STOCK ASSESSMENT AND FISHERY EVALUATION REPORT FOR THE GROUNDFISH FISHERIES OF THE GULF OF ALASKA AND BERING SEA/ALEUTIAN ISLANDS AREA:

ECONOMIC STATUS OF THE GROUNDFISH FISHERIES OFF ALASKA, 2006

by

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ABSTRACT

The domestic groundfish fishery off Alaska is the largest fishery by volume in the U.S. This report contains detailed information about economic aspects of the fishery, including figures and tables, reports on the various fleets operating within the fishery, market analyses for the most commercially valuable species, and a summary of the relevant research being undertaken by the Economic and Social Sciences Research Program (ESSRP) at the Alaska Fisheries Science Center (AFSC).

More specifically, the figures and tables in the report provide estimates of total groundfish catch, groundfish discards and discard rates, prohibited species bycatch and bycatch rates, the ex-vessel value of the groundfish catch, the ex-vessel value of the catch in other Alaska fisheries, the gross product value (F.O.B. Alaska) of the resulting groundfish seafood products, the number and sizes of vessels that participated in the Alaska groundfish fisheries, vessel activity, and employment on at-sea processors. Generally, the data presented in this report cover the years 2002 through 2006 but limited catch and ex-vessel value data are reported for earlier years in order to illustrate the rapid development of the domestic groundfish fishery in the 1980s and to provide a more complete historical perspective on catch[1].

In addition, this report contains data on some of the external factors which, in part, determine the economic status of the fisheries. Such factors include foreign exchange rates, the prices and price indexes of products that compete with products from these fisheries, domestic per capita consumption of seafood products, and fishery imports.

In order to summarize the collective activities of the fleets targeting two of the most important groundfish species in and off of Alaska, we have added profiles of the pollock and Pacific cod fleets to this report. We present brief histories of the fisheries and discuss the gear types used by the fleets, the available biomass of the target species over the years, the Total Allowable Catches (TAC) and the seasons set by fisheries managers, the allocations of quota among the various sectors in the fisheries, the amounts of catch, ports where landings were made, vessel counts, ex-vessel prices and value, and the product forms processed from the catch.

Another new addition to this report is a set of market analyses for pollock, Pacific cod, sablefish, and flatfish. These analyses discuss the current state of the markets for these species in terms of pricing, volume, supply, and demand. We discuss trade patterns, market share, and provide forecasts of future prices.

This report also includes profiles of the top ten Alaskan ports involved in North Pacific Fisheries (based on volume of landings), which update key community-level fisheries indicators from the *Community Profiles for North Pacific Fisheries—Alaska* (Sepez et al. 2005). These profiles examine population trends; the volume of landings at the ports; and the numbers of vessels owned, permits held, and crewmember licenses issued to residents of the communities.

[1] Pacific halibut (*Hippoglossus stenolepis*) is not included in data for the groundfish fishery in this report because for management purposes halibut is not part of the groundfish complex.

We also provide project descriptions and updates for ongoing research activities of the ESSRP at the AFSC. Contact information is included for each of the ongoing projects so that readers may contact us for more detail or an update on the project status. Finally, we have also included a list of publications that have arisen out of our work since 2002.

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INTRODUCTION

The domestic groundfish fishery off Alaska is an important segment of the U.S. fishing industry. With a total catch of 2.2 million metric tons (t), a retained catch of 2.1 million t, and an ex-vessel value of $753 million in 2006, it accounted for 51% of the weight and 19% of the ex-vessel value of total U.S. domestic landings as reported in Fisheries of the United States, 2006. The value of the 2006 catch after primary processing was just over $2.0 billion (F.O.B. Alaska).

All but a small part of the commercial groundfish catch off Alaska occurs in the groundfish fisheries managed under the Fishery Management Plans (FMP) for the Gulf of Alaska (GOA) and the Bering Sea/Aleutian Islands area (BSAI) groundfish fisheries. In 2006, other fisheries accounted for only about 10,000 t of the catch reported above. The footnotes for each table indicate if the estimates provided in that table are only for the fisheries with catch that is counted against federal TACs or if they also include other Alaska groundfish fisheries.

The fishery management and development policies for the BSAI and GOA groundfish fisheries have resulted in high levels of catch, ex-vessel value (i.e., revenue), processed product value (i.e., revenue), exports, employment, and other measures of economic activity. However, the cost data required to estimate the success of these policies with respect to net benefits to either the participants in these fisheries or the Nation are not available. However, the use of the race for fish as a principal mechanism for allocating a majority of the groundfish quotas and prohibited species catch (PSC) limits among competing fishing operations has adversely affected at least some aspects of the economic performance of the fisheries. The individual fishing quota (IFQ) program for the fixed gear sablefish fishery, the Western Alaska Community Development Quota (CDQ) program for BSAI groundfish, and the American Fisheries Act (AFA) cooperatives for the BSAI pollock fishery have demonstrated that eliminating the race for fish as the allocation mechanism and replacing it with a market-based allocation mechanism can decrease harvesting and processing costs, increase the value of the groundfish catch, and, in some cases, decrease the cost of providing more protection for target species, non-target species, marine mammals, and seabirds. It is anticipated that the recent rationalization program instituted in the BSAI crab fisheries will generate many of the same benefits. However, it is unclear at this time how such benefits will be distributed; as with most management measures, there may be winners and losers.

This report presents the economic status of groundfish fisheries off Alaska in terms of economic activity and outputs using estimates of catch, bycatch, ex-vessel prices and value (i.e., revenue), the size and level of activity of the groundfish fleet, and the weight and gross value of (i.e., F.O.B. Alaska revenue from) processed products. The catch, ex-vessel value, and fleet size and activity data are for the fishing industry activities that are reflected in Weekly Production Reports, Observer Reports, fish tickets, and the Commercial Operators' Annual Reports. All catch data reported for 1991-2002 are based on the blend estimates of total catch, which were used by the National Marine Fisheries

Service (NMFS) to monitor groundfish and PSC quotas in those years. Catch data for 2003-06 come from NMFS's new catch-accounting system, which replaces the blend as the primary tool for monitoring groundfish and PSC quotas.

A variety of external factors influence the economic status of the fisheries. Therefore, information concerning the following external factors is included in this report: foreign exchange rates, the prices and price indexes of products that compete with products from these fisheries, gross domestic product implicit price deflators, and fishery imports. This report updates last year's report (Hiatt et al. 2006) and is intended to serve as a reference document for those involved in making decisions with respect to conservation, management, and use of GOA and BSAI fishery resources.

This report also includes fleet profiles which describe the collective activities of the fleets targeting pollock and Pacific cod in and off of Alaska. We report and discuss the number of vessels within the fleets, the gear type used to harvest their target species, the physical characteristics of the vessels, the total biomass of the target species over the years, the TACs and seasons set by fisheries managers, the allocations of catch among the various sectors in the fisheries, the volume of catch, the ports where landings are made, the ex-vessel prices and value of the catch, and the product forms processed from the catch.

Another new addition to this report is a set of market analyses for pollock, Pacific cod, sablefish, and flatfish (yellowfin and rock sole, and arrowtooth flounder). The goal of these analyses is to discuss and, where possible, explain the market fundamentals underlying observed changes in pricing, volume, supply, and demand for each of these groundfish species.

Specifically, the market reports provide information on the trends in ex-vessel prices of a given species, as well as the pricing and product choices for first-wholesale production. For example, some groundfish caught off of Alaska have a large share of the world market and observed changes may be tied to changes in the Alaskan supply (TAC), while in other cases the Alaskan share for that product may be relatively low and changes in the market could be driven by other countries' actions. Changes in consumer demand or the emergence of substitute products can also drive the market for a product or species. Thus, these reports discuss the way in which the particular species or product fits into the world market and how this fit is changing over time (e.g., the market share for the AK product may be growing or declining).

One fact that became evident when conducting these analyses is that the type of information available for explaining the historical trends in a market and the likely outlook for the coming year (such as how might prices change, and whether changes will be driven by supply or demand) varies greatly by species. Generally speaking, the amount of information available for each species is related to its value or market share, and as a result, some species have been more adequately assessed in this report.

We would like to point out that the data descriptions, qualifications, and limitations noted in the overview of the fisheries, the fleet profiles, market reports and the footnotes to the tables are absolutely critical to understanding the information contained in this report. The estimates in this report are intended both to provide information that can be used to describe the Alaska groundfish fisheries and to provide the industry and others an opportunity to comment on the validity of these estimates. It is hoped that the industry and others will identify any data or estimates in this report that can be improved and provide the information and methods necessary to improve them for both past and future years. There are two reasons why it is important that such improvements be made. First, with better estimates, the report will be more successful in monitoring the economic performance of the fisheries and in identifying changes in economic performance that should be addressed through regulatory actions. Second, the estimates in this report often will be used as the basis for estimating the effects of proposed fishery management actions. Therefore, improved estimates in this report will allow more informed decisions by those involved in managing and conducting the Alaska groundfish fisheries. The industry and other stakeholders in these fisheries can further improve the usefulness of this report by suggesting other measures of economic performance that should be included in the report, or other ways of summarizing the data that are the basis for this report, and participating in voluntary survey efforts NMFS may undertake in the future to improve existing data shortages.

There is considerable uncertainty concerning the future conditions of stocks, the resulting quotas, and future changes to the fishery management regimes for the BSAI and GOA groundfish fisheries. The management tools used to allocate the catch between various user groups can significantly affect the economic health of either the domestic fishery as a whole or segments of the fishery. Changes in fishery management measures are expected as the result of continued concerns with: 1) the bycatch of prohibited species; 2) the discard and utilization of groundfish catch; 3) the effects of the groundfish fisheries on marine mammals and sea birds; 4) other effects of the groundfish fisheries on the ecosystem and habitat; 5) excess harvesting and processing capacity; and 6) the allocations of groundfish quotas among user groups.

OVERVIEW OF FEDERALLY MANAGED FISHERIES OFF ALASKA, 2006

The commercial groundfish catch off Alaska totaled 2.2 million t in 2006, approximately the same as in 2005 (Fig. 1 and Table 1). The real ex-vessel value of the catch, including the imputed value of fish caught almost exclusively by catcher/processors, decreased from $764 million in 2005 to $753 million in 2006 (Fig. 3 and Table 16). The gross value of the 2006 catch after primary processing was approximately $2.0 billion (F.O.B. Alaska). The groundfish fisheries accounted for the largest share (56%) of the ex-vessel value of all commercial fisheries off Alaska in 2006 (Fig. 4, Tables 16 and 17), while the Pacific salmon (*Oncorhynchus spp*.) fishery was second with $277 million or 20% of the total Alaska ex-vessel value. The value of the Pacific halibut (*Hippoglossus stenolepis*) catch amounted to $193 million or 14% of the total for Alaska, and exceeded the ex-vessel value of the shellfish fishery by about $68 million.

Catch Data

During the last 14 years, estimated total catch in the commercial groundfish fisheries off Alaska (including foreign and joint venture fisheries as well as the domestic fishery) varied between 1.7 and 2.2 million t (Fig. 1 and Table 1). The rapid displacement of the foreign and joint-venture fisheries by the domestic fishery between 1984 and 1991 can be seen by comparing Figures 1 and 2. By 1991, the domestic fishery accounted for all of the commercial groundfish catch off Alaska. The peak catch occurred in 1991, in part because blend estimates of catch and bycatch were not yet used to monitor most quotas within the season. If the estimates had been used, several fisheries would have been closed earlier in the year. Fortunately, this information was utilized in following years and allowed for more precision in realizing desired catch levels. Since this time, catch levels have varied annually, reflecting changes in the total allowable catch (TAC), area closures or restrictions, and bycatch restrictions.

As a note of caution, readers should be aware that the catch estimates have increasing levels of downward bias for the years 1984 through 1990. Prior to 1991, discards were not included in the reported estimates of domestic catch (only the foreign and joint venture totals were included)[2]. However, the catch (and thus discards) of the domestic fishery increased rapidly over this period and accounted for over one-third of total catch in 1988. In addition, when compared side-by-side, the industry catch reports (on which catch records were based for the domestic fishery prior to 1991) tend to be smaller than the blend data estimates for equivalent years, implying that the domestic component of catch was further biased downward relative to post-1991 periods.

Walleye (Alaska) pollock (*Theragra chalcogramma*) has been the dominant species in the commercial groundfish catch off Alaska. The 2006 pollock catch of 1.57 million t accounted for 71% of the total groundfish catch of 2.2 million t (Table 1). The pollock catch decreased very slightly (less than 1%) from 2005. The next major species, Pacific cod (*Gadus macrocephalus*), accounted for 239,400 t or 11.0% of the total 2006 groundfish catch. The Pacific cod catch was down about 5.4% from a year earlier. The 2006 catch of flatfish, which includes yellowfin sole (*Pleuronectes asper*), rock sole (*Pleuronectes bilineatus*), and arrowtooth flounder (*Atheresthes stomias*) was 231,300 t, up about 10.1% from 2005. Pollock, Pacific cod, and flatfish comprised just under 93% of the total 2006 catch. Other important species are sablefish (*Anoplopoma fimbria*), rockfish (*Sebastes* and *Sebastolobus spp.*), and Atka mackerel (*Pleurogrammus monopterygius*). The contributions of the major groundfish species or species groups to the total catch in the domestic groundfish fisheries off Alaska are depicted in Figure 2.

Trawl, hook and line (including longline and jigs), and pot gear account for virtually all the catch in the BSAI and GOA groundfish fisheries. There are catcher vessels and catcher/processor vessels within each of these three gear groups. Table 2 presents catch data by area, gear, vessel type, and species. The catch data in Table 2 and the catch, ex-vessel value, and vessel information in the tables of the rest of this report are for the

[2] Based on estimates of the discard rates for 1992 through 1995, discards would have been about 16% of total catch.

BSAI and GOA FMP fisheries, unless otherwise indicated.

In the last five years, the trawl catch averaged about 91% of the total catch, while the catch with hook and line gear accounted for 7.7%. Most species are harvested predominately by one type of gear, which typically accounts for 90% or more of the catch. The one exception is Pacific cod, where in 2006, 37.6% (86,000 t) was taken by trawls, 47.6% (109,000 t) by hook-and-line gear, and 14.8% (34,000 t) by pots. In each of the years since 2002, catcher vessels took 46-47% of the total catch and catcher/processors took the remainder. That increase from years prior to 1999 (not shown in Table 2) is explained in part by the AFA, which among other things increased the share of the BSAI pollock TAC allocated to catcher vessels delivering to shoreside processors. The distribution of catch between catcher vessels and catcher/processor vessels differed substantially by species and area.

Target fisheries are defined by area, gear and target species. The target designations are used to estimate prohibited species catch (PSC), apportion PSC allowances by fishery, and monitor those allowances. The target fishery designations can also be used to provide estimates of catch and bycatch data by fishery. The blend catch data are assigned to a target fishery by processor, week, area, and gear. The new catch-accounting system, which replaced the blend as the primary source of catch data in 2003, assigns the target at the trip level rather than weekly, except for the approximately 4% of total catch that comes from NMFS Weekly Production Reports (WPR). CDQ fishing activity is targeted separately from non-CDQ fishing. Generally, the species or species group that accounts for the largest proportion of the retained catch of the TAC species is considered the target species. One exception to the dominant retained-catch rule is that the target for the pelagic pollock fishery is assigned if 95 percent or more of the total catch is pollock. Tables 3 and 4 provide estimates of total catch by species, area, gear, and target fishery for the GOA and the BSAI, respectively.

Residents of Alaska and of other states, particularly Washington and Oregon, are active participants in the BSAI and GOA groundfish fisheries. Catch data by residency of vessel owners are presented in Table 5. These data were extracted from the NMFS blend and catch accounting system catch databases and from the State of Alaska groundfish fish ticket database and vessel-registration file which includes the stated residency of each vessel owner. For the domestic groundfish fishery as a whole, 96% of the 2006 catch volume was made by vessels with owners who indicated that they were not residents of Alaska. The catches of the two vessel-residence groups were much closer to being equal in the Gulf where Alaskan vessels accounted for the majority of the Pacific cod catch.

Groundfish Discards and Discard Rates

The discards of groundfish in the groundfish fishery have received increased attention in recent years by NMFS, the Council, Congress, and the public at large. Table 6 presents the blend (2002) and catch-accounting system (2003-06) estimates of the discarded groundfish catch and discard rates by gear, area, and species. The discard rate is the percent of total catch that is discarded.

Although these are the best available estimates of discards and are used for several management purposes, these estimates are not necessarily accurate. The groundfish TACs are established and monitored in terms of total catch, not retained catch; this means that both retained catch and discarded catch are counted against the TACs. Therefore, the catch-composition sampling methods used by at-sea observers provide the basis for NMFS to make good estimates of total catch by species, not the disposition of that catch. Observers on vessels sample randomly chosen catches for species composition. For each sampled haul, they also make a rough visual approximation of the weight of the non-prohibited species in their samples that are being retained by the vessel. This is expressed as the percent of that species that is retained. Approximating this percentage is difficult because discards occur in a variety of places on fishing vessels. Discards include fish falling off of processing conveyor belts, dumping of large portions of nets before bringing them on-board the vessel, dumping fish from the decks, size sorting by crewmen, quality-control discard, etc. Because observers can only be in one place at a time, they can provide only this rough approximation based on their visual observations rather than data from direct sampling. The discard estimate derived by expanding these approximations from sampled hauls to the remainder of the catch may be inaccurate because the approximation may be inaccurate. The numbers derived from the observer discard approximation can provide users with some information as to the disposition of the catch, but the discard numbers should not be treated as sound estimates. At best, they should be considered a rough gauge of the quantity of discard occurring.

For the BSAI and GOA fisheries as a whole, the annual discard rate for groundfish decreased slightly from 6.8% in 2002 to 6.7% in 2003, increased to 7.0% in 2004, was decreased to 5.2% in 2005, and then increased slightly to 5.3% in 2006. The overall discard rate in 2002 represents a 53% reduction from the 1997 rate of 14.5% (not shown in Table 6), a result of prohibiting pollock and Pacific cod discards in all BSAI and GOA groundfish fisheries beginning in 1998. Total discards decreased by about 52% from 1997 to 2002 due to the reduction in the discard rate and despite a 2% increase in total catch. The prohibition on pollock and Pacific cod discards was so effective in decreasing the overall discard rate because the discards of these two species had accounted for 43% of the overall discards in 1997. The benefits and costs of the reduction in discards since 1997 have not been determined. In 2006, the overall discard rates were 12.2% and 4.7%, respectively, for the GOA and the BSAI compared to 16.2% and 14.3% in 1997.

Although the fixed gear fisheries accounted for a small part of either total catch or total discards, in 1998 and later years the overall discard rates were substantially higher for fixed gear (10.8% in 2006) than for trawl gear (4.8% in 2006). Prior to 1998, the overall discard rates had been similar for these two gear groups. This change occurred because the prohibition on pollock and Pacific cod discards had a much larger effect on trawl discards than on fixed gear discards. In the BSAI, the 2006 discard rates were 11.2% and 4.1% for fixed and trawl gear, respectively. In the GOA, however, the corresponding discard rates were 9.4% and 13.0%. One explanation for the relatively low discard rates for the BSAI trawl fishery is the dominance of the pollock fishery with very low discard rates. The mortality rates of groundfish that are discarded are thought to differ by gear or species; however, estimates of groundfish discard mortality are not available.

Tables 7 and 8, and 9 and 10, respectively, provide estimates of discarded catch and discard rates by species, area, gear, and target fishery. Within each area or gear type, there are substantial differences in discard rates among target fisheries. Similarly, within a target fishery, there are often substantial differences in discard rates by species. Typically, in each target fishery the discard rates are very high except for the target species. The regulatory exceptions to the prohibition on pollock and Pacific cod discards explain, in part, why there are still high discard rates for these two species in some fisheries.

Prohibited-Species Bycatch

The bycatch of Pacific halibut, crab, Pacific salmon, and Pacific herring (*Clupea pallasi*) has been an important management issue for more than twenty years. The retention of these species was prohibited first in the foreign groundfish fisheries. This was done to ensure that groundfish fishermen had no incentive to target these species. Estimates of the bycatch of these “prohibited species” for 2003-06 are summarized by area and gear in Table 11. More detailed estimates of prohibited species bycatch and of bycatch rates for 2005 and 2006 are in Tables 12 - 15. The estimates for halibut are in terms of bycatch mortality because the bycatch limits for halibut are set and monitored using estimated discard mortality rates. The estimates for the other prohibited species are of total bycatch; this is in part due to the lack of well established discard mortality rates for these species. The discard mortality rates probably approach 100% for salmon and herring in the groundfish fishery as a whole; the discard mortality rates for crab, however, may be substantially lower.

