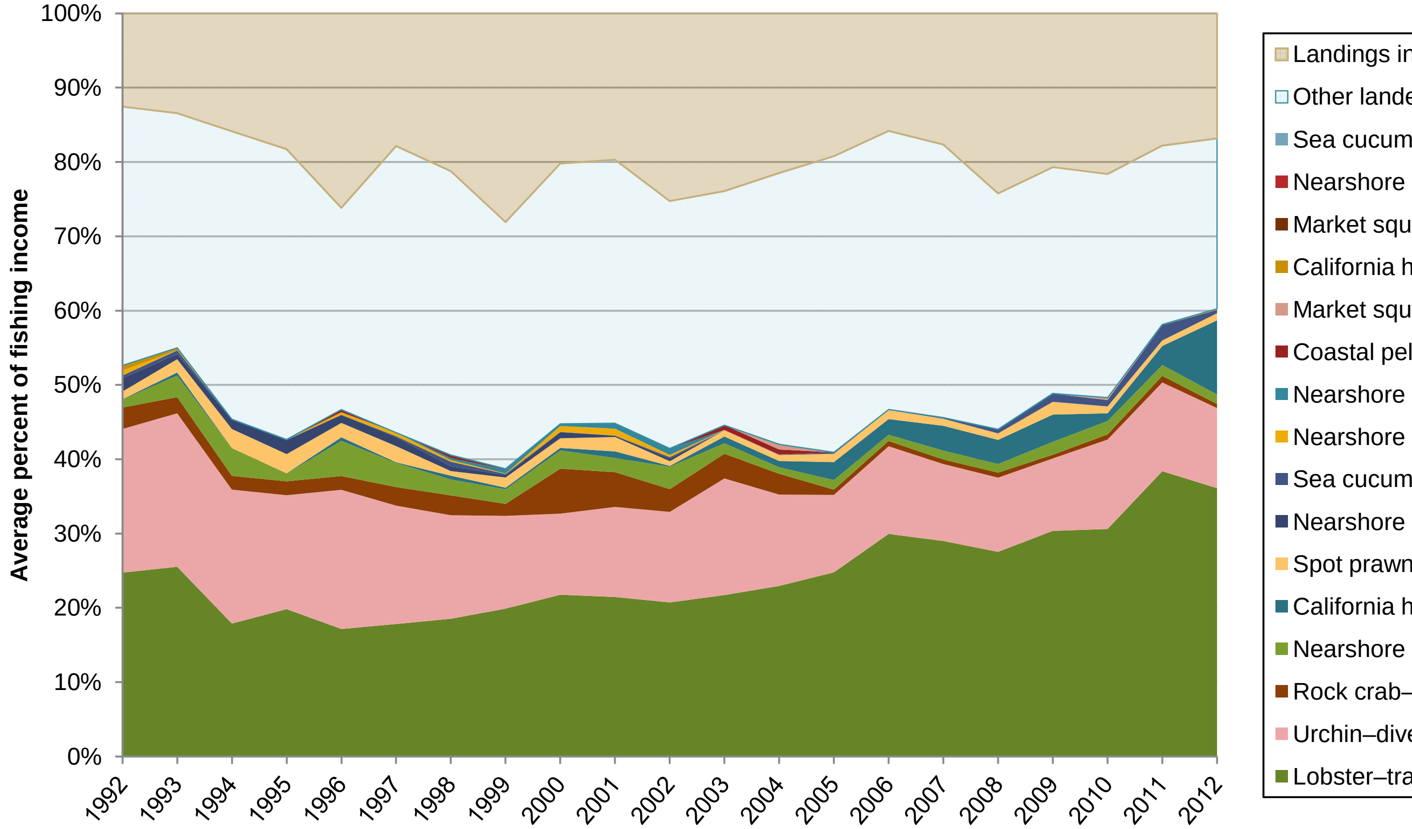
Figure 253. San Diego commercial ex-vessel revenue for fisheries of interest, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 254 displays the average percent contribution to fishing income for those fishermen who made landings in San Diego over the study period from the sixteen fisheries of interest, from other fisheries landed in San Diego, and from landings made from all fisheries landed in other South Coast region ports. This figure shows reliance on a fishery but also on a given port. For fishermen who made landings in San Diego, the port represented 80.1 percent of their total fishing income from the South Coast on average annually, a relatively high percent. Both lobster–trap and urchin–dive ex-vessel revenue were significant, constituting approximately 24.6 percent and 13.6 percent respectively of total fishing incomes on average annually. More significant however, were landings made in San Diego outside of the fisheries of interest examined in this report, constituting nearly a third of the San Diego fisherman's total South Coast fishing income on average annually.

Figure 254. Average percent of individual fishing income from commercial fisheries of interest, San Diego, 1992–2012



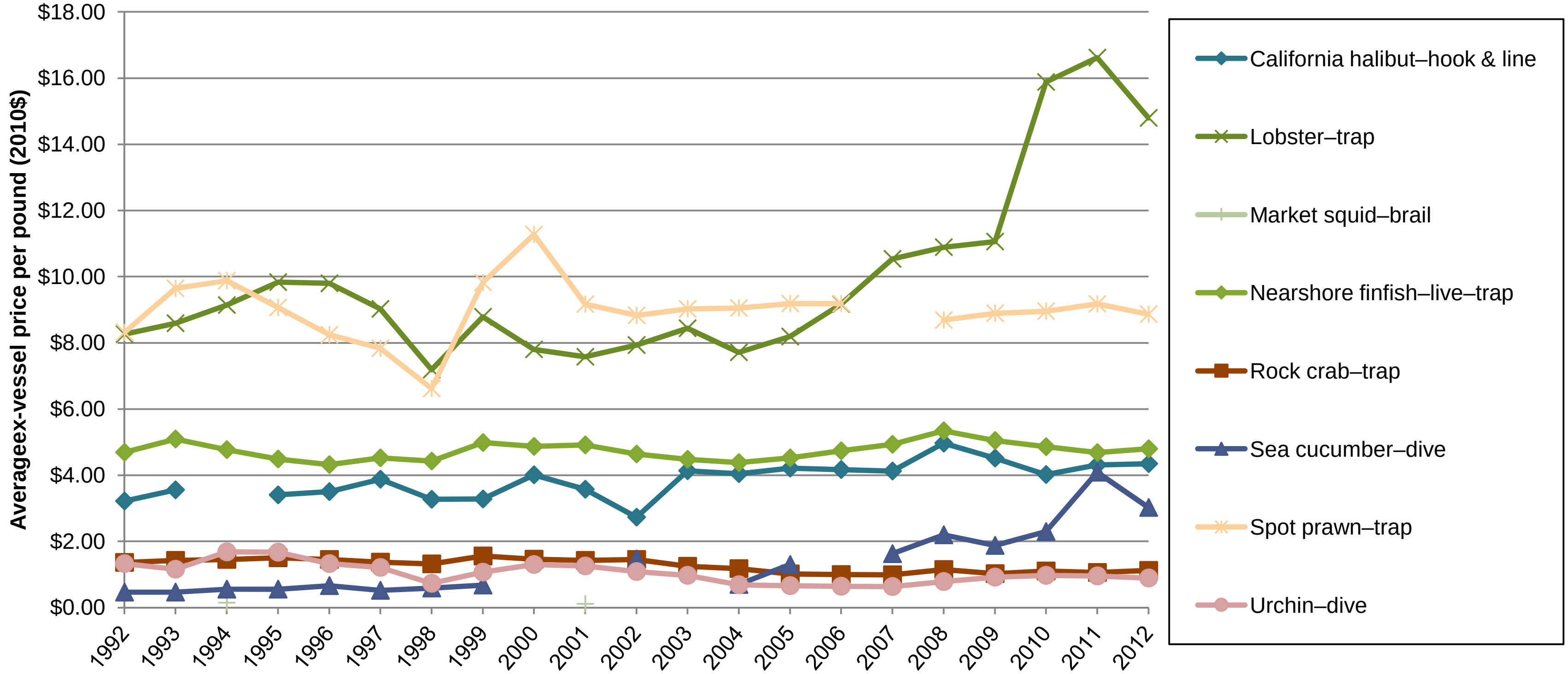
Source: Current study, based off landings data from CDFW.

Figure 255 displays the average ex-vessel prices over time for select fisheries of interest in San Diego over the 1992–2012 study period. Like all other South Coast ports, the highest average ex-vessel prices per pound occurred in the lobster–trap fishery, peaking at $16.62 in 2011 (like Oceanside), and the spot prawn–trap fishery, peaking at $11.27 in 2000. Large increases from 1992 to 2012 were observed for the sea cucumber–dive (547.8 percent), lobster–trap (79.1 percent), and the California halibut–hook & line (35.2 percent) fisheries. Less changed occurred for the spot prawn–trap and nearshore finfish–live–trap fisheries. Declines were observed in the rock crab–trap fishery (17.3 percent) and urchin–dive fishery (32.7 percent).

Figure 256 through Figure 269 display study period landings, ex-vessel revenue, and number of fishermen for select fisheries of interest in San Diego, as well as averaged trends on the level of the individual fisherman. Some notable summary trends include the following:

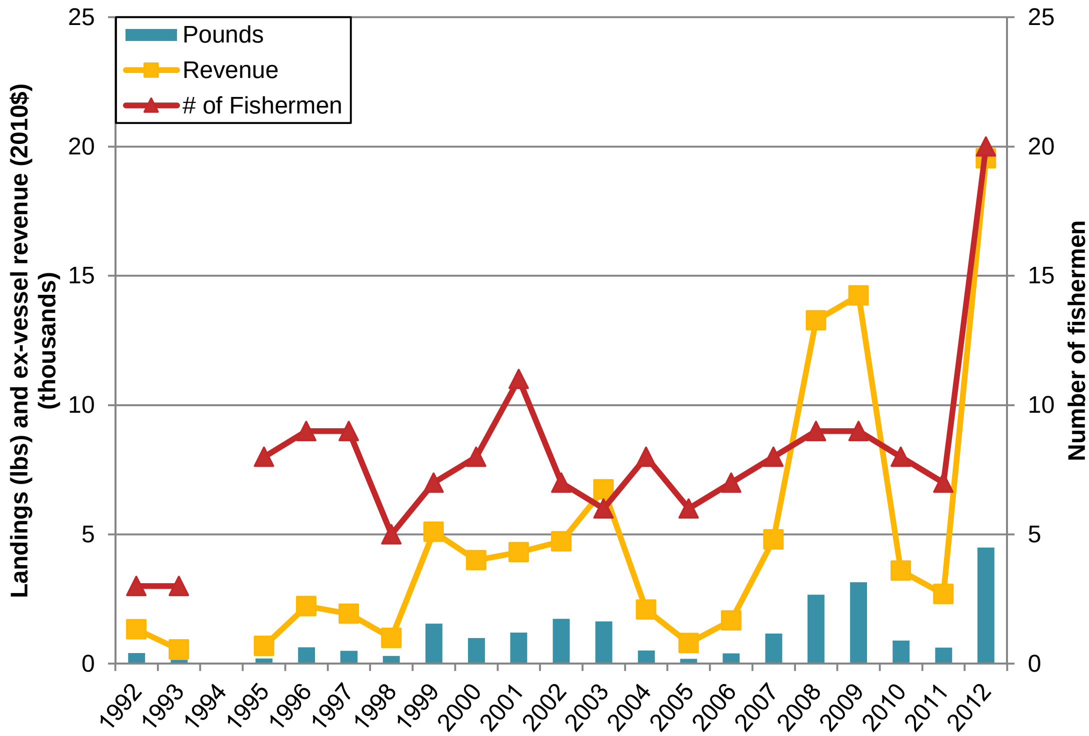
- Except for the urchin–dive fishery, nearly every select fishery of interest displayed higher ex-vessel revenue in 2012 than in 1992 for San Diego.
- The opposite is true for nearshore finfish fisheries (not displayed below) for San Diego, wherein the nearshore finfish–live–trap was the exception (displayed below), being the only fishery in this subset to experience in increase (of 82.5 percent from 1992 to 2012) in ex-vessel revenue over the study period.
- Looking at ex-vessel revenue in 2012 relative to 1992, the fisheries in order of largest proportional increase were the sea cucumber–dive ($367 in 1992 to $58,179 in 2012), California halibut–hook & line (from $1,325 to $19,539), and spot prawn–trap ($43,096 to $305,166).
- The rock crab–trap fishery remained relatively consistent throughout the study period in San Diego, with the exception of the year 2000, where peak landings, ex-vessel revenue, and number of participating fishermen occurred: 243,271 pounds landed for $354,706 by a total of 33 fishermen.
- Despite overall declines in the port's urchin–dive fishery, remaining San Diego urchin–dive fishermen saw their individual landings and ex-vessel revenue increase, on average, slightly over the study period, landing 1.8 times as much in weight and 1.2 times as much ex-vessel revenue by 2012 than their 1992 counterparts.

Figure 255. Average ex-vessel prices over time, select commercial fisheries of interest, San Diego, 1992–2012



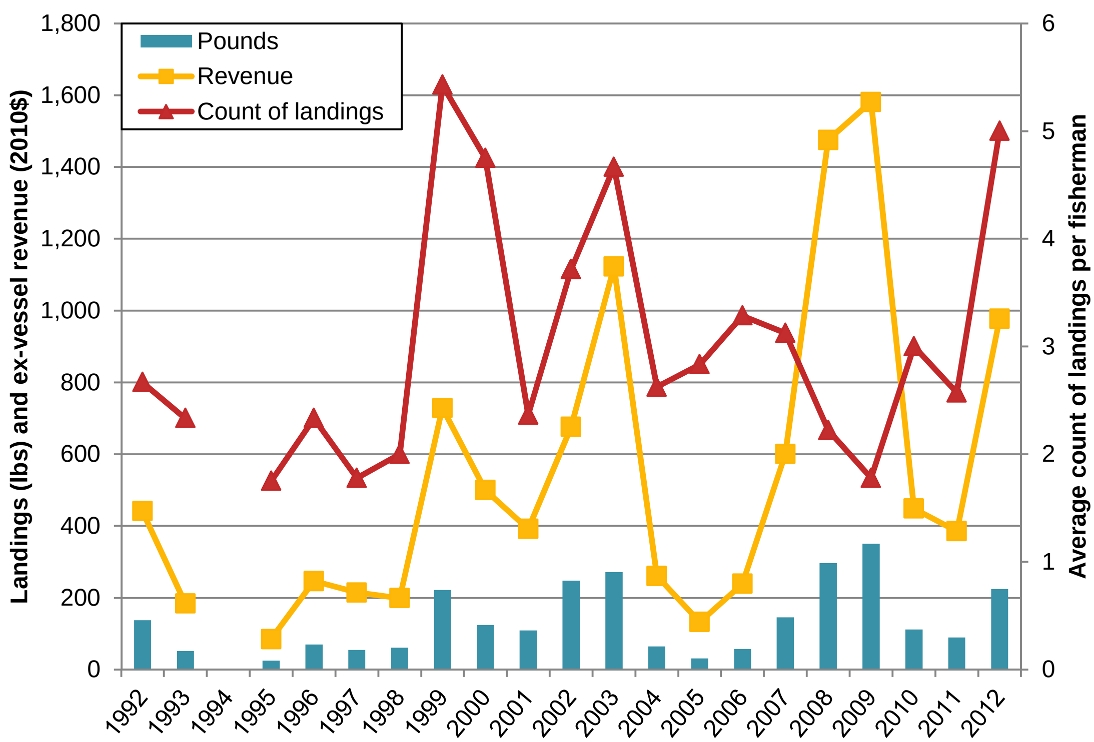
Source: Current study, based off landings data from CDFW.

