OREGON'S COMMERCIAL FISHING INDUSTRY

Year 2011 and 2012 Review

Vessel Counts by Active Fisheries Participation (>=$500 each fishery) in 2012

	Salmon					Groundfish					
Fishery	Net	Troll	D. Crab	P. Shrimp	A. Tuna	LE	OA	P. Whiting	P. Sardine	P. Halibut	Other
Salmon											
Net	171	0	4	0	c	c	0	0	0	c	81
Troll		323	91	0	174	12	48	0	0	44	3
D. Crab			338	37	131	58	54	4	3	56	19
P. Shrimp				64	13	28	c	c	0	c	c
A. Tuna					431	28	56	0	0	57	15
Groundfish											
LE						111	c	19	0	24	4
OA							166	0	0	38	4
P. Whiting								21	0	0	c
P. Sardine									21	0	19
P. Halibut										89	c
Other											135

Total vessels
Unique: 1,140
Active (>=$500 all fisheries): 1,086

Note: "c" means redacted for confidentiality purposes.

Oregon Department of Fish and Wildlife

and

Oregon Coastal Zone Management Association

Suggested Citation

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OREGON'S COMMERCIAL FISHING INDUSTRY

Year 2011 and 2012 Review

Version 1.5

prepared by

The Research Group, LLC
Corvallis, Oregon

with assistance from

Oregon State University
Coastal Oregon Marine Experiment Station
Newport, Oregon

prepared for

Oregon Department of Fish and Wildlife

and

Oregon Coastal Zone Management Association

September 2013

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PREFACE

This study was sponsored by the Oregon Department of Fish and Wildlife (ODFW) and administered by the Oregon Coastal Zone Management Association (OCZMA). The OCZMA is a voluntary association of over 40 local coastal governments comprised of counties, cities, ports, Indian tribe, and soil and water conservation districts. The ODFW contract manager was John Seabourne and the OCZMA administrator was Georgia York.

The study consultant was The Research Group, LLC, Corvallis, Oregon (TRG). Shannon Davis was the principal author and was greatly assisted by Kari Olsen. Dr. Chris Carter (retired ODFW economist) and William Jenkins (current ODFW economist) were instrumental participants in the study conduct. Dr. Gil Sylvia (Superintendent, Coastal Oregon Marine Experiment Station) was consulted on marketing, organizational, and research needs for the industry. Many management agencies' personnel and industry participants are thanked anonymously for providing industry information and perspectives about the harvesting and processing sectors.

TRG has assisted ODFW and OCZMA in the past with economic analysis studies. For this current report, sections from the ODFW and OCZMA previous reports are embellished and/or repeated where applicable so readers do not have to review the more extensive background material. Several other serial reports about Oregon fisheries were relied upon for data and there were conversations with ODFW staff, other government agencies staff, and fishing industry representatives. Standard technical writing practices would demand their citing. For readability reasons, full bibliographies and references to personal communication are not always included in this summary report.

This report was reviewed in draft form for the purpose providing candid and critical comments that were to assist in making study results as sound as possible and to ensure that the report meets standards for objectivity, evidence, and responsiveness to the study charges. Although the reviewers have provided many useful comments and suggestions, they were not asked to endorse study findings and recommendations. The authors are solely responsible for making certain independent examination of this report was carried out in accordance with accustomed procedures and that review comments were carefully considered.

The authors' interpretations and conclusions should prove valuable for this study's purpose, but no absolute assurances can be given that the described results will be realized. Government legislation and policies, market circumstances, and other situations can affect the basis of assumptions in unpredictable ways and lead to unanticipated changes. The information should not be used for investment or operational decision making. The authors do not assume any liability for the information and shall not be responsible for any direct, indirect, special, incidental, or consequential damages in connection with the use of the information.

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Appendices

LIST OF ACRONYMS AND ABBREVIATIONS

ADFG	Alaska Department of Fish and Game
BRD	bycatch reduction device
CFEC	Alaska Commercial Fisheries Entry Commission
CFF	Commercial Fish Fund
COMES	Coastal Oregon Marine Experiment Station
CPS	coastal pelagic species
CPUE	catch per unit effort
DLCD	Oregon Department of Land Conservation and Development
EFH	essential fish habitat
EFP	exempted fishing permit
ESA	Endangered Species Act
FEAM	Fishery Economic Assessment Model
FMP	fishery management plan
HMS	highly migratory species
IPQ	individual processor quota
ITQ	individual transferable quota
LAB	Legislative Approved Budget
LE	limited entry
MRP	Marine Resource Program
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSC	Marine Stewardship Council
MSY	maximum sustainable yield
mt	metric tons
NMFS	National Marine Fisheries Service, now called NOAA Fisheries
NOAA	National Oceanic and Atmospheric Administration
NPFMC	North Pacific Fishery Management Council
OA	open access
OCZMA	Oregon Coastal Zone Management Association
ODFW	Oregon Department of Fish and Wildlife
OSU	Oregon State University
OY	optimum yield
PacFIN	Pacific Fisheries Information Network (PacFIN is sponsored by the Pacific States Marine Fisheries Commission)
PFMC or Council	Pacific Fishery Management Council
PSMFC	Pacific States Marine Fisheries Commission
QP	quota pounds
QS	quota share
RCA	resource conservation area
TAC	total allowable catch
TRG	The Research Group, LLC
U.S.	United States
VMS	vessel monitoring system
WFOA	Western Fishboat Owner Association

OREGON'S COMMERCIAL FISHING INDUSTRY
Year 2011 and 2012 Review

SUMMARY

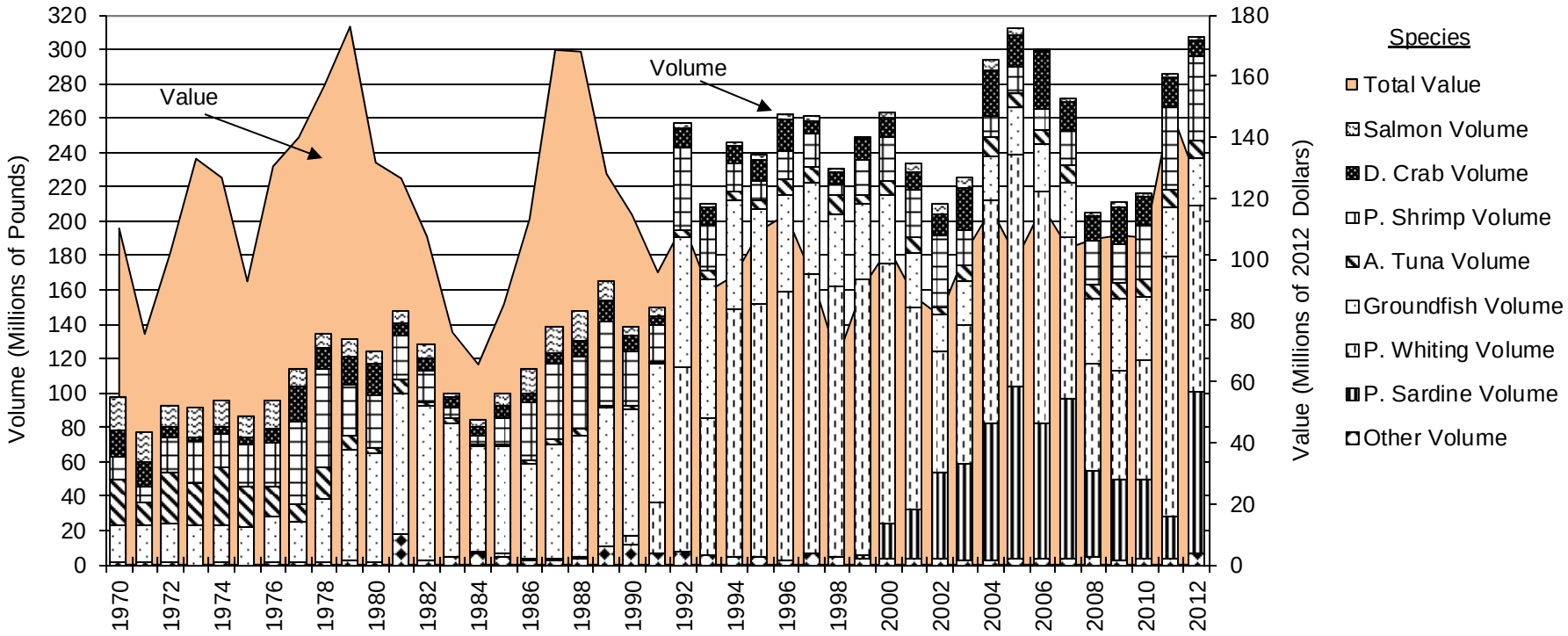
This report section summarizes results from a study sponsored by the Oregon Department of Fish and Wildlife and administered by the Oregon Coastal Zone Management Association that provides information about Oregon's commercial fishing industry. The information includes descriptions for harvests, fleets, processors, distant water fisheries, industry local and state level economic contributions, and current issues facing the industry. Historical trends are offered, and the years 2011 and 2012 are discussed in detail. The report is a biennium serial publication.

The study results show 2011 and 2012 were good years for the industry, although some harvesters and processors dependent on certain fisheries had disruptions in their business opportunities. There were 285.8 and 306.7 million pounds of fish delivered to Oregon ports in 2011 and 2012 respectively (Figure S.1). Salmon totaled about 2.4 and 1.9 million pounds in those years and were mostly delivered in the Astoria area. (Astoria area deliveries include harvests from ocean as well as Columbia River inriver gillnet and treaty fisheries.) The central and southern Oregon Coast (south of Cape Falcon to the Oregon-California border) had traditional open days, but catch rates only allowed a moderate harvested volume. Dungeness crab volume increased to 17.3 million pounds in 2011, but then was about half that at 8.7 million pounds in 2012. (The crab season starts on December 1 and runs through August 14 of the following year, so calendar year landing compilations can mix season conditions.) Shrimp volume soared to 48.3 million pounds in 2011 and increased to a 34-year high of 49.1 million pounds in 2012. Groundfish (mostly black cod and flatfish) volume decreased to 28.9 million pounds in 2011, and stayed about the same at 28.5 million pounds in 2012. There were significant increases in Pacific whiting (151.5 million pounds in 2011 and 107.7 million pounds in 2012). Pacific sardine volume dipped to a 10-year low of 24.3 million pounds in 2011, but rose to a seven-year high of 94.0 million pounds in 2012.

The ex-vessel value of total Oregon onshore landings harvest sector revenue (sometimes called ex-vessel value) received from all onshore landings in Oregon in 2011 was $149.1 million, a 23-year high, but dropped in 2012 to $126.4 million. (All harvest revenue, prices, and economic contributions are adjusted for inflation and expressed in 2012 dollars.) The record high harvest value in 2011 is explained by the extraordinary high prices received for many of the fisheries, especially Dungeness crab, Pink shrimp, and albacore tuna. The prices weakened generally in 2012.

Consumers view seafood as a higher price food commodity and general economic conditions weaken spending for this protein. Lower consumer demand will place downward pressures on wholesale prices that ultimately lower harvest level prices. The world seafood supply/demand situation for substitute Oregon products, foreign currency rates, and distributor hold-over inventories also will influence harvest level prices in any given year. In general, prices paid to harvesters increased in 2011 and had some decreases in 2012. The increases did not recover to levels in the mid-2000's

Figure S.1
Onshore Landed Value and Volume by Major Fishery in 1970 to 2012



Notes:
1. Salmon includes landings of steelhead, which have come exclusively from the treaty Indian fisheries since 1975.
2. D. crab includes only Dungeness crab; p. shrimp includes only pink shrimp; and a. tuna includes only albacore tuna, except a. tuna includes landings of albacore, yellowfin and skipjack tuna for 1970 to 1979. Essentially all tuna landings from 1980 forward are albacore.
3. Groundfish includes landings of halibut and Pacific whiting until 1980. Pacific whiting (also known as hake) did not emerge as a major fishery species until after 1990. Groundfish in 2011 and 2012 includes (respectively, in thousands of round pounds) flatfish (16,486, 15,847), sablefish (5,080, 4,745), and other species (7,369, 7,884).
4. Pacific sardine has a 36 year abundance cycle, and did not emerge as a major fishery species until 2000 in the latest cycle.
5. 'Other' in 2011 and 2012 includes landings (respectively, in thousands of round pounds) of chub mackerel (15, 3,923), hagfish (2,020, 1,610), red sea urchins (588, 567), and other species (816, 908). Shellfish volume excludes aquaculture harvests.
6. Landing data is preliminary for 2012.

except for a few species, for example black cod ($3.48 in 2011) and Pacific sardines ($0.134 in 2011) were at record highs. The per pound harvest price for Pacific whiting rose in 2011 to $0.111 and to $0.136 in 2012 as the Eastern European market for headed and gutted product forms strengthened.

While individual fisheries harvest revenue is an important indicator for showing commercial fishing industry trends, the health of the industry has a social context for the well-being of harvester participants, processor workers, managers/enforcers, and ultimately the public which favors and enjoys Oregon origin seafood products.

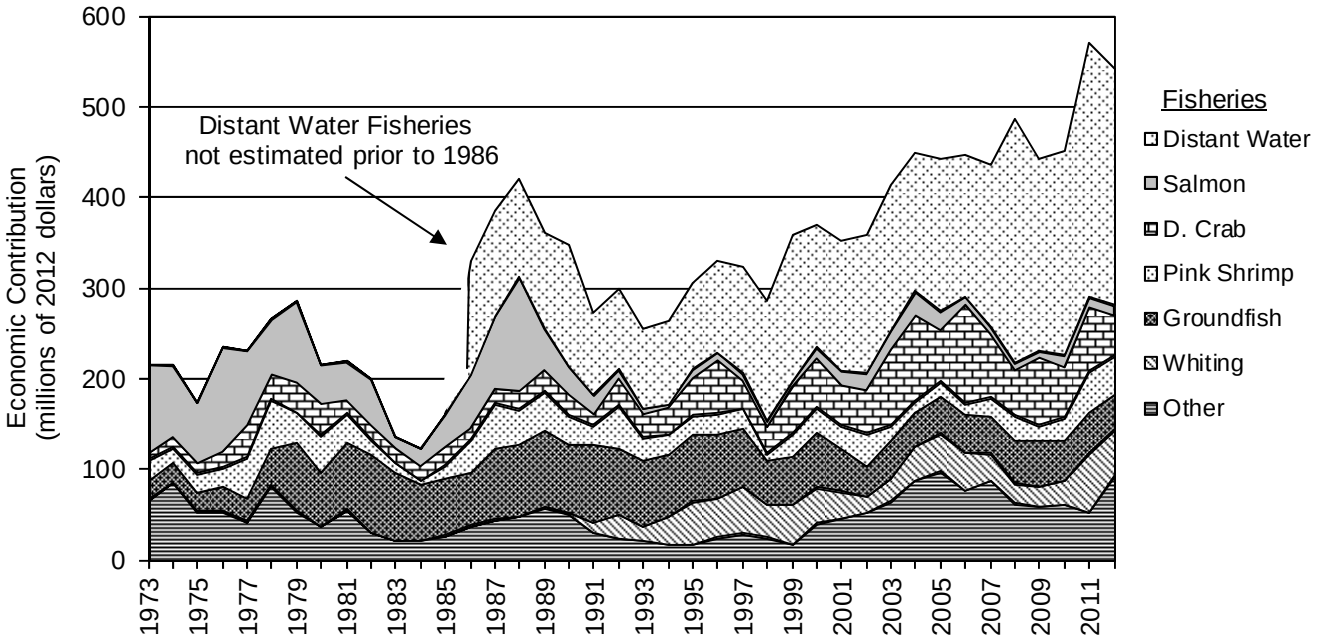
There was a total of 902 active vessels (active means harvested more than $500 in revenue; about one in 20 vessels that make any deliveries lands less than $500) with an Oregon home-port (port group where a vessel delivered the most, measured by revenue) in 2012. There were 27.4 thousand deliveries to Oregon ports in 2012. There was a total of 195 active first-purchasers (purchased more than $500) in 2012. (First purchasers can be buyers that sell to processors, businesses that do process fish into seafood products, restaurants, and the public buying directly from vessels. Using a $500 threshold will tend to filter the latter two buyer types.) The total estimated seafood product wholesale value (sometimes called ex-processor value) of the Oregon onshore harvests was $223 million in 2012. Another intermediary economic value that is difficult to calculate because Oregon produced products get dispersed into many domestic and foreign markets would account for exports and other distribution chain transactions before it reaches the consumer.

The 2012 commercial onshore fisheries generated a total of $280 million personal income, which is down from the $289 million generated in 2011 (Figures S.2 and S.3). (This income includes the so called multiplier effect.) The estimated distant water fisheries economic contribution in 2011 was $282 million and in 2012 was $261 million. (The distant water fisheries are West Coast offshore fishing and fishing that takes place in Alaska and the western Pacific.) So the total estimated total personal income generated by the Oregon commercial fishing industry in 2012 is $541 million, not including effects from the federal and State direct assistance payments to salmon fishery businesses. Based on average earnings in Oregon, the economic contribution is equal to about 15,222 part and full-time equivalent jobs. Using a decade for a comparison period to iron out natural abundance cycles, Year 2012 economic contribution is about 21 percent higher than the average of the previous 10 years. The commercial fishing industry annually pays about $53 million in state and local taxes each year.

These large number economic measurements show the importance and integration of this industry with the Oregon Coast and State's residents and visitors. However, those involved in the industry know its vagaries: part-time employment, changes in abundances, dangerous weather conditions, volatile prices, and seeming unending surprises in management and regulations. Families and businesses must be dynamic and flexible to survive and prosper. Their resilience is appreciated by all those that consume Oregon origin seafood.

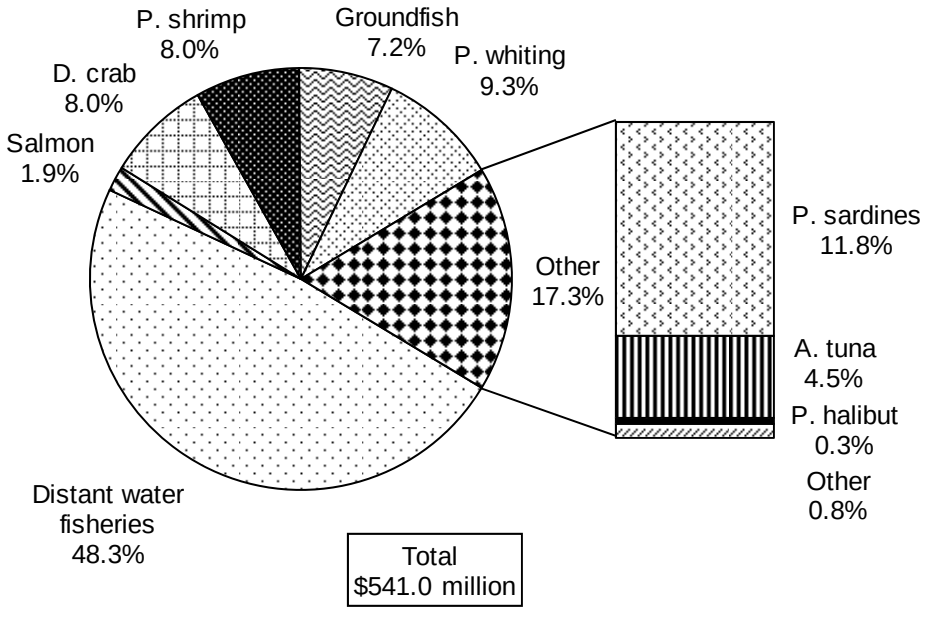
The fishing industry is becoming more industrialized. Fewer vessels are participating and those that do participate require higher annual revenues to be a viable business. The trend in processor ownership consolidation and centralization of

Figure S.2
Economic Contributions From Onshore Landings in 1973 to 2012
and Distant Water Fisheries in 1986 to 2012



Notes: 1. Economic contributions are expressed as total personal income in millions of 2012 dollars.

Figure S.3
Economic Contributions by Major Fishery in 2012



Notes: 1. Economic contributions are expressed as total personal income in millions of 2012 dollars.

operations continues. Some landings are hauled out-of-state, precluding the need for local labor and support businesses.

Goals for the industry would be to extract more value from the fishery resources that are available. Raising resource value has several challenges. There will be continuing price pressures on seafood products from substitute aquaculture products. Consumer concerns about quality (freshness, inclusions of toxics, etc.) will affect seafood product demands. Considerations about health and wholesomeness of natural coldwater fish could be a marketing advantage to Oregon's industry. Modernization of vessels for better handling capabilities and initial onboard processing, and modernization of processing plants will improve seafood products. Assistance through commodity commissions, Oregon State University Sea Grant and Extension Service, and other entities for developing marketing strategies that will gain market power for Oregon seafood products should help the industry raise value at all levels of seafood production.

I. INTRODUCTION

A. Background

This report's purpose is to provide attribute descriptions and economic contribution estimates for the Oregon commercial fishing industry in 2011 and 2012. Descriptions include the total volume (fish weight) and value (revenue realized by harvesters) of landings in Oregon.[1] Harvester and processor characteristics are explained. An estimate of economic contribution from onshore landings made to the State and local economies is provided. An estimate for the economic contribution generated by revenue received in distant water fisheries is also described.[2] Statements are offered about stock abundances, management measures, harvesting and processing technologies, seafood markets, and other structural issues that the industry is currently facing.

B. Data Sources and Definitions

Study results are expressed in different measurements. Landings are either measured by weight in round pounds or value in ex-vessel prices paid to harvesters. Round pounds are either the actual weight of fish when purchased by the buyer or processor, or the weight corrected by an adjustment factor in the case that the fish was dressed (gutted, gilled, and headed) when sold to the buyer or processor. Payments to harvesters (sometimes called harvester revenue or ex-vessel value) is simply the amount of the transaction between the harvester and the purchaser, which is usually a seafood processor. The harvester can also sell directly to the public through provisions of a special license. The value of seafood products with primary manufacturing in Oregon is called first wholesale value (sometimes also called ex-processor value). All values, prices, and economic impact estimates have been adjusted to real dollars using the GDP implicit price deflator developed by the U.S. Bureau of Economic Analysis, except where noted.

Landing data is mostly from ODFW's annual pounds and value reports. Other landing data is from the Pacific Fisheries Information Network (PacFIN) extraction dated April 2013. Both of these information sources use fish ticket data that are submitted when a harvester delivers a catch to a processor or sells catch to the public. The ODFW compiles this information and then uploads it to the PacFIN system.[3] Landing information includes harvests made in the Pacific Ocean, Columbia River, and several other Oregon locations. The other locations include Yaquina Bay for a herring fishery, Alsea Bay for a crab fishery, and a small amount of shellfish and crayfish caught at inland locations. Both non-Indian and treaty commercial fisheries are included in the landings. Treaty ceremonial and subsistence fisheries are not included as they are a relatively minor quantity. For some of the analysis, shellfish harvests from State and private lands, which are not issued fish tickets, have been added to the landing data. Reported characteristics for the crab fishery are calendar years, while crab season management is generally for the period December 1 through August 14.

This report's intent is to provide summary level descriptions about commercial fisheries as soon as possible after data becomes available. However, the early harvest information data for the current years used in the report is subject to verifications and updates. The tabulations and analysis must be considered preliminary. Most tables and graphs in the report have source information that shows

database extraction dates so that reader will know the data status.

A vessel's home-port group is defined as the port group where a vessel made the most annual landings by harvest value. Home-port counts will differ from the number of vessels that make landings at Oregon ports, since some vessels delivering in Oregon may have home-ports elsewhere. Counts exclude those vessels that may moor at Oregon ports, but only participate in distant water fisheries. Counts will also exclude those vessels that generally make landings at Oregon ports, but for some reason are inactive during any one year. Counts will exclude vessels that deliver within tribal fisheries, since vessels are not uniquely identified within those fisheries.

The number of onshore deliveries to a processor or buyer is defined to be fish ticket counts and may be slightly higher than trip counts since a vessel may elect to deliver to more than one processor or buyer following a trip.

This report's annual catch per unit effort (CPUE) applied to major fisheries and calculated by volume divided by deliveries should be considered a general indicator.[4] Time, labor, equipment, etc. dedicated to actual harvesting is not always reflected in delivery counts. Different fishing strategies and the mix of species caught could vary on the same trip. Distance to fishing grounds, gear used, vessel licensing limitations, weather conditions, captain avidity, etc. will be distributed across the statistics. Further, fisheries management changes year-by-year and the fleet response to the changes can be counter to a ratio statistic's value.

A more rigorous statistical treatment would include more information about fisheries' central tendency measures. Variance is an especially important descriptor in fisheries, because measures typically have wide ranges. For example, harvest prices vary within the season and vary depending on fish quality and size. Selling catches is a negotiated transaction that can have a different price for each sale. Vessel fishery harvest participation is highly variable. For example, it can be shown that the Pareto principle generally applies to vessel harvest volume in most fisheries. The principle states that about 20 percent of total participants will harvest about 80 percent of the volume. This skewness is hidden when vessel revenue measurement is a fleet average.

Some measurements used in this report stratify vessels for landing more than $500 harvest value in a year. This is to help account for fish ticket database errors as well as to assist in segregating vessels into a class where a serious economic event is occurring. The threshold may have some justification for showing the vessel is active in the fishery, but it is not necessarily an indicator it is a vessel's targeted fishery.

Another simplifying assumption is the modeling being mostly based on linear relationships between variables. Many economic behavior relationships and certainly biological growth functions are non-linear over time or between causation and effect.

Mostly these statistical caveats are not mentioned unless they are important to qualifying descriptions when averages or totals are the measures. This hides clarity to favor brevity, and the reader is encouraged to look at other fishery descriptive reports by the authors or others if more detail is desired about a fishery or vessel class.

The distant water fisheries economic contribution estimates are modeled using current data from North Pacific Fishery Management Council (NPFMC), NOAA Fisheries, U.S. Energy Information Administration, Alaska Commercial Fisheries Entry Commission (CFEC), and Alaska Department of Fish and Game (ADFG). The model is an extension of an investigation reported by The Research Group (TRG) (1999). An annual fishery change index is developed and applied to the earlier modeling results.

The harbors where landings are made and their assigned port groups are shown on Figure I.1. The Astoria port group includes Gearhart/Seaside and Cannon Beach; Tillamook port group includes Garibaldi, Netarts, Nehalem, and Pacific City; Newport port group includes Depoe Bay and Waldport; Coos Bay port group includes Florence, Winchester Bay, and Bandon; and Brookings port group includes Gold Beach.

Figure I.1 shows some general latitudinal demarcations for groundfish and salmon fisheries management zones. The bathymetric boundary between the continental shelf and slope and Oregon's territorial sea boundary is also shown. The map does not show many of the fishery management boundaries and area closures. For example, refined depth contours were used for the first time in 2003 for federally managed groundfish fishery area closures. Oregon has developed a nearshore groundfish fishery plan whose management overlays federal groundfish fishery jurisdiction. There are several late season salmon bubble fisheries that usually occur within Oregon's territorial sea. While not intended to be used for fishery management purposes, Oregon has established a system of five small marine reserves that will add to permanent fishery area closures. The purpose of the marine reserves includes providing research opportunities for determining whether there are biodiversity and fish resource abundance changes in areas that were once open to fishing.

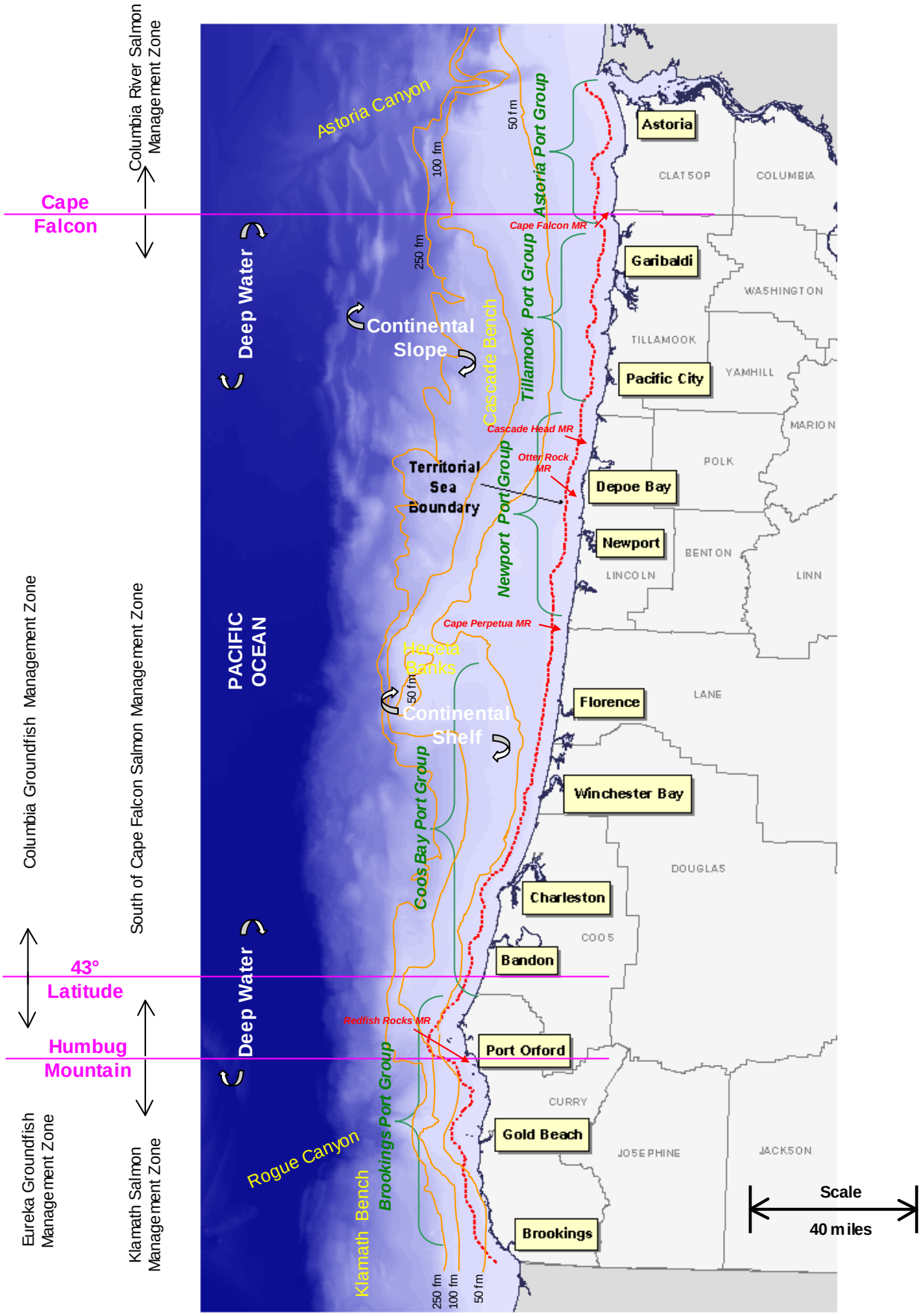
C. Economic Analysis Methods

1. Economic Contribution

Measuring the economic contributions from activities such as harvesting, processing, and distributing seafood products requires development of economic models to show how the dollar flows within and between industries and reaches households in Oregon. Seafood landed and processed in coastal communities and shipped out of state to major markets, such as Los Angeles, is an export that brings in new money to coastal communities as well as the State of Oregon in general. Revenue generated by delivery to at-sea processors, fishing in Alaska, or other fisheries and returned to Oregon in terms of crew shares, profits, and payments for repair and maintenance can also be considered a source of export earnings. The spending and respending of these revenues from local harvesters, local processors, and distant water harvesters creates additional wages and profits for workers and proprietors in the general economy. The sum of all of these dollar flows (in economic jargon, the direct, indirect, and induced effects) that end up in households is called total personal income.

This study did not estimate the impacts of other activity, such as those by visitors drawn to fishing industry attractions, special fishery management and enforcement centers, fish resource education and research institutions, etc. These economic activity generators bring new money into

Figure I.1
Port Groups and Fishery Management Zones



Note: MR = marine reserve site.
Source: Ocean and Coastal Program, Oregon Department of Land Conservation and Development.

communities and their impact can be considerable.

The Fishery Economic Assessment Model (FEAM) was developed and has been updated for this project to calculate fishing industry economic contributions. The FEAM is a derivation of the IMPLAN input-output model. FEAM results are estimates of the total personal income derived from the commercial fishing industry for local economies and for the State of Oregon economy. The FEAM is more fully described in William Jensen Consulting (1996), and more recently by Seung and Waters (2006). The FEAM calculates economic contributions using response coefficients based on revenue flows and expenditure categories of harvesters and processors. A fleet classification scheme is central to the development of the FEAM where effort, revenues and expenditures are tracked by types of commercial fishing vessels. The fleet classification scheme used in this study is more fully described in TRG (2006).

The economic contribution factors associated with fisheries (defined by species and gear groups) in 2011 are contained in Appendix A. Factors for the port group level are also available from the authors. An analyst might find the factors useful as a tool to calculate the economic impacts from marginal changes to fisheries. For example, the factors could be used to show the economic impacts to the State's economy if for some reason (management, natural abundances, etc.) there was a reduction in a certain fishery's harvest. Or the average value of a proportion of a fishery could be calculated. It is suggested the analyst consult TRG (2003) for procedures to determine marginal and average economic contributions.

2. Other Economic Activity Measurement Units

The economic contribution estimates are for the commercial fishing activity that is associated with harvesting and primary processing. It is an expedient albeit arbitrary choice to define total economic value for the commercial fishing industry. There are other metrics that can be used as indicators. For example, Appendix A contains the factors to determine the total added value of harvests as it moves into the market distribution chain.

The data and analysis problem for determining economic contribution is tracking how much the coastal and State economy is benefiting after primary processing. Informal interviews with seafood distributors and retailers tell us that much more seafood consumed in Oregon is imported than comes from local harvests. Further, the degree of economic activity that can have substitution increases downstream of primary processing. Therefore, to have economic contribution measurements that can be compared with other basic industries, a decision is made to limit the extent of producer involvement at the primary processor level.

This study used personal income to measure economic activity. The derived personal income is added to household income as a proportion of the net earnings component of total personal income. This component of personal income includes wages, salaries, and proprietorship income. To measure economic effects using job numbers, the simple ratio of areawide employment counts to net earnings can be used. Even other economic activity measurements can be made. Gross business output and gross value added (gross output less intermediate goods used up in production) can be

calculated or translated from study modeling results. It is left to future research prompted by analyst interest to make these other economic calculations.

3. Fiscal Impact Measurement Units

Fiscal impact measurement units can be approximated with the assumption that there are causal and integral relationships to areas' total personal income. The relationships could be used to show effects to local property taxes and fees as well as State level income taxes and fees.[5] It might be argued that current levels of countywide total property assessed value are being maintained by economic activity. Then district tax rates based on property value can be used to show the proportion of taxes being contributed by the fishing industry sector. The fishing industry's general property and personal property valuation subject to taxation would be related to its estimated business asset value plus a share of downstream supporting business and household property valuation.[6] There are many property valuation exemptions that make such an estimate difficult.

A thorough analysis would be necessary to show marginal fiscal impacts for the purpose of evaluating changes. A change from industrial development can include costs (like roads, schools, and other public services) as well as adding to local property tax bases (University of Nevada Economic Development Center 1996).

The specific fees charged to the commercial fishing industry to help offset ODFW government services is estimated and discussed in this study. Assessments on landing value used to fund commodity commissions are also estimated. Other local and state fees are mentioned, but not estimated.

D. Report Contents

Report contents first include a chapter that describes statewide landings history and trends, fishing fleet characteristics, and other port specific information. The next chapter provides some detail about Oregon's major fisheries that includes statements about the fishery's near-term outlook. Seafood processing businesses are then described in a separate chapter. This is followed by a chapter about the economic contribution that the commercial fishing industry makes at the State and local level. The last chapter discusses current structural and fisheries management issues facing the industry.

II. LANDING HISTORY

A. Landings Overview

Total landed volume in Oregon in 2012 increased to 306.7 million pounds compared to 285.8 million pounds in 2011 and 216.6 million pounds at the end of the previous biennium Year 2010 (Table II.1 and Table A.1). The overall ex-vessel value in 2012 reached $126.4 million, which was down from $149.1 million in 2011 and up from the previous biennium Year 2010 of $107.1 million (Table II.2). The volume in 2012 was the second highest level in the last 40 years, and the value was the thirteenth highest in those years. The increased value in 2011 and 2012 is related to a mix of up and down trends in individual fisheries:

- Chinook salmon volume caught in the ocean with troll gear and landed in Oregon in 2011 and 2012 was down from the previous biennium years average ending in 2010 for the north of Cape Falcon catch area; catch rates south of Cape Falcon were more than double the previous biennium average; there was a decrease in price from the mid-2000's to a seasonal average $4.97 per pound in 2012.

- Decreased landing volume for Chinook and coho salmon caught in the Columbia River using net gear in 2012 from the previous biennium years average, but recent year-over-year price increases were followed by small decreases in 2012.

- Dungeness crab landing volume in 2012 was a 14-year low, while 2011 was about average for those years; Year 2011 and 2012 average price was over 40 percent higher than the previous biennium years.

- Increased volume in pink shrimp in 2012 is the highest since 1978, and 2011 was nearly as high, and prices increased by about 40 percent over the previous two years.

- Price of albacore tuna has generally increased over the last five years, while landings have been steady; the value in 2011 at $1.97 per pound was the highest since 1978. The price decreased from that high to $1.53 in 2012.

- Decreased landings for non-whiting groundfish during 2011 and 2012 over the previous biennium years, but prices increased; sablefish (nearly 50 percent share of groundfish revenue) prices continued upwards in 2011 before declining in 2012 causing overall harvest value to decrease over previous biennium years.

- Landings of Pacific whiting in 2011 were more than double the annual average 2007 to 2010 period; prices rebounded in Years 2011 and 2012 to a record high in 2012, which caused the overall harvest value in 2011 to be a record high, and the average of 2011 and 2012 was nearly 60 percent higher than the previous record high from 1995.

- Sardine harvest in 2011 dipped to nearly half of the previous biennium, then increased in 2012 to the second highest since the start of the current cycle; prices increased in 2011 from the previous biennium, then decreased in 2012.

Table II.1
Onshore Landed Volume by Major Fishery in 1981 to 2012

Year	Salmon	D. Crab	P. Shrimp	A. Tuna	Groundfish	P. Whiting	P. Sardine	Other	Total
1981	7,009	6,981	25,904	7,693	81,835	360	--	17,764	147,546
1982	8,572	7,020	18,429	1,855	90,084	3	--	2,816	128,779
1983	2,669	5,332	6,532	3,397	77,369	143	--	4,531	99,972
1984	3,595	4,999	4,844	1,594	61,309	746	--	6,757	83,844
1985	6,570	7,358	14,840	1,518	61,920	1,950	--	5,089	99,245
1986	13,792	4,658	33,884	2,461	54,883	927	--	2,913	113,517
1987	15,094	5,991	44,589	2,288	67,176	403	--	2,841	138,383
1988	17,789	9,417	41,846	3,967	70,495	543	--	4,068	148,126
1989	11,724	11,676	49,129	1,080	81,047	196	--	10,556	165,408
1990	5,412	9,510	31,883	2,079	73,305	5,058	--	11,656	138,903
1991	5,344	4,924	21,711	1,259	80,847	29,109	--	6,681	149,875
1992	2,364	11,908	48,033	3,896	75,215	107,939	9	7,456	256,820
1993	1,848	10,456	26,923	4,754	81,303	78,970	1	6,039	210,294
1994	1,285	10,638	16,386	4,698	64,265	143,563	0	4,766	245,602
1995	2,862	11,954	12,106	5,034	55,066	147,355	--	4,198	238,574
1996	2,842	19,302	15,727	8,948	57,002	155,590	0	3,041	262,452
1997	2,245	7,777	19,560	9,168	52,703	162,782	0	6,644	260,877
1998	1,978	7,410	6,096	10,603	41,806	157,895	2	4,612	230,402
1999	1,560	12,347	20,451	4,553	44,119	160,965	1,710	3,690	249,394
2000	3,142	11,180	25,462	8,757	39,311	151,461	21,005	3,105	263,423
2001	5,266	9,690	28,482	8,959	31,645	117,673	28,176	3,781	233,671
2002	6,119	12,444	41,584	4,362	21,102	71,220	50,069	3,213	210,112
2003	6,722	23,930	20,546	9,165	25,934	80,648	55,683	3,003	225,632
2004	5,936	27,273	12,207	10,754	25,590	130,238	79,610	2,609	294,217
2005	4,688	17,730	15,784	8,087	27,231	135,503	99,450	3,967	312,439
2006	1,814	33,316	12,195	8,536	27,395	135,186	78,634	3,467	300,543
2007	1,384	17,026	20,125	10,468	30,881	94,360	92,911	3,842	270,997
2008	1,923	13,888	25,520	8,864	37,922	61,466	50,593	4,589	204,765
2009	2,312	21,854	22,153	10,072	41,400	62,988	47,357	2,676	210,811
2010	2,774	15,868	31,463	10,700	36,855	69,530	45,971	3,456	216,618
2011	2,422	17,260	48,314	9,682	28,936	151,464	24,302	3,439	285,821
2012	1,927	8,666	49,144	9,886	28,475	107,652	93,957	7,008	306,716

Notes:
1. Landings are reported in thousands of round pounds.
2. Salmon includes landings of steelhead, which have come exclusively from the treaty Indian fisheries since 1975.
3. D. crab includes only Dungeness crab; p. shrimp includes only pink shrimp; and a. tuna includes only albacore tuna.
4. Pacific whiting (also known as hake) did not emerge as a major fishery species until after 1990. Groundfish in 2011 and 2012 includes (respectively, in thousands of round pounds) flatfish (16,486, 15,847), sablefish (5,080, 4,745), and other species (7,369, 7,884).
5. Pacific sardine has a 36 year abundance cycle, and did not emerge as a major fishery species until 2000 in the latest cycle.
6. 'Other' in 1981 was almost all scallops, and 1989 to 1990 bump was predominantly sea urchins. 'Other' in 2011 and 2012 includes landings (respectively, in thousands of round pounds) of chub mackerel (15, 3,923), hagfish (2,020, 1,610), red sea urchins (588, 567), and other species (816, 908). Shellfish volume excludes aquaculture harvests.
7. Landing data is preliminary for 2012.

Source: Oregon Department of Fish and Wildlife, Table 4 and 42 for years 1970 to 1980; PacFIN annual vessel summary, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions for years 1981 to present.

Table II.2
Onshore Landed Value by Major Fishery in 1981 to 2012

	Price	Salmon		Dungeness Crab		Pink Shrimp		Albacore Tuna		Groundfish		Pacific Whiting		Pacific Sardine		Other		Total	
Year	Index	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal
1981	45.3	24,361	11,047	14,795	6,709	28,743	13,034	14,679	6,657	31,965	14,496	56	25	--	--	11,852	5,375	126,453	57,344
1982	48.1	25,682	12,356	15,658	7,533	19,266	9,269	2,557	1,230	41,704	20,064	0	0	--	--	2,597	1,249	107,464	51,702
1983	50.0	6,080	3,040	15,817	7,910	9,314	4,658	3,767	1,884	36,692	18,349	48	24	--	--	4,313	2,157	76,031	38,023
1984	51.9	9,864	5,118	14,928	7,746	4,149	2,153	1,710	888	28,871	14,981	113	59	--	--	5,948	3,087	65,585	34,031
1985	53.5	16,941	9,056	19,928	10,654	9,794	5,236	1,533	819	31,662	16,927	324	173	--	--	5,091	2,722	85,274	45,587
1986	54.6	27,780	15,181	12,053	6,587	33,178	18,131	2,425	1,325	31,755	17,353	110	60	--	--	5,918	3,234	113,218	61,871
1987	56.2	48,054	26,994	14,867	8,351	53,892	30,273	2,990	1,680	43,354	24,353	61	34	--	--	5,359	3,010	168,576	94,696
1988	58.1	67,153	39,020	19,414	11,280	29,515	17,150	5,728	3,328	41,361	24,033	71	41	--	--	4,751	2,760	167,991	97,612
1989	60.3	23,596	14,228	22,494	13,564	29,694	17,905	1,470	887	41,826	25,221	24	15	--	--	8,901	5,367	128,005	77,187
1990	62.6	15,284	9,573	23,236	14,554	24,953	15,629	2,816	1,764	36,956	23,147	351	220	--	--	10,893	6,823	114,488	71,710
1991	64.8	8,987	5,828	11,507	7,462	18,622	12,076	1,510	979	44,434	28,814	2,113	1,370	--	--	8,564	5,553	95,737	62,083
1992	66.4	5,553	3,687	20,166	13,388	25,889	17,187	5,978	3,969	40,287	26,745	7,650	5,078	--	--	6,105	4,053	111,629	74,106
1993	67.8	3,574	2,425	17,536	11,898	13,135	8,912	5,722	3,883	40,736	27,638	3,374	2,289	--	--	5,621	3,814	89,699	60,859
1994	69.3	2,107	1,459	20,877	14,462	13,896	9,626	5,413	3,750	41,529	28,769	6,204	4,298	--	--	4,759	3,297	94,785	65,662
1995	70.7	5,053	3,574	28,343	20,044	12,160	8,599	5,727	4,050	43,798	30,974	9,899	7,000	--	--	4,562	3,226	109,541	77,467
1996	72.1	4,563	3,288	36,328	26,180	12,991	9,362	10,310	7,430	42,011	30,275	5,754	4,147	--	--	2,695	1,942	114,651	82,623
1997	73.3	3,779	2,772	19,956	14,636	10,786	7,910	10,010	7,342	38,160	27,987	9,303	6,823	--	--	2,867	2,103	94,861	69,573
1998	74.2	3,492	2,590	16,880	12,519	4,300	3,189	8,819	6,540	26,280	19,491	5,065	3,756	1	1	2,586	1,918	67,422	50,005
1999	75.3	2,713	2,042	30,704	23,107	12,717	9,571	5,027	3,784	29,487	22,192	7,863	5,917	114	86	2,315	1,742	90,940	68,441
2000	76.9	5,240	4,029	30,835	23,709	13,255	10,192	9,739	7,489	31,697	24,373	7,909	6,081	1,494	1,149	3,524	2,710	103,694	79,732
2001	78.6	7,436	5,847	24,540	19,296	9,615	7,560	9,613	7,559	25,951	20,405	5,255	4,132	2,059	1,619	3,431	2,698	87,899	69,116
2002	79.9	8,678	6,933	25,984	20,761	14,209	11,353	3,694	2,952	17,785	14,210	4,029	3,219	3,529	2,819	3,632	2,902	81,541	65,149
2003	81.6	10,871	8,869	45,498	37,117	6,192	5,051	7,562	6,169	21,663	17,673	4,465	3,642	3,605	2,941	2,481	2,024	102,337	83,487
2004	83.9	15,493	12,995	51,211	42,954	5,652	4,740	10,902	9,145	19,483	16,342	5,533	4,641	5,806	4,870	2,435	2,043	116,516	97,730
2005	86.7	12,044	10,438	30,689	26,597	7,963	6,901	10,172	8,816	21,318	18,475	8,200	7,107	7,153	6,199	2,808	2,433	100,347	86,965
2006	89.5	5,522	4,940	60,140	53,807	5,023	4,494	9,017	8,067	22,279	19,933	8,912	7,974	4,184	3,743	2,205	1,973	117,281	104,931
2007	92.1	5,063	4,662	41,495	38,202	10,172	9,365	10,284	9,468	22,264	20,497	7,061	6,501	4,943	4,551	2,414	2,222	103,697	95,468
2008	94.1	4,506	4,240	30,997	29,164	14,815	13,939	11,320	10,651	28,637	26,943	7,259	6,830	6,021	5,665	3,100	2,917	106,655	100,349
2009	94.9	3,733	3,544	44,671	42,404	7,178	6,813	10,723	10,179	29,639	28,135	3,919	3,720	5,573	5,291	2,417	2,295	107,854	102,380
2010	96.2	8,002	7,698	34,040	32,746	11,416	10,982	12,913	12,422	26,642	25,629	5,628	5,414	5,460	5,252	2,964	2,851	107,065	102,996
2011	98.3	6,857	6,737	45,486	44,690	25,046	24,607	19,100	18,766	28,946	28,439	16,812	16,518	3,248	3,192	3,599	3,536	149,094	146,485
2012	100.0	6,925	6,925	29,114	29,114	24,685	24,685	15,077	15,077	23,834	23,834	14,611	14,611	8,977	8,977	3,147	3,147	126,370	126,370

Notes:
1. Nominal value is the revenue received by fishermen/harvesters in the landing year. Real value is in thousands of 2012 dollars.
2. Groundfish in 2011 and 2012 includes landings (respectively, real ex-vessel value in thousands) of sablefish ($17,660, $11,529), flatfish ($6,900, $7,316), and other species ($4,385, $4,990). 'Other' in 2011 and 2012 includes (respectively, real ex-vessel value in thousands) hagfish ($1,343, $1,162), Pacific halibut ($1,161, $965), and other species ($1,095, $1,021). Shellfish value excludes private lands harvest.
3. Notes and sources from volume table concerning species composition also apply to this table.