An extensive at-sea observer program was developed for the foreign fleets and then extended to the domestic fishery once it had all but replaced participation by foreign fishing and processing vessels. The observer program, now managed by the Fisheries Monitoring and Analysis Division (FMA) of the Alaska Fisheries Science Center, resulted in fundamental changes in the nature of the bycatch problem. First, by providing good estimates of total groundfish catch and non-groundfish bycatch by species, it eliminated much of the concern that total fishing mortality was being underestimated due to fish that were discarded at sea. Second, it made it possible to establish, monitor, and enforce the groundfish quotas in terms of total catch as opposed to only retained catch. Third, it made it possible to implement and enforce bycatch quotas for the non-groundfish species that by regulation had to be discarded at sea. Finally, it provided extensive information that managers and the industry could use to assess methods to reduce bycatch and bycatch mortality. In summary, the observer program provided fishery managers with the information and tools necessary to prevent bycatch from adversely affecting the stocks of the bycatch species. Therefore, the bycatch in the groundfish fishery is principally not a conservation problem but it can be an allocation problem. Although this does not make it less controversial, it does help identify the types of information and management measures that are required to reduce bycatch to the extent practicable, as is required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Ex-Vessel Prices and Value

Table 18 contains the estimated ex-vessel prices that were used with estimates of retained catch to calculate ex-vessel values. The estimates of ex-vessel value by area, gear, type of vessel, and species are in Table 19. The ex-vessel value of the domestic landings in the FMP fisheries, excluding the value added by at-sea processing, decreased from $619 million in 2002 to $606 million in 2003, increased in 2004 to $624 million, increased to $740 million in 2005, and increased again to $753 million in 2006. The distribution of ex-vessel value by type of vessel differed by area, gear and species. In 2006, catcher vessels accounted for 51% of the ex-vessel value of the groundfish landings compared to 47% of the total catch because catcher vessels take larger percentages of higher-priced species such as sablefish, which was $2.62 per pound in 2006. Similarly, trawl gear accounted for only 70% of the total ex-vessel value compared to 91% of the catch because much of the trawl catch is of low-priced species such as pollock, which was about $0.13 per pound in 2006.

Tables 20 and 21 summarize the ex-vessel value of catch delivered to shoreside processors by vessel-size class, gear, and area. Table 20 gives the total ex-vessel value in each category and Table 21 gives the ex-vessel value per vessel. The relative dominance of each of the three vessel size classes differs by area and by gear.

Table 22 provides estimates of ex-vessel value by residency of vessel owners, area, and species. For the BSAI and GOA combined, 88% of the 2006 ex-vessel value was accounted for by vessels with owners who indicated that they were not residents of Alaska. Vessels with owners who indicated that they were residents of Alaska accounted for 12% of the total. The vessels owned by residents of Alaska accounted for a much larger share of the ex-vessel value than of catch (12% compared to 4.3%) because these vessels accounted for relatively large shares of the higher-priced species such as sablefish.

Table 23 presents estimates of ex-vessel value of catch delivered to shoreside processors, and Table 24 gives the ex-vessel value of groundfish as a percentage of the ex-vessel value of all species delivered to shoreside processors. The data in both tables, which include both state and federally managed groundfish, are reported by processor group, which is a classification of shoreside processors based primarily on their geographical locations. The processor groups are described in the footnote to the tables.

First Wholesale Production, Prices and Value

Estimates of weight and value of the processed products made with BSAI and GOA groundfish catch are presented by species, product form, area, and type of processor in Tables 25, 28 and 29. Product price-per-pound estimates are presented in Table 26, and estimates of total product value per round metric ton of retained catch (first wholesale prices) are reported in Table 27.

Gross product value (F.O.B. Alaska) data, through primary processing, are summarized by category of processor and by area in Table 31, and by catcher/processor category, size class and area in Table 32. Table 33 reports gross product value per vessel, categorized in the same way as Table 32. Tables 34 and 35 present gross product value of groundfish processed by shoreside processors and the groundfish gross product value as a percentage of all-species gross product value, with both tables broken down by processor group. The processor groups are the same as in Tables 23 and 24 and no distinction is made between groundfish catch from the state and federally managed groundfish fisheries.

Beginning in 2002, all processors (including previously-exempted catcher/processors that operate exclusively in the EEZ and process only their own catch) have been required to submit the Alaska Department of Fish and Game (ADF&G) Commercial Operators' Annual Report (COAR). Even though complete at-sea production data are now available from the COAR, however, the estimates of groundfish gross product value (i.e., revenue) for at-sea processors in 2002 through 2006 are calculated the same as in previous years in order to provide a comparison of the estimates from year to year. These estimates are based on COAR product price data (submitted voluntarily by at-sea processors for activity through 2001) and on product quantity data in the WPR. Beginning with the 2001 report (Hiatt et al. 2001), the estimates of gross product value for shoreside processors are based on COAR product price and quantity data. Prior to that, the estimates for all processors were based on COAR price data and WPR product quantity data.

The requirement that all processors now report their production in the COAR enables us to present Table 30, which gives estimates of the weight and value of processed products from catch in the non-groundfish commercial fisheries of Alaska.

Counts and Average Revenue of Vessels That Meet a Revenue Threshold

For the purposes of Regulatory Flexibility Act analyses, a business involved in fish harvesting is defined by the Small Business Administration as a small business if it is independently owned and operated, not dominant in its field of operation (including its affiliates), and has combined annual receipts no greater than $4.0 million for all its affiliated operations worldwide. The information necessary to determine if a vessel is independently owned and operated and had gross earnings no greater than $4.0 million is not available. However, by using estimates of vessels' revenue from the catch or processing of Alaska groundfish and other species, it is possible to identify vessels that clearly are not small entities.

Estimates of both the numbers of fishing vessels that clearly are not small entities and the numbers of fishing vessels that could be small entities are presented in Tables 36 and 37, respectively. With more complete revenue, ownership and affiliation information, some of the vessels included in Table 37 would be determined to be large entities. Estimates of the average revenue per vessel for the vessels in Tables 36 and 37, respectively, are presented in Tables 38 and 39. As data become available, we hope in the future to improve revenue estimates by including revenue from participation in fisheries in the lower 48 states and by incorporating information about the vessels' cooperative affiliations. In addition, a proposed change will raise the small-business revenue threshold (for catcher/processors only) from $4.0 million to $20.0 million.

Effort (Fleet Size, Weeks of Fishing, Crew Weeks)

Estimates of the numbers and net registered tonnage of vessels in the groundfish fisheries are presented by area and gear in Table 40, and estimates of the numbers of vessels that landed groundfish are depicted in Fig. 6 by gear type. More detailed information on the BSAI and GOA groundfish vessels by type of vessel, vessel size class, catch amount classes, and residency of vessel owners is in Tables 41 - 46. In particular, Table 43 gives detailed estimates of the numbers of smaller (less than 60 feet) hook-and-line catcher vessels.

Estimates of the number of vessels by month, gear, and area are in Table 47. Table 48 provides estimates of the number of catcher vessel weeks by size class, area, gear, and target fishery. Table 49 contains similar information for catcher/processor vessels.

The Weekly Production Reports include employment data for at-sea processors but not inshore processors. Those data are summarized in Table 50 by month and area. The data indicate that in 2006, the crew weeks (defined as the number of crew aboard each vessel in a week summed over the entire year) totaled 99,960 with the majority of them (95,531) occurring in the BSAI groundfish fishery. In 2006, the maximum monthly employment (15,921) occurred in February. Much of this was accounted for by the BSAI pollock fishery.

Observer Coverage and Costs

The information provided by the Fisheries Monitoring and Analysis Division (FMA) of the Alaska Fisheries Science Center has had a key role in the success of the groundfish management regime. For example, it would not be possible to monitor total allowable catches (TACs) in terms of total catch without observer data from the FMA. Similarly, the PSC limits, which have been a key factor in controlling the bycatch of prohibited species, could not be used without such data. In recent years, the reliance on observer data for individual vessel accounting is of particular importance in the management of the

CDQ program and AFA fisheries. In addition, much of the information that is used to assess the status of groundfish stocks, to monitor the interactions between the groundfish fishery and marine mammals and sea birds, and to analyze fishery management actions is provided by the FMA. Estimates of the numbers of vessels and plants with observers, observer-deployment days, and estimated observer costs by year and type of operation for 2005-06 are presented in Table 51.

External Factors

There are a variety of at least partially external factors that affect the economic performance of the BSAI and GOA groundfish fisheries. They include landing market prices in Japan, wholesale prices in Japan, U.S. imports of groundfish products, U.S. per capita consumption of seafood, U.S. consumer and producer price indexes, and foreign exchange rates. Such data are included in Tables 52 - 60. U.S. cold-storage holdings data, which were published in this report in previous years, have not been collected by NMFS since the end of 2002. The availability of cold-storage holdings data depends on the cooperation of industry in the form of voluntary reporting, which has declined to the extent that reports compiled from the data were deemed by NMFS management to lack sufficient accuracy. Consequently, the affected tables have been omitted from this report, but the pre-2003 levels may be found in Tables 48 and 49 of earlier reports.

Exchange rates and world supplies of fishery products play a major role in international trade. Exchange rates change rapidly and can significantly affect the economic status of the groundfish fisheries.

CITATIONS

Hiatt, Terry, editor, with contributions from Ron Felthoven, Hans Geier, Alan Haynie, David Layton, Dan Lew, Amanda Poole, Robert Rowe, Jennifer Sepez, Chang Seung, Emilie Springer, and Edward Waters. Stock Assessment and Fishery Evaluation Report for the Groundfish Fisheries of the Gulf of Alaska and Bering Sea/Aleutian Island Area: Economic Status of the Groundfish Fisheries off Alaska, NPFMC, February 2007. http://www.afsc.noaa.gov/refm/docs/2006/economic.pdf

National Marine Fisheries Service, 2007. Fisheries of the United States, 2006. http://www.st.nmfs.gov/st1/fus/fus06/index.html

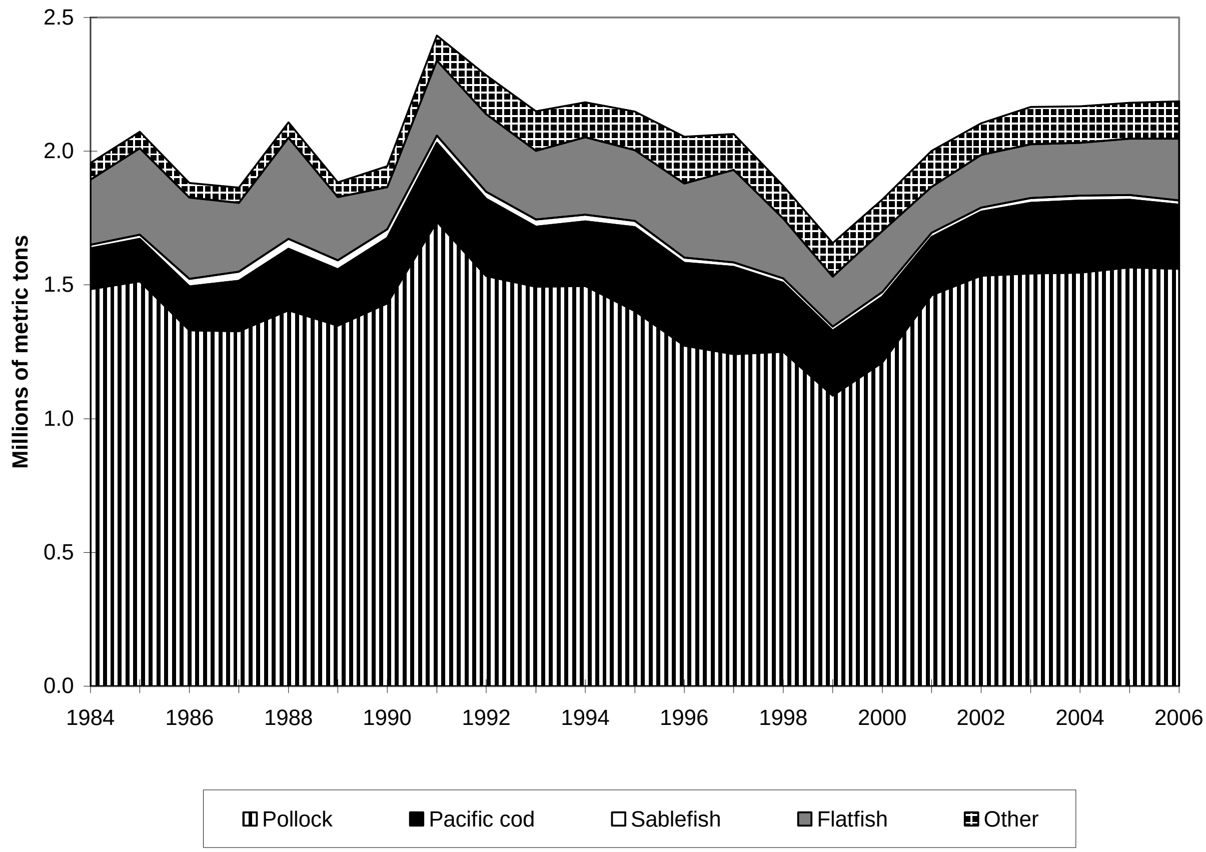

Figure 1. Groundfish catch in the commercial fisheries off Alaska by species, 1984-2006.

Figure 2. Groundfish catch in the domestic commercial fisheries off Alaska by species, 1984-2006.

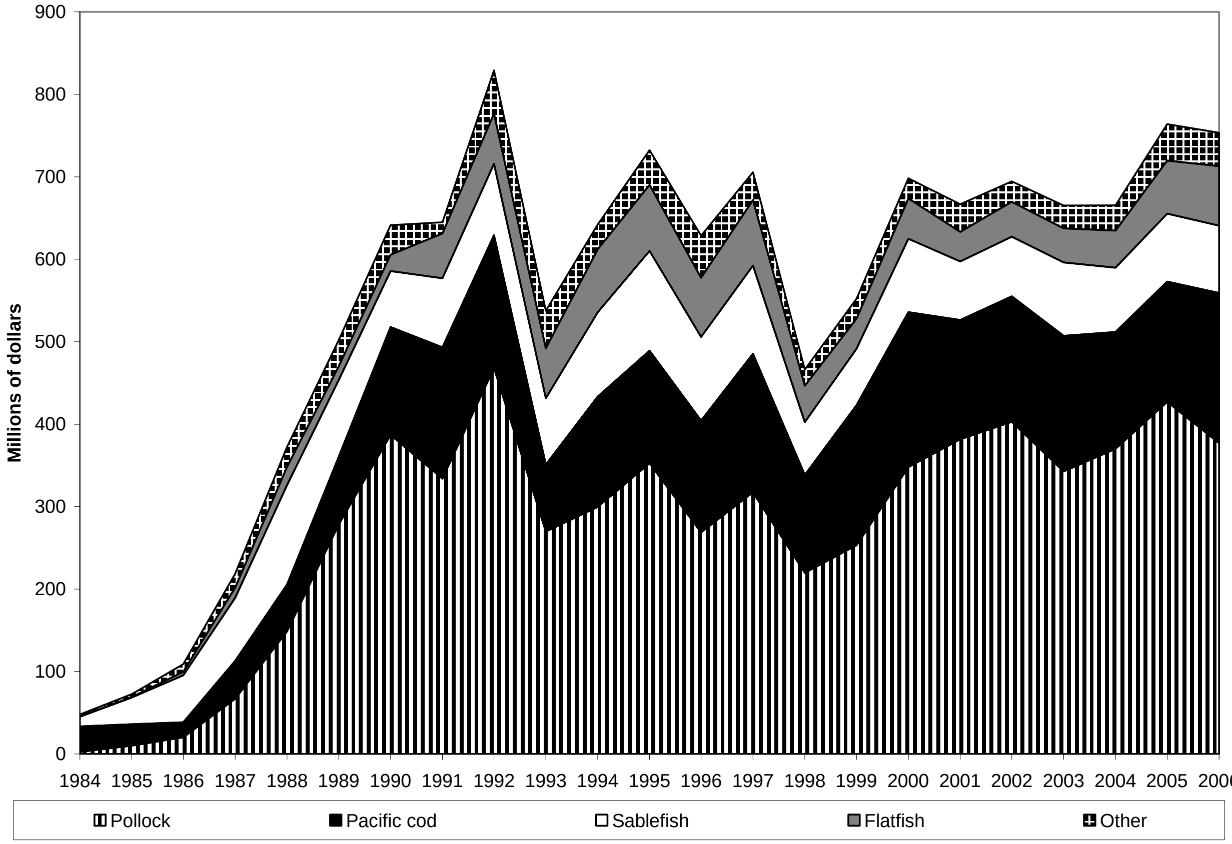

Figure 3. Real ex-vessel value of the groundfish catch in the domestic commercial fisheries off Alaska by species, 1984-2006 (base year = 2006).

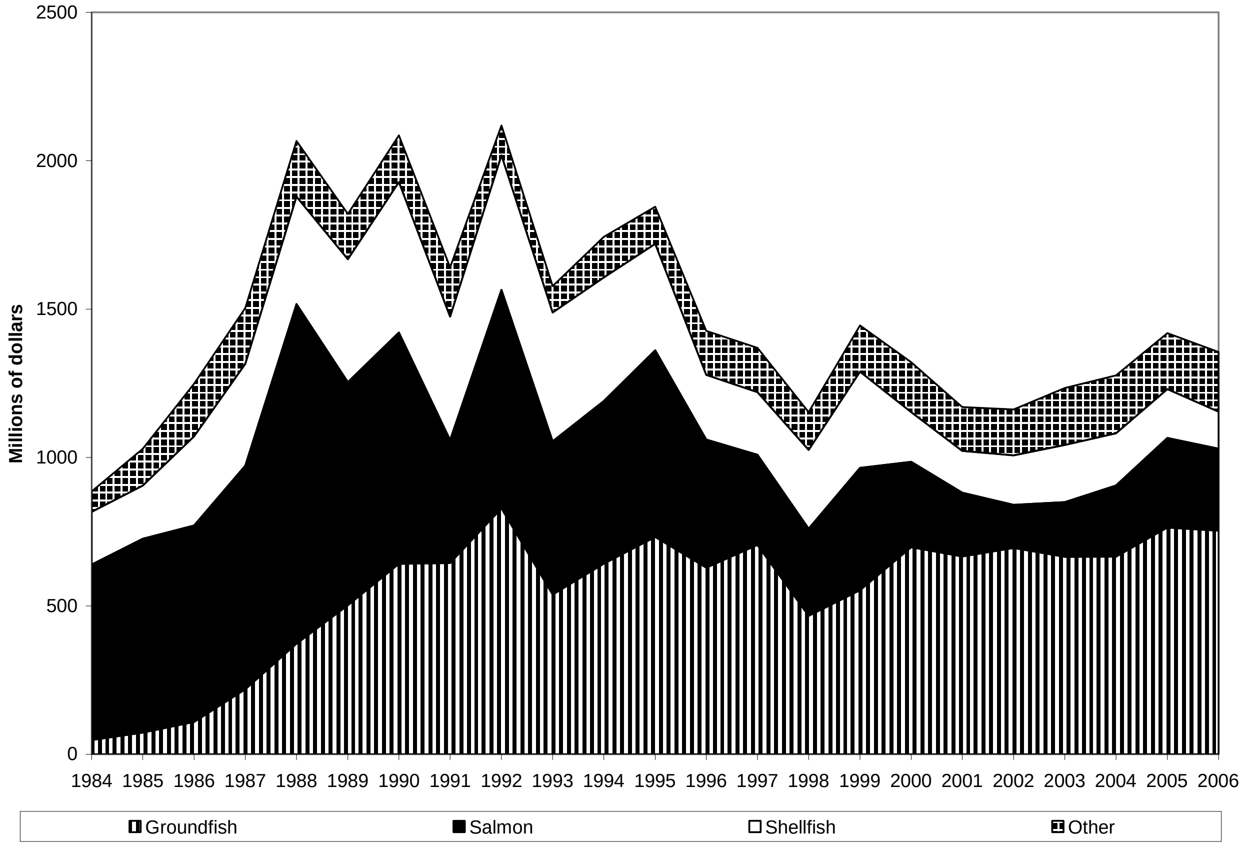

Figure 4. Real ex-vessel value of the domestic fish and shellfish catch off Alaska, 1984-2006 (base year = 2006).