Figure 256. California halibut–hook & line: Commercial landings, ex-vessel revenue, and number of fishermen, San Diego, 1992–2012



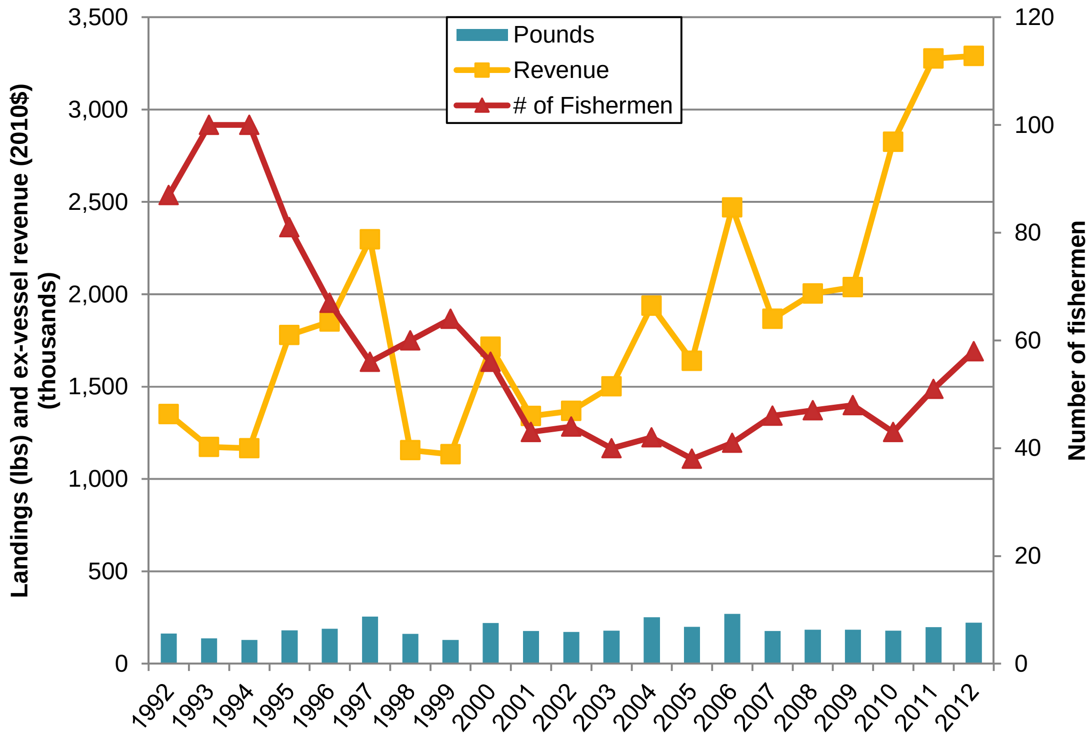
Source: Current study, based off landings data from CDFW.

Figure 257. California halibut–hook & line: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Diego, 1992–2012



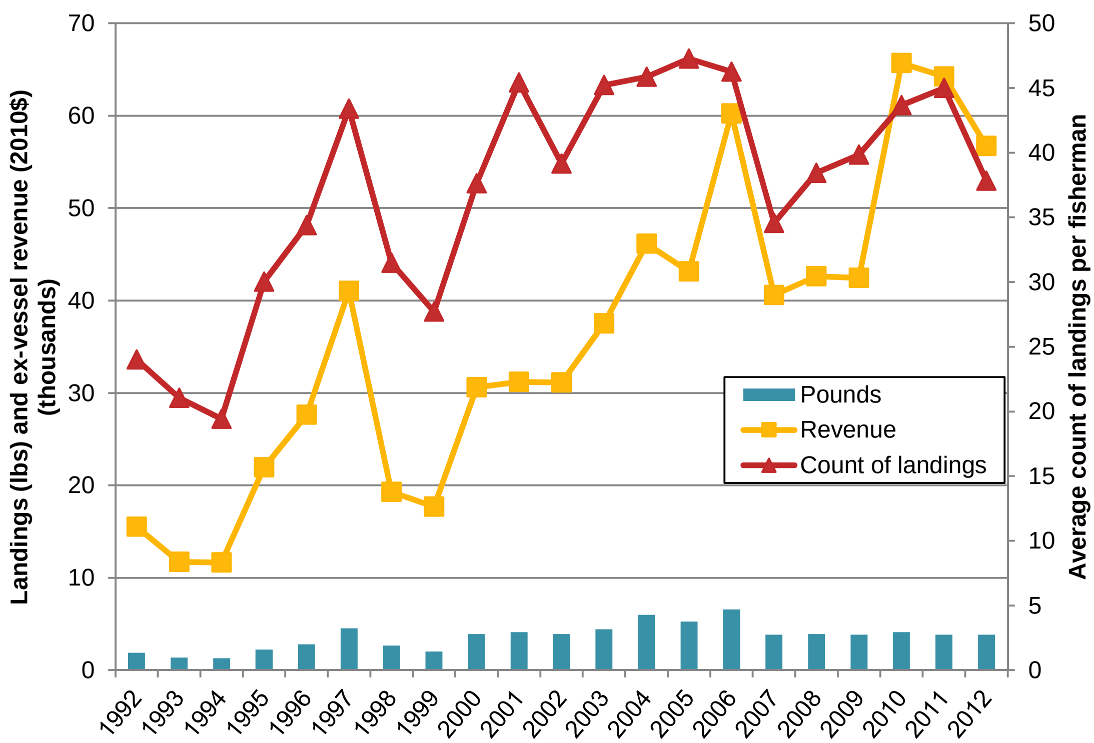
Source: Current study, based off landings data from CDFW.

Figure 258. Lobster–trap: Commercial landings, ex-vessel revenue, and number of fishermen, San Diego, 1992–2012



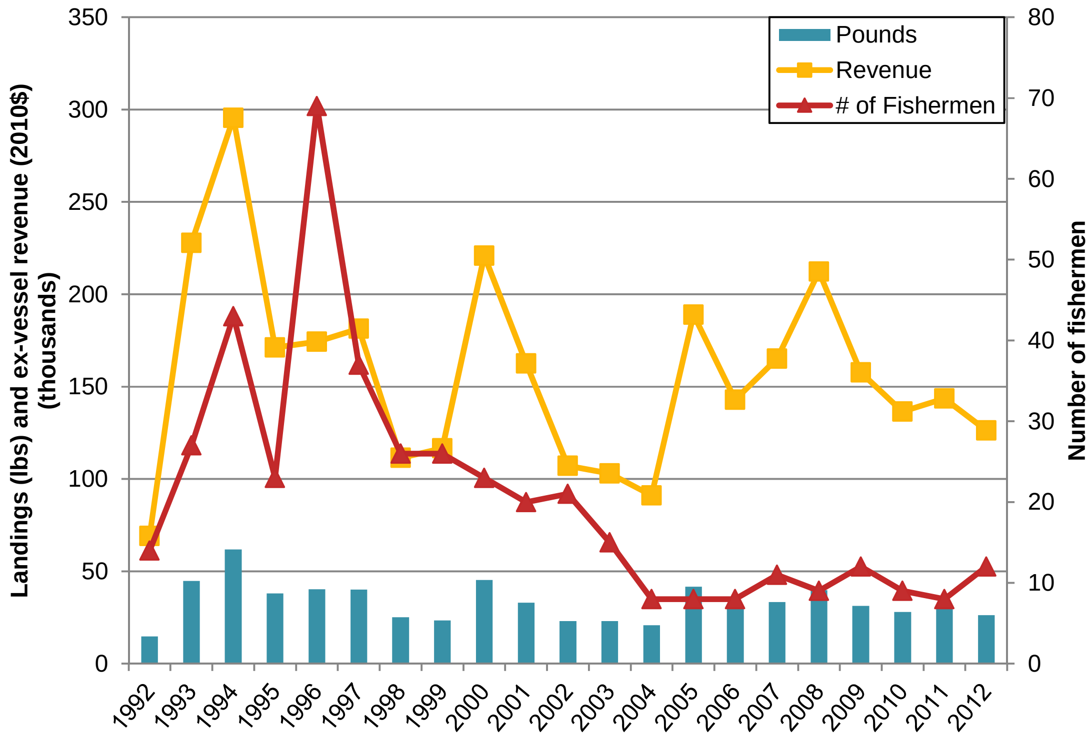
Source: Current study, based off landings data from CDFW.

Figure 259. Lobster–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Diego, 1992–2012



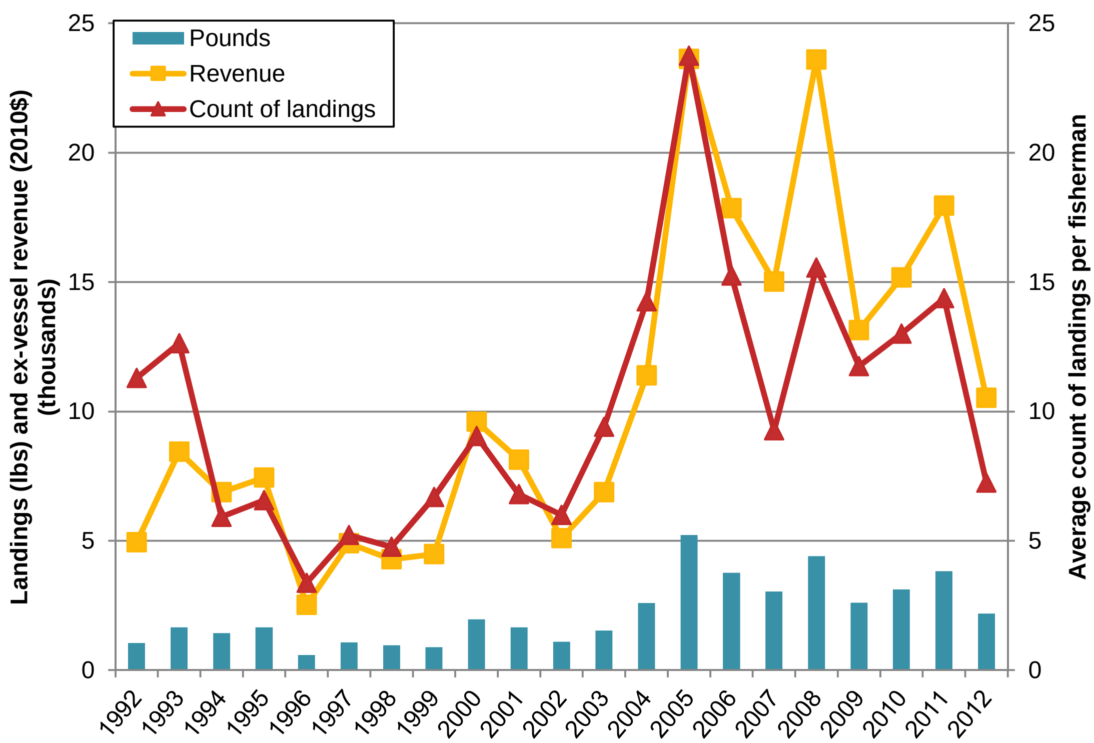
Source: Current study, based off landings data from CDFW.

Figure 260. Nearshore finfish–live–trap: Commercial landings, ex-vessel revenue, and number of fishermen, San Diego, 1992–2012



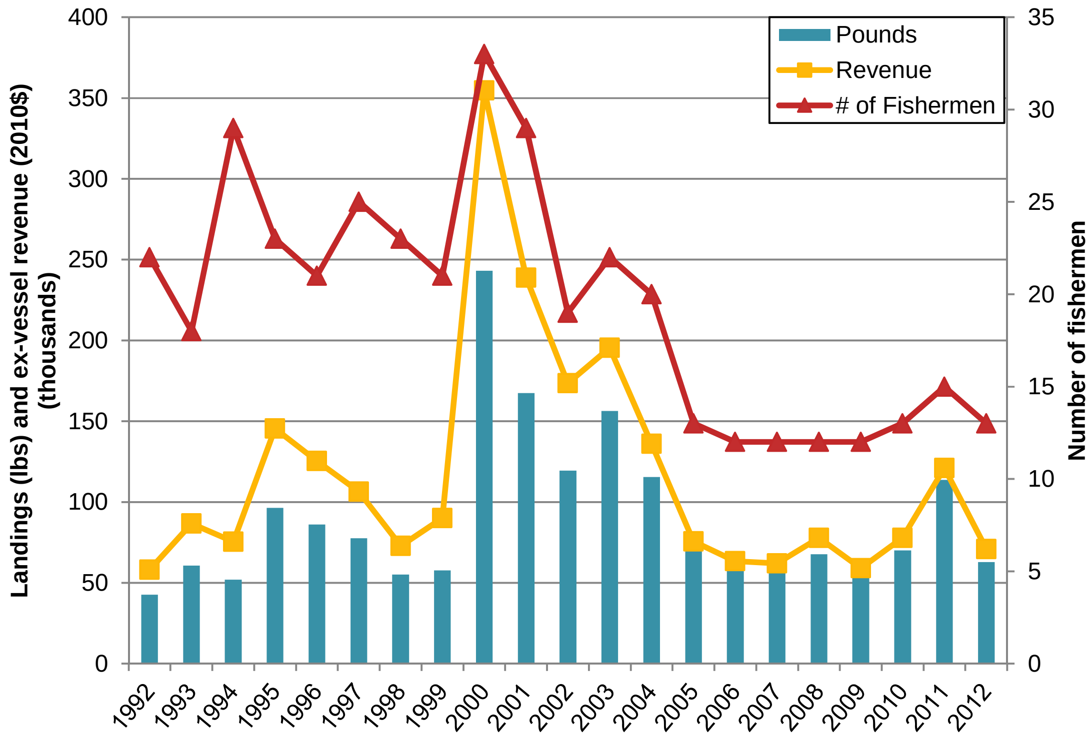
Source: Current study, based off landings data from CDFW.

Figure 261. Nearshore finfish–live–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Diego, 1992–2012



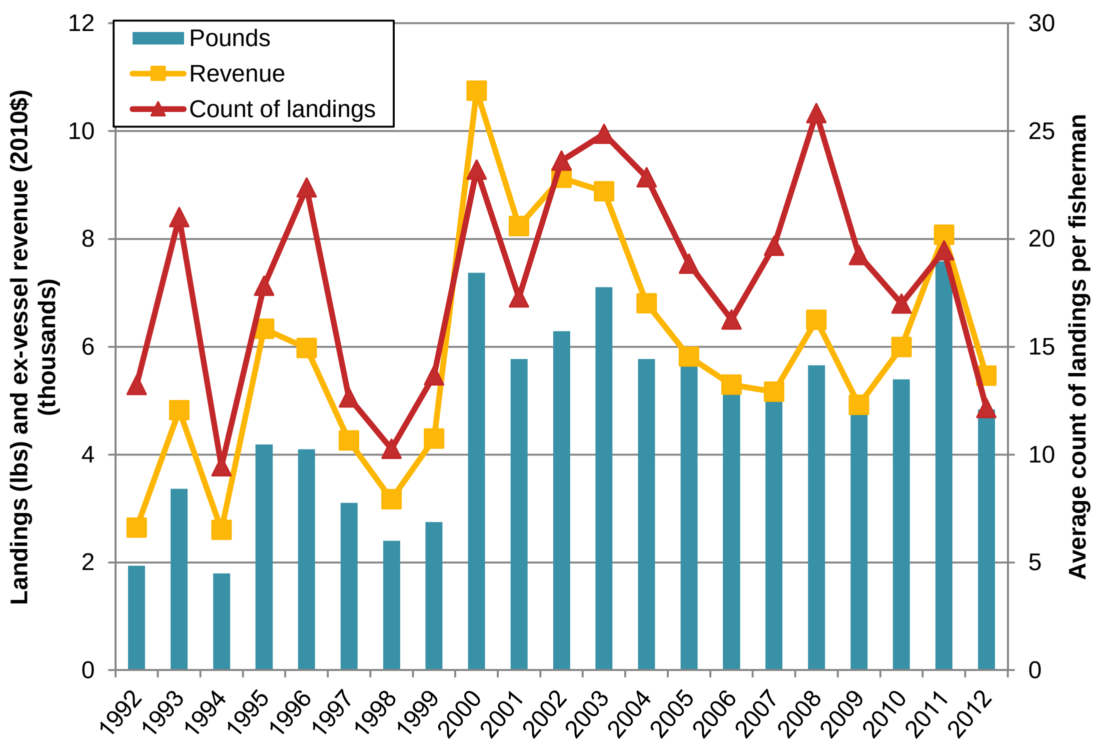
Source: Current study, based off landings data from CDFW.

Figure 262. Rock crab–trap: Commercial landings, ex-vessel revenue, and number of fishermen, San Diego, 1992–2012



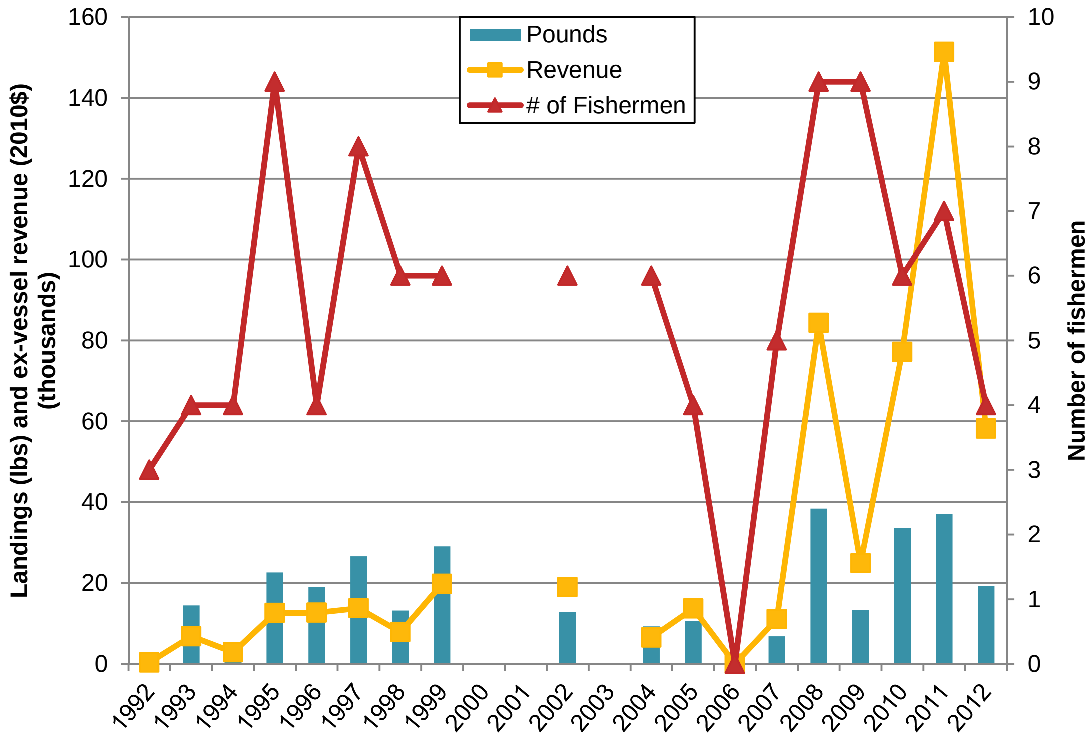
Source: Current study, based off landings data from CDFW.

