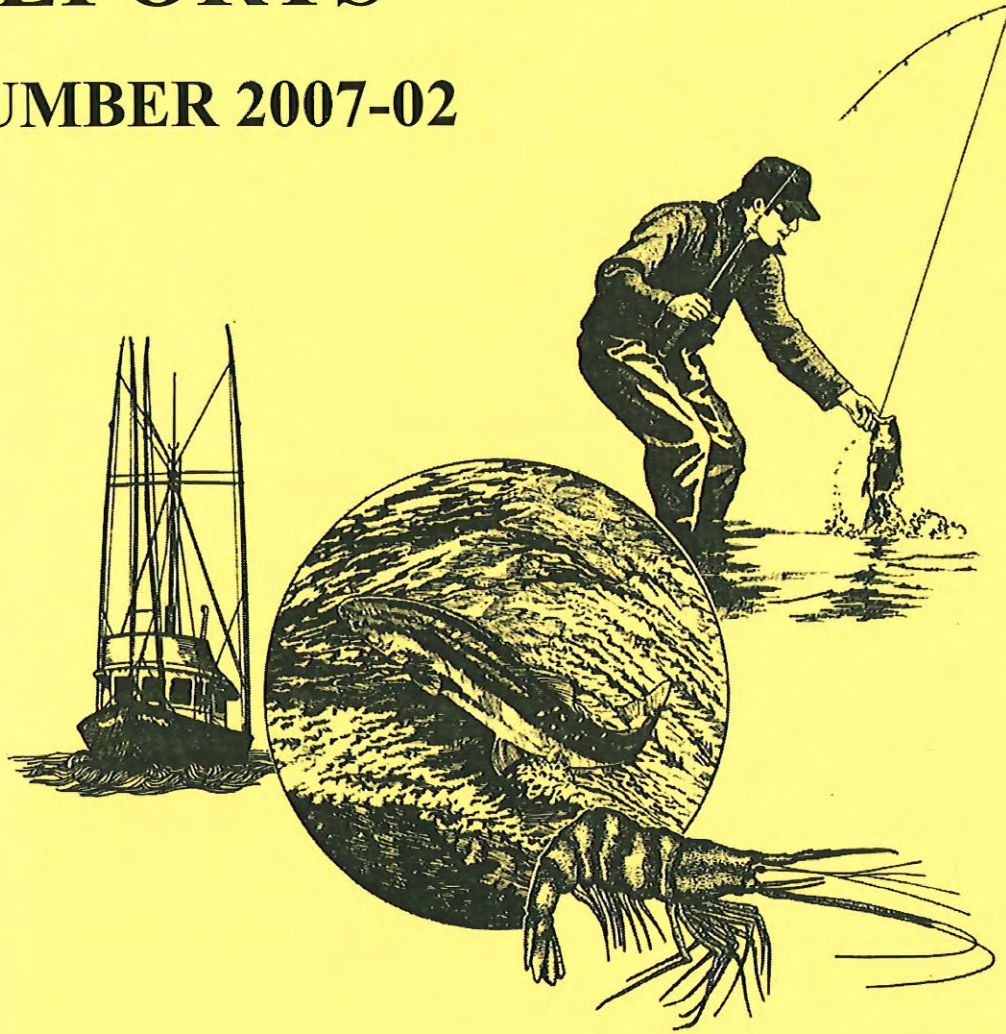


INFORMATION REPORTS

NUMBER 2007-02



FISH DIVISION Oregon Department of Fish and Wildlife

The Economic Contribution of Alaskan Commercial Fisheries
to the State of Oregon

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The Economic Contribution of Alaskan Commercial Fisheries to the State of Oregon

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May 2007

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1.1. Executive summary

1.1.1. Purpose

Alaska commercial fisheries represent a large source of revenue (defined in this report as money earned from the sale of harvested species) to fishermen from many U.S. states. The value to harvesters is enormous, exceeding \$1 billion dollars annually in total. Such large sums of money provide strong incentives for people throughout the nation, including fishermen and crew from Oregon, to participate in these fisheries.

Commercial fishing in Alaska is a complex industry in which financial success is dependent upon several factors. Environmental conditions, market value of catch, costs of operation, changes in quota allocation, regulatory schemes, and even environmental and market conditions in other geographic regions can impact commercial fishing efforts in Alaska. This variability may generate unanticipated outcomes in terms of resource management and economic viability for an Alaskan fishery. The purpose of this report is to examine trends in the participation of Oregon residents in Alaskan fisheries and to determine the economic returns to the state of Oregon from 1998 to 2003. This report will also investigate management and/or economic forces that are associated with these trends, with the goal of better assisting managers in making future decisions.

1.2. Definitions

A brief note about some common terms used in this report. Several terms were adopted to describe vessels from Oregon and to account for revenue and landings data from multiple data sources. Although, attempts have been made to provide definitions within the report, where appropriate, the full list of definitions and acronyms can be found in sections 4.1. and 4.2.

1.3. Participation

1.3.1. Permits

Residents of Oregon are the third most numerous class of participants in Alaskan fisheries, following Alaska and Washington residents. Total involvement from all states, in terms of both the number of permits and the number of vessels, declined steadily between 1998 and 2002, with a slight increase in 2003. Permits held by Oregon residents fell each year from 1998 through 2003, with a sharp decrease between 2000 and 2002 (Table 1). The decline was mainly due to decreased participation in the groundfish and salmon fisheries. The market prices for sockeye, coho and pink salmon decreased significantly 2001 and the prices for chinook and chum salmon decreased in 2002 and stayed down through 2003. The decline in prices was due mainly to competition with farmed salmon (ADFG 2004). Drift gillnet fisheries in Cook Inlet and Bristol Bay experienced the greatest decline in Oregon residents. Oregon participation in groundfish fisheries decreased for a variety of reasons. The implementation of the American Fisheries Act allowed the partitioning of the Bering Sea pollock fishery and the ability of fishermen to sell or lease their catch shares (NPFMC 2002). This allowed many fishermen to sell their allocation and encouraged the consolidation of the pollock fishery.

Additionally, Stellar sea lion protections implemented several spatial and temporal closures in the Bering Sea/Aleutian Islands (BSAI) regions (Kruse et. al. 2000). This reduced the ability to fish in shallow coastal waters restricting participation of smaller vessels.

	Total Permits	Oregon Permits	Oregon Percentage
1998	16949	644	3.800
1999	16559	634	3.829
2000	16179	620	3.832
2001	14309	564	3.942
2002	13394	525	3.920
2003	13624	514	3.773

Oregon residents holding Alaskan permits are found in most cities and counties of the state, with higher concentrations found in coastal communities. Newport and Astoria, in particular, have the largest numbers of permit holders followed by the non-coastal areas of Portland and Woodburn. Alaska and Washington dominate in terms of the number of permits held by their respective residents, but Oregon comprises approximately 3.8% of all permits.

1.3.2. Vessels

Two main types of vessels fish in Alaska, catcher vessels and catcher processors. However, Oregon residents only operated catcher vessels in Alaska between 1998 and 2003 (NMFS 2004). Participating vessels owned by Oregon residents declined sharply between 2000 and 2003, coinciding with the drop in salmon permits held by Oregon residents (Figure 1).

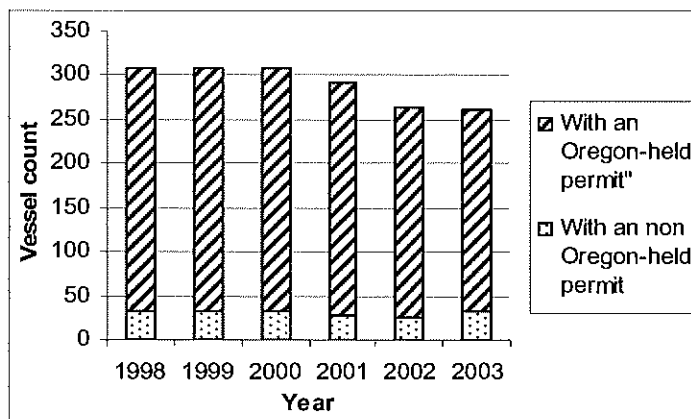


Figure 1. Sources of permits for Oregon-owned vessels

Vessels owned by Oregon residents are moored at a variety of locations, both in state and out. According to the Alaska Commercial Fisheries Entry Commission's (CFEC) vessel information databases, approximately 50% of vessels owned by Oregon residents listed Alaskan harbors as the vessel's home port and 10% listed states other than Oregon or Alaska as the home port. The other 40% of Oregon-owned vessels listed Oregon ports as home ports. Of these vessels ported in Oregon, CFEC databases indicate that 45% are moored either in Newport or Astoria and 35% are moored in Portland. The majority of Oregon-owned vessels moored outside of the state are in Alaskan ports. This analysis assumes that vessels are actually moored for at least part of the year in their home port, although this cannot be confirmed. It is likely that smaller vessels do not return to Oregon each year as indicated by home port.

1.4. Economic returns to Oregon

1.4.1. Total harvest value

Total harvest value (adjusted to 2003 dollars) generally increased since 1998 for Oregon-owned vessels with highs of \$96 million in 2000 and 2003 (Figure 2). The terms Revenue and Harvest Value are defined in this report as the gross amount of money generated by the sale of catch. Despite declines in permit and vessel participation, Oregonians maintained revenue levels of over \$80 million in every year after 1998. This was mainly due to increased catches in crab, halibut, and sablefish fisheries, which have a higher value per pound than other species, and an increase in the total harvest of groundfish (NPFMC 2006b).

The majority of the revenue earned by Oregon residents was generated in onshore fisheries (catch that is delivered to onshore processors). Between 1998 and 2003 Oregon maintained consistent onshore revenue, averaging \$68 million per year. The harvest value generated by offshore fisheries (which is delivered to offshore

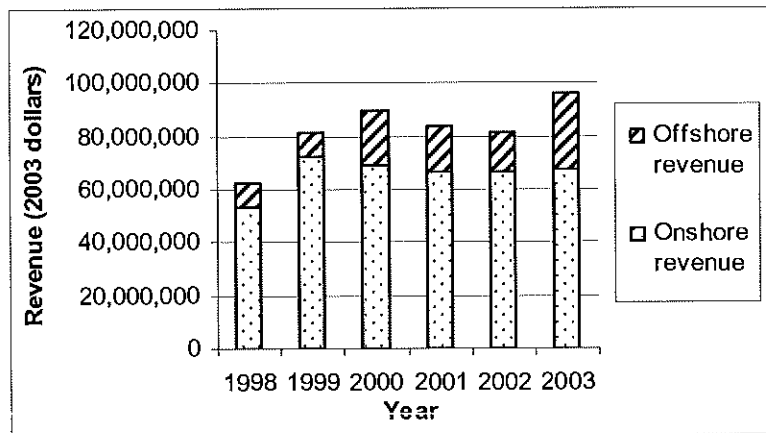


Figure 2. Revenue generated by Oregon-owned vessels

processors) fluctuated significantly during the same period, from lows of \$10 million in 1998 and 1999 to a high of \$28.8 million in 2003. This variability reflected changes in groundfish catches and in market prices for halibut, crab and sablefish (CFEC 2006).

1.4.2. Income to the state of Oregon

Income to the State of Oregon is the proportion of revenue that is available to return to Oregon's economy and is composed of two parts. Return to Labor is the portion of revenue that is paid to crew (crew wages) or that remains for the vessel owner (net income) after expenses. Fish Prosecuting Expenditures is the portion of revenue that is used to fund fishing related costs. Only that revenue that is paid to Oregon residents (net income and crew wages) or that is spent in Oregon on fishing costs is included as income to the state.

Oregon fishermen generated \$18.5 million in net income for 2003 out of \$96 million in total revenue. Pelagic trawl and pot fisheries generated the most net income for Oregon residents, \$5.2 million and \$4 million respectively (Figure 3). Other major sources of net income for Oregon residents were non-pelagic trawl and hook-and-line fisheries, which generated \$3.4 million and \$2.1 million respectively.

Crew wages were difficult to determine due to different pay structures among vessels, non-fisheries-specific crew permits, and short participation times (i.e. weeks or months).

Estimates were made using personal communications (Seung and Sepez, personal communication, February 2006) and related studies (Radtke and Davis 1999) and suggest that Oregon crew earned approximately \$16 to \$20 million dollars annually. There are many uncertainties with this number however and more research will be needed to confirm crew contributions to Oregon's economy.

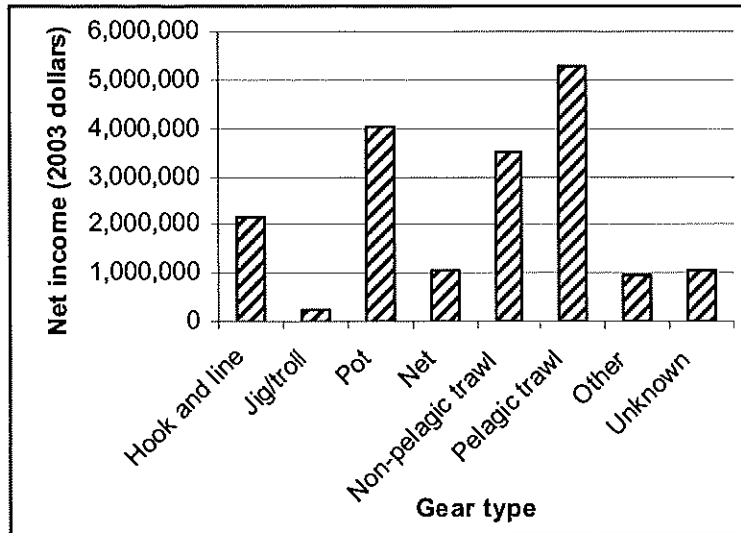


Figure 3. 2003 net income for Oregon-owned vessels.

The amount of money that enters Oregon's economy is variable and dependent upon where the vessel moors each year. Vessels mooring in Oregon spend a greater proportion of their revenue in Oregon on maintenance and supplies than vessels moored in out of state ports. Estimates made for this report indicate that Oregon-owned vessels spent approximately \$42.8 million dollars on fish prosecuting expenditures in 2003. \$17.5 million of this money was spent in Oregon and the remaining \$25.3 million was spent in other states. Of the \$17.5 million in expenditures spent within the state of Oregon, \$13.3 million was spent by Oregon-owned vessels moored in Oregon ports. Oregon-owned vessels moored out of state spent \$3.8 million.

Total 2003 income to the state of Oregon from Alaskan commercial fisheries was approximately \$40.5 million from a harvest value of \$96 million. To compare, revenue generated from Oregon in-state fisheries in 2003 was \$86.8 million (ODFW 2006). This latter figure does not consider the landings made in Oregon by vessels owned by the residents of other states. It also does not consider fish prosecuting expenditures made in Oregon by vessels from other states. A much higher percentage of the revenue generated by Oregon-owned vessels returns to Oregon's economy as does a large portion of the fish prosecuting expenditures.

1.5. Future trends and considerations

A goal of this report was to analyze trends in Alaskan fisheries and the possible impacts to Oregon fishermen. The following issues are three representative potential scenarios and are listed in no particular order.

1.5.1. Impacts of rising fuel costs

Increasing diesel fuel costs reduces the amount of revenue Oregon vessel owners retain as net income. Diesel fuel prices rose 145% between 1998 and 2003 (U.S. Dept. of Energy, 2006). Current fuel prices have resulted in a loss of income to the State of Oregon of \$1 to \$2 million dollars per year, depending in part on the amount of revenue

generated by Oregon boats in that year (assuming fuel is not purchased in Oregon). This added cost would either cause vessels to leave the fishery due to decreased income, demand higher prices for catch, or force them to change fishing behavior. Behavioral changes include fishing for shorter periods of time or making trips to fishing grounds nearer to port at the risk of potential lower catches and revenue. Many Oregon residents that service their vessels in Oregon ports may choose to permanently move their boats to Alaska to cut down on fuel usage, reducing revenue to Oregon ports. The current trend of increased diesel fuel prices is expected to continue for the foreseeable future, which will further impact Oregon fishermen.

1.5.2. Impacts of converting fisheries to IFQ systems

Halibut, sablefish and Bering Sea crab are the only fisheries managed under an individual fishing quota (IFQ) system. A shift of more fisheries to an IFQ system will have positive and negative impacts on Oregon fishermen. IFQs allow a vessel with a quota to take up to a set amount (the quota) of catch. This system reduces pressure on vessels to rush out and fish hard in dangerous conditions, which increases safety for the fleet. IFQs also tend to increase the length of the season, which prevents the market from being flooded with product and keeps harvest values high. However, since IFQ fisheries are a limited entry system some vessels with smaller historical catch or short history in the fishery may be excluded. Vessels with limited catch history and potential new entries into a fishery are likely to be impacted negatively by IFQ systems. There is no evidence that Oregon residents were disproportionately affected in a negative way by the transfer to an IFQ fishery. However, it will be important to consider the vessels involved in any fishery that is under consideration for rationalization. Increasing management concern of overfishing many stocks and vessel safety suggests that additional rationalization of fisheries is set to continue and more fisheries may transfer to IFQ systems.