Over the last 30 years, the Oregon fishing industry has shifted from low-volume and high-value species, such as salmon, to high-volume and low-value species, such as Pacific whiting and sardines. In 2012, about two-thirds of the volume landed was Pacific whiting and sardines, but these high volume species comprised less than 20 percent by landed value. The ex-vessel prices for these species were $0.136 and $0.096 in 2012, respectively, as compared to over $3.00 per pound received sometimes for species like Dungeness crab, Pacific halibut, and Chinook salmon. This trend has had the effect of concentrating landings in ports that have high-volume harvesting and processing capabilities, such as Newport and Astoria. This trend, combined with the reduced number of small boats, has increased annual average revenues for the boats remaining active in commercial fishing.

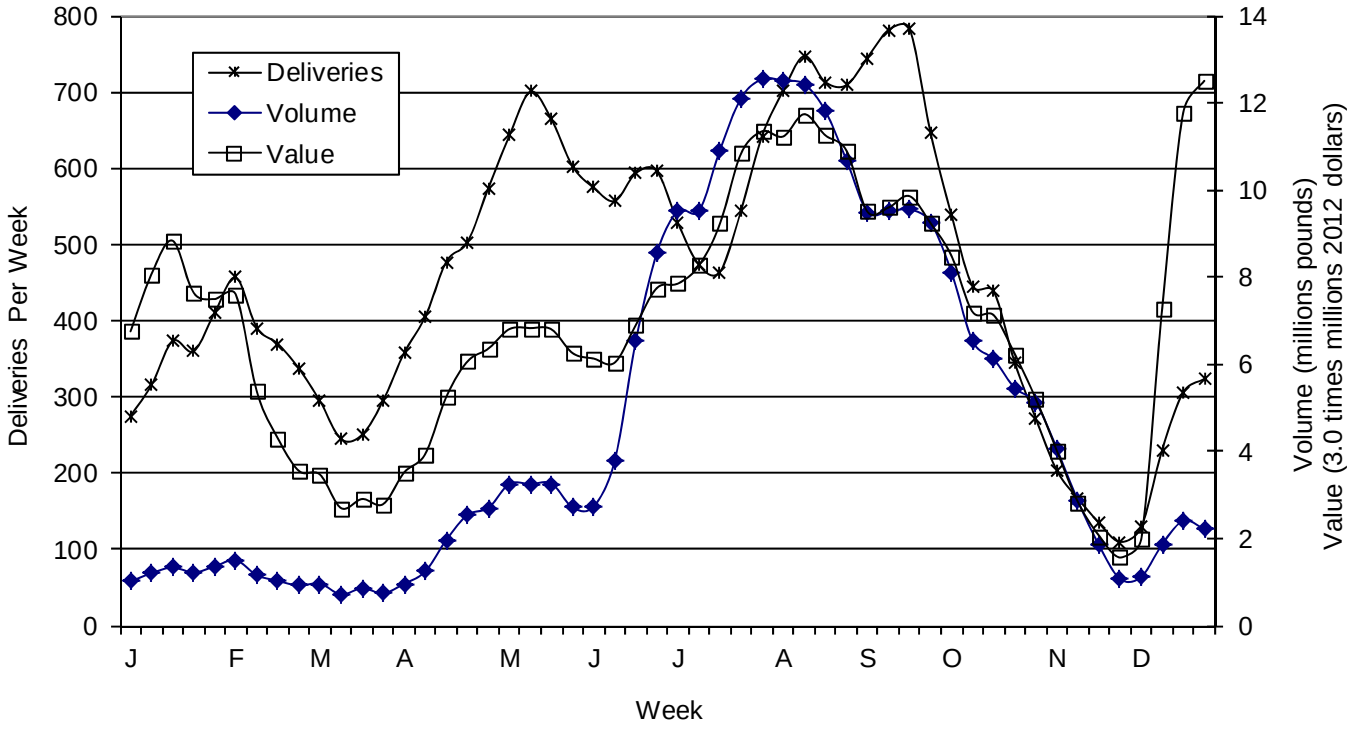
There is a seasonal pattern to Oregon fisheries. However, not every active vessel participates in all fisheries in this cycle. Different species are available at different times of the year, and general fishing, processing, and marketing patterns have developed over time (Figure II.1). It is more appropriate to view the fishing year as a pattern of activities rather than in terms of individual species seasons. Individual species, when viewed in isolation, may not appear important, but these often affect the harvesting, processing, and marketing of other species and the economic health of the fishing industry as a whole (Figure II.2). Fishing vessels as well as crew members move from one fishery to another, depending on seasons and alternatives available. Table II.3 shows active vessel participation in multiple fisheries in 2012.

U.S. West Coast offshore and Alaska fisheries are also important for the total fish harvesting/processing industries in coastal communities. During the year, some crew members and fishing vessels will travel to Alaska to fish for salmon, halibut, sablefish, shellfish, and groundfish.

Harvest volume divided by deliveries and associated with a major fishery (termed catch per unit effort or CPUE) can be descriptive of fleet harvesting characteristics (Table II.4). During the 1990 to 2012 time period, shrimp CPUE increased dramatically. Just as striking was the decrease in the groundfish fishery. This indicator shows the effects of severe trip limits imposed on this fishery in recent years. The salmon fishery's CPUE has followed the increases and decreases in abundances rather than management influences on fishing strategies. The sardine fishery enjoyed steady increases in CPUE, but this report's biennium years are starting a downward trend. Technological advancements in gear and vessels when there is not imposed trip limits can also affect CPUE in fisheries.

The landed volumes and values of commercial fish harvesting are an indication of a bountiful ocean resource off the Oregon Coast. However, individual species typically follow cyclical patterns, and the large harvests seen in recent years may not be there in all years. For example, about 20 percent of the ex-vessel value in 2012 would be excluded if landings were comparable to periods of low abundances for salmon, Dungeness crab, and sardines. Every major fishery has experienced volumes, values, and prices that have increased or decreased as much as tenfold in a span of very few years (Table II.5). The distant water fisheries were down in 2012, but that revenue also depends on varying Alaska fish resource availability and the vagaries of foreign market pricing. (See Section III.B for a more complete description of distant

Figure II.1
Onshore Deliveries, Volume, and Value by Week During Three Year Average of 2010 Through 2012



Notes:
1. Harvest value adjusted to 2012 dollars before calculating three year average.
2. Deliveries per week are fish ticket counts. Fish tickets issued for sales by vessels to the public are excluded, since they do not correspond to a harvest trip. This will slightly undercount the estimate of total coastwide deliveries. This will be offset by situations where a vessel delivers to more than one processor following a trip.
3. Data is adjusted using a three week moving average over a three year period to remove weather events that alter delivery schedules. However, dramatic weather and harvest management changes within the three year period will influence depictions.
4. Includes Oregon home-port vessels (home-port is defined as the port group where a vessel made the most landings by value).
5. The first week of each year starts on Sunday of the week in which January 1 occurs.

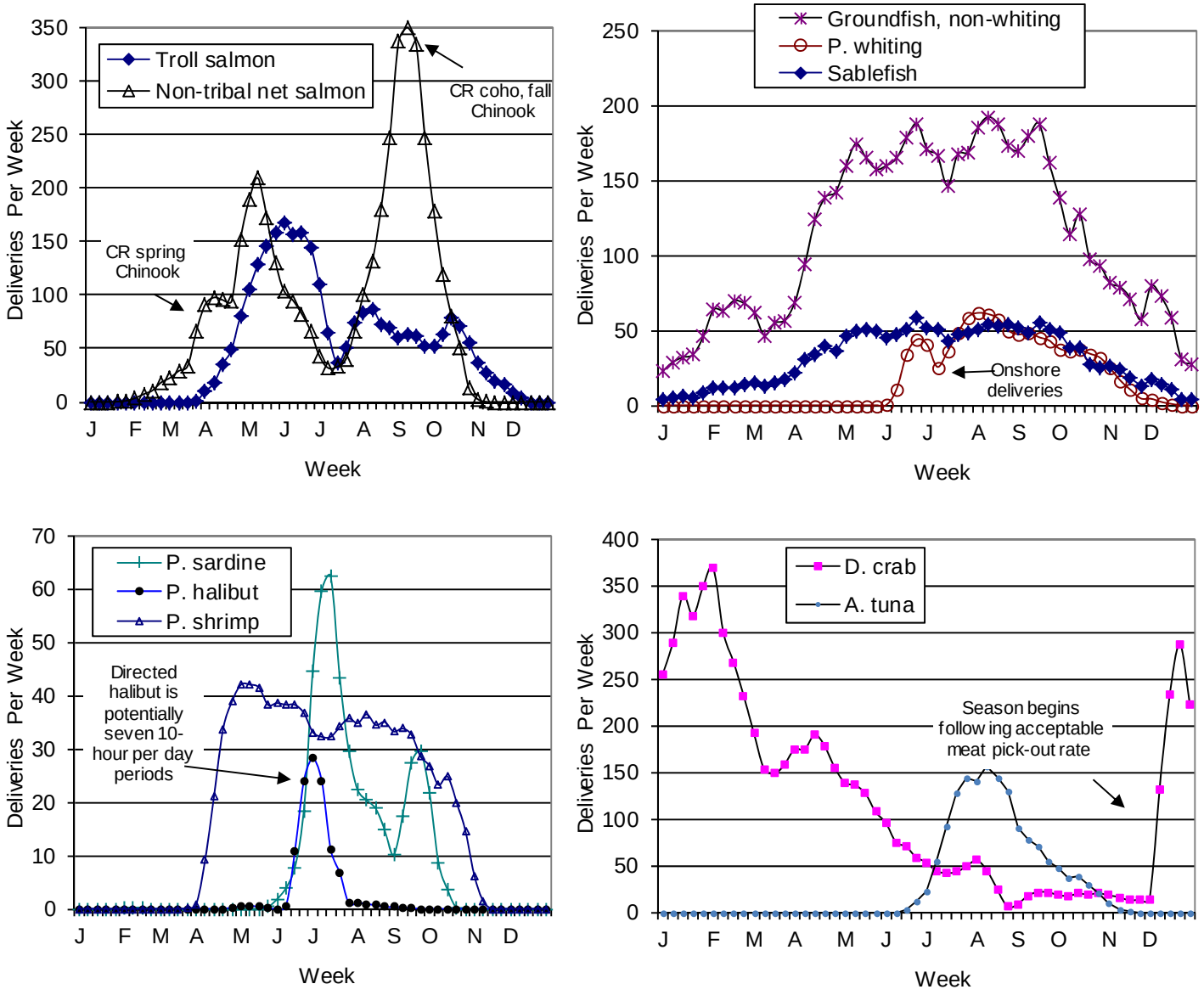
Source: PacFIN fish ticket data, July 2011 and April 2013 extractions, with "ZZ..." and "NONE" identified vessels excluded. These vessel identifiers are usually associated with tribal fisheries and non-boat fisheries such as shellfish harvesting.

water fisheries.) Prudent sustainable harvest management protection for key habitat elements, and marketing techniques that develop the greatest value for each harvested species, may provide the basis for future fisheries industry prosperity in Oregon's coastal communities.

B. Fleet Characteristics

The fleet can be described in terms of vessel license counts and vessels making deliveries counts. The latter can be further disaggregated by whether they are active or inactive. An arbitrary choice of $500 harvest revenue is used to define active and inactive. The active and inactive category is an attempt to sort out whether there was a

Figure II.2
Onshore Deliveries by Fishery and by Week During Three Year Average of 2010 Through 2012



Notes:
1. The figure's purpose is to show harvest seasonality characteristics, so data is adjusted using a three week moving average over a three year period to remove weather events that alter delivery schedules. The averaging will not necessarily remove dramatic weather and harvest management changes within the three year period.
2. Fishery assigned based on plurality of landing volume during a one week period. This assumes a vessel's fishing strategy will not change more than once per week.
3. One fish ticket corresponds to one delivery. This may slightly be an overestimate in the case that deliveries are sometimes made to multiple processors following a trip. Fish tickets issued for sales by vessels to the public are excluded, since they do not correspond to a harvest trip. This will slightly undercount the estimate of total coastwide deliveries. This will be offset by situations where a vessel delivers to more than one processor following a trip.
4. Several fisheries are combined on single charts because of similar vertical axis scales. It was not meant to imply comparison other than to show relative activity between fisheries.

Source: PacFIN fish ticket data, July 2011 and April 2013 extractions, with "ZZ..." and "NONE" identified vessels excluded. These vessel identifiers are usually associated with tribal fisheries and non-boat fisheries such as shellfish harvesting.

Table II.3
Vessel Counts by Active Fisheries Participation in 2012

	Salmon					Groundfish					
Fishery	Net	Troll	D. Crab	P. Shrimp	A. Tuna	LE	OA	P. Whiting	P. Sardine	P. Halibut	Other
Salmon											
Net	171	0	4	0	c	c	0	0	0	c	81
Troll		323	91	0	174	12	48	0	0	44	3
D. Crab			338	37	131	58	54	4	3	56	19
P. Shrimp				64	13	28	c	c	0	c	c
A. Tuna					431	28	56	0	0	57	15
Groundfish											
LE						111	c	19	0	24	4
OA							166	0	0	38	4
P. Whiting								21	0	0	c
P. Sardine									21	0	19
P. Halibut										89	c
Other											135

Notes:
1. Active fisheries are defined as $500 minimum onshore harvest value for a vessel in each fishery. The $500 filter should not be interpreted as an indicator for a vessel's targeted fisheries participation.
2. Vessels with identifier that starts with "ZZ" or "NONE" are not included, which means vessel counts exclude tribal fisheries.
3. Column and row do not sum because a vessel may participate in more than one of the row and column defined fisheries in addition to the fishery in the diagonal counts. The table only shows counts for two single fisheries active vessels participation. For example, of the 338 vessels that harvested at least $500 D. crab, 39 percent (131 divided by 338) of them also harvested at least $500 in A. tuna, 17 percent of them also harvested at least $500 P. halibut, and 27 percent of them also harvested at least $500 troll salmon. It is not possible to discern in this table how many vessels participated in all four of these example fisheries.
4. There were 1,086 vessels making at least $500 onshore harvest value over all fisheries in Oregon in 2012, out of 1,140 total vessels with valid identifiers making any landings in Oregon. These counts include vessels that are home-ported in Oregon and vessels that home-port in other states or British Columbia.
5. Sturgeon was the predominant species in the "other" fishery for the vessels active in both the "net salmon" and "other" fisheries.
6. Counts with a "c" are not shown to avoid revealing confidential information.

Source: PacFIN annual vessel summary, April 2013 extraction.

Table II.4
Catch Per Unit Effort by Major Fishery in 1990 to 2012

Year	Troll Salmon	D. Crab	P. Shrimp	A. Tuna	Groundfish	P. Whiting	P. Sardine	Other
1990	169	958	12,982	5,946	10,635	62,593	-	2,136
1991	229	631	11,106	12,644	10,075	72,534	-	1,555
1992	247	1,150	19,547	5,412	8,582	82,222	-	1,398
1993	191	1,175	17,402	5,204	9,532	101,732	-	1,323
1994	160	1,300	10,912	5,275	8,795	87,038	-	1,053
1995	460	1,346	9,524	13,123	8,095	112,420	-	1,174
1996	470	1,938	11,674	11,142	8,349	115,791	-	989
1997	458	1,007	17,013	7,690	5,830	114,470	-	785
1998	470	1,221	8,833	14,177	5,922	119,118	-	730
1999	283	1,596	14,935	6,138	5,626	105,123	74,442	933
2000	412	1,284	19,667	10,415	5,895	136,565	64,541	995
2001	553	1,387	25,777	7,080	4,102	103,636	62,284	1,019
2002	579	1,825	28,048	6,911	2,676	105,366	76,997	1,077
2003	584	2,962	30,236	7,791	3,818	90,760	77,374	1,631
2004	426	3,222	22,715	7,245	4,381	83,384	84,054	1,104
2005	504	2,511	26,480	8,372	4,752	85,260	91,716	1,479
2006	223	3,688	25,419	7,835	4,826	107,587	104,460	1,138
2007	215	2,120	27,954	7,460	5,378	100,532	107,589	1,128
2008	172	2,032	31,040	9,490	5,870	98,744	105,278	2,064
2009	179	2,900	37,721	7,344	5,402	92,280	120,188	1,196
2010	255	2,522	42,732	7,778	5,579	78,910	113,157	2,404
2011	211	2,316	46,648	5,999	4,675	132,771	123,051	1,988
2012	237	1,482	43,235	6,009	4,947	132,078	122,988	2,806

Notes: 1. Catch per unit effort (CPUE) is calculated by dividing a vessel's volume in a one week period by the number of deliveries a vessel makes during that period, and associating all of the volume with a principal species. Weeks are defined as Sunday through Saturday, so the first and last weeks of each year are usually partial. The principal fishery is assigned based on a plurality of landing volume during the one week period. This assumes a vessel's fishing strategy will not change more than once per week.

2. Deliveries per week are fish ticket counts. Fish tickets issued for sales by vessels to the public are excluded, since they do not correspond to a harvest trip. This will slightly undercount the estimate of total coastwide deliveries. This will be offset by situations where a vessel delivers to more than one processor following a trip.

3. Excludes CPUE for vessels when harvesting in salmon net fisheries.

Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions with "ZZ..." and "NONE" identified vessels excluded. These vessel identifiers are usually associated with tribal fisheries and non-boat fisheries such as shellfish harvesting.

Table II.5
Range of Annual Landed Volume, Value, and Prices by Major Fishery During the Period 1970 to 2012

		Landed Volume		Landed Value		Prices	
Major Fishery		Amount (000's)	Year	Amount ($000's)	Year	Per Pound ($)	Year
Salmon	High	19,628	1970	67,153	1988	4.96	1979
	Low	1,285	1994	2,107	1994	1.41	2001
Dungeness crab	High	33,316	2006	60,140	2006	3.36	2012
	Low	2,350	1973	5,493	1973	1.18	1970
Pink shrimp	High	56,666	1978	53,892	1987	1.43	1983
	Low	4,844	1984	4,149	1984	0.30	2003
Albacore tuna	High	33,040	1974	47,257	1974	1.97	2011
	Low	1,080	1989	1,470	1989	0.79	1977
Groundfish	High	90,084	1982	45,841	1979	1.00	2011
	Low	21,024	1975	7,606	1970	0.36	1970
Pacific whiting	High	162,782	1997	16,812	2011	0.136	2012
	Low	61,466	2008	3,919	2009	0.032	1998
Pacific sardine	High	99,450	2005	8,977	2012	0.134	2011
	Low	21,005	2000	1,494	2000	0.053	2006

Notes: 1. Value and prices are in 2012 real dollars.
2. Pacific whiting did not emerge as a major fishery until after 1990. Onshore landing volume averaged around 150 million pounds for 1997 to 2001. Volatility range uses years 1997 to 2012.
3. Pacific sardine has a 36 year abundance cycle, and did not emerge as a major fishery species until 2000 in the latest cycle. Volatility range uses years 2000 to 2012.

Source: PacFIN March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

serious choice based on economic criteria to participate in a directed fishery and make landings at an Oregon port. A vessel may be licensed and not make deliveries for a variety of reasons such as breakdowns and out-of-state registrants who simply want the flexibility to make landings at Oregon ports. Table II.6 shows there were 1,158 vessels and 955 crew licensed in 2012. There were 1,140 vessels that made deliveries in Oregon of which 951 had home-ports in Oregon (Table II.3 and Table II.7). Of those unique vessels making deliveries, 1,086 total were active and 902 Oregon home-port were active. This is down from 3,737 home-port vessels (2,498 active) making landings in 1981. Because of the return of a modest salmon fishery south of Cape Falcon, the number of home-port active vessels increased in 2011 over numbers in the previous biennium years. Many vessels participating solely in distant water fisheries also use Newport for moorage, provisioning, and repairs, but do not show-up in home-port vessel statistics because most of their landings are not in Oregon.

Identifiable vessels made 24.9 thousand deliveries (Table II.13) and there were 23.0 thousand deliveries from ocean catch areas including unidentifiable vessels in 2012 to Oregon ports (Table II.8 and Figure II.3). The number of deliveries vessels make has been quite steady over the last five years, except for a drop in 2008. However, the deliveries in the last five years are about half of the 1980's averages. Deliveries when troll salmon gear was used have the highest

Table II.6
Oregon Vessel and Crew Licenses by County in 2012

	Vessels	Crew
Resident Boat Licenses		
Oregon addresses		
Clatsop County	211	90
Tillamook County	108	56
Lincoln County	195	123
Coastal Lane and Douglas Counties	54	27
Coos County	163	129
Curry County	156	103
Other Oregon	261	130
All Oregon	1,148	658
Non-Oregon addresses	10	
Non-Resident Boat Licenses	415	297
Total	1,573	955

Source: ODFW, personal communication February 2013.

range over these years. Troll salmon gear deliveries are up in 2011 and 2012 due to the return of salmon fishing south of Cape Falcon. Crab pot gear trips continued a five year downward trend. The crab fishery limited entry program allows for single vessels to use other vessel assigned pot gear limits which would tend to maintain catch volume per delivery while decreasing delivery counts.

While the number of vessels making deliveries has mostly been decreasing in recent years, the average revenue per vessel has generally been increasing (Figure II.4). There have been increasing and decreasing years which is partially explained by participation in salmon fisheries. With the return of salmon fishing south of Cape Falcon, more vessels returned to the fishery and the revenue average decreased in 2010. The revenue average increased in 2011 to the historical high of $145.8 thousand. The 2012 average decreased to $134.6 thousand because of falling overall harvest values.

Table II.9 shows the share of vessels for different revenue size categories by fisheries and gear groups in 2012. It also shows the share of vessels specializing in the various fisheries and gear groups. For vessels in the greater than $50,000 revenue category, the salmon fishery had the least representation. For this same revenue category, the trawl gear group had the highest representation. The table shows that 94 percent of all revenue in 2012 is landed by those vessels that have annual revenue greater than $50,000, but this revenue category represents 40 percent of total home-port vessel count. The overall revenue share for this category has generally been increasing as fleet numbers have dwindled. Vessels in the pink shrimp fishery had one of the highest specializations and highest annual revenues. These vessels tend to have high equipment and gear costs requiring high levels of revenue.

Most of Oregon's summed harvest value is landed by only a small share of all vessels making deliveries. For example, use Figure II.5 to find the 30 vessel line using the left *y*-

Table II.7
Vessel Counts and Revenue Shares by Revenue Categories in 1981 to 2012

	<$500				$500 to $4,999				$5,000 to $49,999				>=$50,000				Total	
	Vessel	Average	Share %		Vessel	Average	Share %		Vessel	Average	Share %		Vessel	Average	Share %		Vessel	Average
Years	Count	Revenue	Count	Revenue	Count	Revenue	Count	Revenue	Count	Revenue	Count	Revenue	Count	Revenue	Count	Revenue	Count	Revenue
1981	1,239	338	33.2%	0.3%	1,339	4,492	35.8%	4.7%	867	36,485	23.2%	25.0%	292	303,682	7.8%	70.0%	3,737	33,915
1982	1,041	298	30.4%	0.3%	1,308	4,258	38.2%	5.1%	820	33,636	24.0%	25.4%	251	298,936	7.3%	69.2%	3,420	31,724
1983	1,643	265	50.4%	0.6%	995	3,408	30.5%	4.5%	403	35,092	12.4%	18.6%	217	267,452	6.7%	76.4%	3,258	23,329
1984	350	331	23.2%	0.2%	526	4,025	34.9%	3.6%	460	33,001	30.5%	25.6%	171	245,039	11.3%	70.6%	1,507	39,360
1985	1,060	223	43.1%	0.3%	626	3,716	25.5%	2.9%	554	32,725	22.5%	22.3%	219	276,207	8.9%	74.5%	2,459	33,014
1986	827	237	30.9%	0.2%	840	3,868	31.4%	3.0%	757	32,344	28.3%	22.6%	251	320,561	9.4%	74.2%	2,675	40,520
1987	492	289	18.8%	0.1%	721	4,037	27.6%	1.8%	1,052	33,677	40.3%	21.8%	346	359,430	13.3%	76.4%	2,611	62,368
1988	276	369	10.5%	0.1%	620	4,002	23.7%	1.6%	1,299	33,838	49.6%	27.7%	424	264,159	16.2%	70.6%	2,619	60,535
1989	436	339	17.7%	0.1%	856	3,614	34.8%	2.6%	894	25,676	36.3%	19.1%	277	338,300	11.2%	78.2%	2,463	48,683
1990	443	288	21.1%	0.1%	720	3,415	34.3%	2.3%	641	26,289	30.6%	15.5%	293	303,578	14.0%	82.1%	2,097	51,686
1991	350	315	18.3%	0.1%	772	3,202	40.4%	2.6%	540	24,966	28.2%	14.1%	251	317,524	13.1%	83.2%	1,913	50,059
1992	293	254	20.0%	0.1%	434	2,966	29.6%	1.2%	422	28,193	28.7%	10.7%	319	306,869	21.7%	88.1%	1,468	75,715
1993	347	225	25.2%	0.1%	383	2,882	27.8%	1.2%	352	26,098	25.5%	10.2%	296	268,413	21.5%	88.5%	1,378	65,180
1994	316	236	26.1%	0.1%	327	3,051	27.0%	1.0%	285	27,500	23.5%	8.1%	283	309,655	23.4%	90.8%	1,211	79,721
1995	282	218	24.0%	0.1%	253	3,006	21.5%	0.7%	311	28,209	26.4%	7.8%	330	311,861	28.1%	91.5%	1,176	95,671
1996	184	258	15.8%	0.0%	266	2,900	22.8%	0.7%	360	26,819	30.9%	8.4%	356	295,197	30.5%	90.9%	1,166	99,111
1997	138	244	12.8%	0.0%	263	2,935	24.3%	0.8%	352	26,070	32.5%	9.4%	329	265,611	30.4%	89.7%	1,082	89,989
1998	124	239	12.7%	0.0%	251	3,069	25.7%	1.1%	332	26,673	34.1%	13.1%	268	216,684	27.5%	85.7%	975	69,463
1999	98	239	10.3%	0.0%	229	3,061	24.1%	0.8%	329	25,261	34.6%	9.1%	295	279,965	31.0%	90.1%	951	96,346
2000	88	267	8.2%	0.0%	218	2,970	20.4%	0.6%	413	25,447	38.7%	10.1%	349	265,326	32.7%	89.2%	1,068	97,171
2001	94	276	8.4%	0.0%	239	2,867	21.2%	0.8%	460	25,953	40.9%	13.3%	332	232,309	29.5%	85.9%	1,125	79,801
2002	81	256	8.0%	0.0%	208	2,862	20.6%	0.7%	426	24,672	42.2%	12.9%	295	238,286	29.2%	86.3%	1,010	80,615
2003	72	259	6.9%	0.0%	205	2,816	19.7%	0.6%	424	24,236	40.8%	10.2%	337	266,768	32.5%	89.2%	1,038	97,084
2004	81	267	7.5%	0.0%	175	2,767	16.2%	0.4%	448	24,214	41.6%	9.5%	373	276,813	34.6%	90.1%	1,077	106,411
2005	69	272	6.3%	0.0%	193	2,650	17.7%	0.5%	476	23,525	43.6%	11.3%	354	246,278	32.4%	88.1%	1,092	90,577
2006	66	222	6.9%	0.0%	189	2,641	19.6%	0.4%	352	21,734	36.6%	6.5%	355	309,836	36.9%	93.1%	962	122,823
2007	56	220	5.8%	0.0%	214	2,543	22.1%	0.5%	357	21,682	36.9%	7.8%	341	266,456	35.2%	91.6%	968	102,437
2008	48	245	5.4%	0.0%	177	2,440	20.0%	0.4%	328	23,548	37.0%	7.4%	333	288,645	37.6%	92.2%	886	117,705
2009	93	250	9.6%	0.0%	202	2,159	20.8%	0.4%	319	21,928	32.9%	6.8%	357	268,444	36.8%	92.8%	971	106,374
2010	77	244	7.9%	0.0%	166	2,303	17.0%	0.4%	369	22,271	37.8%	8.2%	363	251,085	37.2%	91.4%	975	102,321
2011	87	243	8.9%	0.0%	150	2,147	15.3%	0.2%	343	21,939	35.0%	5.3%	400	337,505	40.8%	94.5%	980	145,786
2012	49	202	5.2%	0.0%	169	2,491	17.8%	0.3%	349	20,150	36.7%	5.5%	384	313,907	40.4%	94.2%	951	134,599

Notes: 1. Revenue is in 2012 dollars.
2. Includes only vessels with home-port group in Oregon. Home-port group is defined as the port group where a vessel made the most landings by value.
3. Revenue excludes deliveries to offshore processors and revenues returned from distant water fisheries.
4. Excludes vessel identification codes "NONE" and "ZZ..." which are usually used to identify vessels within tribal commercial fisheries.

Source: PacFIN March 2008, April 2009, March 2010, July 2011, and April 2013 annual vessel summary extractions.

Table II.8
Deliveries by Gear Type From Ocean Catch in 1981 to 2012

Fishery	Five Year Averages 1981-1985	1986-1990	1991-1995	1996-2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Major Gear Groups																
Troll salmon	20,017	30,222	6,119	4,143	6,351	7,180	7,488	8,144	6,360	2,641	3,233	477	924	2,462	2,321	3,803
Albacore tuna	599	311	651	984	1,349	737	1,270	1,547	1,038	1,145	1,519	1,046	1,496	1,455	1,693	1,708
Shrimp trawl	1,641	2,645	1,830	1,260	1,165	1,534	692	535	590	476	716	821	585	733	1,032	1,124
Bottom trawl	4,139	2,891	3,365	2,456	1,853	1,632	1,659	1,164	1,198	1,304	1,342	1,466	1,691	1,382	675	682
Midwater trawl	379	448	1,287	1,606	1,434	731	902	1,578	1,595	1,259	942	629	685	878	1,153	833
P. whiting	9	24	1,019	1,057	777	468	518	816	826	781	579	355	356	448	753	569
Fish pot	360	251	334	254	292	495	388	270	324	412	285	391	381	473	512	378
Crab pot	11,266	7,950	8,372	8,048	7,100	6,805	8,196	8,237	6,748	8,900	7,950	6,897	7,645	6,225	7,352	5,729
Longline	286	563	953	1,434	1,078	612	839	649	1,013	1,073	989	1,554	2,205	1,782	1,704	1,505
Other hook & line	2,038	2,096	2,832	3,070	4,336	5,448	4,148	3,974	3,394	2,992	3,195	3,301	3,646	3,100	3,378	3,112
Other Gears																
Net sardine	--	--	--	70	457	653	726	959	1,104	776	886	487	396	426	199	798
Sea urchin	--	1,711	2,412	582	948	709	109	258	421	346	396	497	587	251	510	442
Squid net	34	1	20	13	--	--	2	4	--	--	--	--	1	--	--	--
Scallop dredge	74	4	10	5	--	1	--	--	2	--	--	--	--	--	--	--
Not elsewhere specified																
Other	3,041	5,825	4,683	2,225	1,687	3,738	2,232	3,972	2,650	2,683	2,562	2,255	4,720	4,107	3,044	2,843
Total	43,875	54,917	32,866	26,149	28,050	30,275	28,651	31,291	26,437	24,007	24,015	19,821	24,962	23,274	23,573	22,957

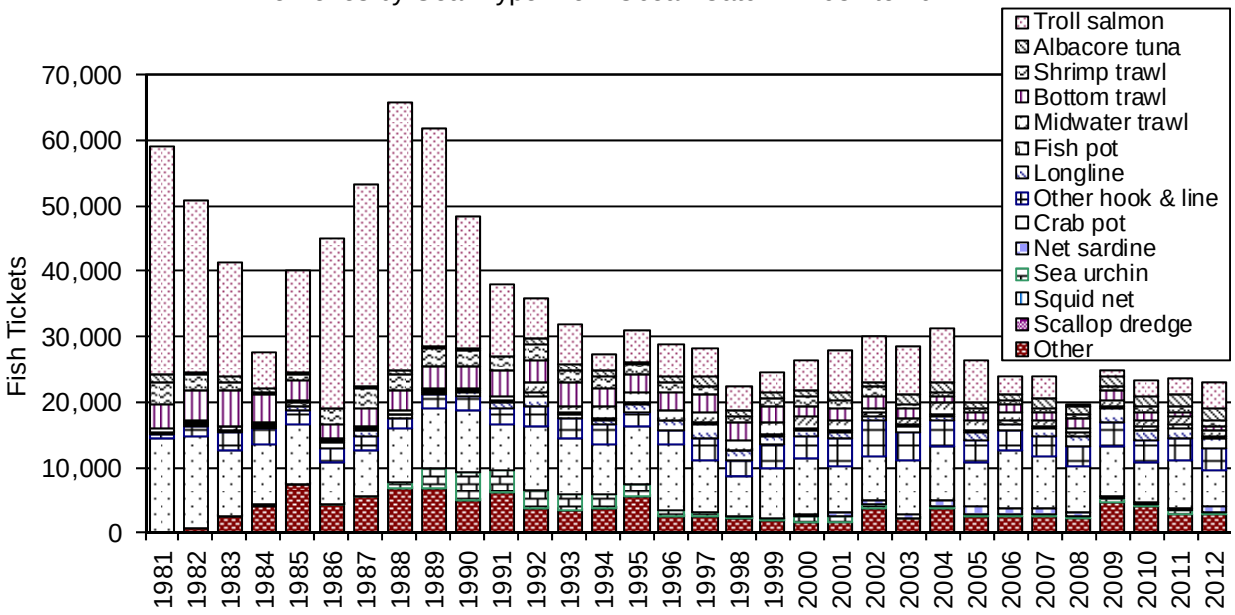
Note: 1. Deliveries are approximated using fish tickets. A fish ticket represents the landing of fish or shellfish product from one fishing trip. Ticket counts may not reflect total ocean fishing trips because some vessels may deliver to more than one dealer after returning to port. The number of these occurrences is probably less than one percent of the total and they are limited predominantly to the salmon, crab and bottom trawl fisheries.

2. Troll fish tickets with both salmon and albacore tuna are assigned to only one of those groups, based on which had more round pounds on the fish ticket.

3. Other fish tickets not elsewhere specified include clams and mussels, other shrimp, and D. crab with unspecified gear, mackerel with net gear, pot gear other than fish pot or crab pot, troll gear fish tickets with neither salmon nor tuna, and other.

Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

Figure II.3
Deliveries by Gear Type From Ocean Catch in 1981 to 2012



Note: 1. Deliveries are approximated using fish tickets. A fish ticket represents the landing of fish or shellfish product from one fishing trip. Ticket counts may not reflect total ocean fishing trips because some vessels may deliver to more than one dealer after returning to port. The number of these occurrences is probably less than one percent of the total and they are limited predominantly to the salmon, crab and bottom trawl fisheries.

2. Troll fish tickets with both salmon and albacore tuna are assigned to only one of those groups, based on which had more round pounds on the fish ticket.

3. Other fish tickets not elsewhere specified include clams and mussels, other shrimp, and D. crab with unspecified gear, mackerel with net gear, pot gear other than fish pot or crab pot, troll gear fish tickets with neither salmon nor tuna, and other.

Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

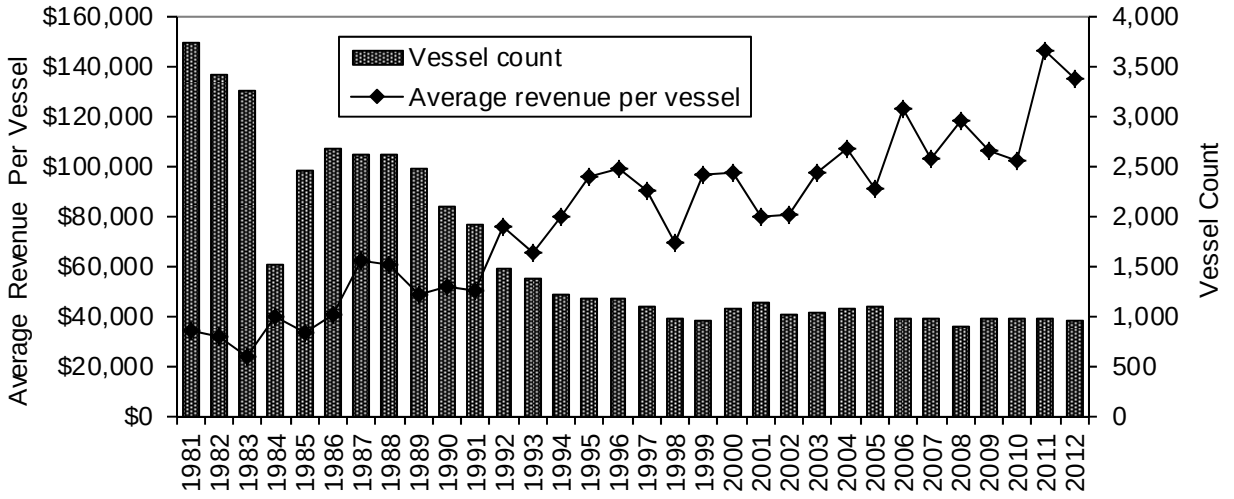
axis scale. The line encompasses vessels in the $200 thousand or more revenue categories. Then find the cumulative harvest revenue line for these vessels using the right *y*-axis scale. The exercise shows that over 70 percent is landed by these 30 top grossing vessels in 2012. The converse is that about 80 percent of all lower grossing vessels only land about 25 per of all harvest value.

Vessels enter and exit fisheries as revenue opportunities present themselves, or in some cases, to allow for permit renewals. Table II.10 and Figure II.6 show that the Dungeness crab fishery has the greatest participation longevity over the last five years and the sardine fishery the least. The annual entry and existing of the different fisheries is shown in Figure II.7.

C. Fishery Limited Entry Programs

Major commercial fisheries are governed by federal and/or state limited entry programs. Historical landing histories before certain cut-off dates are usually used to determine the number and qualifications of permittees.[7] Table II.11 is a summary description of Oregon's limited entry programs.

Figure II.4
Home-Port Vessel Counts and Annual Average Revenue Per Vessel 1981 to 2012



Notes: 1. Revenues adjusted to 2012 dollars.
2. Average revenue per vessel is for onshore landings; distant water fisheries revenue is not included. The revenue may be from landings made in California and Washington as well as Oregon.

Source: PacFIN March 2008, April 2009, March 2010, July 2011, and April 2013 annual vessel summary extractions.

For some existing fisheries and new emerging fisheries, Oregon used the Developmental Fisheries Board to determine permitting requirements. The Developmental Fisheries Program started in 1993 allowed for limited access to new commercial fisheries which were not assessed, nor documented to be economically viable. The goal of the original program was to allow for limited number of permits for newly created fisheries so that gear, market and harvest rates could be analyzed with the cooperation and data collection mandated by the limited-permit program. Since its inception, four fisheries have moved from the Developmental Fishery Program to limited-entry fisheries: brine shrimp, nearshore groundfish, sardines, and bay clams. Species regulated under this Program were swordfish, box crab, anchovy/herring, spot prawn, and hagfish. The Developmental Fishery Program was discontinued in 2007 in favor of stakeholders involvement and legislative and administrative treatment of fisheries management practices.

There are overlapping fishery federal limited entry programs. The programs are for salmon, groundfish trawl and fixed gear fisheries, and coastal pelagic species (CPS). Other fisheries that do not yet have limited entry requirements, but do have federal regulations such as user group allocation plans include halibut, highly migratory species (HMS) such as albacore tuna, and a portion of the groundfish fishery called groundfish open access. The latter fishery does have an Oregon limited entry program when harvesting occurs in State Territorial waters. The Pacific Fishery Management Council (PFMC) is responsible for developing plans and seasonal specifications for the federal managed fisheries as well as developing federal limited entry programs.

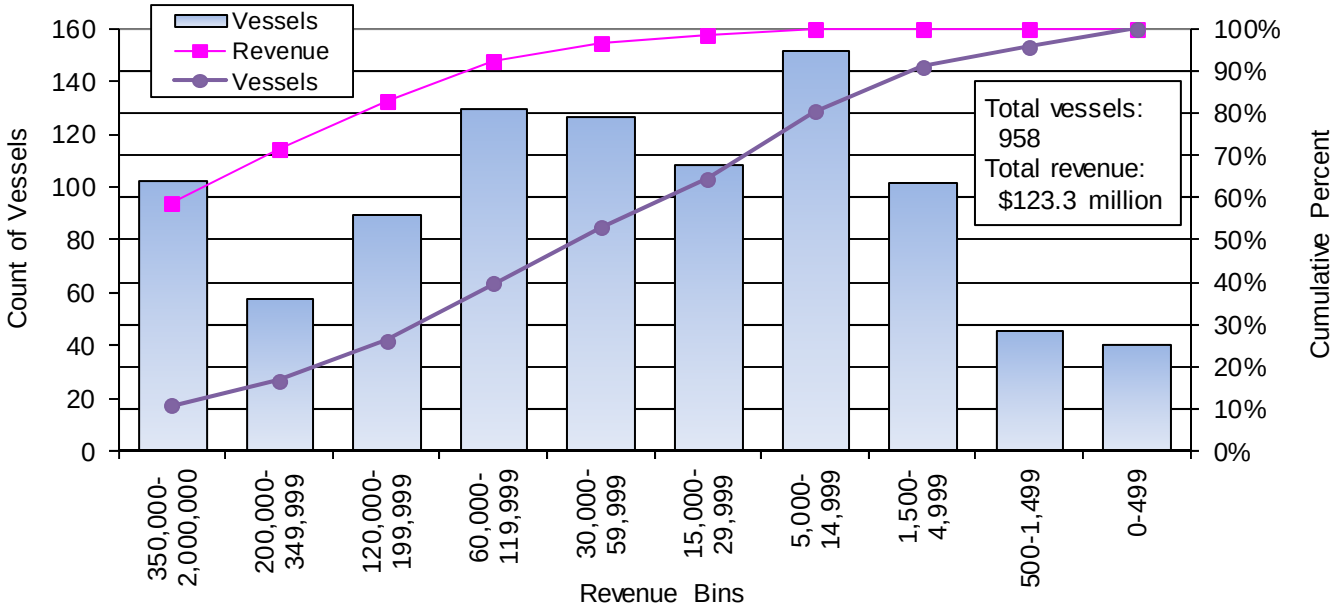
Table II.9
Count of Vessels Within Species and Gear Revenue Groups and Specialization Categories in 2012

	Sum of Revenue (thousands)	Vessel Count	Count of Vessels Within Revenue Categories				Count of Vessels Within Revenue Specialization Categories			Revenue Distribution		
			<$500	$500-$5K	$5K-$50K	>$50,000	>90%	>50%	>33%	Mean	90th Percentile	50th Percentile
Species												
Salmon	6,897	508	6%	20%	44%	30%	45%	61%	67%	13,576	35,586	7,132
D. crab	32,220	326	1%	5%	19%	75%	30%	61%	73%	98,834	210,349	62,030
Pink shrimp	24,168	57	0%	0%	0%	100%	28%	67%	79%	424,009	774,244	407,888
A. tuna	13,994	372	2%	12%	35%	52%	28%	45%	56%	37,618	106,982	12,203
Groundfish	24,498	333	3%	12%	35%	50%	28%	43%	53%	73,569	246,340	7,408
Pacific whiting	14,883	46	0%	0%	0%	100%	28%	33%	39%	323,533	974,787	64
Pacific sardines	7,037	29	0%	0%	3%	97%	17%	48%	52%	242,665	680,486	32,196
Other	4,306	355	1%	9%	42%	48%	3%	6%	6%	12,131	19,325	711
Gear												
Hook and line	7,721	237	4%	14%	42%	40%	34%	49%	60%	32,579	67,011	8,089
Net	11,093	181	7%	26%	56%	11%	96%	98%	98%	61,287	45,848	10,302
Other	532	45	11%	31%	33%	24%	44%	51%	58%	11,814	18,778	1,920
Pot	36,276	308	0%	2%	19%	79%	31%	67%	78%	117,780	246,101	70,113
Trawl	54,026	89	0%	0%	0%	100%	63%	91%	98%	607,029	1,030,095	568,050
Troll	18,355	500	5%	17%	34%	44%	56%	67%	74%	36,711	101,022	12,871

Notes: 1. Includes Oregon home-port vessels (home-port is defined as the port group where a vessel made the most landings by value), and excludes vessels with identifier "NONE" or "ZZ..."
2. Total revenue does not include deliveries to offshore processors or revenues from distant water fisheries.

Source: PacFIN annual vessel summary, April 2013 extraction.

Figure II.5
Ocean Onshore Landing Revenue Bins Showing Cumulative Revenue and Vessel Counts in 2012



Notes: 1. Excludes vessels with identification "NONE" or starting with "ZZ". This identification is usually associated with vessels making tribal commercial fisheries deliveries.
2. Revenue filtered for ocean area-of-catch.
Source: PacFIN annual vessel summary, April 2013 extraction.

The PFMC management processes account for negotiation results and requirements from United States treaties with Canada addressing three transboundary stocks: Pacific salmon, Pacific whiting, and North Pacific albacore. The United States is a party with Canada on the Pacific Halibut Convention. PFMC management processes must also address other multi-state agreements, state-tribal fisheries authorities, and international agreements and forums.