Figure 263. Rock crab–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Diego, 1992–2012



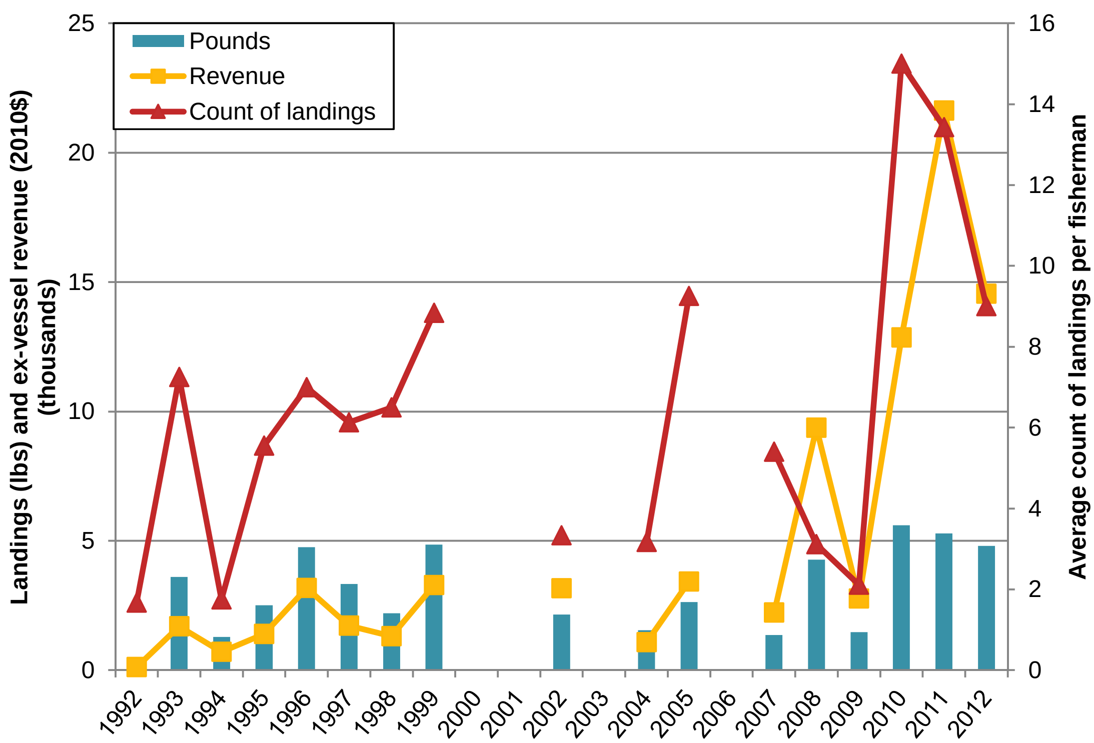
Source: Current study, based off landings data from CDFW.

Figure 264. Sea cucumber–dive: Commercial landings, ex-vessel revenue, and number of fishermen, San Diego, 1992–2012



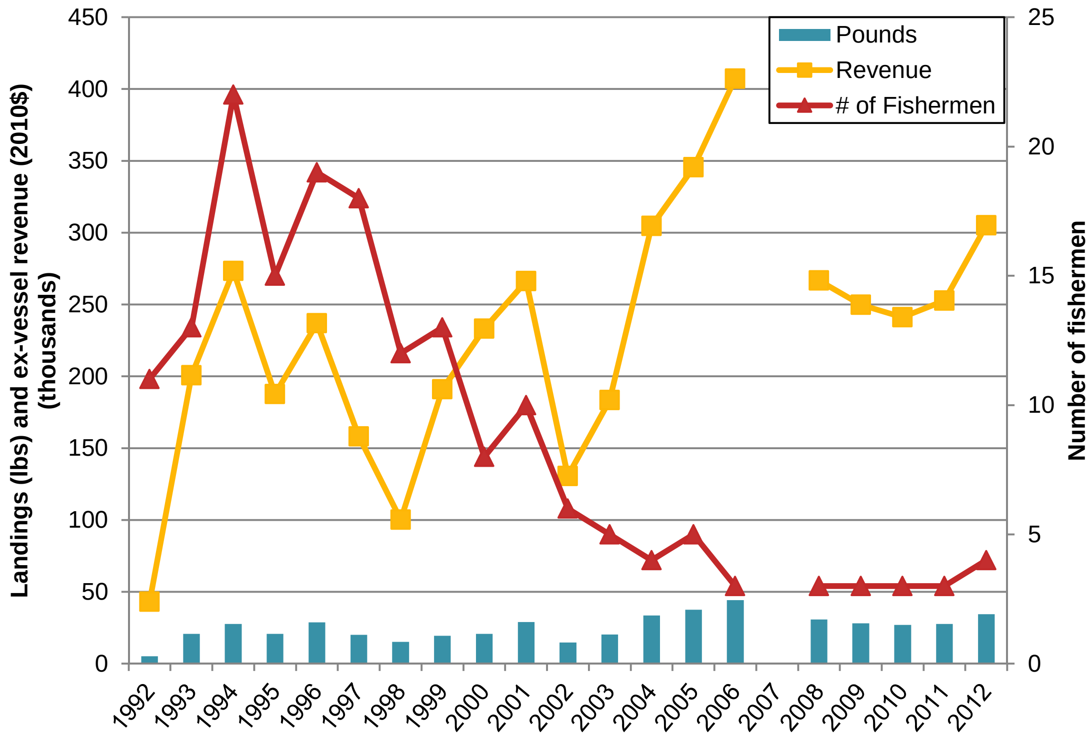
Source: Current study, based off landings data from CDFW.

Figure 265. Sea cucumber–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Diego, 1992–2012



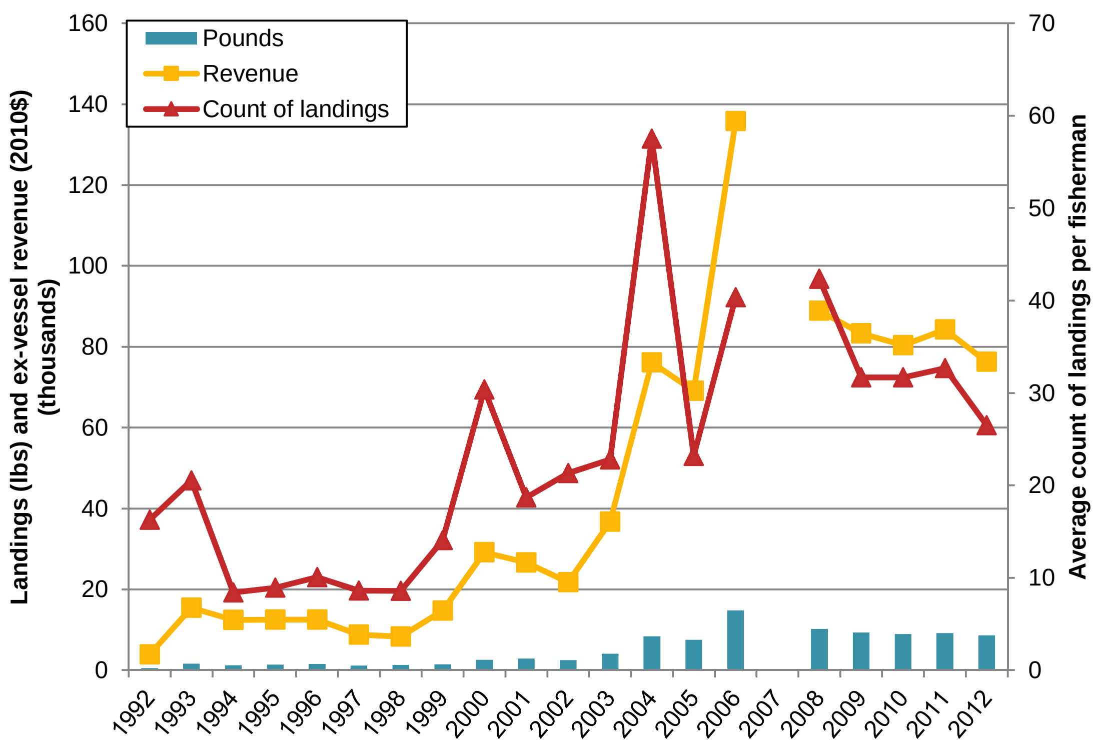
Source: Current study, based off landings data from CDFW.

Figure 266. Spot prawn–trap: Commercial landings, ex-vessel revenue, and number of fishermen, San Diego, 1992–2012



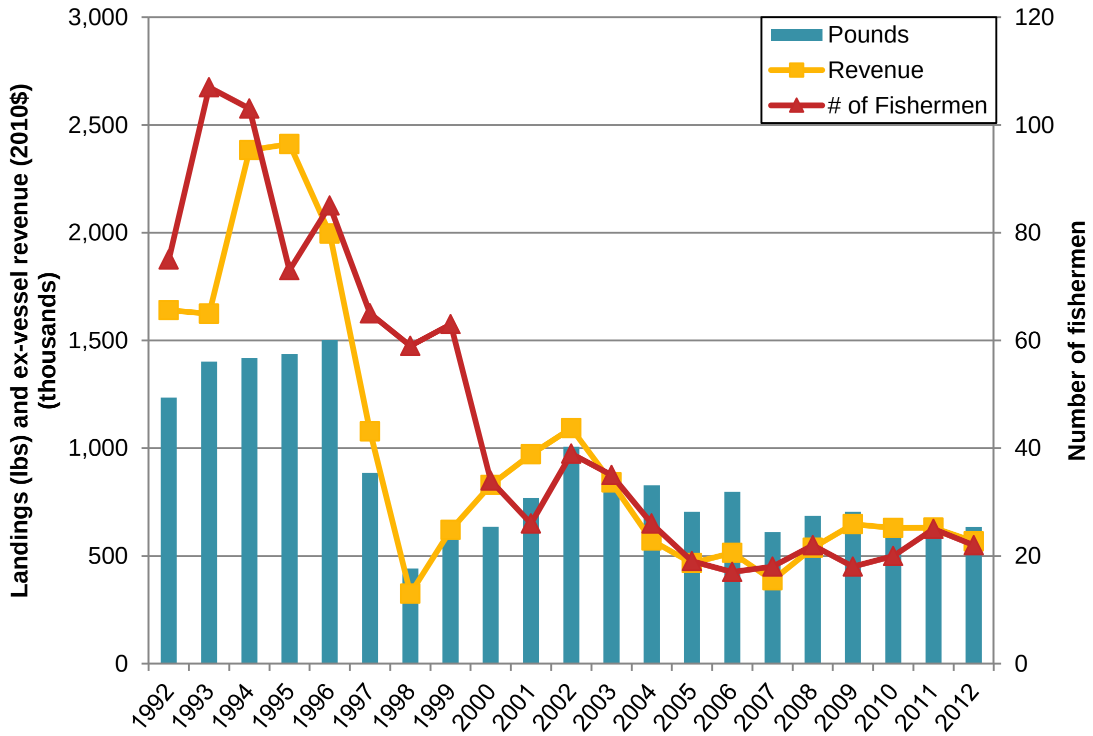
Source: Current study, based off landings data from CDFW.

Figure 267. Spot prawn–trap: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Diego, 1992–2012



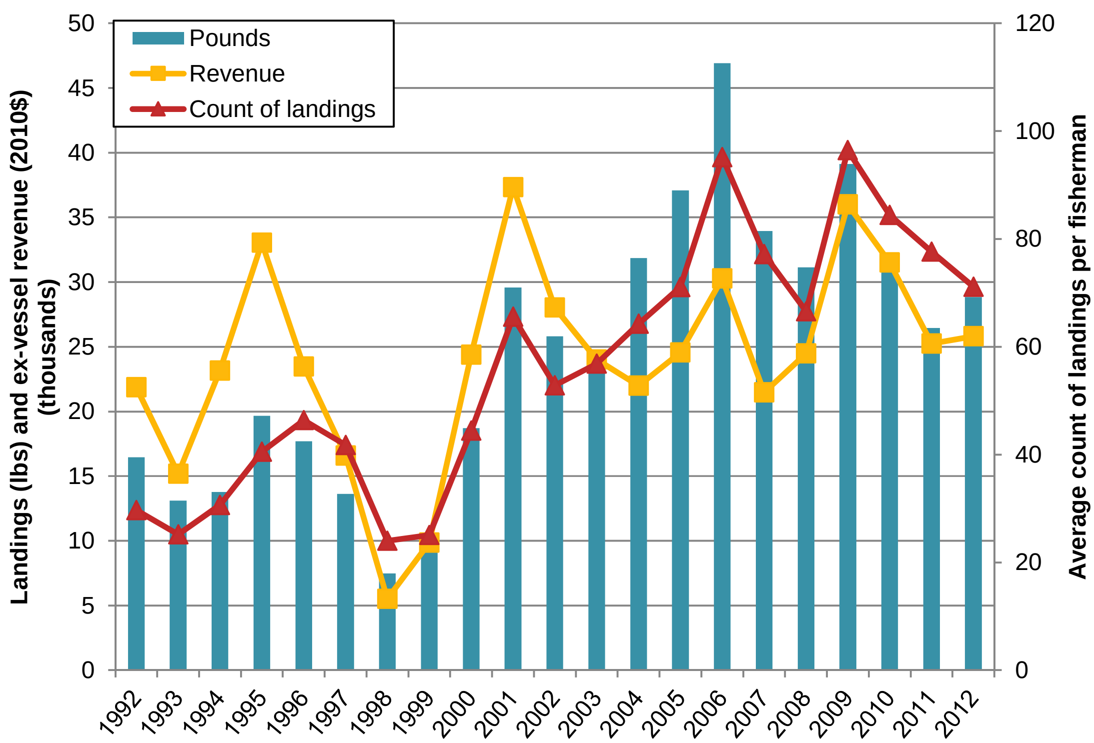
Source: Current study, based off landings data from CDFW.

Figure 268. Urchin–dive: Commercial landings, ex-vessel revenue, and number of fishermen, San Diego, 1992–2012



Source: Current study, based off landings data from CDFW.

Figure 269. Urchin–dive: Average pounds landed, ex-vessel revenue, and count of landings per fisherman, commercial fishing, San Diego, 1992–2012



Source: Current study, based off landings data from CDFW.

4.7.2. San Diego Commercial Baseline Characterization

In 2012, 99 individuals made landings in one or more of the target interview fisheries in San Diego. Combined, they generated $4,438,456 in ex-vessel revenue, which is 5.5 percent of the 80.8 million dollars generated by the target interview fisheries over the entire study region. The majority of the landings came from the lobster—trap fishery (74.1 percent). We interviewed 19 fishermen from San Diego (Table 292).

Table 292. Number of commercial fishermen interviews conducted and fishery ex-vessel revenue value (2012) non spatial survey, San Diego

Fishery	2012 Ex-vessel revenue ($2010)	Number of individuals in landings data	Number of individuals interviewed
California halibut–hook & line	$19,539	20	1
California halibut–trawl	—	—	—
Coastal pelagics–net	—	—	—
Lobster–trap	$3,289,063	58	13
Market squid–brail	*	1	1
Market squid–net	—	—	—
Nearshore finfish live–fixed gear	$127,632	14	5
Rock crab–trap	$71,015	13	3
Sea cucumber–dive	$58,179	4	3
Sea cucumber–trawl	—	—	—
Spot prawn–trap	$305,166	4	—
Urchin–dive	$567,861	22	6
Unique individuals	$4,438,456	99	19

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

The average San Diego fisherman that we interviewed was 52.2 years old and had an average of 28.7 years of experience as a commercial fisherman (Table 293). It should be noted that this question inquired about the number of years of experience an individual had commercial fishing as a whole, not the number of years of experience they had in a specific fishery. Additionally, San Diego fishermen on average made 95 percent of their total personal income from commercial fishing in 2012, an average increase of 9.7 percent since 2008. As shown in Table 294, San Diego fishermen rose above the regional average for percent income from commercial fishing for 2012, when compared to 2008 averages. It should be noted that 2008 averages were taken directly from the 2008 study conducted by Point 97/Ecotrust.

