

Economic Data Collection Program  
Catcher Vessel Report (2009-2012)

Erin Steiner, Lisa Pfeiffer, Abigail Harley, Marie Guldin, Todd Lee

NOAA Fisheries

Northwest Fisheries Science Center<sup>1</sup>

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<sup>1</sup> For questions or comments, please contact the EDC Program at [nwfsc.edc@noaa.gov](mailto:nwfsc.edc@noaa.gov).

2012 Economic Data Collection (EDC)  
 2012 West Coast Groundfish Trawl  
 Catch Share Program

# CATCHER VESSELS

## FISHERY PARTICIPATION

|                       |  | Vessels | Days at Sea | Landings (1000 mt) |
|-----------------------|--|---------|-------------|--------------------|
| CATCH SHARE FISHERIES | At-sea Pacific whiting                 | 16      | 37.2        | 39.1               |
|                       | Shoreside Pacific whiting              | 24      | 56.0        | 66.6               |
|                       | DTS trawl                              | 59      | 41.1        | 12.5               |
|                       | Non-whiting, non-DTS trawl             | 52      | 24.1        | 5.9                |
|                       | Fixed gear with trawl endorsement      | 27      | 35.2        | 1.0                |
|                       | Fixed gear with fixed gear endorsement | 7       | 25.3        | 0.2                |
|                       | Crab                                   | 61      | 36.3        | 2.0                |
|                       | Shrimp                                 | 39      | 46.1        | 11.7               |
|                       | Halibut                                | 5       | 34.4        | <0.1               |
|                       | Salmon                                 | 12      | 23.8        | <0.1               |
| Tuna                  | 15                                     | 11.8    | 0.1         |                    |
| Alaska                | 30                                     | 108.5   | 117.8       |                    |

## ECONOMIC SUMMARY\*

### Vessel Average

\$528K revenue  
 \$288K variable cost  
 \$240K variable cost net revenue  
 \$185K fixed cost  
 \$55K total cost net revenue

\$4K variable cost net revenue per day

### Fleet-wide Totals

112 vessels  
 \$59M revenue  
 \$27M variable cost net revenue  
 \$6M total cost net revenue

## ALASKA PARTICIPATION

Alaska: \$57M  
 30 vessels, typically 24 trips to AK per year

## SHORESIDE PARTICIPATION

Total value of catch share groundfish landings  
 Vessel homeports

Washington: \$9.7M  
 15 vessels

## AT-SEA PARTICIPATION

At-sea: \$9.3M  
 16 vessels

Astoria: \$17.0M  
 37 vessels

Newport: \$10.0M  
 23 vessels

Coos Bay \$2.8M  
 18 vessels

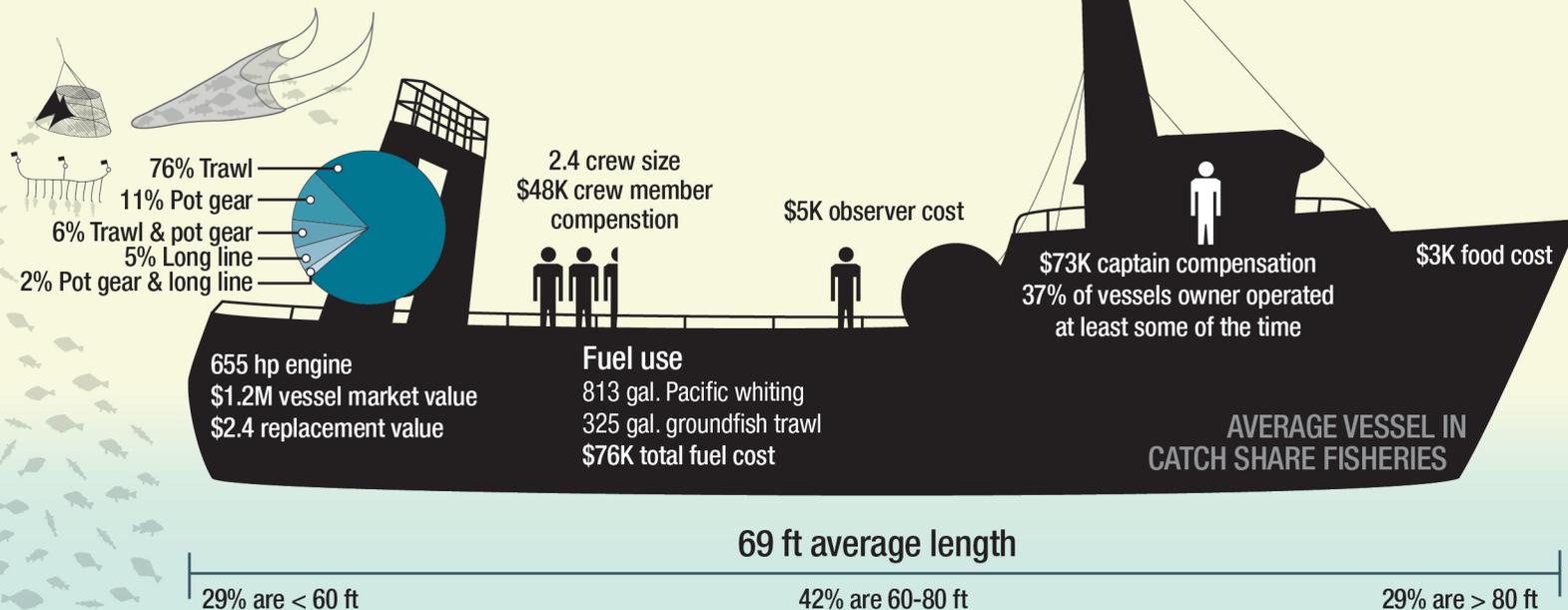
Brookings: }  
 Crescent City: } \$4.6M  
 Eureka: } 15 vessels

Fort Bragg: \$1.9M  
 8 vessels

San Francisco: \$0.5M  
 4 vessels

Monterey: \$0.6M  
 4 vessels

Morro Bay: \$1.8M  
 10 vessels



\*Note that some off-board costs are not collected. Therefore reported net revenue is an overestimate of actual net revenue.



# Catcher Vessel Sector: 2012 Highlights

In 2012, the second year of the catch share program, there were 112 catcher vessels that participated in the West Coast Groundfish Trawl Catch Share program.

- Catcher vessels spent an average of 60 days fishing in the West Coast Groundfish Trawl Catch Share Program (the catch share program).
- Catcher vessels spent an average of 74 additional days fishing in non-catch share fisheries.
- West Coast catcher vessels deliver to ports in Washington, Oregon, California, and at-sea; the two ports with the highest landings in 2012 were Astoria and Newport, both in Oregon.
- An average of 2.4 crew members worked aboard each West Coast catcher vessel, each earning an average compensation of \$48,300.
- 37 percent of vessels were owner-operated at least some of the time in 2012.
- The average ex-vessel revenue per vessel from participation in the catch share fishery was \$528,000.
- Average variable cost net revenue (ex-vessel revenue minus variable costs) per vessel was \$240,000 from participation in the catch share program, and the fleet-wide variable cost net revenue was \$26.9 million.
- Average total cost net revenue (ex-vessel revenue minus variable costs and fixed costs) per vessel was \$55,500 and the fleet-wide total cost net revenue was \$6.21 million.

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The Economic Data Collection (EDC) Program and EDC Reports reflect collaboration and coordination of individuals across the West Coast. There are numerous individuals to thank for their contributions to this effort.

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We thank the Pacific Fishery Management Council and advisory bodies for their valuable comments on the EDC reports and data.

Finally and very importantly, we thank the members of the West Coast fishing industry who met with us to discuss the survey development and interpretation of the information collected. We appreciate the time and effort of each participant in the program.

# Report Introduction

## About the Report

The US West Coast groundfish fishery takes place off the coasts of Washington, Oregon and California, and is comprised of over 90 different species of fish. The fish are harvested both commercially and recreationally. The commercial fishery has four components: limited entry with a trawl endorsement, limited entry with a fixed gear endorsement, open access, and tribal.<sup>1</sup> In January 2011, the West Coast Limited Entry Groundfish Trawl fishery transitioned to the West Coast Groundfish Trawl Catch Share Program. The catch share program consists of cooperatives for the at-sea mothership (including catcher vessels and motherships) and catcher-processor fleets, and an individual fishing quota (IFQ) program for the shorebased trawl fleet.<sup>2</sup> The Economic Data Collection (EDC) Program is a mandatory component of the West Coast Groundfish Trawl Catch Share Program, collecting information annually from all catch share participants: catcher-processors, catcher vessels, motherships, first receivers, and shorebased processors.<sup>3</sup> The EDC information is used to monitor the economic effects of the catch share program, and collects information on operating costs, revenues, and vessel and processing facility characteristics.

This report summarizes information collected from the West Coast catcher vessel fleet. The EDC reports are also produced for the other sectors,<sup>3</sup> and currently cover the years 2009 to 2012. The 2009 and 2010 data were collected in 2011 to provide a baseline of pre-catch share information. There is a one year lag in collecting the EDC data to allow companies to close their accounting books. Thus, 2012 data were collected in September 2013. The EDC reports are updated annually to disseminate the data collected and provide background, analysis, and context to support the interpretation of the data. The reports are also expected to provide a useful catalyst for feedback on the data collected and its analysis. It is envisioned that the scope of these reports will expand, and the methods used will be refined with each annual publication.

The report is composed of two major sections. The first section, Catcher Vessel Overview (beginning on page 9), is an in-depth summary that contains descriptive analyses of the at-sea and shorebased catcher vessel fleet focusing on activities during 2012. The second section, Catcher Vessel Data Summaries (beginning on page 35), provides tables of all of the data collected from 2009 to 2012, with a detailed discussion of the methods used to collect and analyze the data. The tables summarize responses for each EDC form question, as well as net revenue and economic performance rates. The data that form the basis for this report are confidential and must be aggregated so that individual responses are protected. In cases where there are not enough observations to protect confidentiality, the data are

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<sup>1</sup> For more information about West Coast Groundfish, see [www.westcoast.fisheries.noaa.gov/fisheries/groundfish/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish/).

<sup>2</sup> More information about the West Coast Groundfish Trawl Catch Share Program is available online at [www.westcoast.fisheries.noaa.gov/fisheries/groundfish\\_catch\\_shares/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish_catch_shares/).

<sup>3</sup> Please see the EDC website, [www.nwfsc.noaa.gov/edc](http://www.nwfsc.noaa.gov/edc), for links to the forms used to collect the EDC data and for previous year's reports.

either not shown, or are combined with broader groups of data. More information about EDC Program administration and fielding of the surveys, the EDC forms, data quality controls and quality checks, data processing, and safeguarding confidential information can be found in the EDC Administration and Operations Report.<sup>3</sup>

## **Background - Economic Data Collection and West Coast Groundfish Trawl Catch Share Program**

The economic benefits of the West Coast groundfish trawl fishery and the distribution of these benefits are expected to change under the West Coast groundfish trawl catch share program. To monitor these changes, the Pacific Fishery Management Council (PFMC) proposed the implementation of the mandatory collection of economic data. Using data collected from industry participants, the EDC Program monitors whether the goals of the catch share program have been met.<sup>4</sup>

Many of the PFMC's goals for the catch share program are economic in nature. These goals include: provide for a viable, profitable, and efficient groundfish fishery; increase operational flexibility; minimize adverse effects from an IFQ program on fishing communities and other fisheries to the extent practical; promote measurable economic and employment benefits through the seafood catching, processing, distribution elements, and support sectors of the industry; provide quality product for the consumer; and, increase safety in the fishery.

The EDC program is also intended to help meet the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 2007 requirement to determine whether a catch share program is meeting its goals, and whether there are any necessary modifications of the program to meet those goals. The MSA requires a formal review 5 years after the implementation of a catch share program to which the EDC program will make a valuable contribution.

Monitoring the economic effects of a catch share program requires a variety of economic data and analyses. The primary effects of a catch share program can be captured in two broad types of economic analysis: 1) economic performance measures, and 2) regional economic impact analysis. Both of these require information on the costs and earnings of harvesters and processors.

Economic performance measures include: costs, earnings, and profitability (net revenue); economic efficiency; capacity measures; economic stability; net benefits to society; distribution of economic net benefits; product quality; functioning of the quota market; incentives to reduce bycatch; market power; and, spillover effects in other fisheries. Some of these measures are presented in this report, while others will require more specific and involved analysis using EDC data.

Regional economic impact analysis measures the effects of the program on regional economies. In general, the catch share program will likely affect different regional economies in different ways. Regional

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<sup>4</sup> For more information about the EDC program and the West Coast Groundfish Trawl Catch Share Program, please see the Economic Data Collection Program, Administration and Operations Report available at the EDC website: [www.nwfsc.noaa.gov/edc](http://www.nwfsc.noaa.gov/edc)

economic modeling involves tracking the expenditures of all businesses, households, and institutions within a given geographic region to arrive at the effects on income and employment. On the Pacific coast, the Northwest Fishery Science Center's IO-PAC model is used to estimate regional economic impacts.<sup>5</sup>

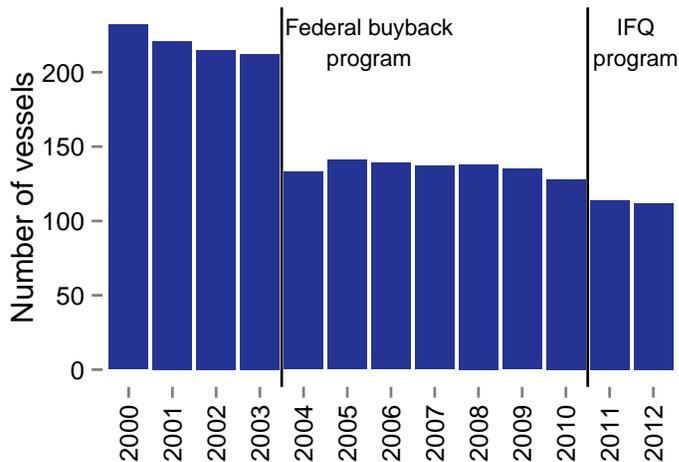
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<sup>5</sup> Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific Coast fisheries. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.

# CATCHER VESSEL OVERVIEW

## Management context

In January 2011, the West Coast Limited Entry Groundfish Trawl fishery transitioned to the West Coast Groundfish Trawl Catch Share Program. The catch share program consists of cooperatives for the at-sea mothership (including catcher vessels and motherships) and catcher-processor fleets, and an individual fishing quota (IFQ) program for the shorebased trawl fleet. The vessels participating in the IFQ program deliver shoreside to buyers and processors with first receiver site licenses and at-sea vessels deliver to mothership vessels.



**Figure 1:** Number of catcher vessels participating in the At-sea and Shoreside limited entry trawl groundfish fisheries (2000-2010) and the number of vessels participating in the West Coast Groundfish Trawl Catch Share Program (2011-2012).

The Pacific Fishery Management Council and the National Marine Fisheries Service are responsible for managing the West Coast Groundfish Trawl fishery. The Pacific Coast Groundfish Fishery Management Plan contains the current rules for managing the fishery, and its amendments give a history of the changes that have occurred. One major milestone was the Limited Entry (license limitation) program, which was established in 1993 and intended to address over-capitalization and restrict further entry into the groundfish fishery. In 2003, there was an industry funded buyback program, designed to further

decrease overcapacity in the fishery.<sup>6</sup> The result of the buyback program was a decrease in the number of active vessels from 212 in 2003 to 133 in 2004 (Figure 1). The number of vessels participating in the limited entry trawl fishery ranged from 129 to 141 between 2004 (post-buyback program) and 2010 (pre-catch share program). In 2011, the first year of the catch share program, the number decreased to 114 and then decreased again in 2012 to 112.

Prior to 2011, the fishery was managed with a system that included harvest guidelines, trip and landings limits, area restrictions, seasonal closures, and gear restrictions. Many of these measures were developed

<sup>6</sup> 68 FR 42613, available at [www.federalregister.gov/articles/2003/07/18/03-18344/magnuson-stevens-act-provisions-fishing-capacity-reduction-program-pacific-coast-groundfish-fishery](http://www.federalregister.gov/articles/2003/07/18/03-18344/magnuson-stevens-act-provisions-fishing-capacity-reduction-program-pacific-coast-groundfish-fishery).

to assist in the rebuilding of 7 species that are caught as targets or bycatch in the groundfish fishery and declared overfished in 2003. The catch share program was designed to alleviate the restrictive, inflexible nature of trip and landings limits, which limited the landings of groundfish species by trip and by two month period. Landings limits tend to encourage discarding, which can be detrimental to the rebuilding of overfished species. Under the catch share program, vessels holding a limited entry permit were allocated individual quota shares. Quota were allocated for 30 different groundfish species and rockfish complexes to permit owners based on their historical participation.<sup>7</sup> Annually, the quota shares are converted into quota pounds, which are then used by vessels to harvest fish within the catch share program. The quota shares and quota pounds are transferable, both through lease arrangements and sale, and are infinitely divisible.<sup>8</sup> The catch share program allows vessels to catch their quota at any time during the season. One hundred percent at-sea observer coverage – another feature of the program – ensures that all catch, including discards, is counted against a vessel's quota pounds.

An interesting industry-led development after the implementation of the catch share program is the formation of voluntary risk pools. Just as all quota for target species are allocated to individuals, so are quota for the overfished species. If an individual is unable to cover catch of overfished species with quota, they are prohibited from fishing. The risk pools mitigate the risk of needing to prematurely end the fishing season by pooling quota of overfished species with other quota owners. The participants in some risk pools are contractually obligated to follow a set of fishing guidelines, and if the guidelines are followed, any catch of overfished species is covered by the pooled risk pool quota and the individual can continue fishing.

There are various ways that quota can be traded. The types of trades most frequently recorded are self trades, other, cash sales, and barter. The “other” category includes cases such as transfers for risk pools and arrangements where there is no predetermined price, but instead the payment will be a percentage of the ex-vessel value of the landed fish. Barter transactions generally refer to a “quota for quota” trade, where an individual trades quota they do not plan to use for quota for an intentionally targeted species or a species for which they need to cover potential catch. In 2012, Pacific whiting quota was traded the most frequently (\$0.04 per pound), followed by sablefish (\$0.96), petrale sole (\$0.40), and thornyheads (\$0.06).<sup>9</sup>

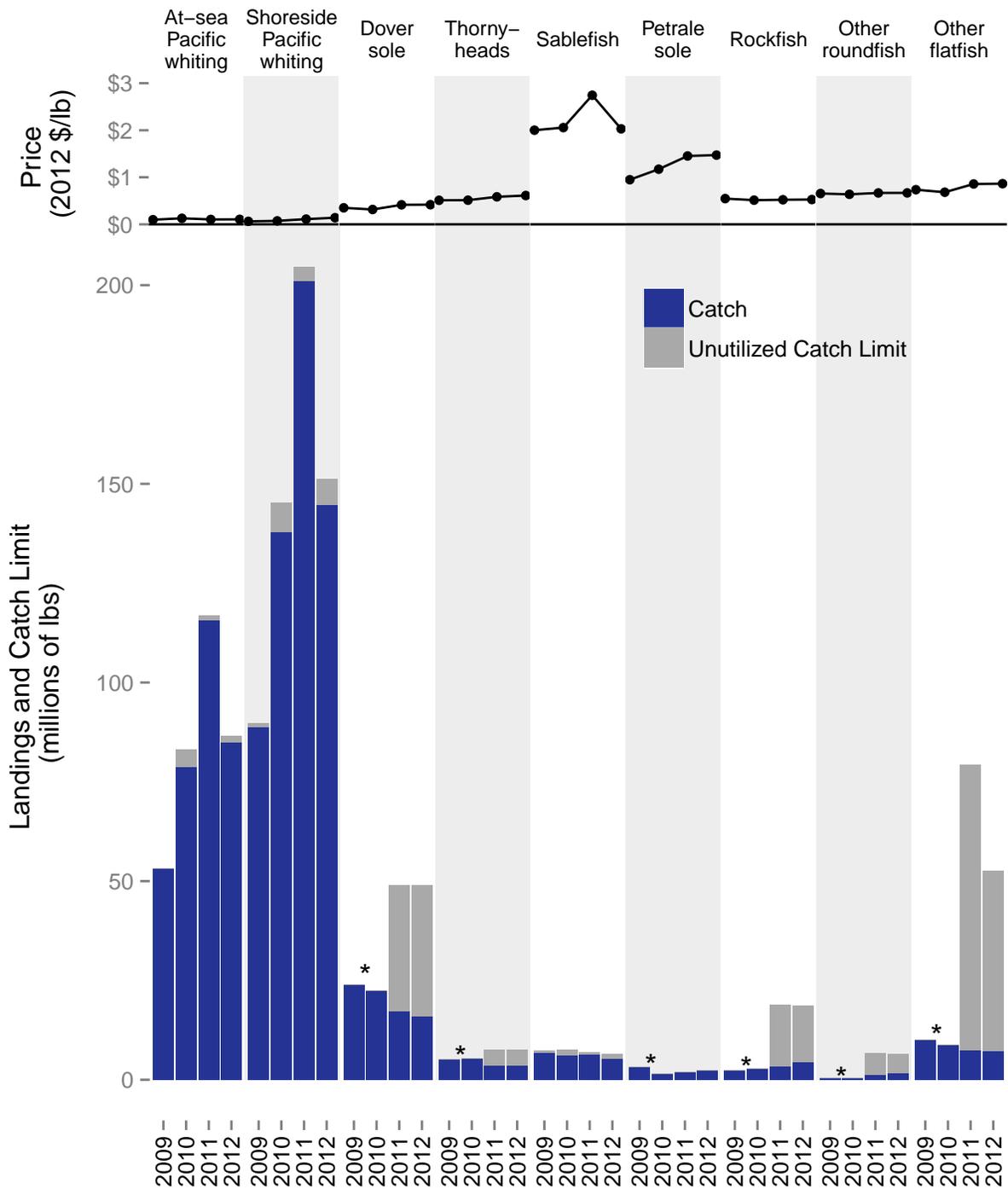
Landings and unutilized quota for each of the catch share species groups are shown in Figure 2, as well as average prices for landings in that group. Trawl sector-specific allocations of the Allowable Biological Catch (ABC) were implemented for all species as part of the catch share program. Prior to the program, only Pacific whiting and sablefish had a sector-specific allocation. Percent utilization of the ABC was low for many species, with the exception of sablefish, Pacific whiting, and petrale sole (Figure 2).

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<sup>7</sup> Additional information on the regulations, including the Federal Register notice, can be found at the West Coast Region website: [www.westcoast.fisheries.noaa.gov/fisheries/groundfish\\_catch\\_shares/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish_catch_shares/).

<sup>8</sup> Sales of quota shares were prohibited until January of 2014.

<sup>9</sup> Note that the prices are based on a relatively small number of single species trades, which are less common than multispecies trades. See Holland, D.S. and K. Norman. The Anatomy of a Multispecies Individual Fishing Quota (IFQ) “Market” in Development. In review.



**Figure 2:** Landings and unused trawl sector catch limit and average ex-vessel prices (2012 \$), by species group. Pacific whiting includes any reapportionment among sectors that may have occurred during the season. \*Unused catch limit is not shown for 2009 or 2010 for most groundfish species and species groups because prior to 2011, there was not a trawl-specific allocation of the ABC (Allowable Biological Catch).

## Catcher Vessel Sector Description

In 2012, the second year of the catch share program, there were 112 catcher vessels that participated in the program. These include both catcher vessels that deliver shoreside and those that deliver to at-sea motherships. Catcher vessels generated \$92.4 million in income and 1,082 jobs from deliveries of fish caught in the catch share program.<sup>10</sup> These vessels caught about 69% of all catch share fish (the catcher-processor sector caught the remainder) and 25% of all fish caught commercially on the West Coast.

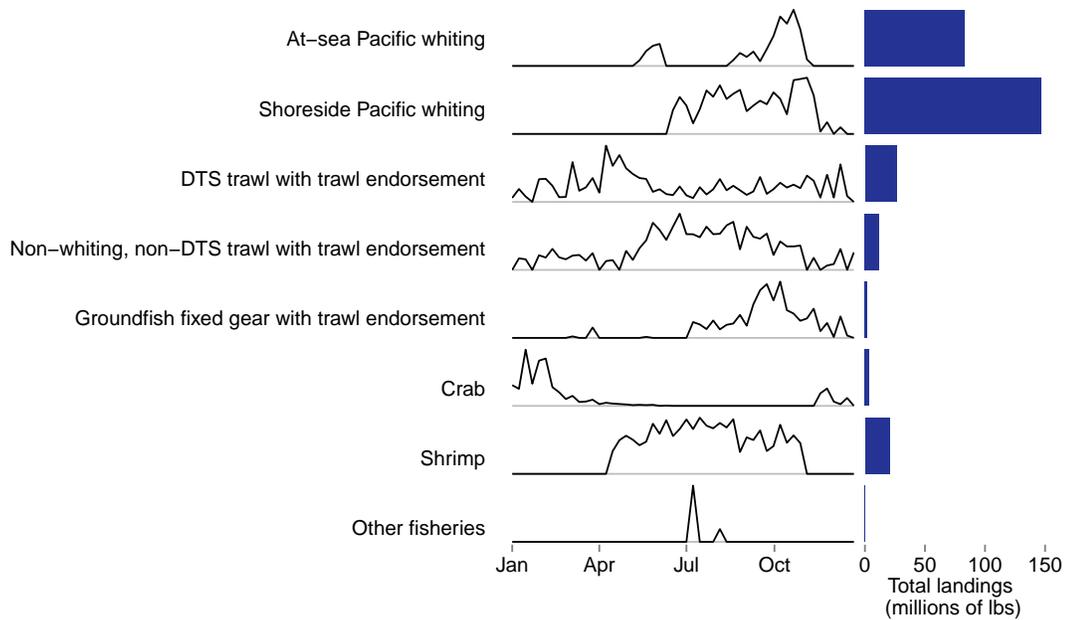
The catcher vessels that fished in 2012 ranged from 38 feet to 148 feet in length and employed between one and four crew members. The total number of days spent fishing in the Limited Entry Groundfish Trawl Fishery has decreased from 8,603 in 2009 to 6,446 in 2012. There were 27 vessels that fished in 2010, but did not fish in 2011 or 2012. Of those vessels, 15 stopped fishing on the West Coast completely, and 12 continued fishing in alternative fisheries (e.g., crab and shrimp).

**Table 1:** Total ex-vessel revenue, landings weight, and number of vessels delivering to each delivery port for all catch share fisheries in 2012. Some vessels make deliveries in multiple ports, and each vessel is counted in every port where catch is delivered. Delivery ports by fishery are not shown to protect confidential information.

|  | Revenue<br>(millions of \$) | Landings<br>(millions of lbs) | Number<br>of vessels |
|--|-----------------------------|-------------------------------|----------------------|
| At-sea                                     | 9.3                         | 84.6                          | 16                   |
| Washington state                           | 9.7                         | 43.2                          | 15                   |
| Astoria, OR                                | 17.0                        | 66.9                          | 37                   |
| Newport, OR                                | 10.0                        | 59.0                          | 23                   |
| Coos Bay, OR                               | 2.8                         | 4.6                           | 18                   |
| Brookings, OR/Crescent City, CA/Eureka, CA | 4.6                         | 6.9                           | 15                   |
| Fort Bragg/Bodega Bay, CA                  | 1.9                         | 2.6                           | 8                    |
| San Francisco, CA                          | 0.5                         | 0.6                           | 4                    |
| Monterey, CA                               | 0.6                         | 1.0                           | 4                    |
| Morro Bay, CA                              | 1.8                         | 1.6                           | 10                   |

The two ports with the highest catch share landings in 2012 were Astoria and Newport, both in Oregon. Both ports received about 60 million pounds of catch share fish, worth \$17 and \$10 million, respectively. Washington received 43.2 million pounds, worth \$9.7 million. All of the California ports combined (including Brookings, OR, to protect confidential data) received 12.8 million pounds, worth \$9.3 million. Sixteen vessels delivered 84.6 million pounds of fish to at-sea motherships, worth \$9.3 million (Table 1).

<sup>10</sup> Note that these impacts do not include the complementary impacts associated with the shorebased buyers and processors, nor the mothership vessels. Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific Coast fisheries. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.



**Figure 3:** Landings by week (left) and total landings (millions of pounds) (right) in each fishery (2012).

For the purposes of this report, the catch share program is divided into the following five fisheries:

- At-sea Pacific whiting fishery
- Shoreside Pacific whiting fishery
- Dover sole, thornyheads, and sablefish (DTS) trawl with trawl endorsement fishery
- Non-whiting, non-DTS trawl with trawl endorsement fishery
- Groundfish fixed gear with trawl endorsement fishery

Most vessels participate in more than one of these fisheries.

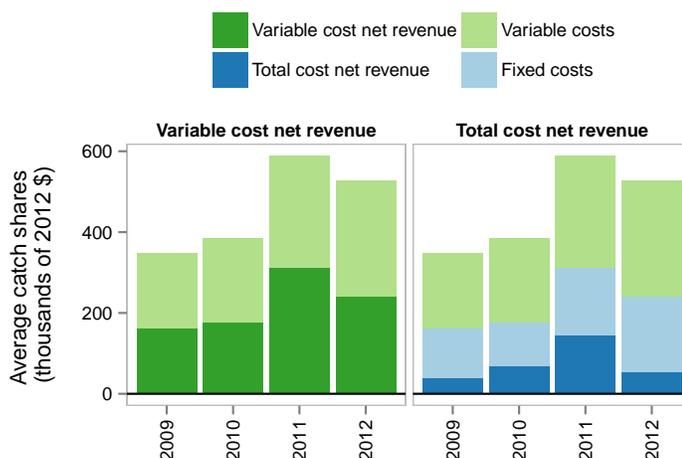
In addition to the catch share fisheries, most vessels also fish in Alaska or participate in state-managed fisheries (primarily shrimp and crab). A few vessels participate in other federally managed fisheries including the Groundfish fixed gear with fixed gear endorsement, halibut, salmon, and tuna fisheries. Participation in these other fisheries is more common for the shoreside non-whiting vessels, while fishing in Alaska is more common for the at-sea and shoreside Pacific whiting vessels. The Groundfish fixed gear with trawl endorsement fishery is a result of a “gear switching” provision that allows either for vessels with trawl quota to fish with fixed gear (pots or longlines) or for vessels that traditionally fished with fixed gear to lease or purchase trawl quota and fish with fixed gear. Fixed gear is primarily used to target sablefish.

The At-sea and Shoreside Pacific whiting fisheries are the highest volume fisheries, and occur between late May and October (Figure 3). The DTS and Non-DTS trawl fisheries occur year-round. The Groundfish fixed gear with trawl endorsement fishery occurs at a higher volume in the second half of the year. The opening of the crab season varies by state, but generally begins in December or January and

lasts until March. Shrimp is caught between April and October. Salmon, halibut, and tuna, which are included in the “Other fisheries” category, are caught in much lower volumes throughout the year.

## Economic Indicators

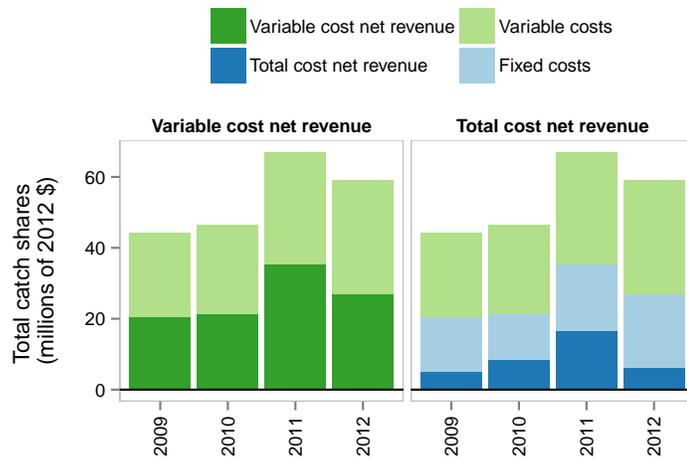
The EDC program measures the net economic benefits of the catch share program by reporting two types of net revenue. The first is variable cost net revenue, which is revenue minus variable costs. The second is total cost net revenue, which is revenue minus both variable and fixed costs.<sup>11</sup> To provide a complete picture of the changes that have occurred, both net revenue figures are presented at two scales. Figure 4 shows the average net revenue per vessel while Figure 5 shows the fleet-wide net revenue. Average net revenue shows the value generated by a typical vessel, while fleet-wide net revenue represents the total value generated by the fishery. Both figures only include revenues and costs associated with the catch share program. It is important to note that the EDC forms attempt to capture only costs that are directly related to vessel fishing operations, and do not include other expenses such as vehicles or office costs that may be related to the fishing business. Therefore, the net revenue reported here is an overestimate of the true net revenue.<sup>12</sup>



**Figure 4:** Average variable cost net revenue (ex-vessel revenue minus variable costs), and average total cost net revenue (ex-vessel revenue minus variable costs and fixed costs) per vessel from participation in all of the catch share fisheries combined (thousands of 2012 \$).

<sup>11</sup> See Figure 6 for a description of which costs are considered variable costs and which costs are considered fixed costs.  
<sup>12</sup> See Section 10 of the Data Summaries for more information.

The trends in both the per vessel average and the fleet-wide net revenue figures are very similar. Both variable cost and total cost net revenue were highest in 2011 and decreased in 2012. Each of the variable cost net revenue figures are higher for the years after the implementation of the catch share program than for the two years prior to the program. In 2012, average total cost net revenue was \$55,500, a decrease of 62% from 2011. In 2012, fleet-wide total cost net revenue was \$6.21 million,<sup>13</sup> a decrease of 62% from 2011. The fleet-wide and vessel average total cost net revenues were at similar levels in 2009 and 2010, while 2011 was substantially greater.



**Figure 5:** Fleet-wide variable cost net revenue (ex-vessel revenue minus variable costs), and fleet-wide total cost net revenue (ex-vessel revenue minus variable costs and fixed costs) from participation in all of the catch share fisheries combined (millions of 2012 \$).

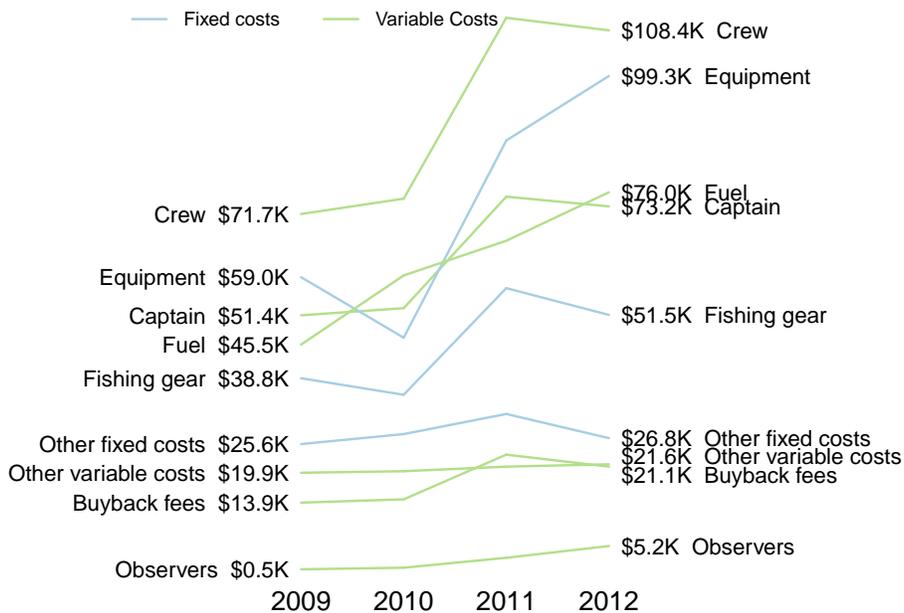
In all four years, the cost categories with the highest variable costs were crew and captain compensation (Figure 6). The highest fixed costs were vessel and on-board equipment. Fixed costs do not vary as directly with the level of fish harvest or production as variable costs. Costs per vessel have increased for nearly all cost categories, with the largest increases coming from equipment, captain and crew compensation, and fuel. Fleet-wide fixed costs have not decreased since the implementation of the catch share program. In addition to fixed and variable costs, 62 vessels spent an average of \$52,884 on the purchase or lease of quota in 2012.

One other change resulting from the implementation of the catch share program was a shift to 100% observer coverage with partial industry funding. Prior to catch shares there was approximately 20% observer coverage, paid for by the National Marine Fisheries Service (NMFS). Vessels participating in Exempted Fishing Permit (EFP) programs generally paid their observer costs. In order to lessen the cost of transitioning to the required 100% observer coverage, catcher vessels received a maximum subsidy of \$328.50 per day in 2011 and 2012. Catcher vessels spent on average \$5,200 on observer coverage (excluding the NMFS subsidy payments) while operating in the catch share program in 2012. This subsidy decreased in 2013 to \$256 per day and in 2014 to \$216 per day. In 2011, observer costs represented 0.6% of total costs, and increased to 1.1% in 2012.

On the revenue side, there have been increases in ex-vessel prices for most species and a considerable increase in Pacific whiting landings. Sablefish prices increased substantially in 2011, then decreased in 2012 to previous years' levels (Figure 2).

As noted above, most vessels participate in more than one fishery within the catch share program, as well as state and federally-managed fisheries that are not a part of the catch share program. More

<sup>13</sup> Values reported in inflation adjusted 2012 dollars. All averages are calculated from non-zero, non-NA responses.



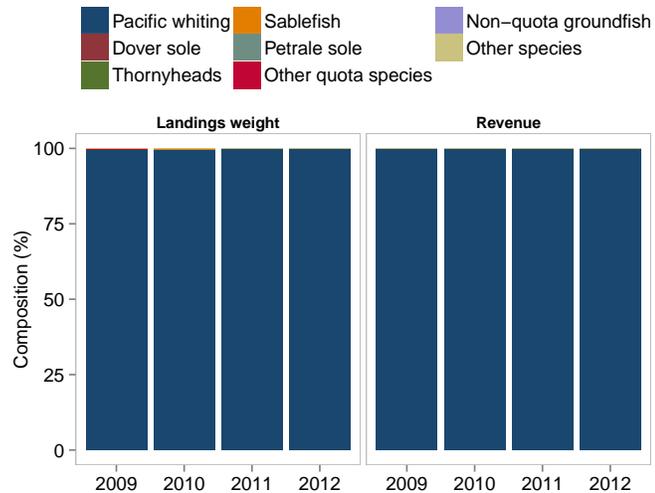
**Figure 6:** Average fixed and variable costs (thousands of 2012 \$) per vessel in the West Coast Trawl Groundfish Catch Share Program.

details about each fishery and the economics of vessels participating in each fishery are included in the fishery specific summaries in the following section.

# Fishery Summaries

## At-sea Pacific whiting

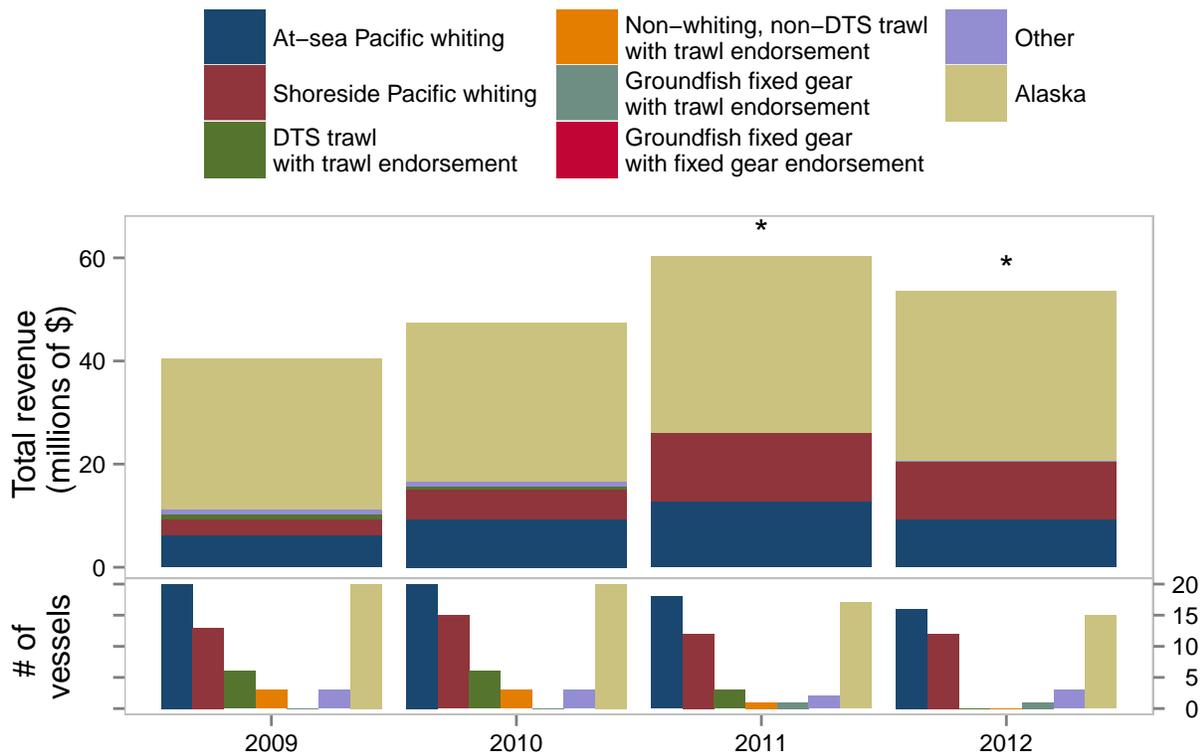
Seventeen vessels participated in the At-sea Pacific whiting fishery in 2012. These vessels delivered to five mother-ships as part of a single fishing cooperative. This fishery targets Pacific whiting (99.8% of total landings by weight) and has very low bycatch (Figure 7). Although the bycatch rate is extremely low, the total weight of bycatch was 1.25 million pounds in 2012. The majority of this catch consisted of rockfish, sharks, skates and rays, and squid. Not all species caught in this fishery must be “covered” with quota, but of the quota species, the most common were widow rockfish (175,000 pounds), roughey rockfish (119,000 pounds), and yellowtail rockfish (95,300 pounds).



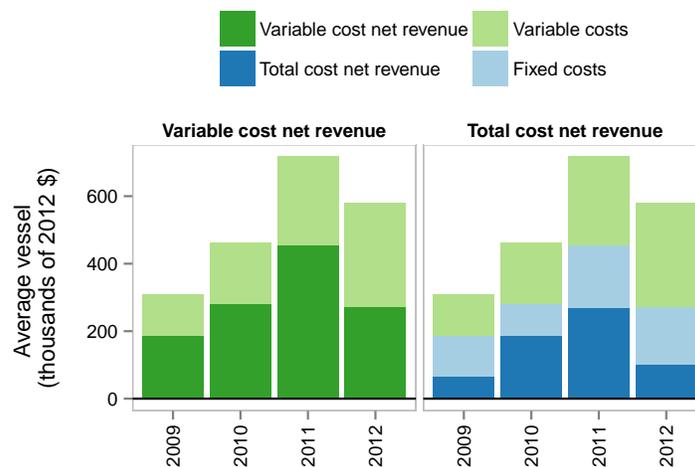
**Figure 7:** The species composition of catch (left) and revenue (right) in the At-sea Pacific whiting fishery (%).