The federal groundfish trawl and fixed gear fishery transitioned into an individual transferable quota (ITQ) program (sometimes also referred to as catch-share program) in 2011. Quotas were assigned to certain permit owner categories, based on fishing history. An assignment to processor owners (individual processor quotas or IPQ's) was also included in the program design for Pacific whiting.

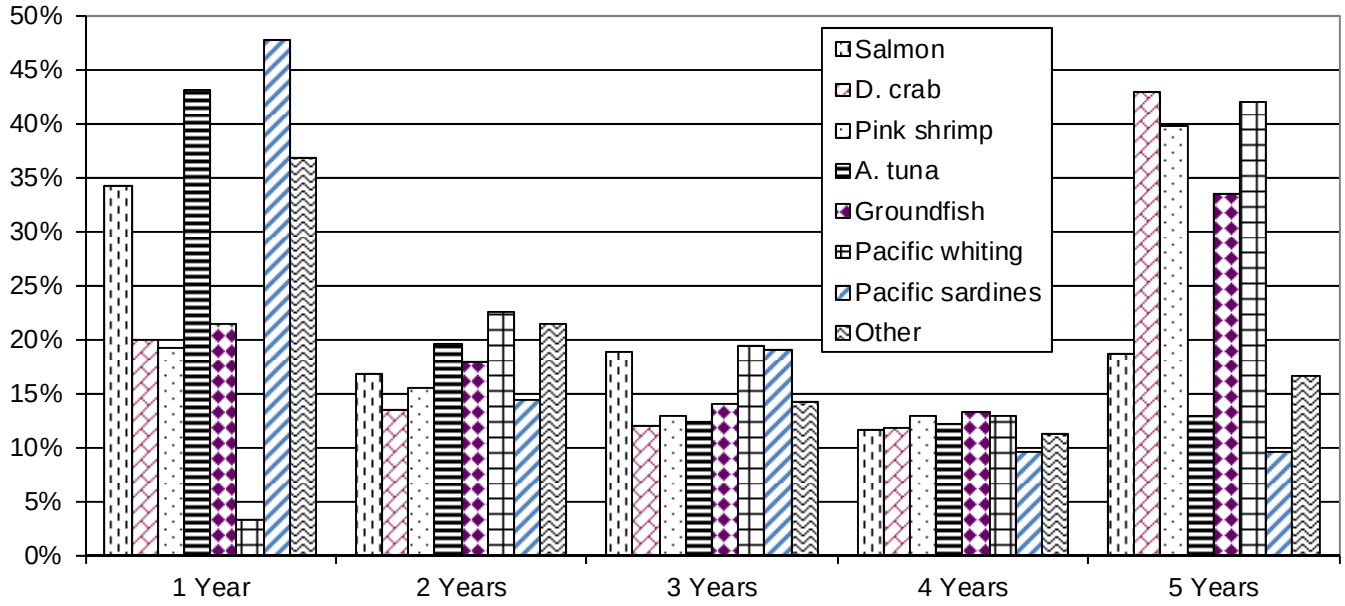
The share of home-port vessels making deliveries totaling more than $500 in 2011 and 2012 that either have a federal groundfish limited entry permit or participate in the groundfish fishery as an open access vessel is shown in Figure II.8. Over 90 percent of all Oregon home-port vessels do not land more than $500 in the groundfish fishery in these years.

The PFMC HMS fishery management plan (FMP) requires a fishery permit. HMS group includes such species as albacore tuna. There were 347 home-port vessels landing greater than $500 of HMS in 2012. Another 84 that home-port in other West Coast states had landings of HMS greater than $500 in Oregon. The PFMC may consider developing a limited entry program to control excess capacity in the future and a control date of March 9, 2000 was approved.[8]

Table II.10
Vessel Participation by Major Fishery During Period 2008 to 2012

	Period Participation											
	1 Year		2 Years		3 Years		4 Years		5 Years		Total	
Fishery	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Salmon	228	34%	112	17%	126	19%	78	12%	125	19%	669	100%
D. crab	93	20%	63	13%	56	12%	55	12%	200	43%	467	100%
Pink shrimp	15	19%	12	15%	10	13%	10	13%	31	40%	78	100%
A. tuna	290	43%	132	20%	83	12%	82	12%	87	13%	674	100%
Groundfish	96	21%	80	18%	63	14%	59	13%	150	33%	448	100%
Pacific whiting	1	3%	7	23%	6	19%	4	13%	13	42%	31	100%
Pacific sardines	10	48%	3	14%	4	19%	2	10%	2	10%	21	100%
Other	162	37%	94	21%	62	14%	49	11%	73	17%	440	100%
Total	384	27%	205	14%	175	12%	163	12%	487	34%	1,414	100%

Figure II.6
Vessel Participation by Major Fishery During Period 2008 to 2012



Notes: 1. Includes Oregon home-port vessels (home-port is defined as the port group where a vessel made the most landings by value), excludes vessels with identifier "NONE" or "ZZ...," includes only vessels with species revenue >$500.
2. Vessels are tracked over years by their plate numbers. If a vessel is re-documented and continues participation in the same fishery, then its previous experience is omitted. Only vessels that make deliveries in each year are included in the analysis.
3. Revenue excludes offshore and distant water fisheries sources.

Source: PacFIN annual vessel summary April 2009, March 2010, July 2011, and April 2013 extractions.

Figure II.7
Vessel Participation Trends by Major Onshore Fishery and Offshore in 2000 to 2012

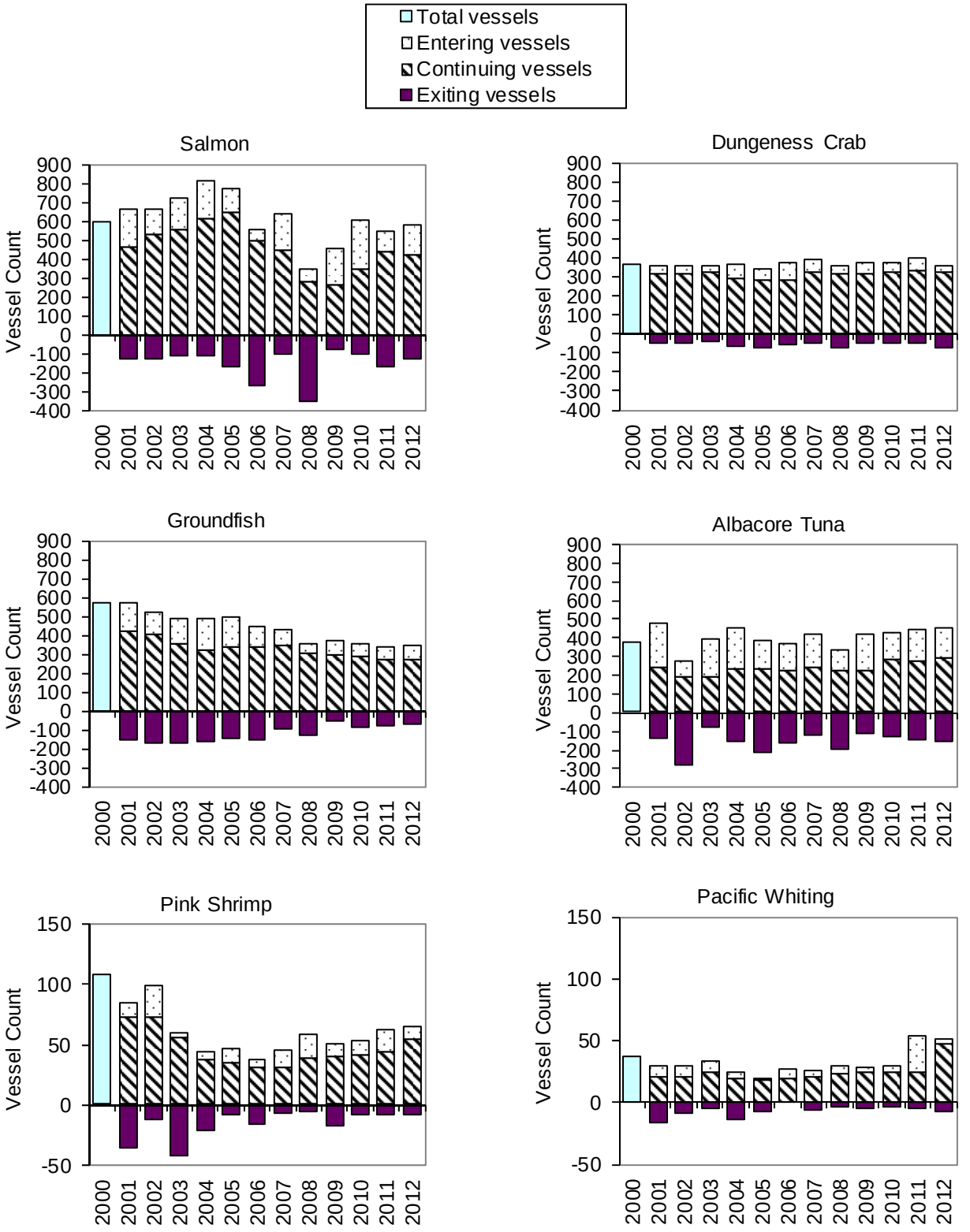
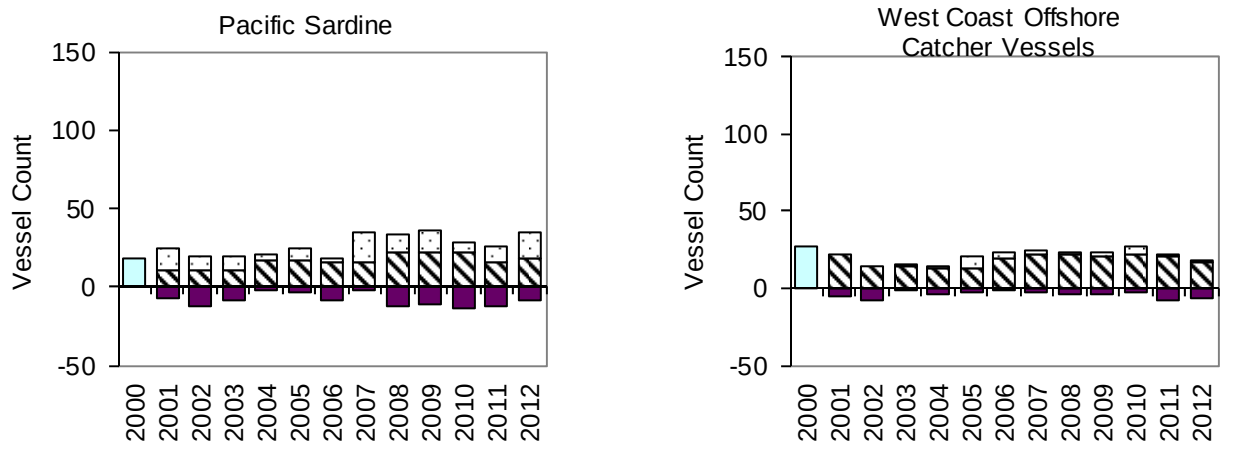


Figure II.7 (cont.)



Notes: 1. Vessel counts itemized for whether they landed in the fishery the previous year.
2. Onshore pink shrimp, Pacific whiting, and Pacific sardine, and offshore catcher vessels *y*-axis scales are different from the other onshore fisheries.

Source: PacFIN annual vessel summary, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions; and PacFIN offshore data, April 2013 extraction.

There is a federal limited entry permit system for CPS. The CPS group includes such species as market squid, sardines, and mackerels. The PFMC CPS FMP Amendment 10 defines the limited entry program and transferability requirements.

D. Port Information

Twelve communities along the Oregon Coast are the mainstay harbors for the fishing fleet. Tables II.12 and II.13 show onshore landings, home-port vessel counts, deliveries, and processor business characteristics for the communities. Tables A.7a, A.7b, and A.8 show onshore landings by fishing strategies and area-of-catch for the communities. The harbors are geographically combined to five port groups to simplify descriptions in this report. The communities have evolved around harbors and fishing grounds with different characteristics. Each has a presence of key facilities and services that make it unique. The proportion of ocean fisheries harvest value being landed at smaller ports has been trending downward since 1990 (Figure II.9). Some serve a locally based fleet and others are regional fisheries centers.

The comparative size of the port groups can be described by the number of home-port vessels moored there and how much volume and value of fish is delivered there.[9] The Astoria port group has the largest share (31 percent) of home-port vessels followed by Newport (23 percent), Coos Bay (20 percent), Brookings (15 percent), and Tillamook (11 percent) in 2012. The Tillamook port group has the least groundfish landings which is explained by comparatively less habitat in nearby fishing grounds for non-whiting groundfish species. Port Orford has a large number of groundfish deliveries, but none by vessels with groundfish LE trawl permits. Vessels are launched by a hoist system and capacity limitations preclude trawl vessels mooring at this port. Vessels at Port Orford have strong participation in fixed gear fisheries, such as the sablefish fishery (Figure II.10). Astoria

Table II.11
Oregon Fishery Limited Entry Programs

Program Features

Fishery	Authorizing Statutes and Rules	Transferable	Renewable
Bay clam dive fishery	OAR 635-005-0305 through OAR 635-005-0360	Yes with restrictions to another vessel - not transferrable to another individual	5 landings consisting of at least 100 lbs. each landing or an annual total of 2,500 lbs.
Dungeness crab	ORS 508.921 through 508.941	Yes with vessel length and other restrictions	Yes
Gillnet salmon	ORS 508.775 through 508.796	Yes	Yes
Pacific sardine	OAR 635-004-0380 through OAR 635-004-0440	Yes with restrictions - two times per calendar year	If harvest guideline greater than 100,000 mt, then minimum of 10 landings of sardines of a least 5 metric tons each, or landings of sardines having an aggregate ex-vessel price of at least $40,000
Rockfish nearshore	ORS 508.945 through 508.960	A transfer can only occur if the permit has been renewed five times.	Minimum of 5 landings that contained at least 15 lbs. of nearshore fish
Scallop	ORS 508.840 through 508.867	A transfer can only occur if the permit has been used in the ocean scallop fishery for three or more calendar years	5,000 lbs. landing any fish prior year
Pink shrimp	ORS 508.880 and 508.915	Yes with vessel length and other restrictions	Yes
Brine shrimp	OAR 635-005-0680 through OAR 635-005-0720		5,000 lbs. prior year
Troll salmon	ORS 508.801 through 508.828	Yes with restrictions	Yes
Sea urchin	ORS 508.760 through 508.762; OAR 635-005-0790 through 635-005-0850;	Yes with restrictions	5,000 lbs. landed sea urchins prior year
Yaquina Bay roe-herring	ORS 508.765	Yes with restrictions	Yes
Boat license	ORS 508.235 and ORS 508.260		
Developmental Fisheries	ORS 506.450 through ORS 506.465	Yes with restrictions	Depends on plans developed for new species

Active Permit Counts

Permit Type	2009	2010	2011	2012	Entry Limits
Bay clam dive fishery, coast wide	10	10	11	10	10 permits authorized
Bay clam dive fishery, south coast	5	4	5	1	5 permits authorized
Dungeness crab	429	429	427	424	Restricted with new vessels allowed in some circumstances
Gillnet salmon	300	297	297	292	200 authorized
Pacific sardine	25	25	25	25	26 authorized

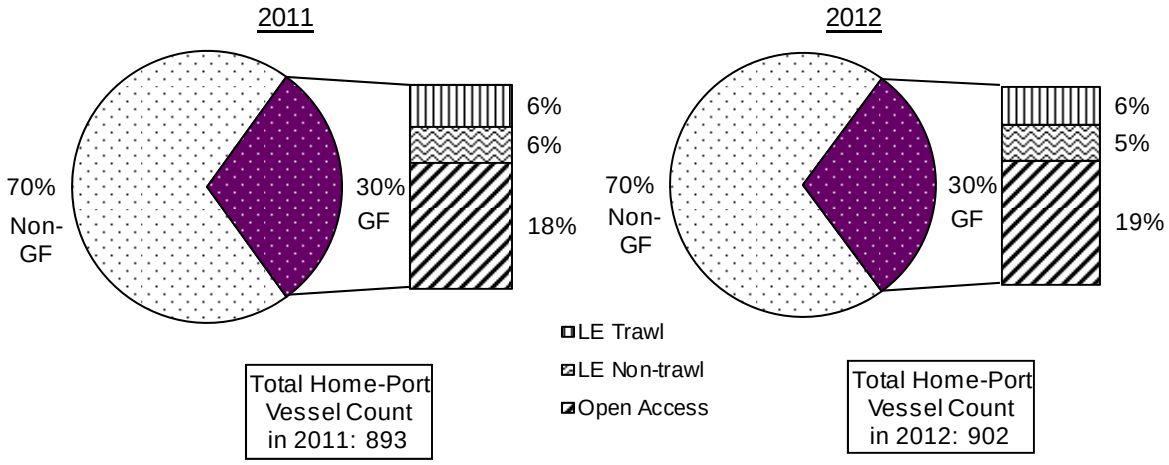
Table II.11 (cont.)

Active Permit Counts (cont.)

Permit Type	2009	2010	2011	2012	Entry Limits
Rockfish black/blue	55	55	53	52	80 authorized
Rockfish nearshore endorsement	70	70	70	70	50 authorized
Scallop	28	26	24	23	Restricted with 25 authorized
Pink shrimp	139	139	139	139	150 authorized
Brine shrimp	3	3	3	3	3 authorized
Troll salmon	1,067	1,036	1,010	995	1,000 authorized
Sea urchin	30	30	28	26	Restricted with 30 authorized
Yaquina Bay roe-herring	10	9	9	9	6 authorized
Resident boat license	1,295	1,234	1,214	1,158	
Non-resident boat license	385	388	364	415	
Tuna	181	318	332	310	

Notes:
1. This table should not be used for determining permit application, transfer, or renewable eligibility requirements. Its purpose is to give cursory information about current permit counts and requirements.
2. Oregon's restricted fisheries permit program is generally described in ORS Chapter 508 (2011 version) and in OAR 635 Division 3 through 6 (2013 version).
3. The table does not show all of the fisheries with limited entry status as defined through the Developmental Fisheries Program.
4. Counts show permits with active status at year-end. A permit may be inactive for several reasons, including non-receipt of renewal payments and pending transfer. Some vessels will have an active boat license, but not make deliveries.
5. All vessels making a commercial fish delivery must possess a commercial fishing boat license (ORS 508.235). All vessels five tons and over must also be federally documented.
6. Logbooks are required for the following fisheries: sea urchin, rockfish nearshore, bay clam dive, sardine, and Dungeness crab. The ODFW requires participants in the pink shrimp fishery to submit logbooks starting in 2008. Logbooks are also required for certain federal limited entry programs.
7. The rockfish nearshore permit includes permits for black and blue rockfish. The permit can have an endorsement for other nearshore rockfish.
8. The Yaquina Bay roe-herring fishery is prosecuted as a cooperative. Ten permits were initially authorized, but one was subsequently purchased in equal shares by the remaining permittees.
9. The albacore tuna fishery is not limited entry and some vessels making deliveries only hold an albacore tuna landing license. The albacore tuna landing license may be obtained in lieu of a commercial fishing and boat license when landing only albacore tuna. The table's shown active permit counts for the tuna fishery relied on the tuna landing license. There were 442 vessels that landed albacore tuna in Oregon in 2011 and 447 that landed albacore tuna in Oregon in 2012, with "ZZ..." and "NONE" identified vessels excluded. Of those, 194 landed no other species in 2011, and 163 landed no other species in 2012.

Figure II.8
Home-Port Vessels Counts by Groundfish LE Permit Status in 2011 and 2012



Notes: 1. Permit status categories are assigned in the following hierarchy: limited entry trawl and fixed gear (LE Trawl), limited entry fixed gear (LE Non-Trawl), and vessels not having limited entry permits that make landings of groundfish managed species (Open Access).
2. A vessel is classified as a groundfish vessel if it made at least $500 of landings in the limited entry or open access groundfish fishery. Vessels with less than $500 total revenue are excluded.
3. Home-port group is defined as the port group where a vessel made the most landings by value.

Source: PacFIN annual vessel summary, April 2013 extraction; vessels with DRVID "NONE" and "ZZ…." are excluded.

had the highest landings in terms of volume and value of any port group in Oregon. The landing order of ports following Astoria is the same as mentioned for the count of home-port vessels.

The Astoria area economy benefits from several large seafood processors and fish meal plants. Estimating the portion of the Astoria area economy benefiting from the fishing industry is complicated by additional ports being located just across the Columbia River. Services and supplies for these Washington ports are generally provided by businesses located in Oregon. Economic modeling attempts to account for these purchase effects. Table A.8 in the appendix shows the rather involved sources of landings that occurred in 2012 at the Astoria and Ilwaco area ports.

Newport is also a regional commercial fisheries center with several active processors. Many vessels participating solely in distant water fisheries use Newport for moorage, provisioning, and repairs, but do not show-up in home-port vessel statistics because they do not make a majority of their landings onshore in Oregon. Other ports, such as Charleston in the Coos Bay port group area and Garibaldi in the Tillamook port group area, also have processors. Many ports have buying stations where harvests can be delivered, but the fish are trucked to regional fisheries centers for processing.

A harbor where a commercial fishing vessel moors is not necessarily where it delivers harvests. There is no statewide data series for vessel moorage locations, and federal vessel documentation information for port

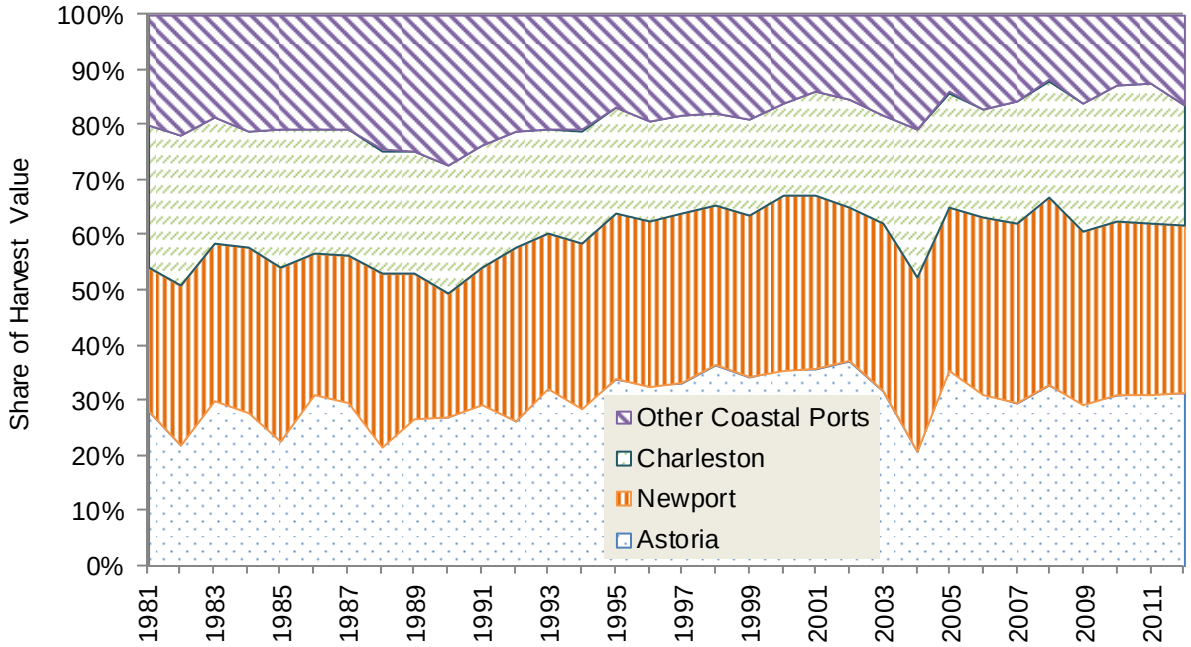
Table II.12
Port Group Share of Onshore Landings and Home-Port Vessels in 2008 to 2012

		2008			2009			2010			2011			2012		
	Local/	Onshore Landings		Home-Port	Onshore Landings		Home-Port	Onshore Landings		Home-Port	Onshore Landings		Home-Port	Onshore Landings		Home-Port
Port Group/Communities	Regional	Volume	Value	Vessels	Volume	Value	Vessels	Volume	Value	Vessels	Volume	Value	Vessels	Volume	Value	Vessels
Astoria		52%	36%	36%	53%	32%	33%	52%	35%	35%	54%	34%	34%	58%	33%	31%
Astoria and Warrenton	R															
Tillamook		1%	3%	11%	1%	3%	12%	1%	3%	10%	0%	2%	10%	0%	2%	11%
Garibaldi	L															
Pacific City	L															
Newport		30%	33%	22%	27%	30%	22%	29%	30%	21%	29%	30%	21%	27%	30%	23%
Depoe Bay	L															
Newport	R															
Coos Bay		14%	22%	16%	15%	23%	18%	15%	24%	20%	14%	26%	21%	11%	23%	20%
Florence	L															
Winchester Bay	L															
Charleston	R															
Bandon	L															
Brookings		3%	7%	15%	4%	12%	14%	4%	9%	14%	3%	8%	14%	3%	12%	15%
Port Orford	L															
Gold Beach	L															
Brookings	R															
Total		204.8 million pounds	$106.7 million ex-vessel	886 vessels	210.8 million pounds	$107.9 million ex-vessel	971 vessels	216.6 million pounds	$107.1 million ex-vessel	975 vessels	285.8 million pounds	$149.1 million ex-vessel	980 vessels	306.7 million pounds	$126.4 million ex-vessel	951 vessels

Notes: 1. Declaration of local or regional considers presence of vessel repair businesses, fishing equipment suppliers, ice services, cold storage, delivery services from buyers and processors, moorage and landing facilities, etc.
2. Value is in millions of 2012 dollars.

Source: PacFIN annual vessel summary April 2009, March 2010, July 2011, and April 2013 extractions.

Figure II.9
Historical Proportion of Ocean Fisheries Harvest Value
Landed at Regional Fishing Centers and Other Coastal Ports



Notes: 1. Harvest value is ex-vessel revenue from ocean catch (excludes Columbia River catch).
Source: PacFIN annual vessel summary, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

location is more aligned with a vessel owner location. To show a profile of the moorage and delivery differences, a ratio of active vessel deliveries at selected ports and all vessel deliveries was developed (Figure II.11). The figure shows that Florence has the lowest ratio because many vessels that moor at the harbor deliver to Newport. The harbor with the highest ratio for "staying-at-home-port" is Port Orford.

A number of communities have recently made or are investigating the feasibility of making capital investments in the processing sector to entice private businesses to operate at their harbors. A partial example listing is as follows. The Port of Astoria entered into a partnership with Bornstein's Seafood to build a cold storage facility. The Port of Newport has upgraded its International Terminal which provides backland and dock services to the distant water fleet. Coos County and the Oregon International Port of Coos Bay facilitated the purchase of the Peterson Plant in Charleston by a local partnership called Oregon Brand Seafood. The Port of Coos Bay has also invested in improvements at a private ice provider to make sure vessels will have this service in the future. The City of Depoe Bay has constructed a marine fuel station and has refurbished docks and buildings. The building is being advertised for a lease to a fish buyer who will provide ice and other services to the local fishing fleet. The Port of Umpqua upgraded the receiving dock and hoist at Winchester Bay and has a lease with Hallmark Fisheries for its operation. The Port of Brookings has purchased the old Eureka Fisheries seafood plant and property

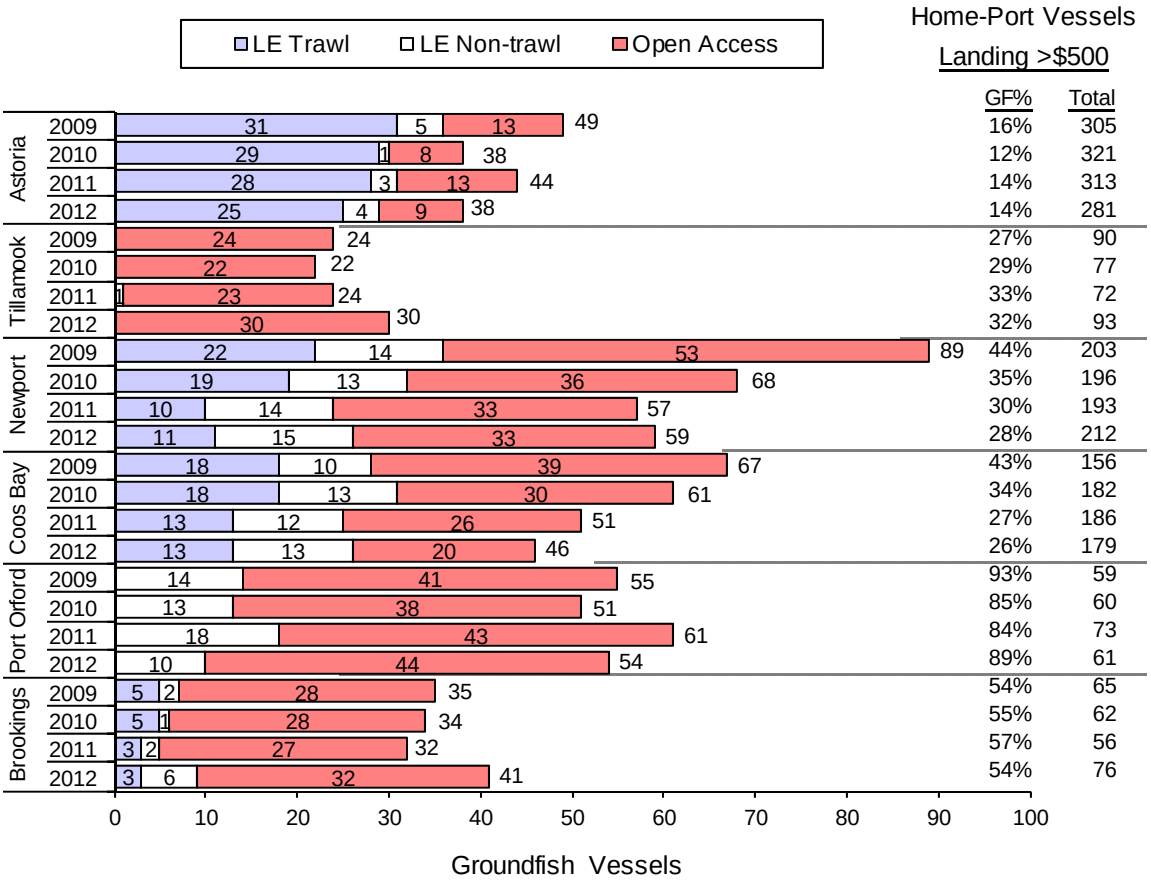
Table II.13
Landings and Participant Counts by Port in 2012

Activity	Astoria and Warrenton	Garibaldi	Pacific City	Depoe Bay	Newport	Florence	Reedsport/ Winchester Bay	Coos Bay and Charleston	Bandon	Port Orford	Gold Beach	Brookings Harbor	Statewide
Volume (millions pounds)	178.0	1.0	0.1	0.2	82.7	0.04	0.6	32.5	0.036	1.4	0.2	8.7	306.7
Value (millions ex-vessel)	$38.9	$2.3	$0.1	$0.2	$37.2	$0.1	$2.0	$26.9	$0.09	$3.3	$0.3	$11.8	$126.4
Deliveries													
Count	3,233	1,598	378	285	4,512	72	445	3,605	120	3,697	855	1,847	24,898
Unique vessels	243	119	39	12	349	11	56	287	11	79	41	106	1,140
Processor/buyer/restaurant counts													
Statewide purchase volume													
>$500 thousand	12	6	3	c	11	c	6	14	c	3	c	6	28
>$10 thousand	23	19	10	13	37	6	17	36	6	10	8	16	86
Purchases at port													
>$500 thousand	10	c	0	0	8	0	c	10	0	c	0	3	
>$10 thousand	16	10	7	4	29	c	7	31	3	7	c	10	

Notes:
1. Shown ports landings do not sum to Oregon total because of minor landings at unspecified ports. Vessel and processor counts do not sum to Oregon total because vessels may deliver to more than one port, and processors may make purchases at more than one port.
2. Deliveries exclude vessels with identification of "NONE" or "ZZ..."
3. Processor counts exclude occurrences when vessels make direct sales to the public.
4. Processing does not necessarily occur at the port where the landings are shown to be purchased. In some cases, the purchases are hauled by truck to another location for processing, cold storage, and distribution.
5. Counts with a "c" are not shown to avoid revealing confidential information.

Source: PacFIN annual vessel summary and fish ticket data, April 2013 extractions.

Figure II.10
Home-Port Vessels Counts by Port Group and by Groundfish LE Permit Status in 2009 to 2012

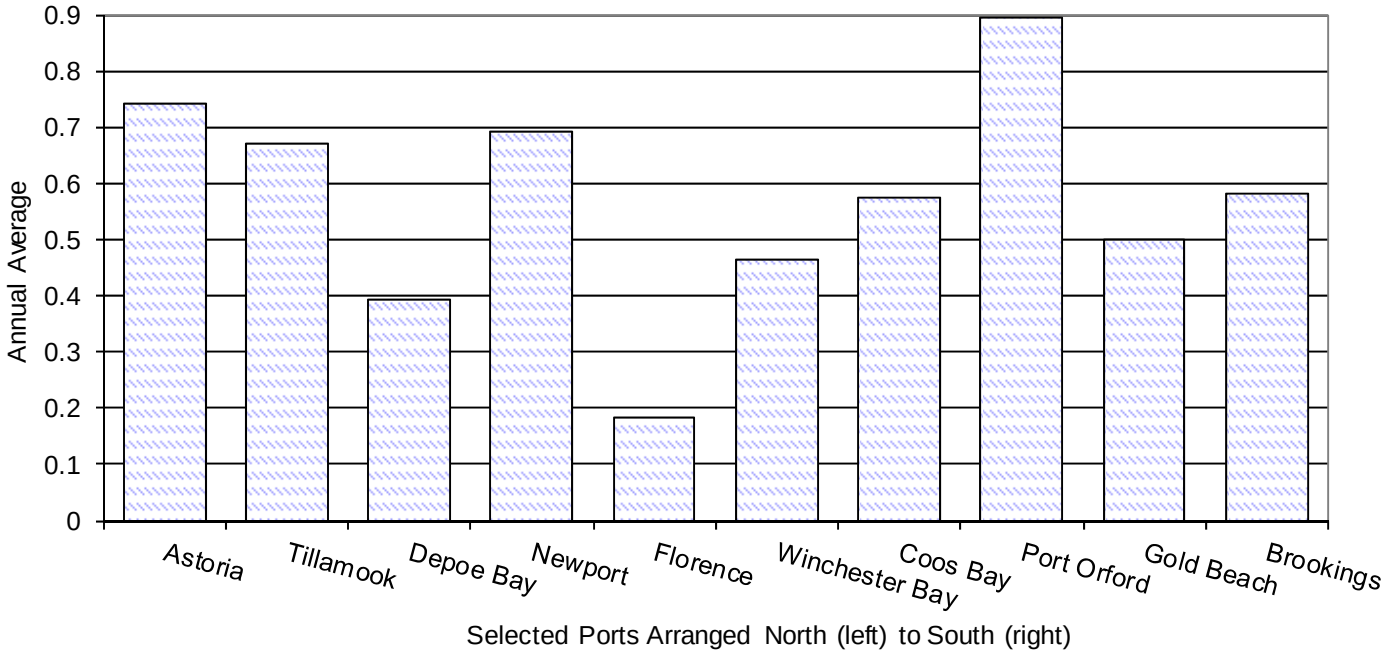


Notes: 1. Permit status categories are assigned in the following hierarchy: limited entry trawl and fixed gear (LE Trawl), limited entry fixed gear (LE Non-Trawl), and vessels not having limited entry permits that make landings of groundfish managed species (Open Access).
2. A vessel is classified as a groundfish vessel if it made at least $500 of landings in the limited entry or open access groundfish fishery. Vessels with less than $500 total revenue are excluded.
3. Home-port group is defined as the port group where a vessel made the most landings by value.

Source: PacFIN annual vessel summary, March 2010, July 2011, and April 2013 extractions; vessels with DRVID "NONE" and "ZZ…." are excluded.

and has upgraded the dock for accommodating a new buying station. The Port has constructed and is operating a cold storage facility. The Port has also received State and federal assistance to repair moorage facilities damaged from a March 11, 2011 tsunami caused by the Tōhoku earthquake off the coast of Japan. Ports own and operate moorage and provide other facilities and services for the fishing industry and are the local sponsors of dredging and waterway improvement projects paid for by the Corps of Engineers. Concerns about federal FY 2013 funding for Corps maintenance projects prompted the State to appropriate $3.0 million to supplement available Corps funds to make

Figure II.11
Ratio of Active Vessel Deliveries at Selected Ports and All Deliveries
by Active Vessels Who Delivered to the Port in 2008 to 2012



Notes:
1. An active vessel is any identifiable vessel that landed at least $500 in Oregon in a year.
2. A directed vessel is any identifiable vessel that landed at least $500 in one of the selected fisheries in Oregon in a year.
3. Vessels or non-vessels (such as from a dock) with no unique identification are called unidentifiable. Landings from unidentifiable vessels are not included.
4. The shares shown are a weighted average of 2008 to 2012.
5. Deliveries are approximated using fish tickets. A fish ticket represents the landing of fish or shellfish product from one fishing trip. Ticket counts may not reflect fishing trips; multiple tickets can be issued for a single trip when a vessel delivers to more than one dealer after returning to port, and vessels issue tickets when a sale is made directly to the public. Trip undercounts could occur in the occasion when tendering services are used because more than one vessel's harvest could be combined onto a single fish ticket. Delivery counts are not additive across fisheries because a fish ticket may include more than one species.

Source: PacFIN fish ticket data, April 2009, March 2010, July 2011, and April 2013 extractions.

sure southern Oregon small ports maintenance dredging was accomplished.

Ports are often the central advocacy and local policy coordinating entity for the fishing industry. They are major players along with commercial fishing organizations in ensuring fairness and equity in regulations and assistance programs for the fishing industry.

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III. MAJOR FISHERIES REVIEW

A. Onshore Fisheries

A short discussion of seven major fisheries is contained in this chapter. Included with the discussions are events and factors that are expected to influence future fisheries. Fishery characteristics (landing trends and economic contribution) and participant information for 2012 are shown in Table III.1. (The derivation and interpretations of economic contribution shown in Table III.1 are explained in Chapter V.) Additional information about management history and the biology of major fisheries can be found in ODFW (2007). There are other important ocean fisheries not discussed. For example, the other fisheries category in 2012 includes $1.2 million hagfish harvest value and $1.0 million halibut harvest value in 2012. The other fisheries category represents about 2.5 percent of all Oregon onshore landed harvest value in 2012.

1. Salmon

The salmon fishery includes ocean troll caught Chinook and coho, and net caught Chinook and coho fisheries in the Columbia River. The ocean Chinook salmon fisheries south of Cape Falcon were declared disasters in 2006 and 2008 and large expanses of ocean were restricted from any salmon fishing.[10,11] The restrictions were due to poor returns to the Klamath River in 2006 and Sacramento River in 2008. The Year 2007 season had many open fishing days, but catch rates were low. The Year 2009 south of Cape Falcon Chinook salmon season was closed to fishing, except there was a short (September only) limited area (north of Humbug Mt. and south of Cape Falcon) coho only salmon season. The south of Cape Falcon Chinook salmon season in 2010 had traditional open days, but Chinook harvest numbers were moderate (Figure III.1). Year 2011 ocean troll Chinook volume was up at 500 thousand pounds and increased again in 2011 to 900 thousand pounds (Table A.1). However, the pre-season expectations for higher numbers of salmon stocks that contribute to the mixed-stock ocean fisheries (such as the Sacramento River fall Chinook) did not materialize for the 2012 ocean season.

There has not been a traditional south of Cape Falcon commercial troll coho fishery since 1993, and the recreational selective (hatchery origin only) coho fishery off the central Oregon Coast only returned after years of closure in 1999. There have been small quota commercial troll coho seasons along with Chinook seasons north of Cape Falcon since 2000. The traditional day seasons for Chinook south of Cape Falcon in 2011 and 2012 additionally had trip limit seasons for marked coho. The year 2012 late Chinook season was supplemented with a September non-mark coho fishery.

For all of the above mentioned seasons 2006 through 2012, there were short late season commercial Chinook salmon bubble fisheries around river entrances that had healthy stock returns.

Columbia River non-Indian and tribal fisheries had reduced landings in 2011 and 2012 as compared to the previous biennium's two years (Figure III.2 and III.3). The Oregon landings went down from 1.9 million pounds in 2011 to 1.0 million in 2012.

Overall (including ocean and Columbia River catch areas) salmon landings increased slightly in the middle 1990's following a historic low volume and ex-vessel value in 1994. This trend was followed by declines again in 1998 and

Table III.1
Major Fisheries Characteristics in 2012

1. SALMON FISHERY

Year 2012		
Volume (thousands pounds)		1,927
Ex-vessel value (thousands)		$6,925
Change from 2011		1%
3 year average		12%
10 year average		-14%
Economic contribution (millions)		$10.31
Share onshore total		4%
	Count	Share
Vessels >$500	494	85%
Average salmon revenue	$13,008	
Salmon share		33%
Vessels 50% value	84	15%
Vessels 90% value	276	48%
Top 10 vessels	10	2%
Average salmon revenue	$63,515	
Salmon share		53%

Type: Troll

Volume (thousands pounds)	857	--
Price	$4.96	--
Ex-vessel value (thousands)	$4,249	--
Vessels >$500	323	88%
Average salmon revenue	$13,118	
Salmon share		26%
Vessels 50% value	54	15%
Vessels 90% value	182	49%
Permits authorized	1,000	
Permits	995	

Type: Net, Non-Tribal, Oregon Landings

Volume (thousands pounds)	893	--
Price	$2.51	--
Ex-vessel value (thousands)	$2,239	--
Vessels >$500	171	91%
Average salmon revenue	$12,799	
Salmon share		82%
Vessels 50% value	30	16%
Vessels 90% value	95	51%
Permits authorized	200	
Permits	292	

Type: Net, Tribal, Oregon Landings

Volume (thousands pounds)	164	--
Price	$2.61	--
Ex-vessel value (thousands)	$427	--

2. DUNGENESS CRAB FISHERY

Year 2012		
Volume (thousands pounds)		8,666
Price		$3.36
Ex-vessel value (thousands)		$29,114
Change from 2011		-36%
3 year average		-30%
10 year average		-29%
Economic contribution (millions)		$43.47
Share onshore total		16%
	Count	Share
Vessels >$500	338	95%
Average crab revenue	$86,129	
Crab share		44%
Vessels 50% value	62	17%
Vessels 90% value	202	57%
Top 10 vessels	10	3%
Average crab revenue	$442,939	
Crab share		63%
Permits authorized	464	
Permits	424	

3. PINK SHRIMP FISHERY

Year 2012		
Volume (thousands pounds)		49,144
Price		$0.50
Ex-vessel value (thousands)		$24,685
Change from 2011		-1%
3 year average		70%
10 year average		129%
Economic contribution (millions)		$43.28
Share onshore total		15%
	Count	Share
Vessels >$500	64	100%
Average shrimp revenue	$385,710	
Shrimp share		69%
Vessels 50% value	17	27%
Vessels 90% value	41	64%
Top 10 vessels	10	16%
Average shrimp revenue	$818,887	
Shrimp share		84%
Permits authorized	150	
Permits	139	

4. ALBACORE TUNA FISHERY

Year 2012		
Volume (thousands pounds)		9,886
Price		$1.53
Ex-vessel value (thousands)		$15,077
Change from 2011		-21%
3 year average		6%
10 year average		43%
Economic contribution (millions)		$24.18
Share onshore total		9%
	Count	Share
Vessels >$500	431	96%
Average tuna revenue	$34,975	
Tuna share		38%
Vessels 50% value	50	11%
Vessels 90% value	192	43%
Top 10 vessels	10	2%
Average tuna revenue	$229,330	
Tuna share		94%

Table III.1 (cont.)

5. GROUNDFISH FISHERY

Year 2012		
Volume (thousands pounds)		28,475
Price		$0.84
Ex-vessel value (thousands)		$23,834
Change from 2011		-18%
3 year average		-16%
10 year average		0%
Economic contribution (millions)		$39.14
Share onshore total		14%
	Count	Share
Vessels >$500	276	80%
Vessels 50% value	21	6%
Vessels 90% value	84	24%

Type: Limited Entry, Trawl and Fixed Gear

Volume (thousands pounds)	27,797	--
Ex-vessel value (thousands)	$22,127	--
Vessels >$500	111	97%
Average LE GF revenue	$199,339	
LE GF share		42%
Vessels 50% value	19	17%
Vessels 90% value	60	53%
Top 10 vessels	10	9%
Average LE GF revenue	$742,258	
LE GF share		84%

Type: Open Access

Volume (thousands pounds)	678	--
Ex-vessel value (thousands)	$1,707	--
Vessels >$500	166	62%
Average OA GF revenue	$10,223	
OA GF share		23%
Vessels 50% value	23	9%
Vessels 90% value	87	33%
Top 10 vessels	10	4%
Average OA GF revenue	$49,573	
OA GF share		67%

Note: Vessel counts include home-port vessels as well as out-of-state vessels making Oregon landings.

6. PACIFIC WHITING FISHERY

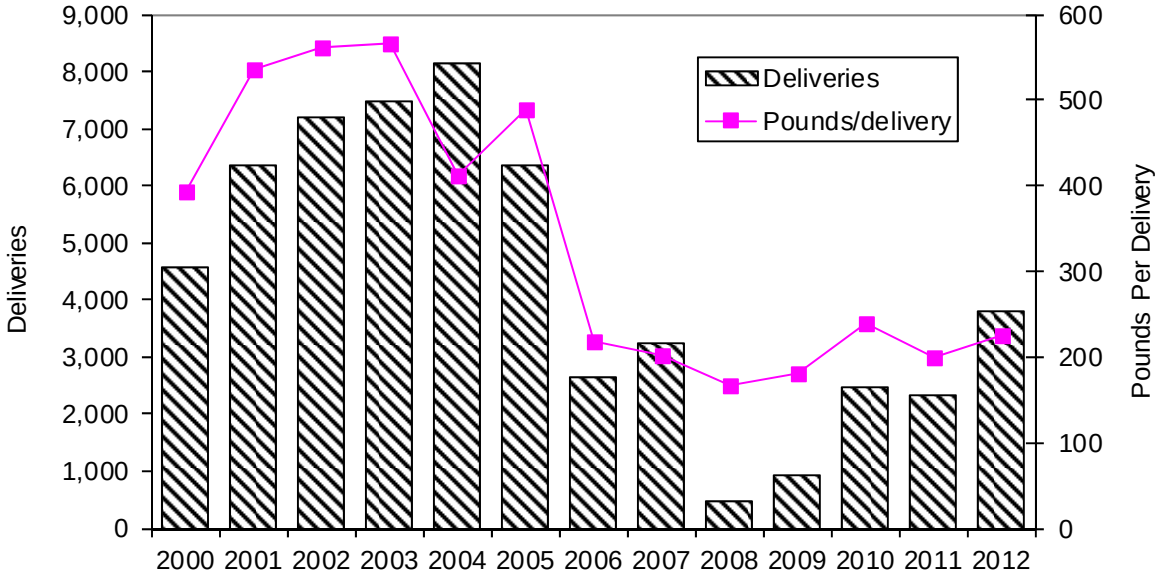
Year 2012		
Volume (thousands pounds)		107,652
Price		$0.136
Ex-vessel value (thousands)		$14,611
Change from 2011		-13%
3 year average		66%
10 year average		103%
Economic contribution (millions)		$50.16
Share onshore total		18%
	Count	Share
Vessels >$500	21	41%
Average whiting revenue	$695,710	
Whiting share		83%
Vessels 50% value	6	12%
Vessels 90% value	15	29%
Top 10 vessels	10	20%
Average whiting revenue	$1,081,813	
Whiting share		96%

7. PACIFIC SARDINE FISHERY

Year 2012		
Volume (thousands pounds)		93,957
Price		$0.096
Ex-vessel value (thousands)		$8,977
Change from 2011		176%
3 year average		89%
10 year average		81%
Economic contribution (millions)		$63.69
Share onshore total		23%
	Count	Share
Vessels >$500	21	60%
Average sardine revenue	$427,326	
Sardine share		95%
Vessels 50% value	5	14%
Vessels 90% value	13	37%
Top 10 vessels	10	29%
Average sardine revenue	$710,823	
Sardine share		95%

Notes: Some vessels land outside Oregon, but only Oregon landings are included.
Source: PacFIN annual vessel summary April 2013 extraction.