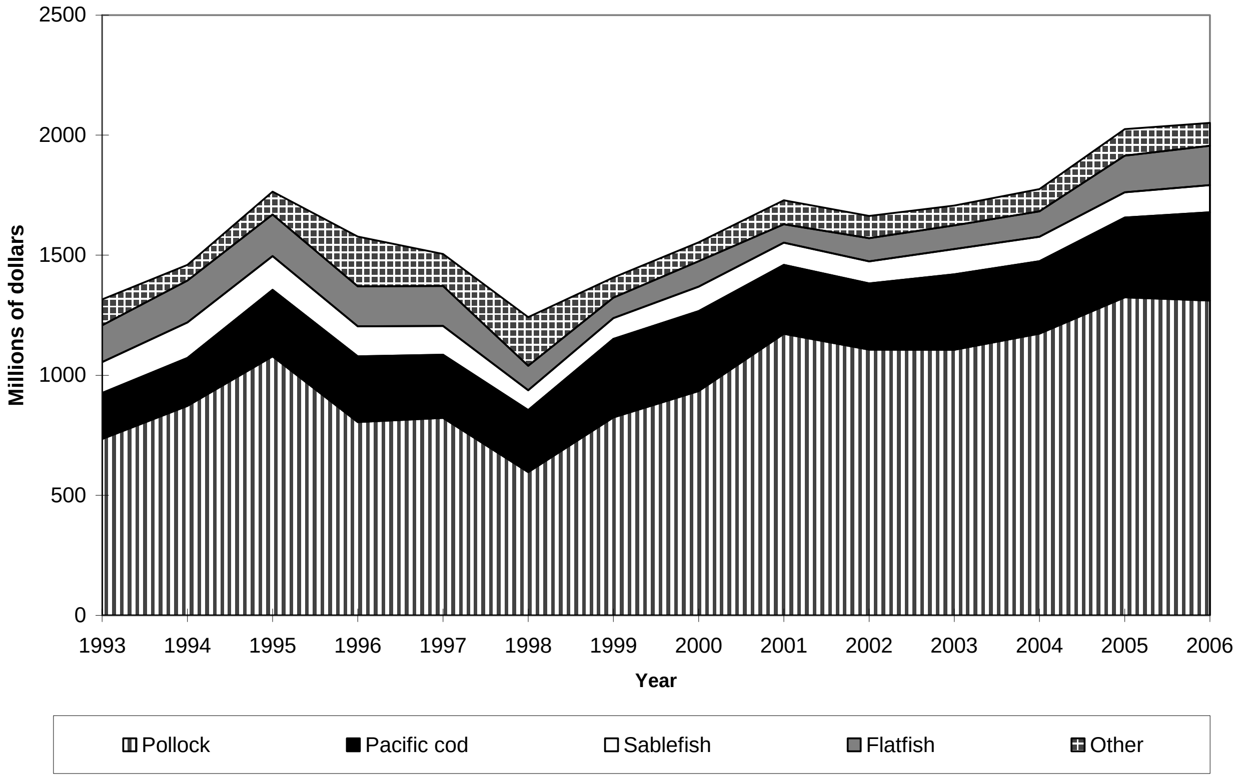

Figure 5. Real gross product value of the groundfish catch off Alaska, 1993-2006 (base year = 2006).

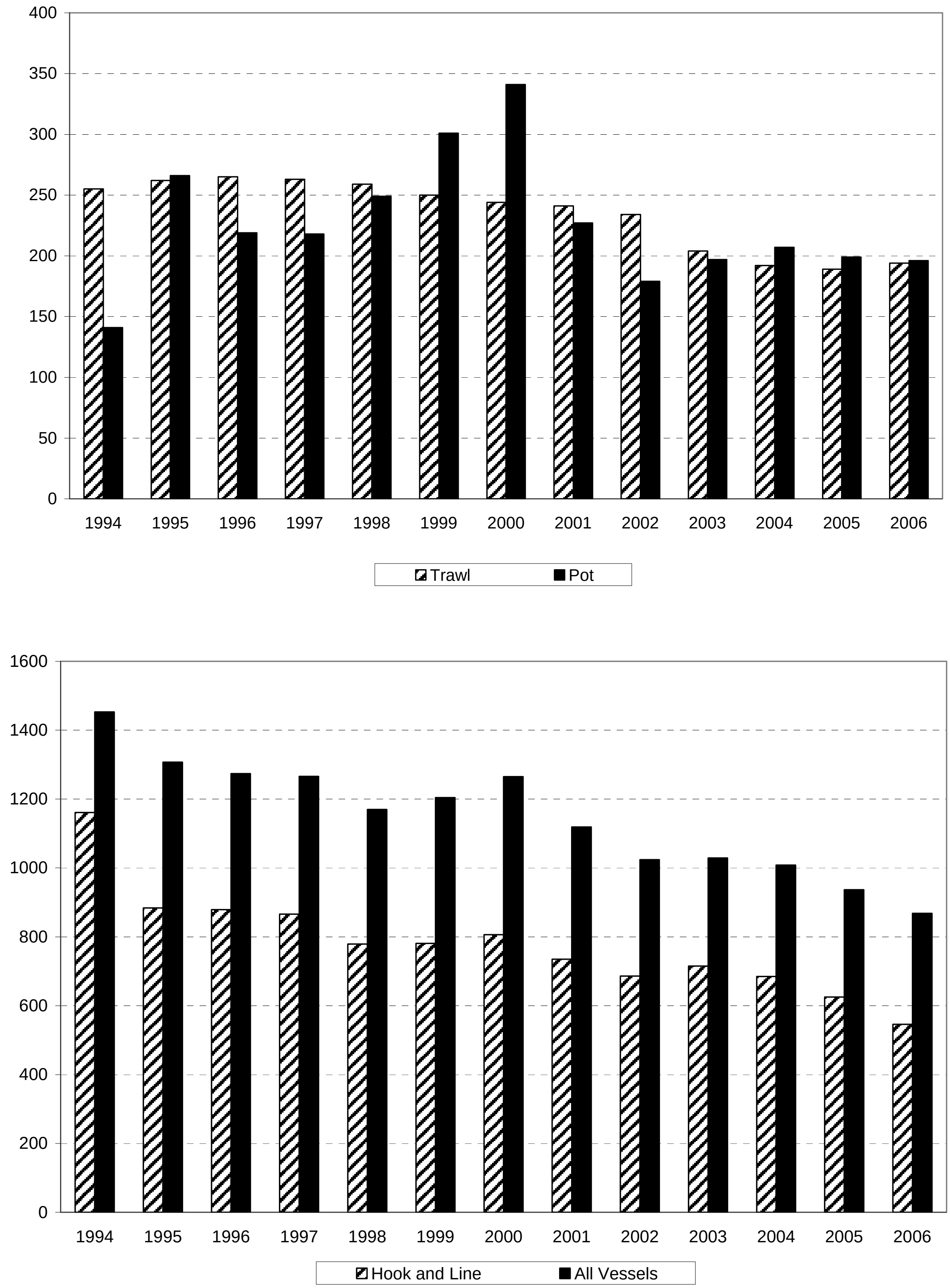

Figure 6. Number of vessels in the domestic groundfish fishery off Alaska by gear type, 1994-2006.

Table 1. Groundfish catch in the commercial fisheries off Alaska by area and species, 1993-2006 (1,000 metric tons, round weight).

		Pollock	Sablefish	Pacific cod	Flatfish	Rockfish	Atka mackerel	Total
Gulf of Alaska	1993	108.9	24.8	56.5	39.5	19.7	5.1	261.4
	1994	107.3	22.5	47.5	36.0	16.1	3.5	235.8
	1995	72.6	20.8	69.0	32.3	19.3	.7	218.1
	1996	51.3	18.2	68.3	43.1	18.2	1.6	205.2
	1997	90.1	15.7	68.5	33.6	19.8	.3	233.5
	1998	125.1	15.2	62.1	23.3	19.5	.3	249.3
	1999	95.6	13.9	68.6	24.9	24.5	.3	231.6
	2000	76.4	15.7	54.5	37.3	21.5	.2	211.1
	2001	72.6	13.2	41.6	31.8	21.5	.1	185.6
	2002	51.9	13.5	42.4	34.1	22.2	.1	168.4
	2003	50.7	15.5	52.6	42.0	23.7	.6	191.5
	2004	63.9	16.9	56.7	23.0	22.2	.8	188.0
	2005	80.9	15.0	47.5	29.7	20.6	.8	199.5
	2006	72.0	13.7	47.7	42.1	24.0	.9	207.5
Bering Sea and Aleutian Islands	1993	1,384.6	2.7	167.4	216.9	24.7	66.0	1,887.2
	1994	1,388.6	2.4	193.8	253.4	18.7	65.4	1,947.2
	1995	1,329.5	2.0	245.0	232.2	16.8	81.6	1,929.8
	1996	1,222.3	1.4	240.7	233.7	24.0	103.9	1,848.6
	1997	1,150.5	1.3	257.8	311.9	17.0	65.8	1,831.1
	1998	1,125.1	1.2	195.8	199.8	15.5	57.1	1,620.9
	1999	990.9	1.4	173.9	161.6	19.9	56.2	1,425.0
	2000	1,134.0	1.8	191.1	190.9	16.4	47.2	1,608.0
	2001	1,388.3	1.9	176.7	140.2	17.6	61.6	1,815.4
	2002	1,482.4	2.3	196.7	162.4	16.8	45.3	1,935.8
	2003	1,492.6	2.1	211.0	159.8	20.8	58.1	1,973.5
	2004	1,481.7	2.0	212.2	174.9	17.7	60.6	1,979.4
	2005	1,484.9	2.6	205.4	180.4	15.1	62.0	1,981.1
	2006	1,488.1	2.2	191.7	189.2	17.7	61.9	1,978.8
All Alaska	1993	1,493.5	27.5	223.9	256.4	44.4	71.2	2,148.6
	1994	1,495.9	24.9	241.3	289.4	34.8	68.9	2,183.0
	1995	1,402.1	22.9	314.0	264.4	36.1	82.3	2,147.9
	1996	1,273.6	19.6	309.0	276.8	42.2	105.5	2,053.8
	1997	1,240.7	17.1	326.2	345.6	36.9	66.2	2,064.6
	1998	1,250.2	16.4	257.9	223.1	34.9	57.4	1,870.2
	1999	1,086.4	15.3	242.5	186.4	44.4	56.5	1,656.6
	2000	1,210.3	17.5	245.6	228.2	37.9	47.4	1,819.1
	2001	1,460.9	15.1	218.4	172.0	39.1	61.6	2,001.0
	2002	1,534.3	15.8	239.1	196.5	39.0	45.4	2,104.2
	2003	1,543.2	17.6	263.6	201.9	44.5	58.7	2,165.1
	2004	1,545.6	18.9	268.8	197.9	39.9	61.4	2,167.4
	2005	1,565.8	17.5	253.0	210.1	35.7	62.8	2,180.6
	2006	1,560.1	15.9	239.4	231.3	41.7	62.8	2,186.3

Notes: These estimates include catch from federal and state of Alaska fisheries. Totals may include additional categories.

Source: Blend estimates for 1993-2002. Catch-accounting system estimates for 2003-06. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 2. Groundfish catch off Alaska by area, vessel type, gear and species, 2002-06 (1,000 metric tons, round weight).

			Gulf of Alaska			Bering Sea and Aleutian			All Alaska		
			Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total
All gear	All Groundfish	2002	119	47	165	864	1,072	1,936	983	1,119	2,101
		2003	127	53	180	883	1,090	1,974	1,010	1,144	2,153
		2004	142	32	174	857	1,122	1,979	999	1,154	2,154
		2005	156	31	187	858	1,120	1,978	1,013	1,151	2,165
		2006	157	41	197	862	1,117	1,979	1,019	1,157	2,176
Hook & Line	Sablefish	2002	9	2	11	1	1	1	10	2	12
		2003	12	2	14	1	1	1	13	2	15
		2004	14	2	16	0	0	1	14	2	16
		2005	12	2	14	0	1	1	12	2	15
		2006	11	2	13	0	1	1	12	2	14
	Pacific cod	2002	7	8	15	1	103	103	7	111	118
		2003	4	6	10	1	109	110	4	115	119
		2004	6	5	11	1	110	111	7	115	122
		2005	5	1	6	1	115	116	6	116	122
		2006	7	4	10	1	98	99	7	102	109
	Flatfish	2002	0	0	1	0	5	5	1	5	6
		2003	0	0	0	1	5	5	1	5	6
		2004	0	0	0	0	5	5	0	5	5
		2005	0	0	0	0	5	5	0	6	6
		2006	0	0	1	0	5	5	0	5	5
	Rockfish	2002	1	0	1	0	0	1	1	1	2
		2003	1	0	2	0	0	0	2	1	2
		2004	1	0	2	0	0	0	1	1	2
		2005	1	0	1	0	0	0	1	0	2
		2006	1	0	1	0	0	0	1	1	2
	All Groundfish	2002	18	11	29	2	130	132	20	140	161
		2003	20	9	28	2	139	142	22	148	170
		2004	23	7	30	2	140	141	24	147	172
		2005	19	4	23	2	146	148	21	149	171
		2006	22	6	28	1	122	123	23	128	151
Pot	Pacific cod	2002	7	1	8	13	2	15	20	3	23
		2003	13	-	13	20	2	22	33	2	35
		2004	15	-	15	14	3	17	29	3	32
		2005	15	-	15	14	-	14	28	-	28
		2006	14	-	14	16	3	19	30	3	34

Table 2. Continued.

			Gulf of Alaska			Bering Sea and Aleutian			All Alaska		
			Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total
Trawl	Pollock	2002	50	0	51	799	677	1,476	849	677	1,526
		2003	50	1	51	807	678	1,485	857	679	1,536
		2004	63	0	64	792	685	1,476	855	685	1,540
		2005	80	0	81	797	683	1,481	878	684	1,562
		2006	71	0	72	798	688	1,485	869	688	1,557
	Sablefish	2002	1	1	2	0	0	0	1	2	2
		2003	1	1	2	0	0	0	1	1	2
		2004	1	1	1	0	0	0	1	1	2
		2005	1	1	1	0	0	0	1	1	2
		2006	1	1	1	0	0	0	1	1	1
	Pacific cod	2002	18	1	20	41	37	79	60	39	98
		2003	17	2	19	42	38	79	58	40	98
		2004	16	1	18	38	45	84	55	47	101
		2005	13	1	15	35	38	72	48	39	87
		2006	12	1	13	34	39	73	46	40	86
	Flatfish	2002	14	20	33	4	153	157	18	172	191
		2003	14	27	42	6	149	154	20	176	196
		2004	14	9	23	6	164	170	19	174	193
		2005	17	13	29	4	170	175	21	183	204
		2006	25	16	42	6	178	184	31	194	226
	Rockfish	2002	9	12	20	0	16	16	9	28	37
		2003	10	12	22	0	20	20	11	31	42
		2004	9	12	21	0	17	17	10	28	38
		2005	8	11	19	1	14	15	9	26	34
		2006	8	14	23	1	16	17	9	31	40
	Atka mackerel	2002	0	0	0	0	45	45	0	45	45
		2003	0	1	1	2	56	58	2	57	58
		2004	0	1	1	1	59	60	1	60	61
		2005	0	1	1	1	61	62	1	62	63
		2006	0	1	1	1	61	62	1	61	62
	All Groundfish	2002	94	35	129	847	940	1,788	941	975	1,916
		2003	94	45	139	859	950	1,808	953	994	1,947
		2004	105	24	129	840	979	1,819	944	1,004	1,948
		2005	121	28	149	840	974	1,814	961	1,002	1,963
		2006	120	34	155	842	992	1,834	963	1,026	1,989

Note: The estimates are of total catch (i.e., retained and discarded catch). All groundfish include additional species categories. These estimates include only catch counted against federal TACs. A dash (-) indicates that data are not available, either because there was no activity or to preserve confidentiality.

Source: Blend (2002) and Catch Accounting System (2003-06) estimates, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 3. Gulf of Alaska groundfish catch by species, gear, and target fishery, 2005-06 (1,000 metric tons, round weight).

			Species											
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rex sole	Flat deep	Flat shallow	Rock-fish	Atka mack.	Other	Total
2005 Gear/ Target	Hook & line	Pollock, bottom	.1	.0	.0	.0	.0	-	-	.0	-	-	.0	.1
		Sablefish	.0	11.9	.1	.2	-	-	.0	.0	.7	.0	.6	13.5
		Pacific cod	.0	.0	5.6	.1	.0	.0	-	.0	.0	.0	.6	6.3
		Arrowtooth	.0	.0	.0	.0	.0	-	-	.0	.0	-	.1	.1
		Rockfish	-	.0	.0	.0	.0	-	-	.0	.1	-	-	.2
		Halibut	.0	.9	.2	.0	.0	.0	.0	.0	.2	.0	.1	1.5
		Total	.1	12.8	5.9	.4	.0	.0	.0	.0	1.1	.0	1.6	21.9
	Pot	Pacific cod	.0	-	14.7	.0	.0	.0	.0	.0	.0	.0	.3	15.0
		Total	.0	-	14.7	.0	.0	.0	.0	.0	.0	.0	.3	15.0
	Trawl	Pollock, bottom	16.7	.0	.2	1.6	.1	.0	.0	.0	.0	.0	.5	19.1
		Pollock, pelagic	62.6	.0	.2	.7	.1	.0	.0	.0	.1	.0	.4	64.0
		Pacific cod	.0	.0	11.1	.6	.0	.0	.0	.3	.0	.0	.1	12.3
		Arrowtooth	.3	.1	.6	10.7	1.2	.7	.1	.1	.2	.0	.9	15.0
		Flathead sole	.0	.0	.2	1.8	.6	.3	.0	.0	.0	.0	.1	3.1
		Rex sole	.0	.0	.1	1.7	.1	.9	.0	.0	.2	.0	.1	3.2
		Flatfish, deep	.0	.0	.0	.0	.0	.0	.1	.0	.0	-	.0	.2
		Flatfish, shallow	.1	.0	1.2	1.3	.3	.1	.0	4.2	.0	.0	.8	8.2
		Rockfish	.3	1.0	.9	1.0	.1	.1	.1	.1	18.7	.7	.1	22.9
		Total	80.0	1.2	14.5	19.4	2.5	2.2	.4	4.8	19.3	.8	3.1	148.2
	All gear	Total	80.1	14.0	35.1	19.8	2.5	2.2	.4	4.8	20.4	.8	5.0	185.1

Table 3. Continued.

			Species											
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rex sole	Flat deep	Flat shallow	Rock-fish	Atka mack.	Other	Total
2006 Gear/ Target	Hook & line	Pollock, bottom	.0	-	.0	.0	.0	-	-	-	.0	-	.0	.1
		Sablefish	.0	11.1	.1	.3	.0	-	.0	.0	.8	-	.6	13.0
		Pacific cod	.1	.0	9.9	.1	.0	.0	.0	.0	.1	.0	1.4	11.6
		Halibut	.0	1.2	.2	.0	.0	-	.0	.0	.5	-	1.0	2.9
		Total	.1	12.3	10.3	.5	.0	.0	.0	.0	1.3	.0	3.1	27.6
	Pot	Pacific cod	.0	-	14.4	.0	.0	.0	.0	.0	.0	.0	.3	14.7
		Total	.0	-	14.4	.0	.0	.0	.0	.0	.0	.0	.3	14.7
	Trawl	Pollock, bottom	29.4	.0	.6	2.5	.5	.2	.0	.4	.0	.0	1.7	35.4
		Pollock, pelagic	38.9	.0	.1	.2	.1	.0	.0	.0	.1	.0	.1	39.5
		Pacific cod	.2	.0	9.4	.9	.2	.1	.0	.4	.2	.0	.1	11.5
		Arrowtooth	.8	.2	.9	15.3	1.3	1.1	.1	.5	.5	.0	.5	21.3
		Flathead sole	.0	.0	.0	.8	.5	.1	.0	.0	.0	.0	.1	1.6
		Rex sole	.1	.0	.3	4.3	.3	1.7	.0	.0	.2	.0	.3	7.2
		Flatfish, deep	-	.0	.0	.0	-	-	.1	.0	.0	-	.0	.1
		Flatfish, shallow	.7	.0	1.3	1.9	.3	.1	.0	6.2	.0	.0	.7	11.2
		Rockfish	.4	.9	.5	1.1	.0	.1	.1	.0	21.4	.8	.1	25.4
		Total	70.4	1.1	13.1	27.1	3.1	3.3	.4	7.6	22.5	.9	3.6	153.2
	All gear	Total	70.5	13.4	37.8	27.7	3.1	3.3	.4	7.6	23.9	.9	7.0	195.6

Notes: Totals may include additional categories. The target, determined by AFSC staff, is based on processor, week, processing mode, NMFS area, and gear. These estimates include only catch counted against federal TACs.

Source: Catch-accounting system estimates, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 4. Bering Sea and Aleutian Islands groundfish catch by species, gear, and target fishery, 2005-06 (1,000 metric tons, round weight).