1.5.3. Impacts of the reduction of commercial salmon fishing off Oregon

Commercial salmon fishing was greatly reduced in 2006 off the coast of Oregon and northern California in order to protect endangered Klamath River salmon. These restrictions, and potential future restrictions of the same nature, could impact the West Coast salmon fleet and could have indirect impacts to the Alaskan salmon fleet.

The severe restrictions placed on the commercial salmon fishery off the Oregon coast leaves salmon fishermen with few options. They can attempt to fish other species in West Coast waters, apply for disaster relief money, or attempt to fish for salmon in other regions, including Alaskan waters. This may result in an increase in the number of Oregon-owned vessels participating in Alaskan fisheries. If salmon prices remain lower, however, any vessels from West Coast salmon fisheries may face the same financial difficulties that have affected the vessels already participating in the fishery. If West Coast commercial salmon fisheries continue to have poor returns and severe restrictions, the economic pressure on the Alaskan salmon fishery will continue.

2.1. Introduction

The waters of the eastern North Pacific Ocean and Bering Sea surrounding Alaska have supported a commercial fishing industry for well over a century. The first major commercial fisheries began in the late 1800's with the harvest of salmon and herring and have since expanded into an industry that landed more than five billion pounds of fish and shellfish at a value of approximately \$1 billion dollars in 2003. Salmon and herring fisheries continue to thrive and have been joined by major fisheries in king crab, halibut, pacific cod, yellowfin sole, and walleye pollock, as well as fisheries for other species of shellfish and groundfish.

The vast diversity and abundance of the marine resources in Alaska has long been a draw for fishing fleets from around the world. Historically, domestic commercial fishing effort came primarily from local fishermen, but this was minimal compared to foreign distant water fleets. Distant water fleets will be defined here as vessels fishing in Alaska that are not owned by residents of the U.S. Vessels from Russia (and later the former Soviet Union), Japan, and Korea made up the majority of the distant water fleet (Woodby et al. 2005). In 1959 Alaska achieved statehood, allowing greater control of management and enforcement of their fisheries. However, state jurisdiction only encompassed a three-mile wide territorial sea, allowing continued exploitation of foreign fleets beyond state waters.

The modern era of Alaskan commercial fishing began in 1976 with the passage of the Magnuson-Stevens Fisheries Conservation and Management Act (FCMA). This legislation established federal jurisdiction over an exclusive economic zone (EEZ) from the three-mile state controlled waters to two hundred miles offshore for all U.S. states and territories. One of the most important articles of the FCMA states that foreign vessels are only allowed to extract resources from the EEZ with the permission of the United States, thus removing or reducing participation by foreign fishing vessels and allowing the U.S. to expand its domestic fleet to take advantage of the bountiful fishery resources.

Alaskan fisheries are currently a combination of federal and state managed fisheries. The Alaska Department of Fish and Game (ADFG) is the primary state fisheries management agency. The National Oceanic and Atmospheric Administration (NOAA) Fisheries (formerly National Marine Fisheries Service) is the primary federal fisheries agency. ADFG has responsibility for managing salmon, herring, crab, and shellfish fisheries, and all fisheries within three nautical miles of shore. NOAA Fisheries is responsible for managing all groundfish fisheries, excluding lingcod, black rockfish, and blue rockfish and fisheries within three nautical miles of shore. The North Pacific Fishery Management Council (NPFMC) is a regional entity, established under the FCMA, which recommends catch quotas and allocations to NOAA for Alaskan fisheries.

In addition to these agencies, there are a number of international treaties and organizations that influence catch levels and allocations for those fisheries that straddle EEZs of multiple nations or that move between U.S. waters and international high seas. These include the International Pacific Halibut Commission (a joint U.S. and Canadian management organization), salmon treaties between the U.S. and Canada, and treaties covering groundfish and crab fisheries in the "donut hole" (an international high seas zone in the middle of the Bering Sea).

While Alaskans comprise a large portion of the participation in Alaskan fisheries, vessels and fishermen hail from all over the United States. Fleets from Washington and Oregon make up the majority of domestic vessels in Alaska, but vessels from 36 other states are also registered in Alaska as of 2003.

The relationship between Alaskan fisheries and the flow of money back to these distant water states is complex and is dependant on many factors, including, but not limited to the number of vessels from that state, vessel type and capabilities, fisheries participated in, whether or not the respective state has domestic fisheries, and whether an owner moors their boat in Alaska or their home state. Many fishermen fish in Alaska exclusively, while others will fish some seasons in Alaska and some seasons on the west coast of the U.S. or other regions. Of those that fish in multiple regions, many rely heavily upon money earned in Alaska to generate their annual income.

The Oregon Department of Fish and Wildlife and Oregon representatives to the North Pacific Fisheries Management Council commissioned this project. ODFW (as the Governor's delegate to the council) holds an interest in understanding the extent of Oregon's participation in Alaskan fisheries, particularly since many of these vessels fish both Alaskan and Oregon waters and management decisions in either region can have impacts on the other. NPFMC representatives from Oregon need to know where and how fishing effort is being expended in order to better represent their constituents. The full terms of reference for this study is shown in Appendix A.

A previous study (Davis and Radtke 1999) examined this issue, looking at Oregon commercial fishing in Alaska and along the West Coast for 1996. The present study is based upon this previous work and will attempt to update their research and reveal any trends over the following six years. Where applicable their data will be compared to the findings of the present study.

3.1. Study purpose

The investigation of the participation of Oregon fishermen and vessels in Alaskan fisheries is comprised of three distinct parts. The first examines the demographics of the fishery, including the number and types of vessels involved, which fisheries they participate in, and who holds permits. This section will also examine participation by Oregon crewmembers, as well as cooperative ventures between residents of different states. The second portion investigates gross revenue generated by Oregon vessels, operating costs involved in fishing activities, and how much money is flows to Oregon. Finally, management implications of the current involvement of Oregon in Alaska will be examined along with hypothetical scenarios that will help illustrate the impact of potential regulatory, environmental, or economic changes to the fisheries.

An additional aspect of this study will be to establish methods and protocols to continue tracking the economic impact of Alaskan fisheries to Oregon. In order to uncover and understand trends in the fisheries it is necessary to gather a continuous stream of data over many years, thus making it possible to establish baselines to assess changes in fisheries trends, management decisions and economic factors and the resulting impacts Oregon commercial fisheries and Oregon communities.

4.1. Acronyms and definitions

4.1.1. Acronyms

ADFG	-	Alaska Department of Fish and Game
AFSC	-	Alaska Fisheries Science Center
AKFIN	-	Alaska Fisheries Information Network
AFA	-	American Fisheries Act
BSAI	-	Bering Sea/Aleutian Islands
CFEC	-	Commercial Fisheries Entry Commission
EEZ	-	Exclusive Economic Zone
FMP	-	Fishery Management Plan
GHL	-	Guideline Harvest Level
GOA	-	Gulf of Alaska
IFQ	-	Individual Fishing Quota
IPHC	-	International Pacific Halibut Commission
MSFCMA	-	Magnuson-Stevens Fisheries Conservation and Management Act
NPFMC	-	North Pacific Fisheries Management Council
NOAA	-	National Oceanic and Atmospheric Administration
ODFW	-	Oregon Department of Fish and Wildlife
PacFIN	-	Pacific Fisheries Information Network
PSMFC	-	Pacific States Marine Fisheries Commission
TAC	-	Total Allowable Catch

4.1.2. Definitions

Revenue or Harvest value: The money generated from the sale of catch.

Oregon revenue: The money generated by Oregon residents from the sale of catch from Alaskan fisheries.

Income to the state of Oregon: The portion of the revenue that enters the economy of the state of Oregon.

Owner: An individual or company that is listed in CFEC vessel database under the “Name” field.

Permit holder: An individual or company that is listed in CFEC permit database under the “Name” field; equivalent to the owner.

Oregon-owned vessels: Commercial fishing vessels that are registered with CFEC to an individual or company listing an Oregon address as the primary address. A vessel with ownership by multiple people from different states is considered an Oregon-owned vessel if the primary owner lists Oregon as the primary address.

Oregon-held permits: Permits registered with CFEC to individuals listing an Oregon address as the primary address.

Net income: Portion of a vessel's revenue that the vessel owner retained after paying crew wages and fish prosecuting expenditures (see below).

Return to labor: Portion of a vessel's revenue that covers crew wages and net income.

Fish prosecuting expenditures: Portion of a vessel's revenue that funds fishing related costs (e.g vessel fuel, fishing gear, or maintenance).

Nearshore fishery: Any Alaskan fishery that delivers catch to an onshore processor regardless of where catch occurred. The catch from these fisheries is recorded in the CFEC fish ticket system. All revenue generated by catch in a nearshore fishery is referred to as *nearshore revenue*.

Offshore fishery: Any Alaskan fishery that delivers catch to an at-sea processor, regardless of where catch occurred. The catch from these fisheries is recorded by AKFIN. All revenue generated by catch in a offshore fishery is referred to as *offshore revenue*.

5.1. Data sources

Accessing economically useful data from Alaskan fisheries is a complex task as there is a multitude of fisheries managed by a diverse group of agencies. ADFG manages all fisheries in state waters, along with all herring, salmon and shellfish fisheries. NOAA Fisheries manages all groundfish fisheries in federal waters between 3 and 200 miles offshore. Fisheries occurring in both areas are managed through the NPFMC council process with the exception of halibut, which also includes the IPHC in the process. Most landing data are recorded by ADFG's fish ticket system, which records catch returned to shore. In some offshore fisheries, particularly groundfish, capture and processing occur entirely at sea and these data are only found through AKFIN, a PSMFC-managed database.

5.1.1. Participation data

Basic vessel attribute data were provided by the ADFG CFEC website, which contains vessel databases with vessel type, capabilities, home port, and residency of the owner of the vessel. Permit ownership, type and associated vessels were gathered from the CFEC permit databases.

5.1.2. Revenue data

Revenue data used in this study were gathered from several sources. Onshore revenue data were collected through a request to CFEC, which has access to fish ticket data. The Alaskan fish ticket system records the species, pounds landed, and gear type for each vessel returning catch to onshore processors. Offshore revenue data were collected through a request to the Alaska Fisheries Information Network (AKFIN), which has access to both the state fish ticket system and the federal blend files. The federal blend files are a combination of on-vessel observer data, shoreside processor landings data, and

weekly processor production reports. AKFIN also provided onshore revenue data to confirm CFEC estimates.

Gross revenue was estimated based upon a vessel's landings in pounds and the average market price per pound for each species. CFEC also produced annual summary reports, which calculated revenue generated by each target species. These reports were used in estimating the average revenue per permit for target species and for estimating revenue generated for fisheries that had fewer than four vessels and were therefore confidential.

5.1.3 Crew data

Commercial crewmember demographics data were provided by ADFG through licensing data and through reports by the Alaska Fisheries Science Center (AFSC). Estimates of crewmember revenue were gathered in part from AKFIN vessel revenue estimates and from various personal communications (Seung and Sepez personal communication, February 2006).

5.2. Data constraints

5.2.1. Confidentiality

Basic permit and vessel information is readily available and accessible to the public, but revenue and landing data are more difficult to obtain. Under Alaskan confidentiality law, section 16.05.815 of Alaskan Fish and Game code (ADFG 2006), revenue and landings data in fisheries that contain less than four vessels cannot be disseminated in studies or reports, and are unavailable except between Alaskan fisheries economists and managers. There are several instances in which there are fewer than four vessels owned by Oregon residents in a particular fishery. These rules make it difficult to provide accurate estimates of the contribution of commercial fishing to the income of the state of Oregon. Additional decreases in the number of participating vessels will further increase the difficulty in making economic estimates.

5.2.2. CFEC and AKFIN participation report discrepancies

Comparisons of CFEC and AKFIN revenue reports revealed discrepancies in the number of catcher processors owned by Oregon residents. CFEC classifies a vessel as a catcher processor if it has any freezing capacity and indicated that approximately 35-40 Oregon-owned vessels were catcher processors. AKFIN classifies a vessel as a catcher processor if it participated in catcher processor activities, that is, actually processing fish on ship, and indicated that there were no Oregon-owned catcher processors. Radtke and Davis (1999) indicated that there was only one Oregon-owned catcher processor in 1996. This information, along with the definitions provided by both agencies, suggests that the AKFIN estimate is the more appropriate choice and is used in this report.

5.2.3. Crew revenue

Crew revenue was difficult to estimate with a high degree of accuracy. Many fishing operations hire crew on a contractual basis and the method of payment may vary

(Package and Sepez 2004). In many cases crew pay depends upon the amount of the catch, that is, the crew receives a “share” of the revenue derived from the vessel landings. In other cases crew are employed on a set wage that pays according to the number of fishing days worked. Additionally, Alaskan crew permits specify neither how many nor in which fisheries a person participates. Since crew revenue often depends on the revenue of the vessel, which in turn depends on the value of the target species, as well as the number of fisheries in which the vessel participates, estimates made in this report will be presented as a range.

6.1. Methods

Analyzing the contribution of Alaskan commercial fishing to the income of the state of Oregon required retrieving specific information from large databases and manipulating this information to arrive at meaningful and relevant conclusions. This section will describe the methods used in the writing of this report to facilitate the replication of this analysis in future years (Figure 4).

6.1.1 Vessel information for agency revenue reports

CFEC’s vessel and permit databases (1998 to 2003) were utilized as the base information for all analyses. Permit databases were initially sorted for the permit holder’s permanent address to isolate Oregon residents. All permits that were listed as inactive, i.e. “inactive emergency holder” and “inactive permit” were removed to limit analysis to those fishermen that had the potential to fish. Vessel databases were also sorted for the owner’s permanent address, which differs from the vessel’s home port, to isolate Oregon vessels. AKFIN and CFEC were given a version of the CFEC vessel database that contained only vessels owned by Oregon residents to limit revenue requests to Oregon residents.

6.1.2 Vessel and permit participation analysis

Using the ADFG vessel identification number as a reference, vessel and permit databases were combined for respective years. This was accomplished using Microsoft Excel’s “lookup” function to create a new database that provided definitive information on all Oregon vessels and associated permits. The new databases were made up of all participating Oregon-owned vessels and the permits associated with that vessel. Information was more accessible in this format and it allowed for crosschecking of permits that were not associated with Oregon-owned vessels.

Some Oregon-owned vessels were not associated with Oregon-held permits and some Oregon-held permits were not associated with Oregon-owned vessels (Figure 4). Each vessel without an Oregon-held permit was crosschecked, using the ADFG number, with the full permit database to determine if the vessel was using a permit held by a resident of another state. Oregon-held permits that were not associated with an Oregon-owned vessel were crosschecked against the full vessel database to determine the owner’s state of residency for the vessel using the permit. This yielded counts of the number of Oregon-held permits, the number of Oregon-owned vessels participating, the home port of Oregon-owned vessels, the number of Oregon-owned vessels registered in Alaska

without a permit, the number of Oregon-owned vessels using permits held by residents of other states, the number of Oregon-held permits used by vessels owned by residents of other states, and the number of Oregon-held permits in each fishery. This information made it possible to reveal trends in each category during the study period.

6.1.3. Revenue analysis

Revenue requests sent to CFEC and AKFIN went through several modifications throughout the study in order to compensate for confidentiality concerns. Both CFEC and AKFIN were provided with databases that contained all vessels owned by Oregon residents. Vessels that recorded less than \$2,500 in revenue were filtered out since this was considered a sufficient amount to identify vessels that were not actually participating in fishing activities. CFEC was asked to take the remaining vessels and provide a vessel count broken down into several revenue levels and by vessel type. They also provided average revenue per vessel, vessel counts based on revenue amounts and vessel length, and a breakdown of vessel revenue based upon target species. The full data request is given in Appendix B. However, much of these data were unavailable due to extensive confidentiality issues. A second request removed vessel length as a criterion, yielding better results (fewer groups).

The data request to AKFIN also asked for vessel counts based on vessel type and defined revenue levels, but differed from the CFEC request in that it did not include vessel length as a category. This was to alleviate confidentiality problems that would have masked much of the information. AKFIN also provided vessel revenue broken down by target species. This included revenue data on groundfish species (from the federal blend files) and was able to break groundfish data into two regions, the Gulf of Alaska and the Bering Sea/Aleutian Islands, which are managed as separate units. A later report from AKFIN supplied vessel revenue with respect to gear type, which was used in estimating vessel expenditures.

A general format for future data requests to both AKFIN and CFEC is included in Appendix D. This format is an optimal amalgamation of the various data requests used to gather data for this project and eliminates some of the confidentiality problems inherent in earlier requests. Due to time constraints and AKFIN availability the format in Appendix D was not used to gather the data for this report, it is merely a guide for future requests.