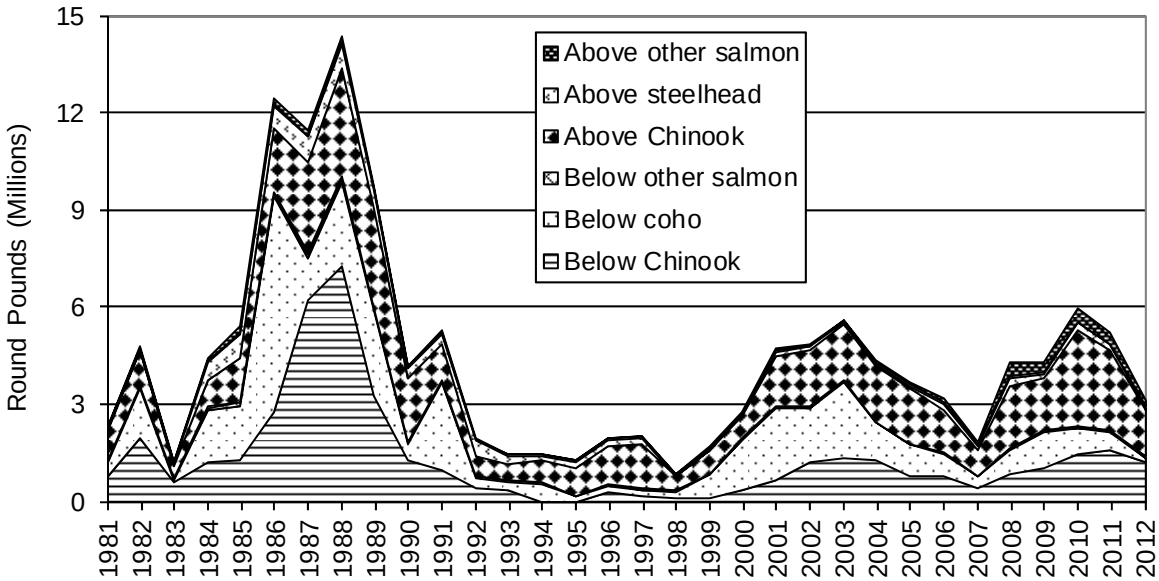
Figure III.1
Troll Salmon Effort Trends in 2000 to 2012



Notes: 1. Weight is round pound equivalent.
2. Deliveries include fish ticket counts when troll Chinook or coho was landed. The deliveries exclude trip counts when salmon was the target fishery, but there was no retained salmon catch.
3. Deliveries are included for both catch areas north and south of Cape Falcon.

Source: PacFIN annual vessel summary and fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

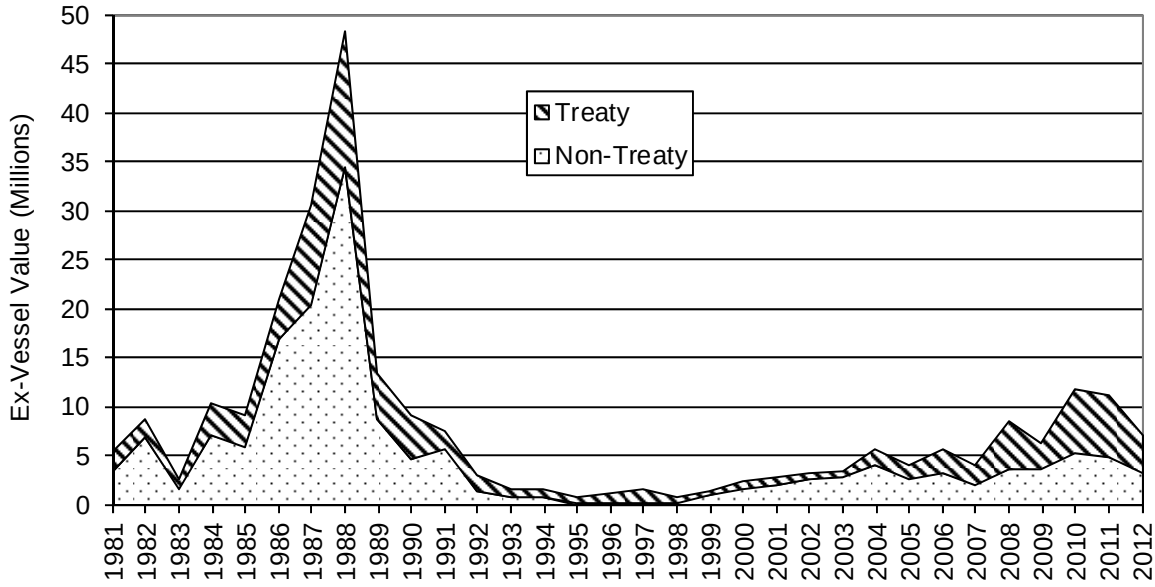
Figure III.2
Columbia River Harvest Volume Above and Below Bonneville in 1981 to 2012



Notes: 1. The determination of harvest area-of-catch used a filter for tribal fisheries. There is a very minor amount (less than 0.5%) of tribal fisheries below Bonneville in the earlier shown years.
2. Harvest information is for Columbia River area-of-catch, including Washington and Oregon landings.

Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

Figure III.3
Columbia River Net Salmon Harvest Value Trends in 1981 to 2012



Notes: 1. Value adjusted to 2012 dollars.
2. Harvest information is for Columbia River area-of-catch, including Washington and Oregon landings.

Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

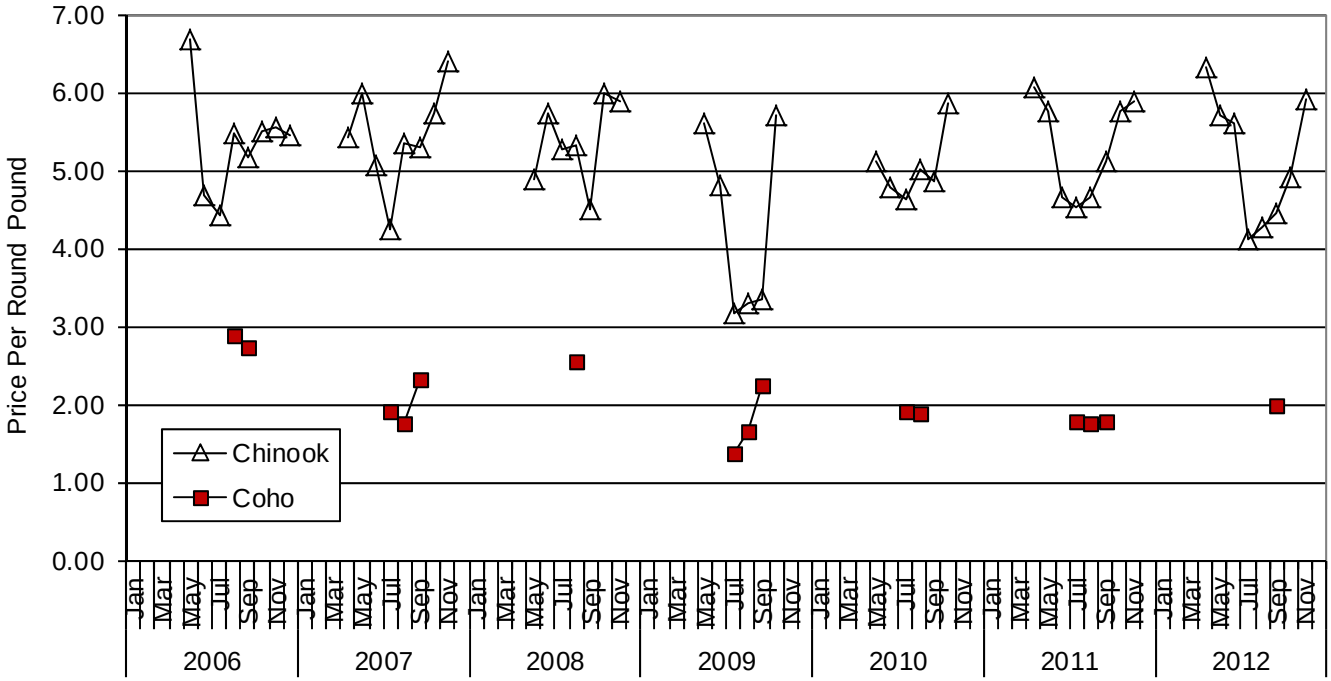
1999. Landings increased in each year from 1999 to 2003. A decline started with the 2005 season and dropped to very low levels in 2006 through 2008. The ocean fisheries rather than Columbia River net fisheries mostly caused the declines. There have been modest overall increases in landings since 2008 that are punctuated with down years.

Prices for ocean harvests of Chinook were up about six percent in 2011 and back down in 2012 to about the same as 2010 (Figure III.4). Prices for Columbia River spring and fall Chinook maintained their levels in 2011 and 2012 (Figure III.5). (See Appendix A Table A.2 for price trend of the various ocean and inriver salmon fisheries.) The price increases despite lower landings resulted in a total increase in salmon harvest value. The resulting value of all salmon landed was $6.9 million in 2012.

There were 323 vessels (88 percent of all vessels making troll salmon deliveries) that delivered more than $500 troll caught salmon in 2012. Their average salmon revenue was $13,118, which was about 26 percent of their total fisheries revenue. The 2007 legislature decreased the number of authorized permits from 1,200 to 1,000 starting in 2008. There were 995 permits issued in 2012. The ODFW has held a lottery to issue new permits to bring the number back up to the authorized number twice since the floor was established through legislation in 1995.

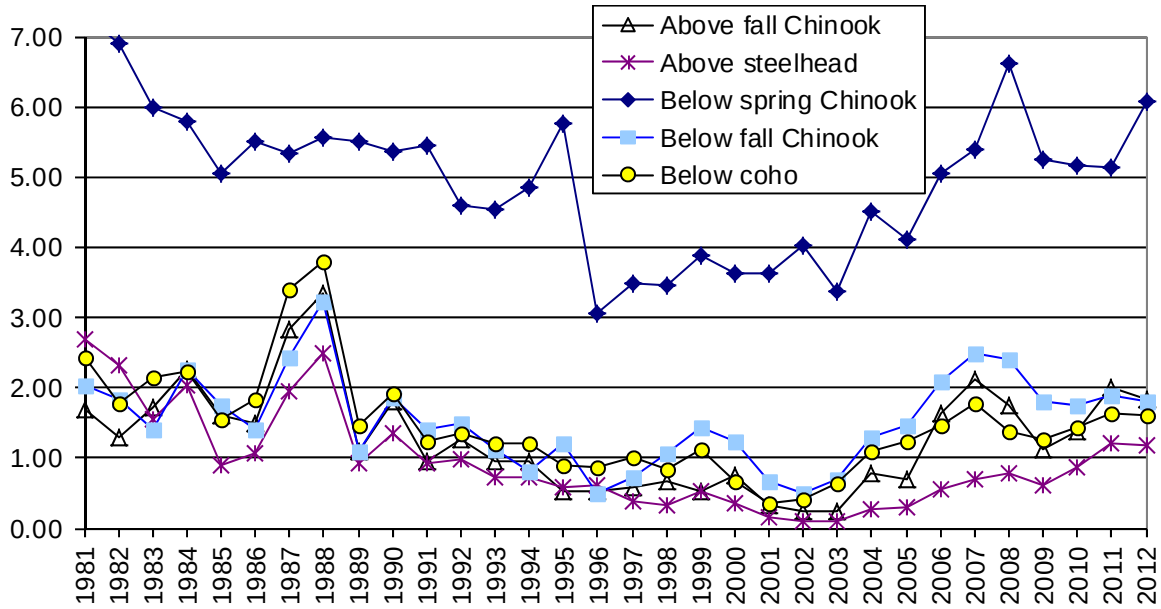
In the gillnet, non-tribal, Columbia River salmon fishery, there were 171 vessels (91 percent of all vessels making net, non-tribal deliveries and 59 percent of those with permits) that delivered more than $500 revenue in that fishery in 2012. Their

Figure III.4
Troll Coho and Troll Chinook Prices by Month, January 2006 to December 2012



Notes: 1. Prices adjusted to 2012 dollars.
2. Excludes prices in months with less than 500 round pounds landed.
Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

Figure III.5
Columbia River Price for Harvests Above and Below Bonneville in 1981 to 2012



Notes: 1. Prices adjusted to 2012 dollars.
2. Prices not shown in years with less than 250 pounds of landings.
3. Harvest information is for Columbia River area-of-catch, including Washington and Oregon landings.
Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

average salmon revenue was $12,799, which was about 82 percent of their total fisheries revenue. There were 571 Oregon permits grandfathered when a limited entry system went into effect in 1980. There have been 133 Oregon licenses retired through buyout programs and there has been attrition for other reasons since then. There are 200 authorized permits. Treaty salmon fisheries landings do not identify vessels, so no vessel performance measures are available for this fishery.

The average salmon revenue for the top 10 troll and net salmon vessels was $63,515 and their dependency on salmon revenue was 53 percent. The top 54 (15 percent) troll salmon vessels harvested 50 percent of this fishery's total value, and the top 182 vessels harvested 90 percent of this fishery's total value. The bottom 141 vessels (i.e. 323 minus 182 vessels or 44 percent of all vessels delivering more than $500) harvested 10 percent of the total value.

There was a general trend in price decreases starting in the early 1980's due to market influences from the availability of aquaculture raised salmon. However, troll Chinook salmon have generally increased in recent years due to consumer preferences for wild-caught salmon. Prices will generally be high when the season starts in spring, then decline during the summer, and rise again when ocean fisheries are finishing for the season (Figure III.4). There have been early ocean season openings since 2003 for large sized Chinook. These have entered the market when river caught spring Chinook have traditionally fetched very high prices. The early ocean season management restrictions on landing small grade fish plus the influence from spring Chinook prices have helped buoy the troll caught Chinook early season prices which in turn statistically increased the annual price.

Despite the recent year's increases, prices are still lower than the six dollars per pound received during the late 1970's (Appendix A Table A.2). The past decline in price for salmon can mainly be attributed to the rapid increase in less expensive farmed salmon introduced to the marketplace. The recent increase in wild caught salmon price may be due to the following factors:

- An increase in seafood consumption in the U.S., coupled with a consumer preference for coldwater, ocean harvested fish. This is an indication that Oregon salmon advertised as a quality, healthy product has been able to position itself in the marketplace at a higher price level. For an example of a mass marketed substitute, frozen filleted Chilean salmon was $1.30 per pound in 2006. This market niche acceptance leading to a higher price trend has had the effect of substantially increasing Oregon troll caught salmon landed value.

- The falling value of the U.S. dollar has raised the demand and therefore the price of salmon. Over the last 10 years, the U.S. dollar compared to the Euro and the Japanese yen has dropped by over 40 percent (Figure A.1). This increased the price of most natural resources in the world. There was a reversal in the U.S. dollar trend mid-year 2012 and it has generally strengthened against the Euro and yen.

- Fish quality for the tribal fall fisheries in the Columbia River provides a challenge to increase the total commercial value of Oregon salmon harvests.

The non-Indian Columbia River salmon fisheries are supported by a lower river hatchery fish acclimation program. Large numbers of Chinook and coho raised in Columbia River mitigation hatcheries are transported to the Astoria area for final rearing and liberation. Adult returns are harvested off-channel to avoid impacts to natural origin stocks. The program is supported by the Bonneville Power Administration and Clatsop County both as a conservation and fishery economic development project (TRG November 2006). While expensive, the program is likely to continue in the future given its success in protecting weak natural origin stocks and reducing conflicts with recreational fisheries.

Salmon commercial fisheries season management measures and allocations are decided after considering impacts to Endangered Species Act (ESA) listed stocks, recreational and tribal fisheries, and inriver escapement needs. In mixed stock species fisheries, restricted salmon seasons can be expected in the future in order to protect a run that has been declared to be of concern. Stock abundances affected by ocean and freshwater environmental conditions are on a downward trend. Management has had to address increasing allocation conflicts to meet international treaties, treaty Indian sharing obligations, and to satisfy river and ocean user group requests all the while meeting natural stock escapement objectives and hatchery brood stock needs. The tiptoeing through weak stock management and allocation conflicts has caused some hatchery origin stocks meant for harvesting are being returned as surpluses.

The major component of the Oregon troll fishery north of Cape Falcon is the Columbia River stocks. The south of Cape Falcon to Humbug Mt. fishery relies heavily on Sacramento fall Chinook salmon. The major component for south of Humbug Mt. is the Klamath River fall Chinook (Table III.2). The recent ESA listing for the lower Columbia River wild coho stocks and Chinook tules will constrain troll fisheries in future years. The Sacramento River and the Klamath River fall Chinook will

Table III.2
U.S. West Coast Chinook Troll Fishery Stock Representative Contributions

	Ocean Harvest Areas			
	U.S.-Canadian Border to Cape Falcon	Cape Falcon to Humbug Mt.	Humbug Mt. to Horse Mt.	Horse Mt. to U.S.-Mexico Border
Production Region				
Puget Sound	2%	0%	0%	0%
Washington Coast	3%	5%	0%	0%
Columbia River	65%	20%	5%	1%
Oregon Coast	5%	5%	0%	0%
Klamath	5%	10%	55%	10%
Sacramento	20%	60%	40%	89%
Other	--	--	--	--
Total	100%	100%	100%	100%

Notes: 1. Stock contribution shares vary year-to-year and the table should only be considered representative of long term averages.
2. Shares were derived from management model assumptions and coded wire tag return information.

Source: Study.

undoubtedly be the constraining stock for ocean troll fisheries in the near future unless there are major freshwater condition improvements. There are many other listed and stocks of concern status, but they have not constrained ocean salmon fisheries in recent years. The challenge for Oregon harvest managers is to provide access to hatchery origin fish and other healthy natural stocks while protecting weak stocks.

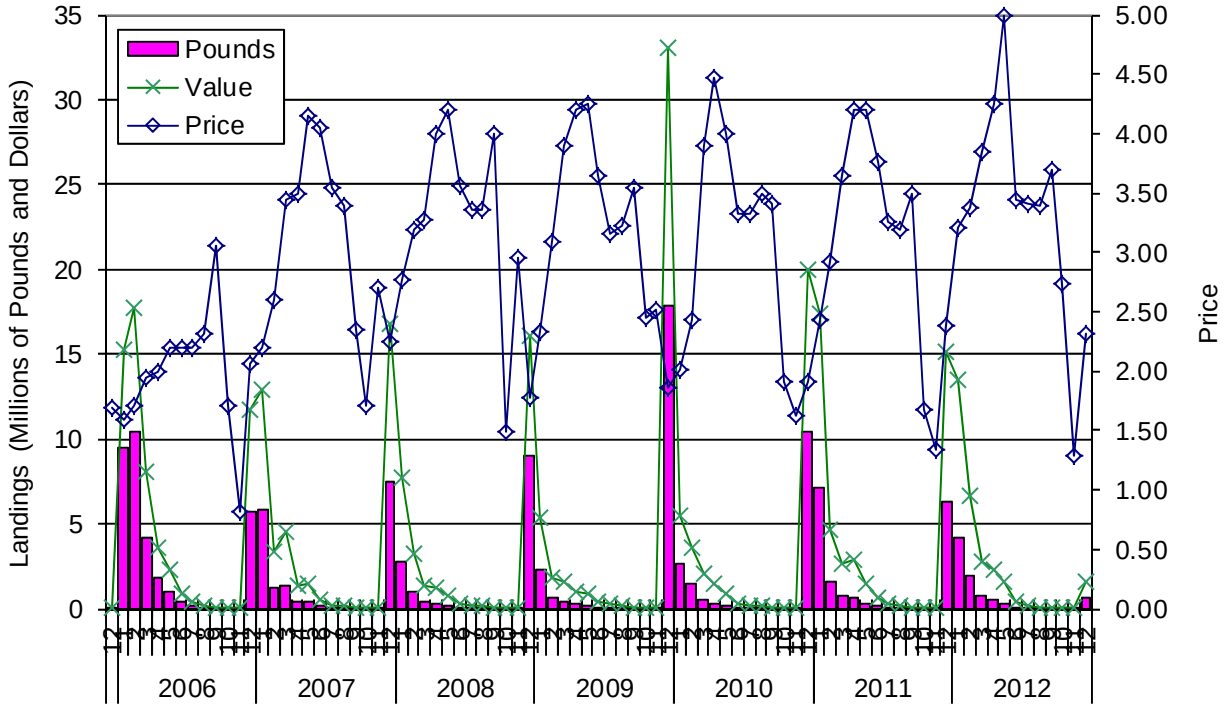
2. Dungeness Crab

The ocean Dungeness crab fishery typically has cyclical abundance trends.[12,13] Crab volumes reached a historic peak in 2006 (somewhat due to the anomaly of shifting December 2005 season into the early months of 2006). The landings decreased through 2008 and bumped up again in 2009. Landings decreased in Year 2010 and were about the same in 2011, however Year 2012 again shows a decreasing trend. The large swing in crab landings is revealed by comparing years 2006 when 33.3 million pounds were landed to 2012 when 8.7 million pounds were landed.

Crab prices were strong at $2.76 and $2.53 in 2000 and 2001, but decreased to less than $2.00 in the middle 2000's. Prices increased to $2.64 and $3.36 in 2011 and 2012, respectively. Crab prices also vary considerably over the season, but are opposite to salmon's variation (Figure III.6). They rise as the season progresses after the early December opening, then after peaking in April or so, fall again.

Because of the high volume of Dungeness crab, the total landed ex-vessel value was a record $60.1 million in 2006. The value

Figure III.6
Onshore Landed Dungeness Crab by Month in December 2005 to December 2012



Notes: 1. Values and prices are in 2012 dollars.
Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions.

decreased to $45.5 million in 2011 and $29.1 million in 2012.

Legislation passed in Oregon in 2003 to exempt fishing organizations from anti-trust laws has been used in the crab and shrimp fisheries to negotiate a price for season openings. This has precluded strikes by harvesters used in the past for price negotiations. These pre-season agreements have assisted in stabilizing a dependable product flow to markets.

The Dungeness crab fishery is one of 205 global (as of September 2013) certified fisheries by the Marine Stewardship Council (MSC). Dungeness crab was certified in December 2010. The certification can have benefits from consumer awareness for product quality and resource sustainability. Premium prices and access to new markets can accompany the certification.

Dungeness crab is a specialty product suited for holidays and special events such as the Super Bowl game. The live market for the ethnic market has also developed to use a small share of the total landed volume. Sections for the restaurant trade and ultimately picked meat is a growing trend. Picking crab for meat is a labor intensive undertaking. Some processors are experimenting with shipping sections to China to produce crab meat products. The expectation is that when the ex-vessel price is $2.00 per pound, the price to the retailer may be about $16 per pound before shrinkage cost mark-ups are included in the price. Because the imported product is twice frozen, the final product may not be of the same quality as that which is processed on the West Coast.

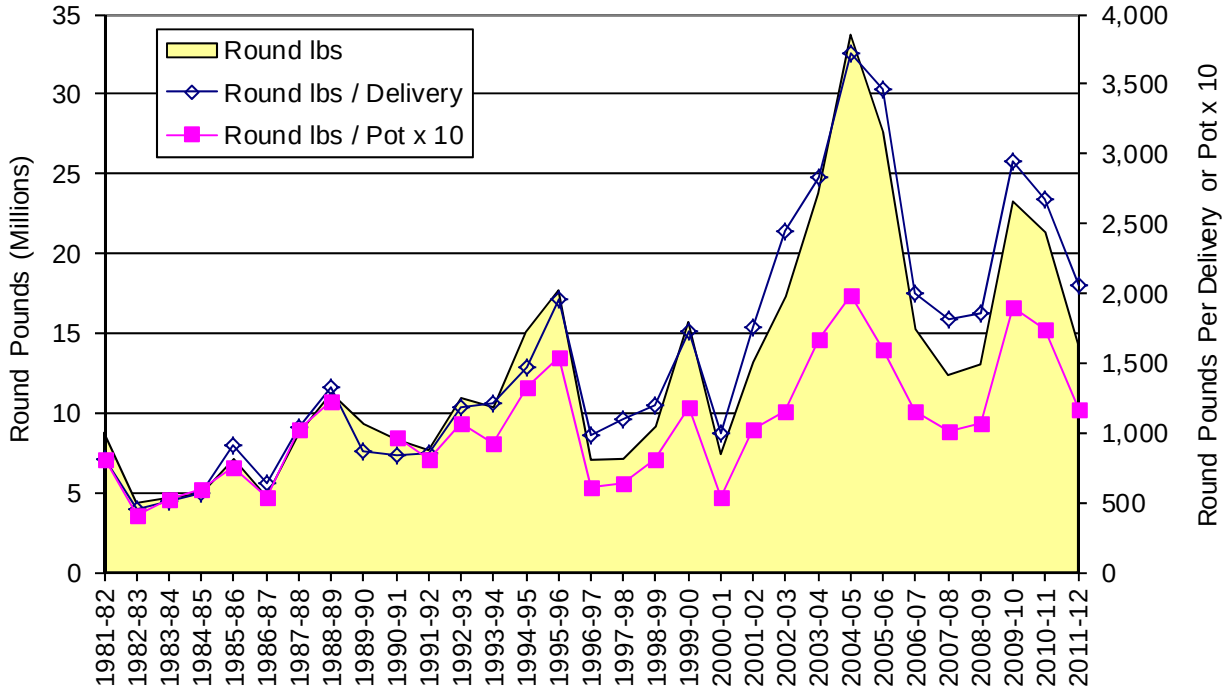
The resource supply of Dungeness crab and declining access to other fisheries has put increased reliance on this species for vessels to maintain revenue streams. This resulted in an increased number of pots used to harvest crab (Figures III.7 and III.8). A three tier (200, 300, and 500) pot limitation program was instituted for the 2006/2007 season to help control the fishing pressure. The limited entry and three tiered system was designed to stabilize an overcapitalized fishery. The crab fishery along with the albacore tuna fishery has been able to "soak up" the capital exposed from the salmon fishery lower revenue levels. A decline in the availability of this resource will create problems for the industry if other fisheries are not in a compensating upswing.

There were 338 vessels (95 percent of all vessels making Dungeness crab deliveries and 80 percent of those with permits) that delivered more than $500 Dungeness crab in 2012. Their average crab revenue was $86,129, which was about 44 percent of their total fisheries revenue. The average crab revenue for the top 10 vessels was $442,393 and their dependency on crab revenue was 63 percent. The top 62 (17 percent) vessels harvested 50 percent of this fishery's total value. The bottom 136 vessels (i.e. 338 minus 202 vessels or 40 percent of all vessels delivering more than $500) harvested 10 percent of the total value. There were initially 464 vessels qualified to hold permits when limited entry was initiated for this fishery in 1995. There are currently 424 permits.

3. Pink Shrimp

Pink shrimp, like Dungeness crab, typically has cyclical abundance trends. Shrimp volumes have been increasing in recent years. Shrimp volumes in 2006 were 12.2 million pounds, went up to 48.3 million pounds in 2011, then increased again to 49.1 million pounds in 2012.

Figure III.7
Dungeness Crab Landings and Effort in 1981 to 2012



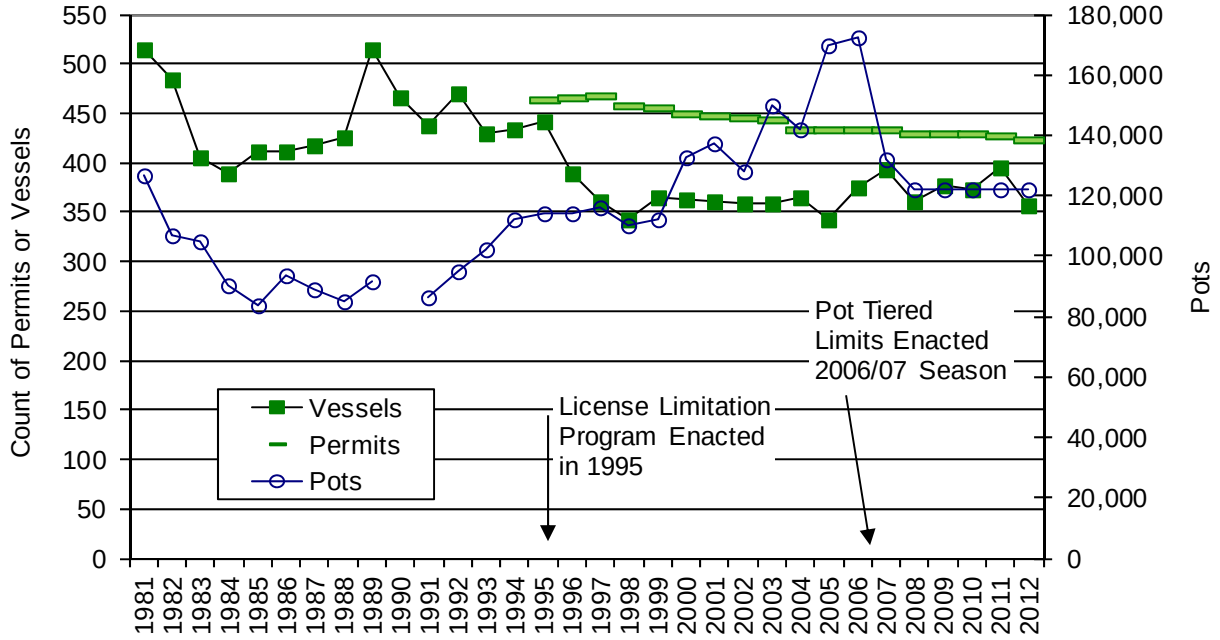
Notes: 1. Years are seasonal, from December to November.
2. Notes on Figure III.8 concerning pot counts are applicable to this figure.

Source: PacFIN fish ticket data, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions, and ODFW for permits and pot declarations.

Shrimp prices were in a decreasing trend in the early 2000's, dropping in 2003 to less than half of what they were in 1998 at $0.30 per pound. This trend reversed in 2004 and 2005, when landed pink shrimp prices averaged $0.46 and $0.50 per pound, before decreasing again to $0.32 in 2009. Prices increased to $0.52 in 2011 and $0.50 in 2012. The earlier decreasing Oregon shrimp prices mirror the declines for shrimp prices in the Gulf of Mexico and Atlantic. (Pink shrimp are small, often referred to as salad shrimp, as compared to shrimp from the Gulf.) A large increase of farmed shrimp from Thailand and China and strong harvests of competing cold water shrimp off Norway and Canada depressed prices of all domestic shrimp harvests in the previous biennium years. The welcome jump in pink shrimp prices in 2011 and 2012 from the lower and middle 30 cent prices in 2009 and 2010 was due to decreased supplies in Canada for a similar species and strong demand from Europe, Japan, and China. Japan and China demand was also prompted by a weakened U.S. dollar against those countries' currencies in those years. The Year 2011 and 2012 Oregon catch had a higher proportion of large sizes which receive a higher price. Establishment of new processing standards by some of Oregon's seafood companies has helped pave the way for opening up European markets and increasing price. Pink shrimp were MSC certified in 2008.

The total landed ex-vessel value of pink shrimp in 2011 and 2012 was more than

Figure III.8
Dungeness Crab Vessel Permits, Active Vessels, and Pots in 1981 to 2012



Notes:
1. Vessels are counted if they make at least one delivery that includes Dungeness crab at an Oregon port. The delivery could be from harvests in a directed Dungeness crab ocean or bay fishery or bycatch, so some vessels do not necessarily hold a limited entry permit. For example, the shown vessel count in 2008 is 361, of which 322 hold ocean limited entry permits. The number of vessels in 2008 holding permits and making at least $500 in landings is 317.
2. Pot counts are from declarations up to year 2006, including vessels that did not make landings, and are from assigned pot tier limits for vessels making landings in Year 2007 and 2008, and repeat 2008 after that. Pot counts are for all vessels permitted from 1995 to 2006, whether or not the vessel participated in the Dungeness crab fishery. The actual number of pots used in harvesting is not tracked.
3. There are pot count issues that might cause undercounts and over counts. The undercounts would occur for vessels that harvest from bays and do not posses an ocean limited entry permit. The over counts would occur if a vessel transferred a permit, causing the permit and associated pot limit to be possessed by more than one vessel during the year.
4. Years are calendar years.

Source: PacFIN annual vessel summary, March 2008, April 2009, March 2010, July 2011, and April 2013 extractions for vessel counts. ODFW for permits and pot declarations.

triple the value in the recent low year of 2009. Because the volume of pink shrimp landed increased in 2012, and the price increased to $0.50 per pound, the total landed value increased to $24.7 million in 2012.

The pink shrimp fishery is State managed using season and size requirements. The season is from April 1 to October 31 which avoids interference with their reproductive season. Vessels are required to deliver shrimp that average 160 per pound or larger. There is a minimum mesh size requirement when fishing south of the Oregon/California border. Pink shrimp are harvested by boats that may also be used for trawling for groundfish. A fleet reduction program of

groundfish trawlers also affected the shrimp fleet because the groundfish trawlers that were bought-out surrendered their shrimp and Dungeness crab permits. The measures to reduce bycatch in shrimp harvesting have caused some harvesting cost increases. The rigid-grate bycatch reduction devices (BRD) with narrow bar spacing also reduce impacts to eulachon smelt. This species was listed as ESA threatened in March 2010. NMFS must develop a recovery plan that may place additional future restrictions on the pink shrimp fishery in order to reduce eulachon smelt "take."

The powerful engines required to drag nets means fishing costs are sensitive to fuel prices. The harvest operations have higher labor costs due to tending nets, icing loads, sorting groundfish to stay within trip limits, and making sure required average 160 shrimp counts for landings over 3,000 pounds are maintained. Vessels were required to have a vessel monitoring system (VMS) onboard in 2009. The VMS ensures avoidance of federal essential fish habitat (EFH) areas and to be compatible with resource conservation area (RCA) groundfish regulations. Federal observers are randomly assigned to a small sample of vessel trips to monitor bycatch. The ODFW has required a logbook program for the shrimp fishery starting in 2008.[14]

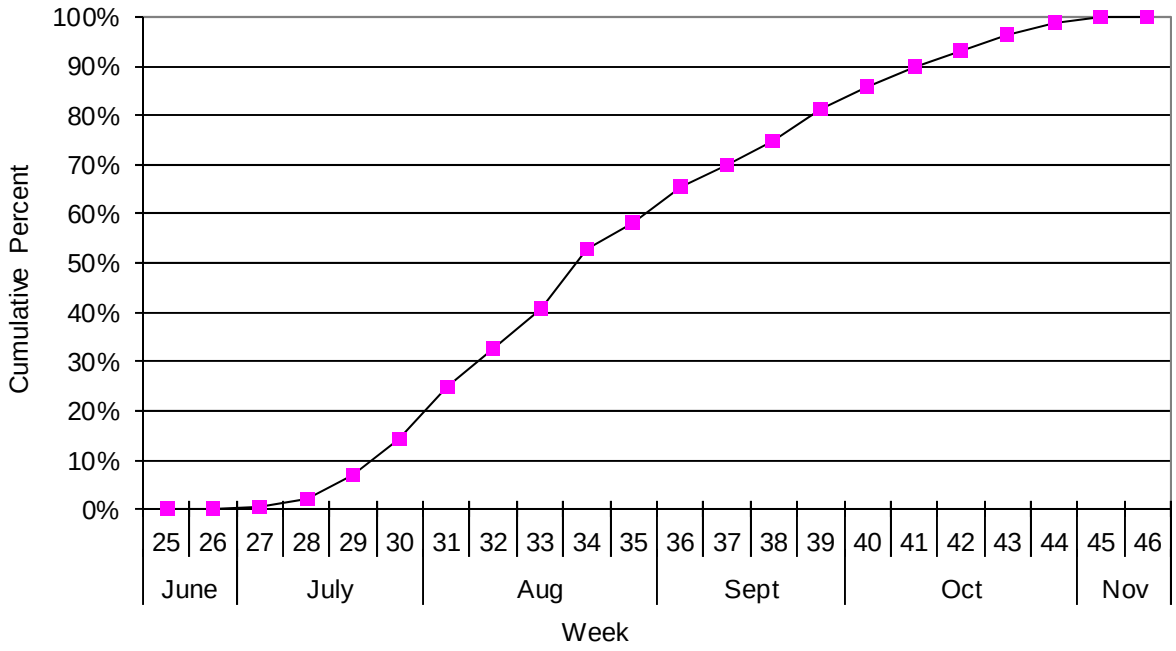
Processing of shrimp involves "soaking" the product to enable the shell to be removed. Longer soaking also increases the amount of water retained by the final product. The standard recovery has been about 26 to 28 percent. The longer soak is increasing this recovery to 33 to 34 percent. This allows the price to the retailer to be reduced. This may make this product more price competitive, but there is also some consumer reluctance to receive more frozen water in their purchase.

There has been some reduction in the shrimp harvesting fleet. The number of vessels making deliveries in 2011 and 2012 is about one-third the number in the late 1980's and early 1990's. Figure II.7 shows the trend in the 2000's. There were 64 vessels (100 percent of all vessels making deliveries and 46 percent of those with permits) that delivered more than $500 pink shrimp in 2012. Their average shrimp revenue was $385,710, which was about 69 percent of their total fisheries revenue. The average shrimp revenue for the top 10 vessels was $818,887 and their dependency on shrimp revenue was 84 percent. The top 17 (27 percent) vessels harvested 50 percent of this fishery's total value. The bottom 23 vessels (i.e. 64 minus 41 vessels or 36 percent of all vessels delivering more than $500) harvested 10 percent of the total value. There are 150 vessels authorized to hold permits for this fishery. There are currently 139 permits.

4. Albacore Tuna

There are a few vessels and processors that specialize in the albacore tuna fishery. The vessels venture as far as necessary to fishing grounds to harvest stocks. However, this is also an opportunity fishery that occurs when other fisheries (such as salmon) may not be deemed profitable or closed and when ocean conditions displace the cold California Current bringing warmer waters closer to shore. While such conditions are deleterious to some anadromous fish species, they allow smaller vessels to make single day and overnight trips to harvest this species. These factors contributed to higher harvests of tuna in recent years. Figure III.9 shows the seasonal structure of albacore tuna landings, which are 90 percent complete by about early October.

Figure III.9
Onshore Landed Albacore Tuna Weekly Cumulative Volume for 2010 to 2012 Average



Source: PacFIN fish ticket data, July 2011 and April 2013 extractions.

While canned tuna, mostly from larger fish caught in the high seas of the western Pacific, are receiving "bad" press because of mercury content warnings, the smaller albacore caught off Oregon provide a marketing opportunity to differentiate these less fatty fish. The albacore tuna fishery from Oregon to British Columbia is called the North Pacific fishery. American Western Fishboat Owner Association (WFOA) spearheaded an effort to get this fishery MSC certified. It was certified in May 2009. The North Pacific fishery overlaps with the fishing area for vessels in the American Albacore Fishing Association which also was MSC certified in May 2009.

The PFMC has adopted an HMS FMP. The FMP has established a maximum sustainable yield (MSY) for albacore tuna, which until now were regulated by the Inter-American Tropical Tuna Commission. Most of the concern for HMS is bycatch and incidental take of mammals and sea birds using driftnet and longline gear. This will not affect the Oregon fleet, because landings are typically from troll gear. There is a U.S.-Canada treaty allowing reciprocity in catch areas and deliveries, although recent negotiations have resulted in amendments to reduce cross country effort. The reciprocity agreement was allowed to elapse while negotiations were occurring. There is currently no state or federal limited entry permit system for this fishery, although the PFMC has set a control date and is considering instituting a limited entry program.

Albacore tuna volume fell about 1.0 million pounds in 2011 from a recent high in 2010, but the 2011 and 2012 landings at 9.7 million and 9.9 million pounds were still over twice that landed in 2002. Prices dropped from the early 1990's, when $1.53 was received, until rising to $1.97 in 2011 and back to $1.53 in 2012. The price in

2002 was $0.85, which made the total landed ex-vessel value $3.7 million. The recent increase in price per pound increased the total landed value to $19.1 million in 2011 and $15.1 million in 2012.

There were 431 vessels (96 percent of all vessels making tuna deliveries) that delivered more than $500 of albacore tuna in 2012. Their average tuna revenue was $34,975, which was about 38 percent of their total fisheries revenue. The average tuna revenue for the top 10 vessels was $229,330 and their dependency on tuna revenue was 94 percent. The top 50 (11 percent) vessels harvested 50 percent of this fishery's total value. The bottom 239 vessels (i.e. 431 minus 192 vessels or 55 percent of all vessels delivering more than $500) harvested 10 percent of the total value.

Most albacore tuna (about three-quarters) is brought ashore in Oregon to be shipped to canneries offshore in places such as Guam. There is a small market for custom canning and loining for fresh/frozen market. There was a convergence of supply problems in 2011 including the Japan earthquake which significantly decreased that country's deliveries. Coupled with concerns about radiation contamination, buyers turned to the West Coast for supplies. Canadian supplies have been interrupted because of the U.S.-Canada Albacore Tuna Treaty reciprocity lapse. There were no West Coast states landings by Canadian vessels in 2012. The price increases due to the supply problems will undoubtedly lead to price concessions as resolution occur in the future. The optimism for new fresh loin markets has been around since the 1980's. A strong European demand for frozen loin product form (Chappell 2012) has developed. Special harvesting techniques are required for these developing markets. There are interests to expand the loin market to Japan, a promising but risky venture because this can be a very volatile market.

5. Non-Whiting Groundfish

Management rebuilding plans for several groundfish species of concern will continue to challenge allowable catch levels. Of the seven species declared overfished as of the end of December 2012, the following are important to Oregon's groundfish fishery: canary rockfish, Pacific Ocean perch, darkblotched rockfish, yelloweye rockfish, and petrale sole. The other species (boccacio and cowcod) are mostly harvested in California fisheries. The ODFW has concerns about other individual species that are not individually managed by the PFMC. ODFW has placed harvest caps on these species through changes to Oregon's Nearshore Fishery Management Plan. The rebuilding plans for overfished species will also affect other fisheries that catch rockfish as a bycatch, like the shrimp fishery.

The concern for the groundfish management measures is from the multi-species nature of the fishery. Drastic economic impacts have occurred because fishing on healthy stocks has to be curtailed to protect the stocks in an overfished and depleted status. New area and time restrictions based on ocean depth were imposed in the nearshore waters in 2002 to keep vessels away from depth ranges where overfished species are more abundant. Recreational fisheries also have restrictions that reduced angler days, hence spending in coastal communities is reduced.

The new regulations have had severe impacts on small trawling vessels - especially on Oregon's north coast. On the north coast, the edge of the continental shelf is 50 miles offshore. On the south coast, the edge of the continental shelf is 20 miles

offshore. Many smaller trawl vessels do not have the capacity to fish in deep water off the continental shelf. Moreover, it becomes dangerous to operate small trawl vessels far offshore. Forcing vessels to shallow waters will cause conflicts due to congestion with other commercial fishing vessels and recreational boaters. Stricter verification requirements (observers, satellite signal locational registry programs, etc.) will add costs to an already distressed industry.

The federal industry-sponsored buyout in 2003 removed close to 50 percent of trawl fishery permits on the West Coast. The remaining fleet did see modest increases in per vessel revenues.[15]

The groundfish fishery in 2009 had a substantial increase in landed volume and ex-vessel value from the mid-2000's.[16] This follows deep declines since the early 1990's. Total volume in 2009 was 41.1 million pounds and total ex-vessel value was $29.6 million. In 2011 and 2012 the volume was about 30 percent lower than 2009, while the value was two percent lower in 2011 and 20 percent lower in 2012. Total volume in 2012 was 28.5 million pounds and total ex-vessel value was $23.8 million. While the last two years are lower than recent years, 2012 is a 43 percent decrease from the 10 year average from 1987 to 1996 by value, and a 60 percent decrease by volume.

There were 111 vessels (97 percent of all vessels making deliveries) that delivered more than $500 limited entry trawl or fixed gear caught groundfish in 2012. Their average groundfish revenue was $199,339, which was about 42 percent of their total fisheries revenue. The average limited entry groundfish revenue for the top 10 vessels was $742,258 and their dependency on groundfish revenue was 84 percent. The top 19 (17 percent) vessels harvested 50 percent of this fishery's total value. The bottom 51 (i.e. 111 minus 60 vessels or 46 percent of all vessels delivering more than $500) harvested 10 percent of the total value. The groundfish trawl fishery is being assessed by the MSC for potential certification in 2013.

There are complex management and organizational issues facing groundfish trawl fishery participants. Emphasis on rebuilding depleted stocks has curtailed the availability of groundfish for harvesting. The results from an individual transferable quota (ITQ) program (where individual quotas are assigned to groundfish permit owners) have meant that all fish quota becomes "transferable." The long range effect of instituting the ITQ program will reduce the total number of trawl boats operating in Oregon as vessels with small quota amounts will sell or lease to larger, more efficient vessels. The program started in January 2011, although quota share (QS) transfers will not start until late in 2013. All vessels holding groundfish trawl permits are paying for a portion of funds used in the 2003 buyout program. The federal government is paying for the ITQ program startup and initial year administration and observer costs, but the program is designed for cost recovery in future years.

6. Pacific Whiting

Pacific whiting onshore volume was steady at about 160 million pounds during the late 1990's. Prices averaged around $0.044, but hit a low level in 1998 ($0.032 per pound). Stock assessments had put this species in an "overfished" status, and harvests under the rebuilding plan were considerably less in 2003 when only 80.6 million pounds were landed in Oregon. Average price was about $0.055, which translates to total landed ex-vessel value of $4.5 million. A new stock assessment information allowed this species

status to be declared rebuilt in 2004. Subsequent new stock assessments increased the U.S. optimum yield (OY) to about 250 thousand mt following the recovery declaration. Concerns about overharvesting bycatch limits on non-whiting species interrupted the whiting harvests in both 2007 and 2008. The 2008 landing volume was about half of the 2004 to 2006 average, but the doubling of price in 2008 resulted in landing value about equaling those years. There was a price collapse in 2009 with harvesters receiving about half of 2008 prices. Low level stock assessments continued from 2008 through 2010. Strong year classes raised total allowable catch in 2011 to more than double the previous three years. Year 2012 catch was half again greater than the three year period. The big news is that harvesters have received increased prices that restored what was being received in 2008.