Participation in the At-sea Pacific whiting fishery resulted in \$9.3 million in ex-vessel revenue in 2012 (Figure 8 (top)). Vessels that participated in the At-sea Pacific whiting fishery also earned revenue fishing in the Shoreside Pacific whiting fishery (20.9% of total revenue) and fishing in Alaska (61.1% of total revenue). Nearly all of the participants in the At-sea Pacific whiting fishery also fished in Alaska (Figure 8 (bottom)). In 2009 and 2010 there were some vessels that also fished in the bottom trawl fisheries (DTS trawl with trawl endorsement and Non-whiting, non-DTS trawl with trawl endorsement fisheries), but in 2012, none of the At-sea Pacific whiting vessels participated in these fisheries. Total revenue has increased in 2011-2012, mainly due to an increase in the catch limit for Pacific whiting and Alaska pollock (for those vessels that fish in Alaska).

Average revenue for participants in the At-sea Pacific whiting fishery was \$580,412, average variable cost net revenue was \$259,210, and average total cost net revenue was \$81,468 in 2012 (Figure 9). The revenue and net revenue figures correlate closely to the volume of Pacific whiting allocated to the mothership sector. Average variable cost net revenue for 2011 was higher than the two years prior to the catch shares program. Higher variable costs contributed to a decrease in average total cost net revenue in 2012.

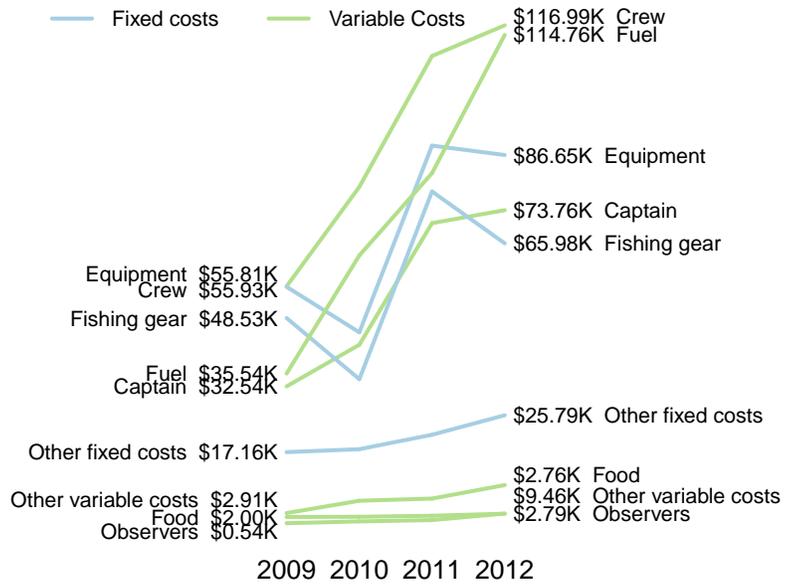


**Figure 8:** Total ex-vessel revenue earned by vessels that participated in the At-sea Pacific whiting fishery by fishery (millions of 2012 \$) (top) and number of vessels that participated in each fishery (bottom). \*Some values are suppressed to protect confidential data.



**Figure 9:** Average variable cost net revenue (ex-vessel revenue minus variable costs) (left), and average total cost net revenue (ex-vessel revenue minus variable costs and fixed costs) (right) from participation in the At-sea Pacific whiting fishery (thousands of 2012 \$).

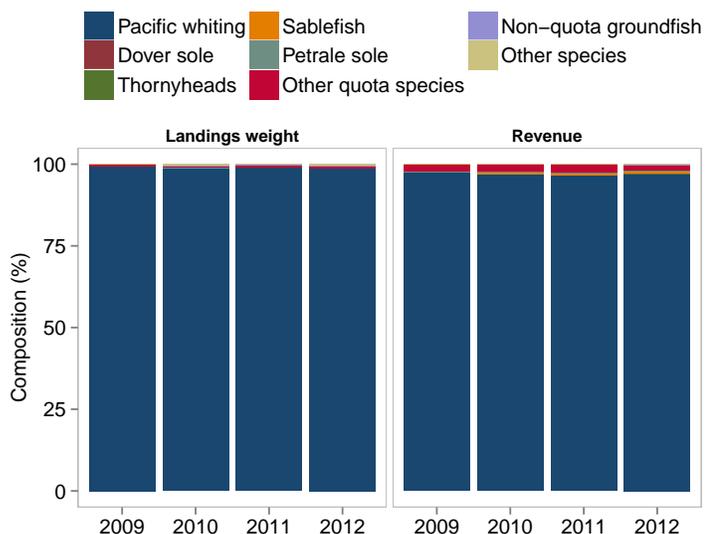
The single largest cost in 2012 was crew compensation (\$117,000) per vessel, on average, followed by fuel (\$115,000), and equipment (\$86,700) (Figure 10). The total amount spent on fuel, crew compensation, and captain compensation nearly doubled between 2009 and 2012. On a per unit basis (not shown in the figure), crew compensation increased from \$1.59 per hundred pounds delivered in 2009 to \$2.29 per hundred pounds delivered in 2012, and captain compensation increased from \$0.92 per hundred pounds delivered in 2009 to \$1.46 per hundred pounds delivered in 2012. The expenses on fuel also increased, from \$1.17 per hundred pounds delivered to \$2.10 per hundred pounds in 2012. The increase in fuel costs can be partly attributed to increases in fuel prices (see Mothership report for a full discussion).



**Figure 10:** Average fixed and variable costs per vessel in the At-sea Pacific whiting fishery (thousands of 2012 \$).

## Shoreside Pacific whiting

Twenty-five vessels participated in the Shoreside Pacific whiting fishery in 2012. This fishery targets mainly Pacific whiting (98.7% of total landings by weight, Figure 11). Like the at-sea fishery, the bycatch rate is extremely low, in 2012 the total weight of bycatch was 1.96 million pounds. The majority of the bycatch consisted of rockfish, sharks, skates and rays, and shad. Not all species caught in this fishery must be “covered” with quota, but of the quota species, the most common were yellow-tail rockfish (441,000 pounds), widow rockfish (227,000 pounds), and sablefish (103,000 pounds).



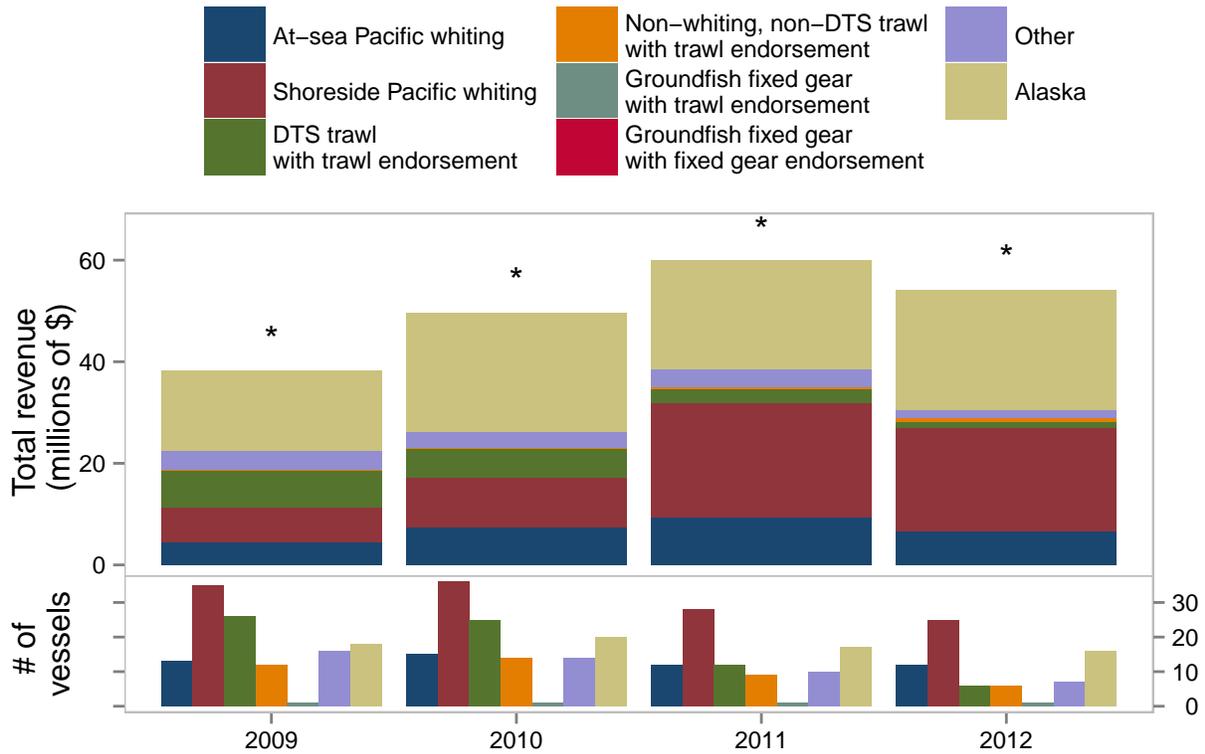
**Figure 11:** The species composition of catch (left) and revenue (right) in the Shoreside Pacific whiting fishery (%).

Participation in the Shoreside Pacific whiting fishery resulted in \$20.3 million in total ex-vessel revenue in 2012 (Figure 12 (top)). Vessels that participated in the Shoreside Pacific whiting fishery also earned revenue from fishing in the At-sea Pacific whiting fishery (12.1% of total revenue) and fishing in Alaska (43.5% of total revenue). Total revenue has increased, mainly due to an increase in the catch limit for Pacific whiting and Alaska pollock (for those vessels that fish in Alaska). Most Shoreside Pacific whiting vessels either fished in Alaska or in the At-sea Pacific whiting fishery (Figure 12 (bottom)).

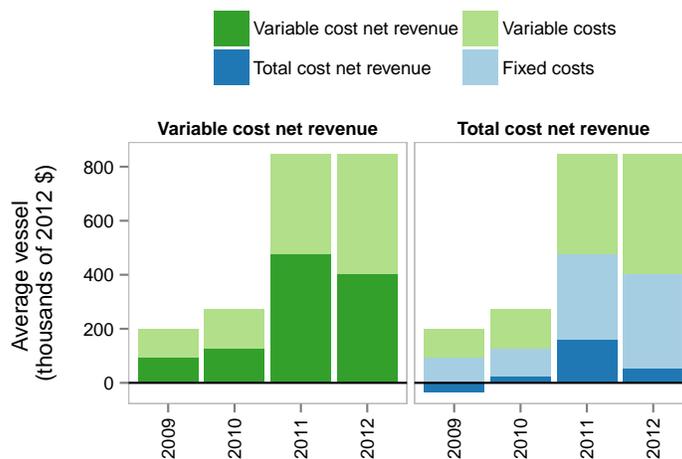
The number of vessels participating in the Shoreside Pacific whiting fishery decreased from 2009 (35 vessels) to 25 vessels in 2012. There was also a decrease in the number of those vessels that participated in the DTS trawl and the non-whiting, non-DTS trawl fisheries.

Average revenue for vessels participating in the Shoreside Pacific whiting fishery was \$847,276, average variable cost net revenue was \$399,649, and average total cost net revenue was \$51,000 in 2012 (Figure 13). Average revenue, average variable cost net revenue, and average total cost net revenue increased substantially from 2009-2010 levels (note that average total cost net revenue was negative in 2009). The increase was due to an increase in the catch limit for Pacific whiting, especially in 2011, and steadily increasing ex-vessel prices paid by first receivers to the shoreside fleet.

The single largest cost in 2012 was for vessel and on-board equipment (\$222,000 per vessel), followed by crew compensation (\$175,000), and captain compensation (\$116,000) (Figure 14). The average amount spent on vessel and on-board equipment nearly quadrupled between 2009 and 2012, and fuel, crew compensation, and captain compensation in 2012 were five times the amount spent in 2009 and 2010. On a per unit basis (not shown in the figure), crew compensation increased from \$1.30 per

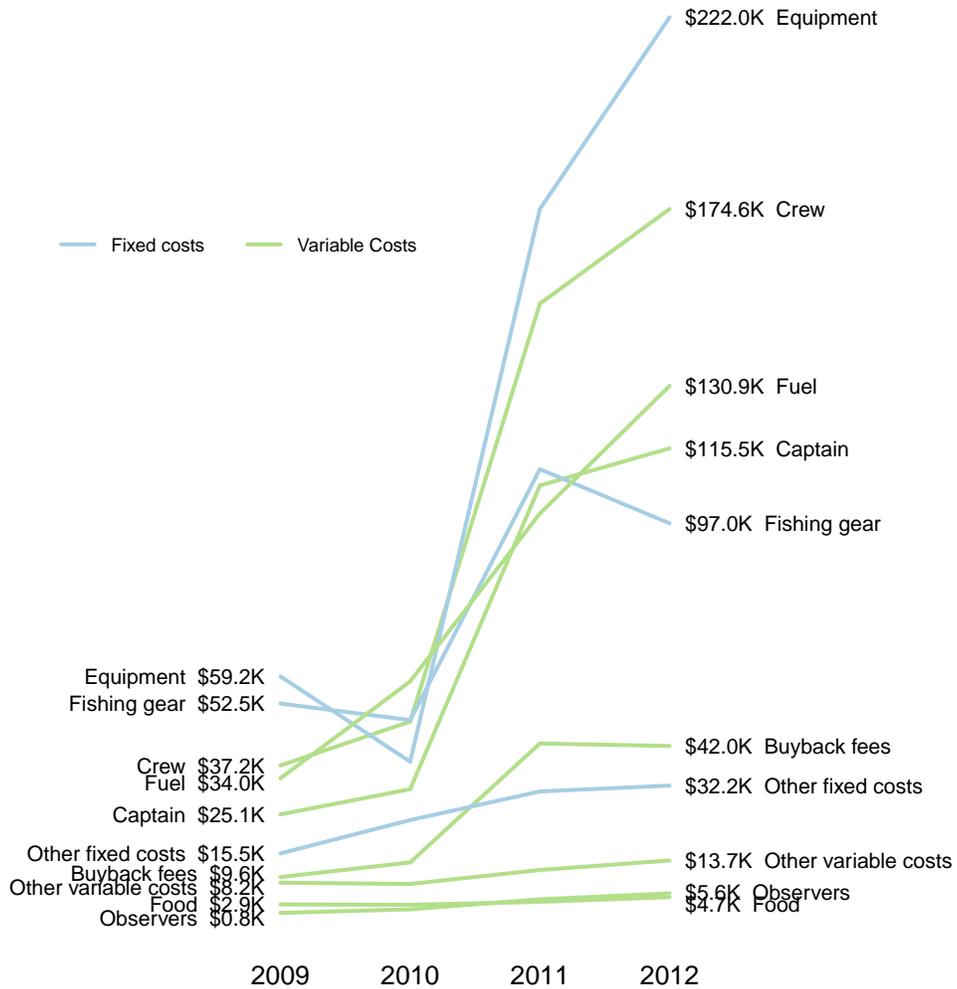


**Figure 12:** Total ex-vessel revenue earned by vessels that participated in the Shoreside Pacific whiting fishery by fishery (millions of 2012 \$) (top) and number of vessels that participated in each fishery (bottom). \*Some values are suppressed to protect confidential data.



**Figure 13:** Average variable cost net revenue (ex-vessel revenue minus variable costs) (left), and average total cost net revenue (ex-vessel revenue minus variable costs and fixed costs) (right) from participation in the Shoreside Pacific whiting fishery (thousands of 2012 \$).

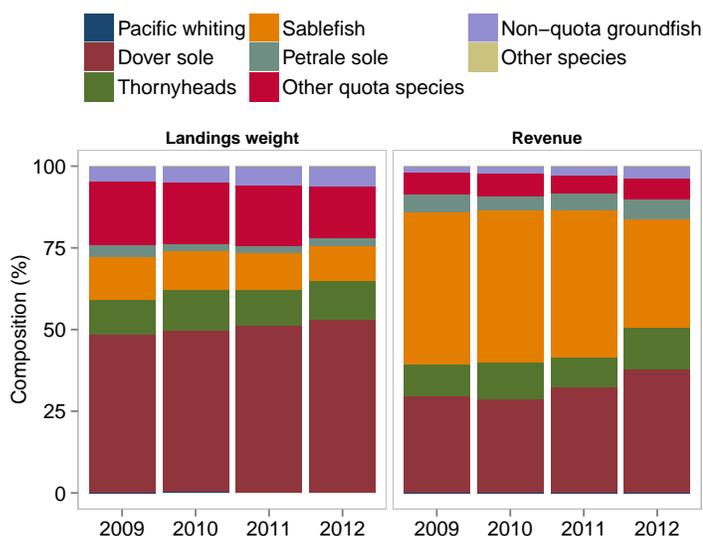
hundred pounds delivered in 2009 to \$3.01 per hundred pounds in 2012, and captain compensation increased from \$0.94 per hundred pounds delivered in 2009 to \$2.04 per hundred pounds in 2012. Expenses on fuel also increased, from \$1.25 per hundred pounds delivered in 2009 to \$2.36 per hundred pounds in 2012. The increase in fuel costs can be partly attributed to increases in fuel prices (see Mothership report for a full discussion).



**Figure 14:** Average fixed and variable costs per vessel in the Shoreside Pacific whiting fishery (thousands of 2012 \$).

## DTS trawl with trawl endorsement

The DTS trawl with trawl endorsement fishery had more participants than any other fishery in 2012, with 59 vessels. This fishery targets mainly dover sole (53% of catch in 2012), thornyheads (12% of catch), and sablefish (11% of catch) using trawl gear. Sablefish constituted the largest revenue source (33% of revenue in 2012) (Figure 15). The fishery catches smaller amounts of other quota species (including rockfish, 16% of catch), and marginal amounts of other non-quota groundfish and other species. The relative share of landings and revenue of dover sole increased slightly from 2009-2012. The relative share of revenue of sablefish decreased from 2011 to 2012, mainly due to a decrease in price from 2011 to 2012 (Figure 2).

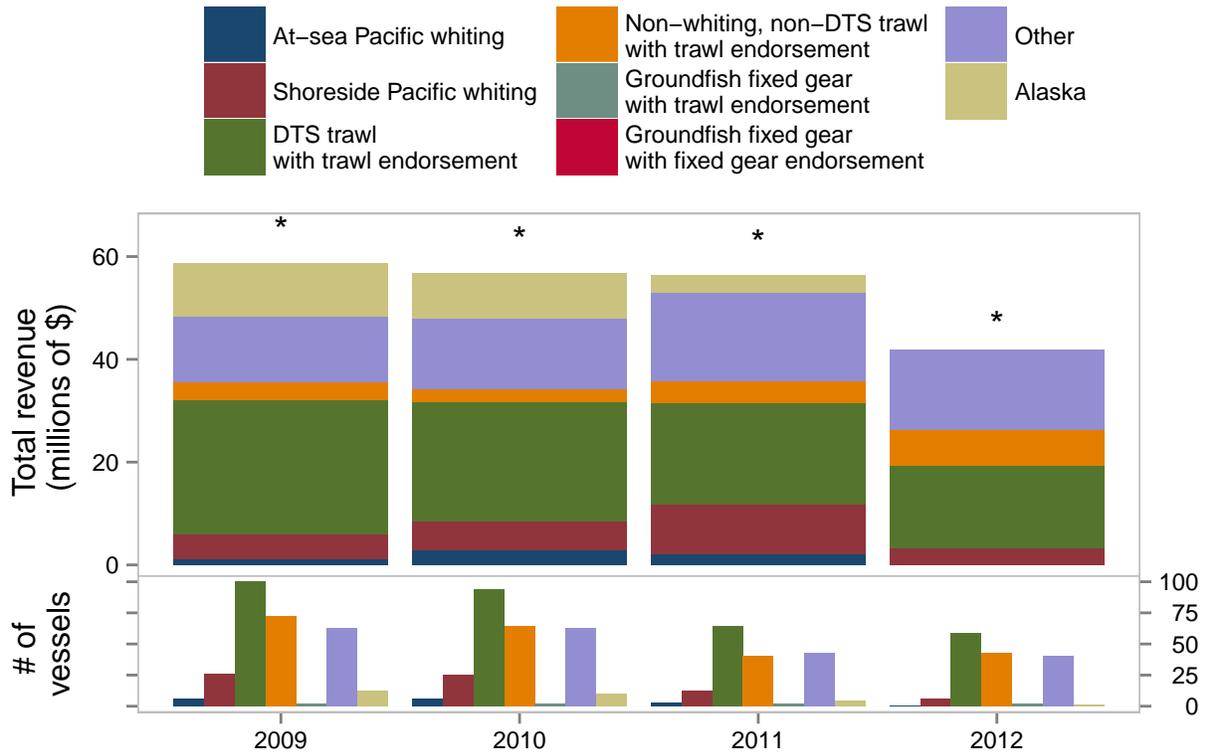


**Figure 15:** The species composition of catch (left) and revenue (right) in the DTS trawl with trawl endorsement fishery (%).

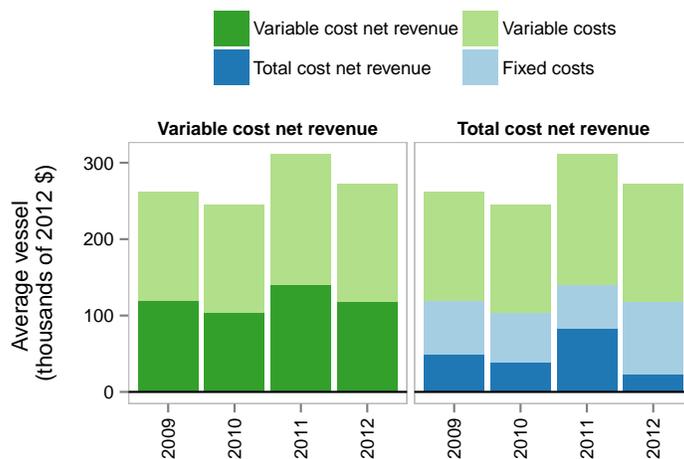
Vessels that participated in the DTS trawl with trawl endorsement fishery also earned revenue from Other fisheries (primarily crab and shrimp), and to a much smaller extent, the Shoreside Pacific whiting fishery, and the Non-whiting, non-DTS trawl with trawl endorsement fishery (Figure 16). Participation in crab, shrimp, and non-whiting, non-DTS trawl makes up around 50% of total revenue. Of the vessels that participated in the DTS trawl with trawl endorsement fishery, 40 vessels also participated in the Other fisheries category. Although some of these vessels fished in Alaska in 2009-2011, there were no vessels in this fishery that went to Alaska in 2012. Total revenue decreased from 2011 to 2012, mainly due to decreasing participation in the At-sea and Shoreside Pacific whiting fisheries and Alaska fishing.

Average revenue for vessels participating in the DTS trawl with trawl endorsement fishery was \$269,284, average variable cost net revenue was \$116,641, and average total cost net revenue was \$33,738 in 2012 (Figure 17). Average variable cost net revenue for both years post-catch shares was higher than the years prior to the catch shares program.

The single largest cost in 2012 was for crew compensation (\$56,300 per vessel, on average), followed by vessel and on-board equipment (\$46,500), and captain compensation (\$41,300) (Figure 18). Unlike the At-sea and Shoreside Pacific whiting fisheries, the DTS trawl with trawl endorsement fishery did not experience the same rise in total and per-unit costs since the implementation of the catch share program. On a per unit basis (not shown in the figure), the one cost category that experienced a large relative increase was expenses on vessel and on-board equipment, increasing from \$9.49 per hundred pounds in

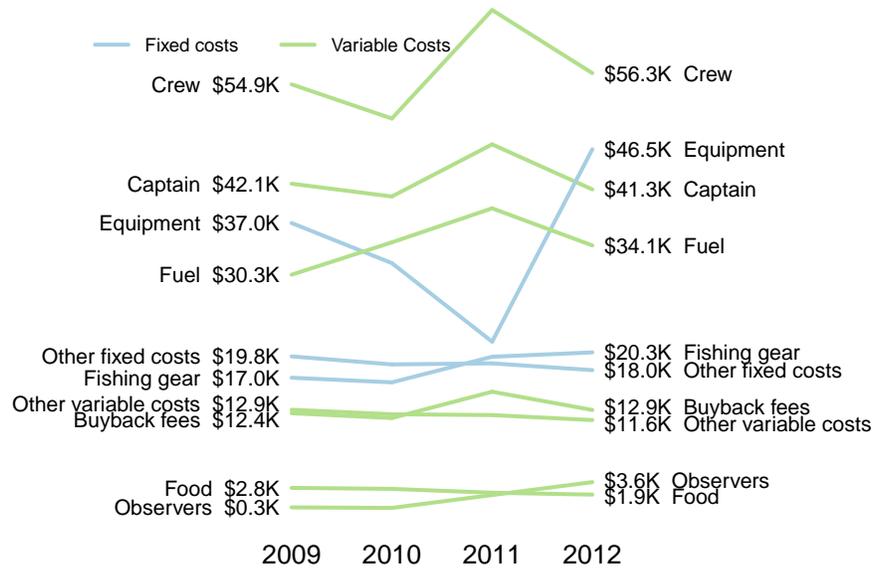


**Figure 16:** Total ex-vessel revenue earned by vessels that participated in the DTS trawl with trawl endorsement fishery by fishery (millions of 2012 \$) (top) and number of vessels that participated in each fishery (bottom). \*Some values are suppressed to protect confidential data.



**Figure 17:** Average variable cost net revenue (ex-vessel revenue minus variable costs) (left), and average total cost net revenue (ex-vessel revenue minus variable costs and fixed costs) (right) from participation in the DTS trawl with trawl endorsement fishery (millions of 2012 \$).

2009 to \$16.25 per hundred pounds in 2012. Compared to 2011 (\$11.34 per hundred pounds), expenses on fuel per hundred pounds were particularly low in 2012 (\$7.68 per hundred pounds).

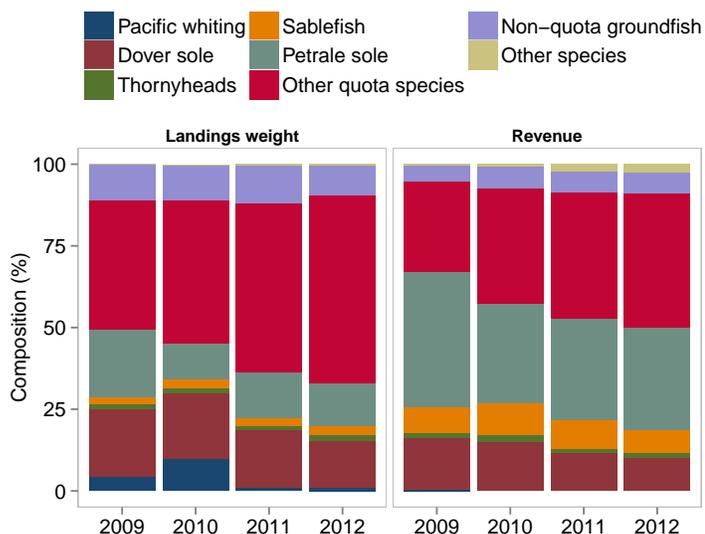


**Figure 18:** Average fixed and variable costs per vessel in the DTS trawl with trawl endorsement fishery (thousands of 2012 \$).

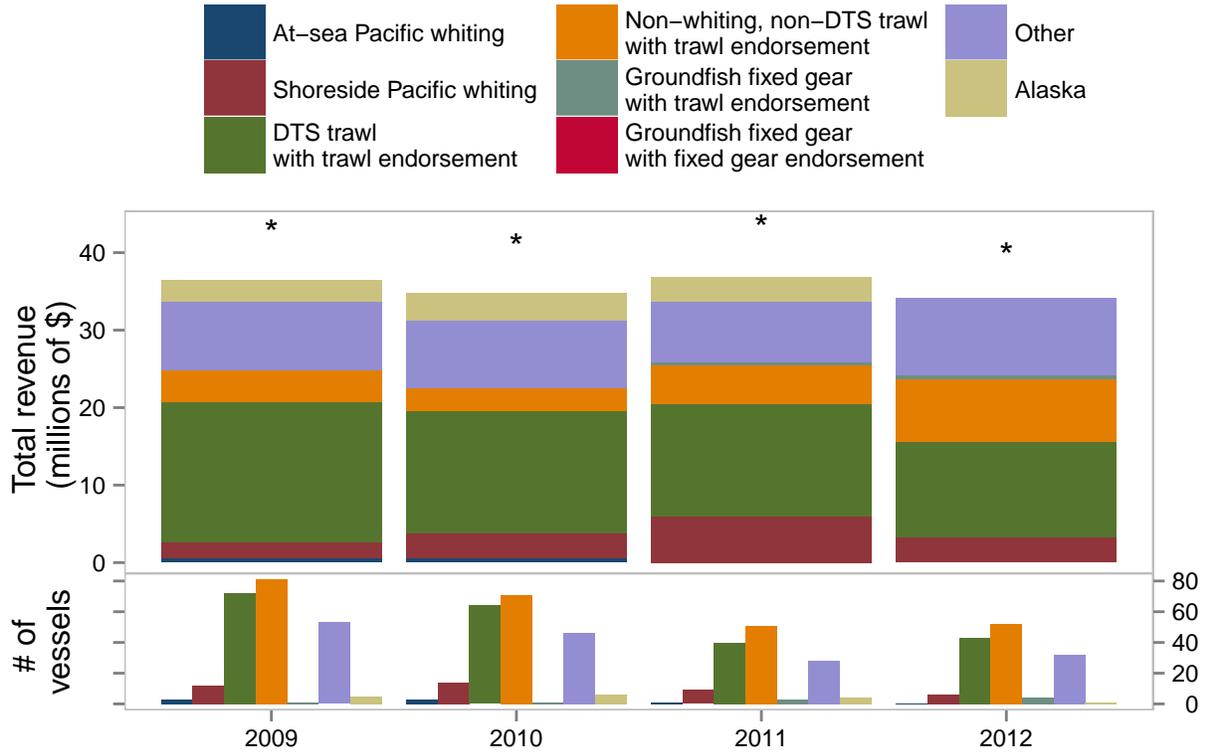
## Non-whiting, non-DTS trawl with trawl endorsement

Fifty vessels participated in the Non-whiting, non-DTS trawl with trawl endorsement fishery in 2012. The Non-whiting, non-DTS trawl with trawl endorsement fishery is a significantly lower volume groundfish fishery (Figure 3) than the other catch share fisheries. This fishery catches mostly dover sole (14% of catch in 2012), petrale sole (13% of catch), and other quota species, primarily rockfish (57% of catch). Non-quota groundfish are also caught in relatively large volumes (Figure 19).

Participation in the Non-whiting, non-DTS trawl with trawl endorsement fishery makes up a minor portion of total revenue for participants in that fishery (Figure 20). They also participate in the Shoreside Pacific whiting, DTS trawl with trawl endorsement, and Other fisheries. A few vessels fish in Alaska as well, although participation in Alaska fisheries decreased in 2012 (Figure 20).



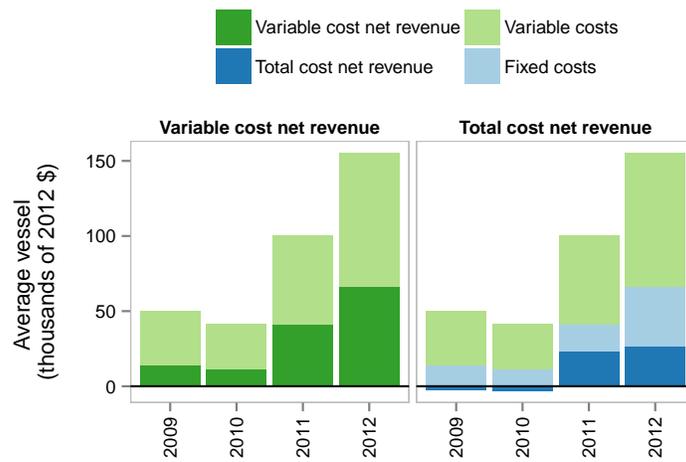
**Figure 19:** The species composition of catch (left) and revenue (right) in the Non-whiting, non-DTS trawl with trawl endorsement fishery (%).



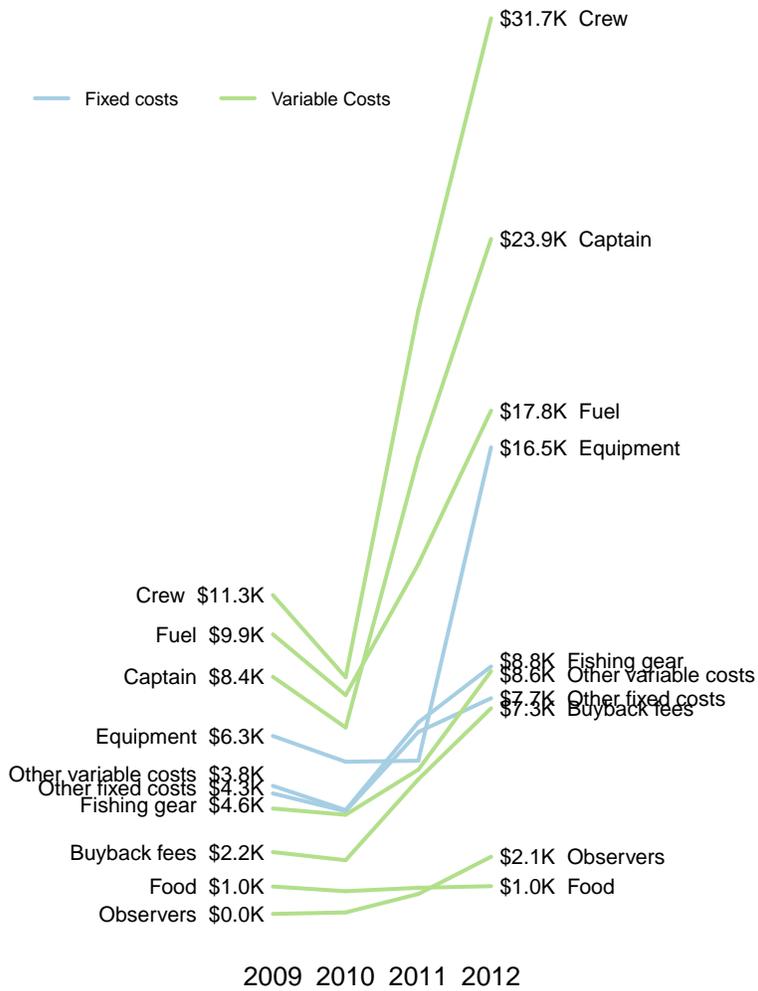
**Figure 20:** Total ex-vessel revenue (2012 \$) earned by vessels that participated in the Non-whiting, non-DTS trawl with trawl endorsement fishery by fishery (top) and number of vessels that participated in each fishery (bottom). \*Some values are suppressed to protect confidential data.

Average revenue for vessels participating in the Non-whiting, non-DTS trawl with trawl endorsement fishery was \$154,312, average variable cost net revenue was \$66,760, and average total cost net revenue was \$34,335 in 2012 (Figure 17). Both net revenue measures were greater in the post-catch shares years.

The largest expense in 2012 was for crew compensation (\$31,700) per vessel, on average), followed by captain compensation (\$23,900), and fuel (\$17,800 each). While all cost categories experienced an increase from 2009 to 2011, crew compensation, captain compensation, and fuel, and equipment increased the most. On a per-unit of deliveries basis (not shown in the figure), all cost categories were relatively constant over the time period except fuel, which decreased from \$0.12 per hundred pounds delivered in 2011 to \$0.08 per hundred pounds delivered in 2012.



**Figure 21:** Average variable cost net revenue (ex-vessel revenue minus variable costs) (left), and average total cost net revenue (ex-vessel revenue minus variable costs and fixed costs) (right) from participation in the Non-whiting, non-DTS trawl with trawl endorsement fishery (thousands of 2012 \$).

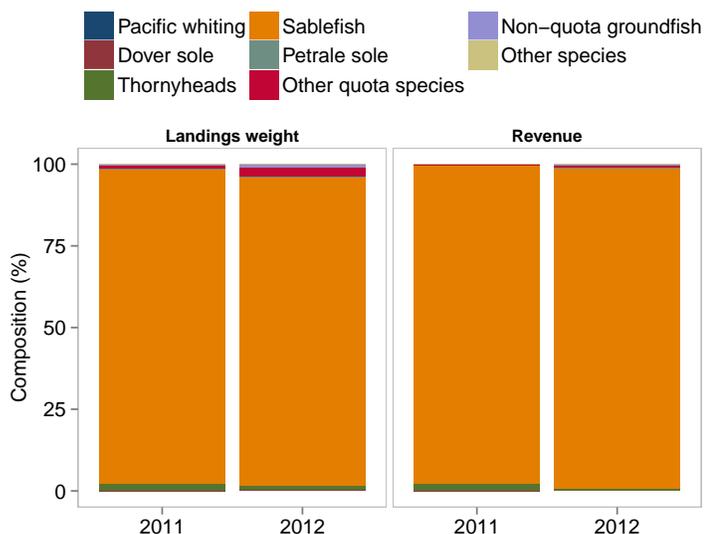


**Figure 22:** Average fixed and variable costs per vessel in the Non-whiting, non-DTS trawl with trawl endorsement fishery (thousands of 2012 \$).

## Groundfish fixed gear with trawl endorsement

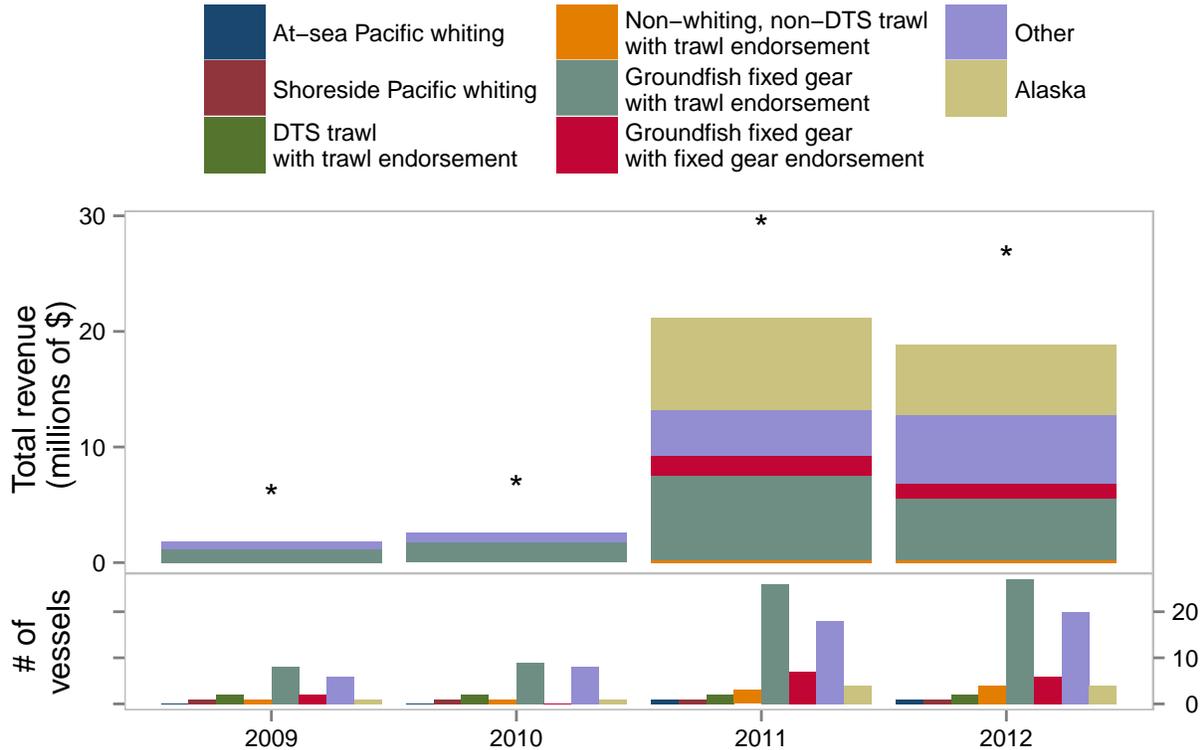
In the first year of the catch share program, 26 vessels caught sablefish allocated to the trawl fishery using fixed gear. In 2012, there was one additional vessel, for a total of 27 vessels. This fishery targets almost exclusively sablefish (94% of catch in 2012) (Figure 23). In 2009 and 2010, the only vessels in the Groundfish fixed gear with trawl endorsement fishery were a small number of vessels participating in an exempted fishing permit program sponsored by the Nature Conservancy (Figure 24).<sup>14</sup>

Unlike the other fisheries, this fishery uses fixed gear (either fish pots or longlines). The number of vessels fishing with pots increased from 2011 to 2012, from 18 to 21, while the number of vessels fishing with longlines remained at 9 vessels. In general, the vessels fishing with fish pots are vessels that have historically fished with trawl gear and have switched to using fish pots to harvest groundfish. The vessels fishing with longline gear participate primarily in the Limited Entry Fixed Gear sablefish fishery and have acquired a limited entry trawl permit and quota in order to target sablefish allocated to the trawl fishery.



**Figure 23:** The species composition of catch (left) and revenue (right) in the Groundfish fixed gear with trawl endorsement fishery (%). The data for 2009 and 2010 are not shown because they represent a small group of vessels participating in an exempted fishery permit program.

<sup>14</sup> For more information, see: [www.opc.ca.gov/2010/05/central-coast-groundfish-project/](http://www.opc.ca.gov/2010/05/central-coast-groundfish-project/)

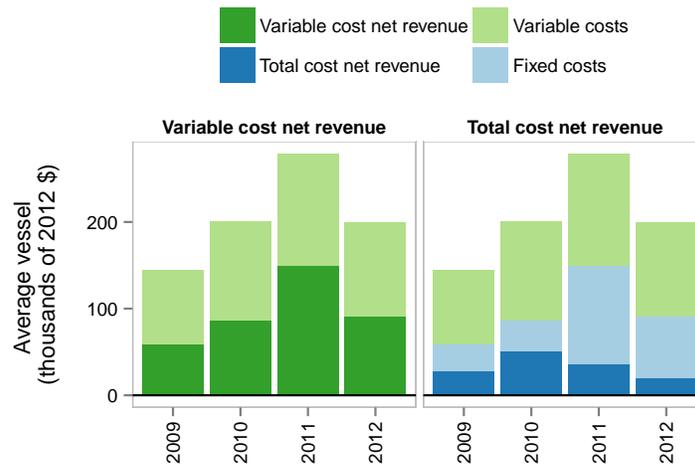


**Figure 24:** Total ex-vessel revenue earned by vessels that participated in the Groundfish fixed gear with trawl endorsement fishery by fishery (millions of 2012 \$) (top) and number of vessels that participated in each fishery (bottom). \*Some values are suppressed to protect confidential data.

Vessels that participated in the Groundfish fixed gear with trawl endorsement fishery also earned revenue from fishing in Alaska, and fishing in Other fisheries (Figure 24 (top)). Participation in other fisheries (particularly crab, shrimp, and non-whiting, non-DTS trawl with trawl endorsement fisheries) makes up around 50 percent of total revenue. Of the vessels that participated in the Groundfish fixed gear with trawl endorsement fishery, 20 vessels also participated in the Other fisheries category (Figure 24 (bottom)).