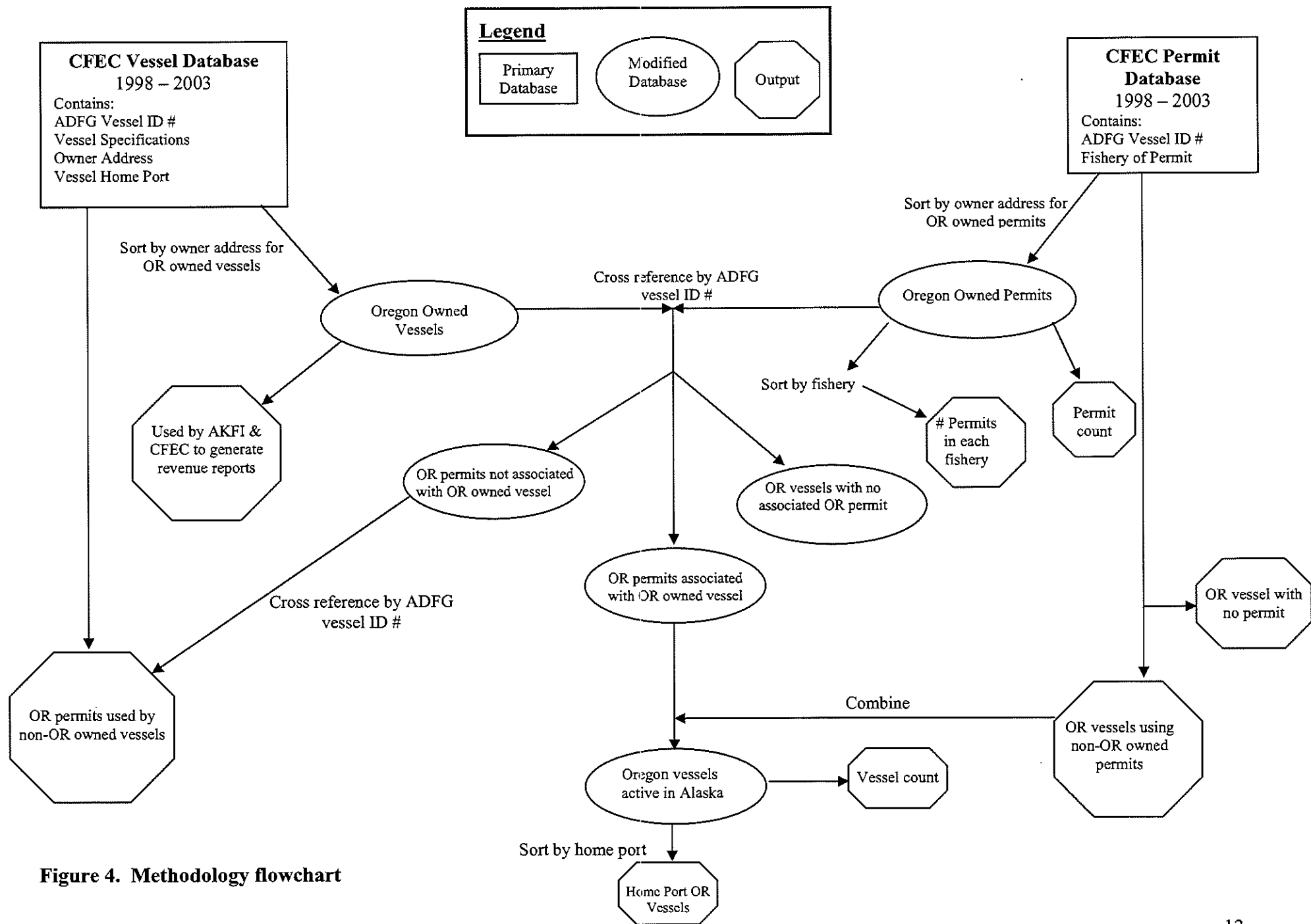


Figure 4. Methodology flowchart

Revenue figures were provided by both AKFIN and CFEC without adjustment for inflation. All revenue and income figures were later adjusted to 2003 dollars using the U.S. Bureau of Labor's West Coast annual average Consumer Price Index (CPI) (U.S. Bureau of Labor 2006). Revenue amounts were divided by the CPI of the respective year and then multiplied by the CPI of 2003 (University of Rhode Island 2004). This step normalizes revenue and makes trends less dependent on fluctuations in inflation.

7.1. Oregon's distant water fleet

Residents of Oregon participate in Alaskan commercial fisheries in a variety of ways. The most common form of participation is Oregon residents who own a vessel and one or more permits with which they fish. Some Oregon residents hold a permit but fish it on vessels owned by residents of other states. A third way of participation is for Oregon residents who own permits, but fish with permits held by residents of other states. Some Oregon residents who hold permits but do not own vessels allow Oregon-owned vessels to fish the permit, but in terms of flow of money to the state of Oregon these cases are no different than an Oregon resident holding a permit and owning the vessel that fishes it. A final way in which Oregon residents participate in Alaskan fisheries is as crewmembers.

7.1.1. Permits - general

Oregon residents participated in a wide variety of Alaskan fisheries from 1998-2003. The total number of permits held by Oregon residents has decreased in each year of the study period from a high of 644 in 1998 to a low of 514 in 2003, with a sharp decline between 2000 and 2002 (Table 2). A corresponding decline was also observed in the overall number of permits for all states, so this was not a trend specific to Oregon. Despite this decline, Oregon-held permits represented a consistent 3.8% share of overall Alaskan permits. Radtke and Davis (1999) did not report the number of permits held nor permit types.

	Total Permits	Oregon Permits	Oregon Percentage
1998	16949	644	3.800
1999	16559	634	3.829
2000	16179	620	3.832
2001	14309	564	3.942
2002	13394	525	3.920
2003	13624	514	3.773

Some Oregon-held permits were used by vessels owned by residents of other states, mainly Alaska and Washington. Non-Oregon vessels use Oregon-owned permits in two ways. Halibut and sablefish permits, which are IFQ fisheries, are leased or purchased from the Oregon resident. Approximately 25 to 32 Oregon-owned halibut permits and 12 to 14 Oregon-owned sablefish permits are used by out of state vessels. Additionally, permits for Bering Sea walleye pollock can be leased or sold. CFEC permit designations do not specify between groundfish fisheries so it was not possible to determine how many Oregon-owned pollock permits are leased out. Permits in non-IFQ fisheries cannot be leased or sold. Out of state vessels can still create business arrangements with Oregon

residents or have the permit holder join the owner or crew on the vessel. Approximately 25 to 30 Oregon-held permits, mainly in salmon fisheries, were used by out of state vessels.

7.1.2. Permits – fisheries

Oregon residents are involved in the harvest of most target species in Alaskan fisheries (Figure 5). Oregon residents were most heavily involved in salmon fisheries, particularly drift gillnet (160 Oregon-held permits in 2003) and set gillnet fisheries (76 Oregon-held permits). Regionally, most Oregon permits are held in Bristol Bay, Cook Inlet, and Prince William Sound salmon fisheries. The number of Oregon-held salmon permits decreased from a high of 302 in 2000 to a low of 242 in 2003.

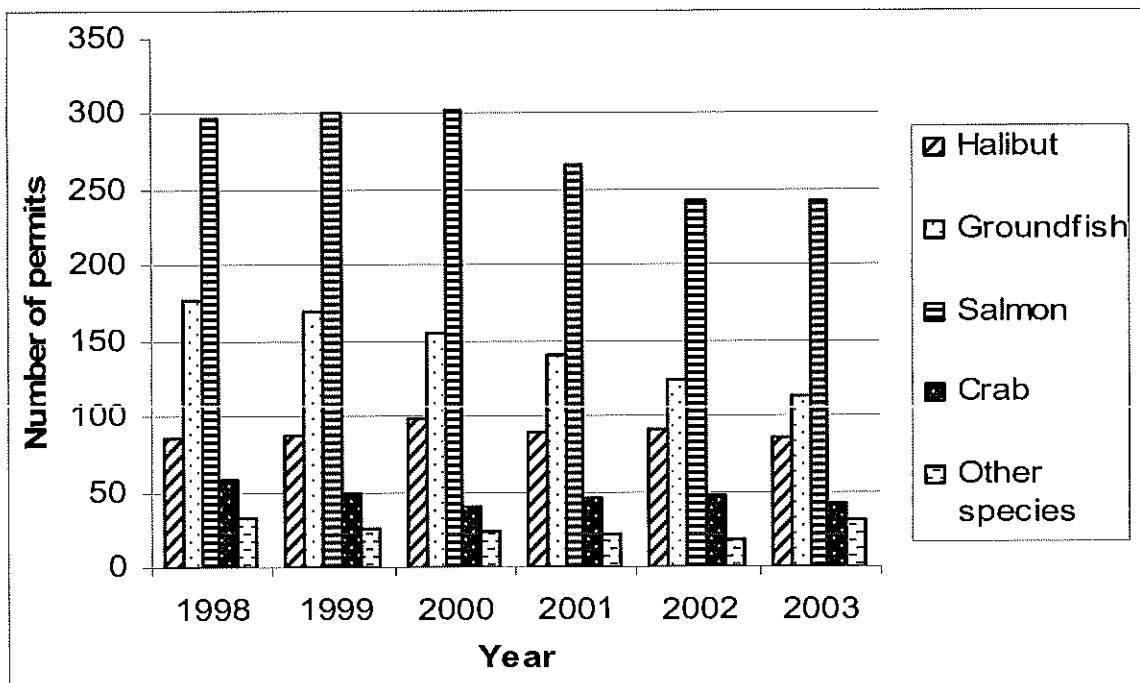


Figure 5. Number of Oregon-held permits for major species groups

Oregon residents also hold many permits in groundfish fisheries. ADFG classifies pollock, mackerel, and Pacific cod as “Miscellaneous finfish” and does not designate separate permits for these species, which required this report to group them as “groundfish”. This makes it impossible to determine the participation of Oregon residents in each fishery. As a whole, Oregon-held groundfish permits have decreased from a high of 177 in 1998 to a low of 113 in 2003. Oregon-held permits in halibut (six year average: 89 permits), crab (47 permits), and all other fisheries (26 permits) remained steady during the study period.

7.1.3. Vessels

There are two main types of vessels that participate in Alaskan fisheries: catcher processors and catcher vessels. Catcher processors are larger vessels, most over 150 feet

in length that perform processing (i.e. filleting, etc.) onboard and store catch in onboard freezers. Catcher processors are able to stay at sea longer and have larger storage capacity. Catcher vessels are harvester vessels only, generally less than 100 feet in length, and may have some freezing and storage capacity, but no ability to process their catch onboard. Catcher vessels in onshore fisheries deliver their catch to onshore processors. Catcher vessels participating in offshore fisheries deliver their catch to a third type of vessel, the motherships. Motherships are large, floating processors that receive fish (mainly groundfish) from vessels. There are no Oregon-owned motherships.

Vessel lengths provided by CFEC and vessel counts from AKFIN indicates that there were no catcher processors owned by Oregon residents fishing in Alaska during the study period (NMFS 2004). Radtke and Davis (1999) indicated that there was only one catcher processor owned by Oregon residents operating in Alaska in 1996, supporting CFEC and AKFIN data.

From 1998 to 2003 the total number of participating vessels owned by Oregon residents declined from 309 vessels in 1999 to 262 vessels in 2003, with the sharpest decline occurring between 2000 and 2002 (Figure 6). As indicated above, these vessels were all catcher vessels. During this period there were also between 95 and 117 Oregon-owned vessels registered in Alaska with no permit associated with the vessel (Oregon-held or otherwise) (Figure 6). The declining trend

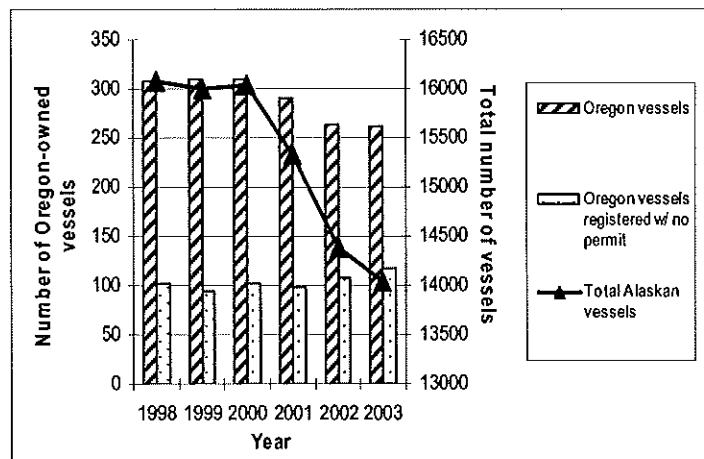


Figure 6. Number of Oregon-owned vessels compared to the entire fishery

in participating Oregon vessels was also seen in the overall Alaskan fleet. Radtke and Davis (1999) reported 520 catcher vessels owned by Oregon residents operating in Alaska. This figure counts all Oregon-owned vessels that were registered, including vessels that had no associated permits, and no accounting of vessels with permits was made. Assuming similar numbers of Oregon-owned vessels were registered with no permit in 1996 there would have been approximately 405 to 425 Oregon-owned vessels operating with a permit. This indicates that the trend of declining Oregon-owned vessels was consistent from 1996 through 2003. The data indicate that the decline in the number of Oregon-owned vessels, and in the overall fishery, was due to trends in two fisheries, salmon and groundfish, though which groundfish fisheries remains unclear.

Many Oregon-owned vessels participate in both Alaskan and West Coast fisheries. A crosscheck of vessels registered with the Pacific Fisheries Information Network (PacFIN) revealed that 80 vessels were registered in both Alaskan and West Coast fisheries in 2003. These vessels likely participate in both regions and move between areas based upon the opening and closing of various fisheries, although an exact determination was

not possible because the PacFIN source did not include such information as permit types or vessel lengths.

Oregon-owned vessels fished with permits owned by residents of other states. These permits were mainly held by Alaskan and Washington residents, with a few exceptions from other states. The number of vessels using permits held by residents of other states ranged between a high of 33 in 1999 to a low of 26 in 2002 (Figure 7).

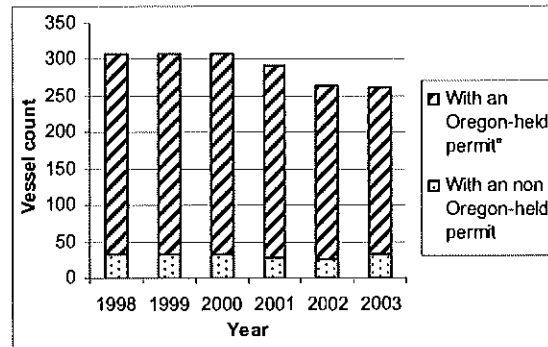


Figure 7. Sources of permits for Oregon-owned vessels

7.1.4. Permit and vessel trends

The decline in the number of Oregon-held permits and Oregon-owned vessels is linked. As a vessel leaves the fishery there will be a corresponding decrease in the number of permits unless new vessels enter the fishery or current vessels apply for additional permits.

The number of Oregon-held salmon permits declined sharply, by 60 permits, between 2000 and 2002, reducing the number of total Oregon-held permits by nearly 20% from 2000 levels and accounting for the majority of the decline in total Oregon-held permits during the study period. The main cause of the decrease in permits was a decrease in the price fishermen received for their catch. From 1998 to 2000, chinook, sockeye, and coho averaged \$1.21 per pound while chum and pink salmon averaged \$0.17 per pound. From 2001 to 2003 the average price of chinook, sockeye, and coho decreased to \$0.50 per pound, while the average price of chum and pink salmon decreased to \$0.12 per pound. The drop in price was due to two factors. In the 1980's, Alaskan waters accounted for 40% to 50% of the world's supply of salmon (ADFG 2004). By 2000, this production had dropped to 20% of the world's total, not due to declines in the total salmon harvest, but to increased production from salmon aquaculture. Farm-raised salmon from Japan, Norway, British Columbia and Washington state was sold at cheaper rates than commercially caught salmon the supply of salmon to the world market increased. An additional factor was the way in which salmon was marketed during the study period. Prior to 2003 Alaskan salmon was marketed as "salmon", a designation that did not differentiate Alaskan product from farmed or any other salmon (K. Criddle personal communication, October 2006). Because Alaskan salmon was not differentiated from other salmon on the market, Alaskan product had to compete on equal footing with non-Alaskan sources, which reduced the price fishermen received. In the years following 2003, there has been a concerted effort to market Alaskan salmon as a distinctive product, i.e. "Copper River sockeye" or "wild troll-caught chinook". In 2004, the average price per pound of chinook, sockeye and coho rose to \$1.04 per pound and the price of chum and pink salmon rose to \$0.15 per pound.

The potential effects of this new marketing technique on the salmon fishery and on Oregon residents are significant. If the prices continue to stabilize or rise, salmon fishermen will benefit economically and participation should level off or rise. The

participation and revenue of Alaskan commercial salmon fisheries in the years following this study period should be examined further.