			Species												
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rock sole	Turbot	Yellow fin	Flat other	Rock-fish	Atka mack.	Other	Total
2005 Gear/ Target	Hook & line	Sablefish	.0	.7	.0	.0	.0	.0	.1	-	.0	.1	-	.0	.9
		Pacific cod	4.2	.0	115.8	1.7	.6	.1	.2	.7	.3	.1	.0	20.4	144.1
		Turbot	.0	.1	.0	.2	.0	-	1.5	-	.0	.1	-	.2	2.0
		Halibut	.0	.1	.2	.0	.0	.0	.1	.0	.0	.0	.0	.1	.6
		Total	4.2	.9	116.1	2.0	.6	.1	1.8	.7	.3	.3	.0	20.8	147.6
	Pot	Sablefish	.0	1.3	.0	.0	.0	-	.0	-	.0	.0	.0	.0	1.4
		Pacific cod	.0	.0	17.1	.0	.0	.0	.0	.1	.0	.0	.3	.4	17.8
		Total	.0	1.3	17.1	.1	.0	.0	.0	.1	.0	.0	.3	.4	19.2
	Trawl	Pollock, bottom	29.1	.0	1.0	.1	.3	.1	.0	.0	.1	.3	.5	.5	32.0
		Pollock, pelagic	1,417.4	.0	6.4	.6	2.1	1.0	.0	.0	.3	.6	.2	1.7	1,430.4
		Pacific cod	10.6	.0	50.8	4.0	1.4	7.9	.0	1.3	1.7	.5	1.1	1.9	81.2
		Arrowtooth	1.1	.1	.5	2.2	.3	.1	.2	.0	.4	.1	.4	.3	5.6
		Flathead sole	3.7	.0	2.1	2.6	9.2	1.2	.1	2.2	.8	.0	.1	1.4	23.4
		Rock sole	7.2	.0	5.2	.6	.9	16.7	.0	7.6	2.3	.0	.0	.9	41.4
		Turbot	.0	.0	-	.0	.0	.0	.0	-	.0	.0	-	.0	.1
		Yellowfin	10.3	.0	3.8	.6	1.2	10.1	.0	82.4	9.4	.0	.1	2.1	120.1
		Other flatfish	.3	.0	.1	.7	.1	.1	.0	.0	.4	.1	.1	.1	2.0
		Rockfish	.4	.1	.1	.3	.0	.0	.1	-	.0	7.0	.2	.1	8.3
		Atka mackerel	.5	.0	2.3	.4	.0	.2	.2	.0	.1	6.2	59.1	.6	69.7
		Total	1,480.7	.4	72.2	12.2	15.5	37.3	.7	93.6	15.5	14.8	61.8	9.5	1,814.2
	All gear	Total	1,484.9	2.6	205.4	14.2	16.1	37.4	2.6	94.4	15.8	15.1	62.0	30.6	1,981.0

Table 4. Continued.

			Species												
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rock sole	Turbot	Yellow fin	Flat other	Rock-fish	Atka mack.	Other	Total
2006 Gear/ Target	Hook & line	Sablefish	.0	.7	.0	.1	.0	-	.1	-	.0	.1	-	.1	1.0
		Pacific cod	3.0	.1	98.9	1.3	.5	.0	.1	.4	.1	.1	.0	14.3	118.9
		Arrowtooth	.0	.0	.0	.5	-	.0	.1	-	.0	.2	.0	.1	1.0
		Turbot	.0	.1	.1	.2	.0	.0	1.2	.0	.0	.1	.0	.1	1.8
		Halibut	.0	.2	.1	.0	.0	.0	.1	-	.0	.0	.0	.1	.5
		Total	3.0	1.0	99.1	2.1	.5	.0	1.6	.4	.2	.4	.0	14.9	123.3
	Pot	Sablefish	.0	1.1	.0	.1	.0	-	.0	-	.0	.0	.0	.0	1.2
		Pacific cod	.0	.0	19.4	.0	.0	.0	.0	.0	.0	.0	.4	.5	20.3
		Total	.0	1.1	19.4	.1	.0	.0	.0	.0	.0	.0	.4	.5	21.5
	Trawl	Pollock, bottom	25.5	.0	.4	.1	.2	.2	.0	.1	.1	.4	.6	.6	28.2
		Pollock, pelagic	1,429.9	.0	6.9	1.0	2.6	1.2	.1	.1	.4	.6	.2	2.8	1,445.7
		Pacific cod	12.2	.0	54.3	4.5	2.9	5.0	.0	1.4	.9	.4	.8	2.9	85.3
		Arrowtooth	1.1	.1	.4	2.0	.1	.1	.0	.1	.2	.0	.0	.2	4.5
		Flathead sole	2.6	.0	2.0	1.6	7.7	1.5	.0	2.6	1.0	.0	.0	1.4	20.4
		Rock sole	6.9	.0	4.9	.5	1.7	20.1	.0	9.9	2.4	.0	.1	1.6	48.2
		Yellowfin	6.1	-	2.6	.4	2.0	8.1	.0	84.2	14.9	.0	.0	2.3	120.6
		Other flatfish	.1	.0	.0	.2	.0	.0	.0	.0	.1	.0	.0	.0	.5
		Rockfish	.3	.1	.1	.4	.0	.0	.1	-	.0	9.0	.1	.1	10.2
		Atka mackerel	.3	.0	1.7	.4	.0	.1	.1	.0	.0	6.8	59.6	.7	69.8
		Total	1,485.1	.1	73.3	11.1	17.4	36.4	.4	98.8	20.5	17.2	61.5	12.6	1,834.4
	All gear	Total	1,488.1	2.2	191.7	13.3	17.9	36.5	2.0	99.1	20.5	17.7	61.9	27.9	1,978.8

Notes: Totals may include additional categories. The target, determined by AFSC staff, is based on processor, week, processing mode, NMFS area, and gear. These estimates include only catch counted against federal TACs.

Source: Catch-accounting system estimates, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 5. Groundfish catch off Alaska by area, residency, and species, 2002-06 (1,000 metric tons, round weight).

		Gulf of Alaska			Bering Sea and Aleutian			All Alaska		
		Alaska	Other	Unknown	Alaska	Other	Unknown	Alaska	Other	Unknown
All groundfish	2002	66	98	1	45	1,889	2	112	1,987	2
	2003	66	114	0	43	1,931	0	109	2,044	0
	2004	73	102	0	47	1,932	0	120	2,034	0
	2005	71	115	1	28	1,953	0	99	2,069	1
	2006	72	126	0	23	1,956	0	94	2,081	1
Pollock	2002	19	31	0	17	1,464	1	36	1,496	1
	2003	18	32	0	15	1,478	0	33	1,510	0
	2004	24	40	0	16	1,466	0	40	1,506	0
	2005	31	50	0	12	1,472	0	43	1,523	0
	2006	28	44	0	6	1,481	0	34	1,526	0
Sablefish	2002	6	7	0	1	1	0	7	8	0
	2003	7	8	0	1	1	0	8	10	0
	2004	8	9	0	1	1	0	9	10	0
	2005	7	8	0	1	2	0	7	10	0
	2006	6	8	0	0	2	0	7	9	0
Pacific cod	2002	25	17	0	19	178	0	44	195	0
	2003	23	18	0	18	193	0	41	211	0
	2004	25	18	0	19	193	0	45	211	0
	2005	23	12	0	14	192	0	36	204	0
	2006	23	14	0	15	177	0	38	191	0
Flatfish	2002	10	24	0	7	156	0	17	180	0
	2003	8	34	0	6	154	0	15	187	0
	2004	8	15	0	7	168	0	15	183	0
	2005	6	24	0	0	180	0	6	204	0
	2006	8	34	0	0	189	0	8	223	0
Rockfish	2002	5	16	0	0	17	0	6	33	0
	2003	6	18	0	0	21	0	6	39	0
	2004	5	17	0	0	17	0	6	34	0
	2005	4	17	0	0	15	0	4	32	0
	2006	4	20	0	0	18	0	4	38	0
Atka mackerel	2002	0	0	0	0	45	0	0	45	0
	2003	0	0	0	1	57	0	2	57	0
	2004	0	1	0	3	57	0	3	58	0
	2005	0	1	0	0	62	0	0	63	0
	2006	0	1	0	0	62	0	0	63	0

Notes: These estimates include only catch counted against federal TACs. Catch delivered to motherships is classified by the residence of the owner of the mothership. All other catch is classified by the residence of the owner of the fishing vessel. All groundfish include additional species categories.

Source: Blend estimates (2002), Catch Accounting System estimates (2003-06), fish tickets, CFEC vessel data, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 6. Discards and discard rates for groundfish catch off Alaska by area, gear, and species, 2002-06 (1,000 metric tons, round weight).

			Fixed		Trawl		All gear	
			Total Discards	Discard Rate	Total Discards	Discard Rate	Total Discards	Discard Rate
Gulf of Alaska	All Groundfish	2002	2.7	7.3%	20.4	15.8%	23.0	13.9%
		2003	3.0	7.5%	26.9	19.5%	29.9	16.8%
		2004	3.0	6.9%	14.7	11.5%	17.8	10.3%
		2005	2.4	6.4%	13.1	8.9%	15.5	8.4%
		2006	4.0	9.4%	19.9	13.0%	23.9	12.2%
	Pollock	2002	.0	16.7%	1.1	2.2%	1.1	2.2%
		2003	.0	15.8%	1.0	2.1%	1.0	2.1%
		2004	.0	14.8%	1.1	1.7%	1.1	1.8%
		2005	.0	3.6%	1.1	1.4%	1.1	1.4%
		2006	.0	9.7%	1.9	2.7%	1.9	2.7%
	Sablefish	2002	.3	2.9%	.7	36.1%	1.0	8.0%
		2003	.4	3.5%	.7	38.2%	1.1	7.9%
		2004	.4	3.0%	.2	14.8%	.6	4.0%
		2005	.2	1.7%	.2	15.4%	.4	2.9%
		2006	.3	2.2%	.3	24.6%	.5	4.0%
	Pacific cod	2002	.2	.9%	3.5	17.7%	3.7	8.8%
		2003	.4	1.7%	2.1	10.9%	2.4	5.9%
		2004	.4	1.6%	.9	5.1%	1.3	3.0%
		2005	.2	1.1%	.7	5.0%	1.0	2.7%
		2006	.4	1.4%	1.4	10.6%	1.7	4.6%
	Flatfish	2002	.7	95.9%	11.2	33.7%	11.9	35.0%
		2003	.3	86.2%	18.5	44.4%	18.8	44.8%
		2004	.3	85.9%	9.5	41.9%	9.8	42.6%
		2005	.3	68.4%	8.6	29.3%	8.9	29.8%
		2006	.5	82.2%	12.4	29.7%	12.8	30.4%
	Rockfish	2002	.3	21.9%	1.9	9.4%	2.2	10.1%
		2003	.4	26.8%	3.1	14.2%	3.5	15.0%
		2004	.3	24.4%	2.0	9.6%	2.3	10.5%
		2005	.2	18.4%	1.2	6.4%	1.4	7.0%
		2006	.4	27.5%	2.3	10.1%	2.6	11.1%
	Atka mackerel	2002	.0	87.1%	.0	60.3%	.1	61.1%
		2003	.0	98.8%	.2	42.7%	.3	43.6%
		2004	.0	96.9%	.3	38.6%	.3	40.1%
		2005	.0	99.4%	.1	17.5%	.2	19.4%
		2006	.0	93.1%	.4	42.5%	.4	43.1%

Table 6. Continued.

			Fixed		Trawl		All gear	
			Total Discards	Discard Rate	Total Discards	Discard Rate	Total Discards	Discard Rate
Bering Sea & Aleutians	All Groundfish	2002	18.8	12.7%	100.1	5.6%	119.0	6.1%
		2003	17.6	10.6%	95.7	5.3%	113.3	5.7%
		2004	20.6	12.8%	112.5	6.2%	133.1	6.7%
		2005	21.1	12.6%	77.1	4.3%	98.2	5.0%
		2006	16.1	11.2%	75.9	4.1%	92.0	4.7%
	Pollock	2002	.9	13.3%	20.6	1.4%	21.4	1.4%
		2003	.8	11.1%	16.6	1.1%	17.4	1.2%
		2004	.7	13.0%	22.8	1.5%	23.5	1.6%
		2005	.6	13.9%	17.2	1.2%	17.7	1.2%
		2006	.4	14.2%	15.2	1.0%	15.6	1.1%
	Sablefish	2002	.2	8.0%	.0	14.7%	.2	9.0%
		2003	.1	7.4%	.1	36.4%	.2	11.1%
		2004	.0	2.7%	.1	26.5%	.1	6.6%
		2005	.1	2.6%	.0	8.2%	.1	3.4%
		2006	.1	2.5%	.0	7.2%	.1	2.8%
	Pacific cod	2002	2.4	2.0%	1.9	2.4%	4.3	2.2%
		2003	1.2	.9%	1.1	1.4%	2.3	1.1%
		2004	2.0	1.5%	.8	.9%	2.7	1.3%
		2005	2.9	2.2%	.7	1.0%	3.6	1.7%
		2006	1.7	1.5%	1.0	1.3%	2.7	1.4%
	Flatfish	2002	2.8	53.2%	52.6	33.5%	55.4	34.1%
		2003	3.3	58.4%	49.0	31.8%	52.3	32.7%
		2004	2.9	60.6%	62.5	36.7%	65.3	37.4%
		2005	2.7	48.1%	43.6	24.9%	46.3	25.6%
		2006	2.1	42.6%	42.6	23.1%	44.7	23.6%
	Rockfish	2002	.4	58.9%	5.5	34.1%	5.9	35.0%
		2003	.2	47.0%	7.5	36.7%	7.7	36.9%
		2004	.2	51.5%	6.3	36.5%	6.5	36.8%
		2005	.1	34.5%	4.8	32.3%	4.9	32.4%
		2006	.2	49.1%	5.1	29.6%	5.3	30.1%
	Atka mackerel	2002	.1	98.6%	7.5	16.5%	7.6	16.7%
		2003	.2	96.2%	13.1	22.7%	13.4	23.0%
		2004	.2	98.8%	11.7	19.4%	11.9	19.6%
		2005	.3	96.9%	3.8	6.1%	4.0	6.5%
		2006	.4	100.0%	2.7	4.4%	3.0	4.9%

Table 6. Continued.

			Fixed		Trawl		All gear	
			Total Discards	Discard Rate	Total Discards	Discard Rate	Total Discards	Discard Rate
All Alaska	All Groundfish	2002	21.5	11.6%	120.5	6.3%	142.0	6.8%
		2003	20.6	10.0%	122.6	6.3%	143.1	6.7%
		2004	23.6	11.5%	127.3	6.5%	150.9	7.0%
		2005	23.4	11.5%	90.3	4.6%	113.7	5.2%
		2006	20.1	10.8%	95.8	4.8%	116.0	5.3%
	Pollock	2002	.9	13.4%	21.7	1.4%	22.6	1.5%
		2003	.8	11.1%	17.6	1.1%	18.4	1.2%
		2004	.7	13.0%	23.8	1.5%	24.6	1.6%
		2005	.6	13.7%	18.3	1.2%	18.8	1.2%
		2006	.4	14.0%	17.1	1.1%	17.5	1.1%
	Sablefish	2002	.5	3.7%	.7	32.9%	1.2	8.2%
		2003	.6	4.0%	.8	38.0%	1.4	8.3%
		2004	.5	2.9%	.3	17.1%	.8	4.3%
		2005	.3	1.9%	.2	13.7%	.5	3.0%
		2006	.3	2.2%	.3	22.6%	.6	3.9%
	Pacific cod	2002	2.6	1.8%	5.4	5.5%	8.0	3.3%
		2003	1.6	1.0%	3.1	3.2%	4.7	1.9%
		2004	2.4	1.5%	1.7	1.6%	4.0	1.6%
		2005	3.1	2.0%	1.4	1.6%	4.5	1.9%
		2006	2.1	1.5%	2.3	2.7%	4.4	1.9%
	Flatfish	2002	3.5	58.2%	63.9	33.5%	67.4	34.3%
		2003	3.6	60.2%	67.5	34.5%	71.1	35.2%
		2004	3.2	62.4%	71.9	37.3%	75.1	38.0%
		2005	2.9	49.4%	52.2	25.6%	55.1	26.2%
		2006	2.6	46.6%	55.0	24.3%	57.5	24.9%
	Rockfish	2002	.6	33.4%	7.4	20.3%	8.1	21.0%
		2003	.6	31.5%	10.6	25.0%	11.2	25.3%
		2004	.5	30.4%	8.3	21.8%	8.8	22.2%
		2005	.3	21.7%	6.0	17.6%	6.3	17.8%
		2006	.6	32.9%	7.4	18.5%	8.0	19.2%
	Atka mackerel	2002	.1	98.3%	7.5	16.6%	7.6	16.8%
		2003	.2	96.3%	13.4	22.9%	13.6	23.2%
		2004	.2	98.6%	12.0	19.6%	12.2	19.9%
		2005	.3	97.1%	3.9	6.2%	4.2	6.7%
		2006	.4	99.8%	3.0	4.9%	3.4	5.5%

Notes: All groundfish and all gear may include additional categories. These estimates include only catch counted against federal TACs. Although these are the best available estimates of discards and are used for several management purposes, these estimates are not necessarily accurate. The reasons for this are as follows: 1) they are wholly or partially derived from observer estimates; 2) discards occur at many different places on vessels; 3) observers record only a rough approximation of what they see; 4) the sampling methods used by at-sea observers provide the basis for NMFS to make good estimates of total catch by species, not the disposition of that catch.

Source: Blend estimates (2002) and catch accounting system estimates (2003-06) National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 7. Gulf of Alaska groundfish discards by species, gear, and target fishery, 2005-06 (1,000 metric tons, round weight).

			Species											
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rex sole	Flat deep	Flat shallow	Rock-fish	Atka mack.	Other	Total
2005 Gear/ Target	Hook & line	Pollock, bottom	.0	.0	.0	.0	.0	-	-	.0	-	-	.0	.0
		Sablefish	.0	.2	.0	.1	-	-	.0	.0	.2	.0	.5	1.1
		Pacific cod	.0	.0	.0	.1	.0	.0	-	.0	.0	.0	.5	.7
		Arrowtooth	.0	.0	.0	.0	.0	-	-	.0	.0	-	.1	.1
		Rockfish	-	.0	.0	.0	.0	-	-	.0	.0	-	-	.0
		Halibut	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.1	.2
		Total	.0	.2	.2	.2	.0	.0	.0	.0	.2	.0	1.2	2.1
	Pot	Pacific cod	.0	-	.1	.0	.0	.0	.0	.0	.0	.0	.2	.3
		Total	.0	-	.1	.0	.0	.0	.0	.0	.0	.0	.2	.3
	Trawl	Pollock, bottom	.3	.0	.0	.1	.0	.0	.0	.0	.0	.0	.1	.5
		Pollock, pelagic	.7	.0	.0	.1	.0	.0	.0	.0	.0	.0	.2	1.1
		Pacific cod	.0	.0	.0	.5	.0	.0	.0	.1	.0	.0	.1	.7
		Arrowtooth	.0	.0	.2	2.1	.2	.1	.1	.0	.1	.0	.3	3.0
		Flathead sole	.0	.0	.0	1.6	.1	.0	.0	.0	.0	.0	.1	1.9
		Rex sole	.0	.0	.0	1.6	.0	.0	.0	.0	.1	.0	.0	1.9
		Flatfish, deep	.0	.0	.0	.0	.0	.0	.0	.0	.0	-	.0	.0
		Flatfish, shallow	.0	.0	.5	.9	.0	.0	.0	.2	.0	.0	.2	1.9
		Rockfish	.0	.1	.0	.7	.0	.0	.1	.0	.9	.1	.1	2.1
		Total	1.1	.2	.7	7.5	.3	.2	.2	.3	1.2	.1	1.2	13.1
	All gear	Total	1.1	.4	1.0	7.8	.3	.2	.2	.3	1.4	.2	2.6	15.5

Table 7. Continued.