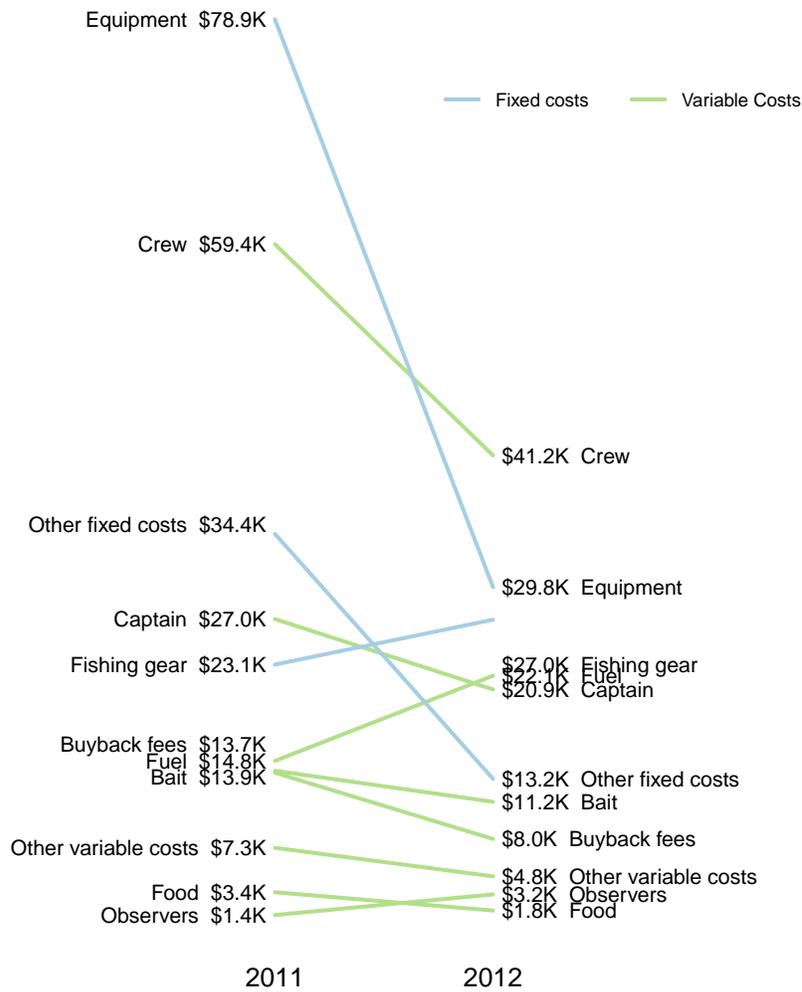
Average revenue for vessels participating in the Groundfish fixed gear with trawl endorsement fishery was \$199,601, average variable cost net revenue was \$93,185, and average total cost net revenue was \$25,499 in 2012 (Figure 25). Average revenue was highest in 2011 due to high sablefish prices (Figure 2), but higher fixed and variable costs resulted in a decrease in average net revenue in 2012.

The largest cost in 2012 was crew compensation (\$41,200 per vessel, on average), followed by vessel and on-board equipment (\$29,800), and fishing gear (\$27,000) (Figure 26). Unlike the trawl fisheries, fixed gear vessels have the additional cost of bait. In 2012, the average expense on bait was \$11,200 per vessel. Average expenses across nearly all cost categories decreased from 2011 to 2012. On a per unit basis (not shown in the figure), equipment expenses decreased from \$9.18 per hundred pounds



**Figure 25:** Average variable cost net revenue (ex-vessel revenue minus variable costs) (left), and average total cost net revenue (ex-vessel revenue minus variable costs and fixed costs) (right) from participation in the Groundfish fixed gear with trawl endorsement fishery (thousands of 2012 \$).

delivered in 2011 to \$0.44 per hundred pounds delivered. Compared to equipment, per-unit expenses in the other cost categories remained relatively constant from 2011 to 2012.



**Figure 26:** Average fixed and variable costs per vessel in the Groundfish fixed gear with trawl endorsement fishery (thousands of 2012 \$). The costs for 2009 and 2010 are not shown here because they were collected from a small group of vessels participating in a exempted fishing permit fishery.

# CATCHER VESSEL DATA SUMMARIES

# CATCHER VESSEL DATA SUMMARIES

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# 1 Introduction

## 1.1 Background

The US West Coast groundfish fishery takes place off the coasts of Washington, Oregon and California, and is comprised of over 90 different species of fish. The fish are harvested both commercially and recreationally. The commercial fishery has four components: limited entry with a trawl endorsement, limited entry with a fixed gear endorsement, open access, and tribal.<sup>1</sup> In January 2011, the West Coast Limited Entry Groundfish Trawl fishery transitioned to the West Coast Groundfish Trawl Catch Share Program. The catch share program consists of cooperatives for the at-sea mothership (including catcher vessels and motherships) and catcher-processor fleets, and an individual fishing quota (IFQ) program for the shorebased trawl fleet.<sup>2</sup>

The Economic Data Collection (EDC) program<sup>3</sup> was implemented as part of these new regulations to monitor the economic effects of the catch share program. Annual economic data submissions are required from all fishery participants: catcher vessels, motherships, catcher-processors, and first receivers and shorebased processors §50 CFR 660.114. Baseline, pre-catch share, data were submitted in 2011 for the 2009 and 2010 operating years. Data for the first year the fishery operated under the catch share program (2011) were submitted in 2012, and the 2012 data submitted for this report were collected in 2013.

This report summarizes the 2009-12 EDC catcher vessel survey data. The EDC Program has enhanced the quantity and quality of economic information available for analysis and the management of the West Coast groundfish trawl fishery. Prior to the EDC Program, voluntary cost earnings surveys were available for 64% of the shoreside catcher vessels with limited entry groundfish permits with trawl endorsements (trawl fleet) (2003-2004 collection<sup>4</sup>) and 57% of the fleet for the 2007-2008 collection.<sup>5</sup> Moreover, no

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<sup>1</sup> For more information about West Coast Groundfish, see [www.westcoast.fisheries.noaa.gov/fisheries/groundfish/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish/).

<sup>2</sup> More information about the West Coast Groundfish Trawl Catch Share Program is available online at [www.westcoast.fisheries.noaa.gov/fisheries/groundfish\\_catch\\_shares/](http://www.westcoast.fisheries.noaa.gov/fisheries/groundfish_catch_shares/).

<sup>3</sup> Additional information on the EDC Program, including the EDC data collection forms can be found at [www.nwfsc.noaa.gov/edc](http://www.nwfsc.noaa.gov/edc)

<sup>4</sup> Lian, C.E. 2010. West Coast limited entry groundfish trawl cost earnings survey protocols and results for 2004. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-107, 35 p.

<sup>5</sup> Lian, C.E. 2012. West Coast limited entry groundfish cost earnings survey: Protocol and results for 2008. U.S. Department of Commerce, NOAA Technical Memorandum NMFS-NWFSC-121, 62 p

costs and earnings data were available for catcher vessels that delivered to motherships.

## 1.2 Understanding the report

It is important to remember that the information presented in this report is for all vessels that were required to complete the EDC form, as described above. Throughout the report, these vessels are referred to as EDC vessels. The EDC vessel include: 1) vessels that have historically participated in the trawl fishery and currently still participate; 2) vessels that no longer participate in the trawl fishery but still have a limited entry trawl permit; and 3) vessels that have not historically had a limited entry trawl permit, but have now obtained one to participate in the gear switching program (use of fixed gear is allowed under the program).

The unit of analysis identified in the summary tables varies by the information summarized. There are three different units of analysis, “entities”, “vessels”, and “participants”. An “entity” is defined as a unique combination of an owner or lessee and vessel, whereas a “vessel” refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel. Therefore multiple forms could be submitted for one vessel, because there were multiple owners or lessees. Finally, “participants” refers to the individuals who actually completed the report. Each summary table clearly states whether the count of individuals represents entities or vessels.

For each value displayed in the summary data tables, N is displayed. In most cases, N represents the number of responses to the question that are not “NA” and not zero, unless noted otherwise. For example, in Table 9.1, for the 94 vessels that had expenses on ice, the mean expense in 2012 was \$6,500. Therefore to calculate the average expense for ice for the entire fleet, one would need to multiply the mean by 94 and then divide by the total number of vessels (127).

The one major difference between the baseline forms (2009 and 2010) and 2011-current forms is that vessels that did not fish during the survey period were only required to fill out the first few pages of the form during the baseline collection. The vessels that did not fish in 2009 and 2010 only provided the vessel name, vessel ID, home port, length of the vessel, fuel capacity, and horsepower of main engines, contact information, and permit numbers. Starting with the 2011 forms, all participants are required to complete the entire form, in order to capture information such as capital investments, and earnings from lease or sale of quota or permits.

One last guideline when interpreting the aggregated data is the use of fiscal year. Although participants are identified on a calendar year basis, they complete the form using information based on the fiscal year of the entity. Currently data are presented for survey year, and therefore data assigned to a survey year may not overlap completely with the calendar year. Information obtained from outside of the EDC Program are adjusted to match the fiscal year provided on each form. For the four years of data collected from catcher vessels, 91% of entities used a fiscal year that is the same as the calendar year.

One change implemented this year is the inclusion of a measure of variation of the data. The stacked dots included in the tables provide information about the coefficient of variation (*CV*) of the mean. For 2009-2012, none of the *CV*s exceeded 2.6. We use the following scoring:

- represents  $CV < 0.5$ ,
- ˙ represents  $0.5 \leq CV < 1.0$ ,
- ∶ represents  $1.0 \leq CV < 2.0$ , and
- ∴ represents  $2.0 \leq CV$ .

All data submitted via the EDC Program are confidential under 402(b) of the Magnuson-Stevens Act (16 U.S.C. 1801, et seq.) and under NOAA Administrative Order 216-100. In order to protect these data, a rule of three and a rule of 90-10 are implemented. The rule of three requires a response from at least three entities in order to show a summary statistic. The 90-10 rule requires that no single entity's response should comprise over 90 percent of all relevant responses. The tables show a "\*\*\*" for data points where there were less than three entities reporting the information, and/or if one entity's responses accounted for greater than 90 percent of the average value. Zeroes are shown if all entities only reported zeroes and/or NAs. More information about how confidential data are protected in the EDC Program can be found in the Administration and Operations Report. Additionally, "—" is used to denote fields where the question was not asked on the form in that survey year.

Unlike the Overview, all numbers reported in the Data Summaries are generated from the raw responses received from participants and, therefore, are in nominal dollars.

### 1.3 Purpose of the data summaries

This report, like the other four EDC reports,<sup>6</sup> has multiple objectives. The first is to provide basic economic data summaries that can be used for a variety of purposes associated with fishery management. Since much of the data collected are confidential under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 2007, the data are summarized as averages or totals for each question on the EDC forms. Thus summarized, the reports make the data available to the public for both research and informational purposes.

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<sup>6</sup> In addition to the catcher vessel report, there are four companion reports:

- Economic Data Collection Program, Administration and Operations Report Draft Report for PFMC Review (November 2014)
- Economic Data Collection Program, Mothership Report, 2009-2012 Draft Report for PFMC Review (November 2014)
- Economic Data Collection Program, Catcher Processor Report, 2009-2012 Draft Report for PFMC Review (November 2014)
- Economic Data Collection Program, First Receiver and Shorebased Processor Report, 2009-2012 Draft Report for PFMC Review (November 2014)

Second, to provide information about the performance of the catch share program. This includes information that can be used to monitor whether and to what degree the goals of the program are being met. It is expected that additional modeling will provide increased detail about program impacts. These reports will serve as the basis for the 5-year review of the catch share program that is mandated in the MSA, as well as the NOAA Fisheries National Catch Shares Performance Indicators. Currently, with just two years of catch share EDC data, it may be difficult to draw firm conclusions about the performance of the program. In addition, the catch share program may have a transitional period in the first few years as participants learn about the system and develop new business strategies.

Third, the reports serve as the basis for economic models that are used as part of the Pacific Fishery Management Council's (PFMC) biennial specification process for groundfish management. These models include the IO-PAC model,<sup>7</sup> as well as estimates of revenue, costs, and net revenue.

Lastly, and perhaps most importantly, the data reports are expected to provide a useful catalyst for feedback on the data collected and its analysis.

The Administration and Operations Report describes the EDC Program administration and fielding of the surveys, the EDC forms, data quality controls and quality checks and data processing, and safeguarding confidential information. The other EDC reports provide basic data summaries of the catcher vessel, mothership, and first receiver and shorebased processor forms.

## 1.4 Catcher vessel form administration

Completion of EDC forms is mandatory for participants in the catch share program. Any owner, lessee, or charterer of a catcher vessel registered to a limited entry groundfish permit with a trawl endorsement (limited entry trawl permit) is required to complete an EDC form §660.114(b)(1). For a permit owner, a limited entry trawl permit application (including MS/CV-endorsed limited entry trawl permit) will not be considered complete until the required EDC form for that permit owner associated with that permit is submitted, as specified at §660.25(b)(4)(i). For a vessel owner, participation in the groundfish fishery (including, but not limited to, changes in vessel registration, vessel account actions, or if own QS permit, issuance of annual QP or IBQ pounds) will not be authorized until the required EDC form for that owner for that vessel is submitted, as specified, in part, at §660.25(b)(4)(v) and §660.140(e). For a vessel lessee or charterer, participation in the groundfish fishery (including, but not limited to, issuance of annual QP or IBQ pounds if own QS or IBQ) will not be authorized, until the required EDC form for their operation of that vessel is submitted.

A calendar year is used to determine which vessels meet the criteria. For example, in 2013, data were collected from all owners, lessees, and charters of a catcher vessel registered to a limited entry trawl permit during 2012. The forms are fielded on this schedule in order to allow participants the time

<sup>7</sup> Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific Coast fisheries. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.

necessary to complete their taxes, which may contain some information that is required on the EDC forms. Participants are identified using contact information provided by the Northwest Regional Office - Permit Office (Permit Office).

If a form has missing information, or the information provided on the form is believed to be incorrect, EDC Program staff attempt to contact the participant to correct the information. On occasion, the participant cannot be reached or the participant cannot provide the missing information. In these cases, the missing or inaccurate data are treated on a case-by-case basis during analysis as documented in the Administration and Operations Report. Data are validated and verified with external data sources whenever possible. These data sources include the Permit Office, state fish tickets, the At-Sea Hake Observer Program data, and the Coast Guard.

## **1.5 About the survey participants**

The EDC catcher vessel participants are identified as any owner, lessee, or charterer of a vessel with a limited entry trawl permit. This includes catcher vessels that deliver Pacific whiting to motherships at-sea (at-sea whiting fishery), catcher vessels that deliver whiting to shorebased facilities (shorebased whiting fishery), and catcher vessels that delivery non-whiting groundfish to shorebased facilities (non-whiting groundfish fishery). Additionally, the non-whiting groundfish fishery can be further classified into two additional fisheries, characterized by the composition of target species groups. These fisheries are the DTS fishery which includes dover sole, thornyheads, and sablefish and the near-shore fishery (includes all Non-whiting, non-DTS species groups). In addition to these fisheries, many vessels also participate in one or both of the state fisheries for shrimp and crab. The other prevalent activity is fishing in Alaska.

The individuals that complete the forms are as diverse as the types of fisheries in which the vessels participate. This adds to the complexity of developing the EDC forms, because the questions on the forms must be understood by fishermen, family members, accountants, bookkeepers, and chief financial officers, to name a few. Often times, the forms are completed by multiple individuals since different people manage different parts of the business. For example, the captain of the vessel might know best how much fuel the vessel uses on a daily basis, but the bookkeeper might have the best information about how much was spent on fuel during the year.

## 2 Survey Response Rates

For the 2012 Catcher Vessel EDC forms, 98.7% of all required forms are complete.<sup>1</sup> This is an increase from the 2009 and 2010 collection, when 88.1% and 92.0% were complete, respectively. Over the three years of the data collection, there has been no entity<sup>2</sup> that was unable to renew a limited entry groundfish permit due to a missing or incomplete EDC. This means that the remaining forms that were received incomplete or never received correspond to participants that are no longer in any West Coast federal fishery. Table 2.2 shows that in 2012, the complete EDCs represented 100.0% of all landings value associated with EDC vessels.

**Table 2.1: Form status.** Number of complete forms, number of incomplete forms, and number of forms that were never received (N = number of forms, % = percent of all forms due in survey year)

| Form status  | 2009 |       | 2010 |       | 2011 |       | 2012 |       |
|--------------|------|-------|------|-------|------|-------|------|-------|
|              | N    | %     | N    | %     | N    | %     | N    | %     |
| Complete     | 148  | 88.1% | 149  | 92.0% | 166  | 96.5% | 154  | 98.7% |
| Incomplete   | 6    | 3.6%  | 1    | 0.6%  | 2    | 1.2%  | —    | —     |
| Not received | 14   | 8.3%  | 12   | 7.4%  | 4    | 2.3%  | 2    | 1.3%  |

<sup>1</sup> For explanation of the term complete, please refer to the Administration and Operations Report section regarding regulations for complete EDC forms

<sup>2</sup> An "entity" is defined as a unique combination of an owner or lessee and vessel, whereas a "vessel" refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.

**Table 2.2: Form response rates as a function of total revenue.** The total ex-vessel revenue (millions of \$) on the West Coast associated with vessels that were required to submit an EDC form, by form status. If two forms were required for one vessel and one was submitted for one entity, and the other was incomplete, the shoreside landings revenue was attributed to both forms and is therefore counted twice in the table (% = percent of total ex-vessel revenue associated with EDC vessels in survey year. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number of individuals who owned or leased the vessel.).

| Form status  | 2009   |       | 2010  |       | 2011   |       | 2012   |        |
|--------------|--------|-------|-------|-------|--------|-------|--------|--------|
|              | Total  | %     | Total | %     | Total  | %     | Total  | %      |
| Complete     | \$54.8 | 96.7% | \$61  | 99.0% | \$97.3 | 99.5% | \$88.7 | 100.0% |
| Incomplete   | \$1.1  | 2.0%  | \$0.3 | 0.5%  | \$0.5  | 0.5%  | \$0    | 0.0%   |
| Not received | \$0.8  | 1.4%  | \$0.3 | 0.5%  | \$0    | 0.0%  | \$0    | 0.0%   |

For most of the forms, there is a one-to-one relationship between a vessel, vessel owner, and vessel operator. In these cases there are no lessees of the vessel and one form is submitted for the vessel each year. More than one form is submitted for a particular vessel when the vessel is leased by a third party, or when the vessel is sold during the survey year. The most common occurrence with two forms submitted for one vessel is when the owner of the vessel submits one form and the lessee of the vessel submits another form. Generally, only the lessee operated the vessel during the fiscal year, but occasionally both the owner and the lessee will operate the vessel (Table 2.3).

**Table 2.3: Information about forms, entities, and vessels.** Number of required forms, number of entities that harvested fish, number of vessels that harvested fish by location, number of vessels that were leased, number of lease contracts, number of vessels that were fished by more than one entity, and number of vessels that were sold during the annual survey qualifying period. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number of individuals who owned or leased the vessel.

| Activity  | 2009 | 2010 | 2011 | 2012 |
|---|------|------|------|------|
| Number of required forms  | 168  | 162  | 172  | 156  |
| Number of entities that harvested fish                            | 133  | 130  | 143  | 133  |
| Number of vessels that harvested fish on the West Coast or Alaska | 132  | 129  | 138  | 132  |
| Number of vessels that harvested fish on the West Coast           | 130  | 126  | 133  | 129  |
| Number of vessels that harvested fish in Alaska                   | 31   | 31   | 34   | 28   |
| Number of vessels that were leased                                | 10   | 8    | 9    | 7    |
| Number of lease contracts   | 11   | 9    | 9    | 7    |
| Number of vessels that were fished by more than one entity        | ***  | ***  | 5    | ***  |
| Number of vessels sold  | ***  | 5    | 8    | 3    |

### **3 Vessel Participation on the West Coast and in Alaska**

Participants provide the total number of days spent fishing by fishery on the West Coast and in Alaska. Participants are instructed to count partial days as full days when recording days at sea on the forms. The West Coast fisheries categories on the EDC form are whiting with trawl gear, non-whiting groundfish with trawl gear, groundfish with fixed gear, shrimp, crab, halibut (both Pacific and California), salmon, tuna, and other. The days spent fishing in all Alaskan fisheries is also requested. In the 2009-2012 data collection, participants provided the total number of days spent chartering or doing research. Starting in 2012, the participants provide separate days at sea for chartering and research in Alaska and chartering and research on the West Coast. Most vessels that participate in the catch share fisheries are also involved in other fishing activities.

Although these data provide most of the information necessary for examining vessel participation, several of the days at sea need to be further split into subfisheries using information from state fish tickets obtained from the PacFIN database, data collected by the At-Sea Hake Observer Program (A-SHOP) obtained from the NORPAC database, and EDC data (ex-vessel revenue from at-sea deliveries). The whiting fishery is split into At-sea Pacific whiting and Shoreside Pacific whiting, the non-whiting groundfish with trawl gear is further split into dover-thornyhead-sablefish (DTS) with trawl gear and Non-whiting, non-DTS groundfish with trawl gear, and the fixed gear fishery is split into groundfish caught with a trawl permit, and groundfish caught with a fixed gear permit.

Allocation of the reported days at sea into the subfisheries is a two step process. First, ex-vessel revenue is used to categorize each delivery into a subfishery (At-sea Pacific whiting, Shoreside Pacific whiting, DTS trawl with trawl endorsement, Non-whiting, non-DTS with trawl endorsement, Groundfish fixed gear with trawl endorsement). Fish ticket data are used to designate each unique delivery to a fishery by compiling data from the start date of the vessel's fiscal year through one full year. A delivery is assigned to a particular fishery based on the species or species group that resulted in the highest revenue for that delivery. For example, if a fish ticket for a particular vessel on a specific day had a mix of rockfish and Pacific whiting, and the Pacific whiting landings accounted for the majority of the revenue, then all landings associated with that trip are designated as "Pacific whiting fishery".

DTS revenue is identified using the landings of the species dover sole, thornyheads, and sablefish.

Blackgill rockfish is also included because it is also a deep-water species which is commonly caught in combination with the other three species. In almost all cases, the daily deliveries where blackgill rockfish had the highest revenue, sablefish yielded the next highest revenue. Gear and permit are also used to distinguish trawl trips from fixed gear trips and trips with a limited entry permit with a trawl endorsement and trips with a limited entry permit with a fixed gear endorsement.

Once each landing/delivery is classified into a subfishery, the reported days at sea are distributed to the subfisheries proportional to the weight of landings/deliveries in each subfishery.

Landings weight was explored as an alternative to using revenue to classify deliveries by fishery. We compared the results of using the highest revenue method versus the highest landings weight method for designating the fishery. The two methods resulted in identification of the same fishery for 95% of all cases. Given that there were few differences in identification of the fisheries, revenue was selected over landings weight because it is assumed to represent the target species more accurately.

In 2009 through 2011, relatively few entities<sup>1</sup> participated in the halibut, salmon, tuna, and other fisheries. These fisheries are grouped together into the “Other fisheries” category. Additionally, groundfish that was caught without a limited entry groundfish permit is also included in the “Other” category. The number of entities that participated in each of these fisheries ranged from zero, for salmon in 2009, to 14, for tuna in 2012. In 2012, there were more vessels that participated in the salmon and tuna fisheries (14 vessels in each) than in the previous years. Most of these participants’ information cannot be shown due to confidentiality restrictions.

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<sup>1</sup> An entity is defined as a unique combination of an owner or lessee and vessel, whereas a “vessel” refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.

**Table 3.1: Average days at sea.** Average days at sea by activity for EDC vessels (N = number of EDC vessels with non-zero, non-NA responses). The Other fisheries category includes salmon, tuna, halibut, and groundfish caught without a limited entry permit.

| Activity   | 2009               |    | 2010               |    | 2011               |    | 2012               |    |
|--|--------------------|----|--------------------|----|--------------------|----|--------------------|----|
|  | Mean               | N  | Mean               | N  | Mean               | N  | Mean               | N  |
| At-sea Pacific whiting                             | 20.5 <sup>‡</sup>  | 20 | 26.8 <sup>‡</sup>  | 20 | 31.4 <sup>‡</sup>  | 18 | 37.1 <sup>‡</sup>  | 16 |
| Shoreside Pacific whiting                          | 31.5 <sup>‡</sup>  | 35 | 37.1 <sup>‡</sup>  | 36 | 51.2 <sup>‡</sup>  | 26 | 55.9 <sup>‡</sup>  | 24 |
| DTS trawl with trawl endorsement                   | 55.6 <sup>‡</sup>  | 99 | 50.5 <sup>‡</sup>  | 93 | 44.9 <sup>‡</sup>  | 64 | 41.2 <sup>‡</sup>  | 59 |
| Non-whiting, non-DTS trawl with trawl endorsement  | 19.1 <sup>‡</sup>  | 80 | 15.4 <sup>‡</sup>  | 70 | 17.4 <sup>‡</sup>  | 50 | 24.1 <sup>‡</sup>  | 52 |
| Groundfish fixed gear with trawl endorsement       | 21.6 <sup>‡</sup>  | 8  | 48.7 <sup>‡</sup>  | 9  | 31.5 <sup>‡</sup>  | 26 | 35.1 <sup>‡</sup>  | 27 |
| Groundfish fixed gear with fixed gear endorsement  | 4.3 <sup>‡</sup>   | 2  | —                  | —  | 18.6 <sup>‡</sup>  | 7  | 25.2 <sup>‡</sup>  | 7  |
| Crab   | 39.3 <sup>‡</sup>  | 56 | 37.9 <sup>‡</sup>  | 57 | 38.5 <sup>‡</sup>  | 65 | 36.3 <sup>‡</sup>  | 61 |
| Shrimp   | 29.7 <sup>‡</sup>  | 31 | 36.3 <sup>‡</sup>  | 36 | 42.7 <sup>‡</sup>  | 41 | 46.1 <sup>‡</sup>  | 39 |
| Alaska   | 102.4 <sup>‡</sup> | 31 | 111.8 <sup>‡</sup> | 31 | 136.7 <sup>‡</sup> | 33 | 104.2 <sup>‡</sup> | 28 |
| Other fisheries                                    | 16.1 <sup>‡</sup>  | 20 | 22.1 <sup>‡</sup>  | 23 | 14.4 <sup>‡</sup>  | 23 | 25.4 <sup>‡</sup>  | 25 |
| Chartering or research on the West Coast or Alaska | 30.0 <sup>‡</sup>  | 10 | 31.8 <sup>‡</sup>  | 11 | 40.5 <sup>‡</sup>  | 13 | —                  | —  |
| Chartering or research in Alaska                   | —                  | —  | —                  | —  | —                  | —  | 46.0 <sup>‡</sup>  | 5  |
| Chartering or research on the West Coast           | —                  | —  | —                  | —  | —                  | —  | 46.3 <sup>‡</sup>  | 7  |

**Table 3.2: Total days at sea.** Total days at sea for EDC vessels (N = number of EDC vessels with non-zero, non-NA responses). The Other fisheries category includes salmon, tuna, halibut, and groundfish caught without a limited entry permit.

| Activity   | 2009  |     | 2010  |    | 2011  |    | 2012  |    |
|--|-------|-----|-------|----|-------|----|-------|----|
|  | Total | N   | Total | N  | Total | N  | Total | N  |
| At-sea Pacific whiting                             | 410   | 20  | 536   | 20 | 565   | 18 | 593   | 16 |
| Shoreside Pacific whiting                          | 1,104 | 35  | 1,335 | 36 | 1,332 | 26 | 1,342 | 24 |
| DTS trawl with trawl endorsement                   | 5,504 | 99  | 4,700 | 93 | 2,875 | 64 | 2,431 | 59 |
| Non-whiting, non-DTS trawl with trawl endorsement  | 1,526 | 80  | 1,079 | 70 | 868   | 50 | 1,255 | 52 |
| Groundfish fixed gear with trawl endorsement       | 173   | 8   | 439   | 9  | 820   | 26 | 948   | 27 |
| Groundfish fixed gear with fixed gear endorsement  | ***   | *** | —     | —  | 130   | 7  | 176   | 7  |
| Crab   | 2,199 | 56  | 2,159 | 57 | 2,505 | 65 | 2,217 | 61 |
| Shrimp   | 919   | 31  | 1,308 | 36 | 1,750 | 41 | 1,798 | 39 |
| Alaska   | 3,173 | 31  | 3,465 | 31 | 4,510 | 33 | 2,917 | 28 |
| Other fisheries                                    | 323   | 20  | 508   | 23 | 330   | 23 | 635   | 25 |
| Chartering or research on the West Coast or Alaska | 300   | 10  | 350   | 11 | 526   | 13 | —     | —  |
| Chartering or research in Alaska                   | —     | —   | —     | —  | —     | —  | 230   | 5  |
| Chartering or research on the West Coast           | —     | —   | —     | —  | —     | —  | 324   | 7  |

### 3.1 Trips to Alaska

The number of trips that were made between the West Coast and Alaska provide additional insight into the patterns of participation. Table 3.3 show the number of one-way trips taken by vessels.

**Table 3.3: Trips to Alaska.** Count of vessels by number of one-way trips between the West Coast and Alaska. (N = number of EDC vessels).

| Number of one-way trips | 2009<br>N | 2010<br>N | 2011<br>N | 2012<br>N |
|-------------------------|-----------|-----------|-----------|-----------|
| 1                       | ***       | 5         | 3         | ***       |
| 2                       | 23        | 20        | 25        | 25        |
| 3                       | ***       | ***       | ***       | ***       |
| 4                       | 5         | 6         | ***       | 3         |

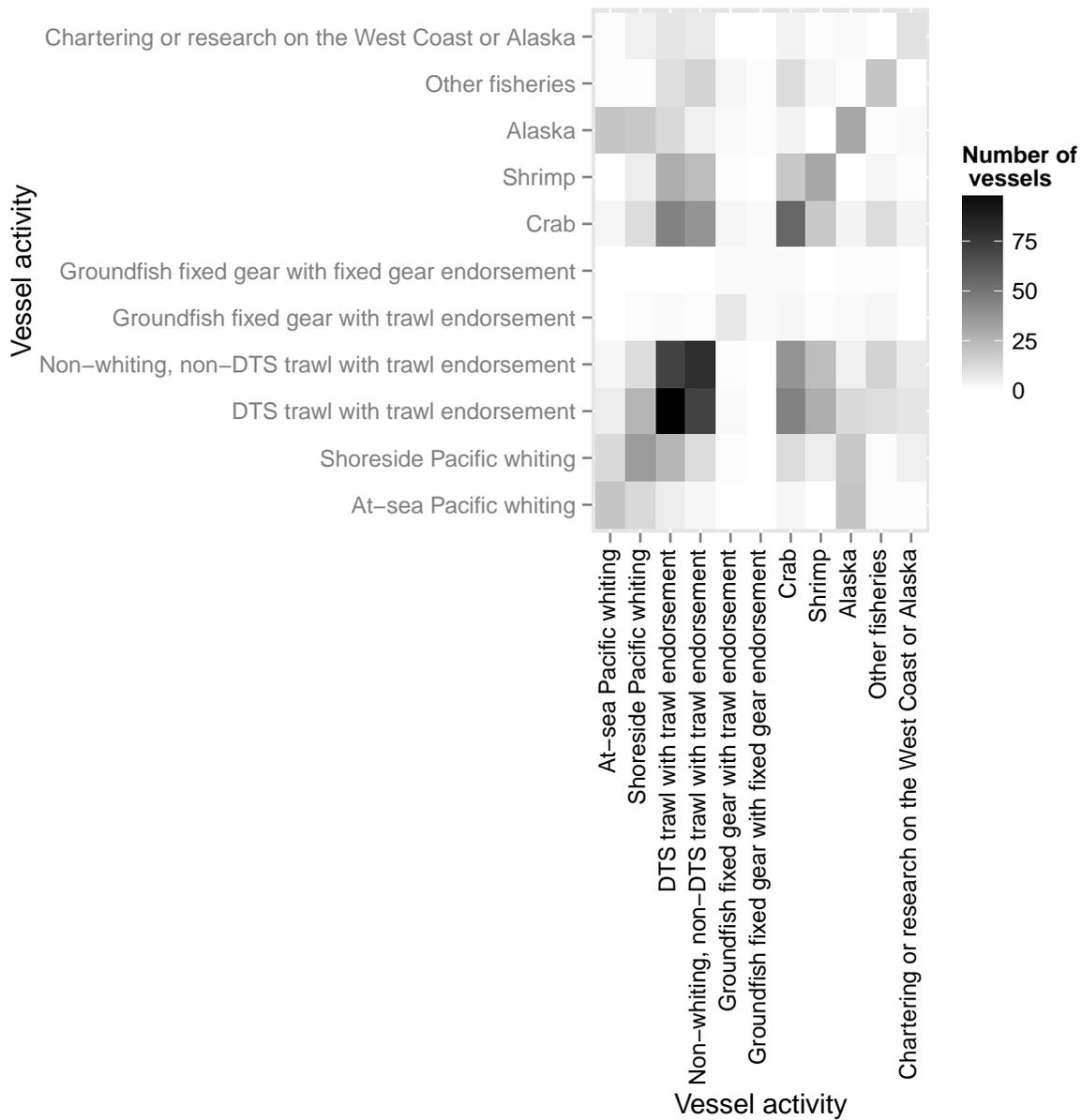
## 3.2 Vessel participation in multiple fisheries

A key characteristic of vessels on the West Coast is participation in multiple fisheries. In 2012, only 9.0% of all entities<sup>2</sup> participated in one fishery. There are several reasons why a vessel would participate in several fisheries. These reasons include maintaining employment throughout different seasonal fisheries and diversification of participation to protect individuals or communities from variability in the abundance of target species. Figures 3.1 - 3.4 provide additional insight into the portfolio of fisheries in which the EDC vessels participate.

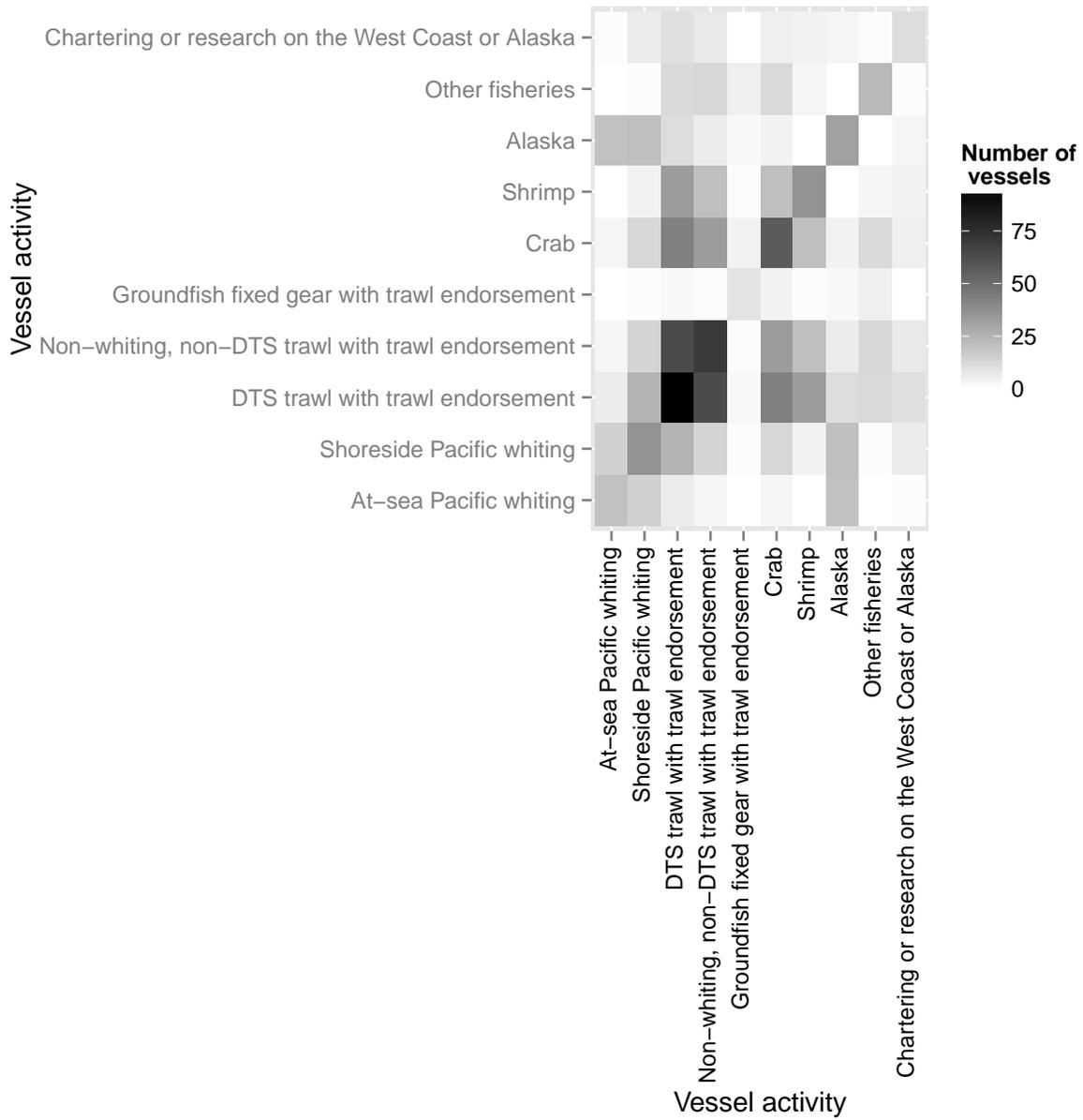
**Table 3.4: Participation in multiple fisheries.** Number of entities that participated in one or more fisheries by year (N = number of entities, % = percent of total entities in survey year. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.)

| Number of fisheries | 2009 |       | 2010 |       | 2011 |       | 2012 |       |
|---------------------|------|-------|------|-------|------|-------|------|-------|
|                     | N    | %     | N    | %     | N    | %     | N    | %     |
| 1                   | 9    | 6.8%  | 5    | 3.8%  | 19   | 13.3% | 12   | 9.0%  |
| 2                   | 37   | 27.8% | 43   | 33.1% | 53   | 37.1% | 51   | 38.3% |
| 3                   | 48   | 36.1% | 43   | 33.1% | 44   | 30.8% | 46   | 34.6% |
| 4                   | 31   | 23.3% | 30   | 23.1% | 21   | 14.7% | 19   | 14.3% |
| 5                   | 5    | 3.8%  | 7    | 5.4%  | 5    | 3.5%  | 5    | 3.8%  |
| 6                   | 3    | 2.3%  | ***  | ***   | ***  | ***   | —    | —     |

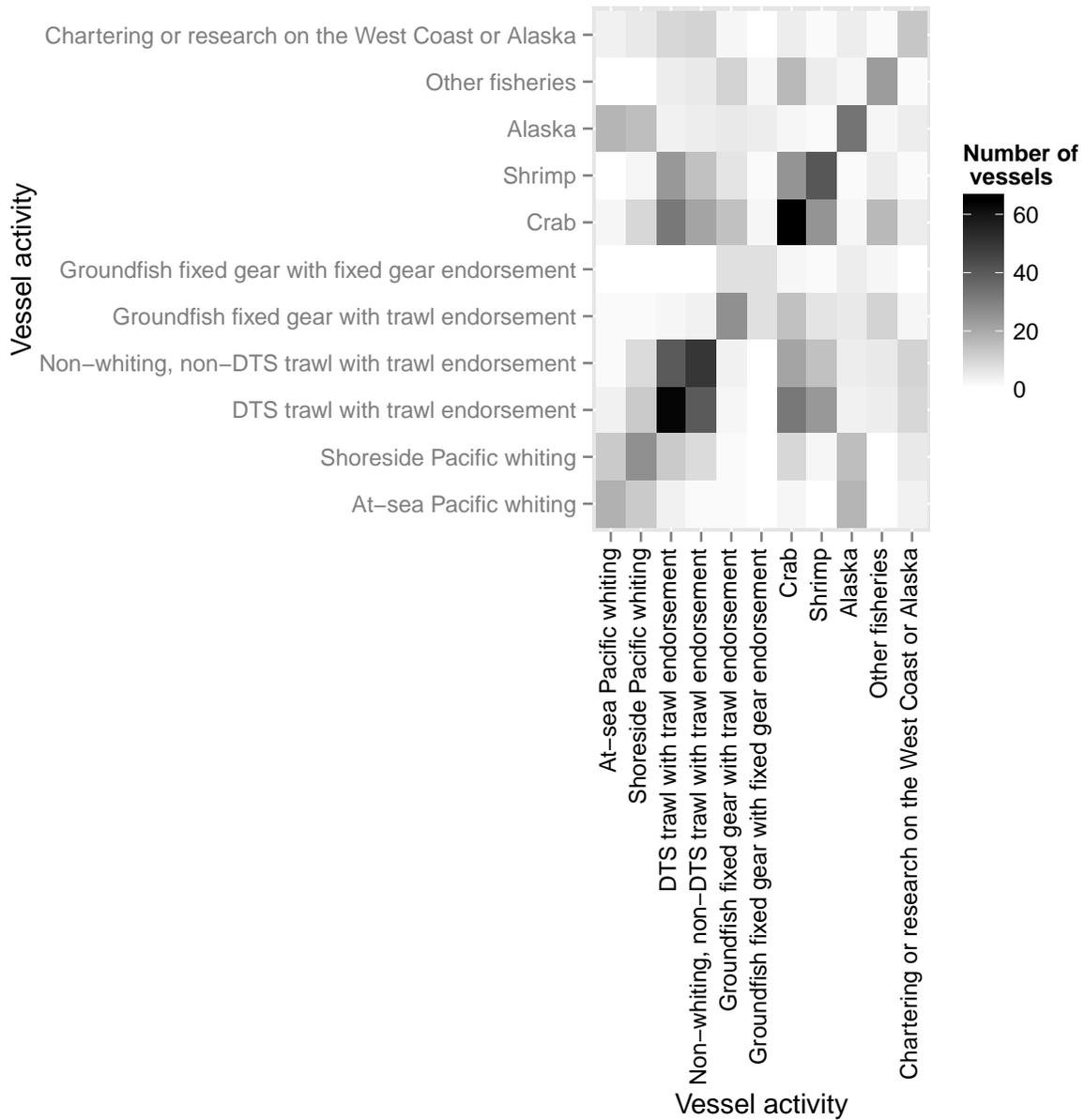
<sup>2</sup> An entity is defined as a unique combination of an owner or lessee and vessel, whereas a "vessel" refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.