Oregon-held groundfish permits also declined during the study period due to a variety of reasons. One major change to the fishery was the enactment of the American Fisheries Act in 1998, which rationalized the Bering Sea pollock fishery (NPFMC 2002). The pollock fishery was not eligible to become an IFQ fishery at the time due to a moratorium on IFQs imposed by the 1996 Sustainable Fisheries Act. The call by fishermen, managers and processors for rationalization of the fishery was strong enough to cause Congress to act, creating the AFA, which has many features of an IFQ program. The AFA partitioned the pollock fishery into shares, similar to quotas used for IFQ fisheries, which are also transferable. The AFA had several effects on the pollock fishery. Many pollock vessels, when given the opportunity to sell their permits and obtain a fair value for their operation took it and left the fishery (K. Criddle personal communication, October 2006). This led to the consolidation of the fishery as boats bought or leased permits from vessels leaving the fishery. The effects of the AFA were not evident from the CFEC permit databases, due to the grouping of groundfish under an umbrella permit, but personal communications that several Oregon-owned vessels used the AFA to leave the fishery.

Groundfish catches in the Gulf of Alaska declined on a per vessel basis during the study period. Declining abundance of some groundfish stocks in the GOA caused managers to break the Gulf into smaller subunits, each with a separate catch quota. This made harvesting the same amount of fish difficult for larger vessels. Smaller vessels and those vessels that had groundfish permits to handle bycatch constraints were not affected significantly.

The other major management issue that impacted groundfish fisheries in the BSAI was measures taken to protect Stellar sea lions. The listing of the western population of Stellar sea lions on the Endangered Species list in 1997 further tightened restrictions. A Biological Opinion indicated that the prosecution of groundfish fisheries, particularly in coastal areas near sea lion rookeries, had a significant impact on the survivability of young Stellar sea lions (NMFS 2006a). The main result was spatial closures in coastal areas and near rookeries in the Aleutian Islands. This had a direct impact on smaller vessels that fished in more shallow waters. These vessels were forced out into deeper waters where they had to compete with larger vessels. The listing also reduced the total allowable catch. In essence, sea lion regulations reduced competition between fishermen and sea lions, but increased the competition between commercial fishermen. The result was that smaller vessels or those working under minimal profit margins were financially unable to continue in the fishery.

A lack of diversification in the types of permits also contributed to the decline in Oregon-owned vessels (F. Yeck Personal communication, October 2006). Oregon-owned vessels participating in salmon fisheries often had only salmon permits. When salmon prices declined many Oregon-owned vessels had no source of revenue from any other fisheries, which made their operations economically unviable. Those vessels that held permits from other fisheries, halibut or groundfish for example, were better able to withstand poor revenue from salmon fisheries. The majority of Oregon-owned vessels in

groundfish fisheries held permits in sablefish, halibut, or crab fisheries. Additionally, many Oregon-owned groundfish vessels held multiple groundfish permits, although it was not possible to confirm that the permits were in different groundfish fisheries.

7.1.5. Crew permits

In 2003, 939 Oregon residents participated as crewmembers on vessels fishing in Alaska (Package and Sepez 2004). Oregon residents thus represent approximately 5% of the 19,000 total crewmembers in Alaska (Figure 8). ADFG crew permits are annual blanket permits, meaning that they do not elaborate on which fisheries crewmembers participate in, nor the length of time that a crewmember was actively fishing. This limits the scope of analysis that can be performed upon the participation of Oregon residents as crew. Radtke and Davis (1999) did not examine the participation of Oregon residents as crew in Alaska.

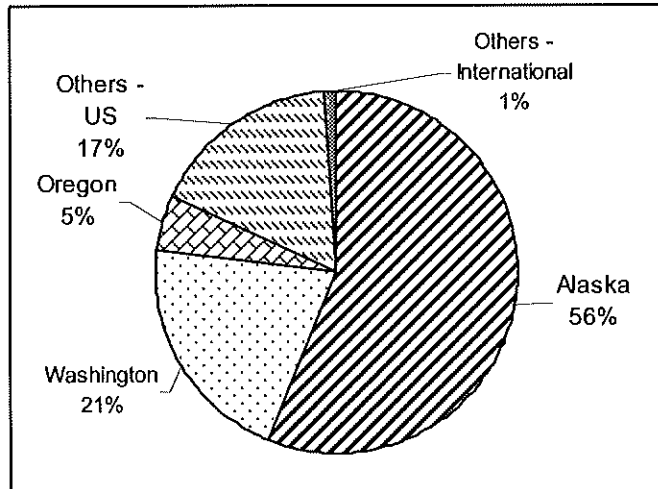


Figure 8. States of origin for Alaskan crewmembers

7.2. Geographical distribution

Commercial fishing contributes economically and culturally to coastal communities. The fishing industry influences the building of structures on coastal waterfronts, including piers, jetties, and various buildings, not to mention associated government infrastructure. When estimating the economic contribution of Alaskan commercial fisheries to the state of Oregon it is important to understand which regions of the state are involved. An examination of CFEC permit and vessel databases revealed that Oregon residents throughout the state are participating in Alaskan fisheries.

The previous work of Radtke and Davis (1999) examined the distribution of commercial fishing participation across Oregon by breaking the state into categories referred to as port groups. Each port group consisted of a major coastal port and the surrounding communities to better gauge the importance of commercial fishing to the respective region. The major ports used in their report were Astoria, Brookings, Coos Bay, Newport and Tillamook. One additional grouping was centered on a non-coastal city: Woodburn, which was found to have a large concentration of permits. All other Oregon communities were grouped together in an “other” category. One modification made in this report is the addition of a group of communities centered on the city of Portland (Appendix F). CFEC permit databases registered a large number of permits in and around the Portland area. Additionally, Portland’s proximity to the Columbia River and subsequent ocean access and port size warranted the inclusion of Portland as a port group. This deviation

from Radtke and Davis (1999) will result in some differences from their data with respect to vessel counts in the “other” category.

7.2.1. Permits

The greatest concentration of Oregon-held permits is in coastal areas, particularly in the Astoria and Newport areas, with a significant concentration also occurring in the Woodburn and Portland areas (Figure 9). The number of permits in each region, except Portland, decreased from 1998 to 2003. The number of permits in the Astoria region decreased from 161 to 110, the number of permits in the Newport area decreased from 111 to 70 and the number of permits in the Woodburn area decreased from 121 to 104. These change reflected trends in the salmon and groundfish fisheries. Radtke and Davis (1999) did not report permit counts.

Astoria had a large concentration of salmon and halibut permits, 64 and 18, respectively, in 2003. The number of salmon permits held by Astoria residents in 2003 was down from 84 in 1998. The number of halibut permits was unchanged. Woodburn also had a strong concentration of salmon and halibut permits, 43 and 32, respectively, in 2003. Similarly, 2003 salmon permit counts were down from 52 permits in 1996. Portland had 18 salmon permits in 1998 and 15 salmon permits in 2003. Newport had a large concentration of groundfish (60), King crab (20), Tanner crab (10), and halibut permits in 1998. Although the number of halibut permits remained stable through 2003, groundfish permits dropped to 38, and King and Tanner crab permits dropped to 11 and 8, respectively.

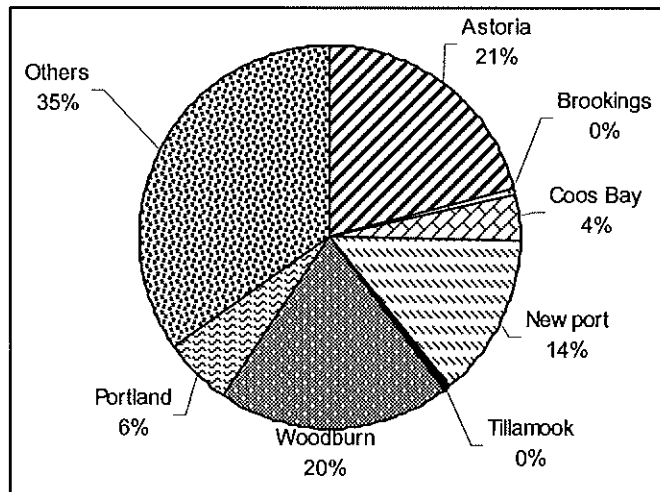


Figure 9. Geographical distribution of Oregon-owned permits in 2003

7.2.2. Vessels

The geographic distribution of Oregon-owned vessels participating in Alaska differs from that of Oregon-held permits. The first distinct distribution is between those Oregon-owned vessels that are moored in Oregon and those that are moored outside of Oregon. Approximately 50% of Oregon-owned vessels list home ports outside Oregon. Of these 45% list Alaskan ports and 4.5% list Washington ports. The number of Oregon-owned vessels listing Oregon home ports decreased from 160 in 1998 to 121 in 2003, representing a decline from 52.5% of all Oregon-owned vessels in Oregon to 47.5%. The number of Oregon-owned vessels with home ports in Alaska increased from 130 in 1998 to 140 in 2000 and then declined to 119 by 2003. Despite the decrease in the last half of the study period the percentage of Oregon-owned vessels increased from a low of 42.6%

in 1998 to a high of 48.8% in 2002. There was minimal change (11 to 14 vessels) in the number of Oregon-owned vessels with home ports in Washington.

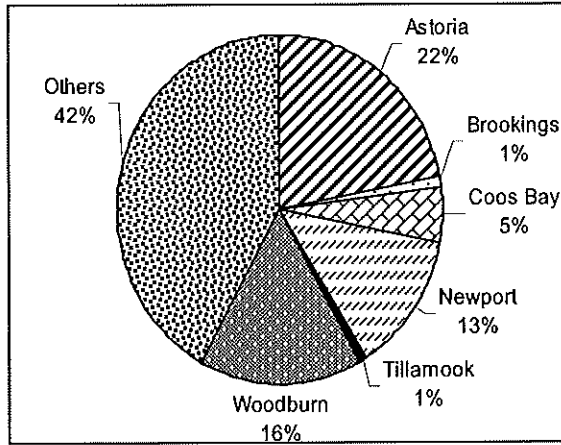


Figure 10. Geographical distribution of Oregon-owned vessels in 1996 (from Radtke and Davis)

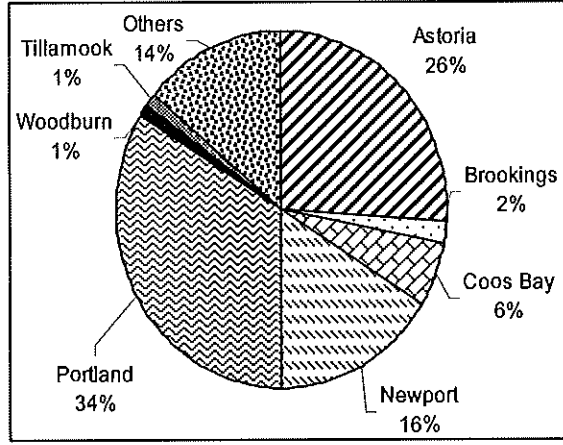


Figure 11. Geographical distribution of Oregon-owned vessels in 2003

This trend has a number of possible causes. Radtke and Davis (1999) reported similar percentages for Astoria and Newport in 1996 (Figure 10). Their analysis included Portland within the “Others” category. The majority of Oregon-owned vessels in 2003 were found in Portland, Astoria and Newport, all communities with ocean access (Figure 11). The most likely cause is that more of Oregon residents who choose to leave the Alaskan fishery are those who moor their boats in Oregon ports. This theory is supported by the number of Oregon-owned salmon vessels leaving the Alaskan fishery. These vessels, for the most part, do not have additional permits and their exit from the salmon fishery signals an exit from Alaskan fisheries as a whole. A competing hypothesis is that more vessels are moving from Oregon ports to Alaskan ports to reduce the fuel costs associated with transiting to Alaska from Oregon. This hypothesis is less likely, at least during the study period. The percentage change in the number of Oregon-owned vessels mooring in Oregon and for Oregon-owned vessels mooring outside Oregon is fairly small and any major economic pressures affecting multiple fisheries would likely force a greater effect. The fuel prices of the past few years, however, may increase the likelihood of this outcome and will be discussed in greater detail below.

7.2.3. Crew

The distribution of Oregon residents holding crew permits is similar to that of Oregon-held fishing permits. The greatest concentration of Oregon-held crew permits are found in the Newport, Portland, and Astoria area (Figure 12). The largest portion of Oregon-held crew permits is found spread among communities throughout the state. As with fishing permits, this distribution highlights the impact that commercial fishing has in traditional non-fishing regions of the state.

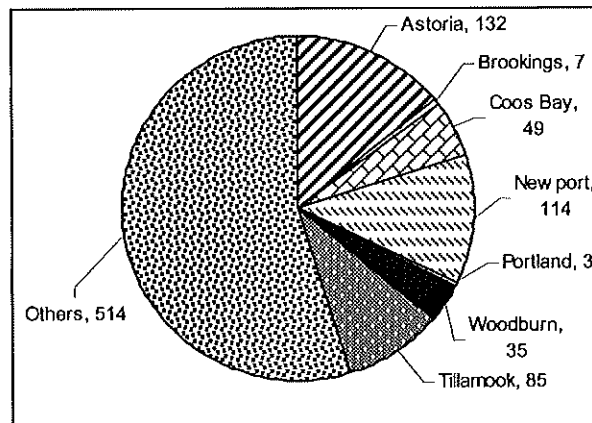


Figure 12. Geographical distribution of Oregon crewmembers in 2003

8.1. Revenue generated by Oregon residents

Alaskan commercial fisheries generated over \$1 billion in revenue in 2003, a portion of which was generated by Oregon residents. This section will examine the revenue earned by Oregon residents between 1998 and 2003. Revenue is defined in this report as the money generated by the sale of catch. Further, revenue will be divided into onshore and offshore categories. This division accounts for the two sources of revenue data and an attempt to prevent overlap in the accounting of revenue. Onshore revenue refers to money generated by that portion of catch that is delivered to onshore processors and is recorded through CFEC's fish ticket system. Although consisting of traditional coastal fisheries, such as salmon, onshore fisheries can also include catch from fisheries in federal waters. The onshore component also includes state-managed groundfish fisheries, meaning that groundfish cannot be considered a wholly offshore fishery. Offshore revenue refers to money generated by that portion of catch that is delivered to offshore processors (motherships) and is recorded through federal blend files. This portion of the revenue will be mainly composed of catch from the groundfish fisheries.

Revenue data and estimates in this section are derived from three sources. AKFIN provided data on total revenue and average revenue per vessel for offshore and onshore fisheries. CFEC provided data on total revenue and average revenue per vessel for onshore fisheries as a way to confirm AKFIN estimates. CFEC annual reports were used to compare participation and revenue for different states. AKFIN also split total revenue by gear type and target species for 2003 to analyze revenue generated by Oregon residents in greater detail. All sources were provided data from 1998 through 2003. All revenue figures are adjusted for inflation to 2003 dollars.

8.1.1. Total Alaskan fisheries revenue

Fisheries revenue for Oregon residents has, on average, increased during the study period from a low of \$71.3 million in 1998 to a high of \$96.7 million in 2000 (Figure 13). Total 2001 Oregon revenue decreased by \$9.9 million from 2000 and by \$3.6 million between 2001 and 2002. Radtke and Davis (1999) reported that Oregon residents generated a total revenue of \$71.3 million in 1996 (adjusted to 2003 dollars from \$59.6 million reported).

Large increases in total Oregon revenue were seen between 1998 and 1999 (\$19.6 million) and 2002 and 2003 (\$12.9 million). These fluctuations are due to a variety of

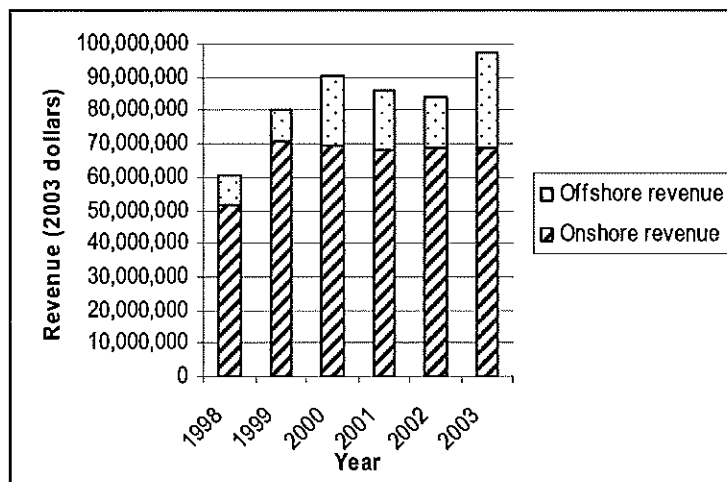


Figure 13. Total Alaskan revenue generated by Oregon residents

factors, including increased landings in high value fisheries and changes in market value for some fisheries.

8.1.2. Onshore fisheries revenue

Total revenue for all states participating in Alaskan onshore fisheries has fluctuated throughout the study period. A maximum total revenue of \$1.3 billion occurred in 1999, while a low of \$802 million occurred in 2002. Alaskan and Washington residents split the majority of the revenue in all years. In 2003, Alaskan residents earned 42.4% of the total onshore revenue, while Washington residents earned 42.3%. Oregon ranked third in onshore revenue with 7.6%, which was the equivalent of all remaining states combined. Although the share of onshore revenue generated by Oregon residents is small in comparison to that generated by Alaskan and Washington residents, Oregon residents generate this revenue with a smaller relative percentage of the total permits (3.8% of total permits). This implies that Oregon vessels are either landing more fish per vessel than the vessels of other states, or that Oregon is generating a large proportion of their revenue from high value fisheries. An investigation of landings by Alaska, Washington, and Oregon residents revealed that landings per Oregon-owned vessel were similar to Alaskan- and Washington-owned vessels (CFEC 2006). Instead, Oregon-owned vessels participated in many high value fisheries, particularly crab, halibut and sablefish. Additionally, Oregon-owned vessels have increased their total landings in groundfish fisheries over the study period. Onshore fisheries also include salmon fisheries, which accounted for approximately half of all Oregon-held permits. Salmon fisheries, however, did not contribute heavily to onshore revenue, averaging only \$5 million to \$8 million annually.