Two surimi production plants along the West Coast have the capacity to process up to 20 million pounds per week. Ex-processor prices for surimi improved somewhat starting in 2003 due to a weaker U.S. dollar and the decreased supplies to market from downturns in other historical surimi based world fisheries. The expected trend in improved prices was dampened by increased yield in both the Pacific whiting and the pollock fisheries with the use of "decanter" technology. There are also other countries, like India, that are starting to produce a lower grade surimi. This caused downward pressure on surimi prices. In late 2004 the Indian Ocean tsunami destroyed a large part of the fish harvesting and fish processing industry that produced a low quality surimi. This had the effect for raising the expected prices for surimi products in 2005. Because of increased awareness of health aspects of fish consumption and the general decline of wild caught white fish availability in the world, and some collapses of "hake" resources, the prices of all Pacific whiting products increased.

The surimi product form's prices are subject to the Alaska pollock surimi market and downturns in the Japanese market have lowered prices in past years. As a consequence, more whiting is being directed to the developing fillet and H&G market. Surimi production dropped to inconsequential at Oregon plants in 2011 and 2012. Filleting and H&G processing also require smaller capital investments. Several smaller processors have moved into whiting processing, especially in the Astoria area. With the use of onboard superchilling technology, there is an opportunity for an improved headed and gutted product for whiting in the eastern U.S. market and some parts of Europe and Israel. Pacific whiting was MSC certified in October 2008.

The "big news" price change for the onshore Pacific whiting fishery is the result of strong global demand (especially eastern European countries) for headed and gutted product that is a lower price substitute for white flesh seafood. In addition to the price big news, there is also the good news that widow rockfish was removed from the list of overfished species. This species is caught coincidentally with the same mid-water trawl gear used in the whiting fishery. It appears that a small amount of the species will be available for an incidental fishery which can mean prosecuting will be less expensive since the species will not have to be avoided as it was in the past.

There were 21 vessels (41 percent of all vessels making deliveries) that delivered onshore more than $500 of Pacific whiting in 2012. Their average whiting revenue was $695,710, which was 83 percent of their

total fisheries revenue. The average whiting revenue for the top 10 vessels was $1.1 million and their dependency on whiting revenue was 96 percent. The top six (12 percent) vessels harvested 50 percent of this fishery's total value. The bottom six (i.e. 21 minus 15 vessels or 29 percent of all vessels delivering more than $500) harvested 10 percent of the total value.

The PFMC approved an ITQ program for the whiting onshore fishery starting in 2011. The QS assigned to vessels was dependent on what was caught during years that the fishery operated under a federal exempted fishing permit (EFP).[17] (A unique feature of the onshore whiting fishery ITQ program is that 20 percent of the QS was assigned to processors. Processors use their owned vessels or lease the quota pounds (QP) to other vessels for the harvests.) Non-EFP vessels could also make landings, but were subject to whiting and other groundfish trip limits, and discard of prohibited species. The EFP permitted vessels were not penalized for landing prohibited species (e.g., salmon, Pacific halibut, Dungeness crab), nor are they held liable for overages of groundfish trip limits. This allowed the fleet to conduct their fishing trips as quickly as possible, contributing to maintaining the quality of the whiting product. However, the shoreside fleet as a whole was capped, meaning that reaching the bycatch cap for a non-whiting species meant the fishery closed before the entire whiting allocation was harvested. Under the new ITQ program, individual vessels are assigned bycatch limits. A single vessel must acquire bycatch QP to continue to harvest or not participate in the fishery.

There is also a large Pacific whiting at-sea fishery off the Oregon Coast (Table III.3). Factory trawlers (vessels that both harvest and process onboard) and motherships (only process what catcher vessels bring them) that usually home-port in Seattle fish from April through fall of each year, catch levels permitting. The tribal fishery is allocated 13.8 percent of the U.S. OY. The non-tribal commercial fisheries received 86.2 percent of the U.S. OY. Allocations of this amount were 42 percent to vessels landing at shoreside processing plants and 58 percent for the at-sea fishery (34 percent to factory trawlers and 24 percent to catcher vessels delivering to motherships). More than a dozen catcher vessels from Oregon ports participate in the at-sea fishery by delivering to the motherships. The harvests are not counted in Oregon landings, but revenue returned to Oregon's economy is included in the distant water fisheries category.

None of the five motherships or nine catcher-processors in 2012 had onshore landings in 2012, but one mothership in 2010 did in 1982 and 1983. Of the 18 catcher vessels in 2012, 12 had onshore landings in 2012. Of those 12, nine had an Oregon home-port group, three had a Washington home-port group, and none had a California home-port group. Of the six with no onshore landings in 2012, three had onshore landings in years other than 2012. Their most recent year's home-port groups were in Washington (two) or Oregon (one).

Of the 24 catcher vessels in 2006, 14 continued in 2012, and 10 dropped out. Three did not participate in every year between 2006 and 2012. So four of the 18 catcher vessels in 2012 were new (entered) or returning (one was new in 2010, two were new in 2011, and one participated prior to 2006 in 2001 and returned in 2010). Thirteen of the 2008 vessels participated in 2012. Three of the other five entered or returned in 2010, and two in 2011. The nine 2006 catcher-processors are the same nine that participated in 2007, 2011, and 2012,

Table III.3
U.S. West Coast At-Sea Vessel Counts by Sector in 1990 to 2012

	Catcher Vessels and Motherships				
	CV	MS		Catcher-Processors	
Year	Count	Count	Volume	Count	Volume
1990	0	0	0.0	4	4,618.4
1991	40	8	87,172.3	13	119,996.3
1992	24	10	36,245.5	23	118,938.7
1993	10	4	14,855.7	15	79,381.7
1994	43	11	81,935.7	9	85,670.5
1995	36	8	40,263.3	9	61,646.6
1996	30	8	61,179.4	10	66,577.8
1997	30	6	75,907.9	10	71,268.2
1998	28	6	75,748.9	7	71,184.7
1999	28	6	74,880.8	6	68,832.1
2000	28	6	53,775.6	8	68,605.4
2001	23	5	42,684.1	7	59,233.7
2002	15	4	49,788.4	5	36,619.2
2003	16	4	46,724.0	6	41,433.2
2004	15	4	48,112.1	6	71,003.2
2005	21	6	73,650.7	6	79,332.8
2006	24	6	61,261.2	9	79,095.0
2007	25	6	53,260.2	9	74,303.6
2008	24	5	72,838.2	8	109,132.7
2009	24	6	38,403.8	6	38,747.2
2010	28	8	52,464.5	7	54,787.0
2011	23	6	56,768.0	9	72,758.1
2012	18	5	38,637.0	9	55,668.1

Notes: 1. Volume is in metric tons. Landed value for at-sea fisheries is not reported.
2. At-sea Pacific whiting is allocated to sectors, which are defined by vessel types for motherships and catcher-processors. A separate tribal allocation is usually delivered to a mothership. The table includes the sector and tribal allocations. There is also an onshore Pacific whiting allocation whose volume trends are shown in Table II.1.
3. No motherships or catcher-processors use Oregon harbors for their home-port and most declare Seattle for their documented hailing port. For the count of catcher vessels shown in 2012 and based on U.S. West Coast onshore landings, three home-port in Washington, nine home-port in Oregon, and none home-port in California. Another six did not have U.S. West Coast onshore landings. Vessel landings in other distant water fisheries were not investigated.

Source: PacFIN offshore and annual vessel summary data, April 2013 extraction.

and three of them participated in each year in between. Three of the six 2006 motherships also participated in 2007 to 2012, one dropped out in 2007, and two dropped out in 2011. Of the two motherships in 2012 that did not participate in 2006, one was new in 2011, and one dropped out in 2001 and returned in 2007 (then dropped out in 2008 then participated in 2009 to 2012). Of the two motherships that were new in 2010, one dropped out in 2011 and one dropped out in 2012.

The PFMC amended the groundfish FMP to reduce impacts from Alaskan vessels that are qualified under the American Fisheries Act and allow higher harvests by local vessels. The problems of lower resource availability in Alaska and higher prices for whiting products meant a "race for fish" for whiting. This resulted in a shorter total season and stress on the stocks at risk that are caught as bycatch. The PFMC ITQ program for this fishery starting in 2011 removed this consequence. The ITQ program will operate as a cooperative for the offshore fishery.

7. Pacific Sardines

Another important market species in Oregon's onshore landings is sardines. There were 24.3 million pounds landed at an ex-vessel value of $3.2 million in 2011 and 94.0 million pounds worth $9.0 million in 2012. Sardine landings explain much of the overall landing volume increase for the "other species" category in recent years. There are about five processors in the Astoria area that handle most of the Oregon landings. Sardine abundances purportedly follow a 60 year cycle, so swings in landings are not expected to be as pronounced as the shorter cyclical periods for crab and shrimp. Sardines are processed into bait for mostly Japanese buyers to be used in longline fisheries. About 60 percent of the sardines are processed for this market that demands a quality product. Another 30 percent goes to human consumption, both for the fresh/frozen as well as the canned market. Because of the strong Dungeness crab market, about 10 percent of the sardines are frozen to be used in West Coast crab pots.

There were 21 vessels (60 percent of all vessels making sardine deliveries) that delivered onshore more than $500 of Pacific sardines in 2012, and all of those landed more than $500 of Pacific sardines in Astoria (Table III.4). The average sardine revenue of all 21 vessels was $427,326, which was 95 percent of their total fisheries revenue. The average sardine revenue for the top 10 vessels was $710,823 and their dependency on sardine revenue was 95 percent. The top five (14 percent) vessels harvested 50 percent of this fishery's total value. The bottom eight (i.e. 21 minus 13 vessels or 38 percent of all vessels delivering more than $500) harvested 10 percent of the total value. The 21 vessels landing more than $500 of sardine in Oregon in 2012 have home-ports in Astoria (15), Los Angeles (5), and Santa Barbara (1). Twelve of them landed only pelagic species, five landed only pelagic species and net salmon, and three landed only pelagic species and crab.

B. Distant Water Fisheries

An important part of Oregon's commercial fishing industry is the distant water fishery.[18] Vessels owned by Oregon residents travel to or are located at ocean fishing areas too far away or dictated by management regulations for harvests to be landed in Oregon. Some of these boats harvest groundfish (mostly pollock) for American processor boats ("motherships") and land based processors along the Alaskan coast. Also very important are the longline fleet that harvests halibut and black cod, and the gillnet fleet that fishes for salmon in Alaskan waters such as Bristol Bay. There are also Oregon fishermen that land salmon and other species in California and Washington. Vessels also deliver Pacific whiting to at-sea motherships off the West Coast. Some vessels travel to the western and south Pacific Ocean to fish for pelagic species, such as tuna. The characteristics of this fleet are discussed in TRG (January

Table III.4
Vessel Participation by Major Fishery and by Port Group in 2012

	Astoria			Tillamook			Newport			Coos Bay			Port Orford			Brookings			Statewide		
Fishery	>$500	50% Value	90% Value	>$500	50% Value	90% Value	>$500	50% Value	90% Value	>$500	50% Value	90% Value	>$500	50% Value	90% Value	>$500	50% Value	90% Value	>$500	50% Value	90% Value
Salmon troll	55	12	33	61	7	36	115	18	64	129	23	72	23	4	13	37	6	23	323	54	182
D. crab	67	14	38	23	5	13	104	22	66	95	15	52	30	7	20	51	11	30	338	62	202
Pink shrimp	17	5	11	c	c	c	18	5	11	26	8	16	0	0	0	14	3	7	64	17	41
A. tuna	71	9	32	54	8	30	214	30	106	140	15	64	8	c	6	5	c	3	431	50	192
Groundfish																					
Limited entry	40	7	18	c	c	c	40	6	19	32	6	18	15	5	10	15	3	9	111	19	60
Open access	9	3	8	31	5	19	34	6	17	27	5	16	46	10	27	34	6	23	166	23	87
Pacific whiting	15	4	8	0	0	0	14	4	9	0	0	0	0	0	0	0	0	0	21	6	15
Pacific sardine	21	5	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	5	13
All fisheries	407	26	111	127	9	46	350	23	133	291	21	95	73	12	37	119	13	44	1,086	79	373

Notes:
1. The column titled ">$500" is an arbitrary threshold to filter for vessels that are actively participating in the shown fishery. The fisheries in each port group are counted separately, so the $500 filter is applied to each. Statewide, the $500 threshold may be landed at any combination of port groups.
2. The vessel counts under the columns titled for percent value are the number of vessels it took to land that percent of the ex-vessel value of the fishery.
3. Some vessels participate in distant water fisheries, such as the West Coast offshore whiting fishery where deliveries are made to motherships. Only Oregon onshore landings are included in the table compilations.
4. Vessels with identification of "NONE" or "ZZ..." are excluded. These vessels are typically delivering in treaty fisheries. The statewide ex-vessel value for these vessels is $0.7 million (including $0.5 million for treaty participation group and $0.3 million for ocean and inriver commercial non-treaty participation group).
5. Vessel counts across fisheries will not sum to a port group or statewide total because vessels can participate in more than one fishery and/or there are other important fisheries not itemized. For example, the statewide ex-vessel value for Columbia River fisheries is $2.3 million or 1.8% of all Oregon landings in 2012. Other ocean fisheries not shown are $2.8 million (including $1.2 million for hagfish and $1.0 million for halibut) or 2.2% of all Oregon landings. The row titled "all fisheries" includes the Columbia River fisheries and other fisheries that were not itemized.
6. Counts with a "c" are not shown to avoid revealing confidential information.

Source: PacFIN annual vessel summary, April 2013 extraction.

1999), Northern Economics (2002), and TRG (2006).

Tables III.5 and III.6 show vessel counts and permit earnings in Alaska onshore fisheries by Washington, Oregon, and California residents in 2012. Appendix E shows the same information for Oregon coastal county residency in 2011. In recent years, there have been around 300 vessels with ownership ties to Washington, Oregon, and California residences that made landings at U.S. West Coast ports and Alaska or other Pacific Ocean locations. There were about another two thousand vessels in 2012 with owner registration residency in West Coast states that fished in Alaska. Total onshore harvest revenue for Alaska permits held by residents of Washington, Oregon, and California was about $866.8 million in 2012 (Figure III.10). This is about 52 percent of all West Coast onshore harvest revenue. Similar distant water harvest values are not estimated for other than Alaska fisheries and the West Coast at-sea fishery. Anecdotal information is relied upon for those fisheries.

Harvest revenue and cost indexes are used to update the various components of the Oregon distant water fisheries economic model (Appendix C). Harvest revenue from the West Coast at-sea fishery and revenue from delivering to other West Coast states is known through available data sources. The Alaskan and other distant water fisheries are estimates based on predetermined applicable indexes of harvest revenue and fishing cost trends.

Table III.5
Vessel Counts for U.S. West Coast Fishing Fleet in 2012

Fishery	Washington	Oregon	California	Total
U.S. West Coast				
Onshore	1,137	1,140	1,890	3,753
Offshore	--	--	--	32
Motherships	--	--	--	5
Catcher-processors	--	--	--	9
Catcher vessels	--	--	--	18
Alaska	1,826	294	163	2,281
U.S. West Coast landings	179	38	14	231
Other	1,647	256	149	2,050
Other Pacific Ocean waters	74	55	79	148

Notes:
1. NA - not available.
2. Excludes vessel identifiers "ZZ.." and "NONE."
3. U.S. West Coast vessel counts among states are not unique vessels. The "total" counts for states are unique.
4. The inclusion criteria for Alaska registered vessel counts with landings at U.S. West Coast states is whether at least one landing was made at a U.S. West Coast port. This excludes vessels that may have a homeport in a U.S. West Coast state, but participate exclusively in offshore or distant water fisheries.

Source: PacFIN annual vessel summary and offshore data, April 2013 extractions; and Alaska Commercial Fisheries Entry Commission (CFEC).

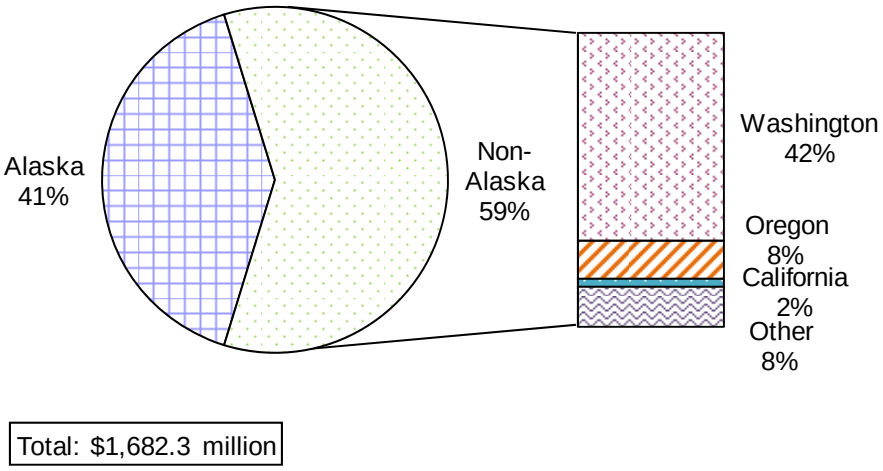
Table III.6
Estimated Gross Earnings for Alaska Permit Holders by Onshore Fisheries and Residency in 2012

Fishery Group	Residents of Alaska	Residents of Washington	Residents of Oregon	Residents of California	WOC Subtotal	Residents of Other	Non-Alaska Subtotal	Total
All fisheries combined	681.4	706.0	132.9	27.9	866.8	134.0	1,000.9	1,682.3
Crab	79.0	147.5	27.7	0.8	176.0	20.8	196.8	275.8
Halibut	91.2	31.1	7.9	1.1	40.0	11.2	51.3	142.5
Herring	15.9	2.7	0.0	0.1	2.8	0.7	3.5	19.4
Other finfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other groundfish	112.9	371.4	74.2	12.9	458.6	55.5	514.1	627.0
Other shellfish	11.1	4.1	0.2	0.6	4.8	0.9	5.7	16.8
Sablefish	55.9	43.9	6.3	1.2	51.4	9.2	60.6	116.5
Salmon	315.3	105.3	16.6	11.3	133.2	35.3	168.5	483.8
Unknown permit landings	0.0	0.0	0.0	0.0	0.0	0.4	0.4	0.4

Notes: 1. Earnings are in millions of 2012 dollars.
2. Fisheries may not sum to "all fisheries combined" due to proxy earnings being used where fisheries are confidential. Proxy earnings are assigned to some permit codes where reveal is precluded due to confidentiality rules. The assigned earnings are based on the average earnings per permit for combined permit areas or combined permit residencies.
3. Fishery group definitions are different than U.S. West Coast onshore landed fisheries.
4. Some offshore fisheries earnings are not included in the tabulations.

Source: Alaska Commercial Fisheries Entry Commission (CFEC) August 2013 extraction, preliminary.

Figure III.10
Share of Estimated Gross Earnings for Alaska Fisheries by Permit Registration Residency in 2012



Notes: 1. Notes for Table III.6 apply to this figure.
Source: Alaska Commercial Fisheries Entry Commission (CFEC) August 2013 extraction, preliminary.

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IV. PROCESSING BUSINESSES AND MARKETING PROGRAMS

This chapter reviews the fish processing segment of the commercial fishing industry. Background information is provided about raw product purchases, finished products, business trends, ownership, and seafood markets. Processors and buyers are described in terms of the amount of raw product purchased and degree of dependence on particular fisheries. Other information about processor businesses such as ownership and plant capacities is not as readily available as processor purchase information. Only Year 2012 profiles are used to have most consistent and complete information about processor businesses. Processor counts are for both the first buying entity identified on an issued fish ticket and how many of these entities are under single ownerships. Data sources for the purchases only show where the purchase occurs; not all landings are processed at their geographical location of deliveries. Purchased fish are transported to processors in other locations and there is cross hauling of species between processor facilities.

A. Processor Characteristics

There were 213 unique names of processors or buyers for Oregon landings in 2012. These businesses include operators of processing plants, buyers that may do little more than hold the fish prior to their shipment to a primary or secondary processor, and consumers buying directly from vessels. Table IV.1 shows the characteristics of 101 purchasers filtered for vessels selling directly to the public and businesses who had only minor activity (less than $500 each). The 112 filtered purchasers only represent about one percent of total purchases.

The higher volume processors and buyers especially depend upon year-around deliveries from many fisheries. Many licensed processors and buyers received salmon, Dungeness crab, pelagics, migratory, and groundfish (other than Pacific whiting) in 2012. However, only the larger volume firms took deliveries of pink shrimp (12 firms, of which 92 percent had revenues greater than $1 million) and Pacific whiting (eight firms, of which 100 percent had revenue greater than $1 million). The species causing greatest specialization was Pacific sardines and the second highest specialization was caused by Dungeness crab (Table IV.1).

There are a relatively small number of processors and buyers that handle most of the deliveries in Oregon. Out of the 101 businesses used to compile information for Table IV.1, 19 percent of the 101 purchased 90 percent of the harvests.

B. Processor Trends

Processing is being centralized to occur at plants in only a few regional commercial fisheries centers. The expense for equipment and refrigeration to meet new quality standards balanced against business risk makes it unlikely this trend will change. Large processors (annual purchases of over $1 million) tend to be year-around operations with product forms from all species harvested in Oregon fisheries. Smaller processors (less than $100 thousand) specialize in products from single seasonal fisheries. Buyer only operations are located at smaller ports and daily purchases are hauled to the central plants for processing.

Table IV.1
Counts and Purchase Distribution of Major Processors or Buyers by Species Groups in 2012

Species	Count Total	Processor Counts Within Purchase Categories <=$10K	<=$100K	<=$1,000K	>$1,000K	Counts Within Purchase Specialization Categories >90%	>50%	>33%
Salmon	60	13%	45%	25%	17%	17%	33%	43%
D. crab	56	5%	43%	29%	23%	20%	41%	54%
Pink shrimp	12	0%	0%	8%	92%	0%	8%	8%
A. tuna	59	8%	39%	29%	24%	17%	29%	37%
Groundfish	55	11%	44%	24%	22%	11%	15%	29%
Pacific whiting	8	0%	0%	0%	100%	0%	25%	38%
Pacific sardines	8	0%	0%	13%	88%	38%	50%	63%
Other	58	5%	34%	33%	28%	5%	7%	12%
Total	101	15%	40%	27%	19%			

Species	Sum of Purchases (thousands)	Purchases Within Purchase Categories <=$10K	<=$100K	<=$1,000K	>$1,000K	Purchase Distribution (thousands) 90th Percentile	50th Percentile	Mean
Salmon	$6,426	0.4%	6.0%	19.6%	74.0%	$321	$15	$107
D. crab	29,053	0.1%	1.5%	18.1%	80.3%	1,700	38	519
Pink shrimp	24,685	0.0%	0.0%	0.3%	99.7%	5,146	919	2,057
A. tuna	14,673	0.1%	2.0%	18.7%	79.2%	824	21	249
Groundfish	23,762	0.1%	0.9%	2.1%	97.0%	973	9	432
Pacific whiting	14,611	0.0%	0.0%	0.0%	100.0%	3,432	1,591	1,826
Pacific sardines	8,974	0.0%	0.0%	8.3%	91.7%	2,013	861	1,122
Other	2,872	0.0%	5.4%	24.3%	70.2%	122	8	50
Total	$125,057	0.1%	1.2%	9.0%	89.7%	$3,075	$74	$1,238

Notes: 1. Purchases are in thousands of 2012 dollars.
2. Purchases exclude vessels selling fish directly to the public and processors or buyers whose activity is less than $500.
3. Table shows counts of unique processors or buyers for >50% specialization, but counts are repeated in species groups for <=50% specialization.

Source: PacFIN annual vessel summary, April 2013 extraction.

There is a growing number of harvesters selling whole, dressed (cleaned and gutted) salmon, crab, and tuna directly to the consumer from vessels. This direct marketing concept is not without controversy, since participating vessels would be in competition with the local retail markets for customers. Harvesters can receive about double the price from what is received when delivering to processors. While the direct sale price appears to be an attractive return, there are costs (advertising, packaging, spoilage, etc.) and legal risks for this type of sale. In addition, there can be lost fishing effort while the vessel is used as a base for sales.

The above are two examples of four significant trends taking place in the fish processing industry where Oregon harvesters traditionally deliver their landings (Grays Harbor, Washington to Ft. Bragg, California). Tracing back to the early 1990's, the four trends are:

(1) Consolidated processor ownership and centralization of general processing plants in limited locations;
(2) Vertical integration into distribution and harvesting operations;
(3) Decreased seafood product wholesale prices; and,
(4) Return of small processors to offering particular products in niche markets.

The following is a more detailed explanation of each trend.

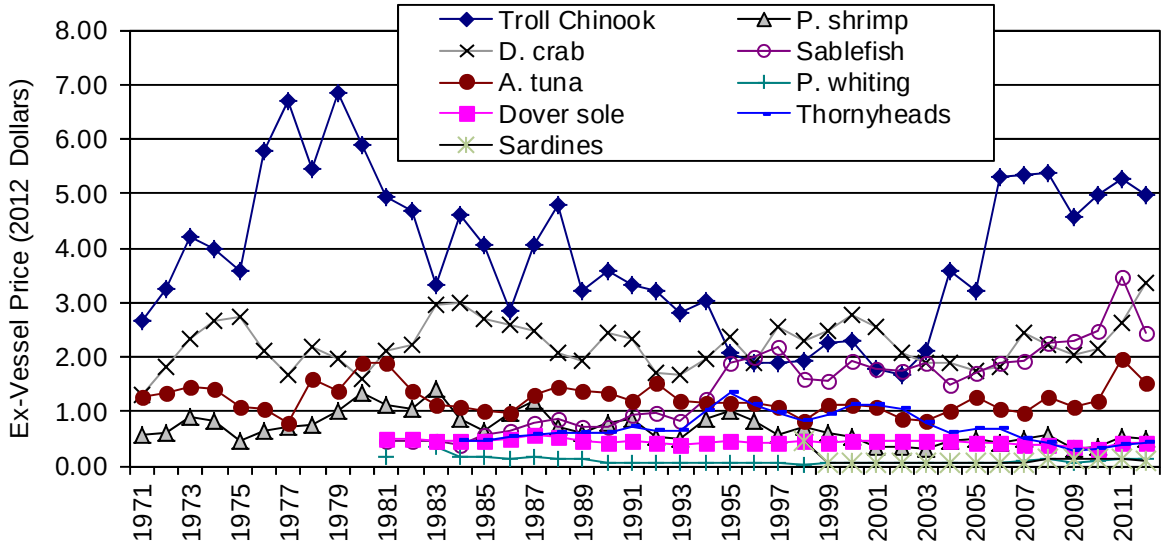
(1) Owner Consolidation and Plant Centralization. There have been dramatic changes in processor business ownership and where fish processing occurs. Ownerships are being consolidated to a few major companies and landings are being hauled to general processing plants at a few locations along the central West Coast.[19,20] In south central Washington, the Westport area has one major processing company that specializes in Pacific whiting. Ilwaco has one major processing company that operates a general plant. There were only two major companies in the Astoria area processing year-around multi-species products in 2012. Several other companies specialized in sardines or other species. Newport has two large general processing plants and another plant specializes in whiting. Several smaller processors concentrate on salmon, tuna, and crab. One major company also owns a multi-species processing plant in the Coos Bay area. In northern California, there are two general processing plants operating: one in the Eureka area and one in Fort Bragg.

Ownership consolidation has typically been accomplished by purchasing seafood buying or seafood processing facilities that are in financial difficulties. At times, this has meant only buying the name of the distressed company. Other times it has involved purchasing working capital and inventory from ongoing businesses. Processing employment was then moved out of smaller ports and replaced by buying stations. Most of the other landings go to specialty buyers or are landed in one port to be hauled to regional processing plants in another location.

(2) Vertical Integration. Vertical integration has been witnessed for both harvesters and processors. Harvesters are participating in direct marketing of their landings to consumers, and large processing companies have acquired vessel ownership positions. One major processing company is becoming more involved in distribution as its capacity to fill large orders grows.

(3) Prices. With several exceptions, there have been stable harvest price trends since the early 2000's. One exception is salmon prices have shot up to nearly late 1970's levels (Figure IV.1). While longer trend price stabilities have eliminated

Figure IV.1
Selected Species Annual Ex-Vessel Price Trends in 1971 to 2012



Notes: 1. Prices adjusted to real 2012 dollars.
2. Ex-vessel price is the amount paid to fishers at the time of fish delivery. Deliveries are for onshore landings.
3. Thornyheads prices are for longspine from 1995 to present, and prior years are mixed longspine and shortspine.
4. Prices are annual and averaged across harvests made in different fisheries. Prices are expressed in round weight equivalents, except for troll Chinook prior to 1981 which are based on dressed weight. Average prices for salmon are across seasons and sizes.

Source: Oregon Department of Fish and Wildlife for years prior to 1981. PacFIN March 2008, April 2009, March 2010, July 2011, and April 2013 extractions for 1981 onward.

valuable product lines and in some cases led to the demise of some processors, the effects mostly are the earnings power of harvesters. Processors will continue to purchase salmon, shrimp, crab, and other species as long as their margins are covered. Vessels sometimes will continue to harvest at losses in order to protect their investment and permits. To remain in business, operation losses for both harvesters and processors in single fisheries will have to be covered by other fisheries.

(4) Specialized Products for Niche Markets. There is a trend is for some small processors to return to particular product and species specialization. Salmon, live groundfish, albacore tuna, and Dungeness crab are species used in these markets. There is a minimum amount of investment needed to set up a buying station and ship products to consumer markets. A number of small ports have policies for assisting in this marketing technique.

The process of ownership consolidation has resulted in three major processing groups buying 61 percent by volume of all fish landed at Oregon ports in 2012. Adding the next two highest processor groups (five in all) raises the proportion to 79 percent. The

share of certain species groups like Pacific whiting is even more concentrated. The end result of this trend is that there are only a few general fish processing plants left operating. Even though fish are landed in one area, they are hauled to a facility in another region. The smaller competing fish buyers specialize in products for which they have established niche markets. This leaves harvesters with very limited markets in any geographic area.

The relationship between harvesters and processors that results in a harvester "having a market" is largely determined by the relative bargaining power of the two sectors. A case-in-point to discuss this harvester-processor relationship is the U.S. West Coast groundfish trawl fishery. The fishery was managed under a license limitation system with equal trip limits for all vessels. Under the status quo:

- Processor ownership consolidation has been increasing.
- There has been a large oversupply of vessels relative to harvest levels.
- There is an information asymmetry as processors know the end value of fishery resources and harvesters do not.

The new management technique starting in 2011 is to use ITQ's and IPQ's. The switch has been controversial for those directly involved.[21,22] Implementation details are still being decided by the PFMC in the form of trailing amendments to the original approval for the FMP change.

C. Processed Product Value

The value added from processing landed fish differs depending on the final seafood product form. Some seafood products are exported fresh or frozen from Oregon with a minimal amount of processing, such as fresh salmon, tuna, and whole crab. Some of the fish products shipped out of Oregon include a fair amount of processing, such as filleting. (Appendix B shows the relative size of the international export market value for Oregon, West Coast, and Alaska seafood products.) Intensive processing, such as smoking and canning, is also carried out by the smaller processors. Another very intensive type of processing that used to occur at plants on the Oregon Coast is Pacific whiting "surimi" production. Pacific whiting is purchased from harvesters at around $0.10 per pound and surimi sells for close to one dollar per pound at the ex-processor level. The changed value is because labor and capital is used to modify the fish resource. However, in recent years it has been more profitable to use Pacific whiting in an H&G product form. The more intensive the processing, the higher contributions are being made to local economies from worker wages and other processing costs.

The value of primary seafood products produced in Oregon can be calculated using sales price of product forms and the landed species group finished product poundage. The ex-processor price was determined using either financial information about five components of product cost or published sales price for product forms.

- Raw product purchase = average price ÷ product form yield
- Labor = cost for labor associated with product form processing
- Tax/fee = costs for ad valorem and poundage taxes and fees paid on deliveries of raw product by the processor
- Other = fixed plant costs, etc.
- Contribution = profit, etc.

The estimated ex-processor value for all species groups, excluding non-edible products such as fish meal, is $221 million in 2012, which is about double the ex-vessel value (Table A.3). Harvester-to-wholesale-to-retail price conversion models for several product forms are shown in appendix Tables A.5a to A.5e.

D. Major Seafood Processing Companies

Large processing companies often own several processing plants under different names, usually the names of former companies. Table A.8 shows existing buying/processing facilities and parent companies representation at port groups in Oregon for 2012. The information includes those facilities with annual landing purchases (ex-vessel values) greater than $100,000 in a port group, and indicates each port group with purchases greater than $10,000. There are some other significant buyers and processors in local areas that are not shown on this table. Many of these small companies are especially important in adding value via canning, smoking, etc. to local fish harvests. Parent company assignment is from personal communication or other investigation of cross ownership. Parents are assigned to subsidiaries groups by interpretations and evidence of various legal arrangements that include ownership ties, lease contracts, and purchasing arrangements.

The distribution of companies by port groups can be made. Table IV.2 shows species group purchases by purchase size categories for the ownerships. These counts are refined for being a "major" company. A major company is defined to be a purchaser of at least $5 million in any state's landings. There are general processing plants not in this table, because they are not located at ports where vessel deliveries are made. For example, general processing plants are or recently have been located in Woodland, Washington; Portland, Oregon; Salem, Oregon; Sacramento, California; and Watsonville, California. There are also several large custom cutting and cold storage businesses which are primary seafood processors; however, they do not make vessel purchases so are not represented in this table. Landing data at the port group level was used to verify the thresholds for the table's processor categories and interviews with processing company representatives were used to determine plant capacity.

Ownership of seafood processing has changed along the Oregon Coast. The rise of the Columbia River salmon industry by European settlers was historically centered in the Astoria area. Later other species, such as tuna and sardines, also were included in this growth. As the salmon fishery expanded to the ocean, Newport and Coos Bay received an ever increasing part of the landings. Vessel technology and market demand led to the development of the groundfish fishery at Newport and Coos Bay. The decline of the abundance of salmon and groundfish species negatively affected these port groups greatly. Coos Bay processors continued using shrimp and crab resources, while Newport continued to be a center for whiting and other groundfish processing.

The Astoria area is again becoming the dominant port area for seafood processing. Besides salmon and Dungeness crab (which are landed all along the Oregon Coast), the Astoria area is receiving a large proportion of the Pacific whiting landings and most of the sardine landings.

Table IV.2
Purchases at Port Groups and Statewide by Species Groups in 2012

Processor Category	Ownership/ Count	Port Group Purchase Share	Major Company	Processing Buyer/ General	Processing Buyer/ Specialized	State	Port Group	Species Group Purchases at Port Group: Groundfish	Whiting	Salmon	Crab/lobst	Shrimp	Sardine	Pelagic	H. Migratory	Halibut	S.urchin	Other
Astoria																		
>$1.5M	6	86%	2	4	2	44,601,544	35,897,337	9,920,254	6,286,999	2,244,213	2,596,805	4,347,220	6,954,102	127,580	3,085,956	164,971	0	169,237
$500K-$1.5M	4	11%	0	0	4	5,965,544	4,577,179	48,375	1,271,054	83,936	1,054,380	0	2,019,735	48,826	25,789	0	0	25,084
$50K-$500K	7	3%	0	0	7	1,291,587	1,153,390	438	0	741,018	338,676	0	0	8,973,837	23,211	2,281	0	47,766
$10K-$50K	8	0%	0	1	7	267,052	136,935	0	0	81,717	15,776	0	2,984	0	24,651	0	0	11,807
<$10K	23	0%	0	7	16	4,125,268	75,015	0	0	26,349	9,455	0	0	0	27,704	0	0	11,507
Subtotal	48	100%	2	12	36	56,250,995	41,839,856	9,969,067	7,558,053	3,177,233	4,015,092	4,347,220	8,976,821	9,150,243	3,187,311	167,252	0	265,401
Tillamook																		
>$1.5M	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$500K-$1.5M	3	82%	1	0	3	13,721,230	2,049,244	32,218	0	287,035	1,336,701	36,196	0	0	350,041	7,053	0	0
$100K-$500K	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$10K-$100K	16	15%	0	4	12	2,479,360	384,095	112,699	0	45,868	72,959	0	0	0	34,003	26,453	0	92,113
<$10K	30	2%	1	8	22	22,541,809	57,109	5,280	0	11,826	7,239	15,191	0	0	11,874	704	0	4,995
Subtotal	49	100%	2	12	37	38,742,399	2,490,448	150,197	0	344,729	1,416,899	51,387	0	0	395,918	34,210	0	97,108
Newport																		
>1.5M	5	87%	3	4	1	49,821,521	32,496,114	5,496,942	7,052,472	708,200	5,235,858	7,513,859	0	335	5,873,819	456,607	0	158,022
$500K-$1.5M	3	7%	1	3	0	15,218,771	2,594,663	54,304	0	605,524	761,076	43,681	0	0	1,071,429	58,649	0	0
$100K-$500K	7	4%	0	1	6	1,751,781	1,387,583	111,575	0	78,115	617,560	0	0	0	448,117	29,664	102,533	19
$50K-$100K	7	1%	0	0	7	3,937,863	428,366	58,155	0	54,494	85,366	109,414	0	0	90,269	30,668	0	0
$10K-$50K	20	1%	1	3	17	11,142,792	488,066	48,274	0	63,932	131,775	32,349	0	40	144,414	5,236	12,867	49,179
<$10K	41	0%	0	14	27	4,840,533	114,884	6,196	0	22,044	13,523	80	0	0	68,434	1,056	678	2,873
Subtotal	83	100%	5	25	58	86,713,261	37,509,676	5,775,446	7,052,472	1,532,309	6,845,158	7,699,383	0	375	7,696,482	581,880	116,078	210,093
Coos Bay																		
>$1.5M	3	65%	3	2	1	45,268,609	18,966,978	3,222,583	4	833,232	2,952,844	10,610,528	0	0	1,257,484	90,147	0	156
$500K-$1.5M	8	26%	1	4	4	28,237,740	7,588,910	929,752	0	211,293	4,132,834	140,534	0	0	1,539,846	0	13,605	621,046
$100K-$500K	6	5%	0	0	6	5,010,875	1,567,586	9,364	0	100,826	594,147	110,324	0	0	478,190	425	0	274,310
$50K-$100K	5	1%	0	0	5	625,848	407,717	72,040	0	98,758	81,517	0	0	20	145,989	9,393	0	0
$10K-$50K	21	2%	0	4	17	3,795,525	479,046	20,738	0	96,558	106,029	57,583	0	0	149,653	42,695	0	5,790
<$10K	38	0%	0	16	22	1,001,301	140,044	5,365	0	14,928	45,330	3,824	0	500	64,311	114	0	5,672
Subtotal	81	100%	4	26	55	83,939,898	29,150,281	4,259,842	4	1,355,595	7,912,701	10,922,793	0	520	3,635,473	142,774	13,605	906,974
Brookings																		
>$1.5M	4	96%	1	0	4	23,239,043	14,749,203	3,347,215	0	410,477	8,839,356	1,798,697	0	0	144,533	21,047	183,775	4,103
$500K-$1.5M	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
$50K-$500K	3	3%	0	0	3	551,892	415,889	254,202	0	64,596	53,873	0	0	0	12,695	16,838	13,570	115
$10K-$50K	7	1%	1	0	7	22,106,847	163,702	60,105	0	21,222	52,083	29,705	0	0	0	548	0	39
<$10K	17	0%	0	4	13	3,884,793	50,895	17,865	0	18,348	9,251	0	0	0	5,431	0	0	0
Subtotal	31	100%	2	4	27	49,782,575	15,379,689	3,679,387	0	514,643	8,954,563	1,828,402	0	0	162,659	38,433	197,345	4,257
Oregon Statewide																		
>$5M	6	64%	6	6	4	80,364,022	80,364,022	20,355,633	11,565,993	3,597,405	12,674,939	22,137,323	1,086,482	18,576	7,963,273	739,730	0	224,668
$1.5M-$5M	10	22%	0	5	8	27,826,589	27,826,589	2,638,981	1,773,482	1,157,629	10,677,606	2,439,940	5,867,620	109,339	2,845,839	0	184,047	132,106
$500K-$1.5M	12	9%	0	6	9	11,159,581	11,159,581	94,257	1,271,054	661,749	3,634,379	127,454	2,019,735	48,826	2,543,229	77,857	13,605	667,436
$100K-$500K	20	4%	0	7	19	4,557,850	4,557,850	446,962	0	1,015,285	1,631,784	0	0	0	1,009,773	47,493	116,103	290,450
$50K-$100K	14	1%	0	5	12	964,859	964,859	117,436	0	159,406	214,911	77,836	0	20	250,355	48,018	406	96,471
$10K-$50K	51	1%	0	12	43	1,169,704	1,169,704	149,238	0	285,665	267,910	52,598	2,984	40	298,524	50,143	12,867	49,735
<$10K	100	0%	0	39	62	327,345	327,345	31,432	0	47,370	42,884	14,034	0	500	166,850	1,308	0	22,967
Subtotal	213	100%	6	80	157	126,369,950	126,369,950	23,833,939	14,610,529	6,924,509	29,144,413	24,849,185	8,976,821	177,301	15,077,843	964,549	327,028	1,483,833

Source: PacFIN annual vessel summary data April 2013 extraction, and ownership information from interviews with company representatives used in TRG (September 2006).

E. Marketing Programs

Harvesters are becoming more interested in participating in seafood product marketing programs that may lead to higher delivery prices. Marketing of Oregon seafood is a challenge and an opportunity. Geographic labeling and quality/sustainability certifications are hoped to make Oregon seafoods distinct in world markets and translate from higher ex-processor prices to higher ex-vessel prices. Harvesters would be willing to invest in onboard equipment for improved handling if justified through increased revenues. There are several organized efforts underway to promote quality assurance programs that are linked between the two industry sectors. In addition, Oregon State University, Oregon Sea Grant Extension Service, Oregon Seafood Laboratory, and Coastal Oregon Marine Experiment Station (COMES) are involved in product and market research as well as education to bring about the modernization that is necessary for harvester and processor quality assurance programs.

V. ECONOMIC CONTRIBUTION

Economic contribution estimates are discussed in separate sections at the statewide and port group level in this chapter. The end section in this chapter provides discussion about commercial fishing industry fiscal analysis matters.

Oregon's commercial fisheries are unique and diverse. They have historically played a role in the development of Oregon's coastal waterfronts and other inland areas. Fishing vessels, seafood processors, and support businesses that participate in Oregon fisheries are also involved in Alaska and other distant water fisheries. The working waterfronts serving both Oregon and distant water fisheries are integrated with restaurants, retail stores, and offices (Kirby and Kellner 2009). The waterfronts attract visitors wanting to experience and see lively commerce activities in a backdrop of expansive harbor views. Many Oregon waterfronts are experiencing gentrification. This sometimes causes conflicts where fishing industry interests feel threatened that their way of life may be lost in favor of higher private sector returns gained from different shoreline land uses (Hall-Arber et al. 2001). But the mix of waterfront uses can help educate and safeguard fishing heritage which helps preserve the industry.

The economic analysis in this section is about commercial fishing activities, but it is acknowledged that a more comprehensive economic study would include the associated uses of waterfronts that are dependent on historical and existing fishing activity. The more thorough analysis would also address the indirect economic contributions for special fishery management and enforcement centers, fish resource education and research institutions, etc.

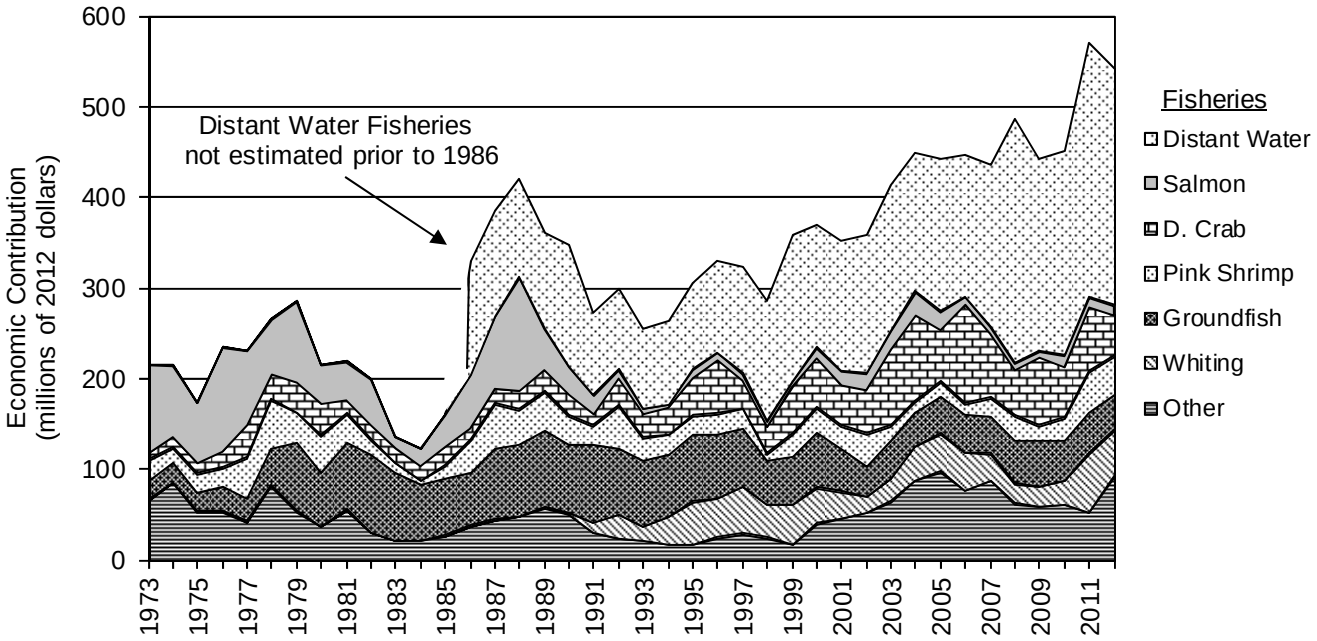
A. Statewide Economic Contribution Estimates

Economic contribution estimates for this report are measured by the increment of personal income received by households in Oregon due to the fishing industry. The estimates include wages and proprietary income made by crewmen, captains, and vessel owners during harvesting and workers at processing plants. It includes income earned by people working at suppliers for fishing industry businesses. It also includes the respending of wages throughout the economy, therefore is inclusive of the "multiplier effect" of the industry.[23]

Using economic contribution for describing the industry simplifies details, and is a more revealing measure of the economic importance of certain fisheries within the industry. It is also useful for comparing the size of the fishing industry to other industries. Direct measurements, such as harvest revenue, can distort the importance of the industry in communities. For example, some fish have a higher labor cost per pound to harvest and process (like groundfish made into fillets) and therefore have higher economic impacts (generate more personal income) on the economy. Other fish (like salmon) are sold whole-fresh and have lower labor costs per pound, and hence have lower economic impacts.