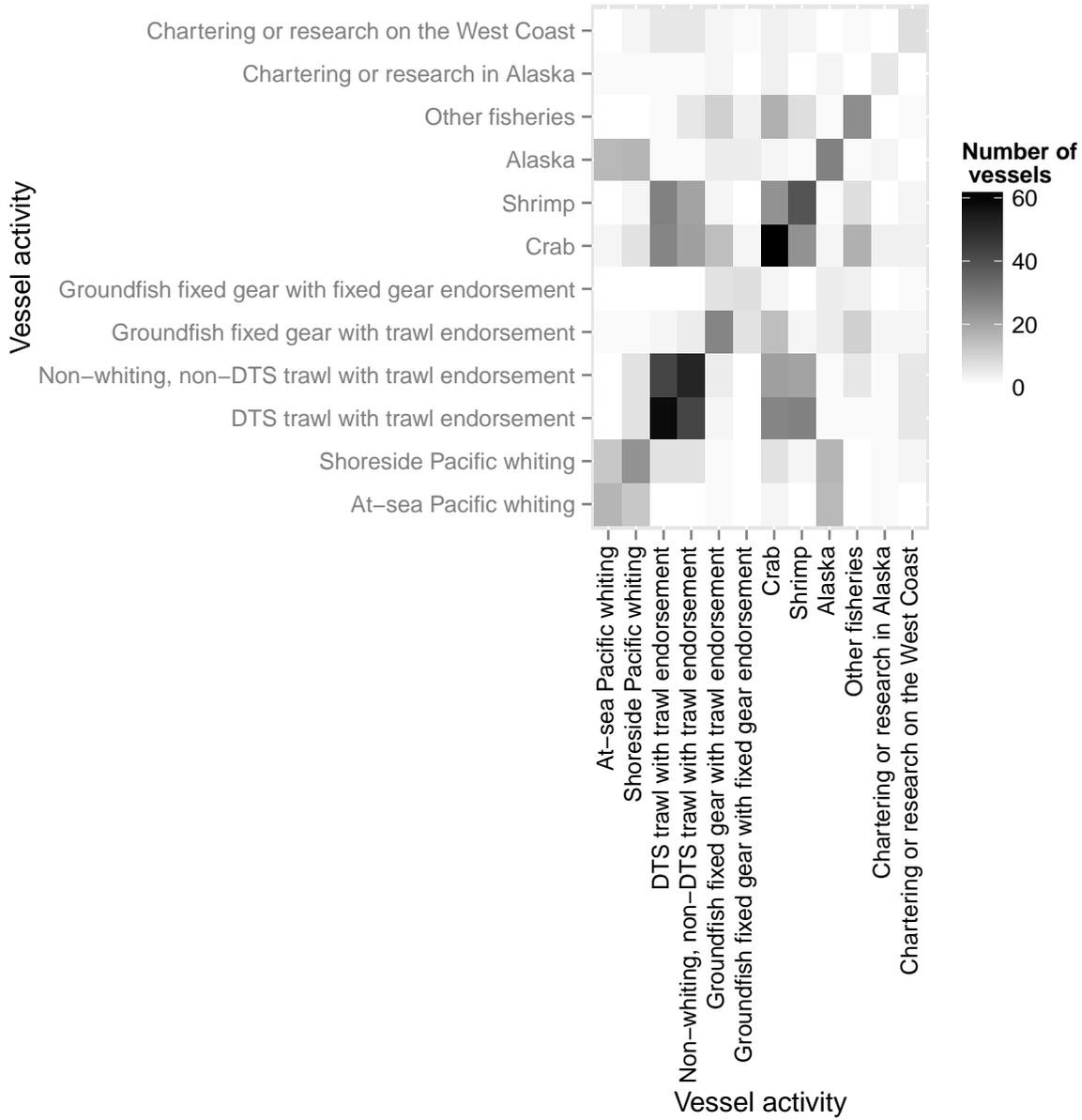
**Figure 3.1: Participation in multiple fisheries - 2009.** Frequency of participation in multiple fisheries during 2009 fiscal year.



**Figure 3.2: Participation in multiple fisheries - 2010.** Frequency of participation in multiple fisheries during 2010 fiscal year.



**Figure 3.3: Participation in multiple fisheries - 2011.** Frequency of participation in multiple fisheries during 2011 fiscal year.



**Figure 3.4: Participation in multiple fisheries - 2012.** Frequency of participation in multiple fisheries during 2012 fiscal year.

## 4 Home Port

Vessel home port information will be particularly useful for understanding how the catch share program may affect communities. Among other uses, home port is commonly used as a method for assigning economic activity to communities. Table 4.1 shows the number of entities by home port. There are many measures of home port, including the home port listed on Coast Guard registrations and the port where the vessel made the most landings. In this table, the home port provided by participants on the EDC form is summarized. Home ports provided on the EDC forms are mapped to the IO-PAC port groupings.<sup>1</sup> These port groupings are also consistent with those used in the PFMC's biennial groundfish management specification process. The ports with the highest concentration of EDC entities are Newport, Astoria, and the Puget Sound region.

In addition to understanding where vessels call their home port, it is important to examine how the home port relates to particular fisheries. Tables 4.2 through 4.14 show the average days at sea by home port and fishery. This provides information about how changes in management for a particular fishery could affect specific port communities. For example, changes in the Shoreside Pacific whiting fishery could have a strong effect on Coos Bay, but a change in the At-sea Pacific whiting fishery might not have a noticeable effect in that port.

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<sup>1</sup> Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific Coast fisheries. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.

**Table 4.1: Vessel home port.** Number of entities by home port reported on EDC form (N = number of entities, % = percent of total entities in survey year. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel).

| Home port                  | 2009 |       | 2010 |       | 2011 |       | 2012 |       |
|----------------------------|------|-------|------|-------|------|-------|------|-------|
|                            | N    | %     | N    | %     | N    | %     | N    | %     |
| Alaska                     | ***  | ***   | ***  | ***   | 3    | 2.1%  | ***  | ***   |
| Astoria                    | 20   | 15.0% | 20   | 15.4% | 26   | 18.2% | 23   | 17.3% |
| Brookings                  | 7    | 5.3%  | 7    | 5.4%  | 8    | 5.6%  | 9    | 6.8%  |
| Coos Bay                   | 20   | 15.0% | 19   | 14.6% | 19   | 13.3% | 19   | 14.3% |
| Crescent City              | 7    | 5.3%  | 7    | 5.4%  | 7    | 4.9%  | 6    | 4.5%  |
| Eureka                     | 9    | 6.8%  | 9    | 6.9%  | 9    | 6.3%  | 7    | 5.3%  |
| Fort Bragg                 | 7    | 5.3%  | 7    | 5.4%  | 7    | 4.9%  | 8    | 6.0%  |
| Monterey                   | 3    | 2.3%  | ***  | ***   | ***  | ***   | 4    | 3.0%  |
| Morro Bay                  | 6    | 4.5%  | 4    | 3.1%  | 6    | 4.2%  | 6    | 4.5%  |
| Newport                    | 23   | 17.3% | 23   | 17.7% | 25   | 17.5% | 21   | 15.8% |
| Puget Sound                | 14   | 10.5% | 14   | 10.8% | 17   | 11.9% | 13   | 9.8%  |
| San Francisco              | 6    | 4.5%  | 8    | 6.2%  | 7    | 4.9%  | 7    | 5.3%  |
| South and central WA coast | 4    | 3.0%  | 4    | 3.1%  | 4    | 2.8%  | 4    | 3.0%  |
| Tillamook                  | 6    | 4.5%  | 6    | 4.6%  | 4    | 2.8%  | 5    | 3.8%  |

**Table 4.2: At-sea Pacific whiting fishery days at sea by home port.** Average number of days vessels fished in the At-sea Pacific whiting fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port     | 2009              |     | 2010              |     | 2011              |     | 2012              |     |
|---------------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|               | Mean              | N   | Mean              | N   | Mean              | N   | Mean              | N   |
| Alaska        | ***               | *** | ***               | *** |                   | 0   |                   | 0   |
| Puget Sound   | 27.1 <sup>‡</sup> | 7   | 31.6 <sup>†</sup> | 7   | 32.2 <sup>‡</sup> | 7   | 45.9 <sup>†</sup> | 6   |
| Astoria       | ***               | *** | ***               | *** | ***               | *** | ***               | *** |
| Newport       | 16.4 <sup>†</sup> | 9   | 24.0 <sup>†</sup> | 9   | 28.2 <sup>‡</sup> | 9   | 26.5 <sup>†</sup> | 8   |
| Brookings     | ***               | *** | ***               | *** |                   | 0   |                   | 0   |
| San Francisco | ***               | *** | ***               | *** | ***               | *** | ***               | *** |

**Table 4.3: Shoreside Pacific whiting fishery days at sea by home port.** Average number of days vessels fished in the Shoreside Pacific whiting fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port                  | 2009 |     | 2010 |     | 2011 |     | 2012 |     |
|----------------------------|------|-----|------|-----|------|-----|------|-----|
|                            | Mean | N   | Mean | N   | Mean | N   | Mean | N   |
| Alaska                     | ***  | *** | ***  | *** |      | 0   |      | 0   |
| Puget Sound                | 34.7 | 7   | 58.0 | 9   | 66.5 | 4   | 54.3 | 5   |
| South and central WA coast | ***  | *** | ***  | *** | ***  | *** | ***  | *** |
| Astoria                    | 26.7 | 3   | 45.1 | 3   | 35.7 | 3   | ***  | *** |
| Tillamook                  | ***  | *** | ***  | *** |      | 0   |      | 0   |
| Newport                    | 37.3 | 14  | 33.9 | 14  | 47.0 | 15  | 55.5 | 13  |
| Coos Bay                   | 16.2 | 4   | ***  | *** | ***  | *** | ***  | *** |
| Brookings                  | ***  | *** | ***  | *** | ***  | *** | ***  | *** |
| Crescent City              | ***  | *** | ***  | *** |      | 0   |      | 0   |
| Eureka                     | ***  | *** | ***  | *** |      | 0   |      | 0   |

**Table 4.4: DTS trawl with trawl endorsement fishery days at sea by home port.** Average number of days vessels fished in the DTS trawl with trawl endorsement fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port                  | 2009              |     | 2010              |     | 2011              |     | 2012              |     |
|----------------------------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|                            | Mean              | N   | Mean              | N   | Mean              | N   | Mean              | N   |
| Alaska                     |                   | 0   |                   | 0   |                   | 0   | ***               | *** |
| Puget Sound                | 79.3 <sup>‡</sup> | 5   | 50.1 <sup>‡</sup> | 4   | 20.4 <sup>‡</sup> | 3   | ***               | *** |
| South and central WA coast | 75.0 <sup>‡</sup> | 4   | 89.0 <sup>‡</sup> | 3   | ***               | *** | 51.4 <sup>‡</sup> | 3   |
| Astoria                    | 76.8 <sup>‡</sup> | 17  | 71.0 <sup>‡</sup> | 17  | 66.4 <sup>‡</sup> | 16  | 55.3 <sup>‡</sup> | 14  |
| Tillamook                  | 50.9 <sup>‡</sup> | 4   | 31.3 <sup>‡</sup> | 4   | ***               | *** | ***               | *** |
| Newport                    | 41.3 <sup>‡</sup> | 18  | 37.3 <sup>‡</sup> | 17  | 20.6 <sup>‡</sup> | 8   | 30.6 <sup>‡</sup> | 6   |
| Coos Bay                   | 45.8 <sup>‡</sup> | 16  | 46.6 <sup>‡</sup> | 16  | 36.9 <sup>‡</sup> | 9   | 33.6 <sup>‡</sup> | 9   |
| Brookings                  | 72.6 <sup>‡</sup> | 7   | 70.7 <sup>‡</sup> | 7   | 58.6 <sup>‡</sup> | 6   | 57.9 <sup>‡</sup> | 5   |
| Crescent City              | 45.4 <sup>‡</sup> | 7   | 28.6 <sup>‡</sup> | 6   | 17.2 <sup>‡</sup> | 3   | 33.0 <sup>‡</sup> | 4   |
| Eureka                     | 54.7 <sup>‡</sup> | 9   | 53.9 <sup>‡</sup> | 8   | 43.4 <sup>‡</sup> | 8   | 40.9 <sup>‡</sup> | 6   |
| Fort Bragg                 | 54.7 <sup>‡</sup> | 7   | 47.2 <sup>‡</sup> | 7   | 35.1 <sup>‡</sup> | 6   | 33.8 <sup>‡</sup> | 5   |
| San Francisco              | ***               | *** | ***               | *** | ***               | *** | ***               | *** |
| Monterey                   | ***               | *** | ***               | *** | ***               | *** | ***               | *** |
| Morro Bay                  | ***               | *** | ***               | *** |                   | 0   |                   | 0   |

**Table 4.5: Non-whiting, non-DTS trawl with trawl endorsement fishery days at sea by home port.** Average number of days vessels fished in the Non-whiting, non-DTS trawl with trawl endorsement fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port                  | 2009              |     | 2010              |     | 2011              |     | 2012              |     |
|----------------------------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|                            | Mean              | N   | Mean              | N   | Mean              | N   | Mean              | N   |
| Alaska                     |                   | 0   | ***               | *** |                   | 0   |                   | 0   |
| Puget Sound                | 22.4 <sup>‡</sup> | 5   | 25.4 <sup>‡</sup> | 4   | 24.4 <sup>‡</sup> | 3   | ***               | *** |
| South and central WA coast | 46.0 <sup>‡</sup> | 3   | ***               | *** | ***               | *** | 46.3 <sup>‡</sup> | 3   |
| Astoria                    | 30.7 <sup>‡</sup> | 16  | 25.3 <sup>‡</sup> | 14  | 29.8 <sup>‡</sup> | 15  | 46.6 <sup>‡</sup> | 15  |
| Tillamook                  | ***               | *** | ***               | *** | ***               | *** | ***               | *** |
| Newport                    | 18.9 <sup>‡</sup> | 9   | 9.1 <sup>‡</sup>  | 7   | 5.3 <sup>‡</sup>  | 7   | 4.7 <sup>‡</sup>  | 7   |
| Coos Bay                   | 17.3 <sup>‡</sup> | 11  | 11.6 <sup>‡</sup> | 11  | 9.6 <sup>‡</sup>  | 7   | 14.9 <sup>‡</sup> | 9   |
| Brookings                  | 4.5 <sup>‡</sup>  | 3   | 5.7 <sup>‡</sup>  | 5   | 3.8 <sup>‡</sup>  | 3   | 2.5 <sup>‡</sup>  | 3   |
| Crescent City              | 3.6 <sup>‡</sup>  | 6   | 2.1 <sup>‡</sup>  | 5   | ***               | *** | ***               | *** |
| Eureka                     | 7.8 <sup>‡</sup>  | 9   | 5.8 <sup>‡</sup>  | 6   | 3.1 <sup>‡</sup>  | 3   | ***               | *** |
| Fort Bragg                 | 15.9 <sup>‡</sup> | 7   | 14.3 <sup>‡</sup> | 6   | 19.1 <sup>‡</sup> | 4   | 17.0 <sup>‡</sup> | 4   |
| San Francisco              | 18.7 <sup>‡</sup> | 5   | 11.5 <sup>‡</sup> | 5   | 10.8 <sup>‡</sup> | 4   | 13.0 <sup>‡</sup> | 4   |
| Monterey                   | ***               | *** | ***               | *** |                   | 0   | ***               | *** |
| Morro Bay                  | ***               | *** | ***               | *** |                   | 0   |                   | 0   |

**Table 4.6: Groundfish fixed gear with trawl endorsement fishery days at sea by home port.** Average number of days vessels fished in the Groundfish fixed gear with trawl endorsement fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port     | 2009              |     | 2010              |     | 2011              |     | 2012              |     |
|---------------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|               | Mean              | N   | Mean              | N   | Mean              | N   | Mean              | N   |
| Alaska        |                   | 0   |                   | 0   | ***               | *** |                   | 0   |
| Puget Sound   |                   | 0   |                   | 0   | 26.1 <sup>‡</sup> | 4   | 46.7 <sup>‡</sup> | 5   |
| Astoria       | ***               | *** | ***               | *** | 61.4 <sup>‡</sup> | 4   | 48.7 <sup>‡</sup> | 7   |
| Tillamook     | ***               | *** | ***               | *** | ***               | *** |                   | 0   |
| Newport       | ***               | *** | ***               | *** | 43.8 <sup>‡</sup> | 3   | 58.6 <sup>‡</sup> | 3   |
| Coos Bay      |                   | 0   |                   | 0   | ***               | *** | ***               | *** |
| Brookings     |                   | 0   |                   | 0   | ***               | *** | ***               | *** |
| Fort Bragg    |                   | 0   |                   | 0   | ***               | *** | ***               | *** |
| San Francisco |                   | 0   | ***               | *** | ***               | *** | ***               | *** |
| Monterey      |                   | 0   |                   | 0   |                   | 0   | ***               | *** |
| Morro Bay     | 19.0 <sup>‡</sup> | 4   | 79.1 <sup>‡</sup> | 3   | 32.2 <sup>‡</sup> | 6   | 22.9 <sup>‡</sup> | 4   |

**Table 4.7: Groundfish fixed gear with fixed gear endorsement fishery days at sea by home port.** Average number of days vessels fished in the Groundfish fixed gear with fixed gear endorsement fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port   | 2009 |     | 2010 |   | 2011 |     | 2012              |     |
|-------------|------|-----|------|---|------|-----|-------------------|-----|
|             | Mean | N   | Mean | N | Mean | N   | Mean              | N   |
| Alaska      |      | 0   |      | 0 | ***  | *** |                   | 0   |
| Puget Sound |      | 0   |      | 0 | ***  | *** | 24.2 <sup>‡</sup> | 4   |
| Astoria     | ***  | *** |      | 0 | ***  | *** |                   | 0   |
| Newport     |      | 0   |      | 0 | ***  | *** | ***               | *** |
| Brookings   |      | 0   |      | 0 | ***  | *** | ***               | *** |
| Morro Bay   | ***  | *** |      | 0 | ***  | *** | ***               | *** |

**Table 4.8: Crab fishery days at sea by home port.** Average number of days vessels fished in the Crab fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port                  | 2009              |     | 2010              |     | 2011              |     | 2012               |     |
|----------------------------|-------------------|-----|-------------------|-----|-------------------|-----|--------------------|-----|
|                            | Mean              | N   | Mean              | N   | Mean              | N   | Mean               | N   |
| Alaska                     |                   | 0   |                   | 0   |                   | 0   | ***                | *** |
| Puget Sound                | ***               | *** | ***               | *** | ***               | *** | ***                | *** |
| South and central WA coast | ***               | *** | 26.6 <sup>‡</sup> | 3   | 54.6 <sup>‡</sup> | 3   | ***                | *** |
| Astoria                    | 50.2 <sup>‡</sup> | 6   | 33.1 <sup>‡</sup> | 5   | 42.6 <sup>‡</sup> | 9   | 45.9 <sup>‡</sup>  | 9   |
| Tillamook                  | ***               | *** | ***               | *** | ***               | *** | ***                | *** |
| Newport                    | 45.2 <sup>‡</sup> | 10  | 53.2 <sup>‡</sup> | 10  | 52.2 <sup>‡</sup> | 11  | 18.7 <sup>‡</sup>  | 10  |
| Coos Bay                   | 35.6 <sup>‡</sup> | 10  | 23.5 <sup>‡</sup> | 9   | 27.6 <sup>‡</sup> | 11  | 14.3 <sup>‡</sup>  | 12  |
| Brookings                  | 55.6 <sup>‡</sup> | 5   | 33.4 <sup>‡</sup> | 5   | 31.4 <sup>‡</sup> | 6   | 42.6 <sup>‡</sup>  | 3   |
| Crescent City              | 44.5 <sup>‡</sup> | 5   | 42.8 <sup>‡</sup> | 6   | 36.2 <sup>‡</sup> | 7   | 65.5 <sup>‡</sup>  | 5   |
| Eureka                     | 26.9 <sup>‡</sup> | 7   | 28.0 <sup>‡</sup> | 7   | 25.4 <sup>‡</sup> | 6   | 30.2 <sup>‡</sup>  | 6   |
| Fort Bragg                 | 47.9 <sup>‡</sup> | 3   | 56.4 <sup>‡</sup> | 4   | 45.1 <sup>‡</sup> | 4   | 100.0 <sup>‡</sup> | 4   |
| San Francisco              | 14.2 <sup>‡</sup> | 3   | 43.4 <sup>‡</sup> | 4   | 38.1 <sup>‡</sup> | 4   | 28.9 <sup>‡</sup>  | 4   |
| Monterey                   | ***               | *** |                   | 0   |                   | 0   |                    | 0   |
| Morro Bay                  | ***               | *** | ***               | *** | 22.2 <sup>‡</sup> | 3   | ***                | *** |

**Table 4.9: Shrimp fishery days at sea by home port.** Average number of days vessels fished in the Shrimp fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port                  | 2009              |     | 2010              |     | 2011              |     | 2012              |     |
|----------------------------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|                            | Mean              | N   | Mean              | N   | Mean              | N   | Mean              | N   |
| Alaska                     |                   | 0   |                   | 0   |                   | 0   | ***               | *** |
| Puget Sound                | ***               | *** | ***               | *** |                   | 0   |                   | 0   |
| South and central WA coast |                   | 0   | ***               | *** |                   | 0   | ***               | *** |
| Astoria                    | 32.1 <sup>‡</sup> | 3   | 32.3 <sup>‡</sup> | 5   | 34.9 <sup>‡</sup> | 7   | 50.6 <sup>‡</sup> | 4   |
| Tillamook                  | ***               | *** | ***               | *** | ***               | *** | ***               | *** |
| Newport                    | 6.5 <sup>‡</sup>  | 5   | ***               | *** | 34.1 <sup>‡</sup> | 6   | 61.2 <sup>‡</sup> | 5   |
| Coos Bay                   | 44.2 <sup>‡</sup> | 10  | 40.1 <sup>‡</sup> | 13  | 42.9 <sup>‡</sup> | 12  | 43.3 <sup>‡</sup> | 11  |
| Brookings                  | ***               | *** | 37.9 <sup>‡</sup> | 4   | 63.1 <sup>‡</sup> | 4   | 54.2 <sup>‡</sup> | 5   |
| Crescent City              | 32.5 <sup>‡</sup> | 4   | 57.2 <sup>‡</sup> | 4   | 57.7 <sup>‡</sup> | 6   | 45.0 <sup>‡</sup> | 6   |
| Eureka                     | 22.0 <sup>‡</sup> | 4   | 22.1 <sup>‡</sup> | 4   | 33.0 <sup>‡</sup> | 4   | 26.2 <sup>‡</sup> | 4   |
| Morro Bay                  | ***               | *** |                   | 0   |                   | 0   |                   | 0   |

**Table 4.10: Other fisheries fishery days at sea by home port.** Average number of days vessels fished in the Other fisheries fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port                  | 2009              |     | 2010              |     | 2011              |     | 2012              |     |
|----------------------------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|
|                            | Mean              | N   | Mean              | N   | Mean              | N   | Mean              | N   |
| Puget Sound                |                   | 0   |                   | 0   |                   | 0   |                   | 0   |
| South and central WA coast |                   | 0   | ***               | *** |                   | 0   |                   | 0   |
| Astoria                    | 29.2 <sup>‡</sup> | 3   | 40.6 <sup>‡</sup> | 3   | ***               | *** | ***               | *** |
| Tillamook                  |                   | 0   | ***               | *** | ***               | *** | ***               | *** |
| Newport                    | 14.8 <sup>‡</sup> | 3   | 17.9 <sup>‡</sup> | 3   | ***               | *** | 30.2 <sup>‡</sup> | 3   |
| Coos Bay                   | 1.6 <sup>‡</sup>  | 4   | 5.1 <sup>‡</sup>  | 3   | 8.9 <sup>‡</sup>  | 5   | 10.9 <sup>‡</sup> | 6   |
| Brookings                  | ***               | *** |                   | 0   | ***               | *** | ***               | *** |
| Crescent City              |                   | 0   | ***               | *** |                   | 0   | ***               | *** |
| Eureka                     | ***               | *** | ***               | *** |                   | 0   |                   | 0   |
| Fort Bragg                 | ***               | *** | ***               | *** | ***               | *** | 43.6 <sup>‡</sup> | 3   |
| San Francisco              | 38.5 <sup>‡</sup> | 3   | 40.9 <sup>‡</sup> | 4   | 17.7 <sup>‡</sup> | 3   | 24.1 <sup>‡</sup> | 3   |
| Monterey                   | ***               | *** | ***               | *** |                   | 0   |                   | 0   |
| Morro Bay                  | 6.8 <sup>‡</sup>  | 3   | 8.9 <sup>‡</sup>  | 3   | 3.8 <sup>‡</sup>  | 3   | 24.5 <sup>‡</sup> | 4   |

**Table 4.11: Alaska fishery days at sea by home port.** Average number of days vessels fished in the Alaska fishery by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port     | 2009               |     | 2010               |     | 2011               |     | 2012               |     |
|---------------|--------------------|-----|--------------------|-----|--------------------|-----|--------------------|-----|
|               | Mean               | N   | Mean               | N   | Mean               | N   | Mean               | N   |
| Alaska        | ***                | *** | ***                | *** | ***                | *** |                    | 0   |
| Puget Sound   | 129.4 <sup>‡</sup> | 11  | 147.3 <sup>‡</sup> | 11  | 166.6 <sup>‡</sup> | 14  | 123.2 <sup>‡</sup> | 10  |
| Astoria       | ***                | *** | ***                | *** | ***                | *** | ***                | *** |
| Tillamook     | ***                | *** | ***                | *** | ***                | *** | ***                | *** |
| Newport       | 79.3 <sup>‡</sup>  | 13  | 91.2 <sup>‡</sup>  | 13  | 106.6 <sup>‡</sup> | 13  | 82.5 <sup>‡</sup>  | 11  |
| Coos Bay      | ***                | *** | ***                | *** | ***                | *** | ***                | *** |
| Brookings     | ***                | *** | ***                | *** | ***                | *** | ***                | *** |
| San Francisco | ***                | *** | ***                | *** | ***                | *** | ***                | *** |

**Table 4.12: Chartering or research on the West Coast or Alaska fishery days at sea by home port.** Average number of days vessels fished in the Chartering or research on the West Coast or Alaska fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port   | 2009              |     | 2010              |     | 2011              |     | 2012 |   |
|-------------|-------------------|-----|-------------------|-----|-------------------|-----|------|---|
|             | Mean              | N   | Mean              | N   | Mean              | N   | Mean | N |
| Alaska      |                   | 0   |                   | 0   | ***               | *** |      | 0 |
| Puget Sound |                   | 0   | ***               | *** | 35.7 <sup>‡</sup> | 3   |      | 0 |
| Astoria     | ***               | *** | ***               | *** | ***               | *** |      | 0 |
| Tillamook   |                   | 0   | ***               | *** |                   | 0   |      | 0 |
| Newport     | 35.5 <sup>‡</sup> | 4   | 36.0 <sup>‡</sup> | 4   | 48.8 <sup>‡</sup> | 4   |      | 0 |
| Coos Bay    | 21.2 <sup>‡</sup> | 4   | ***               | *** | ***               | *** |      | 0 |
| Brookings   | ***               | *** | ***               | *** | ***               | *** |      | 0 |
| Fort Bragg  |                   | 0   |                   | 0   | ***               | *** |      | 0 |

**Table 4.13: Chartering or research in Alaska fishery days at sea by home port.** Average number of days vessels fished in the Chartering or research in Alaska fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port   | 2009 |   | 2010 |   | 2011 |   | 2012 |     |
|-------------|------|---|------|---|------|---|------|-----|
|             | Mean | N | Mean | N | Mean | N | Mean | N   |
| Puget Sound | 0    |   | 0    |   | 0    |   | ***  | *** |
| Astoria     | 0    |   | 0    |   | 0    |   | 43.3 | 3   |
| Tillamook   | 0    |   | 0    |   | 0    |   | ***  | *** |

**Table 4.14: Chartering or research on the West Coast fishery days at sea by home port.** Average number of days vessels fished in the Chartering or research on the West Coast fishery on the West Coast by home port reported on EDC form. (N = number of EDC vessels with non-zero, non-NA responses).

| Home port | 2009 |   | 2010 |   | 2011 |   | 2012 |     |
|-----------|------|---|------|---|------|---|------|-----|
|           | Mean | N | Mean | N | Mean | N | Mean | N   |
| Astoria   | 0    |   | 0    |   | 0    |   | ***  | *** |
| Tillamook | 0    |   | 0    |   | 0    |   | ***  | *** |
| Newport   | 0    |   | 0    |   | 0    |   | 29.3 | 3   |
| Brookings | 0    |   | 0    |   | 0    |   | ***  | *** |
| Monterey  | 0    |   | 0    |   | 0    |   | ***  | *** |

## 5 Vessel Physical Characteristics

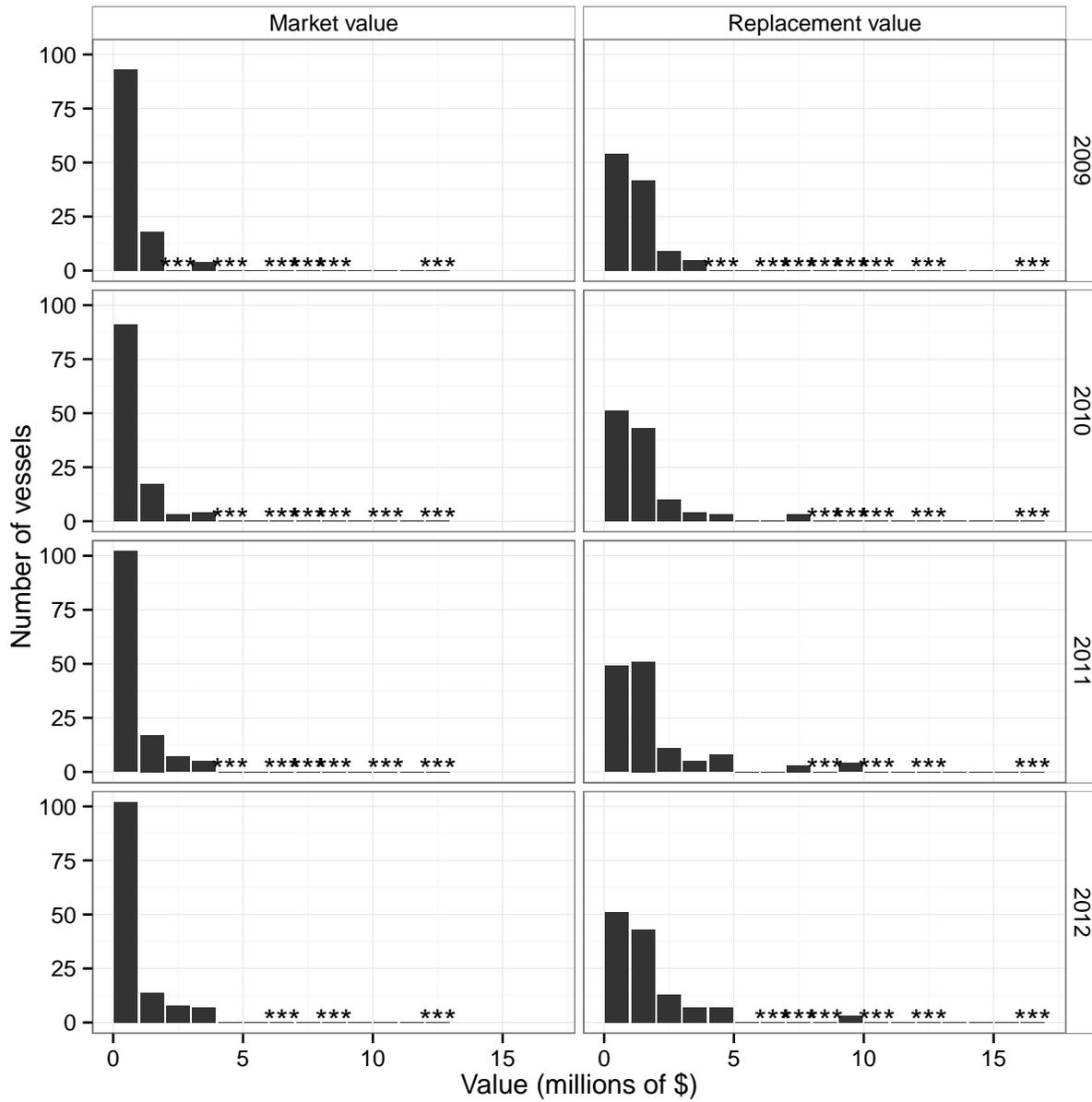
### 5.1 Average market value, replacement value, vessel length, fuel capacity, and horsepower of main engines

Physical vessel characteristics are shown below in Table 5.1. Survey participants were asked to provide basic information about the vessel and its physical characteristics, including market value, replacement value, vessel length, horsepower of main engines, and fuel capacity from the most recent marine survey. Marine surveys are done on a regular basis and are often required for insurance, financing, and other purposes.

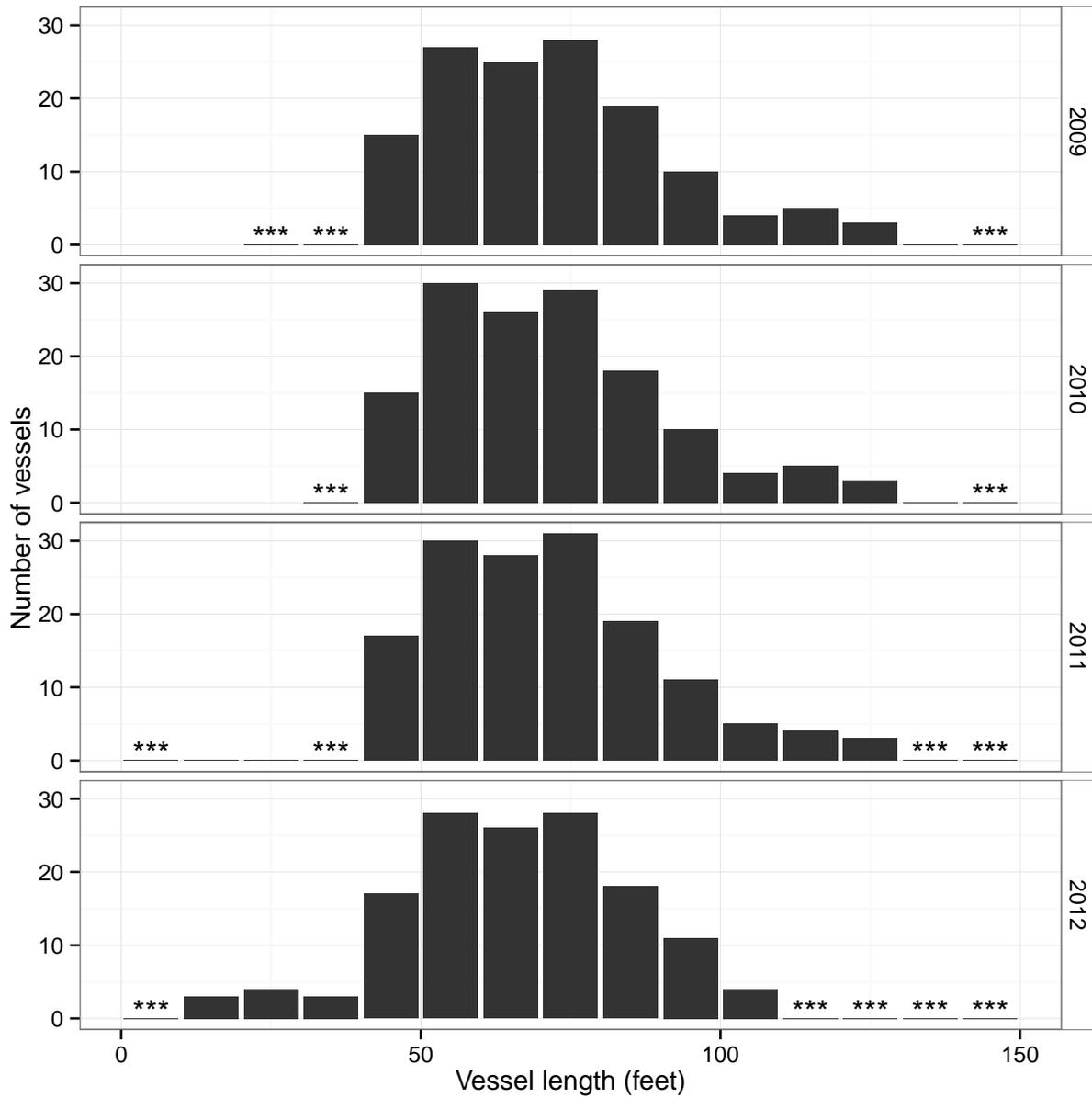
The market value is the marine surveyor's estimate of what the vessel could be sold for in its current condition, and the replacement value is the estimate of what it would cost to replace the current vessel with a new vessel.

**Table 5.1: Average vessel characteristics.** Average market value, replacement value, horsepower, fuel capacity and length (N = number of EDC vessels with non-zero, non-NA responses).

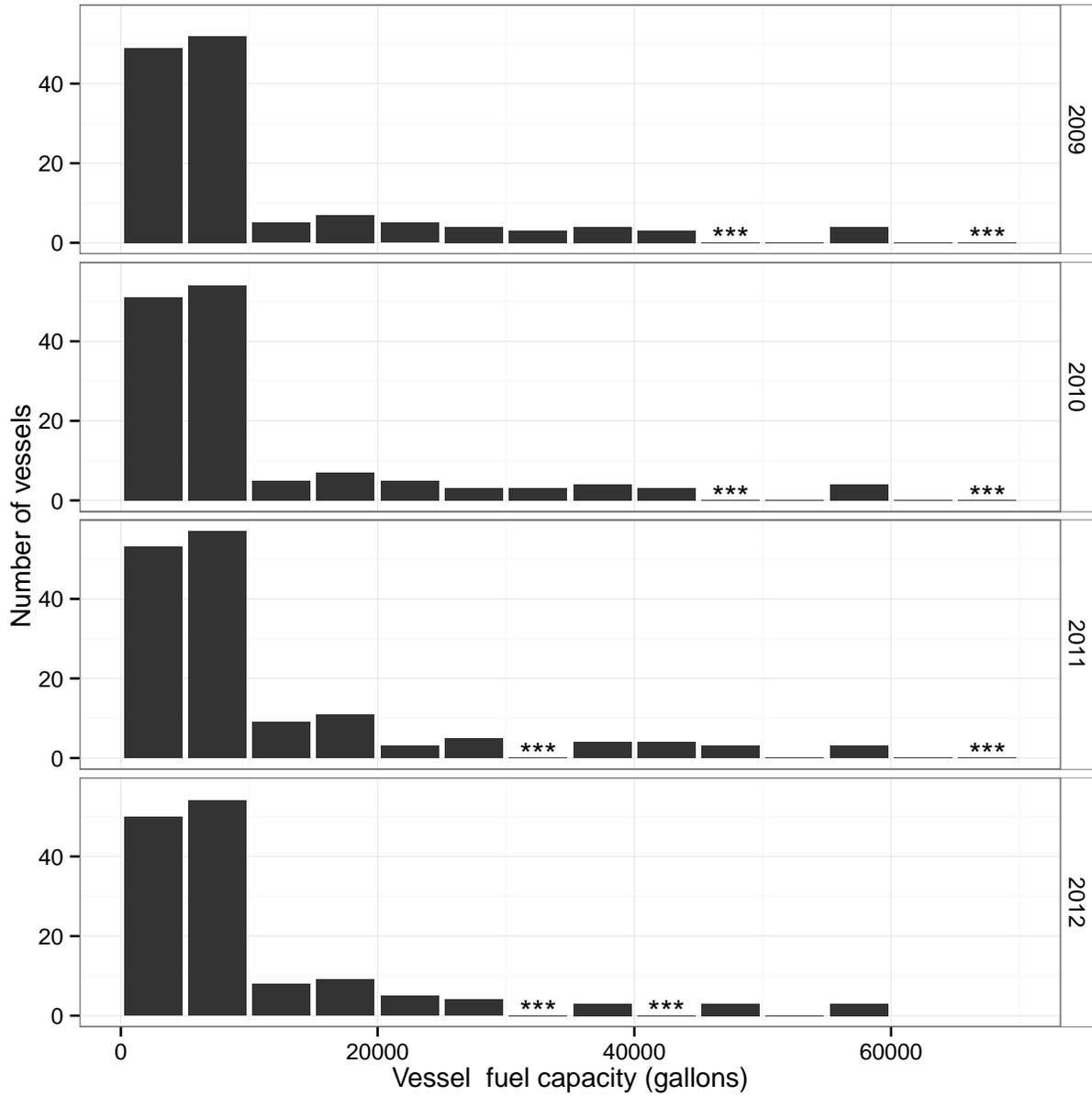
| Vessel characteristic          | 2009                   |     | 2010                   |     | 2011                   |     | 2012                   |     |
|--------------------------------|------------------------|-----|------------------------|-----|------------------------|-----|------------------------|-----|
|                                | Mean                   | N   | Mean                   | N   | Mean                   | N   | Mean                   | N   |
| Market value (\$)              | 1,067,907 <sup>‡</sup> | 123 | 1,145,910 <sup>‡</sup> | 121 | 1,175,649 <sup>‡</sup> | 138 | 1,082,339 <sup>‡</sup> | 135 |
| Replacement value (\$)         | 1,976,306 <sup>‡</sup> | 121 | 2,030,050 <sup>‡</sup> | 120 | 2,229,211 <sup>‡</sup> | 135 | 2,179,984 <sup>‡</sup> | 131 |
| Vessel length (feet)           | 73 <sup>·</sup>        | 140 | 73 <sup>·</sup>        | 143 | 72 <sup>·</sup>        | 153 | 68 <sup>·</sup>        | 149 |
| Vessel fuel capacity (gallons) | 12,440 <sup>‡</sup>    | 139 | 12,153 <sup>‡</sup>    | 142 | 12,142 <sup>‡</sup>    | 154 | 11,366 <sup>‡</sup>    | 143 |
| Horsepower of main engines     | 650 <sup>·</sup>       | 140 | 636 <sup>·</sup>       | 143 | 635 <sup>·</sup>       | 151 | 624 <sup>·</sup>       | 143 |



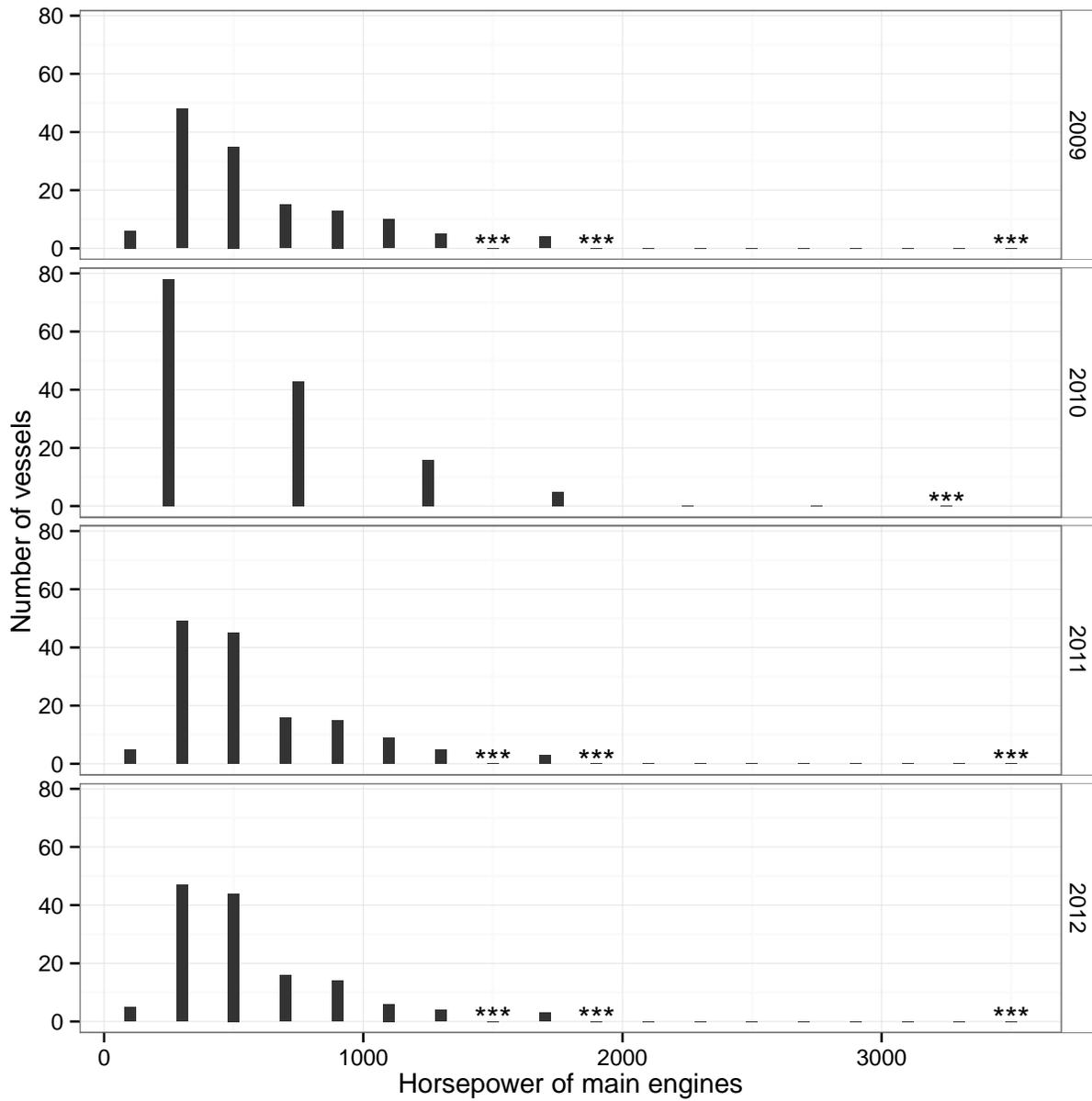
**Figure 5.1:** Market value and replacement value (millions of dollars) of all vessels that completed a survey. \*\*\* indicate that values were suppressed for confidentiality reasons.