The onshore revenue generated by Oregon residents was steady from 2000 to 2003, averaging \$68 million annually. The high onshore revenue mark occurred in 1999 with revenue of \$70.8 million (Figure 13). The low onshore revenue occurred in 1998 with a figure of \$51.4 million. Radtke and Davis (1999) reported that Oregon residents generated onshore revenue of \$53.1 million in 1996, suggesting that onshore revenue earned by Oregon residents increased from 1996 through 1999 before leveling off from 2000 through 2003.

8.1.3. Offshore fisheries revenue

Data for offshore fisheries revenue were derived from data provided by AKFIN, which reported the total (both onshore and offshore) revenue. AKFIN's data relied upon both fish ticket data and federal blend files and it was not possible to separate offshore information due to masking of confidential fisheries. This report calculated offshore revenue indirectly by subtracting onshore revenue figures from total revenue. Offshore revenue has generally increased between 1998 and 2003, reaching a high of \$28.8 million in 2003. This trend closely follows the fluctuations seen in the total revenue generated by Oregon residents, which along with the stability of onshore revenue, suggests that offshore revenue is responsible for observed changes in the total revenue earned by Oregon residents during the study period.

The decline in the offshore revenue generated by Oregon residents in 2001 and 2002 was due to a combination of changes in groundfish, halibut, and sablefish landings, and the market price of crab and halibut. The increase in offshore revenue in 2000 and 2003 was due to increases in crab and halibut prices in 2000 and 2003 and increased landings of halibut in 2000 (Appendix E).

8.1.4. Groundfish revenue by management region

Revenue from groundfish fisheries generated the majority of Alaskan revenue for Oregon residents. However, management of most species is broken up by geographical region. At the largest scale, Alaskan fisheries are divided into two regions, the Gulf of Alaska and the Bering Sea/Aleutian Islands. The stocks in each region are managed separately, with regional catch quotas and restrictions. In 2003, Alaskan groundfish fisheries generated \$59.5 million in revenue for Oregon residents. The BSAI region generated \$41 million in revenue, over double that of the GOA, which generated \$18.5 million.

In the BSAI, pollock generated the most revenue of any single species, \$12.8 million, (Figure 14). In the GOA, Pacific cod generated the most revenue of any single species, \$4.6 million, although this amount is less than the \$7.5 million generated by BSAI Pacific cod (Figure 15).

8.1.5. Average revenue per Oregon-owned vessel

The average revenue per Oregon-owned vessel has generally increased during the study period from a low of \$231,000 in 1998 to a high of \$367,000 in 2003 (Table 3). Average revenue did decrease in 2001, a year in which total revenue decreased by nearly \$6 million from the previous year. Participation by Oregon residents decreased dramatically in 2001, particularly in salmon fisheries. The decrease in the number of Oregon-owned vessels and Oregon-held permits contributed to this decline. Average revenue for Oregon-owned vessels increased dramatically between 2001 and 2003. A large portion of the increase in revenue per vessel in 2002 can be credited to the continued decrease in Oregon-owned vessels in 2002, with a relatively small change in the total revenue. This was due to higher landings in halibut, sablefish, crab, and groundfish fisheries from 2000 to 2001 which

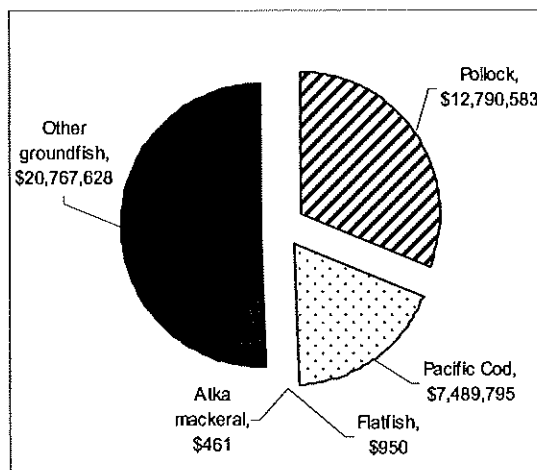


Figure 14. BSAI groundfish revenue generated by Oregon residents in 2003

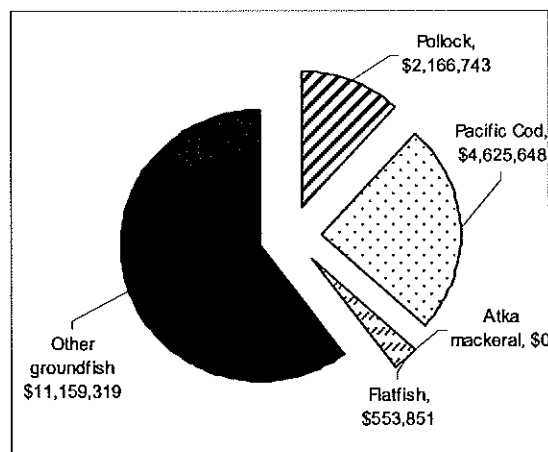


Figure 15. GOA groundfish revenue generated by Oregon residents in 2003

compensated for the decrease in the number of Oregon-owned vessels. The large increase in average revenue in 2003 can be attributed to the increased offshore revenue in that year. Additionally, there was only a small decline in Oregon-owned vessels in 2003.

Oregon-owned vessels landing onshore, such as salmon fisheries, may average considerably less than offshore groundfish vessels. It was impossible to determine, however, the average revenue of Oregon-owned vessels fishing in onshore fisheries compared to offshore fisheries, as many fishermen may participate in both regions and confidentiality rules prevent finer resolution data. Radtke and Davis (1999) did not report average revenue per Oregon-owned vessel.

Table 3. Average Oregon revenue per vessel from Alaskan fisheries

	Number of vessels	Total revenue	Average revenue per vessel
1998	308	\$62,152,581	\$201,794
1999	309	\$81,395,344	\$263,415
2000	309	\$89,665,520	\$290,180
2001	291	\$83,466,043	\$286,825
2002	264	\$81,528,596	\$308,820
2003	262	\$96,210,799	\$367,217

8.2. Additional revenue analysis

8.2.1. Revenue generated by target species

Oregon residents are involved in the harvest of a large variety of species in Alaskan waters, each variable in terms of harvest amounts and market value. The result is that some fisheries are more valuable on a per vessel basis than others.

CFEC fish ticket data reveals that king crab, halibut, pollock, Pacific cod, and sablefish, are the most valuable fisheries on a per vessels basis for Oregon residents. Pollock, one of the largest fisheries in Alaska, was particularly valuable for Oregon residents, bringing in an average of \$484,000 per vessel in 2003, well over \$100,000 more than king crab fisheries, the next most valuable species (Table 4). Radtke and Davis (1999) did not analyze the revenue generated by Oregon residents for target species.

Table 4. 2003 Oregon average revenue per vessel for the five most valuable target species

		Pollock	Crab	Pacific cod	Halibut	Sablefish
Catcher vessels	Total revenue	\$14,994,613	\$7,228,804	\$11,355,363	\$9,142,049	\$2,871,194
	Revenue per vessel	\$483,697	\$361,440	\$298,825	\$268,884	\$159,511

In 2003, Oregon-owned vessels earned \$5.4 million in revenue from salmon fisheries, approximately 5.5% of the total Alaskan revenue generated by Oregon residents (CFEC 2006). This figure was down dramatically from 1998 to 2000 salmon revenue, which averaged \$9 million. This decrease came despite similar landing poundage in all years. The main cause of the decrease in revenue was a decrease in market prices for salmon from 2000 through 2003.

One interesting fact to note is that the total revenue of the five most valuable target species is \$45.6 million, approximately 50% of the total revenue generated in 2003. The majority of the remaining revenue was generated by fisheries in the “other groundfish” category, including rockfish and lingcod. Fisheries in the “other groundfish” category generated \$31.9 million in 2003. These fisheries were treated as a group in this report due to confidentiality conflicts and the number of minor species in this category.

8.2.2. Revenue generated by gear type

Estimating revenue by the gear type used is not particularly useful as an indicator of participation or fishery value because a particular gear type, such as trawl nets, can be used to harvest a wide variety of species, which vary in market value and harvest rate. This estimate was important, however, in determining expenditures that fishermen incurred during fishing operations, which will be discussed in detail in the next section.

Many vessel owners were not specific in CFEC databases when detailing the gear type employed by their vessel, leading to a large number of vessels and, accordingly, revenue listed as “unknown” or “other”. To better allocate revenue of “unknown or other” gear type, revenue was recalculated using CFEC annual databases. This method calculated revenue by taking the average revenue per Oregon-held permit, for each permit type, and multiplying by the number of Oregon-owned vessels participating in the respective fishery. CFEC permits include the gear type in their designation. By recalculating revenue via this method and applying the new figures to the data provided by AKFIN, it was possible to estimate the portion of each gear type that was assigned to “other” or “unknown” categories and add this portion to the correct gear type.

2003 AKFIN data clearly showed that trawl gear generates the most revenue, \$49.5 million, for Oregon residents (Figure 16). The majority of this revenue, \$30 million, was

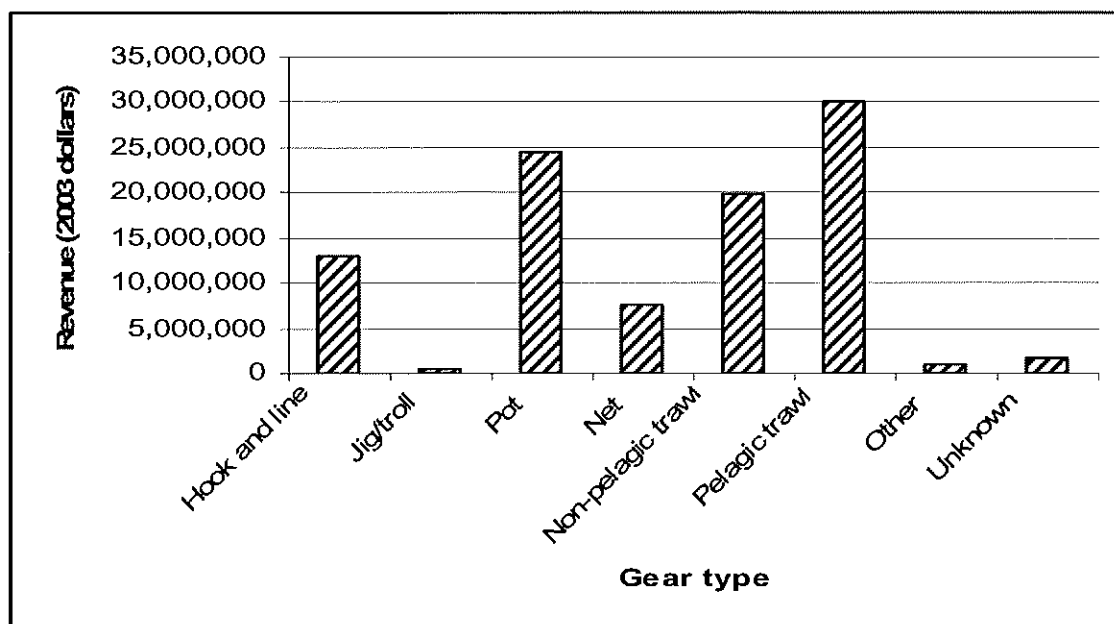


Figure 16. Oregon revenue generated by gear type in 2003 in Alaska

generated in pelagic, or mid-water, trawl fisheries and the remaining \$19.5 million was generated by non-pelagic, or bottom trawl fisheries. Pelagic trawls include many of the major groundfish fisheries, such as pollock. Pot fisheries, including king crab, were also valuable, generating \$24.4 million.

8.2.3. Additional considerations

Individual Fishing Quotas (IFQs) cause additional complexity in determining the revenue generated by Oregon residents. IFQ's are a system that gives a quota holder a set amount of catch. IFQs insure that a vessel will have the opportunity to harvest a set amount of fish in a season rather than having to compete with other vessels under a fishery-wide harvest cap. IFQs are also transferable, that is, a quota holder can decide to sell all or a portion of his quota to another fisherman or lease all or a portion of it (allowing another fisherman to fish the permit for a fee, while the original quota holder maintains ownership of the permit). Alaska currently operates three IFQ fisheries, for halibut and sablefish which were established in 1995 (Pautzke and Oliver 1997) and for Bering Sea king crab, which was established in 2005 (Carroll 2005). The lease fee varies based on the fishery of the quota, the demand for the quota, and the availability of similar quotas and the percentage of the quota that is sold or leased.

An additional benefit of IFQ fisheries is that the program gives a market value to an individual fishing operation. The ability to sell a quota, in the hundreds of thousands of dollars for halibut or pollock quotas, allows a fisherman to treat his business as an investment with future value not dependent on business infrastructure. IFQs give quota holders additional options than simply to fish or lease the quota.

IFQs alter the revenue generated by Oregon residents in two ways. Oregon residents who hold quotas can sell or lease their permits, thus garnering a fee, but without incurring the expenditures that fishermen who actively fish the quota incur. However, the fee generated by such a sale or lease is less than the revenue generated by actively fishing the quota. Alternately, Oregon residents can sell or lease quota from other quota holders. These fishermen can then fish the quotas (sometimes combining quotas for efficiency) and earn the revenue from the catch, but will add the cost of the quota lease or sale to their expenditures. The data provided from AKFIN and CFEC did not provide sufficient information to indicate if Oregon quota holders sold or leased a portion of their quotas or purchased quotas from others. This issue will require future analysis to detail how many permits are leased each year, and at what rate.

Approximately 70 to 80 Oregon-held permits were used by vessels owned by residents of other states and 25 to 35 Oregon-owned vessels used permits held by residents of other states.

9.1. Expenditures of Oregon-owned vessels

In any commercial fishing operation there are costs incurred while actually harvesting. Fuel, fishing gear, vessel maintenance, labor and permitting costs all factor into determining the potential net income that a fisherman can achieve. In regard to the

amount of Alaskan fisheries revenue returning to the Oregon economy, costs play an important determining role.

9.1.1. Cost model

For Oregon's distant water fleet, the state in which expenditures are made can affect the amount of money that flows to the state of Oregon in two ways. First, if Oregon residents moor their vessels in Oregon ports, perform vessel maintenance in Oregon, purchase supplies locally, and/or hire Oregon residents as crew then more money will flow into the state's economy. This is because portions of the vessel's total fishing revenue are used to cover these costs and this money goes to Oregon businesses or goes to Oregon residents (crew or owner) who can use this money to purchase goods in Oregon. Conversely, Oregon residents may choose to moor their vessel out of state, generally in Alaska and Washington. In this situation maintenance, gear, and supplies are often purchased outside Oregon. This means that a greater proportion of the vessel's total revenue will go to the economies of other states.

Costs to Oregon fishermen are treated in this report as a percentage of total revenue, which indicates what portion of the vessel's revenue is allotted to various expenditures. The cost model was incorporated from Radtke and Davis (1999) and defines costs with respect to the gear type used by the vessel (Table 5). The theory behind this model is that vessels with similar gear types will incur comparable costs at a similar percentage to the vessel's total revenue. Vessel size is assumed to be irrelevant in this model. There are several "other" categories that refer to vessels that do not fit into the prescribed categories. "Alaskan onshore other" refers to vessels that used alternate gear types (fish wheels, diving gear, etc.). "Alaska other" refers to vessels that do not conform to catcher vessel or catcher processor categories or to vessels that did not provide complete information to reporting agencies. "Other waters" refers to vessels that fished in international waters, outside federal or state controlled areas.

The cost model was used to calculate the return to labor and the actual fishing expenditures. Return to labor indicates the net income that goes to the vessel owner and the wages earned by crew. Fish prosecuting expenditures describes the portion of the revenue that is spent on various non-labor costs of fishing. These two factors make up the potential Alaskan commercial fisheries income to the state of Oregon. It is important to note, however, that only a portion of the return to labor and fish prosecuting expenses will return to Oregon's economy.

9.1.2. Changes to the cost model

The cost model in Radtke and Davis (1999) was used to examine expenditures for Oregon fishermen in 1996. Because of this, the first section of the model, variable expenditures, was given the same fixed percentages for comparison, although these factors are assumed to fluctuate from year to year (Table 5). This report will also assume that the variable expenditures are a constant proportion of total revenue, with the acknowledgement that large fluctuations in the costs of any of these categories will impact the amount of money that returns to Oregon. One exception is the price of fuel, which will be analyzed further. The average price of diesel fuel more than doubled from

\$1.12 per gallon in 1998 to \$2.75 per gallon, and climbing by 2006 (U.S. Department of Energy 2006). Although the price of fuel rose at a slower rate during the study period, the dramatic rise in cost warrants additional analysis. The percentage cost of fuel in the model will be adjusted from the original model for each year, using annual average West Coast fuel prices as a guide, in order to determine the financial impact during the study period. The impact of continued increases in fuel prices will be discussed further in upcoming sections.