Table 293. Average age and years of experience commercial fishing in 2012, San Diego

	Age			Years of experience		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	1	*	*	1	*	*
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	13	51.4	10.0	13	27.8	11.5
Market squid–brail	1	*	*	1	*	*
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	5	47.0	9.0	5	24.6	11.1
Rock crab–trap	3	48.0	5.0	3	23.7	1.5
Sea cucumber–dive	3	52.3	2.9	3	31.3	6.0
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*
Urchin–dive	6	54.3	4.6	6	31.3	3.9
All target fisheries (unique individuals)	19	52.2	8.6	19	28.7	9.6

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 294. Percent change in income from overall commercial fishing from 2008 - 2012, San Diego

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	1	*	*	1	*	*	*
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	3	100.0%	0.0%	—	—	—	—
Lobster–trap	31	80.0%	30.2%	13	93.5%	12.8%	16.9%
Market squid–brail	—	—	—	1	*	*	*
Market squid–net	5	100.0%	—	—	—	—	—
Nearshore finfish live–fixed gear	9	100.0%	—	5	96.0%	8.9%	-4.0%
Rock crab–trap	11	89.5%	26.9%	3	93.3%	11.5%	4.2%
Sea cucumber–dive	2	*	*	3	96.7%	5.8%	1.8%
Sea cucumber–trawl	1	*	*	—	—	—	—
Spot prawn–trap	4	100.0%	0.0%	1	*	*	*
Urchin–dive	10	99.0%	3.2%	6	98.3%	4.1%	-0.7%
All target fisheries (unique individuals)	47	86.6%	26.1%	19	95.0%	10.9%	9.7%

Source: Current study

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** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Fishermen were also asked how they felt their income from commercial fishing had changed between 2008 and 2012. They were asked to select one of the following options; significantly higher, somewhat higher, no change, somewhat lower, or significantly higher. As shown below in Table 295, the majority of respondents perceived no change; however, some respondents in the lobster—trap (7.7 percent) and the rock crab—trap (33.3 percent) fisheries indicated that personal income from commercial fishing was somewhat higher in 2012.

Table 295. Perceived change in percent of personal income coming from commercial fishing between 2008 and 2012, San Diego

		Percent response				
Fisheries	Number responding	Significantly higher	Somewhat higher	No change	Somewhat lower	Significantly lower
California halibut–hook & line	1	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	13	—	7.7%	92.3%	—	—
Market squid–brail	1	*	*	*	*	*
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	5	—	—	100.0%	—	—
Rock crab–trap	3	—	33.3%	66.7%	—	—
Sea cucumber–dive	3	—	—	100.0%	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*
Urchin–dive	6	—	—	100.0%	—	—
All fisheries (unique individuals)	19	—	5.3%	94.7%	—	—

Source: Current study

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In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their income coming from commercial fishing. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Table 296 lists the reason for the change as well as the number for each fishery. The only reason given for a perceived decrease in percent personal income from commercial fishing was due to personal reasons.

Table 296. Cause of change in percent of personal income coming from commercial fishing between 2008 and 2012, San Diego

Fishery	Number of individuals responding	Responses indicating increase								Responses indicating decrease					
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—

Source: Current study
— indicates that the port/fishery was not sampled or a zero value data point
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Responses indicating increase	A. Increase in fish abundance
	B. Personal reasons
	C. Spending more time fishing
	D. Less revenue from other income sources
	E. More revenue from fishing
	F. Changes in the market/economy
	G. New permit
	H. Becoming a better fisherman
Responses indicating decrease	I. Decrease in fish abundance
	J. Personal reasons
	K. Spending less time fishing
	L. More revenue from other income sources
	M. Less revenue from fishing
	N. Changes in regulations

In interviews, fishermen were asked what percent of their gross economic revenue (GER) went towards their overall commercial fishing operating costs. In Table 297 below, we compare the average responses that were given in a 2008 study conducted by Point 97/Ecotrust (Scholz et al. 2010) to that gathered in this study (2012). As noted previously the responses given in the 2008 study were based on fishermen's cumulative fishing experience—not necessarily specific to the year they were interviewed. Fishermen were not asked to respond for each fishery they participated in, but rather in regards to their fishing as a whole. Responses were then broken out by fishery in the table below. The percent change was then calculated using the averages from both years. Overall, San Diego fishermen reported that in 2012 on average 43.5 percent of their gross economic revenue was spent on operating costs, which is 7.5 percent less than the average reported in 2008. We emphasize that this question is asked about overall commercial fishing operating costs across all fisheries for a particular fisherman.

Table 297. Percent change in percent of gross economic revenue used towards overall commercial fishing operating costs from 2008 to 2012, San Diego

	2008^			2012			
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Average percent change**
California halibut–hook & line	1	*	*	1	*	*	*
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	3	59.3%	24.0%	—	—	—	—
Lobster–trap	27	49.4%	14.8%	13	47.9%	21.4%	-3.1%
Market squid–brail	—	—	—	1	*	*	*
Market squid–net	5	57.2%	20.6%	—	—	—	—
Nearshore finfish live–fixed gear	8	48.5%	15.9%	5	54.4%	31.0%	12.2%
Rock crab–trap	9	53.9%	14.1%	3	41.0%	16.5%	-23.9%
Sea cucumber–dive	2	*	*	3	55.0%	39.7%	15.8%
Sea cucumber–trawl	1	*	*	—	—	—	—
Spot prawn–trap	3	35.0%	13.2%	1	*	*	*
Urchin–dive	10	36.0%	9.7%	6	47.5%	29.8%	31.9%
All target fisheries (unique individuals)	43	47.0%	16.2%	19	43.5%	20.7%	-7.5%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

^2008 data were taken from Scholz et al. 2010.

Table 298. Perceived change in percent of gross revenue going towards overall operating costs from 2008 - 2012, San Diego

		Percent response				
Fisheries	**Number responding**	**Significantly higher**	**Somewhat higher**	**No change**	**Somewhat lower**	**Significantly lower**
California halibut–hook & line	1	*	*	*	*	*
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	13	23.1%	30.8%	46.2%	—	—
Market squid–brail	1	*	*	*	*	*
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	5	40.0%	20.0%	40.0%	—	—
Rock crab–trap	3	33.3%	33.3%	33.3%	—	—
Sea cucumber–dive	3	33.3%	33.3%	33.3%	—	—
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	*	*	*
Urchin–dive	6	33.3%	50.0%	16.7%	—	—
All fisheries (unique individuals)	19	31.6%	36.8%	31.6%	—	—

Source: Current study

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Fishermen were asked their perceptions of if the percent of their overall commercial fishing gross economic revenue that went toward overall operating costs has changed since 2008, which is shown in Table 298. Between the 2008 and 2012 studies, shown in the previous table the urchin—dive fishery saw the largest increase (31.9 percent) in operational expenses from 2008 to 2012, which is reflected well in respondents perceptions as fishermen indicated significantly higher (33.3 percent) or somewhat higher (50 percent), operating costs in 2012. A similar pattern is shown for the lobster-trap fishery in which a small percent change in operating costs were observed between the 2008 and 2012 studies and most fishermen also perceived no change in operating costs.

In addition to indicating a perceived change, respondents were asked what factors they felt had contributed to the change in the percent of their gross economic revenue going towards operating costs. This question was asked as an open-ended question and responses were later coded, categorized, and divided into two groups that explained an increase or decrease in personal income. Similar to the region, in San Diego, the most frequently reported reason for increasing operating costs was the increased cost of fuel, followed by general increases in costs of goods and labor (Table 299).

Table 299. Cause of change in percent income going towards overall operating costs from 2008 – 2012, San Diego

Fishery	Number responding	Responses indicating increase														Responses indicating decrease		
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	7	7	—	—	3	1	—	—	5	1	—	—	1	1	—	—	—	—
Market squid–brail	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	3	3	—	—	1	1	—	—	1	—	—	—	—	1	—	—	—	—
Rock crab–trap	2	2	—	—	1	1	—	—	2	1	—	—	1	—	—	—	—	—
Sea cucumber–dive	2	2	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	5	5	2	2	3	—	—	—	—	—	—	—	—	—	—	—	—	—
All fisheries (unique individuals)	13	13	2	2	6	1	—	—	5	1	—	—	1	1	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Responses indicating increase	A. Increase in fuel price
	B. Large purchase of equipment
	C. Overhaul/large maintenance
	D. Increase in price of goods and labor
	E. More crew
	F. Became captain of own boat
	G. Making less revenue
	H. Traveling further to fish
	I. Loss of fishing areas
	J. Personal reasons
	K. Market price of fish
	L. Had to spend more time/effort fishing
	M. New fishery/permit
	N. Bad fishing year
Responses indicating decrease	O. Not running own boat
	P. New, more fuel efficient engine
	Q. Reduced maintenance/crew

We asked fishermen how many years of experience and how many days they spent targeting each of the fisheries in which they participated. As indicated in Table 300, urchin—dive fishermen have been fishing the longest, on average 33 years, and spent the most days targeting their fishery in 2012, 128.8 days. Fishermen in the nearshore finfish live—fixed gear fishery had the least experience with 13 years, and also spent the least amount of time targeting their fishery, 35 days.

Table 300. Years of experience and number of days targeting specific fisheries in 2012, San Diego

	Years of experience in fishery			Number of days targeting fishery in 2012		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	1	*	*	1	*	*
California halibut–trawl	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—
Lobster–trap	13	23.8	10.4	13	125.4	37.9
Market squid–brail	1	*	*	1	*	*
Market squid–net	—	—	—	—	—	—
Nearshore finfish live–fixed gear	5	13.0	9.3	5	35.0	21.8
Rock crab–trap	3	21.7	3.5	3	36.7	5.8
Sea cucumber–dive	3	16.7	12.2	3	63.3	47.3
Sea cucumber–trawl	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*
Urchin–dive	6	33.0	2.5	6	128.8	68.1

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were also asked how many crew they used for each fishery and what percent of their gross economic revenue was spent on their crew. As reported in Table 301, San Diego respondents in the lobster—trap and nearshore finfish live—fixed gear fisheries reported using on average one crew member. The nearshore finfish live—fixed gear respondents reported using the most revenue on crew (6.8 percent), while the urchin—dive respondents spent the most revenue on fuel (18.3 percent).

Table 301. Number of crew and percent of fishery specific gross economic revenue towards crew and fuel in 2012, San Diego

	Number of crew			Percent revenue to crew			Percent revenue to fuel		
Fishery	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**	**Number responding**	**Average**	**Standard deviation**
California halibut–hook & line	1	*	*	1	*	*	1	*	*
California halibut–trawl	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—
Lobster–trap	13	1	1	13	6.2%	6.5%	13	14.1%	6.1%
Market squid–brail	1	*	*	1	*	*	1	*	*
Market squid–net	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	5	1	1	5	6.8%	7.7%	5	9.7%	3.6%
Rock crab–trap	3	0	0	3	0.0%	0.0%	3	4.3%	4.9%
Sea cucumber–dive	3	0	1	3	3.3%	5.8%	3	15.7%	5.1%
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—
Spot prawn–trap	1	*	*	1	*	*	1	*	*
Urchin–dive	6	0	1	6	3.0%	6.7%	6	18.3%	6.7%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

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Fishermen were asked separately for each fishery they participated in to compare his/her success in the fishery in 2012 to that of the last ten years. As shown in Table 302 below, respondents were given the option of responding in one of the following categories: 1) significantly better; 2) somewhat better; 3) the same; 4) somewhat worse; and 5) significantly worse. Respondents were then asked what factors they felt had contributed to the level of success in his/her fishery. This question was asked as an open ended question and responses were later coded and categorized into positive and negative environmental factors (Table 303), economic factors (Table 304), regulatory factors (Table 305), and other factors (Table 306).

In general, the majority of respondents in the lobster—trap, rock crab—trap, sea cucumber—dive, and urchin—dive fisheries indicated that their overall success was somewhat worse or significantly worse in 2012 when compared to the previous ten years. The primary negative influences were bad oceanic conditions (Table 303), bad prices (Table 304), and MPAs or other closures (Table 305). Only respondents in the nearshore finfish live—fixed gear fishery all agreed that their success in 2012 was the same as the previous ten years.

Table 302. Overall success in specific commercial fishery, 2012 compared to previous ten years, San Diego

Fisheries	Number responding	Percent response: Did not participate in previous seasons	Significantly better	Somewhat better	The same	Somewhat worse	Significantly worse
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	13	—	7.7%	15.4%	—	53.8%	23.1%
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	5	—	—	—	100.0%	—	—
Rock crab–trap	3	—	—	—	33.3%	33.3%	33.3%
Sea cucumber–dive	3	—	33.3%	—	—	66.7%	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn–trap	—	—	—	—	—	—	—
Urchin–dive	6	—	16.7%	—	—	16.7%	66.7%

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Table 303. Environmental changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, San Diego

		Positive					Negative				
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	3	—	—	—	—	—	1	—	2	—	1
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	2	1	—	—	—	—	—	—	1	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	3	—	—	—	1	1	—	1	1	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Abundance of fish
	B. Good weather
	C. Good oceanic conditions
	D. High quality fish/product
	E. Clean water
Negative	F. Lack of fish/product
	G. Bad weather
	H. Bad oceanic conditions
	I. Poor quality product/product not ready for harvesting
	J. Poor habitat quality

Table 304. Economic changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, San Diego

		Positive			Negative			
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**
California halibut–hook & line	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—
Lobster–trap	4	3	—	—	1	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—
Rock crab–trap	2	—	—	—	—	2	—	—
Sea cucumber–dive	1	—	—	—	—	—	1	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—
Urchin–dive	4	—	1	—	3	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Good price
	B. Product has become more popular in US market
	C. Good Chinese market
Negative	D. Bad price
	E. Bad market
	F. Buyer went out of business
	G. Increased prices in fuel or other item

Table 305. Regulatory changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, San Diego

		Negative					
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**
California halibut–hook & line	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—
Lobster–trap	8	—	—	8	—	—	—
Market squid–brail	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—
Sea cucumber–dive	1	—	—	1	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—
Urchin–dive	4	1	—	3	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Negative	A. Size restrictions
	B. Day restrictions
	C. MPAs or other closures
	D. Changes in transferability regulations have brought in young/aggressive fishermen
	E. lack of management
	F. Quota met early

Table 306. Other changes/factors influencing success in a specific commercial fishing in 2012 as compared to previous ten years, San Diego

		Positive						Negative						
Fishery	**Number responding**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**
California halibut–hook & line	—	—	—	—	—	—	—	—	—	—	—	—	—	—
California halibut–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Coastal pelagics–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lobster–trap	4	—	—	—	—	—	—	1	3	2	—	—	—	—
Market squid–brail	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Market squid–net	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Nearshore finfish live–fixed gear	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rock crab–trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sea cucumber–trawl	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Spot prawn—trap	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Urchin–dive	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Source: Current study

— indicates that the port/fishery was not sampled or a zero value data point

** indicates data were collected but cannot be shown due to confidentiality constraints*

Positive	A. Working harder/putting in more effort
	B. Has become a better fisherman/business man
	C. Fished more gear than previous years
	D. No longer running his own boat
	E. Upgrades to boat/gear
	F. Using more walk on divers
Negative	G. Poaching
	H. High concentration of fishing gear in water
	I. Crowding/compaction/increased effort
	J. Fished less b/c boat maintenance
	K. Had a smaller boat
	L. Increased availability of farmed fish
	M. Did better in other fisheries, did not need to target as much

5. SOUTH COAST COMMERCIAL FISHING SPATIAL BASELINE AND INITIAL CHANGES

In this section we list the data available that depict the spatial fishing patterns for specific commercial fisheries at the port and region level. There are two sets of map products for commercial fisheries:

1. Map products depicting the post MPA (2012) spatial fishing patterns and
2. Map products depicting the change in spatial fishing patterns between pre MPA (2000-2007) and post MPA (2012) periods.

The full detailed methodology of how post MPA data were collected, analyzed, and reviewed can be found in the methods section of this report and the full methodology of how the pre MPA spatial data were collected can be found in Scholz et al. 2010.

All maps products can be found in the separate Map Appendix that complements this report. The GIS data layers with associated metadata of these spatial data sets are also available and were included in the deliverables package of this project which can be found on the OceanSpaces website: (http://oceanspaces.org).

The following map products and spatial data sets for South Coast region commercial fisheries for the post-MPA 2012 season are provided in Table 307 below along with the number of fishermen who contributed data in each map and the percent of ex-vessel revenue represented by these fishermen who participated in the mapping portion of the interview. The number of fishermen who participated in the mapping portion of the interview may differ from the number of fishermen who participated in the non-spatial portion of the survey as some fishermen opted to not provide fishing ground information. Only maps with 3 or more fishermen are available for use due to confidentiality protocols as indicated in the table below.