**Figure 5.2:** Vessel length (feet) of all vessels that completed a survey. \*\*\* indicate that values were suppressed for confidentiality reasons.



**Figure 5.3:** Vessel fuel capacity (thousands of gallons) of all vessels that completed a survey. \*\*\* indicate that values were suppressed for confidentiality reasons.



**Figure 5.4:** Horsepower of main engines of all vessels that completed a survey. \*\*\* indicate that values were suppressed for confidentiality reasons.

The participants provide information about whether the vessel was hauled out (vessel was removed from the water for maintenance and repairs). Each year over half of all active fishing vessels are hauled out. The information shown below in Table 5.2 provides context that may be used to explain major costs associated with vessel repair and maintenance.

**Table 5.2: Haul outs.** Number of EDC vessels (N) that hauled the vessel during their fiscal year (% percent of vessels in survey year).

| Haul out | 2009 |       | 2010 |       | 2011 |       | 2012 |       |
|----------|------|-------|------|-------|------|-------|------|-------|
|          | N    | %     | N    | %     | N    | %     | N    | %     |
| YES      | 85   | 64.4% | 65   | 50.4% | 87   | 62.6% | 83   | 62.9% |
| NO       | 47   | 35.6% | 64   | 49.6% | 52   | 37.4% | 49   | 37.1% |

The number of vessels that process (including head and gutting) at-sea has increased over time (Table 5.3). The most common occurrence of at-sea processing is heading and gutting sablefish before delivering the fish.

**Table 5.3: Catcher vessels that processed at-sea.** Number of EDC vessels (N) that processed or headed and gutted fish on-board the vessel (% percent of vessels in survey year).

| Processed at-sea | 2009 |       | 2010 |       | 2011 |       | 2012 |       |
|------------------|------|-------|------|-------|------|-------|------|-------|
|                  | N    | %     | N    | %     | N    | %     | N    | %     |
| YES              | 6    | 4.5%  | 7    | 5.4%  | 15   | 10.8% | 17   | 12.9% |
| NO               | 126  | 95.5% | 122  | 94.6% | 121  | 87.1% | 115  | 87.1% |
| No response      | 0    | 0 %   | 0    | 0 %   | 3    | 2.2%  | —    | —     |

## 5.2 Vessel characteristics by whether the vessel fished on the West Coast and in Alaska, only fished on the West Coast, only fished in Alaska, or did not fish

**Table 5.4: Average horsepower.** Average horsepower of EDC vessels that did not fish on the West Coast or Alaska, fished on the West Coast and Alaska, fished only in Alaska, and fished only on the West Coast. (N = number of entities with non-zero, non-NA responses).

| Characteristic                      | 2009  |     | 2010  |     | 2011  |     | 2012  |    |
|-------------------------------------|-------|-----|-------|-----|-------|-----|-------|----|
|                                     | Mean  | N   | Mean  | N   | Mean  | N   | Mean  | N  |
| Fished on the West Coast and Alaska | 1,257 | 29  | 1,253 | 30  | 1,147 | 29  | 1,089 | 30 |
| Fished only on the West Coast       | 453   | 101 | 447   | 98  | 454   | 105 | 469   | 99 |
| Fished only in Alaska               | 1,233 | 3   | ***   | *** | 994   | 7   | 1,043 | 3  |
| Did not fish                        | 797   | 17  | 640   | 20  | 765   | 20  | 686   | 15 |

**Table 5.5: Average replacement value.** Average replacement value (millions of \$) of vessels that did not fish on the West Coast or Alaska, fished on the West Coast and Alaska, fished only in Alaska, and fished only on the West Coast. In 2009 and 2010 there was no question specifically for Alaska and if the vessel did not fish in 2009 and 2010, the owner was not required to provide the market value of the vessel (N = number of entities with non-zero, non-NA responses. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel).

| Activity                            | 2009   |     | 2010   |     | 2011   |    | 2012   |    |
|-------------------------------------|--------|-----|--------|-----|--------|----|--------|----|
|                                     | Mean   | N   | Mean   | N   | Mean   | N  | Mean   | N  |
| Fished on the West Coast and Alaska | \$4.69 | 29  | \$4.93 | 30  | \$4.49 | 28 | \$4.59 | 30 |
| Fished only on the West Coast       | \$1.05 | 90  | \$1.06 | 89  | \$1.34 | 93 | \$1.43 | 91 |
| Fished only in Alaska               | \$3.41 | 3   | ***    | *** | \$5.30 | 7  | \$4.47 | 3  |
| Did not fish                        | ***    | *** | ***    | *** | \$2.22 | 15 | \$1.13 | 9  |

**Table 5.6: Average market value** Average market value (millions of \$) of vessels that did not fish on the West Coast or Alaska, fished on the West Coast and Alaska, fished only in Alaska, and fished only on the West Coast. In 2009 and 2010 there was no question specifically for Alaska and if the vessel did not fish in 2009 and 2010, the owner was not required to provide the replacement value of the vessel (N = number of entities with non-zero, non-NA responses. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel).

| Activity                            | 2009             |     | 2010             |     | 2011             |    | 2012             |    |
|-------------------------------------|------------------|-----|------------------|-----|------------------|----|------------------|----|
|                                     | Mean             | N   | Mean             | N   | Mean             | N  | Mean             | N  |
| Fished on the West Coast and Alaska | \$3 <sup>‡</sup> | 29  | \$3 <sup>‡</sup> | 30  | \$3 <sup>‡</sup> | 29 | \$3 <sup>‡</sup> | 30 |
| Fished only on the West Coast       | \$0 <sup>‡</sup> | 92  | \$0 <sup>‡</sup> | 90  | \$1 <sup>‡</sup> | 94 | \$1 <sup>‡</sup> | 94 |
| Fished only in Alaska               | \$2 <sup>‡</sup> | 3   | ***              | *** | \$3 <sup>‡</sup> | 7  | \$2 <sup>‡</sup> | 3  |
| Did not fish                        | ***              | *** | ***              | *** | \$1 <sup>‡</sup> | 16 | \$1 <sup>‡</sup> | 10 |

**Table 5.7: Average vessel fuel capacity** Average vessel fuel capacity (gallons) of vessels that did not fish on the West Coast or Alaska, fished on the West Coast and Alaska, fished only in Alaska, and fished only on the West Coast. In 2009 and 2010 there was no question specifically for Alaska (N = number of entities with non-zero, non-NA responses. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel).

| Activity                            | 2009                |     | 2010                |     | 2011                |     | 2012                |    |
|-------------------------------------|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|----|
|                                     | Mean                | N   | Mean                | N   | Mean                | N   | Mean                | N  |
| Fished on the West Coast and Alaska | 29,592 <sup>‡</sup> | 29  | 30,577 <sup>‡</sup> | 30  | 24,983 <sup>‡</sup> | 29  | 23,621 <sup>‡</sup> | 30 |
| Fished only on the West Coast       | 6,654 <sup>‡</sup>  | 101 | 6,807 <sup>‡</sup>  | 98  | 7,314 <sup>‡</sup>  | 105 | 7,616 <sup>‡</sup>  | 99 |
| Fished only in Alaska               | 14,513 <sup>‡</sup> | 3   | ***                 | *** | 25,479 <sup>‡</sup> | 7   | 18,637 <sup>‡</sup> | 3  |
| Did not fish                        | 19,404 <sup>‡</sup> | 16  | 12,807 <sup>‡</sup> | 19  | 15,876 <sup>‡</sup> | 20  | 11,857 <sup>‡</sup> | 15 |

**Table 5.8: Average vessel length.** Average length (feet) of vessels that did not fish on the West Coast or Alaska, fished on the West Coast and Alaska, fished only in Alaska, and fished only on the West Coast. In 2009 and 2010 there was no question specifically for Alaska (N = number of entities with non-zero, non-NA responses. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel).

| Activity                            | 2009 |     | 2010 |     | 2011 |     | 2012 |    |
|-------------------------------------|------|-----|------|-----|------|-----|------|----|
|                                     | Mean | N   | Mean | N   | Mean | N   | Mean | N  |
| Fished on the West Coast and Alaska | 96'  | 29  | 97'  | 30  | 93'  | 29  | 88'  | 30 |
| Fished only on the West Coast       | 65'  | 101 | 66'  | 98  | 66'  | 105 | 66'  | 99 |
| Fished only in Alaska               | 89'  | 3   | ***  | *** | 91'  | 7   | 95'  | 3  |
| Did not fish                        | 80'  | 17  | 72'  | 20  | 73'  | 23  | 54'  | 21 |

## 6 Vessel Fuel Use, Speed, and Crew Size

Participants are asked to estimate the average daily fuel use while fishing. On average, more fuel is used per day in the Pacific whiting fishery than any other fishery.

### 6.1 Fuel use

#### 6.1.1 Average fuel use per day by fishery

**Table 6.1: Daily fuel use.** Average daily fuel use (gallons per day) by fishery (N = number of EDC vessels with non-zero, non-NA responses).

| Activity                               | 2009               |     | 2010               |    | 2011               |    | 2012               |    |
|--|--------------------|-----|--------------------|----|--------------------|----|--------------------|----|
|  | Mean               | N   | Mean               | N  | Mean               | N  | Mean               | N  |
| Pacific whiting                        | 800.9 <sup>‡</sup> | 40  | 805.5 <sup>‡</sup> | 40 | 822.9 <sup>‡</sup> | 34 | 813.7 <sup>‡</sup> | 30 |
| Groundfish with trawl gear             | 298.6 <sup>‡</sup> | 105 | 304.4 <sup>‡</sup> | 99 | 322.8 <sup>‡</sup> | 81 | 318.1 <sup>‡</sup> | 73 |
| Groundfish with fixed gear             | 155.6 <sup>‡</sup> | 8   | 143.3 <sup>‡</sup> | 9  | 141.5 <sup>‡</sup> | 26 | 168.0 <sup>‡</sup> | 24 |
| Crab                                   | 173.6 <sup>‡</sup> | 56  | 178.0 <sup>‡</sup> | 56 | 168.0 <sup>‡</sup> | 66 | 183.1 <sup>‡</sup> | 65 |
| Halibut                                | 271.4 <sup>‡</sup> | 7   | 206.3 <sup>‡</sup> | 6  | 141.1 <sup>‡</sup> | 7  | 202.7 <sup>‡</sup> | 6  |
| Salmon                                 | ***                | *** | 38.8 <sup>‡</sup>  | 4  | 70.0 <sup>‡</sup>  | 5  | 45.2 <sup>‡</sup>  | 10 |
| Shrimp                                 | 240.9 <sup>‡</sup> | 36  | 229.4 <sup>‡</sup> | 36 | 218.9 <sup>‡</sup> | 43 | 238.1 <sup>‡</sup> | 41 |
| Tuna                                   | 128.9 <sup>‡</sup> | 15  | 120.1 <sup>‡</sup> | 14 | 77.9 <sup>‡</sup>  | 8  | 101.5 <sup>‡</sup> | 12 |
| Steaming between West Coast and Alaska | 895.5 <sup>‡</sup> | 31  | 860.5 <sup>‡</sup> | 33 | 809.8 <sup>‡</sup> | 32 | 810.9 <sup>‡</sup> | 30 |

#### 6.1.2 Average fuel use per day by fishery and vessel length class

**Table 6.2: Pacific whiting fishery fuel use.** Average fuel use (gallons per day) of vessels that fished in the Pacific whiting fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |     | 2012             |    |
|-----------------------------------|------------------|----|------------------|----|------------------|-----|------------------|----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N   | Mean             | N  |
| Large vessel (> 80 ft)            | 918 <sup>·</sup> | 31 | 921 <sup>·</sup> | 31 | 920 <sup>·</sup> | 28  | 880 <sup>·</sup> | 25 |
| Medium vessel (> 60 ft, <= 80 ft) | 399 <sup>·</sup> | 9  | 407 <sup>·</sup> | 9  | 396 <sup>·</sup> | 5   | 481 <sup>·</sup> | 5  |
| Small vessel (< 60 ft)            |                  | 0  |                  | 0  | ***              | *** |                  | 0  |

**Table 6.3: Groundfish with trawl gear fishery fuel use.** Average fuel use (gallons per day) of vessels that fished in the groundfish with trawl gear fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |    | 2012             |    |
|-----------------------------------|------------------|----|------------------|----|------------------|----|------------------|----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N  | Mean             | N  |
| Large vessel (> 80 ft)            | 522 <sup>·</sup> | 21 | 516 <sup>·</sup> | 20 | 543 <sup>·</sup> | 16 | 541 <sup>·</sup> | 12 |
| Medium vessel (> 60 ft, <= 80 ft) | 288 <sup>·</sup> | 48 | 289 <sup>·</sup> | 49 | 286 <sup>·</sup> | 45 | 304 <sup>·</sup> | 42 |
| Small vessel (< 60 ft)            | 182 <sup>·</sup> | 36 | 189 <sup>·</sup> | 30 | 230 <sup>·</sup> | 20 | 208 <sup>·</sup> | 19 |

**Table 6.4: Groundfish with fixed gear fishery fuel use.** Average fuel use (gallons per day) of vessels that fished in the groundfish with fixed gear fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009            |     | 2010            |     | 2011             |     | 2012             |     |
|-----------------------------------|-----------------|-----|-----------------|-----|------------------|-----|------------------|-----|
|                                   | Mean            | N   | Mean            | N   | Mean             | N   | Mean             | N   |
| Large vessel (> 80 ft)            | ***             | *** | ***             | *** | ***              | *** | ***              | *** |
| Medium vessel (> 60 ft, <= 80 ft) | ***             | *** | ***             | *** | 200 <sup>·</sup> | 7   | 231 <sup>·</sup> | 8   |
| Small vessel (< 60 ft)            | 91 <sup>·</sup> | 6   | 84 <sup>·</sup> | 7   | 116 <sup>·</sup> | 18  | 102 <sup>·</sup> | 14  |

**Table 6.5: Crab fishery fuel use.** Average fuel use (gallons per day) of vessels that fished in the crab fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |    | 2012             |    |
|-----------------------------------|------------------|----|------------------|----|------------------|----|------------------|----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N  | Mean             | N  |
| Large vessel (> 80 ft)            | 342 <sup>·</sup> | 6  | 350 <sup>·</sup> | 6  | 303 <sup>·</sup> | 7  | 324 <sup>·</sup> | 7  |
| Medium vessel (> 60 ft, <= 80 ft) | 235 <sup>·</sup> | 20 | 239 <sup>·</sup> | 21 | 224 <sup>·</sup> | 26 | 250 <sup>·</sup> | 27 |
| Small vessel (< 60 ft)            | 99 <sup>·</sup>  | 30 | 99 <sup>·</sup>  | 29 | 95 <sup>·</sup>  | 33 | 93 <sup>·</sup>  | 31 |

**Table 6.6: Halibut fishery fuel use.** Average fuel use (gallons per day) of vessels that fished in the halibut fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |     | 2010             |   | 2011             |   | 2012             |     |
|-----------------------------------|------------------|-----|------------------|---|------------------|---|------------------|-----|
|                                   | Mean             | N   | Mean             | N | Mean             | N | Mean             | N   |
| Large vessel (> 80 ft)            | ***              | *** |                  | 0 |                  | 0 |                  | 0   |
| Medium vessel (> 60 ft, <= 80 ft) | ***              | *** | 363 <sup>·</sup> | 3 | 258 <sup>·</sup> | 3 | 272 <sup>·</sup> | 4   |
| Small vessel (< 60 ft)            | 100 <sup>·</sup> | 4   | 50 <sup>·</sup>  | 3 | 54 <sup>·</sup>  | 4 | ***              | *** |

**Table 6.7: Salmon fishery fuel use.** Average fuel use (gallons per day) of vessels that fished in the salmon fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009 |     | 2010            |   | 2011            |   | 2012            |    |
|-----------------------------------|------|-----|-----------------|---|-----------------|---|-----------------|----|
|                                   | Mean | N   | Mean            | N | Mean            | N | Mean            | N  |
| Large vessel (> 80 ft)            |      | 0   |                 | 0 |                 | 0 |                 | 0  |
| Medium vessel (> 60 ft, <= 80 ft) |      | 0   |                 | 0 |                 | 0 |                 | 0  |
| Small vessel (< 60 ft)            | ***  | *** | 39 <sup>·</sup> | 4 | 70 <sup>·</sup> | 5 | 45 <sup>·</sup> | 10 |

**Table 6.8: Shrimp fishery fuel use.** Average fuel use (gallons per day) of vessels that fished in the shrimp fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |    | 2012             |    |
|-----------------------------------|------------------|----|------------------|----|------------------|----|------------------|----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N  | Mean             | N  |
| Large vessel (> 80 ft)            | 350 <sup>·</sup> | 4  | 340 <sup>·</sup> | 5  | 285 <sup>·</sup> | 5  | 306 <sup>·</sup> | 8  |
| Medium vessel (> 60 ft, <= 80 ft) | 263 <sup>·</sup> | 21 | 239 <sup>·</sup> | 21 | 239 <sup>·</sup> | 25 | 257 <sup>·</sup> | 22 |
| Small vessel (< 60 ft)            | 160 <sup>·</sup> | 11 | 153 <sup>·</sup> | 10 | 156 <sup>·</sup> | 13 | 151 <sup>·</sup> | 11 |

**Table 6.9: Tuna fishery fuel use.** Average fuel use (gallons per day) of vessels that fished in the tuna fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010            |     | 2011            |     | 2012             |   |
|-----------------------------------|------------------|----|-----------------|-----|-----------------|-----|------------------|---|
|                                   | Mean             | N  | Mean            | N   | Mean            | N   | Mean             | N |
| Large vessel (> 80 ft)            |                  | 0  |                 | 0   |                 | 0   |                  | 0 |
| Medium vessel (> 60 ft, <= 80 ft) | 251 <sup>·</sup> | 3  | ***             | *** | ***             | *** | 168 <sup>·</sup> | 3 |
| Small vessel (< 60 ft)            | 98 <sup>·</sup>  | 12 | 98 <sup>·</sup> | 12  | 75 <sup>·</sup> | 7   | 79 <sup>·</sup>  | 9 |

**Table 6.10: Steaming between West Coast and Alaska fishery fuel use.** Average fuel use (gallons per day) of vessels that steamed between West Coast and Alaska by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |     | 2012             |     |
|-----------------------------------|------------------|----|------------------|----|------------------|-----|------------------|-----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N   | Mean             | N   |
| Large vessel (> 80 ft)            | 939 <sup>·</sup> | 28 | 917 <sup>·</sup> | 29 | 921 <sup>·</sup> | 26  | 963 <sup>·</sup> | 23  |
| Medium vessel (> 60 ft, <= 80 ft) | 488 <sup>·</sup> | 3  | 450 <sup>·</sup> | 4  | 321 <sup>·</sup> | 4   | 327 <sup>·</sup> | 5   |
| Small vessel (< 60 ft)            |                  | 0  |                  | 0  | ***              | *** | ***              | *** |

### 6.1.3 Average total fuel use

**Table 6.11: Average total fuel use.** Average total fuel use (gallons) per entity. (N = number of EDC vessels with non-zero, non-NA responses. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.)

| Activity                     | 2009                |     | 2010                |     | 2011                |     | 2012                |     |
|------------------------------|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|-----|
|                              | Mean                | N   | Mean                | N   | Mean                | N   | Mean                | N   |
| Other fuel use on West Coast | 336 <sup>‡</sup>    | 7   | 280 <sup>‡</sup>    | 6   | ***                 | *** | 125 <sup>‡</sup>    | 4   |
| Total diesel                 | 25,549 <sup>‡</sup> | 129 | 27,768 <sup>‡</sup> | 126 | 24,573 <sup>‡</sup> | 133 | 27,400 <sup>‡</sup> | 130 |

## 6.2 Speed while fishing or steaming

Participants are also asked to provide the average speed of the vessel while fishing. This value was only required for trawl fisheries, and therefore no speed is provided for halibut, crab, or groundfish with fixed gear.

### 6.2.1 Average speed by fishery

**Table 6.12: Average speed.** Average speed (knots) by fishery (N = number of EDC vessels with non-zero, non-NA responses).

| Fishery                                | 2009             |     | 2010             |    | 2011             |    | 2012             |    |
|--|------------------|-----|------------------|----|------------------|----|------------------|----|
|  | Mean             | N   | Mean             | N  | Mean             | N  | Mean             | N  |
| Pacific whiting                        | 3.1 <sup>‡</sup> | 40  | 3.1 <sup>‡</sup> | 40 | 3.3 <sup>‡</sup> | 34 | 3.1 <sup>‡</sup> | 30 |
| Groundfish with trawl gear             | 2.6 <sup>‡</sup> | 105 | 2.6 <sup>‡</sup> | 99 | 2.8 <sup>‡</sup> | 80 | 2.7 <sup>‡</sup> | 72 |
| Salmon                                 | ***              | *** | 2.5 <sup>‡</sup> | 4  | 2.5 <sup>‡</sup> | 5  | 2.8 <sup>‡</sup> | 10 |
| Shrimp                                 | 2.0 <sup>‡</sup> | 36  | 1.9 <sup>‡</sup> | 36 | 2.7 <sup>‡</sup> | 42 | 2.7 <sup>‡</sup> | 40 |
| Tuna                                   | 5.0 <sup>‡</sup> | 15  | 5.2 <sup>‡</sup> | 15 | 5.5 <sup>‡</sup> | 9  | 5.3 <sup>‡</sup> | 12 |
| Steaming between West Coast and Alaska | 9.0 <sup>‡</sup> | 31  | 9.0 <sup>‡</sup> | 32 | 8.9 <sup>‡</sup> | 32 | 8.8 <sup>‡</sup> | 30 |

### 6.2.2 Average speed by fishery and vessel length class

**Table 6.13: Pacific whiting fishery fishing speed.** Average speed (knots) of vessels that fished in the Pacific whiting fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009 |    | 2010 |    | 2011 |     | 2012 |    |
|-----------------------------------|------|----|------|----|------|-----|------|----|
|                                   | Mean | N  | Mean | N  | Mean | N   | Mean | N  |
| Large vessel (> 80 ft)            | 3.1' | 31 | 3.1' | 31 | 3.3' | 28  | 3.1' | 25 |
| Medium vessel (> 60 ft, <= 80 ft) | 2.9' | 9  | 2.9' | 9  | 3.8' | 5   | 3.2' | 5  |
| Small vessel (< 60 ft)            |      | 0  |      | 0  | ***  | *** |      | 0  |

**Table 6.14: Groundfish with trawl gear fishery fishing speed.** Average speed (knots) of vessels that fished in the groundfish with trawl gear fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009 |    | 2010 |    | 2011 |    | 2012 |    |
|-----------------------------------|------|----|------|----|------|----|------|----|
|                                   | Mean | N  | Mean | N  | Mean | N  | Mean | N  |
| Large vessel (> 80 ft)            | 2.6' | 21 | 2.6' | 20 | 2.6' | 16 | 2.5' | 12 |
| Medium vessel (> 60 ft, <= 80 ft) | 2.4' | 48 | 2.4' | 49 | 2.9' | 44 | 3.0' | 41 |
| Small vessel (< 60 ft)            | 2.8' | 36 | 2.9' | 30 | 2.6' | 20 | 2.1' | 19 |

**Table 6.15: Salmon fishery fishing speed.** Average speed (knots) of vessels that fished in the salmon fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009 |     | 2010 |   | 2011 |   | 2012 |    |
|-----------------------------------|------|-----|------|---|------|---|------|----|
|                                   | Mean | N   | Mean | N | Mean | N | Mean | N  |
| Large vessel (> 80 ft)            |      | 0   |      | 0 |      | 0 |      | 0  |
| Medium vessel (> 60 ft, <= 80 ft) |      | 0   |      | 0 |      | 0 |      | 0  |
| Small vessel (< 60 ft)            | ***  | *** | 2.5' | 4 | 2.5' | 5 | 2.8' | 10 |

**Table 6.16: Shrimp fishery fishing speed.** Average speed (knots) of vessels that fished in the shrimp fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |    | 2012             |    |
|-----------------------------------|------------------|----|------------------|----|------------------|----|------------------|----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N  | Mean             | N  |
| Large vessel (> 80 ft)            | 1.9 <sup>*</sup> | 4  | 2.0 <sup>*</sup> | 5  | 1.9 <sup>*</sup> | 5  | 1.9 <sup>*</sup> | 8  |
| Medium vessel (> 60 ft, <= 80 ft) | 1.8 <sup>*</sup> | 21 | 1.9 <sup>*</sup> | 21 | 3.0 <sup>‡</sup> | 25 | 3.2 <sup>‡</sup> | 22 |
| Small vessel (< 60 ft)            | 2.3 <sup>‡</sup> | 11 | 1.9 <sup>*</sup> | 10 | 2.2 <sup>‡</sup> | 12 | 2.3 <sup>‡</sup> | 10 |

**Table 6.17: Tuna fishery fishing speed.** Average speed (knots) of vessels that fished in the tuna fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |     | 2012             |   |
|-----------------------------------|------------------|----|------------------|----|------------------|-----|------------------|---|
|                                   | Mean             | N  | Mean             | N  | Mean             | N   | Mean             | N |
| Large vessel (> 80 ft)            |                  | 0  |                  | 0  | ***              | *** |                  | 0 |
| Medium vessel (> 60 ft, <= 80 ft) | 5.7 <sup>*</sup> | 3  | 5.7 <sup>*</sup> | 3  | ***              | *** | 5.8 <sup>*</sup> | 3 |
| Small vessel (< 60 ft)            | 4.9 <sup>*</sup> | 12 | 5.1 <sup>*</sup> | 12 | 5.1 <sup>*</sup> | 7   | 5.1 <sup>*</sup> | 9 |

**Table 6.18: Steaming between West Coast and Alaska fishery fishing speed.** Average speed (knots) of vessels that steamed between West Coast and Alaska by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |     | 2012             |     |
|-----------------------------------|------------------|----|------------------|----|------------------|-----|------------------|-----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N   | Mean             | N   |
| Large vessel (> 80 ft)            | 9.0 <sup>*</sup> | 28 | 9.1 <sup>*</sup> | 28 | 9.0 <sup>*</sup> | 26  | 8.8 <sup>*</sup> | 23  |
| Medium vessel (> 60 ft, <= 80 ft) | 9.0 <sup>*</sup> | 3  | 8.8 <sup>*</sup> | 4  | 8.5 <sup>*</sup> | 4   | 8.4 <sup>*</sup> | 5   |
| Small vessel (< 60 ft)            |                  | 0  |                  | 0  | ***              | *** | ***              | *** |

## 6.3 Crew size

The EDC forms collect crew size by fishery. The values provided in Table 6.19 exclude the captain. These data provide information about the total number of jobs or positions on vessels; they do not reflect the total number of individuals who served as crew members. A new question was added for the 2013 data collection that asks participants to provide the total number of individuals that worked on the vessel during the survey year. This information will be included in the 2013 reports.

### 6.3.1 Average crew size by fishery

**Table 6.19: Average crew size.** Average crew size (excluding captain) by fishery (N = number of EDC vessels with non-zero, non-NA responses).

| Activity                               | 2009             |     | 2010             |    | 2011             |    | 2012             |    |
|--|------------------|-----|------------------|----|------------------|----|------------------|----|
|  | Mean             | N   | Mean             | N  | Mean             | N  | Mean             | N  |
| Pacific whiting                        | 2.6 <sup>*</sup> | 41  | 2.6 <sup>*</sup> | 41 | 2.7 <sup>*</sup> | 34 | 2.8 <sup>*</sup> | 30 |
| Groundfish with trawl gear             | 2.0 <sup>*</sup> | 105 | 2.0 <sup>*</sup> | 99 | 2.0 <sup>*</sup> | 81 | 2.1 <sup>*</sup> | 73 |
| Groundfish with fixed gear             | 1.9 <sup>*</sup> | 8   | 2.0 <sup>*</sup> | 8  | 2.6 <sup>*</sup> | 26 | 2.8 <sup>*</sup> | 24 |
| Crab                                   | 2.8 <sup>*</sup> | 56  | 2.9 <sup>*</sup> | 57 | 2.9 <sup>*</sup> | 66 | 3.0 <sup>*</sup> | 63 |
| Halibut                                | 1.8 <sup>‡</sup> | 7   | 1.6 <sup>‡</sup> | 6  | 1.9 <sup>‡</sup> | 7  | 2.1 <sup>‡</sup> | 6  |
| Salmon                                 | ***              | *** | 1.7 <sup>*</sup> | 3  | 1.8 <sup>*</sup> | 4  | 1.4 <sup>*</sup> | 7  |
| Shrimp                                 | 2.0 <sup>*</sup> | 37  | 2.0 <sup>*</sup> | 37 | 2.0 <sup>*</sup> | 43 | 2.1 <sup>*</sup> | 41 |
| Tuna                                   | 1.5 <sup>*</sup> | 15  | 1.6 <sup>*</sup> | 14 | 1.5 <sup>*</sup> | 7  | 1.6 <sup>*</sup> | 11 |
| Steaming between West Coast and Alaska | 2.9 <sup>*</sup> | 31  | 2.9 <sup>*</sup> | 33 | 3.1 <sup>*</sup> | 31 | 2.9 <sup>*</sup> | 30 |

### 6.3.2 Average crew size by fishery and vessel length class

**Table 6.20: Pacific whiting fishery crew size.** Average crew size (not including captain) on vessels that fished in the Pacific whiting fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |     | 2012             |    |
|-----------------------------------|------------------|----|------------------|----|------------------|-----|------------------|----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N   | Mean             | N  |
| Large vessel (> 80 ft)            | 2.7 <sup>*</sup> | 31 | 2.7 <sup>*</sup> | 31 | 2.9 <sup>*</sup> | 27  | 2.8 <sup>*</sup> | 25 |
| Medium vessel (> 60 ft, <= 80 ft) | 2.2 <sup>*</sup> | 10 | 2.2 <sup>*</sup> | 10 | 2.2 <sup>*</sup> | 6   | 2.6 <sup>*</sup> | 5  |
| Small vessel (< 60 ft)            |                  | 0  |                  | 0  | ***              | *** |                  | 0  |

**Table 6.21: Groundfish with trawl gear fishery crew size.** Average crew size (not including captain) on vessels that fished in the groundfish with trawl gear fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009 |    | 2010 |    | 2011 |    | 2012 |    |
|-----------------------------------|------|----|------|----|------|----|------|----|
|                                   | Mean | N  | Mean | N  | Mean | N  | Mean | N  |
| Large vessel (> 80 ft)            | 2.3' | 21 | 2.3' | 20 | 2.4' | 16 | 2.3' | 12 |
| Medium vessel (> 60 ft, <= 80 ft) | 2.1' | 49 | 2.1' | 50 | 2.1' | 45 | 2.1' | 42 |
| Small vessel (< 60 ft)            | 1.8' | 35 | 1.8' | 29 | 1.8' | 20 | 1.9' | 19 |

**Table 6.22: Groundfish with fixed gear fishery crew size.** Average crew size (not including captain) on vessels that fished in the groundfish with fixed gear fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009 |     | 2010 |     | 2011 |     | 2012 |     |
|-----------------------------------|------|-----|------|-----|------|-----|------|-----|
|                                   | Mean | N   | Mean | N   | Mean | N   | Mean | N   |
| Large vessel (> 80 ft)            | ***  | *** | ***  | *** | ***  | *** | ***  | *** |
| Medium vessel (> 60 ft, <= 80 ft) | ***  | *** | ***  | *** | 3.6' | 7   | 3.5' | 8   |
| Small vessel (< 60 ft)            | 1.3' | 6   | 1.5' | 6   | 2.1' | 18  | 2.1' | 14  |

**Table 6.23: Crab fishery crew size.** Average crew size (not including captain) on vessels that fished in the crab fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009 |    | 2010 |    | 2011 |    | 2012 |    |
|-----------------------------------|------|----|------|----|------|----|------|----|
|                                   | Mean | N  | Mean | N  | Mean | N  | Mean | N  |
| Large vessel (> 80 ft)            | 3.6' | 6  | 3.3' | 6  | 3.5' | 7  | 3.5' | 7  |
| Medium vessel (> 60 ft, <= 80 ft) | 3.4' | 21 | 3.4' | 22 | 3.3' | 26 | 3.3' | 26 |
| Small vessel (< 60 ft)            | 2.3' | 29 | 2.4' | 29 | 2.4' | 33 | 2.5' | 30 |

**Table 6.24: Halibut fishery crew size.** Average crew size (not including captain) on vessels that fished in the halibut fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |     | 2010             |   | 2011             |   | 2012             |     |
|-----------------------------------|------------------|-----|------------------|---|------------------|---|------------------|-----|
|                                   | Mean             | N   | Mean             | N | Mean             | N | Mean             | N   |
| Large vessel (> 80 ft)            | ***              | *** |                  | 0 |                  | 0 |                  | 0   |
| Medium vessel (> 60 ft, <= 80 ft) | ***              | *** | 1.7 <sup>·</sup> | 3 | 2.2 <sup>·</sup> | 3 | 2.8 <sup>·</sup> | 4   |
| Small vessel (< 60 ft)            | 1.6 <sup>·</sup> | 4   | 1.5 <sup>·</sup> | 3 | 1.6 <sup>·</sup> | 4 | ***              | *** |

**Table 6.25: Salmon fishery crew size.** Average crew size (not including captain) on vessels that fished in the salmon fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009 |     | 2010             |   | 2011             |     | 2012             |   |
|-----------------------------------|------|-----|------------------|---|------------------|-----|------------------|---|
|                                   | Mean | N   | Mean             | N | Mean             | N   | Mean             | N |
| Large vessel (> 80 ft)            |      | 0   |                  | 0 | ***              | *** |                  | 0 |
| Medium vessel (> 60 ft, <= 80 ft) |      | 0   |                  | 0 |                  | 0   |                  | 0 |
| Small vessel (< 60 ft)            | ***  | *** | 1.7 <sup>·</sup> | 3 | 1.7 <sup>·</sup> | 3   | 1.4 <sup>·</sup> | 7 |

**Table 6.26: Shrimp fishery crew size.** Average crew size (not including captain) on vessels that fished in the shrimp fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |    | 2012             |    |
|-----------------------------------|------------------|----|------------------|----|------------------|----|------------------|----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N  | Mean             | N  |
| Large vessel (> 80 ft)            | 2.1 <sup>·</sup> | 4  | 2.1 <sup>·</sup> | 5  | 2.0 <sup>·</sup> | 5  | 2.1 <sup>·</sup> | 8  |
| Medium vessel (> 60 ft, <= 80 ft) | 2.0 <sup>·</sup> | 22 | 2.0 <sup>·</sup> | 22 | 2.1 <sup>·</sup> | 25 | 2.0 <sup>·</sup> | 22 |
| Small vessel (< 60 ft)            | 1.8 <sup>·</sup> | 11 | 1.7 <sup>·</sup> | 10 | 1.9 <sup>·</sup> | 13 | 2.1 <sup>·</sup> | 11 |

**Table 6.27: Tuna fishery crew size.** Average crew size (not including captain) on vessels that fished in the tuna fishery on the West Coast by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |     | 2012             |   |
|-----------------------------------|------------------|----|------------------|----|------------------|-----|------------------|---|
|                                   | Mean             | N  | Mean             | N  | Mean             | N   | Mean             | N |
| Large vessel (> 80 ft)            |                  | 0  |                  | 0  |                  | 0   |                  | 0 |
| Medium vessel (> 60 ft, <= 80 ft) | 1.8 <sup>*</sup> | 4  | 1.7 <sup>*</sup> | 3  | ***              | *** | 1.3 <sup>*</sup> | 3 |
| Small vessel (< 60 ft)            | 1.5 <sup>*</sup> | 11 | 1.6 <sup>*</sup> | 11 | 1.4 <sup>*</sup> | 6   | 1.8 <sup>*</sup> | 8 |

**Table 6.28: Steaming between West Coast and Alaska fishery crew size.** Average crew size (not including captain) on vessels that steamed between West Coast and Alaska by size class of vessel (large vessel > 80 ft, 60 ft < medium vessels <= 80 ft, and small vessels <= 60 ft) (N = number of EDC vessels with non-zero, non-NA responses).

| Vessel length category            | 2009             |    | 2010             |    | 2011             |     | 2012             |     |
|-----------------------------------|------------------|----|------------------|----|------------------|-----|------------------|-----|
|                                   | Mean             | N  | Mean             | N  | Mean             | N   | Mean             | N   |
| Large vessel (> 80 ft)            | 2.9 <sup>*</sup> | 28 | 2.9 <sup>*</sup> | 29 | 3.0 <sup>*</sup> | 25  | 2.8 <sup>*</sup> | 23  |
| Medium vessel (> 60 ft, <= 80 ft) | 3.0 <sup>*</sup> | 3  | 3.0 <sup>*</sup> | 4  | 3.2 <sup>*</sup> | 4   | 2.6 <sup>*</sup> | 5   |
| Small vessel (< 60 ft)            |                  | 0  |                  | 0  | ***              | *** | ***              | *** |

## 7 At-Sea Deliveries and Shoreside Landings

Vessels in the catch share fishery participate in both shorebased and at-sea fisheries. The only fishery for which vessels deliver at-sea is the whiting fishery. There is also a shorebased whiting fleet. Information about the weight of landings or deliveries is not requested on the EDC forms because this information can be obtained from other sources.

Landings and deliveries information are primarily obtained from state fish ticket data and the At-Sea Hake Observer Program database, respectively, accessed through PacFIN. The weight of landings and deliveries made while fishing in Alaska are obtained from the EDC forms. Species composition is available for West Coast fisheries, but not for Alaska fisheries. Alaska landings weights are provided here because they are used for cost disaggregation in section 9.

**Table 7.1:** Total landings and deliveries in West Coast at-sea and shoreside fisheries and Alaska (round metric tons) (N = number of EDC vessels with non-zero, non-NA responses)

| Location of delivery | 2009    |     | 2010    |     | 2011    |     | 2012    |     |
|----------------------|---------|-----|---------|-----|---------|-----|---------|-----|
|                      | Total   | N   | Total   | N   | Total   | N   | Total   | N   |
| Alaska               | 94,821  | 31  | 103,625 | 31  | 135,276 | 33  | 105,575 | 28  |
| At-sea               | 30,927  | 20  | 34,744  | 20  | 50,220  | 18  | 39,060  | 16  |
| Shoreside            | 77,474  | 124 | 91,828  | 121 | 123,149 | 127 | 100,219 | 125 |
| Total landings       | 203,222 | 132 | 230,197 | 129 | 308,644 | 138 | 244,853 | 132 |

### 7.1 At-sea deliveries

The at-sea fisheries on the West Coast target Pacific whiting. There is very little bycatch in this fishery (Table 7.2).

**Table 7.2:** Total at-sea deliveries (metric tons) by species group (N = number of EDC vessels with non-zero, non-NA responses).

| Species group           | 2009          |           | 2010          |           | 2011          |           | 2012          |           |
|-------------------------|---------------|-----------|---------------|-----------|---------------|-----------|---------------|-----------|
|                         | Total         | N         | Total         | N         | Total         | N         | Total         | N         |
| Arrowtooth flounder     | 1             | 20        | 3             | 19        | 7             | 18        | 2             | 16        |
| Coastal pelagics        | ***           | ***       | 0             | 13        | 10            | 10        | 11            | 15        |
| Crab                    | —             | —         | —             | —         | ***           | ***       | —             | —         |
| Dover sole              | —             | —         | 1             | 11        | 0             | 7         | 0             | 6         |
| English sole            | —             | —         | ***           | ***       | ***           | ***       | ***           | ***       |
| Lingcod                 | 1             | 14        | 0             | 7         | 0             | 8         | 0             | 10        |
| Pacific cod             | ***           | ***       | —             | —         | ***           | ***       | 0             | 3         |
| Pacific halibut         | 0             | 14        | 1             | 12        | 0             | 6         | 0             | 7         |
| Pacific herring         | 0             | 12        | ***           | ***       | ***           | ***       | ***           | ***       |
| Pacific whiting         | 30,666        | 20        | 34,530        | 20        | 49,946        | 18        | 38,888        | 16        |
| Rex sole                | —             | —         | 2             | 11        | 2             | 9         | 0             | 10        |
| Rockfish                | 201           | 20        | 116           | 20        | 93            | 18        | 76            | 16        |
| Sablefish               | 0             | 6         | 5             | 14        | 2             | 14        | 1             | 9         |
| Salmon                  | 1             | 19        | 2             | 19        | 4             | 18        | 6             | 16        |
| Sharks, skates and rays | 9             | 20        | 52            | 20        | 109           | 18        | 44            | 16        |
| Shrimp                  | 0             | 3         | 0             | 3         | 0             | 4         | 0             | 12        |
| Squid                   | 8             | 20        | 21            | 20        | 20            | 18        | 27            | 16        |
| Thornyheads             | —             | —         | 0             | 9         | 2             | 8         | 1             | 11        |
| Other flatfish          | ***           | ***       | ***           | ***       | 0             | 3         | 0             | 7         |
| Other groundfish        | —             | —         | —             | —         | 0             | 5         | 0             | 5         |
| Other shellfish         | 0             | 5         | 0             | 13        | ***           | ***       | 0             | 3         |
| Other species           | ***           | ***       | 10            | 19        | 24            | 18        | 3             | 16        |
| <b>Total deliveries</b> | <b>30,927</b> | <b>20</b> | <b>34,744</b> | <b>20</b> | <b>50,220</b> | <b>18</b> | <b>39,060</b> | <b>16</b> |

## 7.2 Shoreside landings

Pacific whiting makes up the largest part of the total catch by weight in the shoreside groundfish trawl fisheries, (Table 7.3). The next most common species by weight are dover sole, sablefish, and thornyheads. Between 2009 and 2012, there were 1 species grouped into the other groundfish species category. By weight, the most common were sand sole, starry flounder, and rock sole.