Table 5. Operating Expenditures as a Percentage of Total Revenue by Fishery and Vessel Gear Groups

	Alaska Onshore						Alaska Offshore			Other Areas	
	Troll	Longline	Trawl	Pot	Net	Other	Alaska	Catcher	Catcher		Mother-
							Other	Processor	Vessels		ships
Variable Expenditures											
Vessel & engine	15%	6%	9%	6%	10%	10%	6%	10%	9%	10%	9%
Gear replacement	7%	2%	9%	2%	10%	10%	2%	10%	9%	10%	9%
Fuel and lubricants	10.1%	11.9%	9.4%	11.9%	9.5%	11.9%	11.9%	11.2%	9.6%	11.2%	9.6%
Food and supplies	3%	3%	2%	3%	2%	3%	3%	3%	2%	3%	2%
Ice and/or bait	5%	2%	1%	2%	0%	7%	2%	1%	1%	1%	1%
Dues and fees	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Transportation	2%	2%	1%	2%	1%	1%	2%	2%	1%	2%	1%
Miscellaneous	0%	3%	2%	3%	1%	1%	3%	1%	2%	1%	2%
Crew shares and income	5%	39%	38%	39%	39%	39%	39%	39%	38%	39%	38%
Fixed Expenditures											
Insurance	2%	10%	6%	10%	6%	5%	10%	3%	6%	3%	6%
Moorage	4%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Interest expense	1%	3%	2%	3%	2%	1%	3%	1%	2%	1%	2%
Licensing	3%	1%	0%	1%	1%	1%	1%	1%	0%	1%	0%
Miscellaneous	4%	0%	3%	0%	3%	1%	0%	3%	3%	3%	3%
Net Income	39.9%	16.4%	17.4%	16.4%	14.0%	7.1%	16.4%	12.8%	17.2%	12.8%	17.2%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

In addition to fuel, gear replacement is a common and costly expense for vessel owners. Gear replacement occurs regularly as equipment wears down or is lost in the course of regular fishing activities. However, gear replacement can also be required by changes in fishing regulations. This cost can be expensive for any boat, but is particularly expensive for trawl or net gear, which can cost thousands of dollars.

9.1.3. IFQ considerations

If Oregon-owned vessels are participating in an IFQ fishery, additional considerations are needed. If the quota holder decides to sell or lease a portion of the quota they eliminate many costs, except for the cost of the permit and some vessel-related costs, such as moorage, maintenance, etc (Newell et. al. 2002). This will increase the net income percentage in the cost matrix, although the lease or sale price will be less than the potential revenue that could be generated from fishing the quota. However, the sale or

lease of a quota may decrease the amount of money returning to Oregon by reducing or eliminating the need for crew (although this applies only for crew from Oregon) and the fish prosecuting expenditures spent in Oregon.

If the Oregon quota holder purchases or leases a quota from another fisherman this will directly increase costs. The lease or purchase price would be added into the cost matrix under "Licensing" in fixed expenditures. This will decrease the net income percentage in the matrix, although total revenue will be greater with the quota.

9.1.4. Taxes

An additional consideration is that Oregon fishermen and crew are required to pay income taxes to the state of Oregon. Since income tax is collected by the state, this money is considered a portion of the income flowing to the State of Oregon. Although Alaska does tax fisheries businesses that process or export fisheries resources, i.e. processors, Alaska does not collect state income tax from individual fishermen unless they deliver their catch to a processor in another state. There are some local taxes, such as a 1% tax on salmon drift gillnet revenue, and these fall under miscellaneous costs (Alaskan Department of Revenue 2006).

10.1. Income to the State of Oregon

Income from Alaskan commercial fisheries to the state of Oregon is derived from two sources: return to labor and fish prosecuting expenditures. Return to labor refers to crew wages (if the crewmember is an Oregon resident) and the net income that is earned by the vessel owner. Any purchases made by crew or vessel owners in Alaska or other states reduce the return to labor portion of the income to the state of Oregon. Likewise, not all fish prosecuting expenditures return to Oregon's economy.

The majority of catcher vessel gear types earn between 16% and 20% of the vessel's total revenue as net income. Vessels using troll gear take in a much larger percentage, approximately 40%, because these vessels often use few crew, other than the skipper or vessel owner. For comparison, catcher processors net income averages 14% of total vessel revenue.

Income to the State of Oregon is only reported for 2003 because revenue data for gear type was only available for 2003.

10.2. Return to labor

10.2.1. Net income

In 2003, net income for Oregon-owned vessels was estimated at \$18.5 million out of the \$96.2 million in total revenue generated by Oregon residents (Figure 17). This breaks down to an average net income of \$76,500 per Oregon-owned vessel, although actual vessel net income varies widely based on the type of gear used and the type and number of fisheries in which a vessel participated. In 2003, pelagic trawl vessels made up the highest percentage of net income, comprising 31.5% of the total income. This, again,

was due to the low crew costs associated with these vessels. Oregon-owned vessels using pot gear brought in 24.2% of the total net income, while the vessels using non-pelagic trawl and hook-and-line gear brought in 20.7% and 13.3% respectively.

One item to note, however, is that in many cases skippers, skipper-owners, and crewmembers will often purchase gifts, goods or other items (not fishing related) that will reduce the proportion of the return to labor that returns to Oregon's economy. A

recent study by Davis (unpublished manuscript 2006) estimated that for Oregon-owned gillnet vessels approximately 50% of the return to labor is spent outside Oregon. Applying this estimate to all Oregon-owned vessels would reduce 2003's net income returning to Oregon's economy to \$9.25 million. Using this method for all fisheries, however, would overlook differences in purchasing behavior between skippers (or owners) in offshore and onshore fisheries, pot or trawl fisheries, etc. and would skew conclusions. In order to account for this variability, this report will present a range of the net income returning to Oregon from a low end of 40% returning to the state to a high percentage of 60%. Using these values returns a total net income of \$7.4 million to \$11.1 million.

Radtke and Davis (1999) reported a net income of \$21.2 million from Alaskan fisheries for Oregon residents in 1996. Their figures, however, assumed that 100% of the net income returned Oregon. This compares well with the unadjusted net income of \$18.5 million found by this study in 2003.

10.2.2. Crew wages

An additional source of income to the State of Oregon is Oregon residents who work in Alaska as crewmembers. Although crew wages are an expense for the vessel, if a vessel employs Oregon residents as crew the money spent on crew wages still returns to Oregon's economy. Approximately 900 to 1000 Oregon residents work as crew in Alaska, but estimating their wages is difficult due to several factors (Carothers and Sepez 2004). Some vessels pay crew by the number of days worked, while others choose to pay their crew a percentage of the catch revenue. It was not possible to determine, for this study, which fisheries, or even how many fisheries, crewmembers from Oregon participated in based on permit records. ADFG provided commercial crew permits, which are valid for all commercial fisheries in a given calendar year. Additionally, the Alaskan Department of Labor (2006) annual earnings summaries lump vessel owners with crewmembers, thus masking crew earnings. Personal communications have suggested that a rough estimate for crew pay would be about \$5,000 per month (C. Seung and J. Sepez personal communication, February 2006). Combining this information with

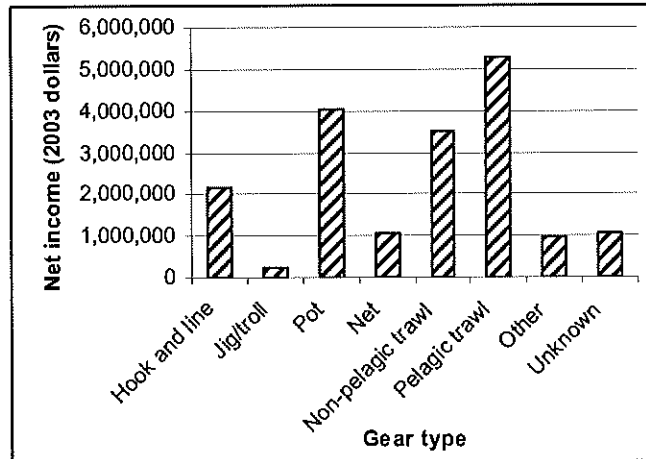


Figure 17. 2003 net income for Oregon-owned vessels

estimates derived from the cost model indicate that in total, crew from Oregon could reasonably earn \$16 million to \$20 million annually.

Estimating how much of crew wages makes it back to Oregon is equally challenging. Crew have far less overhead costs than vessel owners. Crewmembers are responsible for purchasing a license, which cost \$175 for non-residents, covering transportation to and from Alaska, and outfitting themselves with cold weather gear, although vessels often provide gloves, waders, etc. These costs are relatively inexpensive, which means that much of the revenue generated by crew from Oregon can be considered income to the State of Oregon. One complication, however, is considering how much time a crewmember is onshore in Alaska. While onshore, such necessities as lodging and food must be covered by the crewmember. This reduces the crew wages portion of the return to labor, as does any other purchases made in Alaska, which supports the gillnet study by Davis (unpublished data 2006). Additionally, a survey of New England crewmembers indicated that crew spent an average of 60% of their income in their home counties (Northeast Fisheries Science Center 2001). Using these assumptions, crew from Oregon would bring back approximately \$10 million to \$12 million to their local economies. Due to the uncertainties in pay structures, time of employment, and the fisheries worked in the estimates of crew wages should be considered to be rough estimates only and subject to future study.

Radtke and Davis (1999) reported total crew wages of \$42 million. This figure includes non-Oregon crew, however, so no comparisons can be made. Additionally, their report assumes that 100% of crew wages returns to the state of Oregon.

10.3. Fish prosecuting expenditures

The final component of income to the state of Oregon is the portion of fish prosecuting expenditures that is spent in Oregon. Fish prosecuting expenditures includes vessel maintenance, gear repair and replacement, licensing, fuel, bait, etc. The amount of fishery prosecuting expenditures that are spent in Oregon depends heavily where an Oregon-owned vessel is moored. If the vessel is moored in an Oregon port, a greater percentage of that vessel's fish prosecuting expenditures will return to Oregon's economy than from those vessels moored in Alaskan or Washington ports. Again, the study by Davis (unpublished data 2006) suggests that approximately 50% of fish prosecuting expenditures return to Oregon's economy when a vessel is moored in an Oregon port, while only about 25% of fish prosecuting expenditures return to Oregon's economy when a vessel is moored in an Alaskan or Washington port. The cost model was used to estimate the fish prosecuting expenditures for vessels that moored in Oregon and in out of state ports based on home port designation listed on the vessel registration. The 121 Oregon-owned vessels that moored in Oregon ports in 2003 spent approximately \$27.5 million in fish prosecuting expenditures. Assuming 50% of these costs were spent in Oregon, this results in an income of \$13.8 million to the state. The remaining 130 Oregon owned vessels were moored outside of Oregon and generated \$15.3 million in expenditures. Using a 25% return to Oregon for this class, Oregon-owned vessels moored out of state contributed \$3.8 million in fish prosecuting expenditures to the State of Oregon. This results in a total contribution of approximately \$17.6 million to the state.

Radtke and Davis (1999) reported \$19.5 million in fish prosecuting expenses returned to Oregon's economy in 1996. Their analysis did not differentiate between Oregon-owned vessels that moored in Oregon or out of state. The return percentages used in their model assumed higher percentages of expenditures returning to Oregon than this report.

In addition to the considerations above, fish prosecuting expenditures may be affected by behavioral trends by groups of fishermen. For example, personal communications with fishermen suggest that smaller Oregon-owned salmon vessels likely remain in Alaska permanently, but that "big ticket" repairs, such as engine replacement are ordered in Oregon and shipped to Alaska. Additionally, it was suggested that Oregon-owned pot fishery vessels return to Oregon every two to three years to perform maintenance and repairs (R. Jacobson personal communication 2007). These trends would influence the percentage of the return of fish prosecuting expenditures to Oregon on a year by year basis, but were not included in this analysis. One other assumption has the potential to significantly modify the return to Oregon. If a vessel's home port as listed in the vessel registration database (CFEC) does not represent where it spends most of its time, revenue generated by that vessel will be misallocated to geographic region. Currently, there is no method to verify the vessel's home port designation.

10.4. Total income to the state of Oregon

Overall, in 2003 fishermen from Oregon generated \$7.4 million to \$11.1 million in net income and \$17.6 million in fish prosecuting expenditures that returned to Oregon's economy. Crew added \$10 million to \$12 million, resulting in a total income to the state of Oregon of \$35 million to \$40.7 million derived from the sale value of the catch. This does not include other potential routes for revenues generated by Alaskan commercial fisheries to enter the Oregon economy, such as fish products shipped and stored in Oregon, or Oregon residents that work at fish processing plants or related businesses in Alaska.

Radtke and Davis (1999) reported a 1996 total income of \$88.6 million to the state of Oregon. Although their findings double the findings of this report their assumptions differ from this report. They assume that 100% of net income and crew wages return to the state of Oregon. Additionally, they assume that a higher percentage of fish prosecuting expenditures are spent in Oregon.

11.1. Future trends and considerations

The main goal of this study was to evaluate the level of participation in Alaskan fisheries by Oregon residents and to estimate the subsequent income to the state of Oregon. An additional aspect of this report is to examine the effects of selected recent, current or future issues and the impact upon the involvement of Oregon residents in Alaskan commercial fisheries as a way to evaluate how dynamic this relationship is. This section will look at three different issues (biological, management, or economic) and discuss the potential implications in terms of changes to Oregon's fleet in Alaska, changes in fishing pressure (either within a fishery or between fisheries), changes in the income to the state of Oregon, and management concerns that may arise as a result. These issues are meant to highlight the complex connections between Oregon and Alaska and how a change in one area can affect the other.

11.1.1. What would the increase in fuel costs mean to Oregon's participation in Alaskan commercial fisheries?

Fuel is a major factor in operating costs for fishing vessels, and fluctuations in diesel prices affects the net income for many businesses. Since 1998 the average West Coast diesel prices have increased from \$1.12 per gallon to a current high of over \$2.75 per gallon, which is an average of 2006 prices though May, and local prices may be higher (U.S. Department of Energy 2006). This represents a price increase of 145% over eight years and a correspondingly larger portion of the harvest value must be used to cover this cost. The amount of fuel required by a boat during a fishing season varies by vessel. Larger vessels have more fuel capacity than smaller vessels and generally consume more in the course of operations. The fishery in which a vessel participates in also influences the amount of fuel used. Groundfish fisheries that require vessels to range over a large area, or travel far from shore to reach fishing grounds. Oregon-owned vessels that moor in Oregon or Washington ports must travel further to reach Alaskan fishing grounds and will use more fuel traveling back and forth.

The cost matrix used by Radtke and Davis (1999) indicated that fuel costs ranged between 8% and 10% of the vessel's gross revenue, depending on the type of vessel and gear. This report was based on revenue data from one year, thus annual changes in diesel prices were not accounted for. To assess the impact of variable fuel costs the percent cost of fuel was adjusted for each year, 1998 to present, using annual average diesel prices for the West Coast (U.S. Department of Energy 2006). Adjustments were made to the fuel percentage found in the Radtke and Davis cost matrix by determining the percent change in the annual average cost of fuel and applying it to the previous year's cost matrix values (Table 6). No other expenditure values were changed and fishing behavior was assumed to remain constant (ie fishermen used the same amount of fuel and other supplies). To eliminate the effect of annual differences in harvest and changes in catch market value each adjusted year was evaluated using 2003 revenue data.

	Average fuel price	%	Gear type						
			Troll	Longline	Trawl	Pot	Net	Other	Unknown
1996	1.36	0.00%	9%	10%	8%	10%	8%	10%	10%
1997	1.30	-4.18%	8.14%	9.58%	7.57%	9.58%	7.67%	9.58%	9.58%
1998	1.12	-14.27%	6.98%	8.21%	6.49%	8.21%	6.57%	8.21%	8.21%
1999	1.25	12.41%	7.85%	9.23%	7.29%	9.23%	7.39%	9.23%	9.23%
2000	1.61	28.13%	10.06%	11.83%	9.35%	11.83%	9.46%	11.83%	11.83%
2001	1.50	-6.89%	9.36%	11.02%	8.70%	11.02%	8.81%	11.02%	11.02%
2002	1.40	-6.21%	8.78%	10.33%	8.16%	10.33%	8.27%	10.33%	10.33%
2003	1.61	14.75%	10.08%	11.86%	9.37%	11.86%	9.48%	11.86%	11.86%
2004	2.02	25.59%	12.66%	14.89%	11.76%	14.89%	11.91%	14.89%	14.89%
2005	2.57	27.05%	16.08%	18.92%	14.94%	18.92%	15.13%	18.92%	18.92%
2006	2.75	7.11%	17.22%	20.26%	16.01%	20.26%	16.21%	20.26%	20.26%

The economic effect of fuel prices on the income to the state of Oregon was significant. The baseline year used was 2003 with a net income of \$18.5 million and an average

diesel price of \$1.61 per gallon. The lowest average price of fuel between 1998 and 2006 was \$1.12 per gallon in 1998. At that price the 2003 net income would have been \$21.7 million, which represents an increase of \$3.2 million. Conversely, the 2006 average

price, through April, was \$2.75 per gallon. When the 2006 fuel price is applied to 2003 revenue this price results in a net income of \$11.2 million, a decrease of \$7.3 million. This is a range of \$10.5 million in net income with a variation in the cost of fuel of \$1.63 per gallon. One caveat to these impact estimates is the way that added costs could influence the behavior and spending habits of a fisherman. Rather than accept a reduced income fishermen may choose to reduce expenditures in other areas, such as putting off vessel maintenance or in the number of crew they hire. They may also attempt to reduce the amount of fuel that they use, either by planning more efficient cruise routes, remaining in the same area for longer, or by reducing the distance that they must travel from port to fishing grounds. Thus, the impacts to income are likely not as severe as presented above, but they can effect the economic contribution of commercial fishing to Oregon indirectly as well.