Table 307. Number of commercial fishermen interviews conducted and 2012 ex-vessel landings value represented in spatial survey

Port/Region	Fishery	Total number of individuals in 2012 landings revenue	2012 Landings revenue (2010$)	Number interviewed	Total ex-vessel revenue represented by interviews	Percent of ex-vessel revenue represented by interviews	Map available to the public
South Coast Study Region	California halibut--hook & line	110	$199,351	3	$2,810	1%	YES
	California halibut--trawl	26	$246,412	5	$79,169	32%	YES
	Coastal pelagics--net	44	$4,069,765	5	$1,152,139	28%	YES
	Lobster--trap	165	$13,190,202	43	$5,398,512	41%	YES
	Market squid--brail	70	$3,393,970	3	$369,198	11%	YES
	Market squid--net	90	$46,677,219	10	$9,696,196	21%	YES
	Nearshore finfish live--fixed gear	45	$401,587	11	$135,656	34%	YES
	Rock crab--trap	99	$2,280,955	20	$1,215,391	53%	YES
	Sea cucumber--dive	59	$1,074,175	12	$467,580	44%	YES
	Sea cucumber--trawl	24	$700,625	4	$183,892	26%	YES
	Spot prawn--trap	17	$2,996,653	3	$872,042	29%	YES
	Urchin--dive	175	$5,559,458	32	$1,687,575	30%	YES
Santa Barbara	California halibut--hook & line	31	$73,213	2	$2,202	3%	
	California halibut--trawl	11	$54,647	5	$41,232	75%	YES
	Coastal pelagics--net	—	—	—	—	—	
	Lobster--trap	43	$2,487,332	9	$1,138,723	46%	YES
	Market squid--brail	1	$899	—	—	—	
	Market squid--net	—	—	—	—	—	
	Nearshore finfish live--fixed gear	13	$125,930	3	$20,954	17%	YES
	Rock crab--trap	39	$1,647,655	10	$944,493	57%	YES
	Sea cucumber--dive	33	$106,895	2	$12,020	11%	
	Sea cucumber--trawl	14	$578,892	4	$183,892	32%	YES
	Spot prawn--trap	3	$49,244	—	—	—	
	Urchin--dive	101	$3,030,518	16	$919,468	30%	YES
Ventura	California halibut--hook & line	11	$21,161	—	—	—	
	California halibut--trawl	6	$77,487	1	$28,029	36%	
	Coastal pelagics--net	13	$34,598	—	—	—	
	Lobster--trap	12	$1,044,215	5	$788,386	76%	YES
	Market squid--brail	—	—	—	—	—	
	Market squid--net	33	$7,798,682	4	$1,539,170	20%	YES
	Nearshore finfish live--fixed gear	3	$20,059	1	$10,923	54%	
	Rock crab--trap	11	$155,928	4	$84,520	54%	YES
	Sea cucumber--dive	8	$200,313	—	—	—	
	Sea cucumber--trawl	6	$100,872	—	—	—	
	Spot prawn--trap	3	$280,412	—	—	—	
	Urchin--dive	11	$64,503	—	—	—	

Port Hueneme/ Oxnard	California halibut--hook & line	16	$37,020	—	—	—	
	California halibut--trawl	6	$62,280	1	$8,859	14%	
	Coastal pelagics--net	11	$235,745	1	$99,735	42%	
	Lobster--trap	15	$995,264	2	$188,331	19%	
	Market squid--brail	5	$35,007	—	—	—	
	Market squid--net	38	$10,005,565	4	$1,942,171	19%	YES
	Nearshore finfish live--fixed gear	7	$55,492	1	$6,175	11%	
	Rock crab--trap	18	$128,150	2	$21,593	17%	
	Sea cucumber--dive	19	$338,718	4	$155,760	46%	YES
	Sea cucumber--trawl	3	$4,458	—	—	—	
	Spot prawn--trap	3	$883,643	—	—	—	
	Urchin--dive	38	$1,175,691	6	$175,607	15%	YES
San Pedro/Los Angeles	California halibut--hook & line	39	$46,246	1	$608	1%	
	California halibut--trawl	9	$51,838	—	—	—	
	Coastal pelagics--net	29	$3,732,970	4	$1,047,279	28%	YES
	Lobster--trap	43	$2,994,398	9	$955,423	32%	YES
	Market squid--brail	67	$3,357,870	3	$369,198	11%	YES
	Market squid--net	66	$28,872,465	9	$6,143,213	21%	YES
	Nearshore finfish live--fixed gear	6	$47,057	1	$19,517	41%	
	Rock crab--trap	23	$208,983	4	$126,446	61%	YES
	Sea cucumber--dive	21	$367,209	7	$228,253	62%	YES
	Sea cucumber--trawl	2	$16,404	—	—	—	
	Spot prawn--trap	6	$958,114	3	$833,915	87%	YES
	Urchin--dive	42	$642,857	9	$277,731	43%	YES
Dana Point	California halibut--hook & line	1	$146	—	—	—	
	California halibut--trawl	—	—	—	—	—	
	Coastal pelagics--net	—	—	—	—	—	
	Lobster--trap	25	$1,218,510	7	$593,592	49%	YES
	Market squid--brail	—	—	—	—	—	
	Market squid--net	—	—	—	—	—	
	Nearshore finfish live--fixed gear	—	—	—	—	—	
	Rock crab--trap	8	$43,963	1	$6,363	14%	
	Sea cucumber--dive	—	—	—	—	—	
	Sea cucumber--trawl	—	—	—	—	—	
	Spot prawn--trap	3	$334,924	1	$17,253	5%	
	Urchin--dive	11	$78,028	2	$59,518	76%	
Oceanside	California halibut--hook & line	3	$2,026	—	—	—	
	California halibut--trawl	1	$160	—	—	—	
	Coastal pelagics--net	1	$66,452	—	—	—	
	Lobster--trap	14	$1,161,419	4	$572,756	49%	YES
	Market squid--brail	—	—	—	—	—	
	Market squid--net	1	$506	—	—	—	
	Nearshore finfish live--fixed gear	2	$25,627	—	—	—	

Oceanside (cont.)	Rock crab--trap	4	$25,261	1	$11,088	44%	
	Sea cucumber--dive	1	$2,861	—	—	—	
	Sea cucumber--trawl	—	—	—	—	—	
	Spot prawn--trap	2	$185,150	—	—	—	
	Urchin--dive	—	—	—	—	—	
San Diego	California halibut--hook & line	20	$19,539	—	—	—	
	California halibut--trawl	—	—	—	—	—	
	Coastal pelagics--net	—	—	—	—	—	
	Lobster--trap	58	$3,289,063	12	$1,129,445	34%	YES
	Market squid--brail	1	$193	—	—	—	
	Market squid--net	—	—	—	—	—	
	Nearshore finfish live--fixed gear	14	$127,632	5	$80,789	63%	YES
	Rock crab--trap	13	$71,015	3	$11,934	17%	YES
	Sea cucumber--dive	4	$58,179	2	$55,922	96%	
	Sea cucumber--trawl	—	—	—	—	—	
	Spot prawn--trap	4	$305,166	—	—	—	
	Urchin--dive	22	$567,861	5	$232,940	41%	YES

In our map products we also present an effort to examine change in the spatial extent and relative value of commercial fishing areas for the South Coast region. To do this we utilized a pre-MPA spatial fishing dataset collected from commercial fishermen interviews in 2008 as part of the MLPA planning process. The pre-MPA dataset was collected by asking fishermen to map and value their fishing grounds based on their cumulative fishing experience and these individual data were then weighted using an average yearly gross revenue from 2000 to 2007. This differs slightly from the method in which the post-MPA data set was collected in which fishermen were asked to map his/her post-MPA fishing grounds for the year 2012 and ex-vessel revenue from the year 2012 was used to weight the data. However, despite these differences we conceptualize these data sets as generally representative of pre and post MPA period fishing grounds and their relative stated value.

This analysis utilized the raster math functions in ArcGIS to calculate the difference between the pre-MPA and post-MPA data. To conduct this analysis we utilized a snap grid, which is a raster layer that provides the overarching spatial extent and a common structure to build our raster layer products. The snap grid gave us the structure to perform a cell by cell (100 meter square cell size) comparison. Each dataset was also analyzed as a relative dataset in which each data set was standardized to a 0 to 1 index, which supplied a common index of values allowing us to make direct comparisons between the raster layers. Below these series of maps illustrate the location in which fishing grounds have increased or decreased in relative value between the two survey efforts.

It is important to emphasize that these are maps depicting the spatial change in relative value and are not maps depicting spatial change in ex-vessel revenue. Only relative value surfaces (also known as a ‘heat map’) developed for the pre and post-MPA datasets were used in this analysis. Ex-vessel revenue was not applied to the ‘heat map’ value surfaces, however ex-vessel revenue was used to weight the aggregation of individual fishing grounds. We chose to utilize a relative value surface as spatial change in revenue levels may not yield useful information, especially when considering the large magnitudes of change in ex-vessel revenue that may overwhelm any analysis depicting spatial change in ex-vessel revenue levels. Thus, the results below are simply an examination of changes in the relative values/importance of fishing areas to a fishery—not spatial changes in revenue levels across the two datasets. For example, an area that depicts an increase in relative value does not directly translate to an increase in revenue derived from that area. The interpretation should be that the area has increased in relative value across pre and post MPA periods.

We would like to highlight that the pre MPA period in our spatial change analysis is an average over 8 years (2000-2007) where much variability could have occurred year to year—yet we simply utilize an average across these years. Furthermore, 2012 is but only one post MPA year. Many factors influence the relative value/importance of fishing grounds year to year and thus with only one post MPA year available it is difficult to make any robust analyses as to the value/importance of commercial fishing grounds from pre to post MPA periods. Furthermore, changes between pre and post MPA periods are not necessarily a direct impact from the implementation of MPAs and we would like to emphasize that these maps should not be interpreted as such. Instead the spatial change maps we present serve as an example of how spatial pre and post MPA data can be analyzed to assess initial spatial changes since MPA implementation but any causation as to these changes are not assessed.

As is the case with all analyses, an unbiased and representative sample size across both data sets would improve the results and emerging trends could be more rigorously tested. Below in Table 308 we list the region-fishery and port-fishery combinations in which we were able to conduct a spatial change analysis for. Furthermore, we provide the number of fishermen interviewed and the percent ex-vessel revenue represented in the each spatial data set in pre and post MPA periods to help facilitate interpretation of the representativeness and reliability of spatial change analysis results.

We would like to note that the spatial fishing data sets from collected in 2008 are not available to the public and thus are not provided here in this report. These data sets were collected as part of the MLPA planning processes for use only by the Regional Stakeholder Group and have not subsequently been approved for any public release.

Given these caveats, the region level spatial change maps depict the following increase and decrease in the relative value/importance of fishing grounds:

- For the California halibut—hook and line fishery, increases in the value/importance of fishing grounds were primarily depicted just offshore of San Pedro with all other fishing grounds decreasing in relative value/importance.
- For the coastal peglaics—seine fishery there is a general slight increase in the value/importance across fishing grounds—but particularly around the southwest side of Santa Catalina island and a large decrease in the coastal areas off San Pedro.
- For the lobster—trap fishery there is a general decrease in the relative value/importance of fishing grounds across the region but an increase concentrated around the coastal areas off Santa Barbara, Ventura, and Port Hueneme, and San Diego.
- For the nearshore finfish—live—fixed gear fishery increase in the relative value/importance of fishing grounds were shown around San Miguel and Santa Rosa islands as well as around San Nicolas island. Decreases were shown around the San Diego coastal areas.
- For the rock crab—trap fishery increases in the relative value/importance of fishing grounds were shown in the coastal areas offshore of Goleta, Santa Barbara and Ventura as well as in Santa Monica Bay and in the Point Loma region of San Diego. Decreases were shown around Santa Rosa island.
- For the sea cucumber—dive fishery increases in the relative value/importance of fishing grounds were shown around San Clemente island and in the northeast portion of San Nicolas island. Decreases were shown throughout the remaining fishing grounds across the region.
- For the sea cucumber—trawl fishery increases in the relative value/importance of fishing grounds were shown in the coastal area between Point Conception and Goleta Point and offshore of Santa Barbara while decrease were shown in other remaining fishing grounds across the region.
- For the market squid—brail fishery increases in the relative value/importance of fishing grounds were concentrated in the southeast portion of Santa Monica Bay and all other fishing ground showed decreases in the relative value/importance.
- For the market squid—seine fishery increases in the relative value/importance of fishing grounds were mainly shown in the coastal areas offshore of San Pedro as well as offshore of Santa Barbara, Ventura, and Port Hueneme areas. Decreases were mainly shown on the southeast portion of Santa Catalina island.
- For the urchin-dive fishery increases in the relative value/importance of fishing ground on the north side of Santa Rosa island as well as just directly offshore of San Pedro and San Diego. Decreases in the relative value/importance of fishing grounds are shown around San Miguel island.

Table 308. Count number of fishermen and percent of ex-vessel commercial fishing landings represented in interviews, spatial change analysis target fisheries, pre and post MPA

		Count of fishermen interviewed		Percent of ex-vessel revenue represented (2000-2007)	Percent of 2012 ex-vessel revenue represented
Ports	**Fishery**	**Pre MPA**	**Post MPA**	**Pre MPA**	**Post MPA**
South Coast Region	California halibut - hook and line	8	3	13%	1%
	Coastal pelagics - net	21	5	55%	28%
	Lobster - trap	95	42	71%	41%
	Market squid - brail	16	3	20%	11%
	Market squid - net	27	10	40%	21%
	Nearshore finfish - live - fixed gear	30	10	45%	34%
	Rock crab - trap	45	20	58%	53%
	Sea cucumber - dive	17	12	33%	42%
	Sea cucumber - trawl	3	4	2%	26%
	Urchin - dive	74	32	47%	30%
Santa Barbara	Lobster - trap	22	9	70%	46%
	Nearshore finfish - live - fixed gear	11	3	52%	17%
	Rock crab - trap	18	10	62%	57%
	Sea cucumber - trawl	3	4	3%	32%
	Urchin - dive	31	16	49%	30%
Ventura	Lobster - trap	7	4	85%	76%
	Market squid - net	14	4	37%	20%
	Rock crab - trap	5	4	69%	54%
Port Hueneme/ Oxnard	Market squid - net	12	4	19%	19%
	Sea cucumber - dive	8	4	35%	46%
	Urchin - dive	14	6	41%	15%
San Pedro/Los Angeles	Coastal pelagics - net	21	4	57%	28%
	Lobster - trap	18	9	54%	32%
	Market squid - brail	15	3	20%	11%
	Market squid - net	26	9	55%	21%
	Rock crab - trap	7	4	47%	61%
	Sea cucumber - dive	5	7	33%	62%
	Urchin - dive	31	9	42%	43%
Dana Point	Lobster - trap	19	7	81%	49%
Oceanside	Lobster - trap	6	4	80%	50%
San Diego	Lobster - trap	30	12	71%	34%
	Nearshore finfish - live - fixed gear	10	5	72%	63%
	Rock crab - trap	11	3	58%	17%
	Urchin - dive	12	5	52%	41%

Source: Current Study

6. LESSONS LEARNED AND FUTURE RECOMMENDATIONS

This section reflects on several methodological and overall project lessons learned and recommendations to inform future long-term MPA monitoring efforts.

6.1. Community Engagement

Outreach efforts to port communities were initiated at the project's inception and continued throughout the project. Building trust and collaborating with fishing communities were important measures of success for our project; however, due to several factors such as: distrust in how information will be used; dissatisfaction with the MPA network planning process and its outcome; and unclear benefits and outcomes of participating in the project, many fishermen were reticent to participate in the project. This reticence to participate in our project directly affected the survey sample size and thus the representativeness of the data collected. It also affected our ability to provide comprehensive interpretation of data analysis results. A wide base of community feedback and input to interpret project results is critical to add context, meaning, and identify possible drivers of change in the data we present. A good example of this is the interpretation of commercial fishing landings data such as historical and current trends on the number of fishermen, pounds landed, ex-vessel revenue, and ex-vessel prices per pound. Without the intimate knowledge of the fishing community we would only be able to provide a description of the data trends without insights of possible factors influencing observed changes which are important to understand the full landscape of factors (including MPAs) that affect change in commercial fishing and fishermen.

This project originally intended to gather two years of fisherman interview data. However, before we began data collection it became clear that much more time was needed to fully engage the commercial fishing community in supporting and participating in this project.

This presented a difficult challenge to the project, and the nature of the concerns fishermen raised were difficult to address in a limited timeline and the limited scope of Point 97's role in the larger landscape of MPA management and monitoring. Fishermen often raised issues of trust, project intentions, incentives to participate, and use of collected data. Point 97 documented these concerns and worked jointly with the California Ocean Science Trust and Strategic Earth Consulting to increase outreach efforts, network within the fishing community, attend fisherman meetings to disseminate information and answer questions as to the intentions of the project, and, to the extent possible, explain how data will be used to inform the 5-year management review of the South Coast MPA network. Point 97 spent extensive efforts to keep the fishing community informed of project progress to develop transparency in our work and maintaining relationships in the South Coast region. This is exemplified in our document (Appendix A) detailing the key themes that emerged from an extensive community review of the data this project gathered and summarized.