**Table 7.3:** Total shoreside landings (metric tons) by species group of groundfish (N = number of EDC vessels with non-zero, non-NA responses)

| Species group           | 2009          |            | 2010          |            | 2011           |            | 2012          |            |
|-------------------------|---------------|------------|---------------|------------|----------------|------------|---------------|------------|
|                         | Total         | N          | Total         | N          | Total          | N          | Total         | N          |
| Arrowtooth flounder     | 3,489         | 91         | 3,235         | 92         | 2,279          | 83         | 2,281         | 88         |
| Dover sole              | 10,886        | 107        | 10,206        | 105        | 7,665          | 90         | 7,424         | 92         |
| English sole            | 239           | 102        | 149           | 99         | 110            | 70         | 118           | 73         |
| Lingcod                 | 101           | 113        | 72            | 102        | 251            | 86         | 356           | 91         |
| Pacific cod             | 66            | 43         | 88            | 43         | 263            | 42         | 396           | 29         |
| Pacific whiting         | 44,792        | 37         | 59,090        | 44         | 89,893         | 62         | 65,877        | 67         |
| Petrals sole            | 1,524         | 107        | 738           | 102        | 789            | 73         | 1,093         | 77         |
| Rex sole                | 504           | 109        | 429           | 105        | 364            | 81         | 367           | 84         |
| Rockfish                | 946           | 121        | 1,146         | 114        | 1,518          | 104        | 2,016         | 106        |
| Sablefish               | 3,137         | 118        | 2,860         | 111        | 2,950          | 109        | 2,722         | 109        |
| Sanddab                 | 287           | 53         | 152           | 40         | 141            | 30         | 164           | 33         |
| Sharks, skates and rays | 1,261         | 110        | 1,314         | 107        | 1,314          | 91         | 1,341         | 91         |
| Thornyheads             | 2,339         | 109        | 2,449         | 109        | 1,617          | 93         | 1,682         | 102        |
| Other flatfish          | 72            | 61         | 102           | 55         | 101            | 59         | 98            | 52         |
| Other groundfish        | 89            | 37         | 116           | 57         | 92             | 47         | 87            | 52         |
| <b>Total landings</b>   | <b>69,732</b> | <b>121</b> | <b>82,145</b> | <b>118</b> | <b>109,346</b> | <b>115</b> | <b>86,022</b> | <b>112</b> |

**Table 7.4:** Total shoreside landings (metric tons) by species group of non-groundfish (N = number of EDC vessels with non-zero, non-NA responses)

| Species group           | 2009         |            | 2010          |            | 2011          |            | 2012          |            |
|-------------------------|--------------|------------|---------------|------------|---------------|------------|---------------|------------|
|                         | Total        | N          | Total         | N          | Total         | N          | Total         | N          |
| California halibut      | 43           | 6          | 54            | 8          | 48            | 5          | 38            | 4          |
| Coastal pelagics        | 3            | 32         | 4             | 26         | 24            | 30         | 34            | 30         |
| Crab                    | 2,383        | 72         | 2,332         | 72         | 2,560         | 87         | 2,039         | 76         |
| Echinoderms             | 0            | 8          | 0             | 5          | ***           | ***        | 0             | 8          |
| Pacific halibut         | 2            | 16         | ***           | ***        | 14            | 22         | 16            | 24         |
| Pacific herring         | 0            | 6          | 48            | 12         | 1             | 11         | 0             | 5          |
| Salmon                  | 2            | 30         | 16            | 35         | 34            | 32         | 38            | 37         |
| Sharks, skates and rays | 2            | 27         | 29            | 42         | 10            | 53         | 22            | 42         |
| Shrimp                  | 5,709        | 34         | 7,515         | 40         | 12,808        | 42         | 11,738        | 39         |
| Squid                   | 186          | 62         | 112           | 49         | 25            | 44         | 24            | 42         |
| Sturgeon                | 0            | 3          | ***           | ***        | —             | —          | —             | —          |
| Tuna                    | 103          | 18         | 138           | 15         | 59            | 9          | 101           | 17         |
| Other shellfish         | 2            | 29         | 2             | 30         | 1             | 32         | 2             | 26         |
| Other species           | 21           | 56         | 13            | 58         | 13            | 62         | 117           | 63         |
| <b>Total landings</b>   | <b>8,456</b> | <b>115</b> | <b>10,267</b> | <b>117</b> | <b>15,623</b> | <b>114</b> | <b>14,169</b> | <b>120</b> |

### 7.3 Shoreside landings by species group

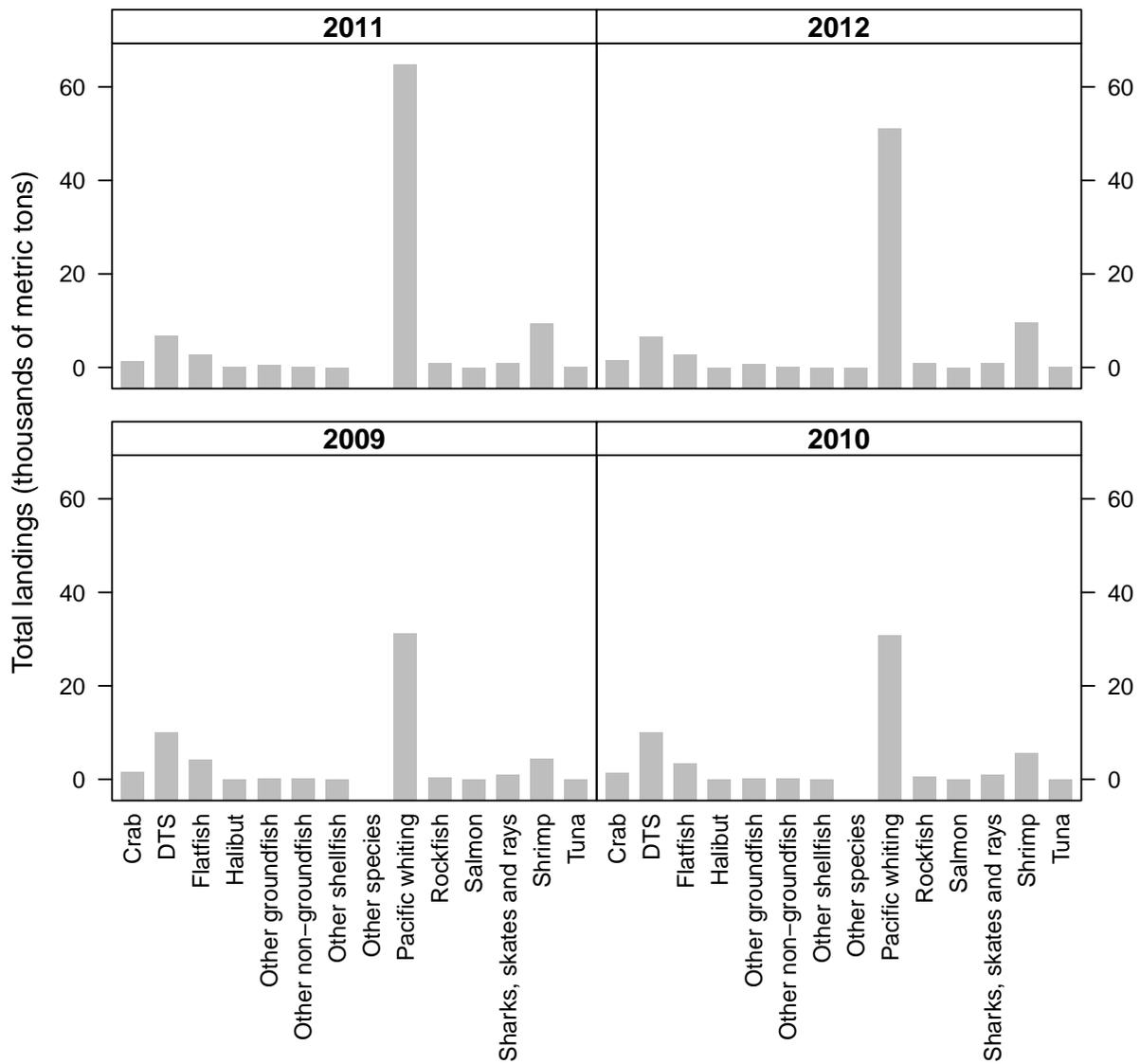


Figure 7.1: Total landings by species group (thousands of metric tons).

## 8 Revenues

There are several sources of earnings for vessels on the West Coast. The primary source is revenue from sale of fish. Ex-vessel revenue is available for all shoreside deliveries, but is not available for at-sea deliveries. EDC data are used for all at-sea delivery revenues. Additionally, the EDC has information about revenue from sale or lease of permits, quota shares, and quota pounds, and from other activities like chartering and research. The full suite of earnings sources can be found in Table 8.1.

## 8.1 All revenue sources

**Table 8.1: Average annual revenue.** Annual average revenue (thousands of \$) for all categories (N = number of EDC vessels with non-zero, non-NA responses).

| Activity   | 2009     |     | 2010     |     | 2011     |     | 2012     |     |
|--|----------|-----|----------|-----|----------|-----|----------|-----|
|  | Mean     | N   | Mean     | N   | Mean     | N   | Mean     | N   |
| Alaska shoreside landings and at-sea deliveries      | \$1,227: | 31  | \$1,321: | 31  | \$1,841: | 34  | \$1,836: | 28  |
| At-sea deliveries                                    | \$345:   | 20  | \$465:   | 20  | \$576:   | 18  | \$568:   | 16  |
| Lease of other permits                               | ***      | *** | ***      | *** | \$142:   | 6   | ***      | *** |
| Lease of quota pounds                                |          | 0   | ***      | *** | \$67:    | 48  | \$73:    | 41  |
| Lease of quota shares                                |          | 0   |          | 0   | \$60:    | 11  | \$83:    | 12  |
| Lease of West Coast limited entry trawl permits      | ***      | *** | ***      | *** | \$82:    | 7   | \$39:    | 6   |
| Leasing the vessel                                   | —        | —   | —        | —   | —        | —   | ***      | *** |
| Sale of other permits                                | \$136:   | 3   | \$85:    | 3   | \$181:   | 5   | ***      | *** |
| Sale of quota pounds                                 | ***      | *** | ***      | *** | \$190:   | 17  | \$158:   | 21  |
| Sale of quota shares                                 | ***      | *** |          | 0   | ***      | *** | ***      | *** |
| Sale of West Coast limited entry trawl permits       |          | 0   | \$403:   | 3   | ***      | *** | ***      | *** |
| Salmon disaster payments                             | \$26:    | 16  | \$2:     | 3   | ***      | *** |          | 0   |
| Shoreside deliveries                                 | \$403:   | 126 | \$424:   | 124 | \$670:   | 127 | \$630:   | 126 |
| Other  | \$89:    | 16  | \$117:   | 9   | \$135:   | 11  | \$103:   | 8   |
| Chartering or leasing the vessel                     | \$117:   | 11  | \$157:   | 11  | \$180:   | 13  | —        | —   |
| Chartering, research, or tendering in Alaska         | —        | —   | —        | —   | —        | —   | \$303:   | 3   |
| Chartering, research, or tendering on the West Coast | —        | —   | —        | —   | —        | —   | \$163:   | 10  |
| Average total revenue                                | \$743:   | 134 | \$820:   | 132 | \$1,246: | 138 | \$1,148: | 133 |

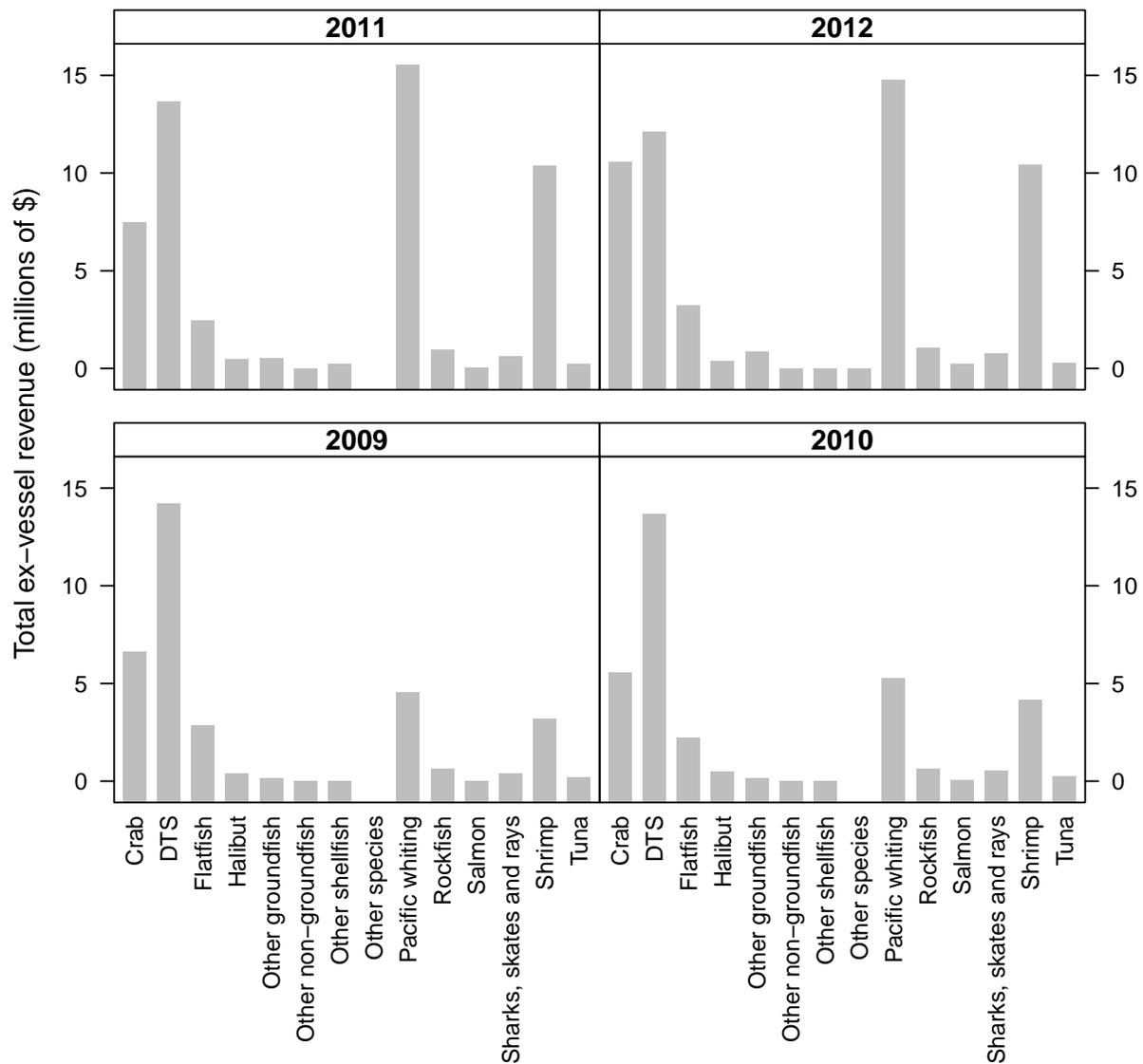


Figure 8.1: Total ex-vessel shoreside revenue (millions of dollars).

## 9 Costs

This section of the report describes the cost data that are collected on the EDC catcher vessel form. It reports on variable costs, fixed costs, and total costs, and how those costs are disaggregated to estimate the proportion of each cost that was incurred for West Coast fisheries.

For the purposes of the EDC, costs are divided into two categories, variable costs and fixed costs. Variable costs vary with the level of fishery participation, and generally include items such as fuel and crew payments. Fixed costs do not vary as directly with the level of fishery participation, and generally include items such as vessel capital improvements. The designation of a cost as variable or fixed depends on many factors, including the relevant time horizon and use of the data. While some costs would clearly be considered fixed (e.g., the purchase of a new engine), others are more difficult to categorize as fixed versus variable. For the purposes of this report, we consider the costs listed in Tables 9.2, 9.3 and 9.4 to be fixed, and the costs listed in Table 9.1 to be variable. The EDC Program will continue to explore, and possibly improve, the categorization of these costs.

The cost section of the EDC form collects both “capitalized expenditures” and “expenses” for vessel improvements and maintenance, fishing gear, and processing equipment. This is because certain costs may be treated for tax accounting purposes as either capitalized or expensed. Capitalized expenditures are depreciated over a number of years. Expensed items are fully deducted as a cost for the year in which they occur. In an effort to reduce the reporting burden and errors, these data are collected as they are reported in the business’ accounting system.

In order to conduct economic analyses of specific fisheries it is important to have costs broken out by fishery. For some costs, it may be feasible for participants to break out or track costs at the fishery level. However, for most costs this is impossible, or would require additional burden to do so. During the EDC form development process, a key issue was the determination of which costs could reasonably be broken out by fishery or groups of fisheries. Each cost item was assigned to one or more fishery-group category based on how they are commonly tracked by industry members: 1) used on West Coast fisheries only (West Coast Only); 2) used on the West Coast and in other fisheries (Shared); and 3) used in all fisheries (All) regardless of whether they are used on the West Coast.

Some costs that are required for economic analysis are not asked for on the EDC forms because they are available through other sources, or can be calculated through fish ticket or permit office data. These include fish landings taxes and fees.

Finally, there are a variety of costs that are associated with running a catcher vessel that are not requested on the form because it is difficult to determine the share of the cost associated with the vessel. These costs include items that can be used for activities other than fishing, or are too difficult to allocate to a particular vessel in a multi-vessel company. These expenses include office space, pickup trucks, storage of equipment, professional fees, and marketing. In general, the EDC forms attempt to capture costs that are directly related to vessel maintenance and fishing operations, and not costs that are related to activities or equipment off the vessel. For these reasons, the EDC aggregated measures of costs (variable costs, fixed costs, and total costs) underestimate the true costs of operating a business.

## **9.1 Variable Costs**

Variable costs were collected for all West Coast activities, including chartering or research. Unlike fixed costs, variable costs are directly related to fishing operations, and therefore it was possible for vessels to separate expenses for activities on the West Coast from other activities. In all three years, the crew compensation made up the largest portion of total variable expenses, followed by captain compensation, and fuel and lubrication (Table 9.1). Together, these expenses made up 88.5% of all variable costs on the West Coast in 2012.

**Table 9.1: Variable expenses.** Average variable expenses on the West Coast for EDC vessels (thousands of \$) (N = number of EDC vessels with non-zero, non-NA responses).

| Expense category             | 2009    |     | 2010    |     | 2011    |     | 2012    |     |
|------------------------------|---------|-----|---------|-----|---------|-----|---------|-----|
|                              | Mean    | N   | Mean    | N   | Mean    | N   | Mean    | N   |
| Bait                         | \$9.9   | 57  | \$10.8  | 55  | \$15.0  | 70  | \$17.2  | 70  |
| Captain                      | \$69.9  | 119 | \$74.6  | 115 | \$107.6 | 121 | \$108.0 | 115 |
| Communication                | \$2.3   | 106 | \$2.6   | 101 | \$2.5   | 127 | \$2.4   | 125 |
| Crew                         | \$90.5  | 129 | \$98.3  | 126 | \$145.3 | 131 | \$148.7 | 127 |
| Fishing association dues     | \$4.4   | 69  | \$4.4   | 66  | \$6.0   | 91  | \$7.5   | 85  |
| Food                         | \$5.6   | 112 | \$5.8   | 107 | \$6.3   | 102 | \$7.2   | 90  |
| Freight                      | \$0.8   | 14  | \$1.0   | 16  | \$2.5   | 20  | \$1.1   | 22  |
| Fuel and lubrication         | \$52.7  | 130 | \$72.1  | 124 | \$80.7  | 131 | \$92.1  | 129 |
| Ice                          | \$6.7   | 94  | \$6.0   | 93  | \$6.0   | 98  | \$6.5   | 95  |
| License fees                 | —       | —   | —       | —   | \$3.3   | 126 | \$3.8   | 125 |
| Observers                    | \$5.5   | 12  | \$6.8   | 15  | \$3.2   | 102 | \$5.7   | 102 |
| Offloading                   | \$6.7   | 42  | \$7.6   | 41  | \$7.4   | 53  | \$11.3  | 38  |
| Supplies                     | \$9.0   | 94  | \$10.6  | 87  | \$6.0   | 97  | \$6.4   | 97  |
| Travel                       | \$2.1   | 31  | \$2.2   | 30  | \$1.9   | 24  | \$2.2   | 24  |
| Trucking of fish             |         | 0   | \$3.5   | 3   | \$5.2   | 5   | \$4.5   | 6   |
| Average total variable costs | \$234.5 | 130 | \$267.2 | 126 | \$360.5 | 132 | \$378.3 | 129 |

## 9.2 Fixed costs

### 9.2.1 Costs on vessel and on-board equipment, fishing gear, and processing equipment

Survey participants are asked to provide capitalized expenditures (Table 9.2) and expenses (Table 9.3) for the survey year associated with the following categories:

- New and used vessel and on-board equipment: Includes all electronics, safety equipment, and machinery not used to harvest fish, but not fishing gear or processing equipment
- Fishing gear: Includes nets, doors, traps, pots, cables, and fishing machinery used for the West Coast fisheries
- Processing Equipment: Includes any equipment used to process or head and gut fish on-board the vessel

**Table 9.2: Capitalized expenditures on vessel and on-board equipment, fishing gear, and processing equipment.** Average capitalized expenditures (thousands of \$) on vessel and on-board equipment, fishing gear, and processing equipment (N = number of EDC vessels with non-zero, non-NA responses).

| Expenditure category   | 2009    |     | 2010    |     | 2011     |     | 2012     |     |
|--|---------|-----|---------|-----|----------|-----|----------|-----|
|  | Mean    | N   | Mean    | N   | Mean     | N   | Mean     | N   |
| Vessel and on-board equipment in all fisheries                         | \$84.4‡ | 75  | \$55.5‡ | 73  | \$86.2‡  | 98  | \$148.0‡ | 91  |
| Fishing gear shared between the West Coast and other fisheries         | \$75.5‡ | 17  | \$65.9‡ | 20  | \$93.1‡  | 25  | \$91.1‡  | 16  |
| Fishing gear used only on the West Coast                               | \$26.2‡ | 67  | \$25.8‡ | 62  | \$41.5‡  | 91  | \$28.4‡  | 81  |
| Processing equipment shared between the West Coast and other fisheries |         | 0   |         | 0   | ***      | *** |          | 0   |
| Processing equipment used only on the West Coast                       | ***     | *** | ***     | *** | \$3.7‡   | 4   | ***      | *** |
| Average total capitalized expenditures                                 | \$98.2‡ | 97  | \$78.5‡ | 91  | \$120.5‡ | 121 | \$167.2‡ | 103 |

**Table 9.3: Expenses on vessel and on-board equipment, fishing gear, and processing equipment.** Average expenses (thousands of \$) on vessel and on-board equipment, fishing gear, and processing equipment (N = number of EDC vessels with non-zero, non-NA responses).

| Expense category   | 2009    |     | 2010    |     | 2011     |     | 2012     |     |
|--|---------|-----|---------|-----|----------|-----|----------|-----|
|  | Mean    | N   | Mean    | N   | Mean     | N   | Mean     | N   |
| Vessel and on-board equipment  | \$70.2‡ | 119 | \$65.2‡ | 113 | \$93.3‡  | 115 | \$93.7‡  | 114 |
| Fishing gear repair and maintenance shared between the West Coast and other fisheries        | \$60.2‡ | 29  | \$58.0‡ | 30  | \$104.1‡ | 30  | \$121.6‡ | 25  |
| Fishing gear repair and maintenance used only on the West Coast                              | \$22.0‡ | 104 | \$22.9‡ | 95  | \$25.4‡  | 106 | \$36.8‡  | 104 |
| Processing equipment shared between the West Coast and Alaska                                |         | 0   | ***     | *** | ***      | *** | \$13.7‡  | 3   |
| Average total costs on vessel and on-board equipment, fishing gear, and processing equipment | \$94.6‡ | 131 | \$88.9‡ | 127 | \$125.9‡ | 132 | \$135.3‡ | 130 |

## 9.2.2 Other fixed costs

**Table 9.4: Other fixed expenses.** Average fixed expenses (thousands of \$) on all other categories (N = number of EDC vessels with non-zero, non-NA responses).

| Expense category                | 2009    |     | 2010     |     | 2011    |     | 2012    |     |
|---------------------------------|---------|-----|----------|-----|---------|-----|---------|-----|
|                                 | Mean    | N   | Mean     | N   | Mean    | N   | Mean    | N   |
| Insurance premium payments      | \$35.1‡ | 120 | \$36.6‡  | 119 | \$38.3‡ | 128 | \$37.7‡ | 124 |
| Lease of vessel                 | \$86.4‡ | 12  | \$108.7‡ | 10  | \$95.2‡ | 10  | \$65.2‡ | 8   |
| Moorage                         | \$5.7‡  | 129 | \$6.3‡   | 123 | \$6.1‡  | 135 | \$6.7‡  | 130 |
| Average total other fixed costs | \$45.3‡ | 132 | \$48.2‡  | 129 | \$48.7‡ | 137 | \$46.2‡ | 131 |

**Table 9.5: Depreciation.** Average depreciation (thousands of \$) taken during the survey year (N = number of EDC vessels with non-zero, non-NA responses).

| Expense      | 2009    |    | 2010    |    | 2011     |    | 2012     |    |
|--------------|---------|----|---------|----|----------|----|----------|----|
|              | Mean    | N  | Mean    | N  | Mean     | N  | Mean     | N  |
| Depreciation | \$86.7‡ | 85 | \$76.5‡ | 80 | \$109.8‡ | 95 | \$103.0‡ | 88 |

### 9.3 Fixed costs on the West Coast only

As described above, not all costs reported on the EDC forms are for West Coast only operations. Therefore, cost disaggregation was required both to estimate total costs and net revenues on the West Coast and for individual fisheries. Research is currently being conducted to establish a method for allocating vessel level costs to the fishery level. This research explores allocating costs based on three variables, ex-vessel revenue, landings weight (including at-sea deliveries), and days at sea. The analyses below use a “mixed method” which chooses for each cost category the variable for disaggregation that is conceptually consistent with prior expectations from economic theory. A full description of the cost disaggregation method can be found in the appendix.

Calculation of the costs on vessel and on-board equipment, fishing gear, and processing equipment on the West Coast required first allocating a share of the total shared capitalized expenditures and expenses to the West Coast and then summing the capitalized expenditures and expenses (Table 9.6). The same cost disaggregation methods were also used to calculate the West Coast share of other fixed costs (Table 9.7).

**Table 9.6: West Coast costs on vessel and on-board equipment, fishing gear, and processing equipment.** Average capitalized expenditures and expenses (thousands of \$) on vessel and on-board equipment, fishing gear, and processing equipment vessel and on-board equipment, fishing gear, and processing equipment on the West Coast (N = number of EDC vessels with non-zero, non-NA responses).

| Cost category  | 2009     |     | 2010    |     | 2011     |     | 2012     |     |
|--|----------|-----|---------|-----|----------|-----|----------|-----|
|  | Mean     | N   | Mean    | N   | Mean     | N   | Mean     | N   |
| Vessel and on-board equipment  | \$70.0‡  | 122 | \$57.1‡ | 118 | \$108.9‡ | 120 | \$143.6‡ | 123 |
| Fishing gear   | \$44.3‡  | 125 | \$45.8‡ | 119 | \$82.2‡  | 127 | \$69.3‡  | 124 |
| Processing equipment   | ***      | *** | ***     | *** | \$16.1‡  | 6   | \$10.6‡  | 3   |
| Average total costs on vessel and on-board equipment, fishing gear, and processing equipment | \$109.5‡ | 130 | \$99.7‡ | 124 | \$180.2‡ | 131 | \$203.7‡ | 129 |

**Table 9.7: West Coast other fixed expenses.** Average other fixed expenses (thousands of \$) on the West Coast (N = number of EDC vessels with non-zero, non-NA responses).

| Expense category   | 2009                |     | 2010                |     | 2011                |     | 2012                |     |
|--|---------------------|-----|---------------------|-----|---------------------|-----|---------------------|-----|
|  | Mean                | N   | Mean                | N   | Mean                | N   | Mean                | N   |
| Insurance premium payments (hull and machinery, protection and indemnity, and pollution insurance) | \$25.7 <sup>‡</sup> | 117 | \$26.2 <sup>‡</sup> | 115 | \$27.7 <sup>‡</sup> | 122 | \$29.1 <sup>‡</sup> | 121 |
| Lease of vessel  | \$20.5 <sup>‡</sup> | 12  | \$49.0 <sup>‡</sup> | 10  | \$32.6 <sup>‡</sup> | 10  | \$29.3 <sup>‡</sup> | 7   |
| Moorage  | \$4.0 <sup>‡</sup>  | 127 | \$4.3 <sup>‡</sup>  | 120 | \$4.5 <sup>‡</sup>  | 131 | \$5.2 <sup>‡</sup>  | 127 |
| Average total other fixed costs  | \$29.0 <sup>‡</sup> | 130 | \$31.9 <sup>‡</sup> | 126 | \$32.6 <sup>‡</sup> | 132 | \$34.2 <sup>‡</sup> | 128 |

## 9.4 Summary of West Coast costs

**Table 9.8: Summary of costs on the West Coast.** Average capitalized expenditures and expenses (thousands of \$) on vessel and on-board equipment, fishing gear, and processing equipment, other fixed costs, and all variable costs on the West Coast (N = number of EDC vessels with non-zero, non-NA responses).

| Cost category  | 2009                 |     | 2010                 |     | 2011                 |     | 2012                 |     |
|--|----------------------|-----|----------------------|-----|----------------------|-----|----------------------|-----|
|  | Mean                 | N   | Mean                 | N   | Mean                 | N   | Mean                 | N   |
| Total costs on vessel and on-board equipment, fishing gear, and processing equipment | \$109.5 <sup>‡</sup> | 130 | \$99.7 <sup>‡</sup>  | 124 | \$169.5 <sup>‡</sup> | 131 | \$201.6 <sup>‡</sup> | 129 |
| Total variable costs   | \$234.5 <sup>‡</sup> | 130 | \$267.2 <sup>‡</sup> | 126 | \$360.5 <sup>‡</sup> | 132 | \$378.3 <sup>‡</sup> | 129 |
| Total other fixed costs  | \$29.0 <sup>‡</sup>  | 130 | \$31.9 <sup>‡</sup>  | 126 | \$32.6 <sup>‡</sup>  | 132 | \$34.2 <sup>‡</sup>  | 128 |
| Average total costs  | \$372.9 <sup>‡</sup> | 130 | \$397.2 <sup>‡</sup> | 126 | \$557.1 <sup>‡</sup> | 133 | \$613.8 <sup>‡</sup> | 129 |

## 9.5 Quota and permit costs on the West Coast

**Table 9.9: Quota and permit costs.** Average costs related to lease and purchase of quota shares, quota pounds, and limited entry groundfish permits (N = number of EDC vessels with non-zero, non-NA responses).

| Expense                                     | 2009     |    | 2010     |     | 2011      |     | 2012     |     |
|---|----------|----|----------|-----|-----------|-----|----------|-----|
|   | Mean     | N  | Mean     | N   | Mean      | N   | Mean     | N   |
| Purchase of trawl limited entry permit      | \$28,934 | 8  | ***      | *** | ***       | *** | \$133    | 3   |
| Lease of trawl limited entry permit         | \$17,261 | 7  | \$14,119 | 8   | \$27,405  | 10  | \$19,284 | 9   |
| Purchase of fixed gear limited entry permit |          | 0  |          | 0   | ***       | *** |          | 0   |
| Lease of fixed gear limited entry permit    |          | 0  |          | 0   | ***       | *** | \$93,557 | 3   |
| Purchase of quota shares                    |          | 0  |          | 0   | ***       | *** | ***      | *** |
| Lease of quota shares                       |          | 0  | ***      | *** | \$22,072  | 3   | \$10,622 | 4   |
| Purchase of quota pounds                    |          | 0  | ***      | *** | \$16,659  | 16  | \$18,415 | 12  |
| Lease of quota pounds                       | \$19,112 | 3  | ***      | *** | \$86,656  | 53  | \$60,306 | 50  |
| Average total quota and permit costs        | \$22,758 | 18 | \$29,830 | 20  | \$103,278 | 69  | \$56,740 | 66  |

## 9.6 Landings taxes and buyback fees

Costs associated with landings taxes were not requested on the catcher vessel forms because it can be calculated based on gross shoreside landings information. These costs were calculated according to the table provided on page 14 of Leonard and Watson (2011).<sup>1</sup> Unlike in the description in Leonard and Watson (2011), moorage was requested on the EDC forms.

**Table 9.10: Landings taxes.** Average taxes (\$) paid by vessels (N = number of EDC vessels with non-zero, non-NA responses).

| Expense               | 2009                    |     | 2010                    |     | 2011                    |     | 2012                    |     |
|-----------------------|-------------------------|-----|-------------------------|-----|-------------------------|-----|-------------------------|-----|
|                       | Mean                    | N   | Mean                    | N   | Mean                    | N   | Mean                    | N   |
| Buyback taxes         | \$15,230.5 <sup>‡</sup> | 123 | \$16,648.3 <sup>‡</sup> | 122 | \$26,887.0 <sup>‡</sup> | 126 | \$20,983.8 <sup>‡</sup> | 123 |
| Washington fish taxes | \$3,139.1 <sup>‡</sup>  | 19  | \$3,050.6 <sup>‡</sup>  | 24  | \$5,123.8 <sup>‡</sup>  | 32  | \$5,543.1 <sup>‡</sup>  | 25  |
| Average total taxes   | \$15,715.4 <sup>‡</sup> | 123 | \$17,248.4 <sup>‡</sup> | 122 | \$27,966.3 <sup>‡</sup> | 127 | \$22,110.4 <sup>‡</sup> | 123 |

<sup>1</sup> Leonard, J., and P. Watson. 2011. Description of the input-output model for Pacific Coast fisheries. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-111, 64 p.

## 10 Net Revenue and Economic Profit

Net returns from operating a vessel are presented in this section. The level of net returns not only indicates whether a vessel is a viable ongoing business, but also the size of net benefit that is created from society's perspective. Two different measures of net returns are examined. They differ in the types of costs that are taken into account, and therefore, their interpretation and use. The first is a monetary, financial measure that attempts to track a vessel's net cash flow, which we call *net revenue*. It is calculated as revenue minus monetary costs. The only costs that are accounted for are those that are actually paid or associated with a financial transaction. The second measure attempts to track the broader economic performance of a vessel and includes all costs regardless of whether there is a cash or financial transaction. Costs are measured by their true resource costs, which may or may not be equal to monetary outlays. This measure is called *economic profit*<sup>1</sup>. The distinction between the two measures is probably most easily understood through a few examples relevant to fisheries.

Labor costs for the net revenue measure are the total payments to the crew and captain. If work is performed that is not paid for, then it is not included as a cost. This commonly occurs in commercial fishing when the owner of a vessel is also the captain, but does not draw a captain's wage. In this case, the net revenue is higher than it would be if the captain drew a wage or hired a captain. In the end, the vessel owner-captain is not necessarily any worse off since s/he is the residual claimant to the net revenue. However, the net revenue would be higher than a comparable vessel that hired a captain.<sup>2</sup> Economic profit, on the other hand, accounts for the cost associated with an owner's time that is used as a captain. This is called an opportunity cost in the economics literature<sup>3</sup>, and is typically approximated by the wage of a comparably productive captain<sup>4</sup>.

A second example of the difference between net revenue and economic profit is the treatment of vessel capital costs. Again, net revenue only includes costs that are actually paid, which includes items such as vessel repair, maintenance, and upgrades. Economic profit would also include the opportunity cost of owning the vessel, a capital asset. By owning a vessel, the owner foregoes other investment

<sup>1</sup> Whitmarsh D., James C., Pickering H., Neiland A. 2000. The profitability of marine commercial fisheries: a review of economic information needs with particular reference to the UK. *Marine Policy*, Vol. 24(3), pp. 257-263

<sup>2</sup> The same would also be true when a vessel owner does not receive a wage for work performed to repair or maintain a vessel or gear.

<sup>3</sup> See Boardman, Anthony, David Greenberg, and Aidan Vining. *Cost-Benefit Analysis: Concepts and Practice*, Prentice Hall, NJ. 2000. pp. 31-32.

<sup>4</sup> A more accurate measure would be the owner-captain's most valued wage off the vessel.

opportunities that would provide a rate of return. This is called the opportunity cost of capital, and is typically approximated by the market rate of return associated with businesses of comparable risk, multiplied by the market value of the vessel.

Both net revenue and economic profit are useful measures for fishery management. Net revenue attempts to measure the annual financial well-being of vessel operations. It can be used to determine if there is a monetary gain or loss, or how changes in fishery management may affect the level of monetary gain or loss. Economic profit is a better indicator of the long-term viability of fishery operations since it includes all costs, and values the costs at their opportunity cost. It can be used to estimate whether there are incentives or disincentives to invest in capital, or enter and leave the fishery. It is also a better measure of the net benefit of the fishery to the nation.

Calculations of net revenue are included in this report. The cost categories used in net revenue, based on those reported in the EDC forms, are discussed below. Currently, calculations of economic profit are beyond the scope of the report. Economic profit relies on opportunity costs, which may be different from some of the costs reported on the EDC forms, so additional methods and analyses are required. The EDC Program economists will continue to work on developing measures of economic profit so that it may be included in future reports.

Net revenue is calculated two ways: using only variable costs, and using variable costs plus fixed costs (total costs)<sup>5</sup>. The first calculation is called *variable cost net revenue*, while the second is called *total cost net revenue*. Variable cost net revenue is useful to examine changes in fishery operations that are not so great as to affect fixed costs. For example, the cost of fishing an additional day, or catching an additional metric ton of fish, is better represented by only considering variable costs. Total cost net revenue is usually a better summary measure of financial gain or loss for an entire year, season, or fishery.

There are several caveats associated with the net revenue calculations in this report. As noted in the Section 9, there are a variety of costs that are associated with running a vessel that are not requested by the EDC form because it is difficult to determine the share of the cost associated with the vessel. These costs include items that can be used for activities other than fishing, or are too difficult to allocate to a particular vessel in a multi-vessel company. These expenses include office space, vehicles and transport trucks, storage of equipment, professional fees, and marketing. In general, the EDC forms attempt to capture only costs that are directly related to vessel maintenance and fishing operations, and not costs that are related to activities or equipment off the vessel. Therefore, the EDC calculated net revenue is an overestimate of the true net revenue. The difference is likely much greater for total cost net revenue than variable cost net revenue since most of the excluded costs are fixed costs.

Another caveat is that the EDC forms do not collect information about income taxes or financing costs. This has several implications. The first is that these costs are not included in the net revenue calculations. Therefore, net revenue is greater than it would be otherwise. The second is that in lieu

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<sup>5</sup> See Section 9 for a more complete discussion of variable and fixed costs used in this report

of financing information (principal and interest payments), EDC total cost net revenue uses the total costs associated with vessel and gear purchases, repair, maintenance and improvements. For example, if a new engine is purchased, the total cost of the engine is used, even though the actual cash outlay, if it were financed, would only be the principal and interest payments made that year. It is likely that many larger capital costs, and perhaps some operating costs, are financed. This would mean that the actual cash outlays in a particular year for those items would be less than what is used in the EDC for the net revenue calculation. This may balance out over time, because previously financed or purchased capital and equipment are also not included, except for the year in which they are purchased<sup>6</sup>. Total cost net revenue is expected to be representative of actual total cost net revenue only when averaged over many years and across vessels because relatively large capital costs occur periodically.