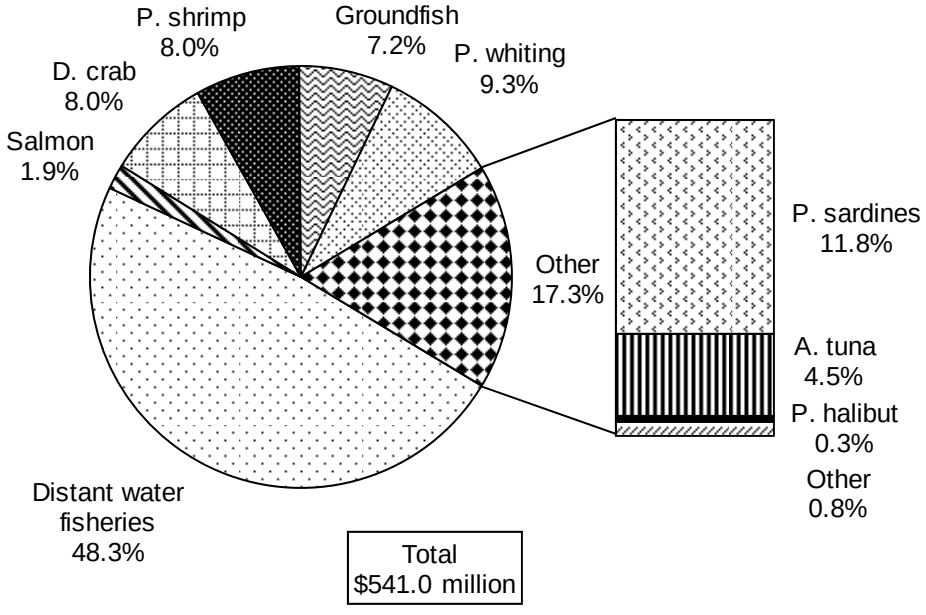
Overall, the Oregon fishing industry generated about $280 million in total personal income from fish landed in Oregon in 2012 (Figure V.1 and V.2 and Table V.1). Another $261 million of personal income was generated in the Oregon economy by the distant water fleet making landings to at-sea processors and onshore processors in other West Coast states, Alaska, southern Pacific Ocean, and elsewhere. The $541

Figure V.1
Economic Contributions From Onshore Landings in 1973 to 2012
and Distant Water Fisheries in 1986 to 2012



Notes: 1. Economic contributions are expressed as total personal income in millions of 2012 dollars.
2. Years 2011 and 2012 are preliminary estimates.
Source: Study.

Figure V.2
Economic Contributions by Major Fishery in 2012



Notes: 1. Economic contributions are expressed as total personal income in millions of 2012 dollars.
2. Year 2012 is preliminary estimates.
Source: Study.

Table V.1
Economic Contributions by Major Fishery in 1981 to 2012

	Onshore Landings								
Years	Salmon	D. Crab	Pink Shrimp	Groundfish	Pacific Whiting	Other Finfish and Shellfish	Total Landed Fish	Distant Water Fisheries	Total
1981	41.6	16.0	29.6	75.2	-	55.2	217.5	-	217.5
1982	50.3	16.2	16.0	86.0	-	30.1	198.6	-	198.6
1983	12.2	15.8	9.1	76.3	-	21.6	134.9	-	134.9
1984	19.7	15.0	4.6	61.0	-	22.4	122.8	-	122.8
1985	34.6	20.6	13.1	64.3	-	26.4	159.1	-	159.1
1986	58.5	13.2	34.9	59.0	-	37.5	203.2	124.9	328.1
1987	78.9	16.3	49.6	78.4	-	44.1	267.5	115.7	383.1
1988	124.5	21.2	36.5	80.4	-	48.1	310.7	109.1	419.8
1989	45.4	23.8	42.6	84.8	-	57.9	254.7	103.9	358.6
1990	30.6	24.0	30.5	75.9	1.2	50.4	212.6	134.6	347.2
1991	20.4	12.4	21.1	86.6	10.2	30.1	180.8	91.1	271.9
1992	8.8	29.7	47.1	73.2	26.3	23.6	208.6	88.4	297.0
1993	5.8	25.7	24.7	74.5	14.3	21.4	166.4	86.7	253.1
1994	3.3	29.8	21.3	69.1	30.2	17.1	170.9	91.8	262.8
1995	8.8	41.9	19.3	75.2	45.6	18.3	209.1	95.8	304.9
1996	8.3	58.5	21.7	73.3	41.8	24.6	228.3	100.6	328.9
1997	6.8	31.1	20.2	66.3	51.1	29.0	204.4	118.7	323.2
1998	5.6	29.1	8.0	48.9	36.1	24.4	152.2	132.8	284.9
1999	4.7	52.6	22.5	54.6	44.3	16.8	195.6	160.9	356.4
2000	10.9	54.0	28.0	60.9	38.7	40.6	233.0	135.2	368.1
2001	15.3	43.8	24.0	49.7	28.4	46.3	207.5	143.4	350.9
2002	17.7	48.2	35.0	33.6	18.4	51.8	204.6	151.9	356.5
2003	20.1	84.6	16.0	41.4	25.1	64.8	252.0	160.3	412.4
2004	25.3	94.8	11.8	38.3	37.2	87.2	294.7	153.9	448.5
2005	19.4	57.7	15.9	40.9	40.7	98.1	272.7	167.5	440.2
2006	8.5	109.8	10.8	42.4	41.7	76.5	289.8	155.4	445.2
2007	7.6	70.0	19.9	42.6	29.0	87.9	257.0	178.1	435.1
2008	7.1	51.0	25.2	49.3	21.0	62.6	216.1	268.6	484.8
2009	6.3	75.0	15.7	51.9	21.6	58.7	229.2	211.5	440.7
2010	12.3	56.3	23.5	46.3	24.8	61.5	224.6	225.1	449.8
2011	10.4	71.4	43.7	46.2	64.4	52.7	288.7	281.7	570.3
2012	10.3	43.5	43.3	39.1	50.2	93.4	279.8	261.3	541.0

Notes:
1. Economic contributions are expressed as personal income in millions of 2012 dollars.
2. Year 2011 and 2012 are preliminary.
3. The economic contributions from salmon fisheries include ocean troll and Columbia River gillnet fisheries, so the estimates will be greater than ocean salmon fisheries as reported by the PFMC.
4. Groundfish in 2011 and 2012 includes (respectively, real dollars in thousands) flatfish ($12,690, $12,918), sablefish ($25,589, $17,494), and other species ($7,911, $8,725).
5. 'Other' in 2011 and 2012 includes (respectively, real dollars in thousands) Pacific sardines ($17,769, $63,689), albacore tuna ($28,655, $24,176), and other species ($6,258, $5,534).
6. Economic contributions from fish meal production are included in Pacific whiting. The largest source of fish carcasses in past years has been mostly from surimi production. Pacific whiting demand has shifted to H&G and fillet product forms which have higher resource yields and lesser material available for fish meal production.
7. The economic contribution from distant water fisheries includes the effects of vessel revenue returned to Oregon's economy from U.S. West Coast at-sea fisheries, Oregon home-port vessels landing in other U.S. West Coast states and Alaska, southern Pacific Ocean, and other fisheries. New fishing vessel construction, fishery management, and fishery research and training are not included.
8. Years 2008 to 2012 use 2007 IMPLAN response coefficients, and prior years use 1998.

Source: Study.

million in 2012 is down from $570 million in 2011.

Four decade averages are shown on Table V.2. Two interesting interpretations from the table are the somewhat consistent effects in the 10 year average economic contributions from onshore fisheries over the four decades and the increasing economic effects from participation in distant water fisheries. While the sum has consistency, the contributions from each of the major fisheries have changed over the table's duration.[24]

Fisheries other than what is itemized in Tables V.1 and V.2 also have measurable economic contributions. For example, sardines alone contributed about $64 million in 2012. Albacore tuna contributed another $24 million in 2012. Shellfish aquaculture is not included in these estimates since it is typically classified as an agriculture product. It has been estimated to have generated about $9 million in 2003 (TRG March 2006). More recent investigations on shellfish production in Oregon can be found in Northern Economics (2013).

B. Port Group Economic Contribution Estimates

Up until the 1980's, the three major port areas (Astoria, Newport, and Coos Bay) have been very similar in the value of their total landings and in total personal income generated from fishing activity in Oregon (Table V.3 and Figure V.3). However, the Coos Bay area is losing its standing to Newport and Astoria. This is partly because the Pacific whiting development did not take place in the Coos Bay area. The Astoria and Newport areas also have a substantial amount of economic impacts generated by distant water fisheries. Astoria has also benefited from a resurgence in the sardine fishery and a rebound in inriver salmon fisheries.

Landed fish in Astoria generated about $108 million income in 2012. Harvested and

Table V.2
Preliminary 2012 and Historical Period Annual Average Economic Contributions by Major Fisheries

	Historical Period					Preliminary	Preliminary
Fishery	1970's	1980's	1990's	2000's	2010	2011	2012
Salmon	83.9	50.8	10.3	13.8	12.3	10.4	10.3
Dungeness crab	20.9	19.3	33.5	68.9	56.3	71.4	43.5
Pink shrimp	29.5	27.8	23.7	20.2	23.5	43.7	43.3
Groundfish	34.1	72.5	69.8	45.1	46.3	46.2	39.1
Pacific whiting	na	na	30.1	30.2	24.8	64.4	50.2
Other	62.1	38.0	25.5	67.5	61.5	52.7	93.4
Subtotal onshore	230.5	208.3	192.9	245.7	224.6	288.7	279.8
Distant water	na	113.4	110.1	172.6	225.1	281.7	261.3
Total	na	372.4	303.0	418.2	449.8	570.3	541.0

Notes: 1. Economic contributions are expressed as personal income in millions of 2012 dollars.
2. The 1970's include 1973 to 1979. Distant water and total in the 1980's includes 1986 to 1989.
3. The fishery titled "other" in the most recent year includes Pacific sardines ($64 million), albacore tuna ($24 million), Pacific halibut ($1 million), sea urchins ($0.4 million), and many other species.

Source: Study.

Table V.3

Area and Statewide Economic Contributions From Onshore Landed Fish and Distant Water Fisheries in 1986 to 2012

	Astoria and Columbia R. Area			Tillamook Area			Newport Area			Coos Bay Area			Brookings Area			All Coastal Communities			Total State Level Contributions		
Year	Landed	Distant	Total	Landed	Distant	Total	Landed	Distant	Total	Landed	Distant	Total	Landed	Distant	Total	Landed	Distant	Total	Landed	Distant	Total
1986	73.0	25.5	98.5	10.7	0.0	10.7	37.8	51.3	89.1	38.7	10.7	49.4	8.4	0.0	8.4	168.7	87.4	256.1	203.2	124.9	328.1
1987	89.4	23.3	112.7	12.4	2.6	14.9	52.1	52.6	104.7	57.5	9.0	66.5	10.7	1.5	12.2	222.0	88.9	310.9	267.5	115.7	383.1
1988	97.5	25.8	123.4	15.3	2.5	17.7	62.3	51.3	113.5	64.0	13.1	77.0	18.9	1.3	20.2	257.9	94.0	351.9	310.7	109.1	419.8
1989	77.6	13.8	91.4	10.5	2.8	13.3	52.6	54.3	106.9	49.1	11.9	61.0	21.5	1.7	23.2	211.4	84.5	295.9	254.7	103.9	358.6
1990	61.2	26.5	87.7	6.9	2.3	9.2	36.4	73.2	109.6	48.2	7.4	55.6	23.8	1.5	25.2	176.5	110.9	287.4	212.6	134.6	347.2
1991	53.6	19.1	72.7	7.5	2.2	9.7	41.7	41.6	83.4	34.1	5.9	39.9	13.2	1.3	14.5	150.1	70.1	220.2	180.8	91.1	271.9
1992	50.2	17.1	67.3	6.0	2.4	8.4	58.4	48.1	106.5	39.2	6.1	45.3	19.5	1.1	20.6	173.2	74.9	248.1	208.6	88.4	297.0
1993	48.6	17.0	65.7	6.5	2.4	8.9	40.7	46.7	87.5	29.8	6.0	35.8	12.4	0.9	13.3	138.1	73.0	211.1	166.4	86.7	253.1
1994	45.9	16.8	62.7	4.0	2.3	6.3	46.8	49.3	96.1	28.3	5.8	34.2	16.9	1.1	18.0	141.9	75.4	217.3	170.9	91.8	262.8
1995	61.7	16.5	78.2	4.3	2.3	6.5	58.6	57.2	115.9	34.7	5.7	40.4	14.3	1.1	15.4	173.6	82.8	256.4	209.1	95.8	304.9
1996	69.6	13.9	83.5	5.4	1.4	6.8	60.3	40.7	101.0	33.9	2.1	36.0	20.2	0.5	20.8	189.5	58.6	248.1	228.3	100.6	328.9
1997	66.2	14.5	80.7	2.6	1.8	4.3	55.8	54.3	110.1	28.7	2.3	31.0	16.5	0.7	17.2	169.7	73.6	243.3	204.4	118.7	323.2
1998	50.7	15.9	66.6	1.4	2.3	3.7	43.6	60.1	103.8	21.4	2.6	24.0	9.2	0.8	9.9	126.3	81.6	207.9	152.2	132.8	284.9
1999	67.6	20.2	87.8	2.9	2.7	5.6	48.9	69.0	117.9	31.0	3.3	34.3	11.8	0.8	12.7	162.3	96.1	258.4	195.6	160.9	356.4
2000	84.8	15.8	100.6	3.9	2.4	6.3	59.1	61.1	120.1	33.0	2.9	35.9	12.5	1.1	13.6	193.3	83.2	276.5	233.0	135.2	368.1
2001	76.6	15.6	92.3	3.6	3.0	6.5	51.8	68.0	119.8	30.9	3.0	34.0	9.8	1.5	11.3	172.7	91.1	263.8	207.5	143.4	350.9
2002	86.7	16.1	102.7	5.5	3.1	8.6	41.4	73.7	115.1	29.0	3.1	32.1	7.6	1.5	9.2	170.3	97.5	267.8	204.6	151.9	356.5
2003	94.9	18.0	112.9	6.0	3.2	9.2	54.6	74.4	128.9	31.6	3.4	35.0	12.0	1.4	13.4	199.0	100.4	299.4	252.0	160.3	412.4
2004	95.6	18.4	114.0	6.3	3.1	9.4	66.6	69.4	136.0	42.7	3.4	46.1	18.3	1.4	19.6	229.5	95.6	325.1	294.7	153.9	448.5
2005	119.6	19.2	138.8	5.2	3.3	8.4	54.5	77.9	132.4	30.9	3.5	34.4	8.6	1.6	10.2	218.7	105.5	324.3	272.7	167.5	440.2
2006	112.0	18.1	130.0	5.9	3.0	8.9	64.2	71.9	136.1	33.7	3.4	37.1	14.4	1.6	16.0	230.2	97.9	328.1	289.8	155.4	445.2
2007	104.0	21.3	125.3	5.2	3.3	8.5	53.7	77.4	131.0	33.6	4.0	37.6	10.3	1.6	11.9	206.8	107.6	314.4	257.0	178.1	435.1
2008	80.1	32.2	112.3	3.6	4.9	8.5	50.8	115.3	166.1	32.7	6.3	39.0	7.5	2.0	9.5	174.7	160.7	335.4	216.1	268.6	484.8
2009	78.0	26.9	104.9	3.5	4.1	7.7	51.6	87.4	139.0	38.2	4.8	43.0	12.6	1.5	14.2	183.9	124.8	308.7	229.2	211.5	440.7
2010	79.7	30.1	109.8	3.3	3.9	7.3	50.4	87.8	138.1	37.5	5.3	42.8	9.1	1.4	10.5	180.0	128.4	308.5	224.6	225.1	449.8
2011	97.8	35.8	133.6	3.6	5.4	9.1	66.4	117.8	184.2	51.5	5.2	56.6	12.2	1.9	14.1	231.5	166.1	397.6	288.7	281.7	570.3
2012	107.5	34.8	142.4	2.8	5.1	7.9	57.3	107.2	164.5	39.0	6.1	45.1	14.9	1.7	16.6	221.6	154.9	376.5	279.8	261.3	541.0

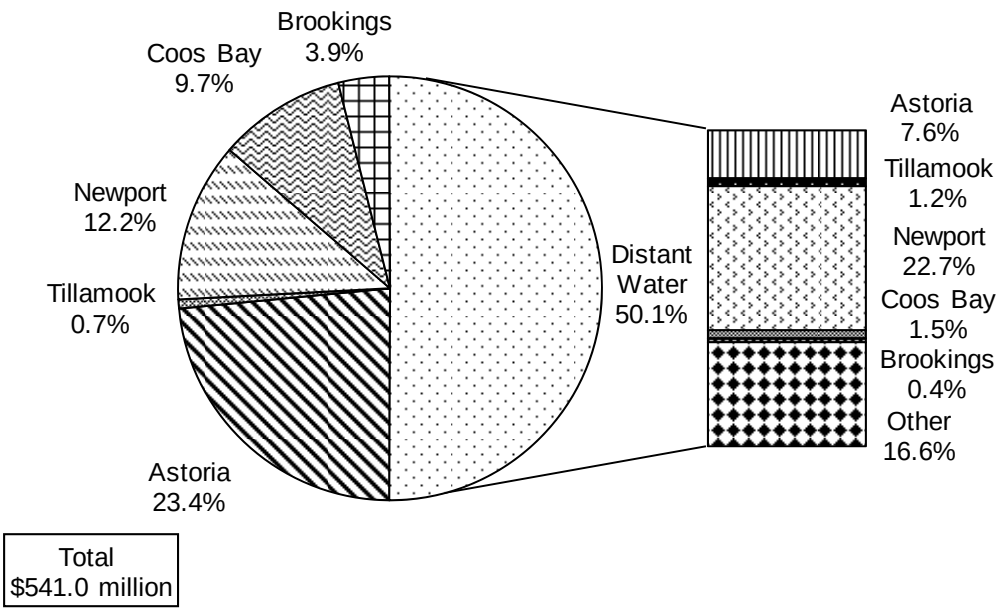
State level averages (landed)

Last 27 years	'86-'12	230.2
90's decade	'90-'99	192.9
Last 5 years	'08-'12	247.7

Notes:
1. Economic contributions are expressed as personal income in millions of 2012 dollars.
2. Economic contributions are calculated with the Fisheries Economic Assessment Model (FEAM) originally developed by Hans Radtke and William Jensen for the West Coast Fisheries Development Foundation in 1988. The estimates include direct, indirect, and induced impacts, therefore include "multiplier effects."
3. The economic contributions for areas listed includes smaller ports: Astoria area includes all Columbia River; Tillamook area includes Pacific City; Newport area includes Depoe Bay; Coos Bay area includes Florence, Reedsport and Bandon; Brookings area includes Port Orford and Gold Beach.
4. The economic contributions at the port group area level do not sum to the statewide level because of trade leakages to the larger economy. The sum of distant water fisheries economic contribution in coastal communities has the additional consideration that some of the revenue is returned to Willamette Valley and Eastern Oregon communities, so is only reflected in the State economy.
5. Years 2008 to 2012 use 2007 IMPLAN response coefficients, and prior years use 1998 IMPLAN response coefficients.

Source: Study.

Figure V.3
Economic Contribution by Port Groups in 2012



Note: Astoria port group includes Warrenton; Tillamook port group includes Garibaldi and Pacific City; Newport port group includes Depoe Bay; Coos Bay port group includes Florence, Winchester Bay, Charleston, and Bandon; and Brookings port group includes Port Orford and Gold Beach.
Source: Study.

processed fish landed in Newport generated a total of about $57 million income in 2012. When income generated by the distant water fleet is included, a greater amount of income is generated in the Newport area ($162 million). Astoria's income is $142 million when distant water fisheries effects are included. For all Oregon coastal communities, a total of $376 million in total personal income was generated by the fishing industry in 2012, from both landed fish and revenue returned from distant water fisheries. Because a portion of the revenues returned "leaks out" to the total Oregon economy and about one-third of distant water fisheries revenue is returned to non-coastal communities, an additional $165 million of personal income was received in 2012 by residents of Oregon outside the Oregon coastal economies

The fishing industry generates about one half percent of earned income in the State's economy and about 10 percent of the coastal economy earned income (Table V.4). At the local level, the fishing industry ranges from 20 percent in the Newport port group to less than two percent in the Tillamook port group in 2012. At average statewide net earnings per year ($43 thousand), the industry represented about 15,222 annual part and full-time equivalent jobs in Oregon in 2012. At county level net earnings per year ($33 thousand), the industry represented 11,417 part and full-time equivalent jobs in the coastal economy in 2012.

Table V.4
Representation of the Commercial Fishing Industry in Area Economies in 2008 to 2012

	2008		2009		2010		2011		2012	
Area	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent	Amount	Percent
Astoria, Columbia River, and Other										
All income sources	1,306.5	8.6%	1,255.5	8.4%	1,270.8	8.6%	1,324.3	10.1%	1,316.5	10.8%
Earned income	771.0	14.6%	723.3	14.5%	737.3	14.9%	770.0	17.3%	765.5	18.6%
Fishing income	112.3	100.0%	104.9	100.0%	109.8	100.0%	133.6	100.0%	142.4	100.0%
Equivalent jobs	3,257		3,070		3,188		3,824		4,147	
Tillamook Area										
All income sources	880.5	1.0%	826.5	0.9%	851.5	0.9%	884.1	1.0%	866.6	0.9%
Earned income	453.2	1.9%	408.9	1.9%	430.3	1.7%	452.2	2.0%	443.3	1.8%
Fishing income	8.5	100.0%	7.7	100.0%	7.3	100.0%	9.1	100.0%	7.9	100.0%
Equivalent jobs	254		232		220		273		242	
Newport Area										
All income sources	1,655.3	10.0%	1,569.7	8.9%	1,560.0	8.9%	1,600.2	11.5%	1,600.5	10.3%
Earned income	842.1	19.7%	792.7	17.5%	783.5	17.6%	812.4	22.7%	812.5	20.2%
Fishing income	166.1	100.0%	139.0	100.0%	138.1	100.0%	184.2	100.0%	164.5	100.0%
Equivalent jobs	5,157		4,324		4,298		5,679		5,162	
Coos Bay Area										
All income sources	3,040.7	1.3%	2,886.0	1.5%	2,895.1	1.5%	2,971.4	1.9%	2,957.6	1.5%
Earned income	1,525.2	2.6%	1,407.0	3.1%	1,413.6	3.0%	1,466.0	3.9%	1,459.2	3.1%
Fishing income	39.0	100.0%	43.0	100.0%	42.8	100.0%	56.6	100.0%	45.1	100.0%
Equivalent jobs	1,170		1,298		1,273		1,690		1,370	
Brookings Area										
All income sources	764.3	1.2%	716.1	2.0%	710.9	1.5%	728.3	1.9%	743.8	2.2%
Earned income	305.3	3.1%	281.0	5.0%	278.6	3.8%	288.6	4.9%	294.8	5.6%
Fishing income	9.5	100.0%	14.2	100.0%	10.5	100.0%	14.1	100.0%	16.6	100.0%
Equivalent jobs	303		448		328		438		524	
All Coastal Areas										
All income sources	7,647.3	4.4%	7,253.7	4.3%	7,288.3	4.2%	7,508.3	5.3%	7,485.2	5.0%
Earned income	3,896.7	8.6%	3,613.0	8.5%	3,643.4	8.5%	3,789.3	10.5%	3,775.4	10.0%
Fishing income	335.4	100.0%	308.7	100.0%	308.5	100.0%	397.6	100.0%	376.5	100.0%
Equivalent jobs	10,141		9,373		9,308		11,903		11,445	
Statewide Contributions										
All income sources	149,835.9	0.3%	141,066.4	0.3%	143,266.3	0.3%	147,887.3	0.4%	151,241.1	0.4%
Earned income	93,523.9	0.5%	87,123.0	0.5%	88,126.3	0.5%	91,396.0	0.6%	93,424.1	0.6%
Fishing income	484.8	100.0%	440.7	100.0%	449.8	100.0%	570.3	100.0%	541.0	100.0%
Equivalent jobs	13,570		12,423		12,543		15,807		15,231	

Notes: 1. Economic contributions are measured as total personal income in millions of 2012 dollars.
2. Earned income is the sum of wages and salaries, proprietors' income. Earned income does not include transfer payments, or dividends, interest, and rent.
3. County average annual earnings per job are computed by dividing the economies all industry earnings estimates by total full-time and part-time jobs estimates. Average earnings per job within industries involving more part-time work is lower than industries involving more full-time work, although there could be little difference in the underlying wage of full-time workers. Since average earnings per job are just a simple average, it does not account for variations in the distribution of earnings among high-pay vs. low-pay jobs. Equivalent jobs at the statewide level include jobs within all coastal communities plus jobs in the rest of the state computed using the difference in fishing income at the state level and fishing income within coastal communities.
4. Personal income and average wage data is from U.S. Department of Commerce, Bureau of Economic Analysis. The most recent year personal income at the county level is a forecast using linear regression over the shown years. The share of earned personal income for the most recent year is the same as the preceding year. The personal income for all coastal communities are for the counties of Clatsop, Tillamook, Lincoln, Coos, Curry, and the coastal areas of Lane and Douglas counties. The methodology used to calculate the amount of personal income for portions of counties is explained in TRG (March 2006). The 1990 and 2000 decennial census information is used with the methodology to calculate the partial county estimates.

Source: Study.

C. Fiscal Contribution Estimates

There are other economic measurements that can be used to characterize the commercial fishing industry (see Section I.C.2 and 3). This section discusses and provides some indicator estimates for fiscal contribution measures. The indicator measures include generation of government fees and taxes. At the local government level, the fishing industry pays fees for moorage, rental of upland property, landing poundage fees, etc. The industry's general and personal tangible assets would add to the local property assessed value.[25] Industry participants and businesses pay State personal and corporate income taxes and fees. There are a host of State level harvest landing and license fees and marine fuel taxes. The fees and taxes offset State and local government costs for services provided to the industry.[26] Government not only provides physical infrastructure (maintained navigation channels and jetties, wharves, moorages, upland storage and work areas, launch facilities, etc.), but also provides other services such as a fish hatchery program in Clatsop County. Local governments and port districts serve as advocates for the industry so as to ensure its continued viability.

Using the assumption that there is a causal and integral relationship to personal income generated from the industry, the state and local tax contributions in 2012 are estimated to be $53 million.[27] State and local taxes includes personal and corporate income taxes, property taxes, selective sales taxes, etc. General revenue from fees, special charges, and government enterprises are not included.

The harvest and processing sectors are assessed ad valorem fees and license/permit fees at the state level. The ad valorem fees are for contributions to the Commercial Fish Fund (CFF) and for support of commodity commissions. The CFF ad valorem rates in 2012 ranged from 1.09 percent for albacore tuna to 5.00 percent for black/blue and other nearshore rockfish. The ad valorem fee for most finfish and shellfish is 2.25 percent. The ad valorem fee on salmon landings was 3.15 percent. A special restoration and enhancement fee is another $0.05 per pound (salmon landed in the round and adjusted for salmon landed in other forms). There are many vessel, crew member, limited entry fishery permit, processor, and other fees. The CFF revenue generated in calendar year 2012 was $3.9 million (Table D.1). The three-year most recent period average for the CFF is about $4.2 million. The revenue is deposited in a State CFF account to help reimburse the ODFW costs for management, enforcement, and research.

A significant portion of the CFF receipts are used to fund the ODFW Marine Resource Program (MRP). (The MRP administers the regulation, harvest and management of commercial and recreational fisheries and management of other marine species, such as marine mammals.) The expected CFF revenue receipts represented about 44 percent of the MRP Legislative Approved Budget (LAB) for the biennium.[28] The balance of the MRP LAB funds come from federal sources (26 percent), State general funds (one percent), and other funds (29 percent). The other funds include sport angling and shellfish license fees and lottery dollars. There are more ODFW commercial fishing oriented programs and services costs other than reflected in MRP expenditures. The CFF also is used in the other ODFW programs, especially propagation. Associating the projected CFF revenue with the MRP expenditures is to illustrate the importance of the revenue source for providing management and research that

benefit both recreational and commercial fisheries.

Marketing support and information services for the industry are provided through four commodity commissions. The Oregon Department of Agriculture oversees the activities of the commissions. Revenue is raised using landing value assessments (ad valorem rates) on deliveries of specific species harvested with specific gear for the Salmon Commission (1.5 percent ex-vessel value troll caught salmon assessed to harvester), Trawl Commission (0.5 percent ex-vessel value of groundfish and shrimp caught with trawl gear assessed to harvester), Albacore Commission (0.75 percent ex-vessel value of albacore tuna whose payment is split evenly by harvesters and processors), and Dungeness Crab Commission (one percent ex-vessel value assessed to harvester). Total expected revenue raised by the assessments is about $900 thousand in 2011 and $736 thousand in 2012 (Table D.2). The commodity commissions can also use funds from other sources to provide services.

The fishing industry payments for fees and taxes can be viewed in a larger picture for receiving government services, offsets, and in some cases direct payments. What is received is sometimes referred to an industry subsidy, although definitions of what constitute subsidies differ with each study. Khan et al. (2006) identified 11 types of fisheries subsidies ranging from fisheries management programs and services to vessel buyback programs.[29] Sharp and Sumaila (2009) attempt to quantify fishing industry subsidies at a national level. They found that fishing industry's state and U.S. subsidies averaged $713 million (2007 dollars) annually which were about one-fifth of the harvest value.[30] They make a connection between subsidies and a build-up of capital and capacity that leads to industry economic instability. They cite the FAO (1999) and WWF (1998) studies that found the number of vessels worldwide is 2.5 times the needed number to prosecute sustainable catch. NMFS (2008) found that 12 of 25 U.S. commercial fishing operations it examined had 50 percent more boats than needed to bring in each operation's total fish catch for the year. Related findings by the Federal Fisheries Investment Task Force Report to Congress (1999) were incorporated into the 2006 Magnuson-Stevens Fishery Conservation and Management Act (MSA) requiring reduction and elimination of overfishing in U.S. commercial fisheries and correcting management approaches through designs that lead to fleet rationalization.

A more general context of subsidies suggests that subsidies through incentives and deterrents can either throttle back or accelerate industry activity as might be necessary for economy influences. Direct and indirect assistance to recipients can be welcome relief to adversarial market conditions or resource failures.[31] A defense of U.S. subsidies is that countries worldwide assist their fishing industry and a level playing field for the industry is needed in order to participate in the global marketplace.

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VI. FISHING INDUSTRY CHALLENGES

The commercial fishing industry is a thriving and important economic sector for many communities along the Oregon Coast, but there are certain segments of the industry that are experiencing severe disruption. This chapter discusses trends and offers a near-term outlook for how the trends might change. More general structural issues the industry is facing are listed. Lastly, challenges for raising net economic value are explained.

General worldwide economic conditions can bring down demand for seafood products (and ultimately influence harvest level prices) because consumers view seafood as a discretionary purchase. Improving general economic conditions and certain situations of fish supply constraints helped increase Oregon fisheries prices in 2011. Some of the increases faded (for example sablefish and albacore tuna) in 2012. The expanded markets for Pacific whiting fillets was not as great as expected, but there was a strong eastern European market for H&G products. A point of optimism may come from demand for some specialty products from Oregon fisheries. Using the market demand for the specialty products along with traceability technology address consumer concerns for food safety and awareness about fish resource conservation (Petersen and Green 2006). The traceability technology allows seafood product to be marketed according to where, when and how they were caught. The authenticity of claims or certifications, such as wild fish harvested only from sustainable stocks, is backed-up with proper and easily accessed documentation about the product's supply chain.

Other issues that the commercial fishing industry is facing are:

- Pressure to set aside areas for: (1) no-take marine protection areas for conducting research and/or preserving their intrinsic values, and (2) other conflicting spatial uses of the ocean, such as wave/wind energy generation.

- Allocations among user groups (commercial, recreational, and tribal fishermen) and communities to meet legal requirements and social objectives.

- Judicial decisions on habitat protection and incidental take issues brought to the forefront by conservation organizations, including protection of sea birds and mammals either impacted by fishing techniques or dependent on protein from the same fish species now being exploited; compacts and international treaties, including treaties with Canada for allocation of Pacific whiting, salmon, and tunas; and, multi-national interests in highly migratory fish stocks in the western and central Pacific Ocean.

- Better understanding in the science of ecosystem interactions and improved stock assessments that may cause fishery management agencies to reduce exploitation rates, control fishing gear, reduce trip limits, or additional restrictions including time/area closures through new initiatives to develop an ecosystem fishery management plan. Stock building programs calculated using variables with large uncertainties; rebuilding programs will take many years for slow growing rockfish

species to return to maximum sustainable harvest levels because of life cycle characteristics of these fish.

- Restrictions on harvests for species in a healthy stock status condition due to fishing techniques that have unavoidable mortalities on species in a depleted stock status where species occupy the same space at the same time. There is a need to develop innovative methods to share real time information among vessels to avoid hotspots where the depleted species are congregating.

- For the most part, there are not major populations of underutilized species which harvesters can exploit, but new fisheries may develop around some minor opportunities for developing niche markets.

- Increasing costs for prosecuting fisheries, such as for fuel, safety equipment, insurance, moorage, etc. New, more selective management tools requiring different gear, area/time closures related to ocean depth, and more intrusive harvest verification techniques (log books, observers, satellite signal location registry programs, etc.) will add to operation costs.

- Implementation of the 2006 Magnuson-Stevens Act reauthorization, which included new definitions and processes for avoiding species overfishing; and, anticipation of new provisions in a future reauthorization since the present Act expires September 30, 2013.

- Expanded use of ITQ and IPQ programs with transferable quotas for vessels, processors, and cooperatives. Additional fisheries being managed using property rights approaches, such as now is being used in the trawl groundfish fishery. The management approach has the potential for greater individual economic profits and greater community benefits. However, poorly crafted rights may result in unintended consequences, including over-consolidation, unbalanced bargaining power favoring one sector over another, or asymmetrical redistribution of vessels and processors among coastal communities.

- The proliferation of certification programs for seafood product quality and capture fisheries sustainability has burdened harvesting associations and processors. The certification concept has merit, but there is considerable expense in trying to meet certifying conditions and science and management requirements. There may also be confusion on the part of consumers given duplicate and conflicting certification systems.

- Consumer concerns about quality (freshness, inclusions of toxics, etc.) will affect seafood product demands. Considerations about health and wholesomeness of natural coldwater fish could be a marketing advantage to Oregon's industry. There is a major consumer concern from contamination of migratory fish stocks by the Fukushima, Japan nuclear power plant radioactive plume.

- Vessels in Oregon depend on public agencies to provide adequate moorage, upland facilities, and safe passage from harbors to the ocean. Decreased federal funding of the Corps of Engineers operation and maintenance budgets will mean smaller ports not meeting waterborne commerce volume standards will not be dredged. Public ports have increasing demands for devoting scarce revenue sources for other than commercial fishing industry uses.

- Federal budgets for fishery management and science are decreasing, and attendant federal support of state agency programs are being more closely scrutinized for cost savings. Some federal programs have opportunities for cost-recovery assessments on industry, but states can be locked into statutory limits on industry assessments.

The Oregon commercial fishing industry is mature, having beginnings in the late 1800's utilizing the amazing salmon returns to the Columbia River. In consideration of this report's landing trends and in light of the above mentioned current issues, it is a prudent assessment that commercial harvesting and processing of marine resources will not be a major growth industry in Oregon. Goals for the industry should include extracting more value from the fishery resources that are available through better resource management, utilization, and marketing.

Raising resource value has several challenges. There will be continuing price pressures on seafood products from substitute aquaculture products. The fall-out from lower values will be disruptive to a fleet where profitability already suffers due to, among other influences, excess capacity.

Net economic value increases for the industry can be obtained through efficiency gains at the individual business level. This gain can be fostered through changed management practices to allow tradable and transferable individual and/or community property rights assigned for effort, catch quota shares, and/or territory. This property rights approach will help reduce capacity, provide remaining vessels a better chance for increased rewards for entrepreneurial behavior, long term incentives for conservation, higher levels of self governance, and stronger participation in science and management. It is not insurmountable that State managed fisheries can implement property rights programs. State managed fisheries take place in both the State territorial sea and federal managed waters, so there would need to be state/federal partnerships in developing rights-based management approaches. Further, there would have to be industry recognition of the management benefits and strong consensus for adopting rights-based approaches. Finally, fish resource conservation benefits would have to be preserved or increased with the new management approach.

Vessels can receive revenue from participating in cooperative research projects and exempted fishing permits. Pursuing such private-government collaborative programs can be of immediate and long term benefit to the industry.

Modernization of vessels for better handling capabilities and initial onboard processing, modernization of processing plants that will improve seafood products, and assistance through commodity commissions and other entities for developing marketing strategies

should help the industry raise value at all levels of seafood production.

Under the auspices of the Oregon Department of Agriculture, there are four seafood commodity commissions (trawl, Dungeness crab, albacore tuna, and salmon). Oregon State University administers several programs supporting the industry, including Sea Grant Extension Service, Astoria Seafood Laboratory, Coastal Oregon Marine Experiment Station, and the interests from several academic departments. The State has provided funds for the Community Seafood Initiative to further intelligence and market development programs. Local governments and coastal port districts provide public services and advocate causes. There have been enormous efforts from government and many watershed protection groups to restore anadromous fish freshwater habitat and passage. There have been commitments to research and improvements in hatchery operations to lower impacts from artificial propagation on wild stocks.

The OCZMA has assisted and advocated unified marketing efforts, such as Seafood Oregon. Industry associations like the Fishermen's Marketing Association, West Coast Seafood Processor's Association, Newport Fisherman's Wives Association, Coos Bay Trawlers Association, Midwater Trawlers Cooperative, and other associations and cooperatives are all working on behalf of the industry. Research agencies (like those located at the Hatfield Marine Science Center in Newport and the Oregon Institute of Marine Biology located at Charleston) provide support for better management, science, and development of seafood products. These marketing, management, and research efforts are needed to assist the industry compete in constantly changing harvest management regimes and changing seafood markets.

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End notes:

1. *Revenue received from harvest sales is not necessarily a good indicator of the economic value of the fishery as it does not include any consideration of a harvester's costs. For fishing vessel businesses and fish dealers, net revenues are measured as the difference between their gross revenues and economic costs. The returns to owners and investors are estimated for these fishery sectors when the after tax profits are calculated. The economic contribution modeling attempts to account for these manufacturing inputs.*

2. *Revenue generated from vessel deliveries in Oregon are referenced in this report as onshore landing revenue. Revenue returned in the form of wages and salaries or profits from deliveries to non-Oregon locations and revenue derived from expenditures made in Oregon for repairs, provisioning, or moorage is referenced in this report as distant water fishery revenue. For example, the revenue generated from the at-sea deliveries for the Pacific whiting fishery is categorized as distant water fishery revenue.*

3. *When landing and participation data is not complete for a full year, expansion factors have been used. The factors are derived from previous years partial landings for the same period as compared to a full year.*

4. *CPUE can be a measure of species abundance given constant fishing power. However, the statistic used in this report should be considered a general CPUE surrogate indicator, and it is not appropriate to use it for judging stock density. The CPUE statistic is more revealing about harvest efficiencies. Variable costs (labor, fuel, etc.) are generally directly proportional to effort. Higher CPUE will dilute variable costs and increase net income.*

5. *The ratio in this report that is used to show indicators of State personal and corporate income taxes, selective excise taxes, etc. is the most current year of the tax amount divided by the State's total personal income. This ratio is then applied to the fishing industry economic contributions.*

6. *The downstream estimates would include valuation of other fishing industry participants (processors and ancillary businesses such as moorage providers, fishing gear businesses, etc.) and the share of valuation attributed to the general economy included in the multiplier effect.*

7. *Permit counts are the number issued, which may be more or less than the number authorized to be issued, and more than the number used for making landings.*

8. *Control dates are established to minimize the rush of new entrants into a fishery that often occurs when limited entry is being considered.*

9. *The dependency of the fishing industry in each community on the groundfish fishery is also explained by showing the share as compared to all landings. The groundfish fishery share for a vessel or buyer is when a majority of landing revenues or purchases is from that fishery. The purchasing entities may be processors, restaurants, etc. Purchase entities are not distinct across port groups. The same entity may issue tickets at several ports. The threshold value of $500,000 was assigned to show where processors may have facilities that include processing lines and inventory handling. The threshold value of $10,000 was assigned to filter vessel owners that sell retail from their boats. There are instances where processor and buyer counts are indicated as "c" when confidentiality rules (three or less entities) apply.*

10. *Secretary of Commerce Carlos M. Gutierrez on August 10, 2006 declared the 2006 salmon fishery to be a commercial fishery failure. Secretary Gutierrez declared a 2008 salmon fishery failure on May 1, 2008. Direct payment assistance programs were appropriated through federal legislation for both years. The appropriated amount for the 2006 disaster was $60.4 million to be distributed in Oregon and California. The appropriated amount for the 2008 disaster was $170 million to be distributed in Washington, Oregon, and California. Oregon also offered direct assistance payments and other social assistance for both disaster declarations. The assistance package for the 2006 disaster was $3.2 million of which $1 million was direct assistance payments. The direct assistance payments for the 2008 disaster were $1 million. The distribution formulas were different*

for the two years' federal and State programs. Some program eligibility was only harvesters and other programs were for any affected business including seafood processors and sportfishing services.

11. *The fishery disaster direct assistance funds distributed to salmon permit holders could be considered net income (i.e. there was no variable cost of fishing associated with generating the income). The Research Group (2007) used econometric modeling to show approximately 40 percent of salmon harvest revenue is "return to owner" after considering fishing, crew, and fixed costs. For example, the 2006 State disaster assistance disbursements (including direct assistance payments and payments for participating in research programs) are comparable to about $3 million of effective ex-vessel value. This addition would make the 2006 Oregon salmon actual and effective ex-vessel value about $8 million. Oregon harvesters, processors, and other businesses received about 40 percent of the $60.4 million 2006 federal disaster assistance funds. The harvester share of the disbursements equates to about $40 million of effective ex-vessel value. The total effective ex-vessel value when added to the State assistance effective ex-vessel value and the landed value would make the 2006 season comparable $48 million ex-vessel value exceed any previous landed value since 1988. The 2008 disaster assistance disbursements to Oregon fisheries are about $19 million (State and federal programs) for troll salmon permittees and about $2 million to gillnet salmon permittees. (Total disbursements of the $170 million congressional appropriation for the 2008 disaster were about $32 million to Oregon businesses.) The effective ex-vessel value is about $50 million. It might be argued that the payments should cover foregone harvest opportunities for a multiple year period whose length is associated with past and future restricted seasons that are in place to allow for weak stock recoveries.*

12. *A University of Oregon report (Ross 2007) discusses the low Dungeness crab larvae production that the waters off Oregon experienced in 2007. This foreshadowed the adult recruitment into the fishery in recent years.*

13. *There is a smaller commercial bay crab fishery which operates under different season and gear restrictions than does the ocean fishery. Any commercial vessel can participate in the bay crab fishery. The number of vessels making bay crab landings by estuary in 2008 are: five vessels in Yaquina Bay, nine vessels in Alsea Bay, two in Winchester Bay, two landing at Pacific City, two at Garibaldi, two at Florence, and eight at Charleston.*

14. *Results and compliance status for the logbook program is discussed in Hannah and Jones (2012).*

15. *There is a federal limited entry permit system for this fishery. As of April 2004, there were 406 groundfish limited entry fishing permits and 312 registered vessels operating with fishing permits on the U.S. West Coast. (Seventeen trawl permits, eight longline permits, and one trap permit were not associated with any particular vessel.) Of the total permits, 176 were endorsed only for limited entry trawl, 194 were endorsed for longline only, 27 were endorsed for trap gear only, four were endorsed for both trawl and longline gear, one was endorsed for both trawl and trap gear, and four were endorsed for both longline and trap gear. Of the total longline and trap permits, 164 were endorsed for sablefish. Limited entry permits may be sold and leased out by their owners, so the distribution of permits between the three states often shifts. As of April 2004, 35 percent of limited entry permits were registered to California operators, 37 percent to Oregon operators and 27 percent to Washington operators.*

    A federal/industry partnership buyback program in 2003 resulted in 91 (34 in Oregon) trawl permits removed from the fishery. The buyback program also resulted in permanently retiring 10 Dungeness crab permits and 40 pink shrimp permits. The Oregon home-port active LE trawl vessels (vessels that had more than $500 in LE trawl gear harvests) decreased from 94 to 69 from 2003 to 2004. Their average revenue from non-whiting groundfish onshore landings increased by 29 percent and their onshore revenue from all fisheries increased by 34 percent during the period. This was mostly due to slightly relaxed trip and period limits, a small increase in prices for certain species, and higher OY's for especially whiting. The home-ports of vessels and the resulting economic conditions were not equally distributed along the coast. Some communities, such as Brookings, Oregon, where vessels depended on the groundfish fishery, were hit harder than others.

16. *The groundfish fishery includes over 80 individual species, including cods, rockfish, and soles. The species Pacific whiting is managed as a groundfish species, but the domestic Pacific whiting fishery did not develop until after 1989. The fishery after that date is usually discussed separately because of its high-volume and low-value characteristics.*

17. *Thirty-one EFP's were approved in 2004 but only 26 midwater trawlers actually made EFP landings. A similar number was approved for the 2009 and 2010 fishery. The EFP requires vessels to monitor what is harvested so that information for evaluating bycatch and discards can be collected. Revenue from marketable species delivered to processors is advanced to the ODFW and used to reimburse for program costs.*

18. *The distant water fisheries components are: (1) revenue returned to West Coast economies through vessels that make West Coast landings and also landings in Alaska, southern Pacific Ocean, or elsewhere; (2) revenue returned by vessel owners, captains, or crewmen whose vessels hail from ports elsewhere on the West Coast, but don't harvest and deliver in the West Coast fishery; (3) Alaska fishery permits owned by companies or individuals with addresses in West Coast states that may be leased by other vessel owners; (4) vessels and processors who buy from provisioning, repair, and services businesses, but whose owners, captains, and workers live elsewhere; and (5) West Coast residents that work as crewmen, skippers, and at processors in Alaska whose vessels and businesses are not registered in Washington, Oregon, or California.*

19. *A "major" company is defined to be a purchaser of at least $5 million Oregon or other state's landings. A processing plant is defined to be "general" if it has the capacity (such as fillet lines and refrigeration equipment) to process multiple species on a year-around basis. These definitions exclude companies and plants that specialize in offering product forms or packaging services for only salmon, tuna, and sardines. Landing data was used to verify the purchase threshold and interviews with processing company representatives were used to determine capacity.*

20. *The Pacific Seafood Group has become the dominant processing/distribution entity in the Pacific Northwest. It has grown from a small, local fish peddler in Portland, Oregon to a major aquaculture, fish harvesting, fish buying, fish processing, and food distribution company on the West Coast, in the U.S., and also in the export market. By its own press releases, the Pacific Group has more than 37 working facilities throughout the West Coast and other states (seven states overall) employing over 2,500 people.*

21. *Individual transferable quotas (ITQ's) can be assigned to vessels and other entities, such as communities, crewmen, and processors. ITQ's are a means for reducing derby fisheries and allowing harvesters to target their catch for available markets. IPQ's would have the effect of tying a certain harvest share to identified processors. In such cases, an assigned share of the harvested share would have to be delivered to a specific processor (sometimes referred to as the two pie system).*

22. *A special concern is the amount of concentration that exists in Pacific whiting processing. Only three companies received delivery of about 90 percent of the Pacific whiting landed in the U.S. Pacific Northwest. An ITQ program that supports such consolidation may mean that any one company could control and may actually introduce constraints on the trade between harvesters, processors, and ultimately the consumer.*

23. *The multiplier effects are calculated using the Fishery Economic Assessment Model (FEAM). The FEAM is based on economic response coefficients generated from the IMPLAN input-output model. IMPLAN models are available for various U.S. geographic levels, states, national economy, and international economies. The models were originally developed by the U.S. Forest Service. They are now maintained and distributed by IMPLAN Group LLC, 16740 Birkdale Commons Parkway, Suite 212, Huntersville, NC 28078.*

24. *The economic contribution estimates do not include effects from money that was received by salmon fishermen through the Oregon and federal disaster assistance programs. A regional economic impact model would have to account for different types of spending. The direct assistance payment receipts might not be spent in the same way as if it was received through fishing industry business operations. There are not research results*

available about such spending information. A survey of assistance recipients would be needed to determine categories of direct and induced spending. Direct spending might include, for example, vessel fixed costs. Induced spending might occur, for example, if vessels participated in other fisheries at changed efficiencies than might normally occur if it was not for displaced opportunities in salmon fisheries. Similar changed spending might have occurred for processors and other businesses receiving assistance.