			Species											
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rex sole	Flat deep	Flat shallow	Rock-fish	Atka mack.	Other	Total
2006 Gear/ Target	Hook & line	Pollock, bottom	.0	-	.0	.0	.0	-	-	-	.0	-	.0	.0
		Sablefish	.0	.2	.0	.3	.0	-	.0	.0	.2	-	.6	1.4
		Pacific cod	.0	.0	.1	.1	.0	.0	.0	.0	.0	.0	.7	.9
		Halibut	.0	.0	.0	.0	.0	-	.0	.0	.1	-	1.0	1.2
		Total	.0	.3	.1	.4	.0	.0	.0	.0	.3	.0	2.4	3.6
	Pot	Pacific cod	.0	-	.2	.0	.0	.0	.0	.0	.0	.0	.1	.4
		Total	.0	-	.2	.0	.0	.0	.0	.0	.0	.0	.1	.4
	Trawl	Pollock, bottom	.6	.0	.0	.5	.0	.0	.0	.0	.0	.0	.4	1.5
		Pollock, pelagic	.8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	1.0
		Pacific cod	.0	.0	.8	.7	.1	.0	.0	.1	.2	.0	.1	2.1
		Arrowtooth	.1	.1	.2	2.7	.1	.0	.1	.0	.3	.0	.3	3.9
		Flathead sole	.0	.0	.0	.8	.1	.0	.0	.0	.0	.0	.0	.9
		Rex sole	.0	.0	.0	4.2	.0	.0	.0	.0	.1	.0	.1	4.6
		Flatfish, deep	-	.0	.0	.0	-	-	.0	.0	.0	-	.0	.0
		Flatfish, shallow	.1	.0	.4	1.4	.0	.0	.0	.2	.0	.0	.2	2.4
		Rockfish	.1	.2	.1	1.0	.0	.1	.1	.0	1.6	.3	.1	3.6
		Total	1.9	.3	1.4	11.2	.3	.2	.2	.5	2.3	.4	1.4	19.9
	All gear	Total	1.9	.5	1.7	11.6	.3	.2	.2	.5	2.6	.4	3.9	23.9

Notes: Totals may include additional categories. The target, determined by AFSC staff, is based on processor, week, processing mode, NMFS area, and gear. These estimates include only catch counted against federal TACs. Although these are the best available estimates of discards and are used for several management purposes, these estimates are not necessarily accurate. The reasons for this are as follows: 1) they are wholly or partially derived from observer estimates; 2) discards occur at many different places on vessels; 3) observers record only a rough approximation of what they see; and 4) the sampling methods used by at-sea observers provide NMFS the basis to make good estimates of total catch by species, not the disposition of that catch.

Source: Catch-accounting system estimates, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 8. Bering Sea and Aleutian Islands groundfish discards by species, gear, and target fishery, 2005-06 (1,000 metric tons, round weight).

			Species												
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rock sole	Turbot	Yellow fin	Flat other	Rock-fish	Atka mack.	Other	Total
2005 Gear/ Target	Hook & line	Sablefish	.0	.0	.0	.0	.0	.0	.0	-	.0	.0	-	.0	.1
		Pacific cod	.6	.0	2.6	1.0	.5	.1	.0	.6	.2	.1	.0	14.1	19.8
		Turbot	.0	.0	.0	.0	.0	-	.0	-	.0	.0	-	.1	.2
		Halibut	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.1	.3
		Total	.6	.0	2.8	1.0	.6	.1	.1	.6	.2	.1	.0	14.4	20.4
	Pot	Sablefish	.0	.0	.0	.0	.0	-	.0	-	.0	.0	.0	.0	.1
		Pacific cod	.0	.0	.1	.0	.0	.0	.0	.1	.0	.0	.2	.2	.6
		Total	.0	.0	.1	.0	.0	.0	.0	.1	.0	.0	.2	.2	.6
	Trawl	Pollock, bottom	.1	.0	.0	.0	.1	.0	.0	.0	.1	.1	.1	.0	.6
		Pollock, pelagic	.5	.0	.0	.2	.8	.5	.0	.0	.1	.1	.0	.9	3.2
		Pacific cod	6.6	.0	.2	2.8	.9	5.0	.0	1.0	1.3	.4	.7	1.6	20.5
		Arrowtooth	.7	.0	.0	.5	.1	.0	.0	.0	.0	.0	.2	.2	1.8
		Flathead sole	2.1	.0	.0	.9	.9	.6	.0	.5	.6	.0	.0	1.1	6.8
		Rock sole	3.4	.0	.1	.3	.2	2.7	.0	1.3	2.2	.0	.0	.8	11.0
		Turbot	.0	.0	-	.0	.0	.0	.0	-	.0	.0	-	.0	.0
		Yellowfin	3.3	.0	.2	.2	.3	4.0	.0	5.5	8.5	.0	.0	1.8	23.9
		Other flatfish	.2	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.1	1.0
		Rockfish	.0	.0	.0	.1	.0	.0	.0	-	.0	.2	.1	.1	.5
		Atka mackerel	.2	.0	.1	.2	.0	.1	.0	.0	.0	3.9	2.6	.5	7.7
		Total	17.1	.0	.7	5.9	3.3	13.0	.1	8.4	12.9	4.8	3.8	7.1	77.1
	All gear	Total	17.7	.1	3.6	6.9	3.9	13.0	.2	9.1	13.2	4.9	4.0	21.6	98.2

Table 8. Continued.

2006 Gear/ Target			Species: Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rock sole	Turbot	Yellow fin	Flat other	Rock-fish	Atka mack.	Other	Total
	Hook & line	Sablefish	.0	.0	.0	.0	.0	-	.0	-	.0	.0	-	.1	.2
		Pacific cod	.4	.0	1.6	.8	.5	.0	.0	.4	.1	.0	.0	10.4	14.4
		Arrowtooth	.0	.0	.0	.0	-	.0	.0	-	.0	.1	.0	.1	.2
		Turbot	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.2
		Halibut	.0	.0	.0	.0	.0	.0	.0	-	.0	.0	.0	.1	.1
		Total	.4	.0	1.6	.9	.5	.0	.1	.4	.1	.2	.0	10.9	15.2
	Pot	Sablefish	.0	.0	.0	.0	.0	-	.0	-	.0	.0	.0	.0	.1
		Pacific cod	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.4	.3	.8
		Total	.0	.0	.1	.1	.0	.0	.0	.0	.0	.0	.4	.3	.9
	Trawl	Pollock, bottom	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.2	.1	.5
		Pollock, pelagic	.6	.0	.1	.2	.7	.4	.0	.1	.0	.2	.0	1.6	4.0
		Pacific cod	8.3	.0	.3	3.2	1.8	2.9	.0	.7	.7	.3	.5	2.4	21.0
		Arrowtooth	.7	.0	.0	1.1	.1	.1	.0	.0	.0	.0	.0	.2	2.2
		Flathead sole	1.1	.0	.2	.7	.7	.2	.0	.4	.7	.0	.0	1.0	4.9
		Rock sole	2.8	.0	.1	.3	.2	2.2	.0	1.0	2.3	.0	.1	1.3	10.3
		Yellowfin	1.5	-	.2	.2	.3	1.9	.0	5.7	12.6	.0	.0	2.1	24.6
		Other flatfish	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.2
		Rockfish	.0	.0	.0	.2	.0	.0	.0	-	.0	.1	.0	.1	.5
		Atka mackerel	.1	.0	.1	.2	.0	.1	.0	.0	.0	4.4	1.8	.6	7.4
		Total	15.2	.0	1.0	6.3	3.9	7.8	.1	8.1	16.6	5.1	2.7	9.3	76.0
	All gear	Total	15.6	.1	2.7	7.2	4.3	7.8	.2	8.5	16.6	5.3	3.0	20.6	92.0

Notes: Totals may include additional categories. The target, determined by AFSC staff, is based on processor, week, processing mode, NMFS area, and gear. These estimates include only catch counted against federal TACs. Although these are the best available estimates of discards and are used for several management purposes, these estimates are not necessarily accurate. The reasons for this are discussed in the Notes for Table 7.

Source: Catch-accounting system estimates, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 9. Gulf of Alaska groundfish discard rates by species, gear, and target fishery, 2005-06 (percent).

			Species											
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rex sole	Flat deep	Flat shallow	Rock-fish	Atka mack.	Other	Total
2005 Gear/ Target	Hook & line	Pollock, bottom	.0	100.0	.0	.0	.0	-	-	100.0	-	-	.0	.1
		Sablefish	30.9	1.5	51.0	57.6	-	-	94.5	100.0	22.7	100.0	96.0	8.1
		Pacific cod	.4	59.0	.4	98.0	100.0	100.0	-	100.0	83.4	100.0	83.0	10.3
		Arrowtooth	100.0	98.4	100.0	2.0	100.0	-	-	100.0	92.7	-	100.0	89.0
		Rockfish	-	.0	.0	.0	100.0	-	-	.0	.2	-	-	.2
		Halibut	100.0	2.4	30.0	94.4	100.0	100.0	95.9	100.0	6.7	100.0	77.6	15.5
		Total	1.4	1.7	2.6	66.0	95.1	100.0	94.6	98.0	17.5	100.0	79.3	9.5
	Pot	Pacific cod	78.0	-	.5	100.0	71.2	100.0	.0	98.9	99.0	99.4	62.6	1.9
		Total	78.0	-	.5	100.0	71.2	100.0	.0	98.9	99.0	99.4	62.2	1.9
	Trawl	Pollock, bottom	1.9	5.2	.1	6.0	.8	1.2	.0	26.3	.7	.0	20.3	2.7
		Pollock, pelagic	1.1	70.2	3.2	20.3	13.3	35.2	.0	50.3	44.2	.0	46.0	1.7
		Pacific cod	63.7	7.9	.2	76.6	43.4	20.1	94.6	17.8	69.3	81.1	85.2	5.9
		Arrowtooth	5.2	36.6	26.4	19.2	12.4	10.0	68.3	9.9	50.4	11.6	36.2	20.2
		Flathead sole	.7	6.7	12.3	90.5	17.3	13.9	99.0	5.8	90.1	10.9	72.3	61.8
		Rex sole	1.0	9.7	12.1	90.6	14.8	3.5	98.0	1.3	85.9	66.2	34.5	57.8
		Flatfish, deep	.0	.0	.0	9.5	.0	.0	.3	.0	.0	-	.0	1.2
		Flatfish, shallow	10.8	39.2	37.9	66.9	8.7	3.8	65.7	5.3	67.3	70.9	24.6	23.0
		Rockfish	6.7	13.7	4.1	71.9	11.1	31.8	83.4	35.8	4.7	14.1	87.1	9.1
		Total	1.4	15.4	5.0	38.7	13.1	8.6	57.5	6.8	6.4	17.5	37.7	8.9
	All gear	Total	1.4	2.9	2.7	39.2	13.3	8.6	58.4	7.0	7.0	19.4	52.2	8.4

Table 9. Continued.

2006			Species											
Gear/Target			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rex sole	Flat deep	Flat shallow	Rock-fish	Atka mack.	Other	Total
Hook & line		Pollock, bottom	.0	-	.0	.0	.0	-	-	-	.0	-	.0	.0
		Sablefish	61.7	2.0	27.5	86.9	100.0	-	98.5	100.0	23.2	-	98.7	10.6
		Pacific cod	10.1	70.5	.7	62.8	97.1	100.0	100.0	99.5	50.6	84.2	53.0	8.2
		Halibut	.0	2.7	9.2	94.0	100.0	-	100.0	100.0	30.8	-	98.6	42.7
		Total	6.8	2.2	1.3	80.5	97.0	100.0	98.4	99.7	26.3	84.2	76.9	13.0
Pot		Pacific cod	47.4	-	1.5	99.6	80.8	.0	100.0	100.0	96.7	99.8	50.6	2.8
		Total	32.3	-	1.5	82.9	80.8	.0	100.0	100.0	96.7	99.8	50.6	2.8
Trawl		Pollock, bottom	2.2	14.5	.6	18.2	2.8	2.3	18.8	1.7	9.5	61.4	22.6	4.3
		Pollock, pelagic	2.1	25.4	.4	10.9	3.0	16.7	.0	.5	24.8	.8	55.6	2.5
		Pacific cod	21.1	.0	8.2	81.6	44.1	9.8	78.8	39.6	97.3	36.5	87.2	18.4
		Arrowtooth	11.2	57.9	16.7	17.4	4.8	3.9	57.5	6.6	60.8	40.4	60.8	18.2
		Flathead sole	6.5	12.9	8.5	90.2	17.9	7.0	20.1	72.6	33.2	16.3	54.9	56.6
		Rex sole	.4	10.6	5.4	97.5	17.2	2.0	100.0	.0	42.7	12.4	51.5	63.6
		Flatfish, deep	-	.0	.0	16.0	-	-	.0	.0	.0	-	100.0	.3
		Flatfish, shallow	18.8	73.9	29.2	72.1	4.7	3.6	14.8	3.4	69.3	66.3	32.0	21.4
		Rockfish	39.0	18.0	13.9	90.2	43.7	57.8	88.9	68.0	7.4	43.3	94.9	14.1
		Total	2.7	24.6	10.6	41.3	10.3	4.6	57.4	5.9	10.1	42.5	39.0	13.0
All gear		Total	2.7	4.0	4.6	42.0	10.5	4.6	59.9	6.2	11.1	43.1	56.2	12.2

Notes: Totals may include additional categories. The target, determined by AFSC staff, is based on processor, week, processing mode, NMFS area, and gear. These estimates include only catch counted against federal TACs. Although these are the best available estimates of discards and are used for several management purposes, these estimates are not necessarily accurate. The reasons for this are as follows: 1) they are wholly or partially derived from observer estimates; 2) discards occur at many different places on vessels; 3) observers record only a rough approximation of what they see; and 4) the sampling methods used by at-sea observers provide the basis for NMFS to make good estimates of total catch by species, not the disposition of that catch.

Source: Catch-accounting system estimates, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 10. Bering Sea and Aleutian Islands groundfish discard rates by species, gear, and target fishery, 2005-06 (percent).

			Species												
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rock sole	Turbot	Yellow fin	Flat other	Rock-fish	Atka mack.	Other	Total
2005 Gear/ Target	Hook & line	Sablefish	13.5	.6	16.9	45.7	100.0	.0	17.0	-	100.0	10.8	-	97.7	8.0
		Pacific cod	13.8	53.2	2.3	57.7	88.6	98.4	10.4	83.6	96.9	68.4	99.9	68.9	13.8
		Turbot	18.7	13.3	1.0	1.8	100.0	-	1.4	-	98.8	8.5	-	86.7	9.5
		Halibut	21.5	.7	78.2	14.8	100.0	91.6	76.5	.0	100.0	46.4	100.0	89.1	58.8
		Total	13.8	3.2	2.4	51.6	88.7	95.6	5.1	83.6	97.0	33.2	99.9	69.1	13.8
	Pot	Sablefish	92.4	2.1	73.8	66.3	100.0	-	62.1	-	69.8	54.8	100.0	77.7	5.4
		Pacific cod	26.5	100.0	.4	100.0	94.8	97.9	100.0	99.6	99.7	100.0	96.6	45.3	3.1
		Total	28.3	2.1	.4	69.3	95.6	97.9	62.1	99.6	96.5	83.6	96.6	44.6	3.3
	Trawl	Pollock, bottom	.4	22.3	.0	43.9	28.2	34.7	.0	91.0	52.2	38.3	20.3	8.6	1.9
		Pollock, pelagic	.0	22.5	.5	31.6	39.8	50.4	41.0	63.7	21.6	20.7	12.2	51.7	.2
		Pacific cod	62.2	18.1	.4	69.5	65.8	63.0	77.1	79.8	78.1	70.9	60.0	86.8	25.3
		Arrowtooth	63.4	7.6	5.0	23.8	22.1	26.1	5.0	8.6	4.5	43.4	59.4	74.2	32.3
		Flathead sole	57.6	.8	1.9	35.6	10.2	48.9	9.4	21.4	81.7	10.1	1.2	78.4	29.1
		Rock sole	47.4	10.1	1.9	52.2	21.4	16.1	88.8	17.2	96.5	100.0	14.9	86.9	26.6
		Turbot	100.0	.0	-	19.6	11.5	.0	.0	-	3.3	8.7	-	91.8	15.1
		Yellowfin	31.6	.0	4.5	37.9	23.0	39.8	96.4	6.7	91.1	22.6	22.1	84.7	19.9
		Other flatfish	82.0	35.9	7.2	71.5	36.4	63.8	13.3	73.0	4.5	36.8	47.8	86.6	51.3
		Rockfish	1.4	.0	.0	46.5	96.4	84.0	3.5	-	16.7	2.6	25.6	100.0	5.5
		Atka mackerel	35.0	3.9	5.9	46.5	39.7	46.1	21.9	16.4	15.4	63.2	4.4	92.4	11.1
		Total	1.2	8.2	1.0	48.2	21.5	34.7	13.7	9.0	83.1	32.3	6.1	74.8	4.3
	All gear	Total	1.2	3.4	1.7	48.8	24.1	34.8	7.9	9.6	83.3	32.4	6.5	70.6	5.0

Table 10. Continued.

			Species												
			Pollock	Sable-fish	Pacific cod	Arrow-tooth	Flathd. sole	Rock sole	Turbot	Yellow fin	Flat other	Rock-fish	Atka mack.	Other	Total
2006 Gear/ Target	Hook & line	Sablefish	94.4	.8	36.5	36.4	100.0	-	30.1	-	100.0	11.3	-	97.6	18.7
		Pacific cod	14.2	20.2	1.6	61.4	92.2	97.3	22.1	89.1	95.1	72.7	100.0	73.0	12.1
		Arrowtooth	5.5	13.5	7.8	4.7	-	100.0	10.0	-	71.7	64.8	100.0	65.9	22.6
		Turbot	15.2	27.5	15.7	3.4	99.1	100.0	1.1	100.0	67.7	33.8	100.0	79.5	10.6
		Halibut	72.8	.4	4.0	38.3	97.2	31.4	11.4	-	46.0	40.2	100.0	56.9	20.8
		Total	14.2	4.6	1.7	41.0	92.3	95.8	5.0	89.1	94.0	47.8	100.0	73.2	12.3
	Pot	Sablefish	94.7	.2	93.0	81.7	2.1	-	86.9	-	100.0	87.2	86.3	95.4	7.1
		Pacific cod	14.9	90.6	.4	99.7	24.8	99.1	100.0	99.1	100.0	99.8	100.0	66.0	4.2
		Total	15.6	.5	.4	85.0	20.9	99.1	87.3	99.1	100.0	94.4	100.0	64.9	4.3
	Trawl	Pollock, bottom	.1	32.1	.0	4.6	1.1	24.5	.0	47.9	19.0	8.7	31.4	21.9	1.8
		Pollock, pelagic	.0	30.8	.8	16.9	25.9	36.7	21.7	84.8	11.0	42.1	16.5	57.1	.3
		Pacific cod	68.3	22.6	.5	70.7	61.2	58.3	66.6	47.8	74.1	59.1	66.4	83.4	24.7
		Arrowtooth	64.0	1.0	.6	53.2	39.4	53.4	24.1	54.4	18.2	13.4	6.2	69.6	48.2
		Flathead sole	41.4	100.0	8.5	41.4	9.6	16.1	5.4	13.8	70.7	46.9	12.1	71.4	24.1
		Rock sole	39.9	35.5	2.7	61.9	14.1	10.8	11.1	10.2	93.0	4.3	69.6	80.0	21.3
		Yellowfin	24.9	-	9.6	67.1	14.6	23.0	100.0	6.8	84.8	97.0	1.2	88.7	20.4
		Other flatfish	73.6	.0	1.5	73.4	56.0	11.5	7.7	19.0	4.3	62.2	54.7	84.4	50.5
		Rockfish	3.1	8.6	9.8	53.8	77.2	66.7	10.6	-	27.9	1.3	41.5	93.2	5.1
		Atka mackerel	35.5	5.7	3.1	61.5	31.8	41.1	27.5	54.4	25.7	65.3	3.0	95.0	10.6
		Total	1.0	7.2	1.3	56.5	22.2	21.5	23.5	8.2	80.9	29.6	4.4	74.4	4.1
	All gear	Total	1.1	2.8	1.4	54.1	24.2	21.5	9.6	8.6	81.3	30.1	4.9	73.6	4.7

Notes: Totals may include additional categories. The target, determined by AFSC staff, is based on processor, week, processing mode, NMFS area, and gear. These estimates include only catch counted against federal TACs. Although these are the best available estimates of discards and are used for several management purposes, these estimates are not necessarily accurate. The reasons for this are discussed in the Notes for Table 9.