## 10.1 Net revenue for all West Coast fishing activities

Average net revenue is calculated for all activities on the West Coast for EDC vessels, and it is reported by fishery for EDC vessels. West Coast revenue includes all revenue from at-sea deliveries and shoreside landings. The variable and fixed costs do not include costs related to acquiring limited entry permits, quota shares, or quota pounds.

$$\text{Variable cost net revenue} = \text{West Coast revenue} - \text{West Coast variable costs}$$

$$\text{Total cost net revenue} = \text{West Coast revenue} - (\text{West Coast variable costs} + \text{West Coast fixed costs})$$

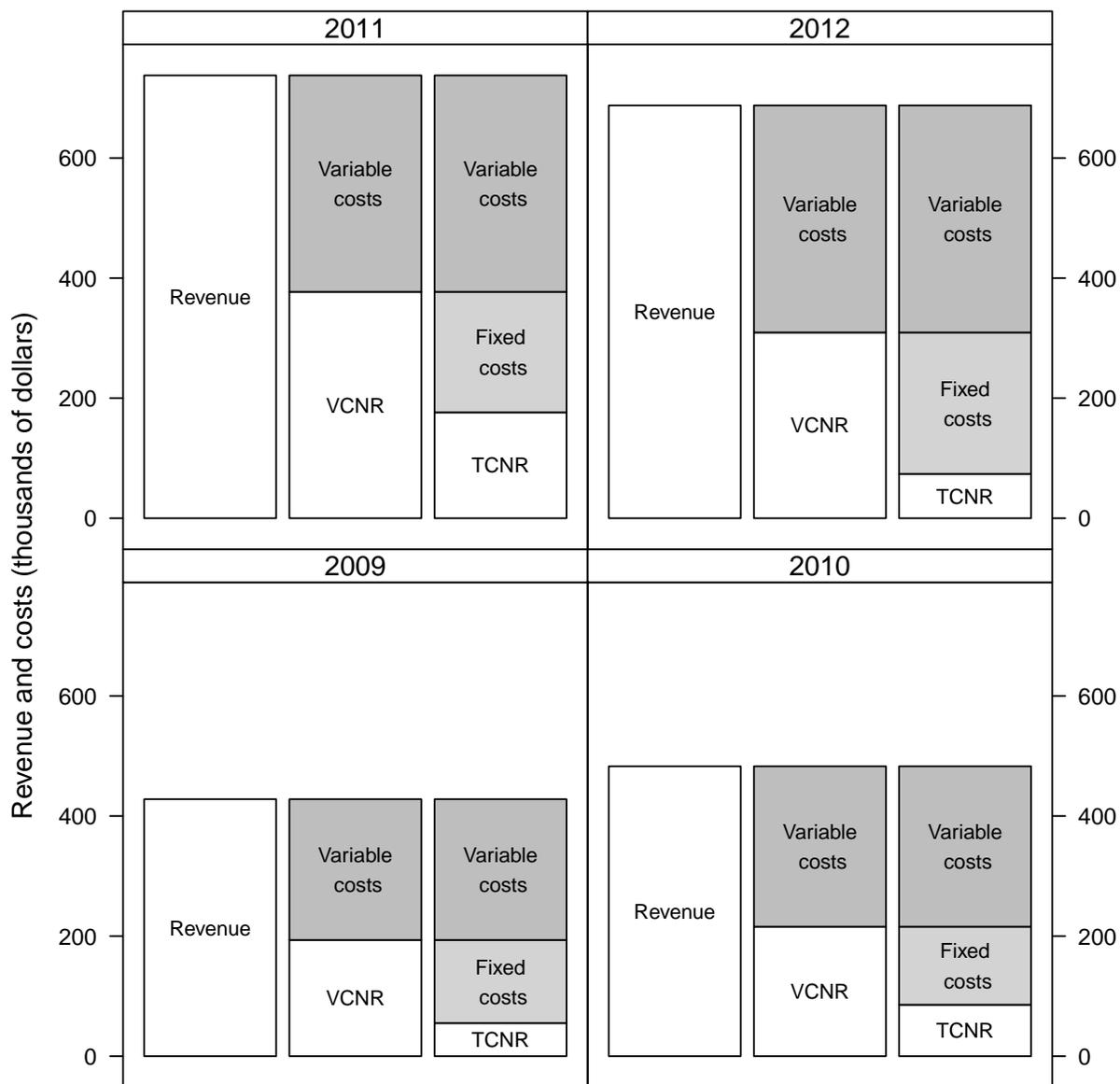
**Table 10.1: Revenues and costs on permits and quota.** Average revenues and costs (thousands of \$) from sale, lease, and purchase of limited entry groundfish permits, quota pounds, and quota shares on the West Coast (N = number of EDC vessels with non-zero, non-NA responses).

| Type                          | 2009              |     | 2010               |     | 2011               |     | 2012               |    |
|-------------------------------|-------------------|-----|--------------------|-----|--------------------|-----|--------------------|----|
|                               | Mean              | N   | Mean               | N   | Mean               | N   | Mean               | N  |
| Limited entry permit revenues | ***               | *** | 309.3 <sup>‡</sup> | 4   | 114.2 <sup>‡</sup> | 11  | 195.0 <sup>‡</sup> | 8  |
| Limited entry permit costs    | 20.3 <sup>‡</sup> | 23  | 59.6 <sup>‡</sup>  | 24  | 140.8 <sup>‡</sup> | 17  | 38.1 <sup>‡</sup>  | 18 |
| Quota pounds revenues         | ***               | *** | 334.0 <sup>‡</sup> | 3   | 103.7 <sup>‡</sup> | 64  | 102.2 <sup>‡</sup> | 63 |
| Quota pounds costs            | 19.1 <sup>‡</sup> | 3   | 48.1 <sup>‡</sup>  | 4   | 77.7 <sup>‡</sup>  | 75  | 59.7 <sup>‡</sup>  | 71 |
| Quota shares revenues         | ***               | *** | —                  | —   | 64.2 <sup>‡</sup>  | 13  | 77.0 <sup>‡</sup>  | 13 |
| Quota shares costs            | —                 | —   | ***                | *** | ***                | *** | 10.8 <sup>‡</sup>  | 5  |

<sup>6</sup> At best it is just a partial balancing out because the interest payments are not accounted in the EDC data

**Table 10.2: West Coast average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) on the West Coast. Fixed costs include capitalized expenditures, capital expenses, and other fixed costs (N = number of EDC vessels with non-zero, non-NA responses).

|                                  | 2009      |     | 2010      |     | 2011      |     | 2012      |     |
|----------------------------------|-----------|-----|-----------|-----|-----------|-----|-----------|-----|
|                                  | Mean      | N   | Mean      | N   | Mean      | N   | Mean      | N   |
| Revenue                          | \$428.0   | 130 | \$482.9   | 126 | \$737.6   | 132 | \$687.7   | 129 |
| (Variable costs)                 | (\$234.5) | 130 | (\$267.2) | 126 | (\$360.5) | 132 | (\$378.3) | 129 |
| <b>Variable cost net revenue</b> | \$193.6   | 130 | \$215.7   | 126 | \$377.2   | 132 | \$309.4   | 129 |
| (Fixed costs)                    | (\$138.5) | 130 | (\$130.0) | 126 | (\$200.8) | 132 | (\$235.5) | 129 |
| <b>Total cost net revenue</b>    | \$55.1    | 130 | \$85.7    | 126 | \$176.4   | 132 | \$73.9    | 129 |

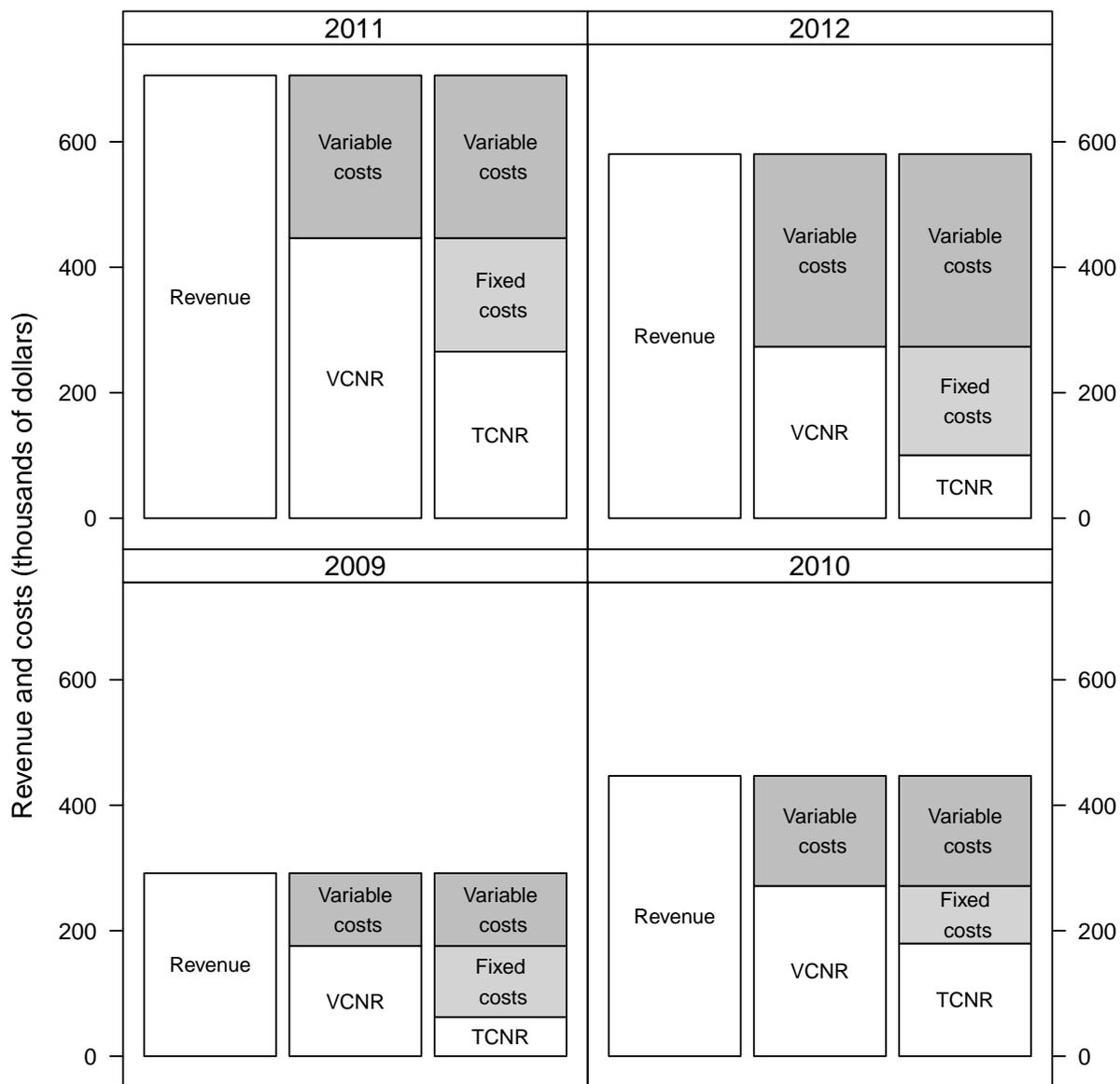


**Figure 10.1: West Coast average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) on the West Coast. Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

## 10.2 Net revenue for West Coast catch share fisheries, crab, shrimp, and other fisheries

**Table 10.3: At-sea Pacific whiting fishery average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) in the At-sea Pacific whiting fishery (N = number of EDC vessels with non-zero, non-NA responses). Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

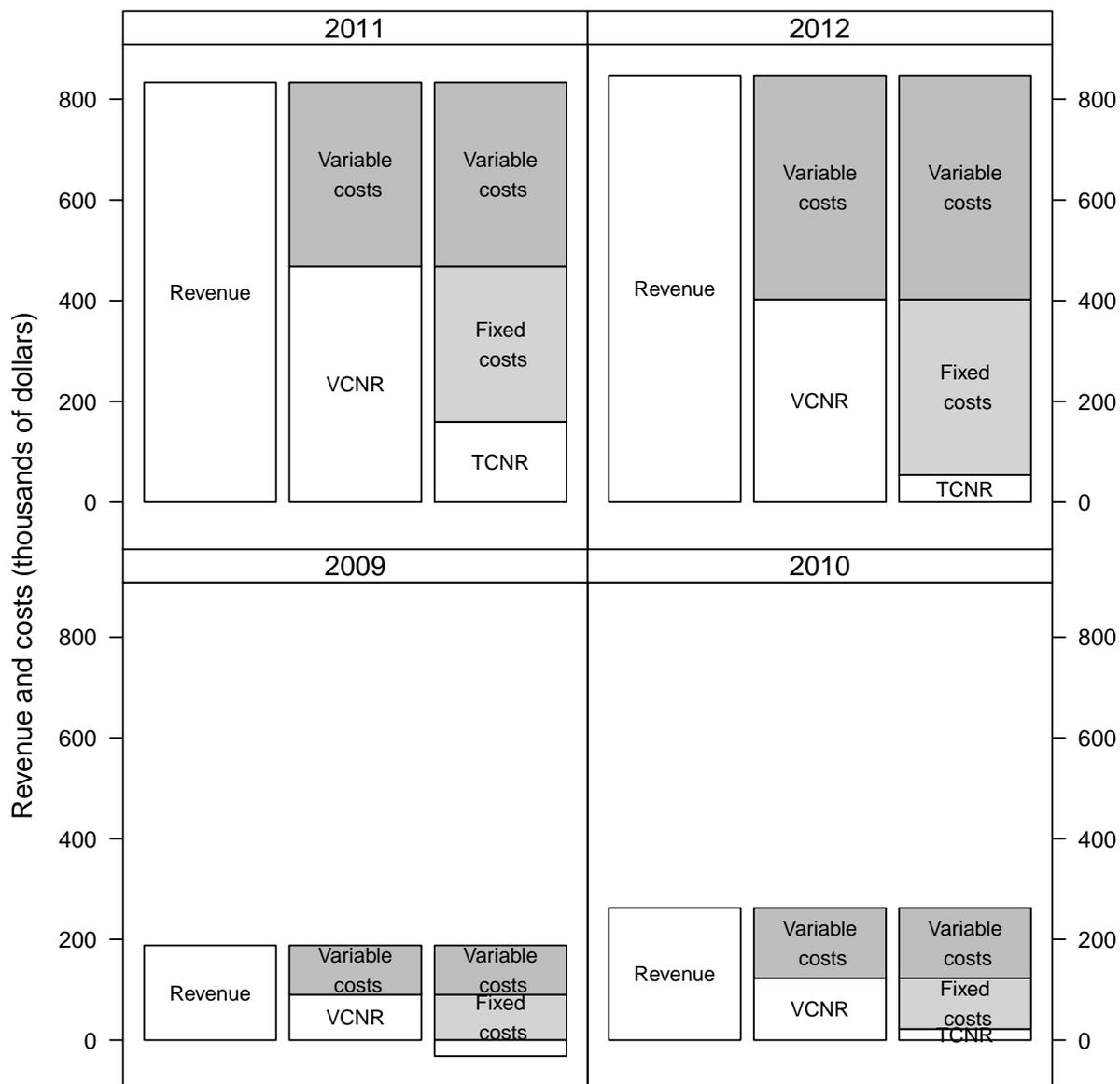
|                                  | 2009      |    | 2010      |    | 2011      |    | 2012      |    |
|----------------------------------|-----------|----|-----------|----|-----------|----|-----------|----|
|                                  | Mean      | N  | Mean      | N  | Mean      | N  | Mean      | N  |
| Revenue                          | \$291.7   | 20 | \$446.8   | 20 | \$705.9   | 18 | \$580.4   | 16 |
| (Variable costs)                 | (\$116.0) | 20 | (\$175.4) | 20 | (\$259.3) | 18 | (\$306.8) | 16 |
| <b>Variable cost net revenue</b> | \$175.7   | 20 | \$271.4   | 20 | \$446.6   | 18 | \$273.6   | 16 |
| (Fixed costs)                    | (\$113.3) | 20 | (\$91.7)  | 20 | (\$181.1) | 18 | (\$173.1) | 16 |
| <b>Total cost net revenue</b>    | \$62.4    | 20 | \$179.7   | 20 | \$265.5   | 18 | \$100.5   | 16 |



**Figure 10.2: At-sea Pacific whiting fishery variable cost net revenue and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) in the at-sea Pacific whiting fishery.

**Table 10.4: Shoreside Pacific whiting fishery average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) in the Shoreside Pacific whiting fishery (N = number of EDC vessels with non-zero, non-NA responses). Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

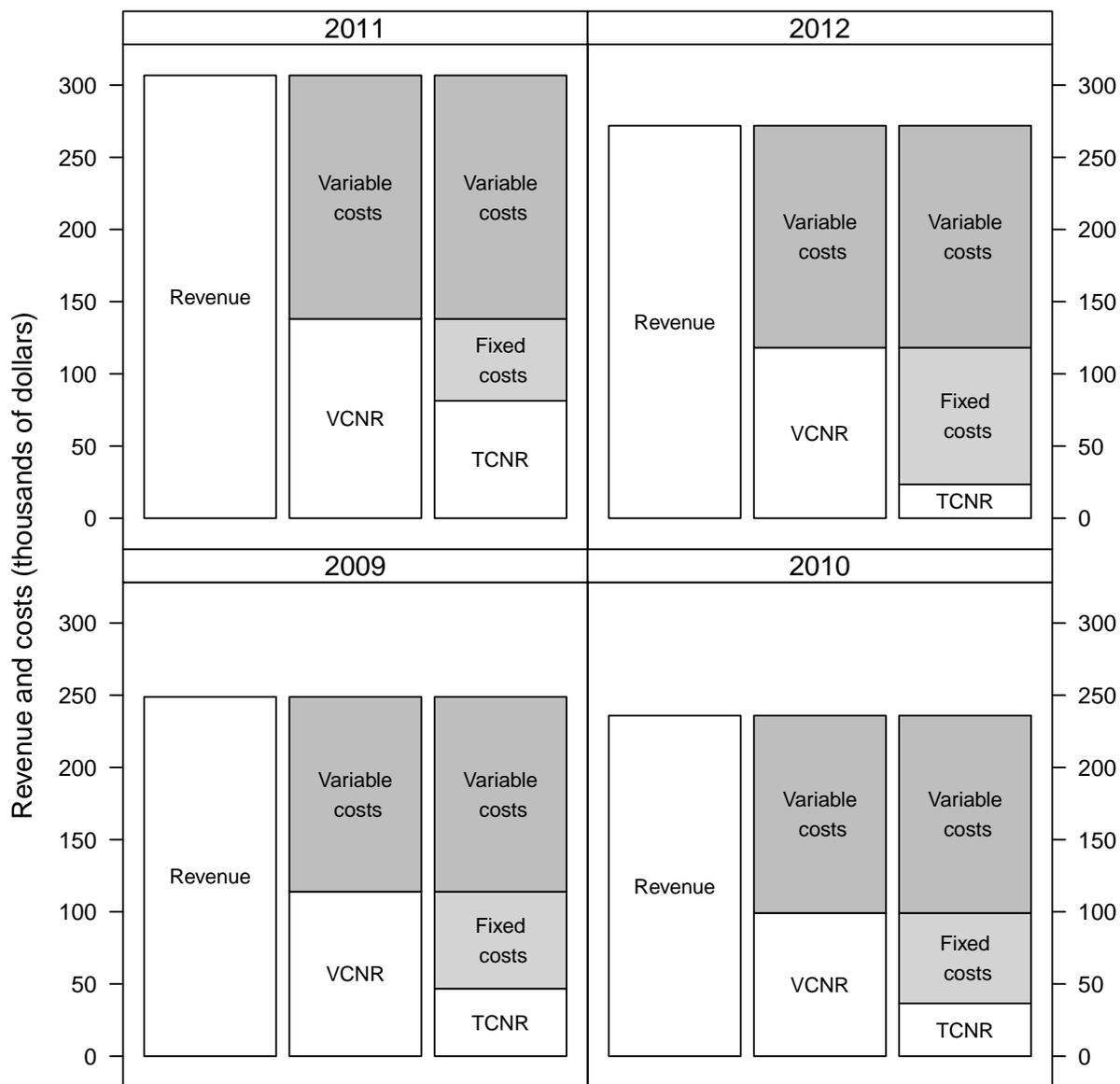
|                                  | 2009      |    | 2010      |    | 2011      |    | 2012      |    |
|----------------------------------|-----------|----|-----------|----|-----------|----|-----------|----|
|                                  | Mean      | N  | Mean      | N  | Mean      | N  | Mean      | N  |
| Revenue                          | \$188.1   | 35 | \$269.9   | 35 | \$832.9   | 26 | \$847.3   | 24 |
| (Variable costs)                 | (\$97.8)  | 35 | (\$139.3) | 36 | (\$365.0) | 26 | (\$444.7) | 24 |
| <b>Variable cost net revenue</b> | \$90.2    | 35 | \$123.1   | 36 | \$467.9   | 26 | \$402.6   | 24 |
| (Fixed costs)                    | (\$122.1) | 35 | (\$101.0) | 36 | (\$308.6) | 26 | (\$348.6) | 24 |
| <b>Total cost net revenue</b>    | -\$31.9   | 35 | \$22.1    | 36 | \$159.3   | 26 | \$53.9    | 24 |



**Figure 10.3: Shoreside Pacific whiting fishery variable cost net revenue and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) in the shoreside Pacific whiting fishery.

**Table 10.5: DTS trawl with trawl endorsement fishery average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) in the DTS trawl with trawl endorsement fishery (N = number of EDC vessels with non-zero, non-NA responses). Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

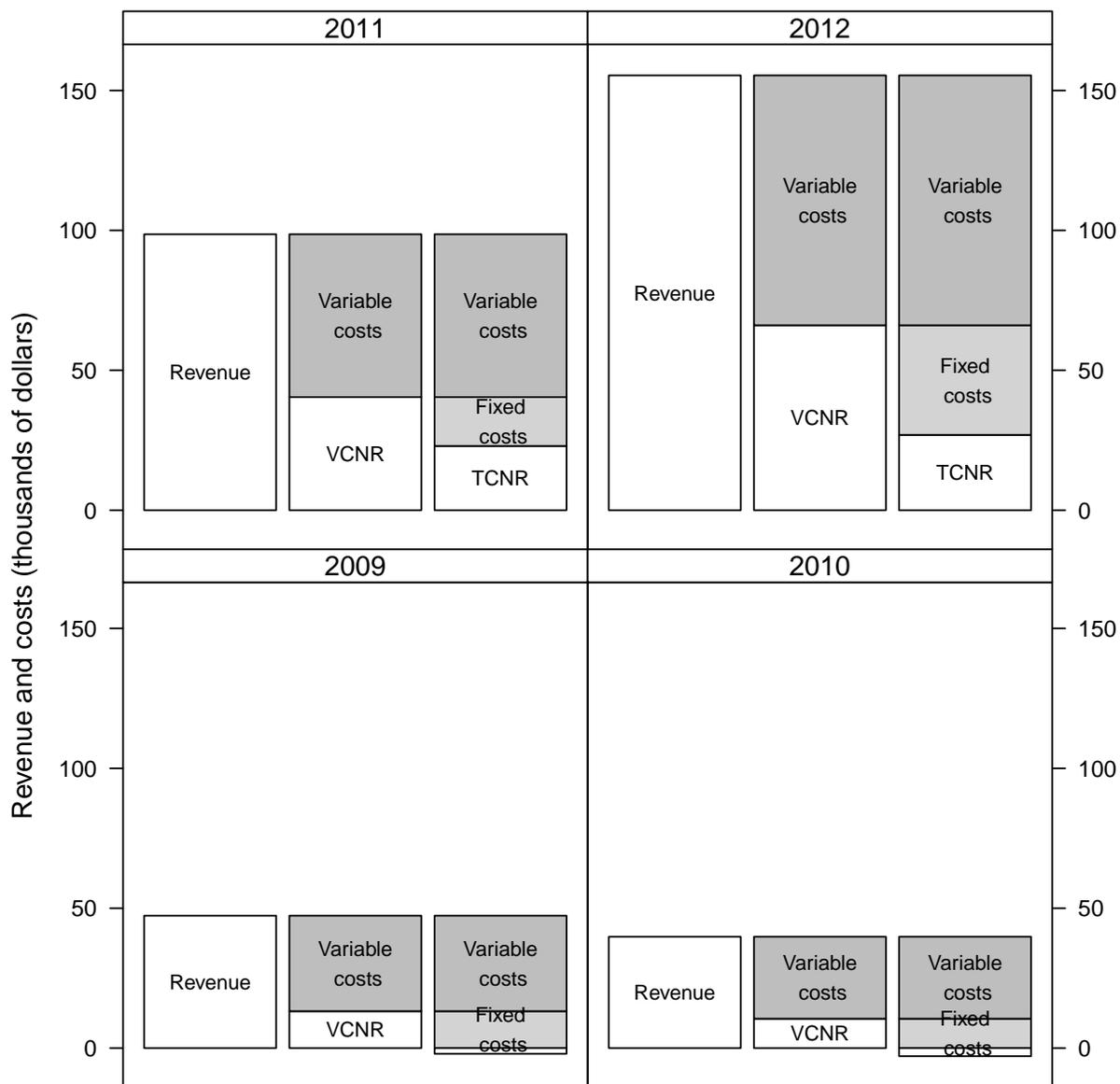
|                                  | 2009      |    | 2010      |    | 2011      |    | 2012      |    |
|----------------------------------|-----------|----|-----------|----|-----------|----|-----------|----|
|                                  | Mean      | N  | Mean      | N  | Mean      | N  | Mean      | N  |
| Revenue                          | \$248.9   | 99 | \$235.9   | 93 | \$306.7   | 64 | \$271.9   | 59 |
| (Variable costs)                 | (\$134.9) | 99 | (\$136.7) | 93 | (\$168.6) | 64 | (\$153.7) | 59 |
| <b>Variable cost net revenue</b> | \$113.9   | 99 | \$99.2    | 93 | \$138.1   | 64 | \$118.2   | 59 |
| (Fixed costs)                    | (\$67.2)  | 99 | (\$62.6)  | 93 | (\$56.8)  | 64 | (\$94.8)  | 59 |
| <b>Total cost net revenue</b>    | \$46.7    | 99 | \$36.5    | 93 | \$81.3    | 64 | \$23.4    | 59 |



**Figure 10.4: DTS trawl with trawl endorsement fishery variable cost net revenue and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) in the DTS trawl with trawl endorsement fishery.

**Table 10.6: Non-whiting, non-DTS trawl with trawl endorsement fishery average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) in the Non-whiting, non-DTS trawl with trawl endorsement fishery (N = number of EDC vessels with non-zero, non-NA responses). Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

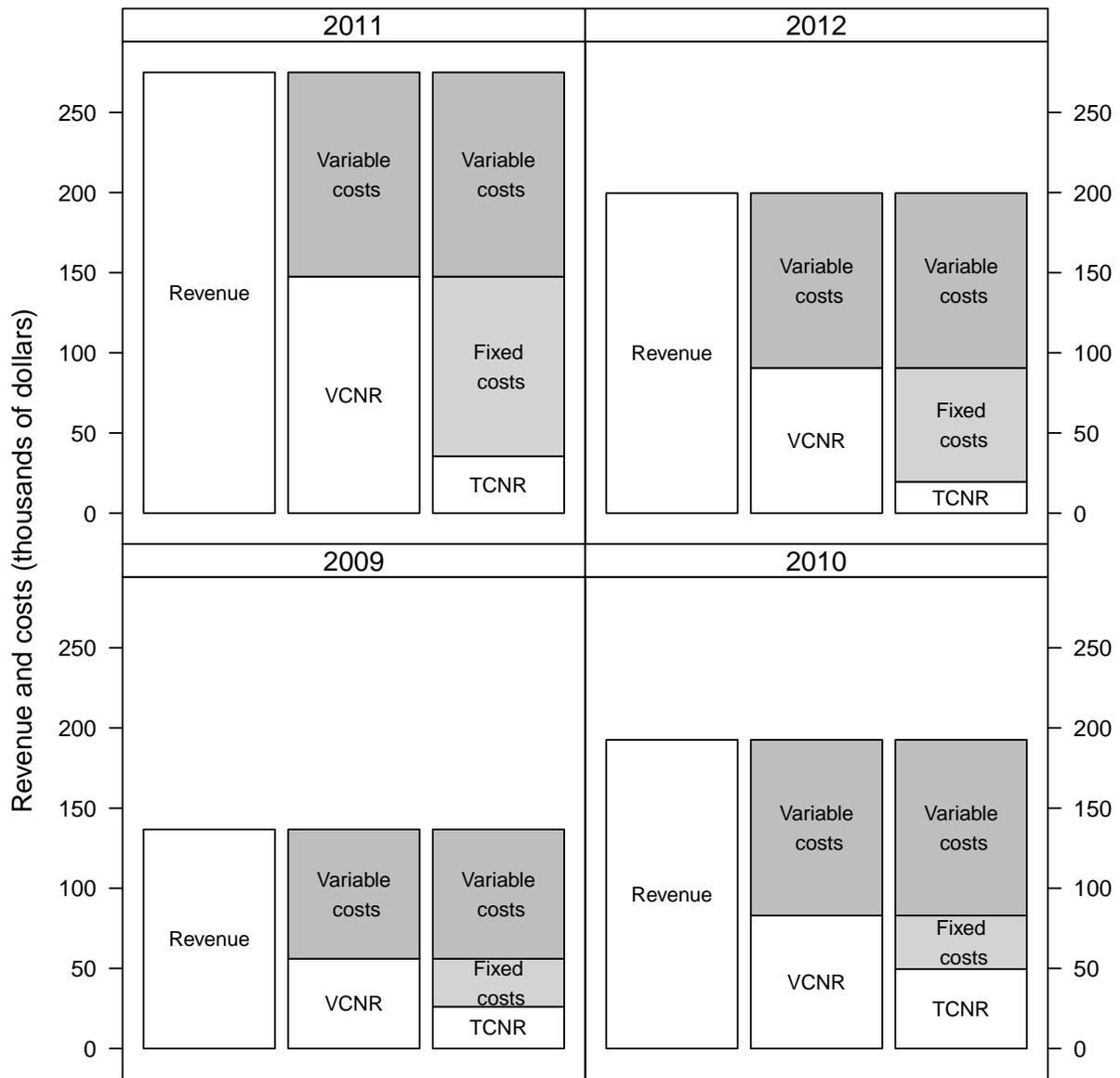
|                                  | 2009     |    | 2010     |    | 2011     |    | 2012     |    |
|----------------------------------|----------|----|----------|----|----------|----|----------|----|
|                                  | Mean     | N  | Mean     | N  | Mean     | N  | Mean     | N  |
| Revenue                          | \$47.3   | 80 | \$40.4   | 69 | \$100.6  | 49 | \$155.4  | 52 |
| (Variable costs)                 | (\$34.1) | 80 | (\$29.3) | 70 | (\$58.2) | 50 | (\$89.3) | 52 |
| <b>Variable cost net revenue</b> | \$13.2   | 80 | \$10.5   | 70 | \$40.4   | 50 | \$66.1   | 52 |
| (Fixed costs)                    | (\$15.2) | 80 | (\$13.4) | 70 | (\$17.4) | 50 | (\$39.2) | 52 |
| <b>Total cost net revenue</b>    | -\$2.0   | 80 | -\$2.9   | 70 | \$23.0   | 50 | \$26.9   | 52 |



**Figure 10.5: Non-whiting, non-DTS trawl with trawl endorsement fishery variable cost net revenue and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) in the non-DTS trawl with trawl endorsement fishery.

**Table 10.7: Groundfish fixed gear with trawl endorsement fishery average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) in the Groundfish fixed gear with trawl endorsement fishery (N = number of EDC vessels with non-zero, non-NA responses). Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

|                                  | 2009     |   | 2010      |   | 2011      |    | 2012      |    |
|----------------------------------|----------|---|-----------|---|-----------|----|-----------|----|
|                                  | Mean     | N | Mean      | N | Mean      | N  | Mean      | N  |
| Revenue                          | \$136.7  | 8 | \$192.6   | 9 | \$275.0   | 26 | \$199.6   | 27 |
| (Variable costs)                 | (\$80.6) | 8 | (\$109.6) | 9 | (\$127.4) | 26 | (\$109.0) | 27 |
| <b>Variable cost net revenue</b> | \$56.1   | 8 | \$83.0    | 9 | \$147.5   | 26 | \$90.6    | 27 |
| (Fixed costs)                    | (\$29.9) | 8 | (\$33.4)  | 9 | (\$112.1) | 26 | (\$71.0)  | 27 |
| <b>Total cost net revenue</b>    | \$26.1   | 8 | \$49.6    | 9 | \$35.4    | 26 | \$19.6    | 27 |



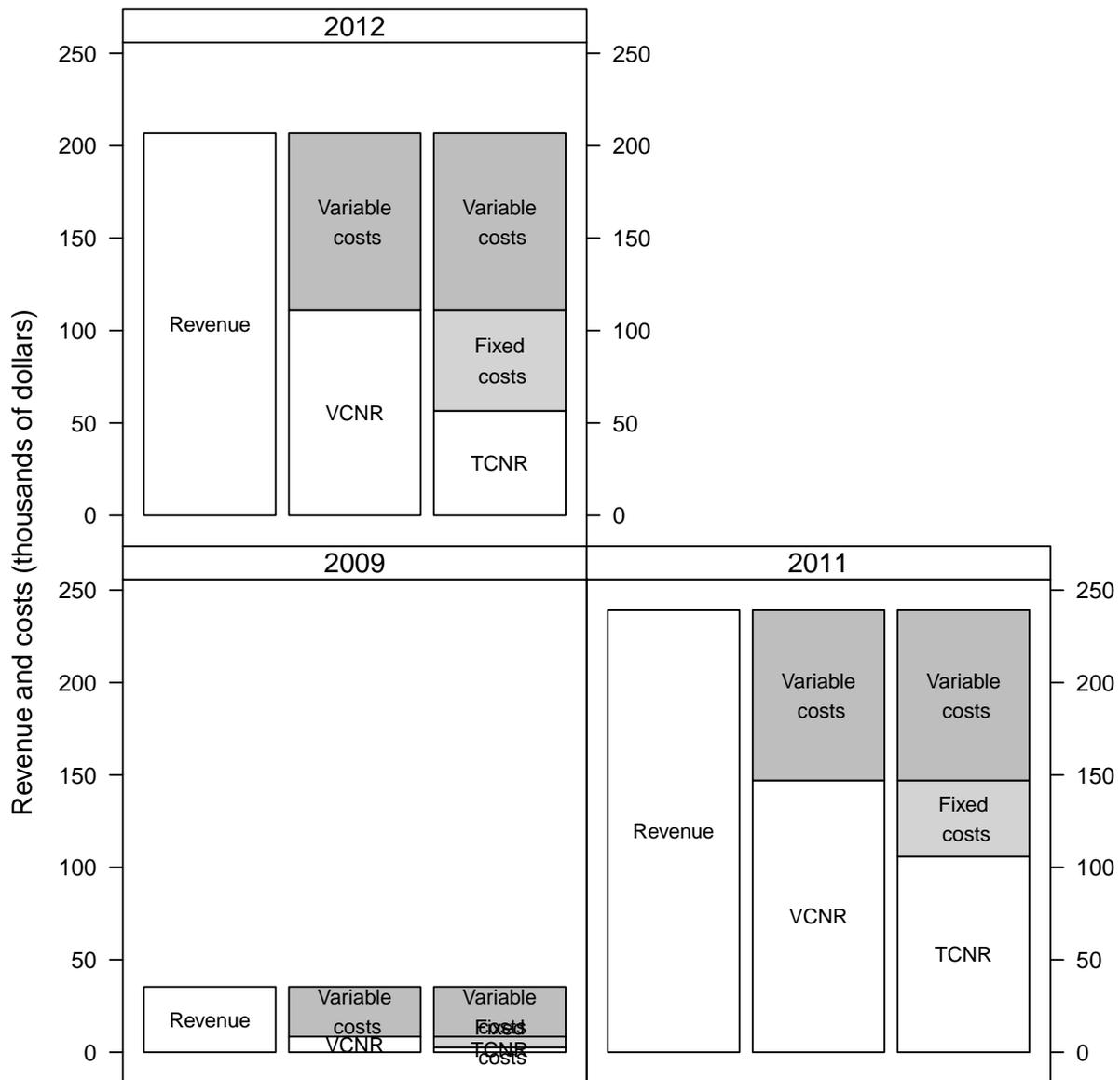
**Figure 10.6: Groundfish fixed gear with trawl endorsement fishery variable cost net revenue and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) in the groundfish fixed gear with trawl endorsement fishery.

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**Table 10.8: Groundfish fixed gear with fixed gear endorsement fishery average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) in the Groundfish fixed gear with fixed gear endorsement fishery (N = number of EDC vessels with non-zero, non-NA responses). Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

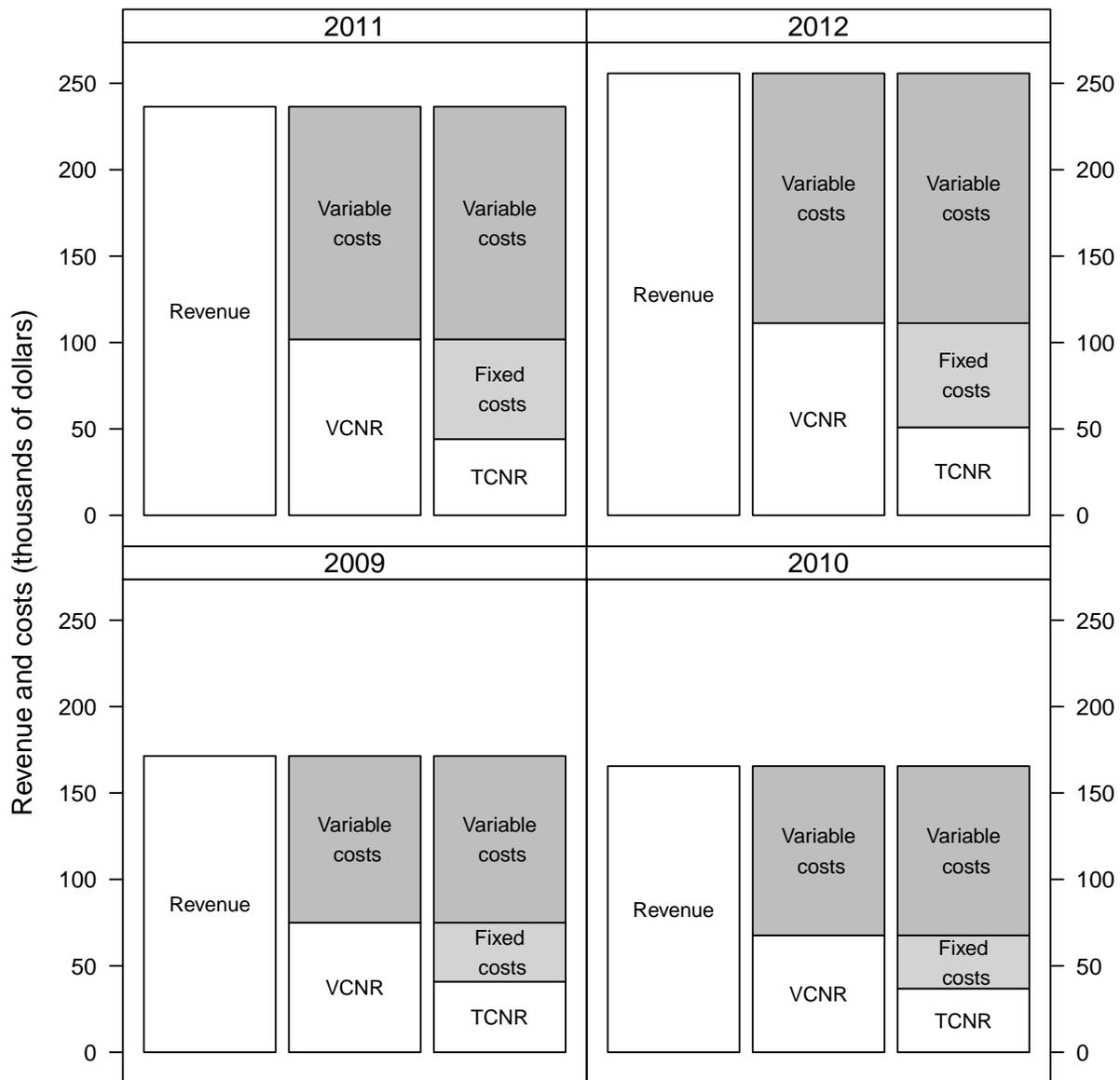
|                                  | 2009 |     | 2010 |   | 2011     |   | 2012     |   |
|----------------------------------|------|-----|------|---|----------|---|----------|---|
|                                  | Mean | N   | Mean | N | Mean     | N | Mean     | N |
| Revenue                          | ***  | *** | —    | — | \$239.1  | 7 | \$206.7  | 6 |
| (Variable costs)                 | ***  | *** | —    | — | (\$92.0) | 7 | (\$95.8) | 6 |
| <b>Variable cost net revenue</b> | ***  | *** | —    | — | \$147.1  | 7 | \$110.9  | 6 |
| (Fixed costs)                    | ***  | *** | —    | — | (\$41.2) | 7 | (\$54.3) | 6 |
| <b>Total cost net revenue</b>    | ***  | *** | —    | — | \$105.8  | 7 | \$56.6   | 6 |



**Figure 10.7: Groundfish fixed gear with trawl endorsement fishery variable cost net revenue and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) in the groundfish fixed gear with fixed gear endorsement fishery.

**Table 10.9: Crab fishery average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) in the Crab fishery (N = number of EDC vessels with non-zero, non-NA responses). Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

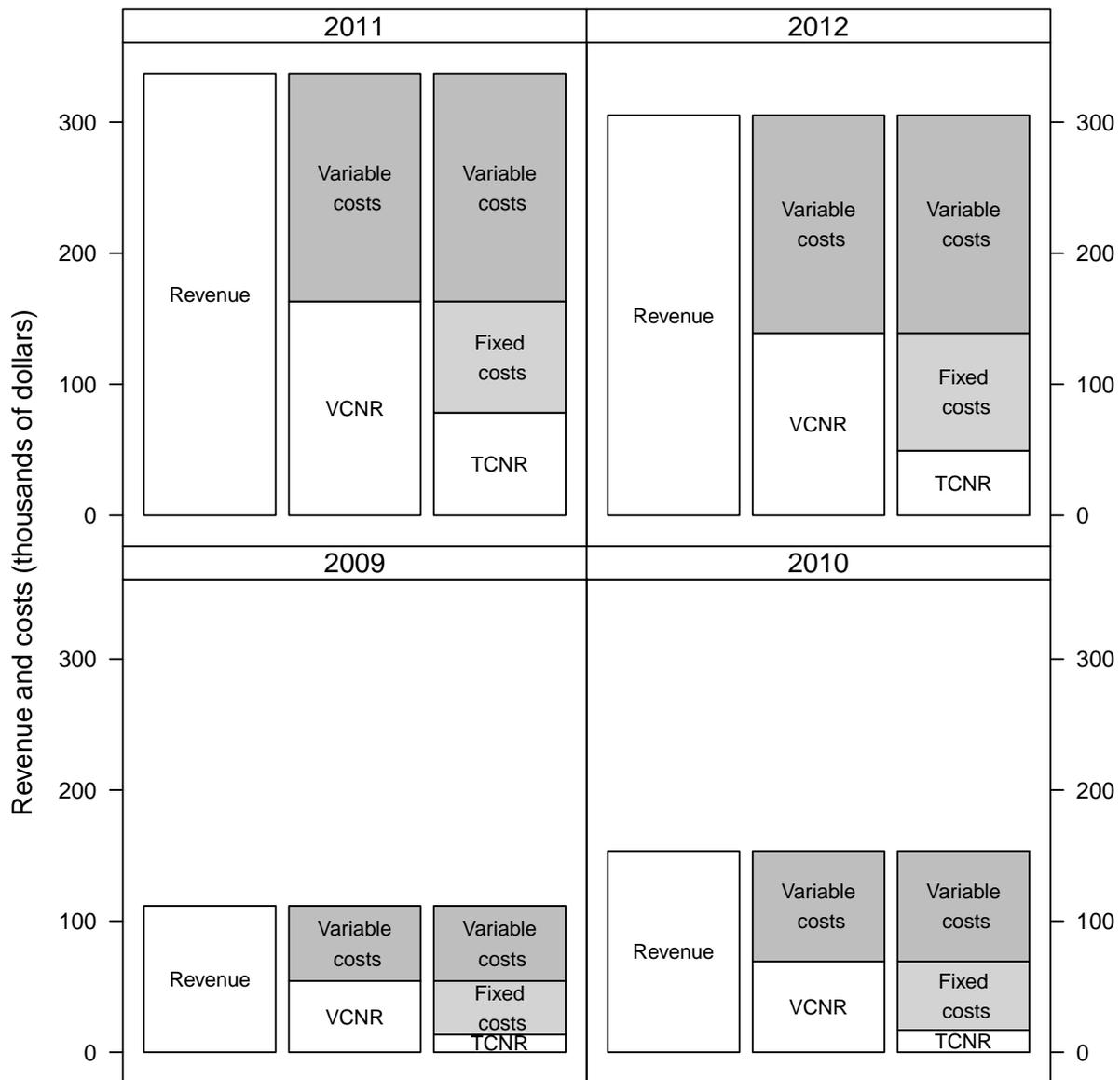
|                                  | 2009     |    | 2010     |    | 2011      |    | 2012      |    |
|----------------------------------|----------|----|----------|----|-----------|----|-----------|----|
|                                  | Mean     | N  | Mean     | N  | Mean      | N  | Mean      | N  |
| Revenue                          | \$171.4  | 53 | \$165.6  | 52 | \$236.5   | 50 | \$255.8   | 47 |
| (Variable costs)                 | (\$96.5) | 53 | (\$97.9) | 52 | (\$134.6) | 50 | (\$144.5) | 47 |
| <b>Variable cost net revenue</b> | \$75.0   | 53 | \$67.6   | 52 | \$101.9   | 50 | \$111.3   | 47 |
| (Fixed costs)                    | (\$34.1) | 53 | (\$30.8) | 52 | (\$57.8)  | 50 | (\$60.3)  | 47 |
| <b>Total cost net revenue</b>    | \$40.9   | 53 | \$36.8   | 52 | \$44.1    | 50 | \$50.9    | 47 |



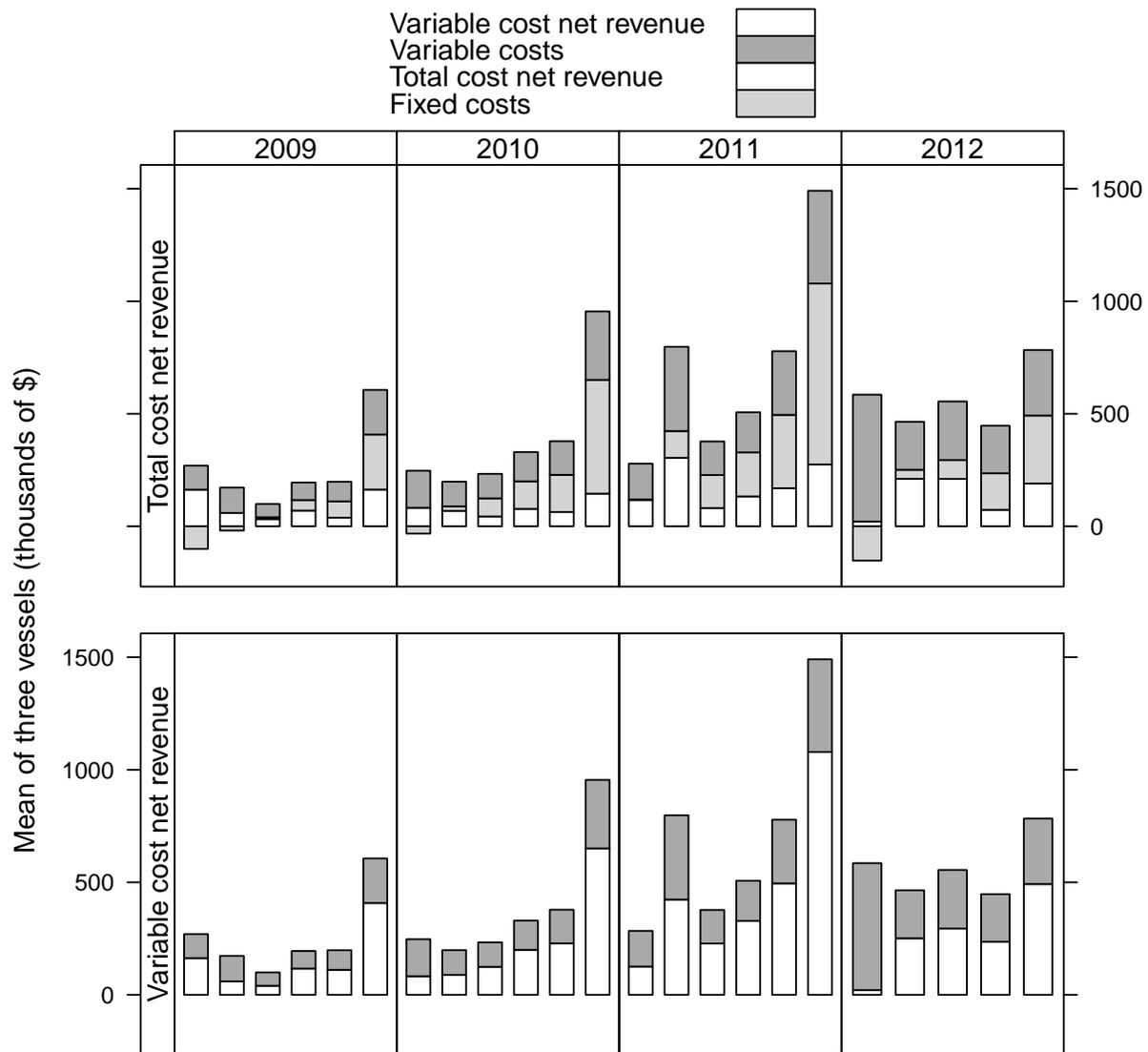
**Figure 10.8: Crab fishery variable cost net revenue and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) in the crab fishery.