25. *Vessel hull and equipment may be taxed as personal property if valued at less than $1 million and is taxed as industrial property if equal or greater than $1 million. Corporate excise tax rates on income are six percent net income.*

26. *In Oregon, moorage and other marina services are mostly provided by local and special district government.*

27. *The applied 9.8 percent rate is state and local taxes divided by total personal income. The ratio can be found in Oregon Legislative Revenue Office (2013).*

28. *The ODFW budget references are from Legislature Ways and Means documents. The Legislative approved budget and resulting actuals may differ from the projections. Any previous biennium balance may be used to augment or defer the actual performance of ad valorem revenue generation. (This means that leftover CFF dollars become part of Other Fund and may not be used in the biennium when collected.)*

29. *The Khan et al. (2006) eleven types of subsidies are : (1) fisheries management programs and services; (2) fishery research and development; (3) tax exemption programs; (4) foreign access agreements; (5) boat construction, renewal, and modernization programs; (6) fishing port construction and renovation programs; (7) fishery development projects and support services; (8) marketing support, processing, and storage infrastructure programs; (9) fisher assistance programs; (10) vessel buyback programs; and (11) rural fishers' community development programs.*

30. *The study years were between 1996 and 2004.*

31. *Based on Khan et al. (2006) and Sharp and Sumaila (2009) who evaluate beneficiary positive and negative subsidy effects, effective subsidies can be: (1) Subsidies that promote a conservation goal. (2) Subsidies that promote the productivity and competitiveness of the industry, such as through research and investment in technology. (3) Subsidies that promote market diversity and growth opportunities. (4) Subsidies that provide relief when necessary to maintain an otherwise healthy industry in the face of high resource variability.*

APPENDIX A

Harvesting and Processing Detail

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Table A.1
Annual Landed Pounds by Selected Species and Species Groups in 1971 to 2012

Species	1971	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Troll Chinook (ocean)						1.8	0.8	2.3	6.0	4.1	0.8	0.9	2.2	1.8	1.6	0.8	1.7	3.3	4.0	4.2	3.3	3.1	0.6	0.5	0.1	0.0	0.6	0.5	0.9
Troll coho (ocean)						3.8	1.3	0.6	2.2	2.3	1.6	0.0	-	-	-	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0
Net Chinook (below Bonneville Dam)															0.1	0.1	0.3	0.6	1.2	1.3	1.3	0.7	0.8	0.4	0.8	1.0	1.3	1.5	1.1
Spring															0.0	0.0	0.1	0.3	0.4	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.5	0.3	0.2
Fall															0.1	0.2	0.2	0.3	0.6	1.0	0.7	0.5	0.5	0.2	0.6	0.7	0.7	1.0	0.8
Net Chinook (above Bonneville Dam)															0.6	0.7	0.7	1.6	1.8	1.8	1.8	1.7	1.3	0.8	2.0	1.6	2.6	2.4	1.3
Spring															-	-	0.0	0.2	0.2	0.1	0.2	0.1	0.2	0.0	0.3	0.2	0.7	0.5	0.2
Fall															0.6	0.7	0.6	1.3	1.6	1.6	1.3	1.6	1.1	0.8	1.5	1.3	1.7	1.8	1.1
Net coho (below Bonneville Dam)															0.2	0.7	1.5	2.3	1.7	2.3	1.1	1.0	0.7	0.3	0.7	1.1	0.8	0.6	0.1
Net steelhead (above Bonneville Dam)															0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1
Dungeness crab	14.9	2.3	4.0	19.9	15.6	7.0	5.3	7.4	6.0	11.7	4.9	10.5	12.0	7.8	7.4	12.3	11.2	9.7	12.4	23.9	27.3	17.7	33.3	17.0	13.9	21.9	15.9	17.3	8.7
Pink shrimp	9.1	24.5	24.1	48.6	29.6	25.9	6.5	14.8	44.6	49.1	21.7	26.9	12.1	19.6	6.1	20.5	25.5	28.5	41.6	20.5	12.2	15.8	12.2	20.1	25.5	22.2	31.5	48.3	49.1
Albacore tuna	13.1	24.4	23.6	9.9	8.8	7.7	3.4	1.5	2.3	1.1	1.3	4.8	5.0	9.2	10.6	4.6	8.8	9.0	4.4	9.2	10.8	8.1	8.5	10.5	8.9	10.1	10.7	9.7	9.9
Groundfish species group	22.0	21.9	21.0	23.4	64.4	81.8	77.4	61.9	67.2	81.0	80.8	81.3	55.1	52.7	41.8	44.1	39.3	31.6	21.1	25.9	25.6	27.2	27.4	30.9	37.9	41.4	36.9	28.9	28.5
Nearshore live fishery						-	-	-	-	-	-	-	-	0.1	0.1	0.2	0.2	0.3	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3
Sablefish						5.2	10.2	11.6	11.6	8.7	8.7	8.7	7.0	6.5	3.9	6.6	6.3	5.7	3.2	4.8	5.6	5.8	5.8	5.4	6.5	7.3	6.3	5.1	4.7
Trawl gear						3.0	6.1	6.3	5.6	5.8	5.4	5.5	4.1	4.1	2.3	3.7	3.3	3.4	1.7	2.8	3.3	3.1	3.4	3.4	4.3	4.4	3.8	2.2	2.0
Fixed gear						2.2	4.1	5.3	5.9	2.9	3.2	3.1	2.9	2.5	1.6	2.9	2.9	2.3	1.4	2.0	2.3	2.7	2.4	1.9	2.2	2.9	2.5	2.9	2.8
Widow rockfish						-	-	9.5	14.0	15.2	9.7	14.7	8.6	11.1	6.5	6.6	6.0	3.7	0.6	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.3
Yellowtail rockfish						-	-	3.0	3.7	4.1	3.9	6.3	6.7	2.8	3.8	3.5	4.4	2.4	0.8	0.1	0.2	0.2	0.2	0.1	0.0	0.1	0.2	1.3	1.3
Thornyhead, longspine						-	-	-	-	-	-	-	5.8	4.0	2.1	1.6	1.7	1.4	1.8	1.6	0.5	0.3	0.5	0.7	1.3	1.3	1.8	0.8	0.7
Thornyhead, shortspine						-	-	-	-	-	-	-	1.6	1.1	1.1	0.7	0.6	0.5	0.6	0.7	0.7	0.6	0.7	1.2	2.0	2.1	1.7	0.9	0.8
Thornyhead, mixed						-	-	2.4	1.5	5.6	7.7	9.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific Ocean perch						4.4	5.2	3.9	3.1	4.6	5.1	6.0	2.8	2.7	2.4	1.4	0.2	0.4	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1
Lingcod						2.3	3.8	2.3	1.6	2.6	3.3	1.8	1.4	1.7	0.4	0.4	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.4	0.6
Arrowtooth flounder						1.3	1.2	1.5	1.6	2.5	4.6	3.7	3.1	2.6	3.5	5.0	2.6	2.3	1.1	1.8	2.1	2.9	3.0	3.6	4.8	6.3	5.1	3.7	3.3
Dover sole						11.7	18.7	12.6	13.4	19.6	19.4	14.3	7.8	8.7	8.4	10.0	10.4	8.2	6.0	8.0	8.4	8.8	7.8	12.2	16.0	16.4	15.2	10.5	9.8
English sole						1.6	2.0	1.0	1.3	1.5	1.9	1.6	0.7	1.2	1.0	0.8	0.5	0.9	1.0	0.8	0.8	0.9	1.0	0.8	0.3	0.4	0.3	0.2	0.2
Petrale sole						1.9	2.4	1.3	1.9	1.9	2.1	1.7	1.8	1.8	1.5	1.5	1.9	2.0	2.0	2.5	2.1	3.2	3.5	2.5	2.5	2.2	1.1	1.2	1.5
Cod, Pacific						0.1	0.2	0.1	1.5	1.7	1.1	1.1	0.2	0.1	0.2	0.1	0.0	0.1	0.1	0.6	1.2	0.6	0.4	0.0	0.0	0.1	0.1	0.6	0.9
Whiting, Pacific						0.4	0.1	2.0	0.4	0.2	29.1	79.0	147.4	162.8	157.9	161.0	151.5	117.7	71.2	80.6	130.2	135.5	135.2	94.4	61.5	63.0	69.5	151.5	107.7
Sardines						-	-	-	-	-	-	-	-	-	0.0	1.7	21.0	28.2	50.1	55.7	79.6	99.4	78.6	92.9	50.6	47.4	46.0	24.3	94.0
Halibut, Pacific						0.2	0.6	0.8	0.9	0.9	0.5	0.7	0.5	0.4	0.2	0.4	0.3	0.3	0.5	0.3	0.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Sturgeon, white						0.3	0.3	0.3	0.4	0.2	0.1	0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Sea urchin, red						-	-	-	0.2	7.8	4.7	2.2	1.5	0.5	0.3	0.2	1.0	1.3	0.8	0.1	0.3	0.5	0.4	0.4	0.6	0.8	0.3	0.6	0.6

Notes:
1. Landings are onshore, round pounds, in millions.
2. Inriver salmon includes Oregon and Washington side landings.
3. Pounds where landings are less than $500 annually are shown with a dash.
4. The nearshore live groundfish fishery includes seven indicator species that are typically landed live in Oregon. These include cabezon, lingcod, black and blue rockfish, greenling, and other unspecified rockfish (not uniquely identified on a fish ticket).

Source: Oregon Department of Fish and Wildlife for years prior to 1981. PacFIN March 2008, April 2009, March 2010, July 2011, and April 2013 extractions for 1981 to 2012. PFMC (February 2013) for inriver Chinook and coho.

Table A.2
Annual Ex-Vessel Prices by Selected Species and Species Groups in 1971 to 2012

Species	1971	1973	1975	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Troll Chinook (ocean)	2.68	4.21	3.60	6.69	6.83	4.92	3.33	4.05	4.04	3.22	3.32	2.80	2.09	1.89	1.92	2.24	2.28	1.78	1.68	2.11	3.58	3.20	5.32	5.35	5.38	4.59	4.96	5.28	4.97
Troll coho (ocean)	1.63	3.22	2.67	4.11	6.00	3.20	1.67	2.45	2.67	1.54	1.33	1.45	-	-	-	1.19	1.20	0.87	0.82	0.91	1.29	1.88	2.83	1.80	2.49	1.87	2.00	1.77	1.91
Net Chinook (below Bonneville Dam)															1.89	1.88	1.87	1.80	1.58	1.03	2.11	1.94	2.81	3.61	3.01	2.14	2.88	2.52	2.64
Spring															3.50	3.76	3.59	3.70	4.09	3.41	4.49	4.02	4.78	6.06	6.71	5.07	5.16	5.03	5.92
Fall															1.34	1.48	1.30	0.82	0.66	0.80	1.59	1.75	2.29	2.81	2.67	2.05	2.14	2.18	2.14
Net Chinook (above Bonneville Dam)															0.65	0.72	0.83	0.52	0.36	0.31	0.89	0.70	1.72	2.21	2.11	1.41	1.98	2.27	2.30
Spring															-	-	2.43	1.62	1.48	1.34	2.02	1.95	2.63	4.06	4.77	3.24	4.02	3.58	4.81
Fall															0.67	0.76	0.81	0.31	0.22	0.23	0.91	0.66	1.59	2.24	1.75	1.13	1.31	1.93	1.84
Net coho (below Bonneville Dam)															0.89	1.11	0.68	0.36	0.42	0.65	1.09	1.23	1.47	1.77	1.38	1.26	1.42	1.64	1.62
Net steelhead (above Bonneville Dam)															0.32	0.55	0.37	0.20	0.12	0.09	0.26	0.32	0.56	0.71	0.75	0.65	0.88	1.15	1.21
Dungeness crab	1.29	2.34	2.75	1.67	1.96	2.12	2.97	2.71	2.48	1.93	2.34	1.68	2.37	2.57	2.28	2.49	2.76	2.53	2.09	1.90	1.88	1.73	1.81	2.44	2.23	2.04	2.15	2.64	3.36
Pink shrimp	0.55	0.90	0.46	0.70	1.01	1.11	1.43	0.66	1.21	0.60	0.86	0.49	1.00	0.55	0.71	0.62	0.52	0.34	0.34	0.30	0.46	0.50	0.41	0.51	0.58	0.32	0.36	0.52	0.50
Albacore tuna	1.25	1.46	1.09	0.79	1.39	1.91	1.11	1.01	1.31	1.36	1.20	1.20	1.14	1.09	0.83	1.10	1.11	1.07	0.85	0.83	1.01	1.26	1.06	0.98	1.28	1.06	1.21	1.97	1.53
Groundfish species group	0.37	0.49	0.49	0.64	0.71	0.39	0.47	0.51	0.65	0.52	0.55	0.50	0.80	0.72	0.63	0.67	0.81	0.82	0.84	0.84	0.76	0.78	0.81	0.72	0.76	0.72	0.72	1.00	0.84
Nearshore live fishery						-	-	-	-	-	-	-	-	1.95	2.59	3.59	4.28	3.93	3.98	3.60	3.30	3.23	3.10	3.08	2.92	2.74	2.93	2.95	3.14
Sablefish						0.46	0.44	0.56	0.79	0.73	0.93	0.81	1.88	2.17	1.61	1.57	1.93	1.78	1.73	1.89	1.47	1.71	1.87	1.93	2.24	2.30	2.48	3.48	2.43
Trawl gear						0.33	0.35	0.42	0.60	0.61	0.66	0.63	1.72	1.71	1.55	1.31	1.60	1.54	1.29	1.54	1.16	1.34	1.52	1.64	1.98	1.96	2.00	2.44	1.73
Fixed gear						0.63	0.58	0.72	0.96	0.97	1.37	1.13	2.10	2.93	1.70	1.89	2.29	2.14	2.26	2.37	1.91	2.13	2.37	2.43	2.76	2.84	3.21	4.25	2.93
Widow rockfish						-	-	0.47	0.57	0.43	0.42	0.40	0.46	0.40	0.47	0.50	0.57	0.52	0.52	0.54	0.50	0.50	0.42	0.47	0.44	0.38	0.44	0.44	0.42
Yellowtail rockfish						-	-	0.47	0.58	0.45	0.47	0.46	0.52	0.50	0.51	0.51	0.58	0.57	0.58	0.58	0.61	0.58	0.54	0.53	0.63	0.47	0.51	0.52	0.52
Thornyhead, longspine						-	-	-	-	-	-	-	1.35	0.98	0.81	0.94	1.11	1.12	1.06	0.79	0.61	0.67	0.68	0.49	0.42	0.28	0.31	0.38	0.41
Thornyhead, shortspine						-	-	-	-	-	-	-	1.57	1.14	0.99	1.19	1.32	1.27	1.25	0.97	0.79	0.81	0.85	0.67	0.70	0.56	0.55	0.60	0.65
Thornyhead, mixed						-	-	0.47	0.58	0.61	0.70	0.66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pacific Ocean perch						0.35	0.43	0.45	0.56	0.42	0.45	0.40	0.41	0.37	0.44	0.45	0.56	0.52	0.55	0.54	0.54	0.54	0.52	0.52	0.51	0.51	0.50	0.51	0.49
Lingcod						0.49	0.50	0.49	0.67	0.56	0.51	0.54	0.60	0.63	0.95	1.00	1.45	1.47	1.44	1.31	1.20	1.15	1.11	1.20	1.32	1.32	1.34	1.09	1.04
Arrowtooth flounder						0.20	0.20	0.19	0.26	0.16	0.18	0.14	0.16	0.13	0.14	0.13	0.15	0.15	0.16	0.15	0.14	0.12	0.12	0.11	0.11	0.10	0.10	0.10	0.12
Dover sole						0.49	0.45	0.47	0.56	0.46	0.47	0.40	0.47	0.41	0.46	0.44	0.48	0.47	0.46	0.46	0.45	0.43	0.41	0.40	0.39	0.34	0.32	0.42	0.42
English sole						0.64	0.65	0.62	0.72	0.61	0.51	0.44	0.50	0.43	0.45	0.42	0.47	0.46	0.44	0.42	0.42	0.37	0.34	0.32	0.32	0.30	0.30	0.30	0.32
Petrale sole						1.16	1.39	1.37	1.47	1.39	1.27	1.13	1.37	1.26	1.27	1.27	1.31	1.25	1.13	1.24	1.21	1.05	1.11	1.04	1.02	0.92	1.16	1.46	1.50
Cod, Pacific						0.47	0.50	0.48	0.58	0.43	0.46	0.48	0.55	0.53	0.65	0.60	0.79	0.74	0.72	0.74	0.57	0.53	0.53	0.57	0.55	0.47	0.52	0.57	0.60
Whiting, Pacific						0.154	0.334	0.166	0.151	0.124	0.073	0.043	0.067	0.057	0.032	0.049	0.052	0.045	0.057	0.055	0.042	0.061	0.066	0.075	0.118	0.062	0.081	0.111	0.136
Sardines						-	-	-	-	-	-	-	-	-	0.471	0.067	0.071	0.073	0.070	0.065	0.073	0.072	0.053	0.053	0.119	0.118	0.119	0.134	0.096
Halibut, Pacific						2.35	2.18	1.84	2.77	2.36	2.89	1.92	2.45	2.52	1.84	2.62	2.74	2.42	2.40	3.09	3.02	2.89	3.41	3.77	3.96	3.02	4.13	5.35	4.89
Sturgeon, white						2.30	2.27	2.73	2.97	3.19	3.03	2.02	2.48	1.47	1.54	1.80	2.03	2.22	2.00	2.11	2.10	2.03	2.25	2.29	2.26	2.05	2.18	2.60	2.68
Sea urchin, red						-	-	-	0.51	0.58	1.17	1.29	1.14	0.73	0.60	0.74	0.90	0.81	0.54	0.52	0.44	0.35	0.42	0.40	0.40	0.48	0.56	0.54	0.58

Notes:
1. Annual prices are in 2012 dollars.
2. Prices are for onshore landings. There will be differences for the same species, such as Pacific whiting, when delivered offshore.
3. Prices are for round pound equivalents, except for troll Chinook and troll coho prior to 1981 which are based on dressed weight.
4. Prices where landings are less than $500 annually are shown with a dash.
5. Inriver salmon prices include Oregon and Washington side landings.
6. The nearshore live groundfish fishery includes seven indicator species that are typically landed live in Oregon. These include cabezon, lingcod, black and blue rockfish, greenling, and other unspecified rockfish (not uniquely identified on a fish ticket).

Source: Oregon Department of Fish and Wildlife for years prior to 1981. PacFIN March 2008, April 2009, March 2010, July 2011, and April 2013 extractions for 1981 to 2012. PFMC (February 2013) for inriver Chinook and coho.

Table A.3
Ex-Processor Value by Species Groups in 2012

Species Group	Round Pounds (thousands)	Ex-Vessel Price	Product Analysis Form	Yield	Use	Processor Costs/Sales Price Per Finished Pound Raw	Labor	Tax/Fee	Other	Contrib.	Sales Price	Finished Pounds (thousands)	Ex-Processor Sales (thousands)
Salmon	1,884	$3.59	Gutted	83%		4.28	0.21	0.15	0.02	0.40	5.05	1,566	7,910
Dungeness crab	7,162	$3.36	Mixed1	58%		5.79	0.61	0.10	0.02	0.40	6.92	4,154	28,756
Pink shrimp	47,304	$0.50	Cooked	31%		1.62	0.25	0.34	0.01	0.40	2.62	14,664	38,426
Albacore tuna	9,854	$1.53	Mixed2	85%		1.79	0.20	0.05	0.01	0.40	2.45	8,376	20,556
Groundfish	26,800	$0.84	Mixed3	34%		2.37	0.32	0.12	0.01	0.40	3.22	9,113	29,387
Pacific whiting	0	$0.136	Surimi		0%	0.54	0.17	0.25	-	0.10	1.06	0	0
	94,691	$0.136	H&G	61%	100%	0.22	0.10	0.08	-	0.19	0.59	57,761	34,223
Pacific sardine	93,961	$0.096	Bait	95%		0.10	0.15	0.20	-	0.19	0.64	89,263	57,179
Other	7,004	$0.45	Mixed4	25%		1.77	0.20	0.15	0.01	0.40	2.53	1,758	4,450
Fish meal	95,288			10%		-	0.04	0.09	-	0.10	0.23	9,529	2,192
Total												196,184	223,079

Notes: 1. Round pounds shown are net processed pounds, which is landed less haul-outs. Ex-processor sales include this effect.

2. Sales price is estimated using cost calculation from the FEAM model or using published market sales price information for the product form.

3. Ex-vessel prices are in round pound or round pound equivalents. Processor costs/sales price are per finished pound.

4. There are many final product forms manufactured within species groups. The following discusses how some of these forms affect species group yields.

Mixed1. Crab tends to start out "whole" during the year-end holidays and then move to "picked" meat later in the season. Over the last few years, "sections" have also become a product form. Final product proportions for landed weight have a weighted average of 58% yield.

Mixed2. Albacore tuna assumes 75% "whole frozen" yield, 25% "fillet" yield, or about 85% mixed yield.

Mixed3. Groundfish generally is processed as a fillet; however, several species, such as sablefish and thornyheads are marketed fresh, whole. Example yields are lingcod and rockfish fillet yield 29%; sablefish and thornyheads H&G yield 55%; and sharks and skates fillet yield 60%. The shown mixed yield is a weighted average for all of these different products.

Mixed4. Other species have many end products, including frozen and fresh whole, fillets, and eggs for the species sea urchin. Example yields are sea urchins eggs yield 7%; other crab and shrimp, clams and mussels, other echinoderms, and shad whole yield 100%; mackerel, market squid, and herring frozen yield 99%; other sharks fillet yield 60%; octopus frozen yield 100%; sturgeon fillet yield 64%; and halibut fillet yield 72%. This category also includes oysters and other shellfish in 2003 at $3,542 thousand. Because "other" includes a variety of different products, the throughput is evaluated on an ex-vessel basis.

Pacific whiting. The two primary products using Pacific whiting are headed and gutted and surimi. Surimi processing requires expensive equipment and established marketing channels. There are a few central ports with processors that produce surimi. Pacific whiting landings at ports without this processing capability are hauled to the processors that have the equipment or the product is processed locally for headed and gutted.

5. Fish meal volume is estimated from non-yield of groundfish and Pacific whiting landed volume.

Source: Study.

Table A.4
Economic Contribution Factors by Fisheries in 2011

FEAM Group No	Resources	Resource Distribution	Landed Round Pounds and Vessel Revenue: Volume	Value	Aggregate Price	Adjusted Price	Price Adjust	Hauled Round Pounds or Revenue: Hauled In	Hauled Out	Net Processed	Product Yield	Processor Costs and Sales Price Per Finished Pound: Raw	Labor	Other	Contri-bution	Sales Price
Oregon 2011																
1	Troll Coho		2,971	5,174	1.74	1.74				2,971	0.87	2.00	0.15	0.17	0.40	2.72
2	Troll Chinook		462,206	2,395,817	5.18	5.18			25,964	436,242	0.87	5.96	0.15	0.12	0.40	6.63
4	Albacore Tuna		9,682,086	18,765,949	1.94	1.94			29,425	9,652,661	0.85	2.28	0.20	0.06	0.40	2.94
5	GN/PS Coho		459,142	754,341	1.64	1.64				459,142	0.80	2.05	0.25	0.17	0.40	2.87
6	GN/PS Fall Chinook	61%	898,792	2,001,345	2.23	2.23	*			898,792	0.80	2.78	0.25	0.18	0.40	3.61
7	GN/PS Tule	19%	280,366	171,054	0.61	0.61	*			280,366	0.75	0.81	0.25	0.17	0.40	1.63
9	Pink/Steel/Chum/Sock		34,543	17,929	0.52	0.52				34,543	0.80	0.65	0.25	0.89	0.40	2.19
11	GN/PS Spring Chinook	19%	284,415	1,391,710	4.89	4.89	*			284,415	0.80	6.12	0.25	0.31	0.40	7.08
12	Sturgeon		106,947	273,200	2.55	2.55				106,947	0.64	3.99	0.25	0.12	0.40	4.76
13	Pacific Halibut		216,975	1,140,841	5.26	5.26			5,399	211,576	0.74	7.11	0.15	0.13	0.40	7.79
14	Cod/Rockfish		5,174,172	3,677,228	0.71	0.71			215,334	4,958,838	0.29	2.45	0.25	0.18	0.40	3.28
15	Sole/Flounder		16,485,831	6,779,734	0.41	0.41			882,484	15,603,347	0.24	1.71	0.38	0.09	0.40	2.58
16	Blackcod Trawl		2,172,430	5,209,704	2.40	2.40			185,740	1,986,690	0.55	4.36	0.25	0.11	0.40	5.12
17	Blackcod Fixed Gear		2,908,059	12,141,607	4.18	4.18			344,371	2,563,688	0.55	7.59	0.25	0.30	0.40	8.54
19	Pink Shrimp		48,313,940	24,607,431	0.51	0.51			1,195,798	47,118,143	0.31	1.64	0.25	0.35	0.40	2.64
20	Dungeness Crab		17,260,406	44,690,045	2.59	2.59			1,079,768	16,180,638	0.58	4.46	0.61	0.12	0.40	5.59
23	Herring/Sardine		24,303,006	3,191,613	0.13	0.13				24,303,006	0.95	0.14	0.15	0.20	0.19	0.68
24	Shark/Skates		2,192,485	630,878	0.29	0.29			50,521	2,141,964	0.50	0.58	0.25	0.10	0.40	1.33
25	Smelt/Shad/Mack $		2,528,190	1,808,819	0.72	1.00	*		38	1,808,781	1.00	1.00	0.15	0.10	0.40	1.65
26	Sea Urchin		589,297	313,550	0.53	0.53				589,297	0.07	7.60	0.75	0.87	0.40	9.62
33	Whiting-Surimi/shore	10%	15,146,437	1,651,752	0.109	0.109			2,339,276	12,807,161	0.25	0.44	0.17	0.25	0.10	0.96
37	Whiting H&G/shore	90%	136,317,932	14,865,764	0.109	0.109			21,053,485	115,264,447	0.61	0.18	0.10	0.08	0.19	0.55
38	Fish Meal	70%	126,278,142							126,278,142	0.10	0.00	0.04	0.09	0.10	0.23
	Total		412,098,770	146,485,485												
	Oregon Landings		285,820,628	146,485,485												

Notes:
1. Fish meal pounds are the average lost yield from cod/rockfish, sole/flounder, blackcod, sharks/skates, and onshore whiting.
2. The asterisk in the landing price adjustment column means price is either from other source material or economic impacts are calculated using revenue rather than landed pounds.
3. FEAM prices and marginal impacts are from 2009 model that uses 2007 response coefficients.
4. Landings do not include private aquaculture.
5. The factor for adjusting between marginal and average economic contribution is 0.89.
6. Distant water economic contributions are not shown.
7. Small amounts of salmon reported as midwater trawl at mid-coast ports with no value are shown with smelt/shad/mackerel group.

Source: PacFIN April 2013 extraction; and study for adjustments and economic contributions.

Table A.4 (cont.)

FEAM Group No	Resources	Processor Revenue	FEAM Marginal Impacts Price	Processor/ Buyer	Harvester	Total	Current Year Price Adjusted Marginal Impacts Factor	Harvester	Total	Adjusted Total Impacts Local	State	State Level Economic Factor
Oregon 2011												
1	Troll Coho	7,035	1.77	0.86	2.50	3.37	0.98	2.46	3.32		8,778	1.00
2	Troll Chinook	2,515,521	4.35	0.80	6.44	7.25	1.19	7.67	8.47		3,485,841	
4	Albacore Tuna	24,124,061	1.01	0.83	1.27	2.10	1.92	2.44	3.27		28,153,298	
5	GN/PS Coho	1,055,538	1.20	0.92	1.45	2.36	1.37	1.99	2.91		1,187,176	
6	GN/PS Fall Chinook	2,598,143	1.71	0.92	2.23	3.16	1.30	2.90	3.82		3,058,778	
7	GN/PS Tule	343,479	0.47	0.86	0.29	1.15	1.30	0.38	1.24		308,526	
9	Pink/Steel/Chum/Sock	60,486	0.54	0.79	2.48	3.27	0.96	2.38	3.17		97,570	
11	GN/PS Spring Chinook	1,610,141	4.21	1.01	6.14	7.15	1.16	7.14	8.15		2,062,107	
12	Sturgeon	325,903	1.95	0.79	2.48	3.27	1.31	3.25	4.04		384,429	
13	Pacific Halibut	1,218,918	2.87	0.70	4.14	4.84	1.83	7.58	8.28		1,599,824	
14	Cod/Rockfish	4,717,784	0.65	0.33	0.91	1.24	1.09	0.99	1.32		6,101,480	
15	Sole/Flounder	9,674,795	0.32	0.31	0.42	0.73	1.29	0.54	0.85		12,468,018	
16	Blackcod Trawl	5,594,717	1.86	0.59	2.82	3.42	1.29	3.64	4.23		8,170,482	
17	Blackcod Fixed Gear	12,043,330	2.69	0.69	3.78	4.47	1.55	5.87	6.56		16,970,521	
19	Pink Shrimp	38,605,007	0.31	0.39	0.37	0.76	1.64	0.61	1.00		42,909,211	
20	Dungeness Crab	52,499,138	1.94	0.96	2.70	3.66	1.33	3.60	4.56		70,103,053	
23	Herring/Sardine	15,659,055	0.11	0.64	0.14	0.79	1.19	0.17	0.81		17,458,219	
24	Shark/Skates	1,419,577	0.20	0.54	0.22	0.76	1.44	0.32	0.86		1,671,338	
25	Smelt/Shad/Mack $	2,984,489	1.00	0.92	1.40	2.32	1.00	1.40	2.32		3,734,849	
26	Sea Urchin	396,877	0.46	0.16	0.57	0.74	1.16	0.66	0.82		429,707	
33	Whiting-Surimi/shore	3,061,579	0.06	0.15	0.08	0.23	1.82	0.15	0.30		4,047,750	
37	Whiting H&G/shore	38,585,022	0.06	0.31	0.08	0.39	1.82	0.15	0.46		55,841,426	
38	Fish Meal	2,904,397	0.00	0.03	0.00	0.03	1.00	0.00	0.03		3,371,626	
	Total	222,004,993									283,624,010	
	Oregon Landings											

Table A.5a
Salmon Troll and Net Fishery Product Price Conversion Model

Fishery: Troll Chinook, Net Chinook	Fresh or Frozen					
Product Form: Whole - Head Off, Fillets - Skin On	Troll Chinook			Net Chinook		
	Whole - Head Off		Fillets - Skin On	Whole - Head Off		Fillets - Skin On
Ex-vessel price /2,3	5.11	5.11	5.11	1.32	2.64	2.64
Fish fees:						
.0315 ad valorem management fee	0.161	0.161	0.161	0.042	0.083	0.083
.05 per lb restoration and enhancement	0.05	0.05	0.05	0.05	0.05	0.05
.05 per lb marketing assessment /4	0.05	0.05	0.05	0.05	0.05	0.05
Total fees	0.261	0.261	0.261	0.142	0.183	0.183
Tendering cost or buyer /5	0.00	0.00	0.00	0.15	0.15	0.15
Total landed cost	5.37	5.37	5.37	1.61	2.97	2.97
Egg yield (percent) /6	0%	0%	0%	4%	4%	4%
Green egg credit @ $5.00/lb coho, $4.50/lb Chinook and chum, $2.50/lb steelhead /7	0.00	0.00	0.00	0.18	0.18	0.18
Waste product sale @ $0.06 lb /8	0.00	0.01	0.02	0.02	0.02	0.03
Yield for primary product (percent)	98%	82%	65%	72%	72%	55%
Raw product cost of primary product	5.48	6.55	8.27	2.24	4.13	5.40
Variable costs:						
Direct labor	0.10	0.15	0.50	0.15	0.15	0.50
Packaging and material	0.05	0.05	0.10	0.05	0.05	0.10
Other costs	0.05	0.05	0.05	0.05	0.05	0.05
Total variable costs	0.20	0.25	0.65	0.25	0.25	0.65
Raw product and variable costs	5.68	6.80	8.92	2.49	4.38	6.05
Contribution margin to fixed costs /9	0.40	0.40	0.40	0.40	0.40	0.40
Primary ex-processor price of product	6.08	7.19	9.30	2.69	4.58	6.24
Sales of green eggs and waste /10	0.00	0.01	0.02	0.20	0.20	0.21
Total revenues (equals total variable plus fixed costs) /11	6.08	7.20	9.32	2.89	4.78	6.45
Marketing margins						
Brokerage (2%)	0.12	0.14	0.19	0.05	0.09	0.12
Distribution (10%)	0.61	0.72	0.93	0.27	0.46	0.62
Retailer (40%)	2.43	2.88	3.72	1.08	1.83	2.50
Customer price for primary product (primary ex-processor price plus marketing margins before shrinkage cost markups)	9.24	10.93	14.13	4.09	6.96	9.49

Notes:
/1 Raw egg prices have declined sharply in recent years. For example, pink and steelhead prices presently are about $1.00 per pound and in some cases were as low as $0.10 per pound.
/2 All calculations are based on round pound equivalents rather than delivery weight. Delivery weight is round pounds for net caught and dressed pounds for some troll caught. Net caught ex-vessel prices use example non-Indian Columbia River fishery (combined landings to Oregon and Washington side) in 2012. Troll caught uses ex-vessel annual prices for deliveries to Astoria in 2012.
/3 Ex-vessel prices are expected long-term prices based on historic prices of similar species.
/4 Assessment fee $0.05 paid by harvester is included in ex-vessel price. Another $0.05 paid by processor. These charges may not be appropriate in all cases, so reduce costs by this amount if no assessment fees.
/5 Not all inland fisheries include a tender or buyer/gatherer. If not, reduce costs by this amount.
/6 Egg yield is on average fish (male and female).
/7 Eggs are a credit which is worth $4.50 and $5.00 per lb. green. Egg credit per lb. ($0.25 for coho, $0.18 for fall Chinook) is adjusted for overall yield.
/8 Some processed waste products sold for $0.06 per pound. At 75% overall yield, on a round pound basis, this would generate $0.015 of revenues, at 50% yield these sales would generate $0.03, etc. This may not be appropriate in every area.
/9 Contribution margin includes financing, administrative costs, marketing and sales staff, etc. This item is sometimes called "plant overhead costs."
/10 Eggs' primary product is for the Japanese market. There are also European markets. Bait eggs may also have a market. Increased yield of 5% is used to offset the bait egg gain.
/11 In general, the processing plant sells its goods at the processor's door. If a broker is involved, this adds about 2% to the cost of the product. The distributor will add 8% to 15%, depending on the cost of transportation. The retailer margin is generally 35% to 40% of the distributor price for fresh products and specialty canned or vacuum packed products. General canned goods retail margins may be as low as 16%, but will generally be about 20%.
/12 Processing derived from variable and fixed costs from FEAM.

Source: TRG (September 2006) and Study.

Table A.5b
Salmon Specialty Product Price Conversion Model

Fishery: All Net Caught	Specialty Products			
Product Form: Specialty Products	Canned (7 1/2 oz) or Vacuum Packed		Smoked and Vacuum Packed	
	Net Coho	Net Chinook	Net Coho	Net Chinook
Ex-vessel price /2,3	1.62	2.64	1.62	2.64
Fish fees:				
.0315 ad valorem management fee	0.051	0.083	0.051	0.083
.05 per lb restoration and enhancement	0.05	0.05	0.05	0.05
.05 per lb marketing assessment /4	0.05	0.05	0.05	0.05
Total fees	0.151	0.183	0.151	0.183
Tendering cost or buyer /5	0.15	0.15	0.15	0.15
Total landed cost	1.92	2.97	1.92	2.97
Egg yield (percent) /6	5%	4%	5%	4%
Green egg credit @ $5.00/lb coho,	0.25		0.25	
$4.50/lb Chinook and chum,		0.18		0.18
$2.50/lb steelhead /7				
Waste product sale @ $0.06 lb /8	0.03	0.03	0.03	0.03
Yield for primary product (percent)	45%	45%	43%	43%
Raw product cost of primary product	4.28	6.60	4.47	6.91
Variable costs:				
Direct labor	1.10	1.10	1.75	1.75
Packaging and material	0.60	0.60	0.50	0.50
Other costs	0.30	0.30	0.50	0.50
Total variable costs	2.00	2.00	2.75	2.75
Raw product and variable costs	6.28	8.60	7.22	9.66
Contribution margin to fixed costs /9	0.40	0.40	0.40	0.40
Primary ex-processor price of product	6.39	8.79	7.34	9.84
Sales of green eggs and waste /10	0.28	0.21	0.28	0.21
Total revenues (equals total variable plus fixed costs) /11	6.68	9.00	7.62	10.06
Marketing margins				
Brokerage (2%)	0.13	0.18	0.15	0.20
Distribution (10%)	0.64	0.88	0.73	0.98
Retailer (40%)	2.56	3.52	2.94	3.94
Customer price for primary product (primary ex-processor price plus marketing margins before shrinkage cost markups)	9.72	13.36	11.16	14.96

Notes: 1. Ex-vessel prices are from net caught, non-Indian, Columbia River fishery (combined landings to Oregon and Washington side) in 2012.
2. Other notes from Table A.5a also apply to this table.

Source: TRG (September 2006) and Study.

Table A.5c
Dungeness Crab Product Price Conversion Model

Fishery: Dungeness Crab Product Form: Three Primary	Whole Cooked	Section	Picked
Ex-vessel price /2,3	3.36	3.36	3.36
Yield for primary product (percent)	90%	50%	25%
Raw product cost of primary product	3.73	6.72	13.44
Variable costs:			
Direct labor	0.61	0.61	5.43
Packaging and material	0.05	0.05	0.60
Other costs (including taxes)	0.10	0.10	0.30
Total variable costs	0.76	0.76	6.33
Raw product and variable costs	4.49	7.48	19.77
Contribution margin to fixed costs /9	0.40	0.40	0.40
Primary ex-processor price of product	4.89	7.88	20.17
Marketing margins			
Brokerage (2%)	0.10	0.16	0.40
Distribution (10%)	0.49	0.79	2.02
Retailer (40%)	1.96	3.15	8.07
Customer price for primary product (primary ex-processor price plus marketing margins before shrinkage cost markups)	7.44	11.98	30.66

Notes: 1. Ex-vessel price example is from annual deliveries to Oregon in 2012.
2. Other notes from Table A.5a also apply to this table.
3. Dungeness crab are sold primarily by processors in three forms: whole cooked, sections, and picked meat. The costs and margins are a weighted average of all three forms.

Source: TRG (September 2006) and Study.

Table A.5d
Pink Shrimp Product Price Conversion Model

Fishery: Pink Shrimp Product Form: Frozen	Frozen (IQF) /2
Ex-vessel price /2,3	0.50
Yield for primary product (percent)	26%
Raw product cost of primary product	1.93
Variable costs:	
Direct labor	0.25
Packaging and material	0.31
Other costs (including taxes)	0.06
Total variable costs	0.62
Raw product and variable costs	2.55
Contribution margin to fixed costs /9	0.40
Primary ex-processor price of product	2.95
Marketing margins	
Brokerage (2%)	0.06
Distribution (10%)	0.30
Retailer (40%)	1.18
Customer price for primary product (primary ex-processor price plus marketing margins before shrinkage cost markups)	4.49

Notes: 1. Ex-vessel price example is from annual deliveries to Oregon in 2012.
2. Other notes from Table A.5a also apply to this table.
3. Pink shrimp are primarily sold as individually quick frozen blocks.

Source: TRG (September 2006) and Study.

Table A.5e
Groundfish Product Price Conversion Model

Fishery: Groundfish	Groundfish Fillet	
Product Form: Skinless Fillet	Lingcod	Petrale Sole
Ex-vessel price /2,3	1.04	1.50
Yield for primary product (percent)	35%	30%
Raw product cost of primary product	2.97	5.01
Variable costs:		
Direct labor	0.25	0.38
Packaging and material	0.05	0.05
Other costs (including taxes)	0.07	0.07
Total variable costs	0.37	0.50
Raw product and variable costs	3.34	5.51
Contribution margin to fixed costs /9	0.40	0.40
Primary ex-processor price of product	3.74	5.91
Marketing margins		
Brokerage (2%)	0.07	0.12
Distribution (10%)	0.37	0.59
Retailer (40%)	1.49	2.37
Customer price for primary product (primary ex-processor price plus marketing margins before shrinkage cost markups)	5.68	8.99

Notes:
1. Ex-vessel price example is from annual deliveries to Oregon in 2012.
2. Other notes from Table A.5a also apply to this table.
3. Groundfish is primarily sold as fresh fillets.

Source: TRG (September 2006) and Study.

Table A.6
Annual U.S. Per Capita Consumption of Seafood Products in 1996 to 2011

	Primary Product			
Year	Fresh and Frozen	Canned	Cured	Total
1996	10.0	4.5	0.3	14.8
1997	9.9	4.4	0.3	14.6
1998	10.2	4.4	0.3	14.9
1999	10.4	4.7	0.3	15.4
2000	10.2	4.7	0.3	15.2
2001	10.3	4.2	0.3	14.8
2002	11.0	4.3	0.3	15.6
2003	11.4	4.6	0.3	16.3
2004	11.8	4.5	0.3	16.6
2005	11.6	4.3	0.3	16.2
2006	12.3	3.9	0.3	16.5
2007	12.1	3.9	0.3	16.3
2008	11.8	3.9	0.3	16.0
2009	12.0	3.7	0.3	16.0
2010	11.6	3.9	0.3	15.8
2011	10.9	3.8	0.3	15.0

	Species					
Year	Salmon	Sardines	Tuna	Shellfish	Other	Total
1996	0.5	0.2	3.2	0.3	0.3	4.5
1997	0.4	0.2	3.1	0.3	0.4	4.4
1998	0.3	0.2	3.4	0.3	0.2	4.4
1999	0.3	0.2	3.5	0.4	0.3	4.7
2000	0.3	0.2	3.5	0.3	0.4	4.7
2001	0.4	0.2	2.9	0.3	0.4	4.2
2002	0.5	0.1	3.1	0.3	0.3	4.3
2003	0.4	0.1	3.4	0.4	0.3	4.6
2004	0.3	0.1	3.3	0.4	0.4	4.5
2005	0.4	0.1	3.1	0.4	0.3	4.3
2006	0.2	0.2	2.9	0.4	0.2	3.9
2007	0.3	0.2	2.7	0.4	0.3	3.9
2008	0.1	0.2	2.8	0.4	0.4	3.9
2009	0.2	0.2	2.5	0.4	0.4	3.7
2010	0.2	0.2	2.7	0.4	0.4	3.9
2011	0.2	0.2	2.6	0.4	0.4	3.8

	Secondary Product		
Year	Fillets and Steaks	Sticks and Portions	Shrimp, including all Preparations
1996	3.0	1.0	2.5
1997	3.0	1.0	2.7
1998	3.2	0.9	2.8
1999	3.2	1.0	3.0
2000	3.6	0.9	3.2
2001	3.7	0.8	3.4
2002	4.1	0.8	3.7
2003	4.3	0.7	4.0
2004	4.6	0.7	4.2
2005	5.0	0.9	4.1
2006	5.2	0.9	4.4
2007	5.0	0.9	4.1
2008	4.8	1.0	4.1
2009	4.6	0.7	4.1
2010	5.0	0.9	4.0
2011	5.0	0.9	4.2

Notes: 1. The calculation of per capita consumption is based on a disappearance model. The total U.S. supply of imports and landings is converted to edible weight and decreases in supply such as exports and inventories are subtracted out. The remaining total is divided by a population value to estimate per capita consumption. Data for the model are derived primarily from secondary sources and are subject to incomplete reporting; changes in source data or invalid model assumptions may each have a significant effect on the resulting calculation.

Source: NMFS (August 2012).