Source: Catch-accounting system estimates, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 11. Prohibited species bycatch by species, area and gear, 2003-06 (metric tons (t) or number in 1,000s)

			Halibut mort. (t)	Herring (t)	Chinook (1,000s)	Other salmon (1,000s)	Red king crab (1,000s)	Other k. crab (1,000s)	Bairdi (1,000s)	Other tanner (1,000s)
Bering Sea & Aleutians	Hook & Line	2003	581	0	0	0	13	2	12	64
		2004	512	0	0	0	15	1	11	46
		2005	609	0	0	0	16	1	13	51
		2006	451	0	0	0	8	4	14	43
	Pot	2003	5	-	-	-	0	144	94	23
		2004	4	-	-	-	0	66	28	95
		2005	3	-	-	-	3	2	124	78
		2006	5	-	-	-	7	47	389	194
	Trawl	2003	3,812	967	55	194	100	6	1,048	711
		2004	3,420	1,243	63	448	85	6	842	1,824
		2005	3,580	695	75	703	115	6	1,586	3,308
		2006	3,549	496	88	325	107	16	926	1,022
	All gear	2003	4,399	967	55	194	113	152	1,153	798
		2004	3,937	1,243	63	448	100	73	881	1,965
		2005	4,193	695	75	704	134	10	1,723	3,437
		2006	4,005	496	88	325	122	67	1,328	1,259
Gulf of Alaska	Hook & Line	2003	-	-	-	0	0	0	0	0
		2004	-	-	0	0	-	0	0	0
		2005	-	-	-	0	0	0	2	-
		2006	-	-	-	0	-	0	0	0
	Pot	2003	14	-	-	-	-	-	10	-
		2004	23	-	-	-	0	-	15	-
		2005	33	-	-	-	-	-	117	-
		2006	19	-	-	-	-	-	103	0
	Trawl	2003	2,170	13	16	10	0	1	139	1
		2004	2,291	278	18	6	0	0	64	-
		2005	2,105	13	32	7	0	-	127	0
		2006	1,996	9	19	4	0	0	307	0
	All gear	2003	2,184	13	16	11	0	1	149	1
		2004	2,313	278	18	6	0	0	79	0
		2005	2,138	13	32	7	0	0	245	0
		2006	2,014	9	19	4	0	0	410	0
All Alaska	All gear	2003	6,583	980	71	205	114	153	1,302	799
		2004	6,250	1,520	81	454	100	74	960	1,965
		2005	6,331	707	106	711	134	10	1,968	3,437
		2006	6,019	505	107	330	122	67	1,739	1,259

Notes: These estimates include only catches counted against federal TACs. Totals may include additional categories. The estimates of halibut bycatch mortality are based on the International Pacific Halibut Commission discard mortality rates that were used for in-season management. The halibut Individual Fishing Quota program allows retention of halibut in the hook-and-line groundfish fisheries, making true halibut bycatch numbers unavailable. This is particularly a problem in the GOA for all hook-and-line fisheries and in the BSAI for the sablefish hook-and-line fishery. Therefore, estimates of halibut bycatch mortality are not included in this table for those fisheries.

Source: Catch Accounting System, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 12. Prohibited species bycatch in the Gulf of Alaska by species,gear, and groundfish target fishery, 2005-06 (Metric tons (t) or number in 1,000s).

			Halibut mortality (t)	Herring (t)	Red king crab (1,000s)	Other king crab (1,000s)	Bairdi (1,000s)	Other tanner (1,000s)	Chinook (1,000s)	Other salmon (1,000s)
2005	Hook & Line	Sablefish	n.a.	.0	.1	.1	.3	.0	.0	.3
		Pacific cod	n.a.	.0	.0	.0	1.5	.0	.0	.0
		Total	n.a.	.0	.1	.1	1.8	.0	.0	.3
	Pot	Pacific cod	32.9	.0	.0	.0	116.8	.0	.0	.0
		Total	32.9	.0	.0	.0	116.8	.0	.0	.0
	Trawl	Pollock, bottom	1.8	.1	.0	.0	.0	.0	15.0	.1
		Pollock, pelagic	.5	12.5	.0	.0	.0	.0	13.1	.7
		Pacific cod	652.0	.0	.0	.0	1.4	.0	.0	.1
		Arrowtooth	504.6	.0	.0	.0	69.4	.0	1.8	.4
		Flathd. sole	43.1	.0	.0	.0	44.0	.0	.0	.0
		Rex sole	85.6	.0	.0	.0	4.5	.0	1.0	.1
		Flat shallow	555.4	.1	.1	.0	5.9	.0	.1	1.8
		Rockfish	262.0	.0	.0	.0	1.6	.0	.5	3.5
		Total	2,105.3	12.6	.1	.0	126.9	.0	31.5	6.7
	All gear	Total	2,138.1	12.6	.2	.1	245.4	.0	31.5	7.0
2006	Hook & Line	Sablefish	n.a.	.0	.0	.1	.0	.0	.0	.2
		Pacific cod	n.a.	.0	.0	.0	.4	.0	.0	.0
		Arrowtooth	n.a.	.0	.0	.0	.0	.0	.0	.0
		Total	n.a.	.0	.0	.1	.4	.0	.0	.2
	Pot	Pacific cod	18.5	.0	.0	.0	103.1	.4	.0	.0
		Total	18.5	.0	.0	.0	103.1	.4	.0	.0
	Trawl	Pollock, bottom	67.9	3.6	.0	.0	8.2	.0	10.2	.6
		Pollock, pelagic	.4	5.3	.0	.0	75.9	.0	5.7	.8
		Pacific cod	348.2	.0	.0	.0	.7	.0	.9	.0
		Arrowtooth	615.1	.1	.0	.0	89.1	.1	.4	.4
		Flathd. sole	22.6	.0	.0	.0	25.9	.0	.1	.0
		Rex sole	129.2	.0	.0	.0	73.5	.0	1.4	.6
		Flat shallow	625.7	.0	.3	.0	32.5	.0	.0	.0
		Rockfish	186.7	.0	.0	.1	1.0	.0	.3	1.9
		Total	1,995.9	9.0	.3	.1	306.8	.1	19.0	4.3
	All gear	Total	2,014.4	9.0	.3	.1	410.3	.5	19.0	4.5

Notes: These estimates include only catches counted against federal TACs. Totals may include additional categories. The target, calculated by AFSC staff, is based on processor, week, processing mode, NMFS area and gear. The estimates of halibut bycatch mortality are based on the International Pacific Halibut Commission discard mortality rates that were used for in-season management. The halibut Individual Fishing Quota program allows retention of halibut in the hook-and-line groundfish fisheries, making true halibut bycatch numbers unavailable. Therefore, estimates of halibut bycatch mortality are not included in this table for those fisheries.

Source: Catch Accounting System, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 13. Prohibited species bycatch in the Bering Sea and Aleutian Islands by species, gear, and groundfish target fishery, 2005-06 (Metric tons (t) or number in 1,000s).

			Halibut mortality (t)	Herring (t)	Red king crab (1,000s)	Other king crab (1,000s)	Bairdi (1,000s)	Other tanner (1,000s)	Chinook (1,000s)	Other salmon (1,000s)
2005	Hook & Line	Sablefish	n.a.	.0	.0	.1	.0	.0	.0	.0
		Pacific cod	596.6	.0	16.0	1.1	12.8	51.1	.0	.1
		Arrowtooth	.1	.0	.0	.0	.0	.0	.0	.0
		Turbot	11.7	.0	.0	.0	.0	.0	.0	.0
		Total	608.9	.0	16.1	1.3	12.9	51.1	.1	.1
	Pot	Sablefish	.6	.0	.0	1.7	.2	.1	.0	.0
		Pacific cod	2.8	.0	3.2	.5	123.6	77.8	.0	.0
		Total	3.4	.0	3.2	2.2	123.8	77.9	.0	.0
	Trawl	Pollock, bottom	14.6	172.6	.0	.0	.0	.1	2.2	8.1
		Pollock, pelagic	98.6	439.8	.0	.0	.6	2.2	65.7	690.2
		Sablefish	.1	.0	.0	.0	.4	.0	.0	.0
		Pacific cod	1,435.6	17.6	4.7	.1	157.1	60.0	3.8	.9
		Arrowtooth	201.1	.0	.0	.3	10.5	.8	1.9	.1
		Flathd. sole	246.5	1.0	.4	.0	270.4	131.2	.0	.5
		Rock sole	775.7	15.5	48.2	.0	392.1	592.7	.3	.0
		Turbot	2.9	.0	.0	.1	.1	.0	.0	.0
		Yellowfin	613.4	48.1	60.4	.2	747.5	2,520.1	.4	.5
		Flat, other	67.7	.1	.2	.0	5.6	.6	.2	.0
		Rockfish	17.3	.0	.6	5.6	.0	.0	.0	.0
		Atka mack.	106.1	.0	.1	.2	1.8	.1	.2	3.2
		Total	3,580.3	694.8	114.7	6.4	1,586.1	3,307.7	74.8	703.5
	All gear	Total	4,192.6	694.8	133.9	9.9	1,722.8	3,436.7	74.9	703.6

Table 13. Continued.

			Halibut mortality (t)	Herring (t)	Red king crab (1,000s)	Other king crab (1,000s)	Bairdi (1,000s)	Other tanner (1,000s)	Chinook (1,000s)	Other salmon (1,000s)
2006	Hook & Line	Sablefish	n.a.	.0	.0	.4	.0	.0	.0	.0
		Pacific cod	433.2	.0	7.5	2.3	13.6	42.6	.0	.4
		Arrowtooth	1.5	.0	.0	.7	.0	.0	.0	.0
		Turbot	11.9	.0	.0	.4	.0	.0	.0	.0
		Total	450.8	.0	7.5	3.8	13.7	42.6	.0	.5
	Pot	Sablefish	.8	.0	1.7	46.7	.0	.1	.0	.0
		Pacific cod	4.3	.0	5.2	.2	388.7	194.2	.0	.0
		Total	5.1	.0	6.9	46.9	388.7	194.3	.0	.0
	Trawl	Pollock, bottom	10.6	213.9	.2	.0	.6	.0	3.0	14.8
		Pollock, pelagic	112.2	222.7	.0	.0	1.1	2.9	80.2	294.6
		Pacific cod	1,449.9	7.8	6.0	1.9	189.5	101.5	3.7	7.5
		Arrowtooth	123.1	.1	.8	.0	25.5	6.1	.3	5.4
		Flathd. sole	350.9	1.9	.8	.0	230.7	114.9	.3	.8
		Rock sole	816.2	13.3	60.9	.3	131.9	73.9	.1	.7
		Yellowfin	510.0	35.4	38.4	1.6	343.8	721.7	.0	.1
		Flat, other	14.7	.1	.0	.0	2.3	.4	.0	.0
		Rockfish	29.6	.0	.1	3.0	.0	.0	.0	.0
		Atka mack.	125.3	1.3	.0	9.7	.0	.1	.0	.8
		Total	3,549.2	496.5	107.2	16.4	926.6	1,022.2	87.7	324.6
	All gear	Total	4,004.6	496.5	121.6	67.2	1,328.3	1,258.9	87.7	325.1

Notes: These estimates include only catches counted against federal TACs. Totals may include additional categories. The target, calculated by AFSC staff, is based on processor, week, processing mode, NMFS area and gear. The estimates of halibut bycatch mortality are based on the International Pacific Halibut Commission discard mortality rates that were used for in-season management. The halibut Individual Fishing Quota program allows retention of halibut in the hook-and-line groundfish fisheries, making true halibut bycatch numbers unavailable. This is particularly a problem in the Bering Sea and Aleutian Islands sablefish hook-and-line fishery. Therefore, estimates of halibut bycatch mortality are not included in this table for that fishery.

Source: Catch Accounting System, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 14. Prohibited species bycatch rates in the Gulf of Alaska by species, gear, and groundfish target fishery, 2005-06 (Metric tons per metric ton or numbers per metric ton).

			Halibut mortality (t/t)	Herring (t/t)	Red king crab (No./t)	Other king crab (No./t)	Bairdi (No./t)	Other tanner (No./t)	Chinook (No./t)	Other salmon (No./t)
2005	Hook & Line	Sablefish	n.a.	.000	.014	.012	.045	.000	.000	.043
		Pacific cod	n.a.	.000	.000	.000	.586	.000	.000	.000
		Total	n.a.	.000	.010	.009	.201	.000	.000	.030
	Pot	Pacific cod	.002	.000	.000	.000	6.109	.000	.000	.000
		Total	.002	.000	.000	.000	6.109	.000	.000	.000
	Trawl	Pollock, bottom	.000	.000	.000	.000	.000	.000	.786	.005
		Pollock, pelagic	.000	.000	.000	.000	.000	.000	.207	.011
		Pacific cod	.053	.000	.000	.000	.112	.000	.003	.011
		Arrowtooth	.034	.000	.000	.000	4.638	.000	.120	.028
		Flathd. sole	.014	.000	.000	.000	14.372	.000	.005	.000
		Rex sole	.026	.000	.000	.000	1.375	.000	.303	.034
		Flat shallow	.068	.000	.011	.000	.728	.002	.008	.218
		Rockfish	.012	.000	.000	.000	.072	.000	.021	.154
		Total	.014	.000	.001	.000	.865	.000	.215	.046
	All gear	Total	.012	.000	.001	.000	1.405	.000	.180	.040
2006	Hook & Line	Sablefish	n.a.	.000	.000	.027	.004	.000	.000	.109
		Pacific cod	n.a.	.000	.000	.000	.057	.003	.000	.000
		Arrowtooth	n.a.	.000	.000	.000	.599	.000	.000	.000
		Total	n.a.	.000	.000	.006	.046	.003	.000	.024
	Pot	Pacific cod	.001	.000	.000	.000	6.648	.024	.000	.000
		Total	.001	.000	.000	.000	6.648	.024	.000	.000
	Trawl	Pollock, bottom	.002	.000	.000	.000	.231	.000	.289	.017
		Pollock, pelagic	.000	.000	.000	.000	1.937	.000	.145	.021
		Pacific cod	.030	.000	.000	.000	.064	.000	.078	.000
		Arrowtooth	.029	.000	.000	.000	4.196	.004	.020	.020
		Flathd. sole	.014	.000	.000	.000	15.747	.000	.034	.000
		Rex sole	.018	.000	.000	.000	10.260	.000	.202	.078
		Flat shallow	.056	.000	.031	.000	2.933	.000	.000	.000
		Rockfish	.008	.000	.000	.003	.039	.000	.012	.077
		Total	.013	.000	.002	.000	2.027	.001	.125	.028
	All gear	Total	.011	.000	.002	.001	2.331	.003	.108	.025

Notes: These estimates include only catches counted against federal TACs. Totals may include additional categories. The target, calculated by AFSC staff, is based on processor, week, processing mode, NMFS area and gear. The estimates of halibut bycatch mortality are based on the International Pacific Halibut Commission discard mortality rates that were used for in-season management. The halibut Individual Fishing Quota program allows retention of halibut in the hook-and-line groundfish fisheries, making true halibut bycatch numbers unavailable. Therefore, estimates of halibut bycatch mortality are not included in this table for those fisheries.

Source: Catch Accounting System, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 15. Prohibited species bycatch rates in the Bering Sea and Aleutian Islands by species, gear, and groundfish target fishery, 2005-06 (Metric tons per metric ton or numbers per metric ton).

			Halibut mortality (t/t)	Herring (t/t)	Red king crab (No./t)	Other king crab (No./t)	Bairdi (No./t)	Other tanner (No./t)	Chinook (No./t)	Other salmon (No./t)
2005	Hook & Line	Sablefish	n.a.	.000	.041	.228	.000	.000	.000	.000
		Pacific cod	.004	.000	.112	.008	.089	.356	.000	.000
		Arrowtooth	.018	.000	.000	.000	.000	.000	.000	.000
		Turbot	.007	.000	.004	.019	.000	.003	.004	.023
		Total	.004	.000	.110	.009	.088	.350	.000	.001
	Pot	Sablefish	.001	.000	.000	1.392	.196	.062	.000	.000
		Pacific cod	.000	.000	.178	.028	6.937	4.368	.000	.000
		Total	.000	.000	.167	.115	6.505	4.092	.000	.000
	Trawl	Pollock, bottom	.000	.005	.000	.000	.000	.003	.070	.257
		Pollock, pelagic	.000	.000	.000	.000	.000	.001	.042	.437
		Sablefish	.003	.000	.000	1.297	14.295	.000	.000	.000
		Pacific cod	.018	.000	.058	.001	1.935	.739	.047	.011
		Arrowtooth	.036	.000	.000	.047	1.882	.140	.344	.024
		Flathd. sole	.010	.000	.019	.001	11.452	5.556	.002	.020
		Rock sole	.018	.000	1.122	.000	9.121	13.787	.008	.000
		Turbot	.035	.000	.000	1.442	1.442	.000	.000	.000
		Yellowfin	.005	.000	.480	.001	5.937	20.017	.003	.004
		Flat, other	.034	.000	.102	.000	2.835	.298	.085	.000
		Rockfish	.002	.000	.082	.764	.000	.000	.000	.000
		Atka mack.	.001	.000	.001	.003	.024	.001	.003	.044
		Total	.002	.000	.058	.003	.804	1.676	.038	.357
	All gear	Total	.002	.000	.063	.005	.806	1.607	.035	.329

Table 15. Continued.

			Halibut mortality (t/t)	Herring (t/t)	Red king crab (No./t)	Other king crab (No./t)	Bairdi (No./t)	Other tanner (No./t)	Chinook (No./t)	Other salmon (No./t)
2006	Hook & Line	Sablefish	n.a.	.000	.000	.800	.000	.000	.000	.024
		Pacific cod	.004	.000	.063	.019	.115	.359	.000	.004
		Arrowtooth	.002	.000	.005	.740	.000	.000	.000	.000
		Turbot	.008	.000	.011	.254	.017	.000	.005	.016
		Total	.004	.000	.062	.032	.112	.350	.000	.004
	Pot	Sablefish	.001	.000	1.444	40.417	.000	.122	.000	.000
		Pacific cod	.000	.000	.259	.012	19.190	9.587	.000	.000
		Total	.000	.000	.323	2.191	18.151	9.075	.000	.000
	Trawl	Pollock, bottom	.000	.008	.006	.000	.021	.001	.108	.524
		Pollock, pelagic	.000	.000	.000	.000	.001	.002	.050	.184
		Pacific cod	.017	.000	.070	.022	2.220	1.189	.043	.088
		Arrowtooth	.032	.000	.206	.010	6.571	1.580	.067	1.389
		Flathd. sole	.017	.000	.037	.000	10.915	5.438	.014	.038
		Rock sole	.016	.000	1.226	.005	2.653	1.486	.002	.014
		Yellowfin	.004	.000	.300	.012	2.687	5.640	.000	.000
		Flat, other	.030	.000	.000	.000	4.635	.864	.000	.000
		Rockfish	.003	.000	.008	.304	.000	.000	.000	.000
		Atka mack.	.002	.000	.000	.138	.000	.002	.000	.011
		Total	.002	.000	.054	.008	.465	.513	.044	.163
	All gear	Total	.002	.000	.057	.031	.622	.589	.041	.152

Notes: These estimates include only catches counted against federal TACs. Totals may include additional categories. The target, calculated by AFSC staff, is based on processor, week, processing mode, NMFS area and gear. The estimates of halibut bycatch mortality are based on the International Pacific Halibut Commission discard mortality rates that were used for in-season management. The halibut Individual Fishing Quota program allows retention of halibut in the hook-and-line groundfish fisheries, making true halibut bycatch numbers unavailable. This is particularly a problem in the Bering Sea and Aleutian Islands sablefish hook-and-line fishery. Therefore, estimates of halibut bycatch mortality are not included in this table for that fishery.

Source: Catch Accounting System, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 16. Real ex-vessel value of the catch in the domestic commercial fisheries off Alaska by species group, 1984-2006 ($ millions, base year = 2006)

	Shellfish	Salmon	Herring	Halibut	Groundfish	Total
1984	178.1	590.7	35.1	33.8	48.0	885.7
1985	179.1	652.8	61.8	62.8	72.7	1,029.4
1986	299.8	662.1	62.9	114.9	109.1	1,248.8
1987	343.0	753.9	66.5	121.6	218.5	1,503.4
1988	362.1	1,144.9	86.1	101.6	372.3	2,066.9
1989	414.2	751.7	27.7	125.2	501.9	1,820.8
1990	506.6	779.9	34.2	124.0	641.3	2,086.0
1991	415.7	414.3	39.5	126.5	644.8	1,640.8
1992	452.9	736.0	36.5	64.9	829.1	2,119.4
1993	434.0	516.8	18.6	70.8	537.6	1,577.9
1994	415.2	548.6	27.9	109.5	642.3	1,743.6
1995	358.7	628.8	49.6	75.4	732.3	1,844.9
1996	218.2	431.6	55.8	92.4	628.5	1,426.6
1997	210.8	303.5	19.5	130.5	705.6	1,369.9
1998	264.9	294.0	13.1	114.0	466.4	1,152.5
1999	323.8	412.8	17.0	139.6	552.1	1,445.2
2000	166.4	287.8	11.2	157.3	698.0	1,320.8
2001	140.8	214.8	11.9	136.0	666.8	1,170.2
2002	166.9	145.7	10.2	144.6	694.6	1,162.0
2003	192.5	184.5	9.8	182.1	665.1	1,234.0
2004	176.3	240.1	14.6	179.8	665.5	1,276.4
2005	164.3	301.7	13.8	175.5	763.8	1,419.2
2006	124.5	276.5	7.5	192.9	753.4	1,354.8

Note: The value added by at-sea processing is not included in these estimates of ex-vessel value. The data have been adjusted to 2006 dollars by applying the GDP implicit price deflators presented in Table 57.

Source: Blend and Catch-Accounting System estimates, CFEC fishtickets, Commercial Operators Annual Reports (COAR), weekly processor reports. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 17. Percentage distribution of ex-vessel value of the catch in the domestic commercial fisheries off Alaska by species group, 1984-2006.