In future projects, implementing efforts to engage fishermen early on, acknowledging and addressing to the extent possible their concerns, and incorporating fishermen in the overall MPA monitoring process is important and key to building the fishing community relationships necessary to conduct long-term socioeconomic studies. This can be done by meaningfully incorporating fishermen into MPA monitoring planning efforts as well as implementation efforts such as project design, data review/analysis, and data dissemination which are important to build trust and transparency as well as foster a sense of ownership and legitimacy over the data, information, and process by the fishermen whose livelihood may be impacted.

A promising model of engaging the fishing community is currently being carried out in the North Coast region of California in which community engagement from citizens to fishermen to county board of supervisors began early on and involves the agencies responsible for both managing the MPA network as well as the MPA monitoring effort. This developed interest and support in MPA monitoring efforts as the community was engaged in shaping the MPA monitoring effort from the grounds up and there was clear opportunity to develop community-based projects. This community-wide investment in MPA monitoring efforts from the beginning, even before the request for MPA monitoring proposals is developed, is critical to garnering the community investment and support needed to carry out effective MPA monitoring—especially socioeconomic MPA monitoring efforts.

6.2. Existing Data Gaps in Fisheries Data Collection

The California Department of Fish and Wildlife (CDFW) is mandated to gather commercial fisheries data and currently gathers this data through fish landing receipts and fishery logbook data. The data gathered through landing receipts and logbooks provide a wide array of data to inform long term MPA monitoring. As with all long term data collection efforts, tradeoffs must be considered of what data are feasible to gather and how changes in current data collection program affect comparability with previously gathered data. Fisheries are complex and thus designing comprehensive and robust data collection efforts is a tremendous challenge. In the interest of improving fishery data collection efforts into the future, below we describe recommendations of how data gaps or additional data can be gathered to better inform long term MPA monitoring efforts.

6.2.1. Commercial Landings Receipts

Landing receipts or fish tickets are filled out by the fish buyer who purchases landed fish from a specific commercial fisherman and both the buyer and the fisherman keeps copies of the receipt while a copy is submitted to CDFW for entry into the commercial landings database. As data are provided at the individual fisherman level, these data records can be summarized to the statewide and landing port level for specific fisheries and across fisheries. In general the data available and data that may be derived from the commercial fisheries landings database include:

- Number of fishermen making landings in a given port or fishery;
- Pounds, price per pound, and ex-vessel revenue from fish caught;
- Percent of an individual's overall fishing revenue from a given fishery;
- Number of trips taken by individual fishermen for a given fishery and overall (derived from counting unique landing dates); and
- General location of fish caught (10 x 10 nautical mile fish block ID).
- This database also connects to the commercial fishing license database and the vessel registration database so that purchased permits and vessel information/characteristics can be connected to individual fishermen and their fish landings.

However, there are limitations of the CDFW commercial fisheries landings data that can be improved upon to provide more robust data for long term MPA monitoring:

- Coarse resolution and inaccuracies in location of where fish are caught:
    - Fishing location information is recorded as a fish block location, which is 10 x 10 nautical mile in size and may be too coarse a resolution needed for effective fisheries management.
    - Only one fish block number may be entered into the fish landings receipts even if a fisherman may have fished in more than one fish block.
    - The fish buyers, whom may not have knowledge of where the fisherman was, are those who fill out the fish landing receipt. Some fish buyers may ask the fisherman where they fished but some may simply fill out an arbitrary fish block number:
        - An analysis conducted by Ecotrust in 2004 comparing CDFW fish landings block data to that of spatial data collected and mapped through in-person interviews with commercial fishermen revealed large discrepancies in the location of Dungeness crab fishing grounds. CDFW landings data showed the majority of the Dungeness crab fishing grounds value as far offshore and in thousands of fathoms deep waters where fisherman cannot feasibly fish. This analysis revealed possible inaccuracies in fishing location data being recorded in landings receipts.
        - If fish location data were more accurate, summaries could be developed for specific spatial locations. For example, data may be summarized for specific

MPAs or a National Marine Sanctuary by simply querying the fishing records that reference the fish blocks contained within a specific boundary. This type of analysis is useful to summarize socioeconomic fishing information to specific jurisdictional boundaries.

- Data does not contain homeport of fishing vessels but rather just the port fish were landed:
  - This is an important data field to capture for economic analyses, as the economic value of fish landed may not be realized in the port in which fish are landed but rather by the homeport of the fisherman. This is especially true for fisheries such as the Dungeness crab, coastal pelagic, or market squid fisheries in which fishermen from out of state or from other regions of the state are making fish landings in a particular port.
- Delay in available data:
  - Landings receipts forms must be mailed and then manually scanned into the CDFW database. Finalized landings data are only available in June/July the next year, which is a significant delay.

6.2.2. Commercial Fishery Logbooks

Fisheries data is also gathered through commercial fishery logbooks. These logbooks are filled out by fishermen during fishing trips and must be submitted to CDFW each month and a copy of the logbook is kept by the individual fisherman for their records. To the best of our knowledge the fisheries that have commercial fishing logbooks are:

- Lobster–trap
- Spot prawn–trap
- Sea urchin–dive
- Sea cucumber–dive
- Edible seaweed–hand harvest
- Kelp harvest
- Shrimp/prawn–trawl (included pink shrimp, golden/ridgeback prawn, and sea cucumber)
- Live bait (coastal pelagics/market squid)
- Swordfish–harpoon
- Gill and trammel net fisheries (includes sharks, swordfish, white seabass, yellowtail, barracuda, and California halibut)
- Market squid–seine and brail
- California and Pacific halibut–trawl

The CDFW commercial fishing logbooks are different for each fishery but across logbooks there are data elements in common such as estimates in catch (either pounds/tons or number of fish/lobster caught) and the location of the catch (with either fish block number, nearest landmark, and/or latitude and longitude coordinates). Because of these differences, comparisons across fisheries are difficult beyond simply location of catch and estimated amounts of fish caught. The following are the primary analyses that can be conducted using the CDFW commercial fisheries logbook data:

- Location and amount of fish caught:
  - Since fishermen themselves are filling out these logbooks the data collected on fishing location may be more accurate than the fishing locations indicated on fish landing receipts. Also, more than one fish block may be entered into a logbook, as location data is often collected per fishing event, which provide more accurate data than fishing landing receipts which allow for only one fish block to be indicated where fish were caught.
  - The amount of fish caught may also be summarized from logbook data however, the amount of fish caught may be better estimated in the fish landings receipt data as not all fishermen have the ability to weight their catch on board their vessel.
- Fishing effort:
  - There are additional data collected in each logbook, which range from fishing depth, number of traps used, and hours fishing, amongst others. Some of this data may be used

to calculate fishing effort such as the ratio of pounds caught to hours fishing/number of traps used, which is an important metric to monitor over time.

However, there are limitations of the CDFW commercial fishery logbook data that can be improved upon to provide more robust data for long term MPA monitoring:

- Logbook data often cannot be connected to landings receipt data. With the exception of the lobster fishery, there is not a way to connect fish landing receipt data to specific logbook entries. This prevents a cross check of data as well as information on the port in which the logged catch was landed. The landing receipts data can be connected to logbook data using a fisherman's license number but it is not possible to know which exact logbook entry coincides with a particular landings receipt.
- Estimates of pounds of fish caught may not be accurate as the fishing landing receipt data, as fish may not be weighted until at time of landing/sale.
- Because of differences across logbooks (e.g. location data captured as GPS coordinates or as closest landmark) it makes it difficult to conduct any comparisons across fisheries using these data. Furthermore, not all state-managed fisheries have logbooks.
- Delay in available data. Logbook forms must be submitted each month and then manually entered into a database. Finalized logbook data are not typically available several months after submission.

6.3. Explore Factors that Impact Economic Well Being

In this report we largely utilize and aggregate individual commercial fisherman data to develop port and region level analyses in order to examine historical trends, initial changes since MPA implementation, as well as establish a post MPA baseline data set. However, a future recommendation is to conduct more advanced analyses using individual commercial fisherman data to explore typologies of commercial fisherman such as the specific attributes of fishermen (e.g., fishermen whom have diversified the fisheries they pursue) and how these types of fishermen are experiencing and coping with change over time. Specifically, some questions to explore include:

- What type of commercial fishermen are doing better or worse over time?
- What attributes do these fishermen that are doing better or worse have in common—what do they fish for, have they diversified their fishery profile, how much do they fish, and what ports are they from?
- What type of fishermen have dropped out of commercial fishing over time and why?

We know that the impacts of economic change do not unfold evenly across fishermen—some fishermen are more or less able to cope with change depending on their adaptive capacity. The questions above help explore the fisherman attributes that may help us better understand what types of people are successfully coping with change and why they are successful. Understanding this can lead to identifying target areas in which to focus policy efforts that help commercial fishermen cope with economic change, such as the change that follows MPA establishment, in order to better maintain viable livelihoods.

6.4. Advance Digital Fisheries Data Collection Systems

MPA managers are tasked with using ecosystem-based and adaptive management measures to maximize the ecological and economic benefits of MPA to coastal communities into the future. To do so, requires cost-effective and innovative approaches to collecting robust, fine-scale, and spatially explicit socioeconomic fisheries data that will better enable MPA managers to design, monitor, and adapt MPAs to effectively reach stated goals and objectives.

Current socioeconomic data on state-managed fisheries is fragmented and incomplete which limits the ability of managers to provide a comprehensive understanding of the historical, current, and potential future state of fisheries that surround MPAs. This understanding is necessary so that MPA managers can better develop effective management plans that minimize socioeconomic costs to fisherman livelihoods. Overall, there is great need to collect economic data across all fishing sectors and to conduct regular collection of economic data to continually inform MPA management efforts. Furthermore, significant improvements to spatially referenced catch and effort data can be made to address the limitations highlighted in this report and promote the comparability and utility of existing socioeconomic fisheries data.

Indeed, there is great need to advance current data collection programs toward more streamlined and cost-effective solutions. A promising direction in fisheries data collection is the use of mobile digital data collection technology. Fisheries across the globe are piloting digital logbooks or digital data collection applications using GPS enabled mobile phones or tablet devices. Through these mobile data collection applications, spatial fishing data can automatically be captured using a mobile phone or tablet's GPS unit and associated fishing trip characteristics and economic information may also be digitally captured. This data may then be uploaded to a data server via a cellular data connection after each fishing trip—making data available in near real-time to fisheries managers and fishermen themselves. This type of technology would enable fisheries managers to closely and actively monitor and manage fisheries performance and effectively implement adaptive management approaches.

In California, digital fisheries data collection technology would benefit both long-term MPA monitoring as well as fisheries management. Both initiatives require cost-effective technology solutions that tighten the feedback loop between data collection and data analysis needed to support adaptive management measures. Together this would better enable innovative management approaches to be piloted, tested, and refined to advance the way we manage fisheries so that management costs are lowered, fish stocks are sustainable, and economic benefits to fishing communities are maximized.

Modernizing fisheries data collection programs will not only streamline data collection and delivery but also allow MPA and fishery managers to quickly update data collection forms to respond to changing information needs and emerging uses. Digital data collection allows for the flexibility needed to develop, test, and refine fisheries data collection programs that can be integrated across fishing sectors as well as with biological and ecological data. This ability to quickly and iteratively adapt data collection programs will be key to developing the robust socioeconomic fisheries data needed to explore bio-economic linkages and dynamics that are foundational to ecosystem-based and adaptive management approaches.

6.5. Present Fisheries Data in a Dynamic Online Format

As exemplified in the length of this report, there is need to make socioeconomic data accessible, easier to explore, and enable the presentation of dynamic information. The CDFW maintains a large database on commercial, CPFV, and recreational fishing data that provide a wealth of knowledge on California state managed fisheries. To date, these data have largely been summarized to static tables or graphs presented in paper based reports and these reports are often lengthy and the data is presented in various summarized form (e.g. summarized to the fishery vs. the port).

To better enable more robust and dynamic presentation, exploration, and comparison of socioeconomic fisheries data a promising avenue is to develop a socioeconomic data portal in which CDFW socioeconomic fisheries data can be presented (and easily and cost-effectively updated each year) in a way so that researchers, members of the public, and MPA managers can easily explore time series data on key fishery performance indicators. Indeed, an online data portal would provide a format in which to dynamically present information such as flows and linkages that are difficult to present in paper report form. An online portal could also facilitate side-by-side comparison of fisheries, ports, or time periods---allowing technology to advance how we present and investigate large data sets. Furthermore, as better spatial data are collected for fisheries over time, additional time series spatial data could be integrated into this portal to facilitate the exploration of spatial trends and changes over time. An online data portal would provide a cost-effective means in which to continually update socioeconomic fisheries data and create a foundation in which to expand the socioeconomic knowledge base of fisheries.

6.6. Recommendations on Key Commercial Fishing Monitoring Metrics

On the following page, encapsulated in Table 309, are Point 97's recommendations for key metrics for long-term monitoring of the commercial fishing sector. To inform the existing monitoring plan structure we included the key monitoring metrics recommended for consumptive uses detailed in the South Coast MPA monitoring plan and added additional metrics with an associated rationale.

Table 309. Recommendations for key monitoring metrics in the commercial fishing sector

Metric	**Purpose**	**Source**
Landings (pounds and ex-vessel revenue)	This metric is to monitor how many pounds of fish are being caught and how much revenue is being generated in key fisheries. This data may be analyzed at the port, region, and state scales so that nested comparisons may be made of trends over time.	CDFW commercial landings data
Operating costs (average yearly percentages)	This metric is to monitor how operating costs may be changing over time. This may be increases/decreases in fuel costs, equipment costs, maintenance costs, crew costs, etc. From this information changes in net revenue for individual fishermen may be calculated. These operating cost percentages may also be used to help estimate secondary economic impacts upon commercial fishing support industries. It is recommended that operating costs be collected at the fishery level as some fisheries are more equipment intensive or require less/more fuel and crew.	Survey data
Total number of fishermen landing in key fisheries	This metric is to monitor how many fishermen are participating in key fisheries each year. This data may be analyzed at the port, region, and state scales so that nested comparisons may be made of trends over time.	CDFW commercial landings data
Total number of trips in key fisheries	This metric is to monitor how many total trips fishermen are taking in key fisheries each year. This data may be analyzed at the port, region, and state scales so that nested comparisons may be made of trends over time.	CDFW commercial landings data
Landings (pounds and ex-vessel revenue) and trips per fisherman	This metric is to monitor how landings (pounds and revenue) and fishing effort may be changing at the individual fisherman level for key fisheries	CDFW commercial landings data
Spatial value of fishing areas	This metric is to monitor changes in how coastal/ocean areas are being utilized and valued by fishermen. Data may be analyzed with previous spatial data sets to determine spatial shifts in the value of fishing areas for key fisheries	CDFW commercial landings data
Catch per unit effort (CPUE)	This metric is to monitor the average amount effort expended by fishermen in key fisheries. This data may be calculated by examining pounds/ex-vessel revenue per trip for key fisheries and	CDFW commercial landings data
Price per pound	This metric is to monitor changes in the average ex-vessel price received by fishermen in key fisheries. This metric may be calculated on average by dividing ex-vessel revenue by pounds landed.	CDFW commercial landings data
Average percent of fishing revenue from key fisheries	This metric is to monitor changes in the average proportion individual fishermen rely upon a fishery for their fishing income. This metric may be calculated by examining and averaging across the ex-vessel revenue portfolio of individual fishermen who make landings in a given port or region.	CDFW commercial landings data
Attitudes and perceptions	This information is to monitor and collect contextual information that may help identify key fishery issues and factors driving the change observed in the metrics listed above.	Survey data/focus groups
Job satisfaction/ Well-being/ Quality of life	These social metrics are important to monitor as economic metrics may not reveal changes in personal well-being. For example, a fisherman may be making the same amount of revenue from one year to the next, but his/her quality of life may decline in increased work hours or travel time in order to do so.	Survey data/focus groups

7. CONCLUSIONS

The intention of this report was to provide information on the historical trends, initial changes since MPA implementation, and a post MPA baseline characterization and description of key target commercial fisheries and ports in the California South Coast Region. It should be noted that in this report we do not account for the secondary economic effects of changes in fishing revenue and how that may affect support industries such as fish processors/buyers, port workers, or crew which benefits and may rely on the business of commercial fishermen. Indeed, these industries are vital to the success and health of fishing communities and are important to account for in future monitoring efforts.