Table A.7a
Harvest Pounds by Fishery by Port for Ocean Area-of-Catch in 2012

Fishery	Astoria and Warrenton	Garibaldi	Pacific City	Depoe Bay	Newport	Florence	Reedsport/ Winchester Bay	Coos Bay and Char-leston	Bandon	Port Orford	Gold Beach	Brookings Harbor
Salmon	104,469	71,808	2,654	0	321,991	628	32,062	222,387	0	38,654	2,952	70,282
Dungeness crab	1,213,573	390,160	4,852	6,460	2,015,206	8,133	331,537	1,911,172	32	460,184	7,776	2,316,810
Pink shrimp	8,796,171	67,569	0	0	14,866,078	0	0	21,734,367	0	0	0	3,679,865
Albacore tuna	2,008,284	248,887	37,974	4,092	5,030,208	26,715	166,962	2,237,353	13,842	24,599	6,949	80,168
Groundfish non-whiting	15,787,327	34,980	31,407	18,494	4,195,085	167	86,747	5,129,843	22,419	540,430	77,493	2,550,728
Trawl gear	15,072,302	0	0	0	2,863,723	0	0	4,729,944	0	0	0	2,368,375
Fixed gear LE	697,238	0	0	0	1,274,540	0	86,314	358,843	0	230,597	1,524	153,184
Non-sablefish	35,009	0	0	0	72,483	0	16,380	27,045	0	50,573	1,524	10,802
Longline or setline	32,300	0	0	0	70,087	0	16,128	22,889	0	44,538	1,524	10,802
Other hook and line	0	0	0	0	0	0	0	0	0	6,035	0	0
Fish pot	2,709	0	0	0	2,396	0	252	4,156	0	0	0	0
Sablefish	662,229	0	0	0	1,202,057	0	69,934	331,798	0	180,024	0	142,382
Longline or setline	226,375	0	0	0	612,567	0	58,248	300,799	0	180,024	0	142,382
Fish pot	435,854	0	0	0	589,490	0	11,686	30,999	0	0	0	0
Fixed gear OA	17,787	34,271	31,399	18,494	51,976	167	416	38,565	22,419	308,344	75,961	29,169
Non-sablefish	6,484	33,159	31,399	18,494	19,792	52	83	7,891	22,419	214,668	75,961	21,438
Longline or setline	6,364	140	0	0	2,870	52	10	4,031	0	52,048	0	824
Other hook and line	0	29,096	31,399	18,494	16,922	0	73	3,814	22,419	162,620	75,961	20,614
Fish pot	120	3,923	0	0	0	0	0	46	0	0	0	0
Sablefish	11,303	1,112	0	0	32,184	115	333	30,674	0	93,676	0	7,731
Longline or setline	3,480	313	0	0	18,127	115	333	30,038	0	93,676	0	7,731
Other hook and line	0	0	0	0	561	0	0	0	0	0	0	0
Fish pot	7,823	799	0	0	13,496	0	0	636	0	0	0	0
Non-trawl gear and non-fixed gear LE	0	0	0	0	3,126	0	0	311	0	976	0	0
Non-sablefish	0	0	0	0	2,831	0	0	311	0	976	0	0
Sablefish	0	0	0	0	295	0	0	0	0	0	0	0
Non-trawl gear and non-fixed gear OA	0	709	8	0	1,720	0	17	2,180	0	513	8	0
Non-sablefish	0	709	8	0	1,720	0	17	2,180	0	513	8	0
Pacific whiting	51,847,185	0	0	0	55,803,036	0	0	2,051	0	0	0	87
Pacific sardine	93,956,395	0	0	0	257	0	0	0	0	0	0	0
Sea urchin	0	0	0	187,881	16	0	0	27,207	0	287,115	63,786	1,113
Halibut	35,700	6,419	201	102	118,924	995	6,388	20,546	0	7,409	0	454
Hagfish	68,012	0	0	0	297,806	0	0	1,244,102	0	156	0	0
Other	4,235,201	193,399	6,004	5,535	89,965	1,690	16,899	20,854	0	4,666	4	9
Total	178,052,317	1,013,222	83,092	222,564	82,738,572	38,328	640,595	32,549,882	36,293	1,363,213	158,960	8,699,516

Notes: 1. Astoria includes Cannon Beach and Gearhart/Seaside; Garibaldi includes Tillamook and Nehalem Bay; Pacific City includes Netarts Bay; Depoe Bay includes Siletz Bay; Newport includes Waldport.

Source: PacFIN annual vessel summary, April 2013 extraction.

Table A.7b
Harvest Revenue by Fishery by Port for Ocean Area-of-Catch in 2012

Fishery	Astoria and Warrenton	Garibaldi	Pacific City	Depoe Bay	Newport	Florence	Reedsport/ Winchester Bay	Coos Bay and Char-leston	Bandon	Port Orford	Gold Beach	Brookings Harbor
Salmon	501,534	331,000	13,729	0	1,532,309	3,386	169,178	1,183,031	0	198,300	13,931	302,412
Dungeness crab	4,010,227	1,400,742	16,139	24,099	6,809,577	33,477	1,282,810	6,581,880	74	1,439,368	27,791	7,487,404
Pink shrimp	4,347,220	35,090	0	0	7,613,380	0	0	10,861,386	0	0	0	1,828,370
Albacore tuna	3,187,311	340,149	55,769	6,212	7,689,945	62,489	295,915	3,260,772	16,044	28,903	9,184	124,572
Groundfish non-whiting	9,969,016	91,099	59,113	40,873	5,734,600	538	220,851	3,960,342	78,120	1,394,436	219,311	2,065,929
Trawl gear	7,979,141	0	0	0	1,863,600	0	0	2,845,854	0	0	0	1,532,811
Fixed gear LE	1,960,713	0	0	0	3,728,687	0	219,990	1,009,600	0	520,624	6,921	455,823
Non-sablefish	26,024	0	0	0	60,745	0	13,004	24,286	0	103,186	6,921	10,669
Longline or setline	24,075	0	0	0	59,399	0	11,873	19,299	0	84,025	6,921	10,669
Other hook and line	0	0	0	0	0	0	0	0	0	19,161	0	0
Fish pot	1,949	0	0	0	1,346	0	1,131	4,987	0	0	0	0
Sablefish	1,934,689	0	0	0	3,667,942	0	206,986	985,314	0	417,438	0	445,154
Longline or setline	692,050	0	0	0	2,094,195	0	167,043	915,244	0	417,438	0	445,154
Fish pot	1,242,639	0	0	0	1,573,747	0	39,943	70,070	0	0	0	0
Fixed gear OA	29,162	89,603	59,105	40,873	136,572	538	827	100,273	78,120	872,152	212,374	77,295
Non-sablefish	4,236	87,116	59,105	40,873	41,821	78	202	13,489	78,120	655,031	212,374	58,734
Longline or setline	4,163	131	0	0	3,261	78	1	4,403	0	139,192	0	2,401
Other hook and line	0	71,214	59,105	40,873	38,560	0	201	9,076	78,120	515,839	212,374	56,333
Fish pot	73	15,771	0	0	0	0	0	10	0	0	0	0
Sablefish	24,926	2,487	0	0	94,751	460	625	86,784	0	217,121	0	18,561
Longline or setline	9,031	807	0	0	58,613	460	625	85,419	0	217,121	0	18,561
Other hook and line	0	0	0	0	2,673	0	0	0	0	0	0	0
Fish pot	15,895	1,680	0	0	33,465	0	0	1,365	0	0	0	0
Non-trawl gear and non-fixed gear LE	0	0	0	0	1,899	0	0	525	0	1,076	0	0
Non-sablefish	0	0	0	0	1,371	0	0	525	0	1,076	0	0
Sablefish	0	0	0	0	528	0	0	0	0	0	0	0
Non-trawl gear and non-fixed gear OA	0	1,496	8	0	3,842	0	34	4,090	0	584	16	0
Non-sablefish	0	1,496	8	0	3,842	0	34	4,090	0	584	16	0
Pacific whiting	7,558,053	0	0	0	7,052,472	0	0	4	0	0	0	0
Pacific sardine	8,973,837	0	0	0	0	0	0	0	0	0	0	0
Sea urchin	0	0	0	116,062	16	0	0	13,605	0	152,033	44,032	1,280
Halibut	167,252	33,160	1,050	445	581,435	5,623	35,963	101,188	0	36,279	0	2,154
Hagfish	61,212	0	0	0	207,422	0	0	893,038	0	16	0	0
Other	234,594	108,994	4,414	14,713	86,116	1,690	14,930	73,947	0	3,950	2	32
Total	39,010,256	2,340,234	150,214	202,404	37,307,272	107,203	2,019,647	26,929,193	94,238	3,253,285	314,251	11,812,153

Notes: 1. Astoria includes Cannon Beach and Gearhart/Seaside; Garibaldi includes Tillamook and Nehalem Bay; Pacific City includes Netarts Bay; Depoe Bay includes Siletz Bay; Newport includes Waldport.

Source: PacFIN annual vessel summary, April 2013 extraction.

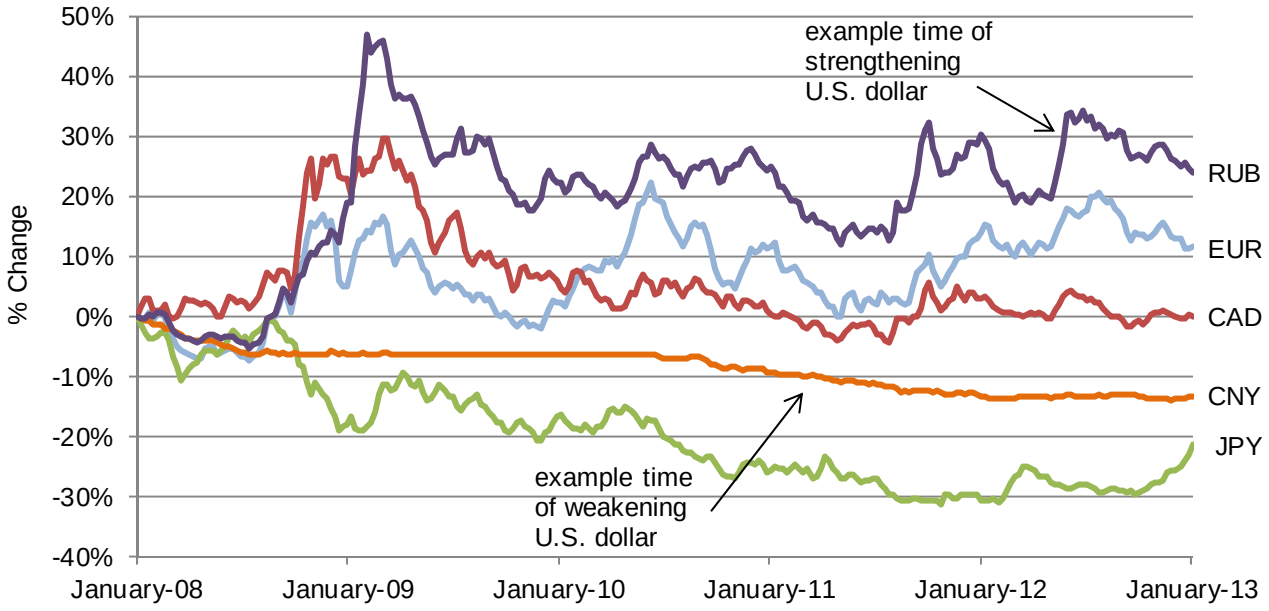
Table A.8
Harvest Revenue Delivered to Lower Columbia River and Other Ports Itemized for Area-of-Catch in 2012

Landing Location	Area-of-Catch ($000)				
		Columbia River		Other Harvest	
Gear and Species	Ocean	Lower	Upper	Locations	Total
Salmon Net					
Astoria	0	2,221	0	0	2,221
Ilwaco	0	937	0	854	1,791
Other ports		171	3,795		3,967
Salmon Troll					
Astoria	502	0	0	0	502
Ilwaco	152	0	0	0	152
Groundfish					
Astoria	9,969	0	0	0	9,969
Ilwaco	3,257	0	0	0	3,257
Pacific Whiting					
Astoria	7,558	0	0	0	7,558
Ilwaco	512	0	0	0	512
Dungeness Crab					
Astoria	4,010	0	0	0	4,010
Ilwaco	6,614	0	0	0	6,614
Pacific Sardine					
Astoria	8,974	0	0	0	8,974
Ilwaco	1,480	0	0	0	1,480
Pink Shrimp					
Astoria	4,347	0	0	0	4,347
Ilwaco	560	0	0	0	560
Albacore Tuna					
Astoria	3,187	0	0	0	3,187
Ilwaco	10,254	0	0	0	10,254
White Sturgeon					
Astoria	0	117	0	0	117
Ilwaco	0	57	0	12	70
Other ports		3	208		211
Pacific Halibut					
Astoria	167	0	0	0	167
Ilwaco	168	0	0	0	168
Shellfish					
Astoria	51	0	0	0	51
Ilwaco	13,941	0	0	69	14,010
Other Species River					
Astoria		1	0	0	1
Ilwaco		16	31	0	47
Other ports		0	2		2
Other Species Ocean					
Astoria	245				245
Ilwaco	469				469
Total					
Astoria	39,010	2,339	0	0	41,349
Ilwaco	37,406	1,010	31	935	39,383
Total Astoria/Ilwaco	76,416	3,350	31	935	80,732
Total other ports		175	4,005		4,180

Notes:
1. Fish ticket information for Columbia River salmon area-of-catch is assigned to two general river landing codes. One code is for Washington side landings and one code is for Oregon side landings. It is assumed the lower Columbia River area-of-catch landings on the Washington side are delivered to Ilwaco purchasers and landings on the Oregon side are delivered to Astoria. Fish ticket information for area-of-catch when not made at a river location (i.e. deliveries to a Seattle area purchaser) does not have this limitation and is assigned to "other ports." The same assumption for upper river treaty harvests is not valid. About a quarter of the upper river harvests are purchased by the same processors and buying stations that purchase from lower river harvests. This means there will be a slight undercounting of business activity for Astoria and Ilwaco processing businesses.
2. For ocean area-of-catch, Astoria includes Cannon Beach and Seaside landing locations. Ilwaco includes Willapa Bay and Chinook locations. Other ports include other Columbia River points of landing as well as out-of-region locations such as the Seattle area. Other areas-of-catch include Willapa Bay, Grays Harbor, and Puget Sound.
3. Salmon net gear includes gillnet, in some years a very minor amount of set net in the lower Columbia River, and set net, dip net, and other net in the upper Columbia River.
4. Salmon troll includes a very minor amount harvested in the ocean with other non-net and net type gear.
5. There is a minor amount of groundfish showing on fish tickets for being caught in the upper Columbia River and landed at Oregon side Columbia River ports. No attempt was made to resolve inconsistencies in fish ticket information.
6. Shellfish includes Washington aquaculture shellfish.
7. "Other species river" includes anchovy ($31 thousand) and shad ($18 thousand). "Other species ocean" includes hagfish ($445 thousand), chub and unspecified mackerel ($224 thousand), and anchovy ($24 thousand).

Source: PacFIN annual vessel summary and fish ticket data, April 2013 extraction.

Figure A.1
Currency Exchange Rate for U.S. Dollar and Countries that Import U.S. Seafood Production



Notes:
1. Currencies are weekly percent change from first week of January 2008 = 0%.
2. USD = U.S. dollar; EUR = Euro; CAD = Canadian dollar; JPY = Japanese yen; CNY = Chinese yuan renminbi; RUB = Russian rouble.

Source: OANDA.

Table A.9
Location and Parent Company of Major Seafood Processing Groups as of 2012

Landing Processor or Buyer Name	Identification Code	Parent Company	Out-of-State Presence	Facility Location (Port Group Area)					
				Astoria	Tillamook	Newport	Coos Bay	Port Orford	Brookings
AIR FRESH SEAFOODS MADRAS, OR	0936			X					
AMERICAN ALBACORE FISHING ASSOCIA ASTORIA, OR	0989					X			
ASTORIA HOLDINGS INC ASTORIA, OR	0728	Astoria Holdings Inc.		X					
ASTORIA PACIFIC SEAFOODS ASTORIA, OR	0739	Bornstein Seafoods	(W)	X					
AUE, ROBERT TOLEDO, OR	0792					X			
BANDON PACIFIC INC CHARLESTON, OR	0698	Pacific Seafood Group	(A)(W)(C)			X	X		
BARNACLE BILLS SEAFOOD LINCOLN CITY, OR	0354				X	X			
BELL BUOY SEASIDE, OR	0769	Bell Buoy Crab Co. Inc.	(W)	X					
BILLS SEAFOOD, , II MCMINNVILLE, OR	0884			X		X	X		
BLAINE CRAB, BC FISHERIES LLC HARBOR, OR	0940								X
BLANCHARD, JOHN BAY, OR	2958						X		
BORNSTEIN SEAFOODS INC ASTORIA, OR	0646	Bornstein Seafoods	(W)	X		X	X		X
BOUNDERS FRESH CRAB HARBOR, OR	1004								X
BRANDYWINE FISHERIES LLC LEABURG, OR	1054						X		
BURRIS, JOHN DEPOE BAY, OR	1111					X			
CBTA MARKETING DIVISION CHARLESTON, OR	0961						X		
CHARLESTON CRAB SHACK LLC CHARLESTON, OR	0988						X		
CHETCO SEAFOOD MARKET HARBOR, OR	1099								X
CHUCKS SEAFOODS INC CHARLESTON, OR	2020						X		
CODYS SEA TO YOU SEAFOODS NEWPORT, OR	0871					X			
CRAB BAIT INC BEAVERTON, OR	4524				X				
D & G BAIT INC CLACKAMAS, OR	4215					X			
DA YANG SEAFOODS INC ASTORIA, OR	0891			X		X	X		
DEEPWATER SEAFOODS LLC GARIBALDI, OR	0853				X				
DEEPWATER SEAFOODS LLC GARIBALDI, OR	4528				X				
DELMAR SEAFOODS ASTORIA, OR	0267			X					
DEPOE BAY FISH CO INC SILETZ, OR	0016					X			
DUMAN, TERRY W FLORENCE, OR	2946			X			X		
ECOLA SEAFOODS INC CANNON BEACH, OR	0599			X	X				
EDER FISH COMPANY NEWPORT, OR	0821					X			
EKO UNI OREGON FLORENCE, OR	1087					X	X		
EVANS, MARY NEWPORT, OR	1042					X			
FIRSTCO MARINE LLC TOLEDO, OR	1094					X			
FISHERMANS CHOICE MARKET LLC CLOVERDALE, OR	1058						X		
FISHERMENS WHARF CHARLESTON, OR	0926						X		
FISHHAWK FISHERIES ASTORIA, OR	0385	Fishhawk Fisheries	(A)(W)	X					
FOODS IN SEASON INC PORTLAND, OR	1049			X					
FULLER, PAUL ELMIRA, OR	1073					X			
GOODELL, DANIEL L WASHOUGAL, WA	2872					X			

Table A.9 (continued)

Landing Processor or Buyer Name	Identification Code	Parent Company	Out-of-State Presence	Facility Location (Port Group Area)					
				Astoria	Tillamook	Newport	Coos Bay	Port Orford	Brookings
HALLMARK FISHERIES CHARLESTON, OR	1505	California Shellfish Co.	(C)			X	X	X	X
HEUKER BROTHERS INC CASCADE LOCKS, OR	0096			X					
JEWELL, KEN GARIBALDI, OR	0991				X				
JOHNS FRESH SEAFOOD BROOKINGS, OR	0243								X
JRE BIO INC NORTH BEND, OR	1104						X		
KOSON ENTERPRISES INC COOS BAY, OR	1086						X		
KRAB KETTLE FISHERIES INC FLORENCE, OR	0422					X			
KROO, KATHY ROCKAWAY BEACH, OR	4453				X				
LAVIOLETTE STEAMERS LLC ROCKAWAY BEACH, OR	0582				X				
LIVING PACIFIC SEAFOOD SILETZ, OR	0627					X			
LOCAL OCEAN SEAFOODS INC NEWPORT, OR	0777					X			
LOGSDON, DAVID M NEWPORT, OR	2757					X			
MEYER, PAUL TILLAMOOK, OR	2951				X				
MOORE, DOUGLAS NEWPORT, OR	2606					X			
MORGAN, MICHAEL J NEWPORT, OR	2440					X			
NEWELL SEAFOODS LLC NEWPORT, OR	0954				X	X	X		
NEWPORT BAY FISH CO SOUTH BEACH, OR	0788					X			
NOR-CAL SEAFOODS INC PORT ORFORD, OR	0684	Nor-Cal Seafoods	(C)				X	X	X
NORTHWEST WILD PRODUCTS ASTORIA, OR	1022			X			X		
O M SEAFOOD CO PORTLAND, OR	0524			X			X	X	
OCEAN BEAUTY SEAFOODS LLC PORTLAND, OR	0029			X					
OCEAN BLEU SEAFOODS NEWPORT, OR	1032					X			
OCEAN FRESH LLC ROSEBURG, OR	1103					X			
OCEAN GOLD SEAFOODS CHARLESTON, OR	0908				X		X		
OCEAN KING MARKET PORTLAND, OR	1092						X	X	
OCEAN STAR FISHERIES INC NEWPORT, OR	0917					X	X		
OPAC SEAFOODS LTD/STARVIN MARVINS CHARLESTON,	0807	Starvin Marvin's Seafood	(W)				X		
OREGON BRAND SEAFOOD LLC CHARLESTON, OR	0692						X		
OREGON OCEAN SEAFOODS WARRENTON, OR	0020			X					
OREGON PRIDE SEAFOOD CRESSWELL, OR	1043						X		
OREGON SEAFOOD CO INC WARRENTON, OR	1044			X					
OREGON SEAFOODS LLC COOS BAY, OR	1061						X		
OREGON UNDERSEA GARDENS INC NEWPORT, OR	4230					X			
PACIFIC CHOICE SEAFOODS BROOKINGS, OR	0736	Pacific Seafood Group	(A)(W)(C)					X	X
PACIFIC COAST SEAFOODS COMPANY WARRENTON, OR	0081	Pacific Seafood Group	(A)(W)(C)	X	X				
PACIFIC OYSTER CO BAY CITY, OR	0784	Pacific Seafood Group	(A)(W)(C)		X				
PACIFIC SHRIMP COMPANY NEWPORT, OR	0654	Pacific Seafood Group	(A)(W)(C)			X	X		
PACIFIC WAVES TUNA AND SEAFOOD CO CHARLESTON, (	1023						X		
PACIFIC WILD SALMON TRIBAL FISHER STEVENSON, WA	0699			X					

Table A.9 (continued)

Landing Processor or Buyer Name	Identification Code	Parent Company	Out-of-State Presence	Facility Location (Port Group Area)					
				Astoria	Tillamook	Newport	Coos Bay	Port Orford	Brookings
PAZAR, ALAN FLORENCE, OR	2157						X		
PHILLIPS SEAFOODS SILETZ, OR	1082					X			
POINT ADAMS PACKING CO - HAMMOND HAMMOND, OR	0242	California Shellfish Co.	(C)	X					
POORT DBA PORT ORFORD SUSTAINABLE PORT ORFORD,	0993						X	X	
PORT O CALL BANDON, OR	0964						X		
PORTER, WAYLON CLOVERDALE, OR	1063				X				
REINHOLDT FISHERIES ST HELENS, OR	0298								
ROGUE KING SEAFOOD GOLD BEACH, OR	0651						X		X
SCHUTTPELZ, STUART REEDSPORT, OR	2813						X		
SEA Q FISH LTD PACIFIC CITY, OR	0623				X				
SEA STAR ENTERPRISE NEWPORT, OR	0793					X			
SEA WATER SEAFOODS CO SOUTH BEACH, OR	1113					X			
SEAFOOD PRODUCERS COOPERATIVE CHARLESTON, OR	0776	Seafood Producers Co-op,	(W)(C)			X			
SEAFOOD XP LLC CHARLESTON, OR	1079						X		
SHENANEGAN SEAFOODS COOS BAY, OR	0799						X		
SMITH, TIM REEDSPORT, OR	2897						X		
SOUTH BEACH FISH MARKET INC SOUTH BEACH, OR	0943				X	X			
SPORTSMEN'S CANNERY WINCHESTER BAY, OR	0972						X		
ST PAUL HAMMOND, OR	1064			X					
STICKRODS BAIT CO OTIS, OR	4486					X			
STICKRODS FISH CO OTIS, OR	0992				X				
TARABOCHIA, BRIAN ASTORIA, OR	0672			X					
TEREBESI, JOHN E BROOKINGS, OR	2412								X
THE CHICKEN MAN, ERIC EDER WALDPORT, OR	1112					X			
THE FISH FACTOR KEIZER, OR	1076					X			
TILLAMOOK BAY BOATHOUSE LLC GARIBALDI, OR	0726				X				
TONY'S SMOKE HOUSE & CANNERY INC OREGON CITY, OF	0520			X					
TRIDENT SEAFOODS CORP NEWPORT, OR	0714	Trident Seafoods Corp.	(A)(W)			X			
WEST BAY MARKETING ASTORIA, OR	0803	West Bay Marketing		X					
WEST COAST CLAMS COOS BAY, OR	1093						X		
WHITTIER, LUKE EUGENE, OR	2957						X		
WILD PLANET FOODS INC NEWPORT, OR	0907					X			
WILKES, HARRY R REEDSPORT, OR	2929						X		
WILSON FISH MARKETS LLC BRIGHTWOOD, OR	1056				X	X	X		
WINGS FOOD MARKET PORTLAND, OR	0976						X	X	X

Notes:
1. Landing processor or buyer name and identification code is from fish dealer license information. Blank parent companies identify small, independent, local processing plants. Processor or buyer names that have more than one type of license are listed separately, such as Deepwater Seafoods and Stickrods, which each have a bait type license.
2. Parent company assignment is from personal communication or other investigation of cross ownership. Parents are assigned to subsidiaries groups by interpretations and evidence of various legal arrangements that include ownership ties, lease contracts, and purchasing arrangements.
3. Only named processors or buyers making substantial purchases in any port group area are shown.

Source: PacFIN annual vessel summary April 2013 extraction, TRG (September 2006), and ODFW personal communication.

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APPENDIX B

Exports

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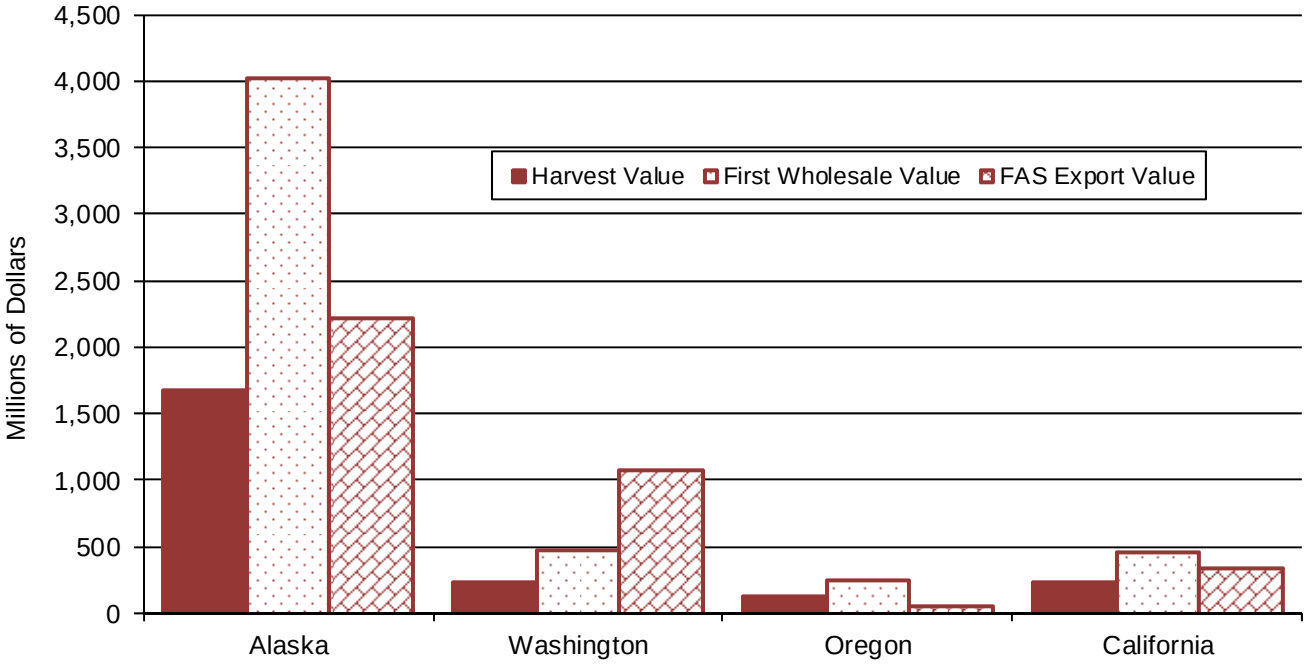
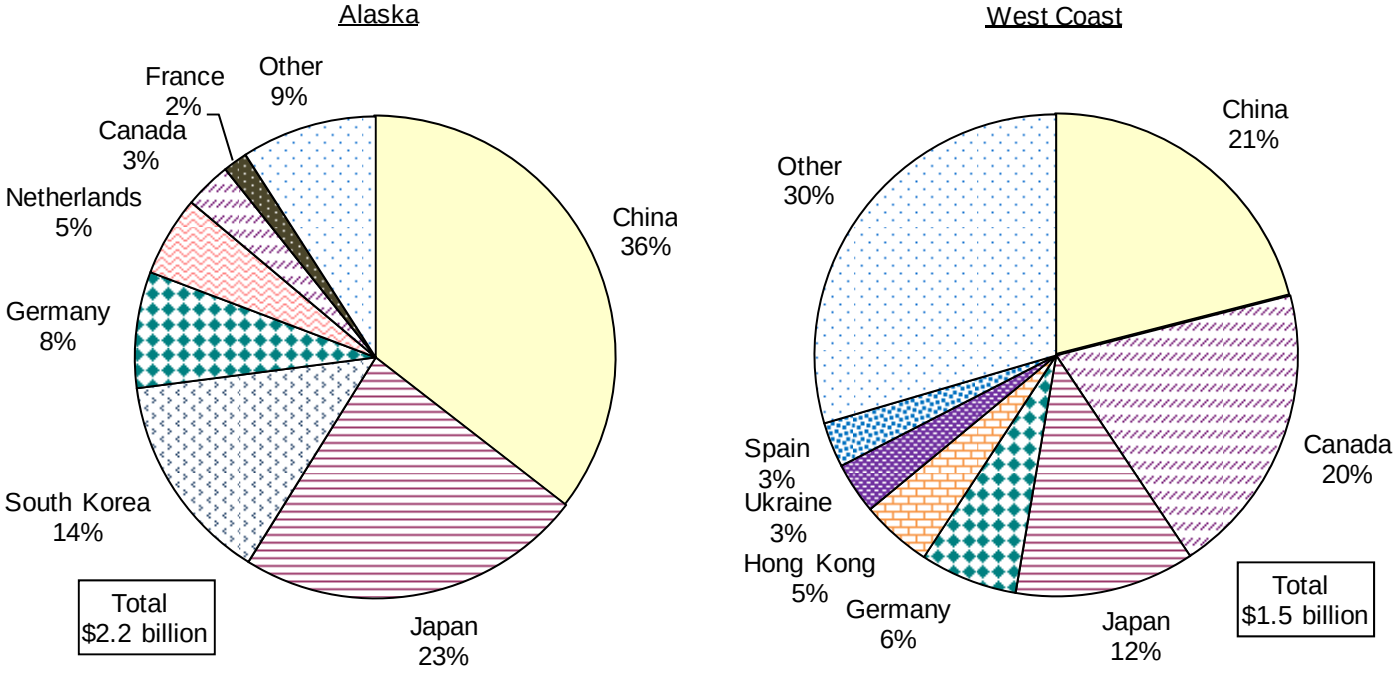
Figure B.1
Alaska and West Coast Seafood Product Flows: Harvest Value,
First Wholesale Value, and Processed Product International Exports in 2012



Notes:
1. Washington harvest value includes all West Coast offshore fishery.
2. First wholesale value for Alaska is reported by ADFG, and 2010 ratio is applied to 2012 harvest value. West Coast states use a rule-of-thumb for factor of 2 of harvest value.
3. Value basis is FAS (Free Alongside Ship). FAS is value measured in USD at country of origin. It is the transaction price and includes delivery to the port or airport of departure approved and ready for export. It does not include licensing, inspection, custom/duties, loading, transport, off-loading, carriage spoilage, nor insurance costs.

Sources: U.S. Bureau of Census.

Figure B.2
Processed Product International Exports for the Top Seven Countries in 2012



Sources: U.S. Bureau of Census.

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APPENDIX C

Distant Water Fishery Index

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Table C.1
Distant Water Fishery Index

	West Coast Offshore Pacific Whiting			Oregon Home-Port Vessels Revenue From Other West Coast States		Alaska Offshore Pollock			Alaska Onshore													Fuel Price Index	
									Salmon			Halibut		Sablefish		Halibut Sablef.	Crab						
	Pounds					Pounds			Pounds			Pounds		Pounds		Wt.Avg.	Pounds			Diesel	
Year	(000's)	Price	Index	Revenue ($000)	Index	(000's)	Price	Index	(000's)	Price	Index	(000's)	Price	(000's)	Price	Index	(000's)	Price	Index	Retail	Index
1996	132,423	0.023		6,083		1,278,668	0.08		907,770	0.40		33,295	2.16	58,154	1.46		97,239	1.75		1.36	
1997	163,111	0.036	1.86	5,971	0.98	1,289,691	0.10	1.56	630,410	0.48	0.69	47,981	2.12	36,813	2.28	1.12	145,290	1.17	0.96	1.28	1.06
1998	161,184	0.021	1.07	3,935	0.65	1,437,399	0.07	1.76	712,810	0.38	0.54	49,270	1.31	36,551	1.49	0.82	279,666	0.77	1.70	1.08	1.25
1999	160,135	0.030	1.57	4,481	0.74	1,424,172	0.09	1.78	890,840	0.45	0.86	56,585	2.04	30,536	1.90	1.26	216,189	1.41	2.17	1.20	1.13
2000	116,406	0.034	1.25	4,965	0.82	1,518,969	0.12	2.76	710,980	0.41	0.62	52,907	2.63	34,777	2.28	1.76	52,348	2.67	1.13	1.50	0.90
2001	91,645	0.028	0.82	5,380	0.88	1,801,158	0.12	4.16	768,840	0.33	0.45	56,616	2.13	32,267	2.05	1.66	47,342	2.67	0.93	1.37	0.99
2002	106,265	0.035	1.19	4,413	0.73	1,871,705	0.12	4.23	624,069	0.29	0.37	59,143	2.39	33,192	2.11	1.61	57,950	2.72	1.11	1.27	1.07
2003	99,470	0.034	1.09	5,555	0.91	1,891,547	0.11	3.86	799,428	0.30	0.47	58,925	3.14	38,198	2.39	1.80	57,170	3.32	1.57	1.42	0.95
2004	104,650	0.027	0.89	8,329	1.37	1,884,933	0.12	3.86	803,702	0.39	0.67	57,981	3.40	39,168	2.21	1.67	52,841	3.39	1.44	1.74	0.78
2005	158,947	0.037	1.89	7,128	1.17	1,933,434	0.15	4.85	961,343	0.42	0.84	56,073	3.55	38,286	2.45	2.02	57,185	3.25	1.21	2.14	0.63
2006	133,494	0.041	1.74	8,649	1.42	1,915,797	0.16	4.71	731,355	0.59	0.80	53,770	4.55	36,610	2.80	2.31	69,250	2.29	0.89	2.32	0.58
2007	115,817	0.047	1.76	5,913	0.97	1,706,360	0.16	4.45	948,121	0.56	1.01	51,495	5.38	36,033	2.98	3.15	70,919	3.17	1.59	2.38	0.57
2008	159,705	0.069	3.53	8,723	1.43	1,269,850	0.27	5.19	707,805	0.83	1.07	114,528	4.70	31,652	3.60	5.91	99,561	3.27	3.89	2.96	0.46
2009	82,690	0.037	0.99	6,990	1.15	1,051,594	0.25	4.23	731,023	0.75	1.25	58,970	3.06	34,396	3.19	2.33	89,771	2.71	2.90	1.95	0.70
2010	114,446	0.044	1.63	6,525	1.07	1,102,300	0.20	3.42	818,604	0.99	1.76	57,322	4.74	28,313	4.38	3.13	79,875	3.72	3.34	2.34	0.58
2011	123,473	0.065	2.58	9,063	1.49	1,569,675	0.22	5.89	797,604	1.13	1.84	43,386	6.49	28,824	6.15	3.31	80,565	4.92	4.56	2.93	0.46
2012	84,478	0.085	2.31	15,626	2.57	1,601,491	0.22	5.00	693,980	1.11	1.83	34,047	5.81	33,046	4.89	3.17	111,941	3.42	4.19	3.00	0.45

Notes:
1. Ex-vessel prices and revenues are adjusted to 1996 dollars.
2. West Coast fisheries indexes are current year fishery revenue divided by fishery revenue in 1996. Alaska fisheries indexes are current year fishery revenue times Oregon share, divided by fishery revenue in 1996 times Oregon share. Oregon share is declared residence of permit holder. Fisheries harvested predominately by longline gear use halibut and sablefish revenue weighted average index. Indexes are used as a factor to estimate current year economic impacts for a particular component of Oregon's distant water fisheries. All previous years data is refreshed with latest data available before index calculations are made.
3. The current year indexes are preliminary because assumptions are sometimes used to make complete year estimates of landings from partial year data. Alaska pollock and West Coast Pacific whiting volume and price are only for catcher vessel retained harvests. The catcher vessel price for the previous year is assumed to be the same as in the current year for pollock. West Coast Pacific whiting observer data may be complete; price is based on onshore price less 15%. Crab landings are summed over several species, for example the shares of pounds in 2005 are king (42%), tanner (6%), snow (44%), Dungeness (8%), and other (<0%).
4. Home-port state is defined as the state of the port group where a vessel makes the most landings by revenue.
5. The fuel price index is the inverse of the of the inflation adjusted price of West Coast diesel fuel highway retail price.

Sources: PacFIN offshore and annual vessel summary extractions up to April 2013, North Pacific Fishery Management Council for pollock, and Alaska Department of Fish and Game (ADFG) for Alaska salmon. Halibut, sablefish, and crab from CFEC, NOAA Fisheries, and ADFG. Fuel prices from U.S. Energy Information Administration.

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APPENDIX D

Landing and License Fees and Assessments

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Table D.1
Estimated Commercial Fish Fund Fees in 2010 to 2012

COMMERCIAL FISHING LANDING FEES a/	2010	2011	2012	Average
SALMON	$242,530	$212,730	$218,810	$224,690
SHRIMP	$256,149	$563,165	$561,544	$460,286
CRAB	$738,791	$1,006,140	$655,665	$800,199
ALBACORE	$135,438	$204,742	$164,331	$168,170
SARDINE	$120,714	$74,012	$207,780	$134,169
SABLEFISH	$340,313	$390,748	$259,532	$330,197
SOLE/FLOUNDER	$155,804	$153,995	$165,785	$158,528
GROUNDFISH, MISC	$117,010	$131,254	$147,162	$131,809
WHITING	$138,490	$387,749	$338,226	$288,155
OTHER	$60,404	$77,486	$73,730	$70,540
TOTAL LANDING FEES	$2,305,643	$3,202,022	$2,792,564	$2,766,743
EST XFER TO R&E	$121,116	$121,116	$96,310	$112,848
EST XFER TO NEARSHORE	$49,605	$52,075	$54,091	$51,924
EST XFER TO DEVO	$0	$0	$0	$0
NET REV LANDINGS FEES	$2,256,038	$3,149,946	$2,738,473	$2,714,819
XFER TO GEN FUND	$0	$0	$0	$0
RETAIN IN CFF	$2,256,038	$3,149,946	$2,738,473	$2,714,819
COMMERCIAL FISHING LICENSE & PERMIT FEES				
FISHING	$274,332	$256,294	$200,014	$243,547
CREW FISHING	$179,567	$163,927	$139,125	$160,873
JUVENILE	$1,152	$1,344	$1,344	$1,280
BAIT FISHING	$6,426	$7,752	$5,814	$6,664
TUNA LANDING	$15,870	$19,528	$15,010	$16,803
BOAT	$699,174	$674,346	$532,582	$635,367
SHRIMP PERMIT	$22,768	$22,184	$19,453	$21,468
TROLL PERMIT	$145,570	$144,072	$113,228	$134,290
GILLNET PERMIT	$37,648	$38,612	$32,284	$36,181
SCALLOP PERMIT	$3,632	$3,378	$3,071	$3,360
CRAB PERMIT	$69,358	$68,571	$58,798	$65,576
URCHIN PERMIT	$3,454	$2,550	$3,002	$3,002
BLACK/BLUE	$5,508	$5,406	$5,304	$5,406
NEARSHORE	$7,140	$7,140	$7,140	$7,140
CLAM	$1,428	$1,632	$1,020	$1,360
SARDINE	$2,550	$2,550	$2,550	$2,550
SINGLE DELIVERY	$127	$127	$381	$212
WHOLESALE FISH DEALER	$67,800	$66,896	$67,348	$67,348
FISH CANNER	$1,356	$904	$1,356	$1,205
SHELLFISH CANNER	$904	$904	$904	$904
FISH BAIT DEALER	$7,140	$6,426	$5,304	$6,290
LIMITED FISH SELLER	$6,678	$5,460	$5,460	$5,866
FISH BUYER	$23,940	$20,916	$24,444	$23,100
DUPLICATES	$1,665	$2,331	$1,665	$1,887
TOTAL LICENSES & PERMITS	$1,585,187	$1,523,250	$1,246,601	$1,451,679
EST XFER TO R&E	$87,543	$86,095	$85,893	$86,510
TRANSFER TO NEARSHORE	$12,648	$12,546	$12,444	$12,546
NET REV LICS AND PERMITS	$1,484,996	$1,424,609	$1,148,264	$1,352,623
XFER TO GF	$0	$0	$0	$0
RETAIN IN CFF	$1,484,996	$1,424,609	$1,148,264	$1,352,623
EST CONFISCATED	$418,441	$80,755	$30,645	$176,614
GRAND TOTAL (TOTAL INCLUDES NS, R&E, DEVO)	$4,309,271	$4,806,027	$4,069,810	$4,395,036
GRAND TOTAL TO COMM FISH FUND	$4,159,475	$4,655,311	$3,917,382	$4,244,056
Total Transfer to R&E	$208,659	$207,211	$182,203	$199,358
Total Transfer to NEARSHORE	$62,253	$64,621	$66,535	$64,470
Total Transfer to DEVO	$0	$0	$0	$0

Notes: a/ Landing fees are based on landings and value data reported on fish tickets and not actual dealer remittances. Actual dealer landings fee remittances are very close to the estimates based on fish ticket pounds and values.

b/ Effective July 1997, all commercial fishing industry fees are retained by ODFW; no transfer is made to the General Fund.

c/ Effective October 23, 1999, all proceeds from sales of confiscated fish are retained by ODFW; no transfer is made to the General Fund.

d/ The Salmon Limited Fish Seller license was combined with the regular Limited Fish seller license after action by the 1999 legislature.

e/ Transfers to DEVO were discontinued effective January 1, 2010.

Source: ODFW.

Table D.2
Estimated Commodity Commission Assessment Revenue in Fiscal Years 2011 and 2012

Year	Species	Gear	Round Pounds (thousands)	Harvest Value (thousands)
2011	Pink shrimp	Trawl	48,314	$24,607
2011	Groundfish	Trawl	25,366	$14,903
2011	Pacific whiting	Trawl	151,464	$16,517
2011	Other	Trawl	119	$6
	Total		225,263	$56,034
2012	Pink shrimp	Trawl	49,144	$24,685
2012	Groundfish	Trawl	25,037	$14,223
2012	Pacific whiting	Trawl	107,652	$14,611
2012	Other	Trawl	206	$3
	Total		182,039	$53,522

Year	Species	Round Pounds (thousands)	Harvest Value (thousands)	Assessment Rate	Producer/ Handler Assessments
2011	Salmon troll	465	$2,401	1.50	$36,019
2011	Albacore tuna	9,682	$18,766	0.75	$140,745
2011	Dungeness crab	17,260	$44,690	1.00	$446,900
2011	Trawl	225,263	$56,034	0.50	$280,172
	Total	252,671	$121,892		$903,835
2012	Salmon troll	857	$4,249	1.50	$63,730
2012	Albacore tuna	9,886	$15,077	0.75	$113,079
2012	Dungeness crab	8,666	$29,114	1.00	$291,136
2012	Trawl	182,039	$53,522	0.50	$267,611
	Total	201,449	$101,962		$735,557

Notes: 1. Annual landings are for fiscal year months ending in the table's shown year.
2. Trawl gear category includes any species landed with the following trawl gears: flatfish, groundfish (otter), midwater, roller, selective FF (small footrope), shrimp (double rigged or single rigged), or other trawl gear.
3. The four commodity commissions are the Salmon Commission (1.5 percent ex-vessel value troll caught salmon assessed to harvester), Trawl Commission (0.5 percent ex-vessel value of groundfish and shrimp caught with trawl gear assessed to harvester), Albacore Commission (0.75 percent ex-vessel value of albacore tuna whose payment is split evenly by harvesters and processors), and Dungeness Crab Commission (one percent ex-vessel value assessed to harvester). Actual producer/handler assessments accruing to commodity commission budget revenue may be different because it depends on harvest value exemptions that can differ from fish ticket reported harvest value.
4. Trawl assessment estimates starting in year 2011 exclude some non-trawl gear groundfish harvest allowed with the LE trawl permit ITQ program.

Source: Study.

APPENDIX E

Oregon Resident Participation in Alaska Fisheries

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Table E.1
Oregon Resident Participation in Alaska Fisheries for Vessel and Permit Registrants, Crewmember Licenses, and Major Fisheries Earnings in 2011

		Vessel Permits		Crew
Residency	Vessels	Count	Registrants	Licenses
Clatsop County	65	104	88	160
Tillamook County	0	3	3	4
Lincoln County	34	65	49	115
Coastal Lane and Douglas Counties	4	10	8	20
Coos County	5	17	16	66
Curry County	4	10	6	8
Other Oregon	169	449	364	975
All Oregon	281	657	534	1,348

Permit Fisheries	Fishery Permits	Earnings (thousands)	Earnings per Permit (thousands)
Crab	19	30,733	1,618
Other groundfish	76	85,138	1,120
Halibut	63	8,005	127
Sablefish	33	7,054	214
Salmon	229	18,214	80
Herring, shellfish, other	18	239	13
All fisheries	438	149,382	341

Notes:
1. Earnings are the same as harvest value.
2. Unique registrants are determined by unique occurrences of the permit file "name" field, which includes first name, last name, and middle initial of permit holders.
3. Registrant declared resident zip codes are used to compile Oregon locations. An undetermined number of participants not included in this table's counts may maintain principal residency in Alaska and live part-time in Oregon.
4. Permit fishery groups for herring and other shellfish are not available due to confidentiality, so they are estimated by the residual of the total earnings and other fishery groups.
5. The permits shown by county include all issued permits, and the permits shown by statewide fisheries are permits fished.
6. Not all columns are additive, for example permits can't be in more than one permit fishery group, so permit count is additive by permit fishery groups, but permits can have more than one zip code, so permit counts are not additive for the counties. A summation underline is used for columns that are additive, and no underline for columns that are not additive.

Sources: Alaska Commercial Fisheries Entry Commission (CFEC) for vessel, permit, and fishery earnings data, downloaded December 2012 from http://www.cfec.state.ak.us/; and, Alaska Department of Fish and Game (ADFG) for crewmember license data, personal communication December 2012.

Table E.2
Oregon Registrant Alaska Fisheries Permit Estimated Earnings by Selected Regions in 2011

	Clatsop County			Lincoln County		
Permit Fisheries	Permits	Registrants	Earnings (thousands)	Permits	Registrants	Earnings (thousands)
Crab	2	2	1,863	14	7	13,038
Other Groundfish	10	9	9,254	38	37	35,166
Halibut	14	14	1,601	3	3	343
Sablefish	8	8	1,612	1	1	202
Salmon	63	65	3,187	7	8	354
Herring, shellfish, other	7	7	25	2	2	7
All fisheries	104	88	17,542	65	49	49,110

	Other Coastal			Other Oregon		
Permit Fisheries	Permits	Registrants	Earnings (thousands)	Permits	Registrants	Earnings (thousands)
Crab	2	2	1,863	15	11	13,969
Other Groundfish	6	6	5,552	38	35	35,166
Halibut	4	4	457	49	47	5,603
Sablefish	3	3	605	23	22	4,636
Salmon	16	15	810	275	267	13,913
Herring, shellfish, other	9	8	32	49	47	175
All fisheries	40	33	9,319	449	364	73,462

Notes: 1. Estimated earnings are calculated from Oregon statewide average earnings per permit issued, times the number of permits issued for each county.
2. Other coastal region includes Tillamook, Coos, and Curry Counties and coastal portions of Lane and Douglas Counties.
3. See Table E.1 for other notes and sources.