The potential impacts of fuel prices to Oregon’s distant water fleet are many (Ess 2006). The increased costs will impact every vessel in the fishery, but some will feel it more than others. Vessels that operate under a smaller profit margin (i.e. vessels that have costs that are close to their gross revenues) will have their profits reduced further and may be financially unable to continue fishing. In order to reduce fuel costs, Oregon residents may choose to moor vessels in Alaska year-round. While this reduces the cost of fuel and increases the income of these vessels, the amount of money entering Oregon ports from commercial fishing expenditures will decrease. The Port of Newport provided data that reported revenue ranging from \$500,000 to \$620,000 per year in marina and terminal moorage and hoist services related to commercial fishing vessels during the study period. Not all of these vessels participate in Alaskan fisheries, however, and no decrease in port revenue was observed between 1998 and 2003. This indicates that if vessels are switching to Alaskan homeports, there was little impact during the study period, but impacts may be seen in future years.

Oregon-owned vessels are choosing to moor their vessels in Alaskan ports more often. This trend is evident when examining the home port of Oregon-owned vessels fishing in Alaska. From 1998 to 2003 the number of vessels using Oregon ports as their home port has decreased. The number of vessels using Alaskan ports has also decreased due to the

Table 7. Home port of Oregon owned vessels

	Oregon vessels moored in:					% of Oregon vessels moored in:		
	AK	WA	OR	Other	Total vessels	OR	AK	WA
1998	130	12	161	3	306	52.6%	42.5%	3.9%
1999	131	12	160	2	305	52.5%	43.0%	3.9%
2000	140	14	148	2	304	48.7%	46.1%	4.6%
2001	129	12	139	1	281	49.5%	45.9%	4.3%
2002	125	12	119	2	258	46.1%	48.4%	4.7%
2003	117	13	121	3	254	47.6%	46.1%	5.1%

overall decrease in Oregon vessels, but the *percentage* of Oregon vessels using Alaskan

ports rather than Oregon ports has increased (Table 7). The number of vessels using Washington ports has remained constant, although the percentage of Oregon-owned vessels in Washington ports has increased slightly. This trend is expected to continue with the current increase in gas prices. An alternate possibility is that the number of vessels involved in Alaskan fisheries will decrease as fishermen are unable to maintain a sufficient income level.

Personal communications with fishermen indicate that these potential effects have been seen by the fleet (F. Yeck personal communication 2006). One Oregon resident, participating in the pollock fishery, estimated that fuel costs reduced his profits by approximately 40% in 2006, which is double the impact estimated in the analysis above. Additionally, he indicated that some regular maintenance projects were delayed due to the costs of traveling back to port in Oregon (approximately \$50,000 for a round trip). For some smaller, Oregon-owned vessels, fuel costs have forced some owners to trade fish (in the form of quotas in the pollock fishery) for fuel or lease out their quota because the costs related to fishing are too high.

Fuel prices are not expected to decrease in the foreseeable future. It is likely that the sustained high fuel prices will force some Oregon-owned vessels out of the fishery, continuing the decline in participation. Fishermen will also have to adjust their behavior by reducing the number of trips they make between port and fishing grounds and by delaying maintenance projects. Although fuel prices are outside their sphere of influence fisheries managers and NPFMC representatives should remain aware of how these additional costs affect fishing behavior when setting seasons and fishing zones and policy.

11.1.2. How will fishermen from Oregon be affected if more fisheries adopt an IFQ system?

IFQ's, or individual fishing quotas, are a limited access system in which participating vessels are given a quota for a set amount of catch. This differs from an open access fishery in which an overall TAC (Total Allowable Catch) is set and vessels catch as much as they can until the TAC is reached. These so-called "derby" fisheries are competitive, often requiring fishermen to fish long hours in all types of weather to harvest a portion of the catch. Proponents of IFQ systems contend that by allowing a vessel to catch a set quota, it removes the pressure to fish from fishermen and promotes stability to the fishery. This allows vessels to remain in port during dangerous weather and to operate on a schedule that suits the fisherman. IFQs also have economic benefits. In an open access fisheries the majority of the TAC is often caught in a relatively short period. This floods the product with product, increasing supplies with respect to the demand, and consequentially, decreasing the price paid to the fishermen. IFQs allow a quota holder to fish at their leisure within the season, and spreads out the delivery of fish to the market, keeping supply lower than in derby fisheries, and keeping price up. This effect has been seen in the Alaskan halibut and sablefish fisheries, which have experienced market price increases of 120% and 45% per pound respectively during the study period. Also, under derby fishery constraints, fishermen would typically have to choose which of simultaneously occurring derbies to participate in. IFQs allow fishermen to schedule

their time more efficiently and take advantage of these multiple overlapping fisheries, greatly increasing their potential revenue.

An additional benefit of many IFQ systems is the transferability of quotas. Quota holders have the ability to sell or lease all or a portion of their quota to another fisherman. The sale or lease price depends upon several factors, including the fishery involved, whether the whole quota or just a portion is available, and the supply and demand of similar quotas. Further, the sale of a quota will be more expensive than a lease, reflecting the permanency of a sale. IFQs carry the benefit of giving value to a fishing operation. Fishermen can sell their quota and be able to pay off vessel loans, gear expenses and have money to set aside. This allows fishermen the option of leaving the fishery while still recouping the value of their business.

Allocation of quota is one of the main problems with IFQ systems. How do managers determine how much quota to assign and who will receive quota? Because IFQs represent a move from open access to limited access some vessels that participated in the fishery in past years may not receive a quota, although they may still buy or lease quota from another vessel. IFQs are generally allocated based on the historical catch of a vessel and the length of involvement in a fishery. This is a potential problem for smaller Oregon vessels, particularly if they have only recently joined the fishery. Catcher processors and catcher vessels owned by Alaskan and Washington residents dominate most fisheries in terms of the number of vessels and in catch volume and thus a large portion of quota will be given to vessels of these states. Again, any vessel that is excluded from the fishery can still purchase or lease quota from a vessel with a quota. Thus, although IFQ fisheries are limited access, access is limited only by the scope of the quota trading market and the divisibility of quotas.

Alaska first employed two IFQ fisheries in 1995, for halibut and sablefish (Pautzke and Oliver 1997). Prior to 1995 these fisheries were often open for no more than a few days a year as fishermen raced to catch as many fish as possible, reaching the TAC within a week. In the years after the establishment of the IFQ system the halibut season was extended to 245 days a year, as fishermen no longer needed to compete with each other for their catch. The price fishermen received for their catch increased as well. According to NOAA Fisheries annual landings database, halibut fisheries received \$0.73 per pound in 1992 and \$0.94 per pound in 1993. Following the introduction of the IFQ system, price per pound rose to \$1.68 in 1996. By the end of the study period, the price per pound for halibut was \$2.16. A similar trend occurred in the sablefish fishery. The price per pound in 1993 was \$0.94, but rose to \$1.96 per pound in 1996 and to \$2.27 per pound by 2003.

The AFA, although not an official IFQ, partitioned the Bering Sea pollock fishery into shares, or quotas in 1998 (NPFMC 2002). The enactment of the AFA allowed shareholders to sell or lease their shares. Many fishermen, including Oregon residents, to leave the fishery, which led to the consolidation of the fishery as participating vessels bought or leased the shares of the exiting vessels.

In late 2005 an IFQ system was approved for Bering Sea king crab fisheries (Carroll 2005). Crab fishermen from Oregon are mainly involved in the king crab fishery.

Involvement of Oregon fishermen in the king crab fishery was at a maximum in 1998 at 34 permits, but decreased to less than 20 permits in 2000 and 2001. In the final two years of the study period Oregon-held king crab permits increased to 23.

Many Oregon residents enjoy the benefits of holding quotas in the halibut and sablefish fisheries. Oregon residents have held between 85 to 99 halibut permits (out of 2487 total permits in 2003) during the study period and between 25 and 29 sablefish permits (out of 797 total permits in 2003) during the same period. Approximately 25 to 32 halibut permits and 12 to 14 sablefish permits were associated with vessels owned by residents of other states, suggesting that these are leased quotas. It was not possible to tell if there were quota leases between Oregon residents from the available information.

11.1.3. What effect will reduced salmon harvests off of Oregon have on Alaskan salmon fisheries?

Salmon remains one of the traditional West Coast commercial fisheries off of the coast of Oregon. Recent years, however, have seen dramatic reductions in the length of the season and in the daily harvest limits, culminating in the severe reductions of the 2006 season off the coast of Oregon and northern California. The reductions were made to protect endangered Klamath River salmon, which mingle with more plentiful runs, such as the Sacramento River salmon while at sea. The restrictions devastated the fishing fleet, leading to the governors of California and Oregon declaring state disasters and asking for federal disaster relief money to ease the financial burden of the fishing community (Barnard 2006). This difficulty within the West Coast fishery may have implications for the participation of Oregon fishermen in Alaskan fisheries.

During the study period salmon permits comprised nearly half of all Alaskan permit held by Oregon residents. The number of Oregon-held salmon permits decreased from approximately 300 from 1998 to 2000 to 242 by 2003. In 2003, Oregon-owned vessels earned \$5.4 million in revenue from salmon fisheries, approximately 5.5% of the total Alaskan revenue generated by Oregon residents (CFEC 2006). This figure was down dramatically from 1998 to 2000 salmon revenue, which averaged \$9 million and came despite similar landing poundage in all years. The main cause of the decrease in revenue was a decrease in market prices for salmon from 2000 through 2003. Salmon prices declined from an average of \$1.20 per pound (for chinook, sockeye and coho) from 1998 to 2000 to an average of average of \$0.66 per pound (of the same species) from 2001 to 2003. The reduction in revenue for salmon fishermen from all states has resulted in many vessels leaving the fishery.

The severe restrictions placed on the commercial salmon fishery off the Oregon coast leaves salmon fishermen with few options. They can attempt to fish other species in West Coast waters, apply for disaster relief money, or attempt to fish for salmon in other regions, including Alaska. This may result in an increase in the number of Oregon-owned vessels participating in Alaskan fisheries. If salmon prices remain lower, however, any vessels from West Coast salmon fisheries may face the same financial difficulties that have affected the vessels already participating in the fishery.

12.1. Summary, management implications and recommendations

Commercial fisheries as an industry are constantly evolving, adapting to fluctuations in the health of the stocks, changes in market forces, and new management schemes. Managers, therefore, need to receive a consistent stream of information about participation and revenue to understand how the fishermen who make up the fishing fleet are impacted by changes to the fishery and the implications of these impacts. One of the primary goals of this report was to provide Oregon fisheries managers and the Oregon representative to the NPFMC a profile of Oregon's distant water fleet from 1998 to 2003, the trends that affected these fishermen, and the income that the state of Oregon received as a result of their participation in Alaskan fisheries. This information can then be incorporated in appropriate NEPA analyses examining potential impacts from management decisions. This section will focus on summarizing the key data, what this information means to managers, and highlighting recommendations that will improve the ability of researchers to gather this information in future years.

12.1.1. Summary - Participation

Fishermen from Oregon are a small, but important, portion of the fleet prosecuting Alaskan fisheries. Alaskan fisheries provided jobs to over 250 vessels and fishermen, and nearly 1000 crewmembers in 2003. Oregon residents held permits in most fisheries in Alaska, but participated most heavily in salmon, groundfish and halibut fisheries. The participation of Oregon residents declined, in terms of the number of permits and vessels, throughout the study period, with the greatest decline between 2000 and 2002. The number of Oregon-held permits decreased from 620 in 2000 to 525 in 2002 and the number of Oregon-owned vessels decreased from 304 in 2000 to 258 in 2002, each a decrease of 15%. These declines were due to poor market prices in the salmon fisheries and the rationalization of Bering Sea pollock fisheries under the AFA and spatial restrictions of groundfish fisheries related to Stellar sea lion protections.

12.1.2. Summary – Fisheries of note

Groundfish fisheries, particularly from the BSAI region, generated the most revenue for Oregon residents. BSAI groundfish fisheries generated \$41 million to \$18.5 million from the GOA. Pollock fisheries produced the highest average revenue on a per vessel basis. King crab, Pacific cod, halibut and sablefish fisheries were also important fisheries for Oregon residents. Salmon fisheries, which comprise approximately half of all Oregon-owned permits, are important in terms of the number of vessels and fishermen employed, but generates relatively little revenue (\$5 million to \$9 million).

12.1.3. Summary – Total income to the state of Oregon

In 2003, the participation of Oregon residents in Alaskan fisheries generated \$96.4 million in revenue, of which \$35 million to \$41 million returned as income to the state of Oregon. Oregon fishermen received \$18.5 million in net income and spent approximately \$17.6 million in fish prosecuting expenditures in Oregon. Crewmembers from Oregon contributed \$10 million to \$12 million.

Oregon's West Coast and domestic fisheries generated \$86.8 million in revenue in 2003. The income to the state from West Coast and domestic fisheries is greater due to a higher percentage of fish prosecuting expenditures spent in Oregon. Radtke and Davis (1999) reported an economic contribution of \$200 million to the state of Oregon from West Coast and domestic fisheries in 1996. These fisheries produced \$83.3 million in revenue during the same year. Reporting an economic contribution of \$88 million to Oregon from Alaskan fisheries, Radtke and Davis indicated that Alaskan fisheries generated \$1 for every \$2 generated by West Coast and domestic fisheries in 1996. This report did not determine the total contribution of West Coast and domestic fisheries to the state of Oregon. However, using the estimates of Radtke and Davis, the findings of this report indicate that Alaskan fisheries generate approximately \$1 for every \$3-\$4 generated by West Coast and domestic fisheries. The difference between this report and the findings of Radtke and Davis can be attributed to differences in estimating crew revenue and in estimating the portion of fish prosecuting expenditures.

12.2. Management implications

The portion of Oregon's distant water fleet that fishes Alaskan waters presents NPFMC representatives with interesting implications with regards to management. Oregon residents represent a small portion of the fishery with respect to Alaskan and Washington vessels, but Alaskan fisheries represent approximately one quarter of the total income from commercial fisheries to the state of Oregon and an important source of net income to many Oregon residents.

In terms of the number of Oregon-owned vessels and Oregon-held permits salmon fisheries are the most important to Oregon residents. Salmon fisheries represent approximately 50% the total Oregon vessels and permits fishing in Alaska. However, in terms of the harvest value, groundfish fisheries generate over 60% of the total Alaskan revenue for Oregon residents. Bering Sea groundfish fisheries produced \$41 million in revenue for Oregon residents, approximately 69% of their total groundfish revenue.

These fisheries are the most important to Oregon residents and to the state of Oregon as a whole. Particular care should be taken to assess the potential impacts to Oregon residents when discussing management changes to these fisheries.

Oregon fishermen have benefited greatly from the establishment of IFQ fisheries in the halibut and sablefish fisheries, and the rationalization of the Bering Sea pollock fishery. IFQs help raise the market value of catch, contribute to increased fleet safety, and give assurance to quota holders that they will not have to compete with other vessels to harvest their share. Managers assessing the viability of new IFQ fisheries must weigh the benefits against the number of vessels that may be excluded from the fishery.

12.3. Recommendations

In the course of collecting the relevant data for this report several issues arose which highlighted the need for recommendations to managers and NPFMC members. These are recommendations that may assist future data gathering by ODFW researchers for use

related to the contents of this report. These recommendations also address future concerns that may occur if the trends found by this report continue.

12.3.1. Recommendations – Confidentiality

One of the major challenges in gathering revenue data was Alaskan fisheries confidentiality law. This masked the landings and revenue of any request that had fewer than four vessels participating in a given year. Initial requests asked for revenue generated by Oregon-owned vessels broken down by species group, vessel type (catcher vessel or catcher processor), and vessel length. The resulting revenue report was filled with masked fisheries. Ultimately, vessel length had to be removed as a criterion in order to get the majority of the data, although revenue information for herring, shellfish (other than crab), and miscellaneous species still remained masked. Oregon fisheries managers wishing to obtain revenue and landings data must be aware that some specific criterion for data requests may result in masking of information and must be prepared to use summary data instead. This problem may be compounded in light of the trends found in this report. If the number of Oregon-owned vessels continues to decline the number of fisheries masked by confidentiality will only increase, making it harder to obtain state and fishery specific information.