**Table 10.10: Shrimp fishery average variable cost and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue, fixed costs, and total cost net revenue (thousands of \$) in the Shrimp fishery (N = number of EDC vessels with non-zero, non-NA responses). Fixed costs include capitalized expenditures, capital expenses, and other fixed costs.

|                                  | 2009     |    | 2010     |    | 2011      |    | 2012      |    |
|----------------------------------|----------|----|----------|----|-----------|----|-----------|----|
|                                  | Mean     | N  | Mean     | N  | Mean      | N  | Mean      | N  |
| Revenue                          | \$111.7  | 31 | \$153.5  | 35 | \$337.2   | 31 | \$305.3   | 33 |
| (Variable costs)                 | (\$57.4) | 31 | (\$84.1) | 35 | (\$174.0) | 31 | (\$166.2) | 33 |
| <b>Variable cost net revenue</b> | \$54.3   | 31 | \$69.3   | 35 | \$163.2   | 31 | \$139.1   | 33 |
| (Fixed costs)                    | (\$40.9) | 31 | (\$52.4) | 35 | (\$84.8)  | 31 | (\$89.8)  | 33 |
| <b>Total cost net revenue</b>    | \$13.4   | 31 | \$16.9   | 35 | \$78.4    | 31 | \$49.3    | 33 |

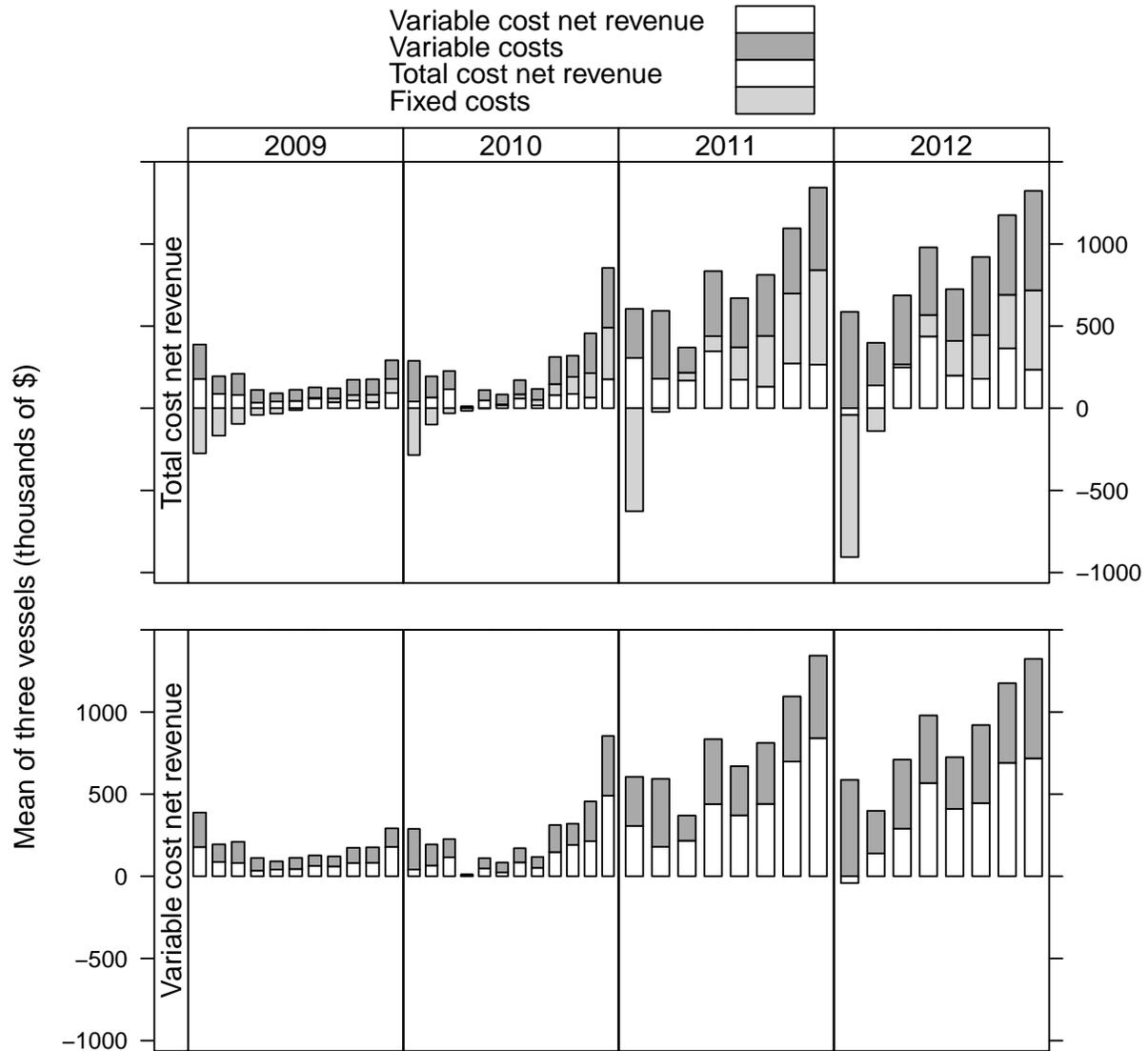


**Figure 10.9: Shrimp fishery variable cost net revenue and total cost net revenue.** Average total revenue, variable costs, variable cost net revenue (VCNR), fixed costs, and total cost net revenue (TCNR) in the shrimp fishery.



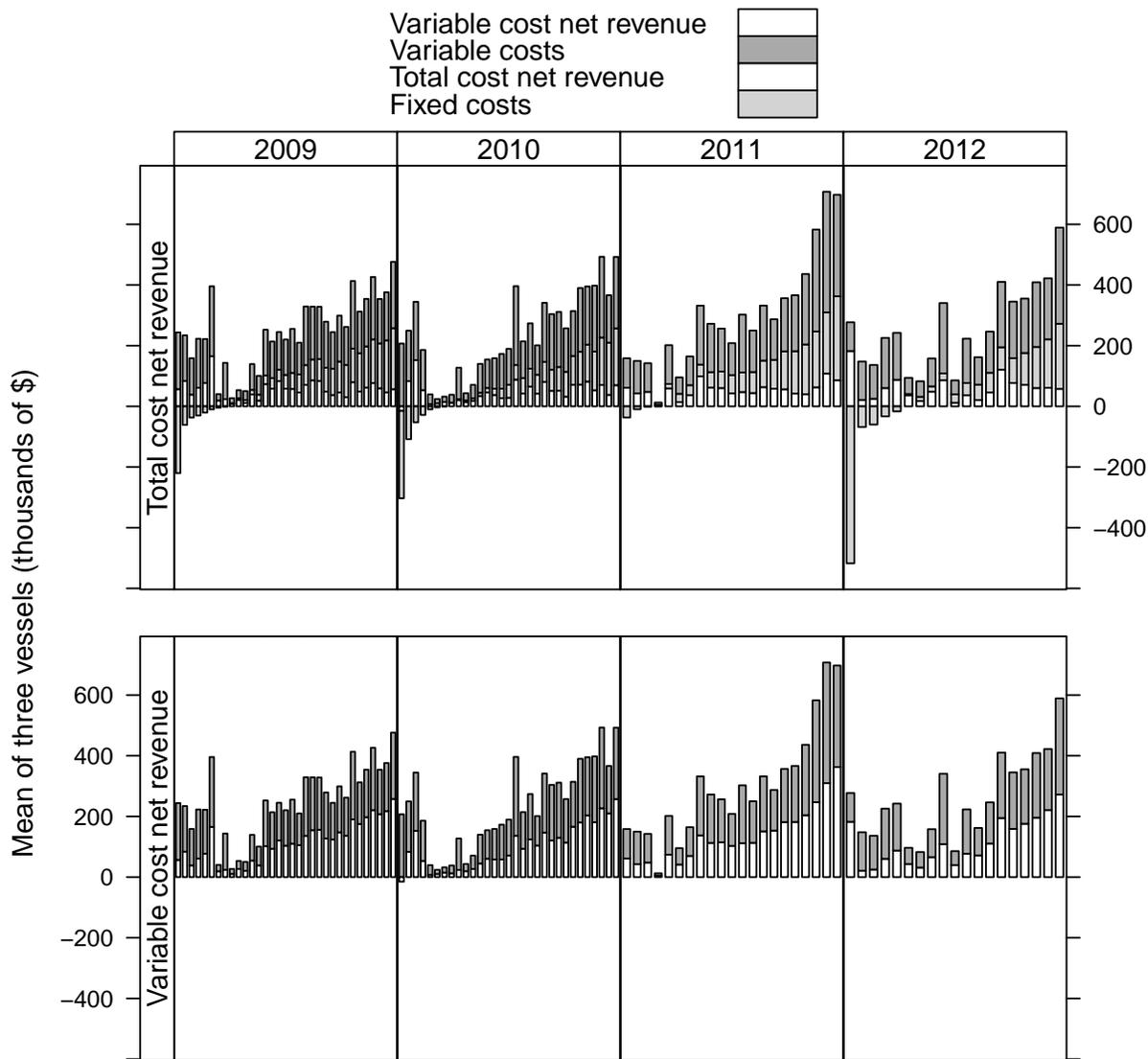
Vessels grouped by three and ordered by total cost net revenue

**Figure 10.10: Net revenue in the at-sea Pacific whiting fishery by vessel groups.** Revenue, fixed costs, variable costs, variable cost net revenue, and total cost net revenue in the at-sea Pacific whiting fishery. To protect confidentiality, vessels were sorted by revenue, put into groups of three vessels, and then means were calculated on the group of vessels.



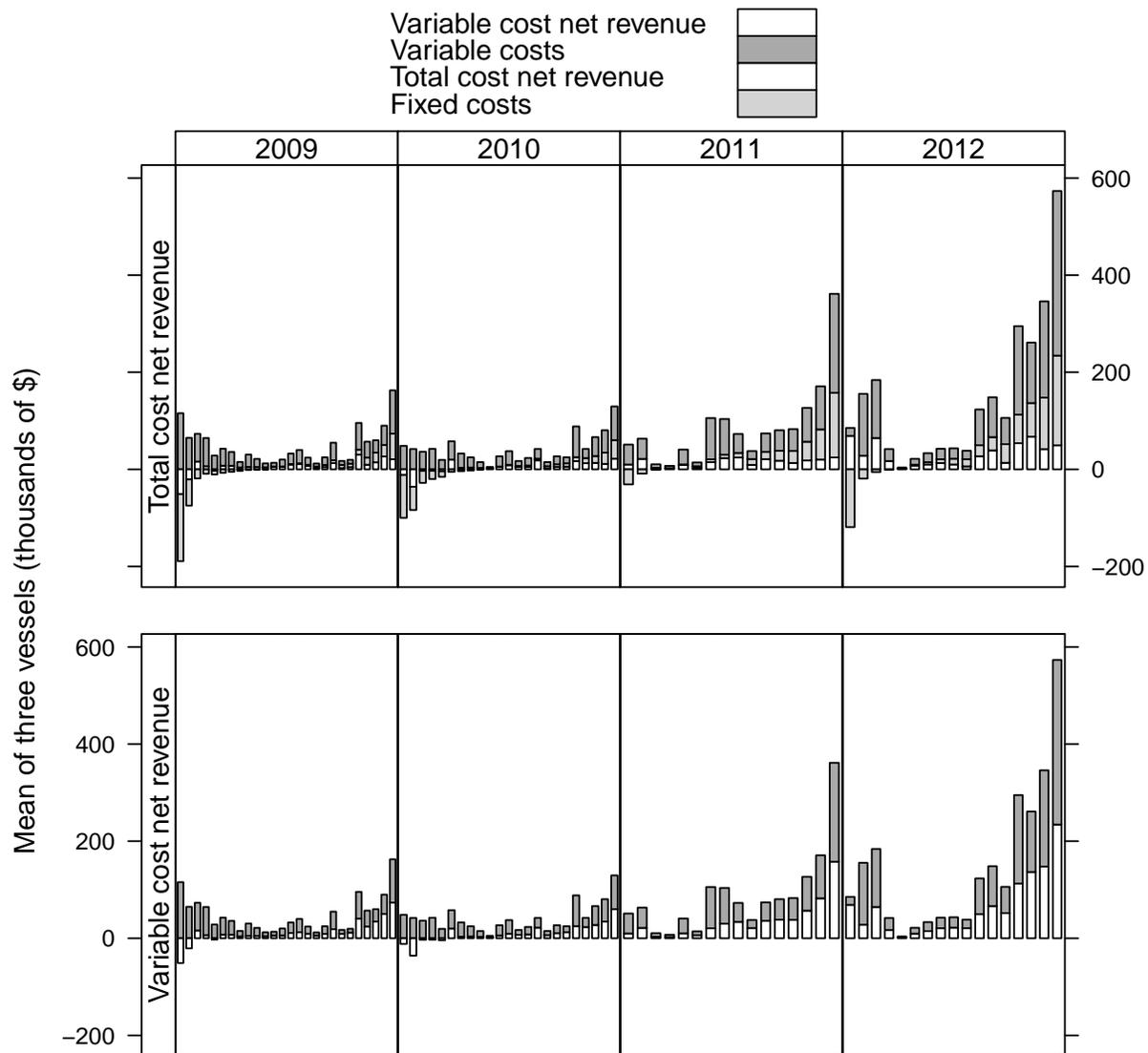
Vessels grouped by three and ordered by total cost net revenue

**Figure 10.11: Net revenue in the shoreside Pacific whiting fishery by vessel groups.** Revenue, fixed costs, variable costs, variable cost net revenue, and total cost net revenue in the shoreside Pacific whiting fishery. To protect confidentiality, vessels were sorted by revenue and means were calculated on groups of three vessels.



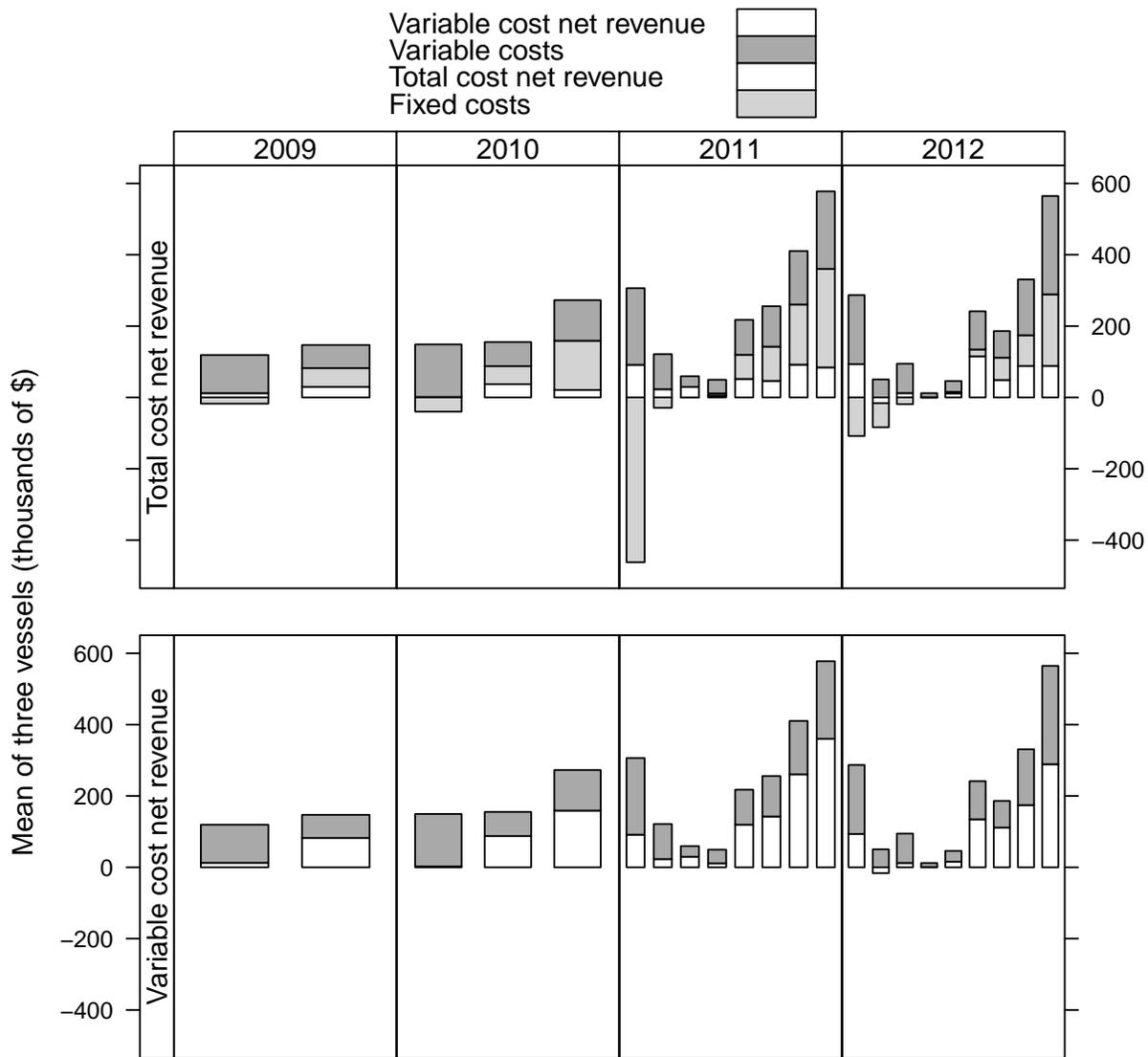
Vessels grouped by three and ordered by total cost net revenue

**Figure 10.12: Net revenue in the DTS trawl with trawl endorsement fishery by vessel groups.** Revenue, fixed costs, variable costs, variable cost net revenue, and total cost net revenue in the DTS trawl with trawl endorsement fishery. To protect confidentiality, vessels were sorted by revenue and means were calculated on groups of three vessels.



Vessels grouped by three and ordered by total cost net revenue

**Figure 10.13: Net revenue in the non-whiting, non-DTS trawl with trawl endorsement fishery by vessel groups.** Revenue, fixed costs, variable costs, variable cost net revenue, and total cost net revenue in the non-whiting, non-DTS trawl with trawl endorsement fishery. To protect confidentiality, vessels were sorted by revenue and means were calculated on groups of three vessels.



Vessels grouped by three and ordered by total cost net revenue

**Figure 10.14: Net revenue in the groundfish fixed gear with trawl endorsement fishery by vessel groups.** Revenue, fixed costs, variable costs, variable cost net revenue, and total cost net revenue in the groundfish fixed gear with trawl endorsement fishery. To protect confidentiality, vessels were sorted by revenue and means were calculated on groups of three vessels.

# 11 Crew Share System

The most common system for remunerating crew is the crew share system where crew are paid a percentage of the total revenue earned by the vessel after certain expenses are deducted. Most vessels in the groundfish trawl fishery use this system (Table 11.1).

**Table 11.1: Frequency of crew share distributions.** Number of entities who used a crew share system, did not use a crew share system, or did not respond to the question. An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.

| Crew share system | 2009 | 2010 | 2011 | 2012 |
|-------------------|------|------|------|------|
| YES               | 127  | 123  | 121  | 114  |
| NO                | 5    | 5    | 14   | 17   |
| No response       | 1    | 2    | 8    | 0    |

Participants were asked to provide the percentage of fishing trips in which the vessel owner served as captain in West Coast groundfish fisheries (Table 11.2). In 2012, 91 participants provided the response "NA". These responses are most commonly a result of ownership of a vessel by an LLC that is not identified with a specific person who could operate the vessel as a captain.

**Table 11.2: Percentage of trips with owner operated vessels.** Average percentage of trips when the vessel owner served as captain.

| Share  | 2009 |    | 2010 |    | 2011 |    | 2012 |    |
|--|------|----|------|----|------|----|------|----|
|  | Mean | N  | Mean | N  | Mean | N  | Mean | N  |
| Percentage of trips vessel owner served as captain | 87.3 | 50 | 81.9 | 51 | 88.9 | 51 | 80.7 | 42 |

**Table 11.3: Average crew shares when vessels were owner operated.** Average share paid to captain, crew, vessel, and other on trips when the vessel owner served as captain (N = number of EDC vessels with non-zero, non-NA responses).

| Share         | 2009 |    | 2010 |    | 2011 |    | 2012 |    |
|---------------|------|----|------|----|------|----|------|----|
|               | Mean | N  | Mean | N  | Mean | N  | Mean | N  |
| Captain share | 24.5 | 41 | 20.5 | 36 | 22.5 | 41 | 19.3 | 33 |
| Crew share    | 24.2 | 52 | 22.9 | 52 | 25.0 | 52 | 24.9 | 45 |
| Vessel share  | 58.8 | 51 | 62.3 | 51 | 59.8 | 51 | 60.5 | 45 |
| Other share   | —    | —  | —    | —  | 12.7 | 3  | 24.0 | 5  |

**Table 11.4: Average crew shares when using a hired captain.** Average share paid to captain, crew, vessel, and other on trips when the vessel owner did not serve as captain (N = number of EDC vessels with non-zero, non-NA responses).

| Share         | 2009 |    | 2010 |    | 2011 |    | 2012 |    |
|---------------|------|----|------|----|------|----|------|----|
|               | Mean | N  | Mean | N  | Mean | N  | Mean | N  |
| Captain share | 17.7 | 94 | 17.8 | 93 | 17.9 | 91 | 18.0 | 87 |
| Crew share    | 21.7 | 98 | 21.2 | 96 | 22.2 | 93 | 22.4 | 89 |
| Vessel share  | 60.3 | 96 | 61.1 | 94 | 59.1 | 92 | 59.3 | 89 |
| Other share   | —    | —  | —    | —  | 7.3  | 6  | 8.0  | 8  |

**Table 11.5: Fixed costs deducted before calculating crew shares.** Percent of entities who deducted fixed costs by cost category (N = number of entities that used a crew share system to pay its crew when operating in West Coast groundfish fisheries during the survey year). An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.

| Expenses category                              | 2009 |     | 2010 |     | 2011 |     | 2012 |     |
|--|------|-----|------|-----|------|-----|------|-----|
|  | %    | N   | %    | N   | %    | N   | %    | N   |
| Depreciation                                   | 0%   | 133 | 0%   | 130 | —    | 0   | —    | 0   |
| Insurance                                      | 2.3% | 133 | 1.5% | 130 | 1.4% | 143 | 1.5% | 133 |
| Lease of vessel                                | 0%   | 133 | 1.5% | 130 | 0.7% | 143 | 2.3% | 133 |
| Limited entry permit                           | 0%   | 133 | 0.8% | 130 | 2.1% | 143 | 2.3% | 133 |
| Onboard equipment repair and maintenance       | 0%   | 133 | 0%   | 130 | —    | 0   | —    | 0   |
| Other permits                                  | 0%   | 133 | 0%   | 130 | —    | 0   | —    | 0   |
| Other West Coast permits                       | —    | 0   | —    | 0   | 0%   | 143 | 1.5% | 133 |
| Repair and maintenance fishing gear            | 0%   | 133 | 0%   | 130 | —    | 0   | —    | 0   |
| Repair and maintenance on processing equipment | 0%   | 133 | 0%   | 130 | —    | 0   | —    | 0   |

**Table 11.6: Variable costs deducted before calculating crew shares.** Percent of entities who deducted variable costs by cost category (N = number of entities that used a crew share system to pay its crew when operating in West Coast groundfish fisheries during the survey year). An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.

| Expenses category                 | 2009  |     | 2010  |     | 2011  |     | 2012  |     |
|-----------------------------------|-------|-----|-------|-----|-------|-----|-------|-----|
|                                   | %     | N   | %     | N   | %     | N   | %     | N   |
| Bait                              | 32.3% | 133 | 31.5% | 130 | 37.8% | 143 | 39.8% | 133 |
| Buy back taxes                    | —     | 0   | —     | 0   | 58%   | 143 | 63.9% | 133 |
| Communication                     | 3%    | 133 | 2.3%  | 130 | 2.8%  | 143 | 5.3%  | 133 |
| Fishing association dues          | 36.8% | 133 | 36.9% | 130 | 32.2% | 143 | 33.1% | 133 |
| Food                              | 46.6% | 133 | 42.3% | 130 | 51.7% | 143 | 46.6% | 133 |
| Freight to the vessel on supplies | 0%    | 133 | 0%    | 130 | 0.7%  | 143 | 0%    | 133 |
| Fuel and lubrication              | 55.6% | 133 | 57.7% | 130 | 64.3% | 143 | 63.9% | 133 |
| Ice                               | 47.4% | 133 | 44.6% | 130 | 45.5% | 143 | 47.4% | 133 |
| Licensing fees                    | —     | 0   | —     | 0   | 4.2%  | 143 | 5.3%  | 133 |
| Moorage                           | 0%    | 133 | 0%    | 130 | —     | 0   | —     | 0   |
| Observer coverage                 | 14.3% | 133 | 16.9% | 130 | 46.9% | 143 | 52.6% | 133 |

**Table 11.7: Variable costs deducted before calculating crew shares (cont'd).** Percent of entities who deducted variable costs by cost category (N = number of entities that used a crew share system to pay its crew when operating in West Coast groundfish fisheries during the survey year). An entity is defined as a unique combination of an owner or lessee and vessel, whereas a vessel refers to all activities related to that vessel, regardless of the number individuals who owned or leased the vessel.

| Expenses category                   | 2009  |     | 2010  |     | 2011  |     | 2012  |     |
|-------------------------------------|-------|-----|-------|-----|-------|-----|-------|-----|
|                                     | %     | N   | %     | N   | %     | N   | %     | N   |
| Offload fees                        | 24.1% | 133 | 21.5% | 130 | 27.3% | 143 | 24.1% | 133 |
| Other                               | 15.8% | 133 | 16.2% | 130 | 9.1%  | 143 | 25%   | 48  |
| Other costs                         | 15.8% | 133 | 16.2% | 130 | 9.8%  | 143 | —     | 0   |
| Other supplies                      | 1.5%  | 133 | 2.3%  | 130 | 2.1%  | 143 | 4.5%  | 133 |
| Quota held at the start of the year | 0%    | 133 | 0%    | 130 | 2.8%  | 143 | 2.3%  | 133 |
| Quota pounds held                   | 6%    | 133 | 4.6%  | 130 | 28%   | 143 | 38.3% | 133 |
| Quota shares purchased              | 0%    | 133 | 0%    | 130 | 2.8%  | 143 | 1.5%  | 133 |
| Travel                              | 1.5%  | 133 | 1.5%  | 130 | 5.6%  | 143 | 6.8%  | 133 |
| Trucking of fish                    | 3%    | 133 | 2.3%  | 130 | 3.5%  | 143 | 3.8%  | 133 |

## **12 Cost, Revenue, and Net Revenue Rates**

**Table 12.1: Mean and median rates for all vessels that fished on the West Coast.** Mean and median revenue, costs, and net revenue per day and per metric ton harvested. ( $N_{2009} = 130$ ,  $N_{2010} = 126$ ,  $N_{2011} = 133$ ,  $N_{2012} = 129$ ).

| Description                                     | 2009    |         | 2010    |         | 2011     |         | 2012     |         |
|---|---------|---------|---------|---------|----------|---------|----------|---------|
|   | Mean    | Median  | Mean    | Median  | Mean     | Median  | Mean     | Median  |
| Fixed costs per day                             | 1,820.6 | 1,038.4 | 1,511.2 | 1,086.1 | 6,816.3  | 1,592.1 | 5,713.9  | 1,742.0 |
| Fixed costs per metric ton landed               | 428.0   | 242.7   | 351.7   | 233.4   | 4,927.6  | 297.5   | 1,909.1  | 335.2   |
| Revenue per day                                 | 5,029.3 | 4,319.6 | 5,371.8 | 4,506.9 | 9,512.8  | 7,268.3 | 7,802.4  | 6,824.7 |
| Revenue per metric ton landed                   | 1,296.2 | 1,103.5 | 1,357.5 | 1,066.4 | 2,431.5  | 1,493.7 | 2,500.2  | 1,405.4 |
| Total cost net revenue per day                  | 223.4   | 708.0   | 714.8   | 839.0   | -1,974.9 | 1,871.7 | -2,496.9 | 1,438.1 |
| Total cost net revenue per metric ton landed    | -64.7   | 131.9   | 188.1   | 130.2   | -3,987.2 | 287.6   | -949.3   | 168.1   |
| Variable cost net revenue per day               | 2,044.0 | 1,985.0 | 2,226.0 | 1,873.9 | 4,841.4  | 3,392.3 | 3,217.0  | 2,938.4 |
| Variable cost net revenue per metric ton landed | 363.3   | 388.1   | 539.8   | 410.0   | 940.4    | 636.7   | 959.8    | 577.7   |
| Variable cost per metric ton landed             | 932.9   | 585.9   | 817.7   | 615.0   | 1,502.4  | 807.1   | 1,540.4  | 836.1   |
| Variable costs per day                          | 2,985.3 | 2,393.2 | 3,145.8 | 2,567.4 | 4,706.8  | 3,974.4 | 4,585.4  | 3,949.5 |

**Table 12.2: Small vessel (< 60 ft) mean and median rates for West Coast operations.** Mean and median revenue, costs, and net revenue per day and per metric ton harvested. ( $N_{2009} = 43$ ,  $N_{2010} = 40$ ,  $N_{2011} = 45$ ,  $N_{2012} = 45$ ).

| Description                                     | 2009      |           | 2010      |           | 2011        |           | 2012       |           |
|---|-----------|-----------|-----------|-----------|-------------|-----------|------------|-----------|
|   | Mean      | Median    | Mean      | Median    | Mean        | Median    | Mean       | Median    |
| Fixed costs per day                             | \$1,158.9 | \$865.6   | \$820.7   | \$810.8   | \$13,474.6  | \$1,461.8 | \$3,775.3  | \$1,364.2 |
| Fixed costs per metric ton landed               | \$629.3   | \$390.3   | \$503.4   | \$362.1   | \$13,694.4  | \$609.1   | \$4,053.3  | \$819.7   |
| Revenue per day                                 | \$4,288.9 | \$4,082.2 | \$4,068.6 | \$4,232.8 | \$6,402.7   | \$6,227.1 | \$5,373.2  | \$5,788.9 |
| Revenue per metric ton landed                   | \$2,190.3 | \$1,667.1 | \$2,362.6 | \$1,824.2 | \$3,847.5   | \$4,080.1 | \$4,051.6  | \$4,586.0 |
| Total cost net revenue per day                  | \$730.4   | \$705.5   | \$953.2   | \$1,016.9 | -\$11,260.2 | \$1,543.3 | -\$1,670.9 | \$1,139.7 |
| Total cost net revenue per metric ton landed    | \$390.4   | \$313.3   | \$596.7   | \$407.8   | -\$12,663.8 | \$580.6   | -\$2,625.0 | \$439.4   |
| Variable cost net revenue per day               | \$1,889.4 | \$1,957.4 | \$1,773.9 | \$1,863.8 | \$2,214.4   | \$2,899.8 | \$2,104.4  | \$2,638.8 |
| Variable cost net revenue per metric ton landed | \$1,019.7 | \$647.3   | \$1,100.1 | \$779.2   | \$1,030.5   | \$1,271.6 | \$1,428.3  | \$856.0   |
| Variable cost per metric ton landed             | \$1,170.6 | \$854.2   | \$1,262.5 | \$941.0   | \$2,817.0   | \$1,693.4 | \$2,623.3  | \$1,931.3 |
| Variable costs per day                          | \$2,399.6 | \$2,174.6 | \$2,294.7 | \$2,291.2 | \$4,188.3   | \$3,486.1 | \$3,268.8  | \$2,994.5 |

**Table 12.3: Medium vessel (> 60 ft, <= 80 ft) mean and median rates for West Coast operations.** Mean and median revenue, costs, and net revenue per day and per metric ton harvested. ( $N_{2009} = 50$ ,  $N_{2010} = 50$ ,  $N_{2011} = 53$ ,  $N_{2012} = 52$ ).

| Description                                     | 2009      |           | 2010      |           | 2011      |           | 2012      |           |
|---|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|   | Mean      | Median    | Mean      | Median    | Mean      | Median    | Mean      | Median    |
| Fixed costs per day                             | \$1,440.8 | \$951.5   | \$1,479.0 | \$1,057.1 | \$2,063.2 | \$1,376.1 | \$3,369.7 | \$1,537.0 |
| Fixed costs per metric ton landed               | \$385.4   | \$249.5   | \$396.1   | \$259.2   | \$588.5   | \$276.0   | \$985.5   | \$364.0   |
| Revenue per day                                 | \$4,142.3 | \$4,093.9 | \$4,407.9 | \$4,198.9 | \$9,216.3 | \$7,179.2 | \$7,061.6 | \$6,842.0 |
| Revenue per metric ton landed                   | \$1,176.0 | \$1,081.3 | \$1,251.4 | \$1,046.5 | \$2,184.7 | \$1,416.5 | \$2,258.0 | \$1,395.3 |
| Total cost net revenue per day                  | \$218.0   | \$652.8   | \$84.7    | \$716.2   | \$3,119.4 | \$1,708.1 | -\$449.6  | \$1,351.0 |
| Total cost net revenue per metric ton landed    | \$29.4    | \$161.0   | -\$28.4   | \$148.2   | \$474.8   | \$303.1   | -\$36.8   | \$263.9   |
| Variable cost net revenue per day               | \$1,658.8 | \$1,693.6 | \$1,563.7 | \$1,661.0 | \$5,182.6 | \$3,280.6 | \$2,920.1 | \$2,898.5 |
| Variable cost net revenue per metric ton landed | \$414.8   | \$396.2   | \$367.6   | \$445.9   | \$1,063.3 | \$672.6   | \$948.8   | \$611.1   |
| Variable cost per metric ton landed             | \$761.2   | \$579.3   | \$883.7   | \$616.1   | \$1,121.3 | \$775.0   | \$1,309.3 | \$810.2   |
| Variable costs per day                          | \$2,483.6 | \$2,235.1 | \$2,844.2 | \$2,575.3 | \$4,033.7 | \$3,812.1 | \$4,141.5 | \$3,990.9 |

**Table 12.4: Large vessel (> 80 ft) mean and median rates for West Coast operations.** Mean and median revenue, costs, and net revenue per day and per metric ton harvested. ( $N_{2009} = 37$ ,  $N_{2010} = 36$ ,  $N_{2011} = 35$ ,  $N_{2012} = 32$ ).

| Description                                     | 2009      |           | 2010      |           | 2011       |            | 2012       |            |
|---|-----------|-----------|-----------|-----------|------------|------------|------------|------------|
|   | Mean      | Median    | Mean      | Median    | Mean       | Median     | Mean       | Median     |
| Fixed costs per day                             | \$3,102.8 | \$2,192.9 | \$2,323.2 | \$1,707.6 | \$5,453.2  | \$3,358.6  | \$12,249.3 | \$3,397.5  |
| Fixed costs per metric ton landed               | \$251.7   | \$77.7    | \$121.6   | \$59.2    | \$226.6    | \$75.4     | \$394.4    | \$113.0    |
| Revenue per day                                 | \$7,088.4 | \$6,370.7 | \$8,158.6 | \$7,702.7 | \$13,960.6 | \$14,606.4 | \$12,422.1 | \$13,621.1 |
| Revenue per metric ton landed                   | \$419.6   | \$199.9   | \$388.2   | \$197.9   | \$984.6    | \$251.2    | \$711.9    | \$305.4    |
| Total cost net revenue per day                  | -\$358.5  | \$927.5   | \$1,325.1 | \$1,071.1 | \$2,249.1  | \$4,538.6  | -\$6,985.4 | \$2,020.3  |
| Total cost net revenue per metric ton landed    | -\$720.9  | \$40.5    | \$34.9    | \$65.2    | \$411.8    | \$92.2     | -\$75.8    | \$57.5     |
| Variable cost net revenue per day               | \$2,744.3 | \$2,600.3 | \$3,648.3 | \$3,203.5 | \$7,702.3  | \$7,973.5  | \$5,263.9  | \$6,240.2  |
| Variable cost net revenue per metric ton landed | -\$469.2  | \$95.7    | \$156.5   | \$111.6   | \$638.4    | \$152.2    | \$318.6    | \$155.4    |
| Variable cost per metric ton landed             | \$888.8   | \$107.0   | \$231.7   | \$124.5   | \$356.4    | \$111.5    | \$393.3    | \$192.2    |
| Variable costs per day                          | \$4,344.1 | \$3,475.7 | \$4,510.3 | \$4,124.4 | \$6,442.4  | \$6,188.7  | \$7,158.2  | \$6,043.2  |

## Appendix A Cost Disaggregation

In order to conduct economic analyses of specific fisheries it is important to have costs broken out by fishery. However, vessels participating in multiple fisheries incur costs that are aggregated across fisheries. These are called joint costs in the economics and accounting literature. They may include fixed costs (e.g., a new engine), or variable costs (e.g., fuel). The former are joined by the nature of the costs, while the latter are joined due to observational limitations. It is difficult to assign fixed costs to a particular fishery because the level of the cost does not vary with vessel participation (at least over the short run).

Some variable costs can be tracked by fishery, but would be costly to do so. For example, although a vessel could theoretically set up a system to track fuel expenditures by fishery, doing so is rare among the EDC catcher vessels. Moreover, some types of fuel use are inherently (by their nature) difficult to allocate, even if they are tracked. An example is a vessel that fishes both on the West Coast and in Alaska. It is not obvious what proportion of the fuel consumed while steaming between the fisheries should be allocated to the West Coast.

Research is currently being conducted at the Northwest Fisheries Science Center to determine the “best” method of cost allocation relative to certain criteria. For the purposes of this report, four different methods were explored: 1) disaggregation by weight of shoreside landings and at-sea deliveries; 2) disaggregation by value of shoreside landings and at-sea deliveries; 3) disaggregation by days at sea; and, 4) disaggregation by a combination of the other three methods by cost category (“mixed method”).

Use of these methods requires data from various sources. The total weight and ex-vessel revenue from shoreside landings are obtained from fish ticket data. The total weight of at-sea deliveries is obtained from A-SHOP data, and the ex-vessel revenue from at-sea deliveries is obtained from EDC data. The days at sea are also obtained from EDC data. Landings and days at sea are allocated to specific fisheries using the methods described in Section 3: .

Alaska landings and revenues obtained from EDC data were appended to the information extracted from the West Coast fish ticket data. This was only done for operators who also operated the vessel on the West Coast. If a vessel only participated in Alaska fisheries, the data were excluded from the analyses. If a vessel fished in Alaska, but the operator of the vessel was different from the operator on the West Coast, the Alaska portion was also excluded.

If the vessel was operated by more than one company during the fiscal year, the range of dates that are used to pull the fish ticket records is adjusted. There are two cases when this would occur: the vessel was leased to a different operator, or the vessel was sold mid-year to another company. In cases where the vessel was sold mid-year, information from the Permit Office must be obtained to determine when the vessel was transferred to a new company. Although both the Coast Guard and the Permit Office track vessel ownership information, we use the Permit Office data as the authoritative source for this information. When the vessel transfers ownership, a new record is made in the Permit Office database and so the dates of operation of the multiple companies can be determined and used as the range of dates for pulling the fish ticket records. Occasionally, the paperwork for vessel sales lags with the change in operation, additional information provided by the participant on the form or other communications is used to adjust the fiscal year used to calculate total revenue to best correspond with the information provided on the form. If the vessel was leased by the owner of the vessel, then the lease dates provided on the EDC form are combined with the fiscal year data to pull the fish ticket records.

Once the total revenues from shoreside landings is calculated, it is then added to the other revenue categories provided on the forms to generate the total revenue. Landings of species associated with zero revenue were excluded entirely from the cost disaggregation analyses.

Listed below are the variables used to disaggregate each cost category for the “mixed” method:

- Costs were disaggregated using ex-vessel revenue for the following cost categories:
  - Capitalized expenditures
  - Crew wages
  - Captain wages
  - Travel
  - Fishery association dues
  - Fees
  - Vessel and on-board equipment.
- Costs were disaggregated using at-sea deliveries and shoreside landings weight for the following cost categories:
  - Bait (only aggregated to non-trawl fisheries)
  - Offload fees
  - Trucking expenses
  - Fishing gear.
- Costs were disaggregated using days at sea for the following cost categories:
  - Food

- Fuel
- Ice
- Insurance
- Other supplies
- Communications
- Lease of the vessel
- Moorage.