It is difficult to discern the specific effects of MPAs on fishing communities as they are confounded by a multitude of factors such as other regulatory constraints (e.g., fisheries management policies such as area based closures, quota limits, and limited entry fisheries) and general economic downturn, environmental variability/change, market variability, and increasing competition for marine space. However, advancing our understanding of how humans utilize, value, and rely upon marine space will be critical to unraveling these interconnections as well as monitor how MPAs are benefitting or impacting fishing communities into the future. This information may then be used in adaptive management measures to improve the performance of MPAs towards meeting ecological and socioeconomic goals. Similarly, it is our hope that the data collected/compiled and lessons learned through this project will be applied to future MPA monitoring efforts to improve how we gather socioeconomic fisheries data and build a time series data set on how human uses and the socioeconomic health of fishing communities are changing over time. Such a robust and longitudinal dataset that provides both socioeconomic characterization and spatial fishing patterns on consumptive human uses could be used for a wide array of marine planning application including the monitoring of MPAs.

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APPENDIX A: KEY THEMES FROM COMMUNITY DATA REVIEW

South Coast Marine Protected Areas (MPAs) Human Use and Values Evaluation Summary of Key Themes

Small Group Discussions with Commercial Fleet to Review Socioeconomic Data Collection (Summer 2013)

January 27 – February 7, 2014

Prepared by Point 97/Ecotrust and Strategic Earth Consulting

OVERVIEW

Beginning in July 2013, Point 97/Ecotrust conducted a series of interviews with 114 commercial fishermen throughout the South Coast (Point Conception south to the border of Mexico) in an effort to evaluate the social and economic health of Southern California's commercial fishing fleet. Fishermen were invited to share their experience and expertise, including information about operating costs, historical and current fishing grounds, and the direct/indirect impacts of marine protected areas (MPAs).

The information collected will help establish a baseline dataset of socioeconomic information to measure initial and future changes in commercial fishing and to the fishing fleet since the time of the implementation of the Marine Life Protection Act (MLPA) in 2012. This information will also help Point 97, fishermen, resource managers, and decision-makers to better understand how MPAs and other factors are effecting fishing patterns, economic activities, and commercial fishermen's ability to maintain a livelihood. A list of the questions asked during these interviews is available on Ecotrust's website (http://www.ecotrust.org/monitoring/downloads/Monitoring-SC-Questions_2013.pdf).

As a follow up to the interviews conducted in summer 2013, Point 97 coordinated a series of small group discussions with fishermen to ensure the results of the data collection are accurate and tell a complete story (all data was presented in an aggregated form to uphold confidentiality of participants). Each fisherman who participated in an interview was invited to take part in a small group discussion; a total of 35 fishermen participated in these informal conversations.

This project will directly inform the 5-year review of South Coast MPAs by the state of California and is one of eleven projects—and the only socioeconomic project—that makes up the South Coast MPA Baseline Program (http://oceanspaces.org/program/south-coast-mpa-baseline-program). The baseline program is administered by the MPA Monitoring Enterprise, a program of California Ocean Science Trust, in collaboration with the California Ocean Protection Council, the California Department of Fish and Game (CDFW), and California Sea Grant.

This document has been made available on Ecotrust's monitoring page (www.ecotrust.org/monitoring) and was circulated via email and/or mail to commercial fishermen who conducted an interview (July-October 2013). It is intended as a summary of key themes expressed by the 35 fishermen who attended the small group discussions (January-February 2014) and aims to reflect their perspectives and opinions. The information provided has not been vetted for accuracy (e.g., specific dates given for regulation and management changes). The intended audience for this document is commercial fishermen to ensure that Point 97's notes from the small group discussions is accurate. Point 97 will incorporate the feedback and input in this document into a final report, which will be made available on OceanSpaces.org later this year and ultimately shared as part of the state's 5-year review of South Coast MPAs.

This feedback provided by the South Coast commercial fishermen is organized into the following sections:

- Key Themes (aggregated spatial and socioeconomic data, historical data, and impacts of MPAs)
- Questions and Concerns
- Recommendations for Future Management

KEY THEMES

Review of Data Collected in Summer 2013

Information shared by commercial fishermen from July-August 2013 was reviewed, evaluated, aggregated, and summarized by port and fishery. Data from any port/fishery combination with less than three respondents was suppressed to protect confidentiality. All data collected refers to activities during the 2012 calendar year. For some fisheries (e.g., lobster), this means fishermen considered the end of the 2011-12 season and the start of the 2012-13 season.

Across all fisheries

Aggregated Spatial Data (e.g., maps)

- Generally, fishermen were comfortable with the results reflected in the maps.
- There was concern expressed that Point 97 did not speak with every commercial fisherman, and in some cases very few fishermen within a specific fishery (e.g., squid, seine). Some fishermen felt that the small sample size may influence the accuracy of the mapped information.
  - One fishery had very few fishermen participate in the interview process. With this in mind, and after discussing the maps with the fishermen, it was decided that a data set would be removed from the map due to only having three respondents (the minimum number required) and the nature of the data highlighting an individual's fishing areas. Therefore, no maps will be available for this particular fishery.
- A number of recommendations were made to improve interpretation and readability of the maps, including:
  - Integrate maps with CDFW landings data by block number. This would allow for comparison of two different data sources. Since Point 97 did not speak with every commercial fisherman in the South Coast, there was some concern the information displayed on the maps was misleading and the CDFW dataset would add additional perspective to the results.
  - Include satellite imagery into the maps (i.e., identify specific landmarks).
  - Add a kelp canopy/cover layer to the maps (i.e. kelp cover shows habitat quality).
  - Add other fisheries regulations, including federal MPAs and military closures.
  - There should be no fishing effort displayed inside an MPA.

Aggregated Socioeconomic Data (e.g., responses to survey questions)

- 2012 was a unique year for operating costs as a high number of boats underwent an engine retrofit to upgrade to more fuel-efficient engines due to funding made available by a grant program.
- Operating costs are increasing, which most fishermen attributed to increasing fuel prices, which has a great impact on fishermen's bottom line since some fishermen need more fuel to travel further due to MPAs.
- Some fishermen would prefer for the data relating to the questions about job satisfaction be placed in a different chapter of the final report than the chapter discussing the impacts from MPAs since the responses from those questions are not a reflection of MPA satisfaction.

Historical Data (1992-2012)

- Fishermen thought it would be helpful to compare the historical landings data to changes in fisheries management (i.e. limited entry) to better explain trends.
- Revenue trends for a number of high valued fisheries are deeply dependent on foreign markets, and many fishermen expressed concern about long-term financial sustainability and security.
- A number of fisheries identified their strong economic reliance on solid international markets, historically Japan and currently China.

Impacts due to MPAs

- Fishermen across all fisheries expressed that MPAs have led fishermen to travel longer distances, often through MPAs, to access areas that permit fishing. This costs time, fuel, energy and leads to more time on the water without an immediate return on the investment. It also results in less time off the water with family.

- In addition to fishermen losing fishing grounds, many fishermen expressed that the primary way they were impacted by MPAs was due to displaced fishermen now fishing in their traditional grounds.
    - Movement of fishermen from traditional fishing grounds to offshore areas can be challenging for fishermen with smaller boats (i.e., safety). Therefore, the fishing effort from the smaller boats that cannot get to the islands is condensed into smaller areas along the coast.
- MPAs have compacted fishing grounds, creating congested areas that have more fishing pressure.
    - Fishermen have had to diversify their fishing areas and have fewer options to rotate fishing grounds. Areas that are open are typically less productive and produce a less quality product.
- Fishermen identified there are fewer safe havens to fish or anchor in during times of high winds and/or swell, as many MPAs traditionally acted as fair-weather spots.
- Fishermen expressed that fisheries such as lobster and urchin have been hit hard by MPAs, and that MPAs are not a successful management tool for these types of species.
- Some fishermen have moved ports, which has led to a shift in the social dynamic of each port, resulting in overcrowding, limited space for boats (particularly in ports without slips), etc. Other fishermen have left commercial fishing entirely.
- Many fishermen expressed concern that the full effects of MPAs are yet to be felt since the last few years have had excellent ocean conditions and there have been particularly good fishing years, for most fisheries.

Fishery Specific Feedback

CALIFORNIA HALIBUT TRAWL

Aggregated Spatial Data (e.g., maps)

- Fishermen confirmed the maps look accurate and they were generally comfortable with how the data was represented.
    - Fishermen noted that there was effort being shown in an area where halibut trawling is prohibited, between Point Conception and Gaviota.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- No comments provided.

Historical Data (1992-2012)

- Fishermen recalled that the decrease in revenue and pounds landed in 1997 was as a result of international fishermen purchasing California permits and landing their catch abroad.
- Fishermen suggested Point 97 investigate changes in international and domestic markets to better interpret changes in revenue and prices.
- Fishermen mentioned the introduction of farmed flatfish has impacted the price of wild halibut.

Impacts Due to MPAs

- A halibut trawler noted that MPAs are impacting the white sea bass fishery also.

COASTAL PELAGICS

Aggregated Spatial Data (e.g., maps)

- Fishermen confirmed the maps generally look accurate and they were comfortable with how the data was represented.
    - Fishermen noted Santa Monica Bay is closed to seining and no effort should be reflected in that area.
    - Fishermen noted effort off San Clemente Island should include the front side.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- For the fishermen Point 97 spoke with, 2012 was an unusually high year for operational costs due to high maintenance and retrofits.

Historical Data (1992-2012)

- Fishermen recalled that the spike in the number of fishermen in the fishery in 1996 was due to this being the year before the moratorium on new permits and fishermen wanted to secure their landings.
- Fishermen recalled in 2000 there was an increase in the abundance of sardines.
- Recognizing most coastal pelagic fishermen are dual permit holders, fishermen expressed that the general decline in pounds landed and number of participants in the fishery over the past few years is due to increased abundance of squid.
- Fishermen expressed they would like to see the landings data measured in metric tons instead of pounds.

Impacts Due to MPAs

- Since the MPAs went into effect, squid have been available in such high numbers that fishermen have not relied as much on coastal pelagics. However, fishermen did express concern regarding times in the future when squid may be less abundant and they may have to rely on coastal pelagics more. In this case, fishermen felt they would likely be more impacted by MPAs.

LOBSTER

Aggregated Spatial Data (e.g., maps)

- Fishermen confirmed that the maps were generally accurate in representing fishing effort in 2012 with some exceptions (see below). It was also acknowledged that since Point 97 did not speak with every lobster fisherman in the fleet, the maps were missing key information that would have displayed more effort/value in specific areas if more fishermen had participated in the study.
    - Fishermen identified all of the offshore islands as experiencing increased fishing effort due to MPAs.
        - Additional information for San Nicholas Island was provided to gain a more accurate representation of fishing in 2012.
        - There was some discrepancy among fishermen regarding the effort displayed at Santa Rosa Island. Some fishermen felt that the maps showed too much fishing effort in that area, while others felt the maps accurately displayed the shift of more fishermen from the coast to that offshore area.
        - A number of fishermen indicated that Santa Cruz Island should show more effort on the backside of the island due to displacement from MPAs.
        - A number of fishermen indicated that greater effort should be shown for Anacapa Island, since some displaced Ventura/Channel Island fishermen who traditionally fished the coast have moved to. Conversely, others said those who have traditionally fished Anacapa were moving to Santa Cruz Island.
        - Some fishermen indicated that maps should show greater effort on the leeward side of San Clemente than the backside while other fishermen confirmed that the effort shown on the leeward side was accurate.
    - Some fishermen also said they would expect the maps to show more effort in coastal areas between MPAs, while others felt that in general there has been less coastal fishing and increased fishing at the islands since the MPAs were implemented.
        - Some fishermen identified that the maximum depths displayed in the maps was incorrect and that actual fishing grounds are shallower, however other fishermen confirmed that the deeper depth contours were accurate.
        - A number of fishermen identified the areas north of Dana Point Harbor, as well as north and south of Swami's state marine conservation area (SMCA) as needing to show more effort.

    - Some fishermen identified the line from Malibu Point to Rocky Point across Santa Monica Bay needs to be corrected to reflect the existing boundary for commercial fishing.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- Most fishermen confirmed that while revenue for lobster in 2012 was relatively high due to the good price per pound, increased operating costs (e.g., cost of fuel and materials, amount of fuel used to travel longer distances, etc.) offset any revenue generated.
- Some fishermen also identified that catch volume has decreased, which also has had a negative impact on income and the amount of time required on the water to offset operating costs.
- Fishermen indicated that costs associated with crew depends on where someone fishes: fishermen on the coast typically do not use crew, while those fishing offshore have a crewmember.
- A few fishermen felt the “quality of life” type questions needed additional context. For example, the majority of fishermen indicated they were “unhappy” with the “management of the rules.” One fisherman clarified that it was not unhappy with the fact that there are rules, but rather the manner in which the lobster fishery is managed.

Historical Data (1992-2012)

- Fishermen confirmed that warm water years provide the best fishing conditions for lobster, which has a positive effect on landings.
- Many fishermen expressed that the transferability of permits changed the level of effort within the fishery. For example, fishermen who have more recently entered the fishery have made a financial investment and need to fish harder to pay off debts/bills.
- The increase in revenue and landings in 1997 was due to an El Nino year, which provides good fishing conditions. Some fishermen identified that 1997 also saturated the market with lobster, which had adverse effects to the price/revenue in the following years.
- In 2008-9 fuel prices increased, which affected the cost of bait, materials (zinc, metal), etc.
- Some fishermen said they experienced poor environmental conditions in 2009-10, as well as in 2012 (i.e., cold water year). Fishermen fishing offshore islands tend to be more affected by slight changes in environmental conditions.
- The Chinese market drove an increase in the price per pound in 2010 from around $12/pound to over $16/pound. Many fishermen expressed that this increase in price made the increase in operational costs manageable.
    - A few fishermen indicated that this increase in market price has driven up the price of permits.
        - There are too many active fishermen and permits in the lobster fishery. Some fishermen felt that reducing the number of permits in the fishery would have an impact on the number of traps being fished without the need for a commercial trap limit.

Impacts Due to MPAs

- All fishermen expressed that MPAs have led to compaction, crowding, increased fishing pressure on less productive areas and more gear in the water resulting in fishermen needing to fish harder and for longer periods of time.
    - The increased price for lobster in recent years has caused an increase in gear in the water, which is intensified when effort is condensed into smaller areas due to MPAs.
- Most fishermen identified that they are needing to travel further to find viable fishing grounds and/or they are experiencing more crowding due to other fishermen being displaced from traditional grounds due to MPAs.
    - Many fishermen who have traditionally fished the coast are now fishing offshore. This has led to a variety of safety issues.
    - Fishermen with smaller boats are condensed along the coast.

- Traditionally fishermen may have rotated areas within a given season or between seasons and expressed that this strategy was no longer possible due to MPAs.
- The only way fishermen are maintaining themselves financially is due to the high price.
    - Some fishermen shared that they are seeing more lobster fishermen finding part time jobs between seasons to help offset costs.
- Fishermen explained that there has been a shift in the way fishing is conducted. Traditionally, coastal fishermen began the season by working close to shore, and then would move into deeper water. Now, due to MPAs, compaction, crowding, and large amounts of gear in the water, the "race to fish" has resulted in traps being set in all water depths at the start of the season. This leads to a much shorter fishing season.
- Many fishermen confirmed that they have adapted to MPAs, however they are concerned about the economic, physical, and mental hardships of the closures. Additionally, fishermen expressed that they are running out of options to be flexible and maintain a viable living with current regulations. Additionally, many fishermen said that they were able to adapt because they were getting such a good price for lobster and voiced concern over how they would be impacted by MPAs if the price were to drop.
- Most fishermen were in agreement that MPAs are not a suitable management tool for lobster due to lobster behavior.
- While not MPA specific, a number of fishermen identified changes in military closures (i.e., San Clemente Island, San Nicholas Island) as leading to increased effort along the coast. Some specifically mentioned that there have been changes in regulations and enforcement off San Nicolas Island.

NEARSHORE FINFISH

Aggregated Spatial Data (e.g., maps)

- There was concern expressed that the maps did not accurately represent fishing south of Point Loma, as habitat in this area is not appropriate for most finfish.
- Fishing effort/value that was depicted on the rock crab maps seemed more appropriate for finish, while the finfish maps seemed more appropriate for rock crab.
- Additional spatial information was provided that showed a more accurate representation of fishing in 2012 off San Nicholas Island.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- No comments provided.

Historical Data (1992-2012)

- No comments provided.

Impacts Due to MPAs

- No comments provided.

ROCK CRAB

Aggregated Spatial Data (e.g., maps)

- Fishermen confirmed that the maps were generally accurate in representing fishing effort in 2012 with some exceptions (see below). It was also acknowledged that since Point 97 did not speak with every rock crab fisherman in the fleet, there are likely key fishing areas that are not represented in the maps.
    - Some fishermen confirmed that there should not be any effort off San Nicholas or San Clemente Islands.
    - Fishermen identified that there should be less effort shown above the South La Jolla SMR relative to fishing effort below this MPA.
    - Fisherman identified the fishing effort/value that was depicted on the rock crab maps seemed more appropriate for finfish, while the finfish maps seemed more appropriate for rock crab.

- Fisherman expressed that the areas surrounding the Swami's State Marine Conservation area were too deep to fish rock crab.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- No comments provided.

Historical Data (1992-2012)

- No comments provided.

Impacts Due to MPAs

- No comments provided.