Future studies will need to prepare for data collection by prioritizing the criterion used in the request and knowing which criterion can be rolled up into summary data if problems arise.

12.3.2. Recommendations – Permits

Ambiguity in the classification of some permits prevented in-depth analysis of a number of participation and revenue trends. Of particular concern was the lumping of walleye pollock, Pacific cod and Atka mackerel into a “miscellaneous saltwater finfish” category. Because these groundfish species were grouped together it was not possible to track changes in participation of Oregon residents in these fisheries. The effects of the AFA in terms of the number of Oregon-owned pollock boats or the impacts of Stellar sea lion restrictions on the number of Pacific cod vessels were two analyses that could not be performed. Personal communications with fisheries managers and Oregon fishermen did shed some light on the trends of these fisheries as a whole, but without permit or vessel counts exact figures were unavailable.

It would be most useful to researchers if permit designations for these groundfish species were changed to indicate the particular target species being prosecuted.

The generality of crewmember permits also caused difficulties in estimating the contributions of crew wages to the income of Oregon. Crew permits did not indicate which fisheries the permit holder participated in, nor the length of time they were participating. Crew wages, at least for model used in this report, depends on the fishery that the individual crewed for and the length of time that the person was participating as a crewmember. Unfortunately, crewmembers often work in more than one fishery, making permit classifications difficult.

At the time of this report the Alaska Fisheries Science Center was working on crewmember involvement in Alaska and may prove to be a valuable resource in future estimates of the contribution of Oregon crewmembers.

12.3.3. Recommendations – Discrepancies between agencies

The majority of the revenue data used in this report came from CFEC and AKFIN. CFEC provided revenue data collected from its fish ticket system, while AKFIN had access to the fish ticket data and federal blend files. For this report, AKFIN was used as the primary data source, while CFEC was used to double check onshore revenue. A major discrepancy was found however between the two agencies regarding the classification of vessels as a catcher processor. CFEC classified a vessel as a catcher processor if it had freezing and/or packing capabilities. AKFIN classified a vessel as a catcher processor if it participated in processing activities, that is, processing fish onboard the vessel. CFEC reported approximately 35-40 Oregon-owned catcher processors, while AKFIN reported no Oregon-owned catcher processors. Based upon the Radtke and Davis report and vessel length information this report followed the AKFIN definition. This raised an interesting question, however. How do two agencies, with access to much of the same data, have such different definitions and arrive at such different results? This poses questions about whether reports based on information from one source will result in different conclusions than if both agencies were consulted.

In order to provide managers with reliable and consistent information this report recommends that AKFIN and CFEC standardize, to as reasonable a level as possible, their definitions and methods in querying fisheries data.

12.3.4. Recommendations – Data Gaps

Gaps in vessel and permit data also presented a challenge in analyzing participation information. CFEC gathers information including the permit holder's home city and state, and vessel owner's home port and permanent address. Additional information includes vessel length, gear types used, and ADFG registration number. Unfortunately, there are many instances of vessel owners that do not list an ADFG registration number, nor vessel specifications. Some instances, such as clam fisheries, do not require vessels, but a large number of the vessels missing information are in salmon fisheries. This missing information prevented accurate counts of the home ports of Oregon-owned vessels.

Analyses are only as strong as the completeness of the data. CFEC should consider evaluating their registration procedures to ensure that fishermen registering their vessels include all requested information.

12.4. Conclusion

The continued presence and success of Oregon-owned vessels in Alaska will be shaped by the trends described here. High diesel prices have had a major impact on the net income of many vessels, forcing some vessels out of the fishery and other to change the way in which they operate. . The continued rationalization of fisheries and adoption of

IFQ programs presents many Oregon vessels with stable catches, higher market prices, and safer conditions. A few vessels, however, will be lost in the process due to limited access and stiff competition for quota allocation. Finally, fishing conditions in Oregon may play a role in the future of Oregon's participation in Alaskan waters. Continued poor years for salmon or restrictions in other fisheries could increase the number of vessels attempting to make a living in Alaska, adding more pressure to the already declining fleet. All of these trends will need to be watched and continued effort must be made to track the involvement of Oregon vessels in Alaska in order to preserve Oregon fishermen's way of life and continued economic viability.

13.1. Acknowledgements

We would like to extend our deepest thanks to Shannon Davis and Hans Radtke of The Research Group for guidance and advice throughout this project. We thank Gil Sylvia for support and Roy Hyder of the NPFMC for sponsoring this project. Special appreciation to Lorelie Enos of AKFIN, Don Huntsman of CFEC and Jennifer Sepez of the AFSC for providing the necessary data. Finally, we thanks to Bob Jacobson, Keith Criddle, and Fred Yeck for sharing their personal knowledge and experience of Alaska fisheries.

14.1 Appendices

14.1.1. *Appendix A. Data request framework*

Data request framework

Revenue data was gathered from two sources, CFEC and AKFIN, through requests to their respective databases. Alaskan confidentiality laws prevent direct access by anyone that does not work within the two organizations, but analysts for CFEC and AKFIN are able to provide reports for public requests, masking those portions that refer to fisheries with less than three vessels. This is the request framework that was used to collect the relevant information. Requests 1, 2, and 4 were sent to CFEC and all four requests were sent to AKFIN. All requests allowed for revenue categories to be combined in the event that confidentiality issues arose.

1. The first request would be for a count of Oregon vessels for each the year in the period 1998 to 2003 stratified by appropriate revenue bins. The \$0 dollar bin is to identify vessels that might be registered, but did not participate in fishing activities.

Average revenue and frequency distribution (vessel counts) for landings from any species and any area in revenue bins (rows) for each of the last 6 complete years (columns). There would be two tables: one for catcher vessels and the other for catcher-processors. Catcher processors are those classified as a freezer/canner or tender/packer by CFEC vessel registry. The combination of the two tables should be a unique count of all vessels registered to Oregon addresses that participate in fisheries showing up in the database.

Revenue frequency distribution categories (2 tables: one for catcher vessels and one for catcher processors)

Number of vessels in each revenue category 1998-2003:

\$0
 >\$0 and <\$2,500
 ≥\$2,500 and < \$10,000
 ≥\$10,000 and < \$25,000
 ≥\$25,000 and < \$50,000
 ≥\$50,000 and <\$ 100,000
 ≥\$100,000 and <\$500,000
 ≥\$500,000
 Total vessels

Average revenue per vessel (for catcher vessels and another table for catcher processors)

Overall average revenue

Average revenue by year for vessels >\$0 to <\$2,500

Average revenue by year for ≥\$2,500 vessels

Catcher vessels

Average revenue by year for vessels >\$0 to <\$2,500

Average revenue by year for ≥\$2,500 vessels

Catcher processors

Average revenue by year for vessels >\$0 to <\$2,000,000

Average revenue by year for vessels ≥\$2,000,000

2. The second request is for vessel count and revenue data based on species (columns). The columns are vessel types and areas (rows) for Oregon addressed vessels from 1998-2003. Any vessel that falls under \$2500 should be filtered out if revenue level considered reasonable. The species aggregations and vessel types are listed below.

Vessel count and total revenue matrix for last complete year (filter out any vessel <\$2,500 total revenue for the last complete year)

A. SPECIES (matrix columns)

1. Groundfish (split into BSAI and GOA columns)

(a) Pollock

(b) Pacific cod

(c) Atka mackerel

(d) Flatfish

(e) "Other groundfish"

2. Herring

3. Halibut

4. Salmon (including all of the various species of Pacific salmon)

5. Crab (including red king crab, golden king crab, and tanner/snow crab)

6. Scallops

7. "Other shellfish" (including all clams, shrimp, abalone, and other crab species)

8. "Other species" (including lingcod, eels, and other infrequently caught forage species)

B. VESSELS (matrix rows)

1. Catcher-processors

Vessel length categories

0'-60' (small)

61'-125' (medium)

126'+ (large)

2. Catcher vessels

0'-60' (small)

61'-125' (medium)

126'+ (large)

3. The third request is for 2003 Oregon revenue based on gear type. The data should be broken into two tables, one for catcher processors and one for catcher vessels, with the total Oregon revenue (for the respective vessel type) given for each gear type.

Gear type

1. Hook and line
2. Jig
3. Pelagic trawl
4. Non-pelagic trawl
5. Pot
6. Other
7. Unknown

4. The fourth request is for total revenue of Oregon vessels (a separate table for catcher vessels and catcher processors) for 1998-2003.

14.1.2. Appendix B. Alterations of income calculations of this report from Radtke and Davis (1999) methods

Assumptions	Radtke and Davis (1999)	Alteration
Portion of net income returning to Oregon	Assumed 100% of crew and net income returned to Oregon	Assumed that 50-70% of net income returned to Oregon, and a rough estimate of 60% return for crew income
Portion of crew income returning to Oregon	Assumed that all crew income went to Oregon sources	Assumed that a portion of crew working on Oregon-owned vessels were not Oregon residents
Fish prosecuting expenditures - vessel homeport	Did not account for differences in spending between Oregon-owned vessels moored in Oregon ports vs. out-of-state ports	Assigned differing returns of expenditures to vessels moored in-state vs. out-of-state

14.1.3. Appendix C: General revenue data spreadsheet

Total revenue of Oregon (total fishery) combined			
	Catcher vessels	Catcher processors	Total
1998			
1999			
2000			
2001			
2002			
2003			

Total revenue of catcher processors from Oregon (total fishery) combined																			
	BSAI							GOA											
	Pollock	Pacific cod	Atka mackerel	Flatfish	Other groundfish	Salmon	Crab	Pollock	Pacific cod	Atka mackerel	Flatfish	Other groundfish	Salmon	Crab	Herring	Halibut	Scallops	Other shellfish	Other species
1998																			
1999																			
2000																			
2001																			
2002																			
2003																			

Total revenue of catcher vessels from Oregon (total fishery) combined																			
	BSAI							GOA											
	Pollock	Pacific cod	Atka mackerel	Flatfish	Other groundfish	Salmon	Crab	Pollock	Pacific cod	Atka mackerel	Flatfish	Other groundfish	Salmon	Crab	Herring	Halibut	Scallops	Other shellfish	Other species
1998																			
1999																			
2000																			
2001																			
2002																			
2003																			

Total revenue of catcher processors from Oregon (total fishery) combined							
	Hook and line	Jig	Non pelagic trawl	Pelagic trawl	Pot	Other	Unknown
1998							
1999							
2000							
2001							
2002							
2003							

Total revenue of catcher vessels from Oregon (total fishery) combined							
	Hook and line	Jig	Non pelagic trawl	Pelagic trawl	Pot	Other	Unknown
1998							
1999							
2000							
2001							
2002							
2003							

14.1.4. Appendix D: Total Alaskan landings, revenue, and revenue per pound 1998-2003

	1998			1999			2000			2001			2002			2003		
	Landings	Revenue	\$/lb	Landings	Revenue	\$/lb	Landings	Revenue	\$/lb	Landings	Revenue	\$/lb	Landings	Revenue	\$/lb	Landings	Revenue	\$/lb
Salmon																		
Chinook	9,798	12,607	1.29	7,128	14,268	2.00	5,237	10,282	1.96	5,426	9,362	1.72	9,272	11,053	1.19	10,026	9,302	0.93
Chum	123,767	22,825	0.18	141,391	24,852	0.18	159,264	37,951	0.24	101,831	31,475	0.31	92,251	15,304	0.16	82,077	13,773	0.17
Coho	34,417	19,922	0.58	27,038	21,011	0.78	29,091	15,568	0.53	32,141	13,753	0.40	32,887	11,293	0.34	26,556	12,366	0.46
Pink	332,581	53,169	0.16	381,888	52,400	0.14	208,200	27,093	0.13	378,386	40,770	0.11	255,826	17,588	0.07	329,097	24,327	0.07
Sockeye	125,501	154,150	1.22	244,226	233,155	0.95	204,924	155,747	0.76	168,604	93,136	0.55	132,821	74,664	0.56	182,771	108,325	0.59
Halibut	71,044	68,432	0.96	75,851	116,913	1.54	71,727	134,825	1.88	74,380	109,053	1.47	77,939	128,922	1.65	76,616	165,906	2.16
Pollock	2,752,656	175,663	0.06	2,325,888	162,812	0.07	2,606,800	160,525	0.06	3,178,821	230,636	0.07	3,333,647	203,263	0.06	3,364,261	203,018	0.06
Pacific cod	588,272	111,816	0.19	523,281	82,925	0.16	529,664	141,942	0.27	470,768	117,605	0.24	510,759	95,157	0.18	564,562	158,077	0.28
Atka mackerel	112,871	7,369	0.07	113,396	5,670	0.05	98,308	8,848	0.09	125,874	1,710	0.01	83,244	2,525	0.03	99,542	3,022	0.03
Sablefish	36,480	85,561	2.34	33,316	79,430	2.38	35,563	80,178	2.25	31,296	62,200	1.98	32,217	65,809	2.04	35,705	81,355	2.28
Flatfish	10,341	889	0.08	28,133	2,507	0.09	16,435	1,286	0.08	9,923	696	0.07	11,569	808	0.07	1,564	62	0.04
Herring	86,790	12,824	0.15	85,276	12,834	0.15	68,005	9,647	0.14	84,754	10,385	0.12	69,858	9,139	0.13	68,984	8,930	0.13
Herring roe	233	1,209	5.19	444	1,338	3.01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Rockfishes	21,438	5,115	0.24	29,655	12,905	0.43	25,182	6,747	0.26	23,113	6,467	0.25	22,901	6,459	0.28	26,435	7,959	0.30
Lingcod	1,305	816	0.62	568	348	0.61	49	30	0.61	56	32	0.56	93	42	0.44	33	13	0.40
Crab																		
Dungeness	2,995	4,452	1.49	3,932	6,556	1.67	2,779	4,234	1.52	4,297	7,538	1.75	7,850	8,631	1.10	5,252	7,099	1.35
King	23,723	56,212	2.37	16,919	88,074	5.20	15,097	61,639	4.08	16,051	65,556	4.08	16,791	84,753	5.04	22,886	105,455	4.61
Snow	240,434	135,847	0.56	182,997	161,037	0.88	32,811	60,535	1.84	24,792	38,319	1.54	31,936	43,977	1.38	27,511	50,424	1.83
Clams/Bivalves	395	220	0.55	373	210	0.56	N/A	N/A	N/A	N/A	N/A	N/A	361	302	0.83	439	327	0.75
Scallops	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Shrimp	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: Landings and revenue information gathered from NOAA Fisheries Landings database. Landings are presented in 1000's of pounds, revenue is presented in 1000's of dollars (nominal).

14.1.5. Appendix E: Oregon Towns and Cities Assigned to Port Groups

<u>Coos Bay</u>	<u>Brookings</u>	<u>Portland*</u>	<u>Woodburn</u>	<u>Others</u>	
Bandon	Brookings	Gresham	Brooks	Albany	La Pine
Charleston	Langolis	Hillsboro	Gervais	Aloha	Lebanon
Coos Bay	Port Orford	Lake Oswego	Hubbard	Ashland	Marcola
Coquille		Portland	Independence	Athena	McMinnville
Florence		St. Helens	Jefferson	Aurora	Medford
Mapleton			Mollala	Banks	Merlin
Myrtle Point			Monmouth	Beaverton	Milton Freewater
North Bend			Mt. Angel	Bend	Milwaukie
Reedsport			Salem	Boring	Moro
Winchester Bay			Silverton	Burns	Mosier
			Woodburn	Canby	Mount Vernon
				Canyon City	Murphy
<u>Astoria</u>	<u>Tillamook</u>		<u>Newport</u>	Carlton	Oregon City
Astoria	Cloverdale		Depoe Bay	Cascade Locks	Pendleton
Cannon Beach	Garibaldi		Lincoln City	Corbett	Philomath
Cascadia	Pacific City		Logsden	Cornelius	Post
Clatskanie	Tillamook		Newport	Corvallis	Prineville
Gearhart			Seal Rock	Cottage Grove	Redmond
Hammond			Siletz	Cove	Richland
Rainier			South Beach	Dallas	Roseburg
Seaside			Tidewater	Days Creek	Sandy
Vernonia			Toledo	Dufur	Scio
Warrenton			Waldport	Estacada	Sherwood
			Yachats	Eugene	Sisters
				Forest Grove	Springfield
				Gladstone	Stayton
				Glide	Sublimity
				Grants Pass	Sun River
				Grass Valley	Sutherlin
				Halfway	Sweet Home
				Heppner	Terrebonne
				Hood River	The Dalles
				Jacksonville	Troutdale
				John Day	Tualatin
				Joseph	Vale
				Junction City	West Linn
				Klamath Falls	Winston
					Yoncalla

* Portland group added from original port groups designations in Radtke and Davis (1999)

Data from Radtke and Davis (1999) and from CFEC vessel information databases

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