SEA CUCUMBER DIVE

Aggregated Spatial Data (e.g., maps)

- Sea cucumber divers confirmed the maps were generally accurate and showed appropriate levels of effort/associated value. There was some concern expressed that Point 97 did not speak with all members of the sea cucumber fleet, and so key fishing areas were not represented.
  - Some fishermen expressed that typical years show more effort on Catalina, however for a number of reasons there was less fishing at Catalina in 2012 (back and leeward side).
  - Fishermen also indicated the map didn't accurately reflect fishing on both sides of the Point Vincente SMCA, which is traditionally targeted by the Cambodian fleet.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- Fishermen indicated the average percentage of revenue from an individual's gross income that was allocated for operating costs in 2012 may have been influenced by the geographic location of the port (i.e. fishermen north of Los Angeles typically have 2-3 divers on a boat, whereas Los Angeles south typically have 1-2 divers).
- Since many sea cucumber fishermen are dual permit holders with urchin, fishermen were generally comfortable with the average operating costs that additional operating costs they incur are shared amongst the two fisheries.
- A number of fishermen identified the need for better understanding of the life cycle of sea cucumber, as well as better management mechanisms.
  - While some fishermen thought it should have been done years ago, most fishermen were encouraged by a recent survey circulated by CDFW designed to gather information about the fishery to inform management.
- Similar to urchin, sea cucumber fishermen would like to see a better relationship with processors, particularly with regards to setting better standards for urchin "grades" and pricing.
  - Fishermen involved in direct marketing are able gain a higher price per pound.

Historical Data (1992-2012)

- When reviewing the average price per pound of cucumber over twenty years, some fishermen identified the increase in price (2008, 2010) has been driven by increased demand in China.
  - Increase in pricing is indicative of increased affluence in China. An economic boom has resulted in many more people able to afford to each this delicacy, whereas in the past it would only be eaten on special occasions.
  - 2008 increase in price per pound represented increased demand for product from China in celebration of the Olympics held that year in Beijing. The number of processors in the South Coast increased from 1-2 to 6-8.
  - 2012 increase represents the Chinese preparing for 2012, the year of the Dragon, which is a luck year to have a child. Fishermen shared that an increase in weddings in 2010/11 where cucumbers would be served as a banquet delicacy led to increased demand.
- This increased demand led to a "gold rush" in this relatively unmanaged fishery in 2010.
  - Also in 2010, the increase in price led many dual permit-holding fishermen to land sea cucumber instead of urchin.
- 2011 was a very strong year in pounds/landings and pricing for sea cucumber.

- 2012 the MPAs went into effect, and pounds landed, number of fishermen in the fishery, and revenue all decreased. Pricing maintained at 2011 levels.

Impacts Due to MPAs

- MPAs located on the backside of Catalina Island have impacted cucumber fishermen, removing access to key habitat that was highly productive, as well as safe haven for inclement weather.

SEA CUCUMBER TRAWL

Aggregated Spatial Data (e.g., maps)

- Fishermen confirmed the maps look accurate and they were generally comfortable with how the data was represented.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- No comments provided.

Historical Data (1992-2012)

- No comments provided.

Impacts Due to MPAs

- No comments provided.

SPOT PRAWN

Aggregated Spatial Data (e.g., maps)

- Fishermen confirmed that on the whole maps looked accurate, however there was some concern regarding anonymity and requested that the map be suppressed to maintain anonymity.
  - Fishermen confirmed the backside of Catalina is accurate, however there should also be some level of effort depicted on the front side of Catalina.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- Fishermen indicated that operating costs related to fuel and bait is lower for spot prawn when compared to other fisheries (e.g., lobster). However, there is a high investment in crew, which could be the reason for the average percentage of operating costs relative to gross annual revenue.

Historical Data (1992-2012)

- No comments provided.

Impacts Due to MPAs

- No comments provided.

SQUID – BRAIL

Aggregated Spatial Data (e.g., maps)

- Fishermen confirmed that the maps are acceptable. However, there was some concern expressed that Point 97 did not speak with all members of the fleet.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- Fishermen expressed concern that the average percentage of gross annual revenue allocated for operating costs seemed low, since 40% of the revenue per trip is allocated to the crew. Other fishermen identified paying crew 20% of revenue. Some suggested 50% would be a more accurate average for operating costs.
- 2012 only provided brailers ~20 days of fishing before the season closed. Additional days were fished as allowed by the “two ton” fishery regulation.
- Fishermen would like to see better relationship between management and the fishery, and for the quota to be based on fisheries dependent data.

Historical Data (1992-2012)

- Over the past few years, the quota for squid has been met early, leaving little opportunity for fishermen that brail to do so. This can put economic and emotional strain on fishermen.
- Fishermen identified the spike in average price per pound (1998) was likely due to the El Niño event that caused a decrease in the abundance of squid, but led to an increase price driven by Chinese demand.
- Chinese markets have positively impacted the price for squid. There was concern expressed over what will happen to the squid fishery once the Chinese markets are saturated.

Impacts Due to MPAs

- Loosing access to key areas on Catalina, including Blue Cavern no-take SMCA and Long Point SMR have had large, negative impacts on the brail fleet.

SQUID – SEINE

Aggregated Spatial Data (e.g., maps)

- Fishermen made significant edits to their own maps (which will modify the aggregated map), particularly regarding the depths fishing takes place within (between 10-50 fathoms).
- Fishermen confirmed that in 2012, seiners did not fish Catalina.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- For the fishermen Point 97 spoke with, 2012 was an unusually high year for operational costs due to large maintenance and retrofit projects on their vessels.

Historical Data (1992-2012)

- Fishermen expressed concern with the data showing the number of fishermen in the fishery exceeded the 52 seiner permits available.
- Fishermen recalled that the spike in the number of fishermen in the fishery in 1996 was due to this being the year before the moratorium on new permits and fishermen wanted to secure their landings.
- The minimal landings in 1998 were due to the 1997-98 El Nino effect. Most fishermen are dual permit holders with coastal pelagics, and focused on that fishery in 1998.
- In 2010, 2011, 2012 the quota was met before the end of the season, however the fluctuations in pounds landed is due to landings by the brail fleet.

Impacts Due to MPAs

- Since the MPAs went into effect, squid have been available in such high numbers that fishermen have been able to work around MPAs. However, there have been years where squid remain inside an MPA and inaccessible for the greater part of a season. Concern was expressed for the impact fishermen face in future years where there may be less squid, and the squid are congregating within MPAs.

URCHIN

Aggregated Spatial Data (e.g., maps)

- Fishermen confirmed that the maps were generally accurate in representing fishing effort in 2012 with some exceptions (see below).
- Since Point 97 did not speak with all members of the urchin fleet, there was concern expressed that not enough fishermen participated in a number of the ports to fully inform the information displayed on the maps.
    - Some fishermen felt that there are areas of fishing effort that were missing from the map (e.g., north of Pt. Vincente State Marine Conservation Area (SMCA), off Palos Verdes).
    - A number of fishermen indicated that more effort should be shown on the west end of Santa Cruz Island. Santa Cruz Island has become a fall back area that typically has good weather conditions following the implementation of both coastal and offshore MPAs in the Santa Barbara/Ventura area.
        - Other fishermen indicated they are seeing less fishing effort on Santa Rosa and Santa Cruz Islands.

  - One fisherman indicated that the maps for the Northern Channel Islands needs to reflect fishing effort that takes place at 10 fathoms, and in the coastal areas.
- San Clemente currently represents one of the most important areas for urchin fishermen fishing out of San Pedro.
- Even though areas of San Miguel and Santa Rosa are still open and highly productive, they are much further away than the coastal areas that were previously fished. This is very difficult for fishermen due to fuel costs, and those with smaller boats are unable to cross the channel.

Socioeconomic Aggregated Data (e.g., responses to survey questions)

- While the sample size of urchin fishermen interviewed in some ports was relatively small, urchin fishermen confirmed that the socioeconomic data provided a good representation of the conditions and sentiments within the fishing community.
  - Since some urchin fishermen are dually permitted for sea cucumber, fishermen were generally comfortable that additional operating costs they incur are shared across these two fisheries.
- Most urchin fishermen make all their income from the fishery and about 40% goes back to operating costs.
- Operating costs also vary depending on what type of air supply is used (SCUBA vs. hookah).
- There was some discrepancy regarding the percent of gross annual income in 2012 that was allocated for crew.
  - Channel Islands fishermen have larger boats and use SCUBA more often so they need to use more crew than in other regions.
- When presenting the average percent of revenue that goes to crew, fishermen who do not use crew should not be included in the average since it makes the percentage look lower than it should be.
- Most urchin fishermen, particularly those fishing south of Channel Islands Harbor, have a deep interest in building better working relationships with processors, particularly with regards to setting better standards for urchin “grades” and pricing.
  - Current prices (ranging from $0.80-$1.50 per pound) have not varied for last ten years, and do not consider increases associated with costs of living, nor the price per pound the processors receive.
  - The amount of money urchin divers earn is unpredictable and dependent on the amount a processor is willing to pay. Fishermen have no control over pricing.
- There is an interest to improve the urchin fishery’s direct marketing capabilities, and fishermen would like to see the leadership within the urchin fishery have the opportunity to play a stronger role in setting fair pricing.

Historical Data (1992-2012)

- Fishermen explained that in the early 1990s, urchin was primarily exported to Japan.
- Spike in pricing in 1994 represents the strong economic climate of the United States, and strong exchange rate with Japan for product.
- In the late 1990s, Japan began receiving product from Russia and other countries, which spurred on the establishment of a local market.
- As identified above, most fishermen identified the processors as controlling the pricing and profit.
- In years where landings were higher in San Pedro than in Santa Barbara, pick up boats in San Pedro may be responsible for the higher landings for those years.
- Most fishermen agreed that the ocean has been healthy (e.g., good kelp cover) the last 7-8 years. This, coupled with a minimum size limit that gives urchins an opportunity to spawn before they are harvested, has been positive for landings and the fishery as a whole.
- A number of fishermen felt that the pricing included in the historical data is inaccurate.
  - Some fishermen commented that at times a low base price is recorded on a fish ticket and the actual pricing is later updated to reflect the quality of the urchin. The prices are not changed on the original ticket. Therefore, the data on price in CDFW’s database is inaccurate.
- Fishermen shared that 1 in 3 permits in the urchin fishery typically is latent.

Impacts Due to MPAs

- Almost all urchin fishermen expressed being greatly impacted by MPAs. Primary effects include:
  - o Traveling greater distances, including through MPAs to get to “fishable” areas that are typically less productive. This requires more effort, more fuel, more time away from family, and a greater possibility of running into weather and/or having increases in boat maintenance.
  - o Compression, compaction, creating more effort in open areas that are generally less productive.
  - o Loss of useful “fallback” areas when weather is poor or simply as part of a fisherman’s rotation so to not fish a specific area too hard. (E.g., Gull Island and Point Dume had huge impacts for the Santa Barbara and Channel Island urchin divers because they were good fallback areas during inclement weather.)
- Some fishermen indicated up to 50% of their traditional fishing grounds were no longer accessible due to MPAs.
- There were some fishermen who were puzzled by the 25% in San Pedro of urchin fishermen who identified they have not been impacted by MPAs.
  - o A possible explanation is that those not impacted by MPAs are new permit holders.
- Some fishermen stated that MPAs were not necessary for the urchin fishery since they were harvested sustainably and the stock was healthy prior to implementing MPAs.
- MPAs create more effort in the open areas such that only small urchins are in the open areas and the closed areas are overgrown with urchins that eat all of the kelp and create urchin barrens, which is not beneficial to support fish and vital habitat.
- MPAs do not work for urchins and there is no “spill over” effect because urchins do not move inside and outside of MPAs. Additionally, most fishermen believe that the current harvest rates are sustainable for the fishery and do not need to be further restricted.

QUESTIONS AND CONCERNS

The following are key questions and concerns expressed by fishermen across fisheries.

Point 97 Socioeconomic Survey Methods

- Fishermen expressed concern that Point 97 did not interview enough fishermen within specific fisheries (e.g., sea cucumber, squid).
- It was acknowledged that fishermen understood why there would be a reluctance to participate. There remains a great deal of mistrust of scientific data collection and research, particularly regarding how data used in MPA planning led to many closures of valuable fishing grounds.
- Most fishermen recognized the value of socioeconomic data collection, however concerns were raised as to how the data collected will be used and how fishermen will be adversely affected.
- Fishermen encouraged Point 97 to build on and be informed by the many ecological research projects have been/continue to be conducted in the South Coast.
- A number of fishermen were interested in learning how NAFTA has contributed to socioeconomic shifts within specific fisheries.
- Fishermen also mentioned there is a disincentive for fishermen to participate in this study and provide information of this nature (or provide inaccurate information) for fear that the data may be used in a manner that incite new regulations and additional restrictions on the fishing community.

Fisheries Management

- A number of fisheries management topics were raised during discussions with fishermen including:
  - o *Lobster:* the lobster fishery management plan (FMP) that is currently in development was raised in most conversations with lobster fishermen. Some fishermen expressed that 300 traps should be the maximum with no option to stack multiple permits; while other fishermen did not believe a trap limit was needed. Most fishermen expressed the need to better regulate the sport industry. Transferability of permits was also a concern, with many fishermen identifying this as a driver for increased traps in the water.

  - *Nearshore finfish:* fishermen expressed confusion and frustration that there has been no increase to the quota, even though the number of permits has decreased.
  - *Sea Cucumber:* interest expressed in convening a meeting with the fleet, CDFW to discuss redesigning sea cucumber management.
  - *Squid:* concern was raised that the brail fleet will no longer have access to the "two-ton" fishery. Additionally, fishermen expressed concern that the quota that has been set is not based in science, and would benefit by being flexible to reflect the ever-changing biology/ecology of the species.
- Fishermen expressed that CDFW is focused on creating revenue rather than effectively managing California's ocean resources. Fishermen would like to see CDFW managers have additional credentials in fisheries management, economics, etc.
- A number of fishermen stated that if there is limited entry in one fishery then there should be limited entry in all fisheries to prevent a transfer of effort from one fishery to another.
- Some fishermen expressed interest in developing co-management strategies with CDFW.
  - Fishermen have extensive ocean experience and many have been making observations for over 30 years. Including fishermen's knowledge as a key part of fisheries management if essential to the success of California's commercial fisheries.
  - Fishermen would like to be considered as resource managers who are invested in protecting the resource.

Other

- Some fishermen expressed concerns about how MPAs are adding complexity to Federal programs like VMS, as fishermen need to identify if they are planning to transit an MPA. Enforcement demands and increased costs associated with VMS are a problem.
- A number of fishermen identified the recent – and plans for ongoing – sand replenishment activities in north San Diego County. Fishermen would like to see research conducted on the effects of sand replenishment on local fisheries, particularly lobster, urchin, and sea cucumber.

RECOMMENDATIONS FOR FUTURE MANAGEMENT CONSIDERATIONS

The following are recommendations for future management considerations expressed by fishermen across fisheries.

Socioeconomic Data Collection

- For fisheries where permits are transferable, fishermen identified the need to better understand how permits move within a fishery (i.e., geographically, age of fishermen, etc.) and how these shifts may impact a specific port or community socially and economically.
- Most fishermen would like to be more involved in the collection and interpretation of data.

Adaptive MPA Management

- Many fishermen identified rotating MPAs as a beneficial management approach, particularly for urchin and lobster fisheries since permanent MPAs do not help improve those stocks. The state of Washington's approach to rotating urchin fishing grounds was identified as possible model.
  - Additionally, urchin fishermen would like to have access to MPAs to translocate larger urchin out of MPAs to avoid urchin barrens within MPAs and improve overall quality.
- Fishermen would like to see MPA management better integrated with fisheries management and the Marine Life Management Act (MLMA).
- Fishermen are concerned that their participation in projects that collect socioeconomic information are designed to gather information that will be used to restrict access and place limits on a fisherman's livelihood. Most fishermen want to ensure the time they have invested in participating in a survey does not negatively impact them in the short- and long-term.

Fisheries Science

- Fishermen expressed the need for better understanding of the lifecycles of specific species (e.g., sea cucumber, squid, lobster), as well as interspecies relationships.

Fisheries Management

- Most fishermen would like better fisheries management based on robust, neutral science and informed by fishermen's knowledge to maintain ecological longevity and economic security.
- Some fishermen are interested in collaborating with scientists and managers in research projects. A recent collaborative project with lobster fishermen was highlighted as a model that could be used for other fisheries.
- Fishermen identified a number of fisheries where they felt management measures should be revised (e.g., quota for squid) or strengthened (e.g. sea cucumber).
    - Some fishermen identified the need for a size limit in the sea cucumber fishery.
- A number of fishermen were interested in learning about the harvest patterns in each port, including the number of permits by port correlated with catch and block numbers, number of active/inactive permits, number of part-time fishermen, number of buyers and distribution scale, etc.
- Fishermen would like to have landings receipts cross-referenced with buyer's receipts (especially in the urchin fishery) to help improve accuracy and transparency of data.