	Shellfish	Salmon	Herring	Halibut	Groundfish
1984	20.1%	66.7%	4.0%	3.8%	5.4%
1985	17.4%	63.4%	6.0%	6.1%	7.1%
1986	24.0%	53.0%	5.0%	9.2%	8.7%
1987	22.8%	50.1%	4.4%	8.1%	14.5%
1988	17.5%	55.4%	4.2%	4.9%	18.0%
1989	22.7%	41.3%	1.5%	6.9%	27.6%
1990	24.3%	37.4%	1.6%	5.9%	30.7%
1991	25.3%	25.3%	2.4%	7.7%	39.3%
1992	21.4%	34.7%	1.7%	3.1%	39.1%
1993	27.5%	32.7%	1.2%	4.5%	34.1%
1994	23.8%	31.5%	1.6%	6.3%	36.8%
1995	19.4%	34.1%	2.7%	4.1%	39.7%
1996	15.3%	30.3%	3.9%	6.5%	44.1%
1997	15.4%	22.2%	1.4%	9.5%	51.5%
1998	23.0%	25.5%	1.1%	9.9%	40.5%
1999	22.4%	28.6%	1.2%	9.7%	38.2%
2000	12.6%	21.8%	.8%	11.9%	52.8%
2001	12.0%	18.4%	1.0%	11.6%	57.0%
2002	14.4%	12.5%	.9%	12.4%	59.8%
2003	15.6%	15.0%	.8%	14.8%	53.9%
2004	13.8%	18.8%	1.1%	14.1%	52.1%
2005	11.6%	21.3%	1.0%	12.4%	53.8%
2006	9.2%	20.4%	.6%	14.2%	55.6%

Source: Blend and Catch-Accounting System estimates, CFEC fishtickets, Commercial Operators Annual Reports (COAR), weekly processor reports. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 18. Ex-vessel prices in the groundfish fisheries off Alaska by area, gear, and species, 2002-06 ($/lb, round weight).

		Gulf of Alaska		Bering Sea and Aleutians		All Alaska
		Fixed	Trawl	Fixed	Trawl	All gear
Pollock	2002	.068	.107	-	.116	.115
	2003	.081	.095	.049	.107	.106
	2004	.060	.102	-	.106	.106
	2005	.086	.124	.074	.125	.125
	2006	.081	.135	-	.128	.129
Sablefish	2002	2.148	1.682	2.177	.934	2.112
	2003	2.435	1.749	2.229	.951	2.369
	2004	2.122	1.691	1.827	.837	2.056
	2005	2.258	1.708	2.033	.900	2.183
	2006	2.710	2.048	2.302	1.083	2.621
Pacific cod	2002	.287	.234	.213	.193	.245
	2003	.307	.283	.292	.268	.283
	2004	.267	.251	.254	.219	.245
	2005	.297	.269	.294	.232	.269
	2006	.396	.369	.444	.346	.384
Flatfish	2002	-	.124	.157	.143	.142
	2003	-	.116	.188	.143	.142
	2004	-	.085	-	.165	.160
	2005	-	.117	-	.198	.192
	2006	-	.139	.106	.203	.196
Rockfish	2002	.714	.132	.609	.125	.156
	2003	.707	.145	.614	.128	.156
	2004	.746	.159	.737	.153	.178
	2005	.693	.230	.738	.229	.246
	2006	.703	.250	.725	.260	.268
Atka mackerel	2002	-	.217	-	.134	.134
	2003	-	.169	-	.105	.106
	2004	-	.129	-	.115	.115
	2005	-	.155	-	.119	.120
	2006	-	.108	-	.108	.108

Notes: 1) Prices do not include the value added by at-sea processing; therefore they reflect prices prior to processing. Prices do reflect the value added by dressing fish at sea, where the fish have not been frozen. Except where noted, unfrozen landings price is calculated as landed value divided by estimated or actual round weight.
2) Trawl-caught sablefish and flatfish in the BSAI and trawl-caught Atka mackerel and rockfish in both the BSAI and the GOA are not well represented by on-shore landings. A price was calculated for these categories from product-report prices; the price in this case is the value of the product divided by the calculated round weight and multiplied by a constant 0.4 to correct for value added by processing.
3) The "All Alaska/All gear" column is the weighted average of the other columns.

Source: Blend estimates (2002), Catch Accounting System (2003-06), CFEC fish tickets, Commercial Operators Annual Report (COAR), weekly processor reports, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 19. Ex-vessel value of the groundfish catch off Alaska by area, vessel category, gear, and species, 2002-06, ($ millions).

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total
All gear	All species	2002	106.5	19.5	126.0	223.2	270.1	493.2	329.6	289.6	619.2
		2003	107.0	20.7	127.7	216.4	261.6	477.9	323.4	282.3	605.6
		2004	106.5	17.5	124.0	209.1	291.0	500.1	315.6	308.5	624.1
		2005	119.8	18.6	138.4	240.9	361.0	602.0	360.7	379.7	740.3
		2006	130.8	23.1	153.9	250.9	348.3	599.2	381.8	371.4	753.2
	Pollock	2002	11.9	.0	12.0	197.5	149.6	347.2	209.5	149.7	359.2
		2003	10.3	.1	10.4	181.3	120.7	302.0	191.5	120.8	312.3
		2004	12.1	.0	12.2	185.5	149.6	335.1	197.6	149.6	347.3
		2005	21.5	.1	21.6	216.8	175.9	392.7	238.2	176.0	414.3
		2006	19.8	.1	19.8	214.4	142.8	357.2	234.2	142.8	377.0
	Sablefish	2002	48.6	8.9	57.5	4.5	2.4	6.9	53.0	11.3	64.4
		2003	62.0	9.8	71.8	6.4	2.7	9.0	68.3	12.5	80.8
		2004	60.2	9.1	69.2	1.9	1.9	3.8	62.1	11.0	73.1
		2005	63.4	9.9	73.3	3.6	2.8	6.4	66.9	12.7	79.6
		2006	66.3	9.0	75.3	3.1	3.1	6.2	69.4	12.1	81.5
	Pacific cod	2002	39.4	5.8	45.2	20.4	70.2	90.6	59.8	76.0	135.8
		2003	26.7	5.1	31.8	27.8	90.0	117.9	54.6	95.1	149.7
		2004	27.4	3.8	31.2	20.0	81.7	101.7	47.4	85.5	132.9
		2005	26.3	1.3	27.6	18.9	94.7	113.6	45.2	96.0	141.3
		2006	33.1	4.3	37.4	30.5	114.2	144.7	63.6	118.5	182.1
	Flatfish	2002	2.0	1.5	3.5	.5	33.5	34.0	2.5	35.0	37.5
		2003	1.4	2.2	3.6	.6	33.5	34.1	1.9	35.7	37.6
		2004	1.4	.6	2.0	.7	39.3	40.0	2.1	39.9	42.0
		2005	2.7	1.4	4.2	1.0	57.2	58.2	3.8	58.6	62.4
		2006	5.2	2.2	7.4	2.2	62.4	64.6	7.4	64.6	72.0
	Rockfish	2002	4.4	3.1	7.5	.2	3.0	3.3	4.6	6.2	10.8
		2003	4.5	3.2	7.7	.2	3.8	4.0	4.7	7.0	11.7
		2004	4.8	3.7	8.5	.2	3.8	4.0	4.9	7.5	12.5
		2005	5.3	5.6	10.9	.3	5.1	5.4	5.6	10.7	16.3
		2006	5.7	7.2	12.9	.4	7.0	7.3	6.1	14.2	20.3
	Atka mackerel	2002	.0	.0	.0	.1	11.1	11.1	.1	11.1	11.2
		2003	.0	.1	.1	.1	10.3	10.4	.1	10.4	10.5
		2004	.0	.1	.1	.2	12.2	12.3	.2	12.3	12.5
		2005	.0	.2	.2	.1	15.1	15.3	.1	15.3	15.5
		2006	.0	.1	.1	.1	13.9	14.0	.1	14.0	14.2

Table 19. Continued.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher process ors	Total	Catcher vessels	Catcher process ors	Total	Catcher vessels	Catcher process ors	Total
Trawl	All species	2002	25.0	7.4	32.4	209.6	210.1	419.7	234.6	217.6	452.1
		2003	31.9	8.1	40.0	200.2	187.3	387.5	232.1	195.3	427.5
		2004	27.6	6.7	34.3	198.5	222.3	420.8	226.1	228.9	455.1
		2005	36.4	9.3	45.7	229.1	266.3	495.4	265.6	275.5	541.1
		2006	41.0	11.7	52.7	231.1	246.0	477.1	272.1	257.7	529.8
	Pollock	2002	11.9	.0	12.0	197.5	148.1	345.7	209.5	148.2	357.6
		2003	10.3	.1	10.3	181.3	119.6	300.8	191.5	119.7	311.2
		2004	12.1	.0	12.2	185.5	148.6	334.0	197.6	148.6	346.2
		2005	21.5	.1	21.6	216.8	174.7	391.4	238.2	174.7	413.0
		2006	19.8	.1	19.8	214.4	142.2	356.6	234.2	142.3	376.5
	Sablefish	2002	1.0	2.4	3.3	.0	.5	.6	1.0	2.9	3.9
		2003	1.9	1.8	3.7	.0	.3	.4	1.9	2.2	4.1
		2004	2.6	1.6	4.1	.0	.4	.4	2.6	2.0	4.6
		2005	1.9	1.6	3.5	.0	.7	.7	1.9	2.3	4.2
		2006	2.6	1.5	4.1	.0	.3	.3	2.6	1.8	4.4
	Pacific cod	2002	7.6	.5	8.1	11.5	14.8	26.3	19.0	15.4	34.4
		2003	14.6	.9	15.5	18.2	20.6	38.8	32.8	21.5	54.3
		2004	8.2	.7	9.0	11.9	18.7	30.7	20.2	19.5	39.6
		2005	6.1	.5	6.7	10.9	14.6	25.5	17.1	15.1	32.1
		2006	8.9	.8	9.7	14.0	21.5	35.5	22.9	22.3	45.3
	Flatfish	2002	2.0	1.5	3.5	.4	32.6	33.0	2.5	34.1	36.5
		2003	1.4	2.2	3.6	.6	32.6	33.2	1.9	34.8	36.8
		2004	1.4	.6	2.0	.7	38.6	39.3	2.1	39.2	41.3
		2005	2.7	1.4	4.2	1.0	56.3	57.3	3.8	57.7	61.4
		2006	5.2	2.2	7.4	2.2	61.3	63.5	7.4	63.5	70.9
	Rockfish	2002	2.4	3.0	5.4	.1	2.9	2.9	2.5	5.8	8.3
		2003	3.2	2.8	6.0	.0	3.6	3.6	3.2	6.4	9.7
		2004	3.0	3.5	6.5	.1	3.6	3.7	3.1	7.1	10.3
		2005	3.8	5.3	9.2	.2	4.9	5.1	4.0	10.2	14.2
		2006	4.2	7.0	11.2	.3	6.6	6.9	4.5	13.6	18.1
	Atka mackerel	2002	.0	.0	.0	.1	11.1	11.1	.1	11.1	11.2
		2003	.0	.1	.1	.1	10.3	10.4	.1	10.4	10.5
		2004	.0	.1	.1	.2	12.2	12.3	.2	12.3	12.5
		2005	.0	.2	.2	.1	15.1	15.3	.1	15.3	15.5
		2006	.0	.1	.1	.1	13.9	14.0	.1	14.0	14.2

Table 19. Continued.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total
Hook and line	All species	2002	71.7	11.8	83.5	7.7	58.7	66.4	79.4	70.5	149.9
		2003	66.9	12.6	79.5	3.9	73.3	77.2	70.8	85.9	156.7
		2004	65.0	10.7	75.7	2.4	66.9	69.3	67.4	77.6	145.0
		2005	68.0	9.2	77.2	4.2	92.3	96.4	72.1	101.5	173.6
		2006	71.1	11.3	82.4	4.0	99.2	103.1	75.1	110.4	185.5
	Sablefish	2002	47.6	6.6	54.2	4.4	1.8	6.3	52.0	8.4	60.5
		2003	60.1	8.0	68.0	3.4	2.3	5.7	63.4	10.3	73.7
		2004	57.6	7.5	65.1	1.9	1.5	3.4	59.5	9.0	68.5
		2005	61.5	8.3	69.7	3.6	2.1	5.7	65.0	10.3	75.4
		2006	63.7	7.6	71.2	3.1	2.6	5.7	66.8	10.1	76.9
	Pacific cod	2002	22.2	5.0	27.1	3.0	54.4	57.4	25.2	59.3	84.5
		2003	4.7	4.1	8.8	.4	68.4	68.8	5.1	72.6	77.6
		2004	5.4	2.9	8.3	.5	61.1	61.6	5.8	64.1	69.9
		2005	4.9	.7	5.6	.5	78.0	78.5	5.4	78.7	84.1
		2006	5.6	3.3	9.0	.8	89.7	90.5	6.4	93.1	99.5
	Flatfish	2002	-	.0	.0	.0	1.0	1.0	.0	1.0	1.0
		2003	-	.0	.0	-	.9	.9	-	.9	.9
		2004	-	.0	.0	-	.7	.7	-	.7	.7
		2005	-	.0	.0	-	.9	.9	-	1.0	1.0
		2006	-	.0	.0	-	1.1	1.1	-	1.1	1.1
	Rockfish	2002	2.0	.2	2.1	.2	.2	.3	2.1	.3	2.5
		2003	1.4	.4	1.7	.1	.2	.3	1.5	.6	2.0
		2004	1.7	.2	2.0	.1	.2	.3	1.8	.4	2.2
		2005	1.5	.2	1.7	.1	.2	.3	1.6	.5	2.0
		2006	1.5	.2	1.7	.1	.3	.4	1.6	.5	2.1
Pot	Pacific cod	2002	9.6	.3	9.9	5.9	1.0	6.9	15.5	1.3	16.8
		2003	7.5	.1	7.5	9.2	1.0	10.2	16.7	1.0	17.7
		2004	13.9	.2	14.0	7.6	1.8	9.4	21.4	2.0	23.4
		2005	15.3	.1	15.4	7.5	2.2	9.7	22.8	2.3	25.1
		2006	18.6	.2	18.8	15.7	2.9	18.6	34.3	3.1	37.4

Note: These estimates include only catch counted against federal TACs. Ex-vessel value is calculated using prices on Table 18. Please refer to Table 18 for a description of the price derivation. All groundfish includes additional species categories. The value added by at-sea processing is not included in these estimates of ex-vessel value.

Source: Blend estimates (2002), Catch Accounting System (2003-06), CFEC fish tickets, Commercial Operators Annual Report (COAR), weekly processor reports. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 20. Ex-vessel value of Alaska groundfish delivered to shoreside processors by area, gear and catcher-vessel length, 1996-2006. ($ millions)

		Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
		<60	60-125	>=125	<60	60-125	>=125	<60	60-125	>=125
Fixed	1996	40.2	28.3	.2	1.5	8.1	.9	41.7	36.4	1.1
	1997	43.3	27.7	.1	.9	5.8	1.3	44.3	33.4	1.4
	1998	31.4	20.0	.1	1.0	3.6	.8	32.4	23.5	.9
	1999	41.0	22.1	-	1.0	5.9	2.1	42.0	27.9	2.1
	2000	49.9	28.2	.7	2.0	6.6	3.0	52.0	34.7	3.7
	2001	38.6	18.5	-	3.4	7.6	1.2	41.9	26.0	1.2
	2002	40.2	17.3	-	4.0	6.1	1.2	44.2	23.4	1.2
	2003	50.8	23.8	-	4.0	10.3	1.5	54.8	34.1	1.5
	2004	49.0	24.7	-	3.7	7.9	1.4	52.7	32.6	1.4
	2005	49.3	25.6	-	4.0	9.6	1.1	53.3	35.2	1.1
	2006	56.1	29.2	-	5.9	12.4	2.5	61.9	41.6	2.5
Trawl	1996	9.1	19.0	1.3	-	43.3	43.8	9.1	62.3	45.1
	1997	11.5	28.1	4.2	-	42.1	56.6	11.5	70.2	60.8
	1998	8.0	23.9	3.9	.2	26.2	38.0	8.2	50.1	41.9
	1999	8.5	32.1	2.0	.2	43.1	61.3	8.8	75.1	63.2
	2000	8.7	30.5	-	-	64.5	78.2	8.7	95.0	78.2
	2001	8.5	27.1	-	.3	59.7	82.3	8.8	86.8	82.3
	2002	4.2	18.9	-	1.6	67.3	88.8	5.8	86.2	88.8
	2003	2.6	20.3	-	1.3	59.2	73.3	3.9	79.5	73.3
	2004	4.0	23.1	-	.6	64.9	89.8	4.6	88.0	89.8
	2005	7.0	28.8	-	-	71.4	108.7	7.0	100.3	108.7
	2006	6.2	29.0	-	-	60.0	88.9	6.2	88.9	88.9
All gear	1996	49.3	47.3	1.5	1.5	51.4	44.7	50.8	98.7	46.2
	1997	54.8	55.8	4.3	.9	47.8	57.9	55.7	103.6	62.2
	1998	39.4	43.8	4.0	1.2	29.8	38.8	40.6	73.6	42.8
	1999	49.5	54.1	2.0	1.2	48.9	63.4	50.8	103.1	65.4
	2000	58.7	58.7	.7	2.0	71.0	81.2	60.7	129.7	81.9
	2001	47.1	45.5	-	3.6	67.3	83.5	50.7	112.9	83.5
	2002	44.4	36.1	-	5.6	73.5	89.9	50.0	109.6	89.9
	2003	53.3	44.1	-	5.4	69.4	74.8	58.7	113.6	74.8
	2004	53.0	47.8	-	4.3	72.8	91.2	57.3	120.6	91.2
	2005	56.3	54.4	-	4.0	81.1	109.8	60.3	135.5	109.8
	2006	62.3	58.2	-	5.9	72.4	91.4	68.2	130.6	91.4

Note: These estimates include only catch counted against federal TACs.

Source: CFEC Fishtickets, NMFS permits, CFEC permits. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 21. Ex-vessel value per catcher vessel for Alaska groundfish delivered to shoreside processors by area, gear and catcher-vessel length, 1996-2006. ($ thousands)

		Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
		<60	60-124	>=125	<60	60-124	>=125	<60	60-124	>=125
Fixed	1996	47	168	34	26	72	59	47	177	72
	1997	49	186	16	19	61	88	49	184	74
	1998	39	135	16	21	44	39	40	134	40
	1999	50	128	-	26	64	92	51	137	92
	2000	61	171	73	39	73	125	61	175	124
	2001	53	166	-	48	101	82	56	168	82
	2002	61	160	-	62	108	84	66	171	84
	2003	76	231	-	61	146	113	80	235	113
	2004	75	220	-	65	124	98	78	219	98
	2005	83	244	-	69	179	115	87	255	115
	2006	110	276	-	115	243	311	116	313	311
Trawl	1996	152	246	83	-	541	1,509	152	582	1,555
	1997	188	319	167	-	592	1,825	188	638	1,960
	1998	143	265	177	29	403	1,187	141	451	1,308
	1999	174	396	75	62	567	1,915	175	696	1,976
	2000	178	462	-	-	859	2,443	178	863	2,443
	2001	184	392	-	39	807	2,839	190	796	2,839
	2002	110	331	-	148	922	3,061	142	845	3,061
	2003	85	350	-	103	811	2,618	126	803	2,618
	2004	181	428	-	156	914	3,098	200	936	3,098
	2005	279	554	-	-	1,051	3,881	279	1,102	3,881
	2006	230	579	-	-	895	3,175	230	977	3,175
All gear	1996	56	200	70	26	268	994	56	327	1,028
	1997	60	245	142	19	290	1,259	60	367	1,243
	1998	48	190	142	22	214	826	49	272	873
	1999	60	226	75	30	298	1,153	61	349	1,188
	2000	71	268	73	39	433	1,449	71	440	1,321
	2001	63	263	-	47	452	1,942	66	439	1,942
	2002	67	229	-	75	565	2,092	74	472	2,092
	2003	79	281	-	69	486	1,824	84	473	1,824
	2004	80	293	-	72	543	2,121	85	505	2,121
	2005	93	358	-	69	670	2,890	98	608	2,890
	2006	120	393	-	115	618	2,611	126	607	2,611

Note: These estimates include only catch counted against federal TACs.

Source: CFEC Fishtickets, NMFS permits, CFEC permits. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 22. Ex-vessel value of the groundfish catch off Alaska by area, residency, and species, 2002-06, ($ millions).

		Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
		Alaska	Other	Unknown	Alaska	Other	Unknown	Alaska	Other	Unknown
All groundfish	2002	67.0	58.5	.5	16.4	476.3	.5	83.4	534.8	1.0
	2003	63.3	64.4	.0	17.1	460.8	.0	80.4	525.2	.0
	2004	61.9	62.1	.0	15.1	485.0	.0	77.0	547.2	.0
	2005	65.6	72.8	.0	12.3	589.7	.0	77.9	662.4	.0
	2006	72.7	81.3	.0	14.5	584.6	.1	87.2	665.9	.1
Pollock	2002	4.4	7.5	.0	3.9	342.8	.4	8.4	350.3	.4
	2003	3.7	6.6	.0	3.0	299.0	.0	6.7	305.7	.0
	2004	4.6	7.6	.0	3.1	331.9	.0	7.7	339.6	.0
	2005	8.1	13.5	.0	3.4	389.3	.0	11.5	402.7	.0
	2006	7.5	12.4	.0	1.8	355.3	.1	9.3	367.7	.1
Sablefish	2002	30.0	27.3	.2	2.8	4.1	.0	32.8	31.4	.2
	2003	36.4	35.4	.0	2.9	6.2	.0	39.3	41.5	.0
	2004	35.3	34.0	.0	1.3	2.6	.0	36.5	36.6	.0
	2005	35.6	37.6	.0	1.5	4.9	.0	37.2	42.5	.0
	2006	37.1	38.2	.0	1.5	4.7	.0	38.6	42.9	.0
Pacific cod	2002	29.2	15.8	.2	8.5	82.0	.1	37.7	97.9	.2
	2003	18.5	13.3	.0	9.8	108.1	.0	28.2	121.4	.0
	2004	18.7	12.6	.0	9.2	92.5	.0	27.9	105.0	.0
	2005	18.4	9.3	.0	7.3	106.4	.0	25.6	115.6	.0
	2006	23.7	13.8	.0	11.1	133.5	.1	34.8	147.3	.1
Flatfish	2002	1.1	2.4	.0	1.1	32.9	.0	2.2	35.3	.0
	2003	.8	2.8	.0	1.2	32.8	.0	2.0	35.6	.0
	2004	.7	1.3	.0	1.0	38.9	.0	1.7	40.2	.0
	2005	.9	3.3	.0	.0	58.2	.0	.9	61.4	.0
	2006	1.6	5.8	.0	.0	64.6	.0	1.6	70.4	.0
Rockfish	2002	2.3	5.2	.0	.1	3.2	.0	2.3	8.4	.0
	2003	2.3	5.5	.0	.1	3.9	.0	2.4	9.3	.0
	2004	2.4	6.1	.0	.1	3.9	.0	2.5	10.0	.0
	2005	2.4	8.5	.0	.0	5.3	.0	2.5	13.8	.0
	2006	2.5	10.4	.0	.0	7.3	.0	2.6	17.7	.0
Atka mackerel	2002	.0	.0	.0	.0	11.1	.0	.0	11.1	.0
	2003	.0	.1	.0	.1	10.2	.0	.2	10.3	.0
	2004	.0	.1	.0	.2	12.1	.0	.2	12.2	.0
	2005	.0	.2	.0	.0	15.3	.0	.0	15.5	.0
	2006	.0	.1	.0	.0	14.0	.0	.0	14.2	.0

Note: These estimates include only catches counted against federal TACs. Ex-vessel value is calculated using prices on Table 18. Please refer to Table 18 for a description of the price derivation. Catch delivered tc motherships is classified by the residence of the owner of the mothership. All other catch is classified by the residence of the owner of the fishing vessel. All groundfish include additional species categories.

Source: Blend estimates (2002), Catch Accounting System (2003-06), Commercial Operators Annual Report (COAR), ADFG fish tickets, weekly processor reports. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 23. Ex-vessel value of groundfish delivered to shoreside processors by processor group, 2000-06. ($ millions)

	2000	2001	2002	2003	2004	2005	2006
Bering Sea Pollock	153.7	157.6	174.7	173.3	166.1	191.1	199.8
AK Peninsula/Aleutians	25.8	25.7	28.2	34.9	29.5	34.1	46.5
Kodiak	36.6	30.9	40.5	27.0	28.7	40.5	50.0
South Central	25.0	18.1	18.1	23.8	23.9	24.1	22.1
Southeastern	39.5	30.9	29.6	34.6	35.0	32.9	32.8
TOTAL	280.6	263.2	291.2	293.6	283.1	322.7	351.2

Table 24. Ex-vessel value of groundfish as a percentage of the ex-vessel value of all species delivered to shoreside processors by processor group, 2000-06. (percent)

	2000	2001	2002	2003	2004	2005	2006
Bering Sea Pollock	77.1	81.5	77.9	75.1	74.3	76.7	80.0
AK Peninsula/Aleutians	16.5	22.6	23.8	21.8	16.2	16.6	21.9
Kodiak	48.0	45.3	55.8	41.6	39.9	40.0	44.0
South Central	23.3	19.7	18.9	22.4	17.5	15.0	16.7
Southeastern	23.3	18.9	22.5	23.9	18.7	18.5	16.2
TOTAL	38.6	41.0	44.9	41.1	34.7	35.3	37.6

Note: These tables include the value of groundfish purchases reported by processing plants, as well as by other entities, such as markets and restaurants, that normally would not report sales of groundfish products. Keep this in mind when comparing ex-vessel values in this table to gross processed-product values in Table 34. The data are for catch from the EEZ and State waters.
The processor groups are defined as follows:
"Bering Sea Pollock" are the AFA inshore pollock processors including the two AFA floating processors.
"AK Peninsula/Aleutian" are other processors on the Alaska Peninsula or in the Aleutian Islands.
"Kodiak" are processors on Kodiak Island.
"South Central" are processors west of Yakutat and on the Kenai Peninsula.
"Southeastern" are processors located from Yakutat south.

Source: ADFG Commercial Operators Annual Report, ADFG intent to process. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 25. Production and gross value of groundfish products in the fisheries off Alaska by species, 2001-06 (1,000 metric tons product weight and million dollars).

		2002		2003		2004		2005		2006	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Pollock	Whole fish	1.79	$2.4	4.30	$2.9	3.58	$2.7	1.45	$1.2	.85	$.5
	Head & gut	10.50	$8.9	8.35	$9.8	18.27	$17.9	21.08	$23.4	22.26	$27.7
	Roe	26.49	$298.5	22.80	$270.1	26.37	$345.7	25.47	$346.2	30.17	$293.4
	Deep-skin fill.	26.59	$63.2	47.08	$118.1	46.87	$120.9	40.40	$111.0	53.96	$155.7
	Other fillets	97.94	$211.3	112.53	$223.4	115.60	$242.7	116.05	$287.5	120.01	$326.4
	Surimi	204.81	$324.8	203.56	$317.8	187.14	$290.5	200.35	$425.7	181.86	$370.9
	Minced fish	24.92	$30.2	15.53	$18.6	19.84	$25.8	17.41	$24.7	29.55	$52.4
	Fish meal	55.07	$38.1	47.24	$36.1	56.24	$43.4	65.46	$48.8	54.66	$58.5
	Other products	21.35	$9.5	20.49	$10.2	18.52	$11.3	25.64	$15.7	29.25	$25.4
	All products	469.45	$987.0	481.88	$1,007.0	492.43	$1,100.9	513.31	$1,284.2	522.56	$1,311.0
Pacific cod	Whole fish	2.26	$1.8	4.13	$4.8	2.34	$2.5	2.05	$2.6	1.11	$1.8
	Head & gut	72.73	$155.6	72.33	$177.6	90.58	$215.9	81.67	$238.1	71.96	$254.9
	Salted/split	-	-	-	-	-	-	-	-	.98	$3.9
	Fillets	12.31	$58.2	16.61	$80.4	9.44	$44.3	9.34	$54.9	10.95	$75.9
	Other products	15.82	$30.2	16.49	$24.4	10.62	$20.3	11.66	$25.8	13.38	$31.0
	All products	103.12	$245.8	109.56	$287.1	112.98	$283.1	104.72	$321.4	98.38	$367.5
Sablefish	Head & gut	9.23	$80.8	9.80	$89.7	11.05	$93.7	10.85	$98.1	10.64	$109.0
	Other products	.24	$.7	.89	$5.5	.21	$1.1	.38	$3.6	.59	$4.6
	All products	9.47	$81.5	10.68	$95.1	11.27	$94.8	11.23	$101.7	11.23	$113.6

Table 25. Continued.

		2002		2003		2004		2005		2006	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Flatfish	Whole fish	16.53	$14.8	14.27	$15.2	14.08	$14.3	23.67	$30.5	25.59	$33.6
	Head & gut	50.00	$60.9	54.67	$65.4	56.29	$78.8	66.94	$112.1	73.06	$123.8
	Kirimi	2.86	$3.5	3.68	$4.3	1.81	$2.5	1.62	$1.7	-	-
	Fillets	1.33	$5.8	1.02	$4.0	1.01	$2.8	.43	$2.3	.74	$3.6
	Other products	.83	$1.1	.74	$1.0	1.39	$1.6	1.14	$1.5	1.84	$2.4
	All products	71.55	$86.1	74.39	$89.9	74.58	$100.1	93.80	$148.0	101.23	$163.4
Rockfish	Whole fish	1.85	$3.1	1.65	$4.0	2.37	$2.9	2.16	$4.2	2.82	$5.7
	Head & gut	9.78	$14.1	11.09	$15.4	10.77	$18.2	11.31	$27.2	14.77	$40.8
	Other products	1.71	$5.3	2.06	$5.9	1.40	$4.1	.83	$2.8	.51	$2.7
	All products	13.35	$22.5	14.81	$25.2	14.53	$25.1	14.31	$34.2	18.10	$49.3
Atka mackerel	Whole fish	3.27	$2.3	7.13	$4.0	5.00	$3.1	.89	$.6	2.57	$2.1
	Head & gut	18.55	$22.5	20.89	$20.1	24.90	$26.0	32.99	$36.0	32.74	$31.4
	All products	21.82	$24.9	28.02	$24.1	29.90	$29.1	33.88	$36.5	35.31	$33.6
All species	Total	704.01	$1,483.3	735.65	$1,555.2	758.89	$1,665.8	790.36	$1,962.6	795.85	$2,051.3

Notes: Total includes additional species not listed in the production details as well as confidential data from Tables 28 and 29. For shoreside processors, these estimates include production resulting from catch from federal and state of Alaska fisheries. For at-sea processors, they include production only from catch counted against federal TACs.

Source: Weekly processor report and commercial operators annual report. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 26. Price per pound of groundfish products in the fisheries off Alaska by species and processing mode, 2002-06 (dollars).

		2002		2003		2004		2005		2006	
		At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside
Pollock	Whole fish	$.64	$.32	$.33	$.26	$.34	$.38	$.39	$.29	$.25	$.28
	H&G	$.36	$.52	$.53	-	$.45	$.44	$.53	$.44	$.58	$.54
	Roe	$6.16	$3.94	$6.12	$4.31	$6.68	$4.91	$6.77	$5.42	$5.08	$3.62
	Deep-skin	$1.08	-	$1.15	$1.11	$1.21	$1.04	$1.25	-	$1.35	$1.22
	Other fillets	$.88	$1.06	$.85	$.94	$.97	$.94	$1.12	$1.12	$1.25	$1.22
	Surimi	$.81	$.64	$.71	$.70	$.75	$.66	$1.03	$.90	$1.01	$.84
	Minced fish	$.53	$.59	$.54	-	$.59	-	$.64	-	$.82	$.77
	Fish meal	$.32	$.31	$.35	$.34	$.37	$.33	$.38	$.32	$.52	$.46
	Other products	$.30	$.19	$.31	$.22	$.17	$.29	$.48	$.25	$.51	$.38
	All products	$1.09	$.82	$1.03	$.86	$1.16	$.87	$1.28	$1.00	$1.27	$1.00
Pacific cod	Whole fish	$.29	$.41	$.41	$.56	$.43	$.54	$.56	$.58	$.67	$.79
	H&G	$.97	$.99	$1.13	$.97	$1.09	$1.04	$1.29	$1.50	$1.67	$1.38
	Salted/split	-	-	-	-	-	-	-	-	-	$1.82
	Fillets	$1.58	$2.28	$2.29	$2.18	$2.20	$2.13	$2.07	$2.72	$3.37	$3.12
	Other products	$1.03	$.79	$.89	$.59	$1.02	$.80	$1.32	$.81	$1.31	$.94
	All products	$.98	$1.31	$1.14	$1.29	$1.09	$1.26	$1.29	$1.65	$1.66	$1.76
Sablefish	H&G	$3.59	$4.05	$3.67	$4.25	$3.41	$3.93	$3.75	$4.18	$4.20	$4.72
	Other products	$1.09	$1.52	$1.30	$2.91	$1.63	$2.63	$1.70	$4.72	$1.67	$3.72
	All products	$3.48	$4.00	$3.58	$4.13	$3.35	$3.91	$3.68	$4.20	$4.10	$4.67
Deep-water flatfish	Whole fish	-	-	$.19	-	-	-	-	-	-	-
	H&G	$1.09	-	$.32	-	-	-	$.31	-	-	$.65
	Fillets	-	$1.57	-	$1.52	-	-	-	$1.97	-	-
	All products	$1.09	$1.57	$.32	$1.52	-	-	$.31	$1.97	-	$.65

Table 26. Continued.

		2002		2003		2004		2005		2006	
		At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside
Shallow-water flatfish	Whole fish	$.29	$.36	-	$.36	-	$.56	-	$.50	-	$.47
	H&G	$.49	-	$.30	-	$.54	-	$.75	-	$.80	$.63
	Fillets	-	$2.13	-	$2.02	-	$2.10	-	$2.46	-	$2.21
	Other products	-	-	$1.10	-	$.88	-	$1.23	-	$1.44	-
	All products	$.40	$1.64	$.33	$1.82	$.55	$1.21	$.76	$.98	$.92	$1.01
Other flatfish	Whole fish	$.83	-	$.96	-	$.97	-	$1.15	-	$1.08	-
	H&G	$.15	-	$.23	-	$.43	-	$.67	-	$.48	-
	Other products	$.31	-	$.30	-	$.32	-	$.26	-	$.29	-
	All products	$.78	-	$.90	-	$.92	-	$1.09	-	$.86	-
Arrowtooth	Whole fish	-	-	$.25	-	-	-	-	-	-	-
	H&G	$.38	-	$.39	-	$.54	-	$.72	$.63	$.59	$.47
	Fillets	-	-	-	-	-	$.72	-	-	-	-
	Other products	$.31	-	$.15	-	$.32	$.48	$.25	-	$.29	-
	All products	$.38	-	$.38	-	$.54	$.60	$.72	$.63	$.59	$.47
Flathead sole	Whole fish	$.40	$.36	-	$.44	-	-	$.53	$.38	$.35	$.35
	H&G	$.56	-	$.57	-	$.68	-	$.87	$.49	$.89	-
	Fillets	-	$1.87	-	$2.00	-	$2.16	-	$2.56	-	-
	Other products	$.90	-	$.89	-	$.83	-	$.99	-	$1.26	-
	All products	$.67	$1.73	$.62	$1.58	$.73	$2.16	$.87	$.91	$1.01	$.35
Rock sole	Whole fish	$.27	-	-	-	-	-	$.50	-	$.45	-
	H&G	$.42	-	$.43	-	$.52	-	$.76	-	$.72	-
	H&G with roe	$1.07	-	$1.09	-	$1.04	-	$1.19	-	$1.59	-
	Other products	$.33	-	$.30	-	$.46	-	$.25	-	$.29	-
	All products	$.80	-	$.76	-	$.84	-	$.95	-	$.97	-

Table 26. Continued.

		2002		2003		2004		2005		2006	
		At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside	At-sea	Shoreside
Rex sole	Whole fish	$.85	-	$.92	-	$1.03	$.50	$1.19	$.75	$1.07	$1.07
	H&G	-	-	$.42	-	-	-	-	-	-	-
	Fillets	-	$1.59	-	-	-	-	-	-	-	-
	All products	$.85	$1.59	$.92	-	$1.03	$.50	$1.19	$.75	$1.07	$1.07
Yellowfin sole	Whole fish	$.29	-	$.30	-	$.35	-	$.49	-	$.52	-
	H&G	$.39	-	$.46	-	$.47	-	$.65	-	$.68	-
	Kirimi	$.55	-	$.53	-	$.63	-	$.48	-	-	-
	Other products	$.26	-	$.36	-	$.35	-	$.35	-	$.39	-
	All products	$.37	-	$.43	-	$.45	-	$.59	-	$.63	-
Greenland turbot	H&G	$1.05	-	$1.29	-	$1.46	-	$1.83	-	$1.71	-
	Other products	$.84	-	$.86	-	$.77	-	$.99	-	$1.33	-
	All products	$1.01	-	$1.19	-	$1.29	-	$1.60	-	$1.61	-
Rockfish	Whole fish	$.85	$.66	$1.02	$1.33	$.69	$.47	$1.24	$.72	$1.16	$.84
	H&G	$.58	$2.17	$.60	$1.22	$.75	$.88	$1.11	$.96	$1.25	$1.27
	Other products	$1.09	$1.40	$1.00	$1.30	$.75	$1.32	$.84	$1.55	$.52	$2.56
	All products	$.61	$1.31	$.64	$1.29	$.75	$.88	$1.12	$.99	$1.24	$1.22
Atka mackerel	Whole fish	$.33	-	$.25	-	$.28	-	$.29	-	$.37	-
	H&G	$.55	-	$.44	-	$.47	-	$.49	-	$.44	-
	Other products	$.50	-	$.30	-	$.32	-	$.16	-	$.29	-
	All products	$.52	-	$.39	-	$.44	-	$.49	-	$.43	-

Note: Prices based on confidential data have been excluded.

Source: Weekly production reports and Commercial Operators Annual Reports (COAR). National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 27. Total product value per round metric ton of retained catch in the groundfish fisheries off Alaska by processor type, species, area and year, 2002-06, (dollars).

		Bering Sea and Aleutians					Gulf of Alaska				
		2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Motherships	Pacific cod	981	828	1,046	1,142	1,720	-	-	-	-	-
	Pollock	619	531	594	443	717	-	-	-	-	-
Catcher/ processors	Atka mackerel	662	537	603	630	570	1,243	850	370	558	731
	Flatfish	669	701	844	986	1,002	713	742	1,364	1,263	1,232
	Other species	358	470	364	334	263	524	558	484	576	365
	Pacific cod	978	1,160	1,172	1,389	1,593	1,047	1,169	1,202	1,277	1,434
	Pollock	697	730	816	961	919	329	358	346	396	404
	Rockfish	640	696	795	1,213	1,438	702	845	869	1,263	1,409
	Sablefish	4,925	4,731	5,099	4,618	4,998	4,213	4,948	4,944	5,117	5,898
Shoreside processors	Flatfish	66	100	-	141	-	699	619	521	684	703
	Other species	-	2,070	1,535	401	756	549	805	584	619	549
	Pacific cod	1,101	1,058	959	1,332	1,418	1,881	1,254	1,247	1,371	2,087
	Pollock	635	624	681	815	798	795	794	750	865	1,010
	Rockfish	562	1,237	664	1,082	1,438	856	735	768	988	1,580
	Sablefish	6,007	6,810	5,870	5,262	7,246	5,953	5,987	5,231	6,315	7,885

Notes: These estimates include the product value of catch from both federal and state of Alaska fisheries. A dash indicates that data were no available or were withheld to preserve confidentiality.

Source: Weekly processor reports, commercial operators annual report (COAR), blend (2002) and catch accounting system (2003-06) estimates of retained catch. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 28. Production of groundfish products in the fisheries off Alaska by species, product and area, 2002-06 (1,000 metric tons product weight).

		Bering Sea and Aleutians					Gulf of Alaska				
		2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Pollock	Whole fish	1.67	3.37	3.33	1.32	.38	.12	.92	.25	.13	.47
	Head & gut	8.96	8.17	11.06	14.40	14.89	1.54	.18	7.21	6.68	7.37
	Roe	24.99	21.73	25.37	23.90	28.40	1.50	1.08	1.00	1.56	1.76
	Fillets	121.15	154.71	156.52	148.56	164.97	3.38	4.90	5.94	7.89	8.99
	Surimi	195.19	194.89	179.97	191.45	173.92	9.62	8.67	7.17	8.91	7.94
	Minced fish	24.92	15.53	19.84	17.41	29.55	-	-	-	-	-
	Fish meal	55.07	47.24	56.24	65.46	54.66	-	-	-	-	-
	Other products	20.46	19.43	17.72	23.85	27.05	.89	1.06	.81	1.79	2.20
Pacific cod	Whole fish	1.22	1.96	1.54	1.15	.55	1.05	2.18	.80	.90	.56
	Head & gut	65.65	67.98	80.32	75.29	64.84	7.08	4.35	10.26	6.38	7.13
	Salted/split	-	-	-	-	.98	-	-	-	-	-
	Fillets	5.60	8.03	2.92	3.45	2.82	6.71	8.58	6.52	5.89	8.13
	Other products	9.69	10.30	5.56	6.65	7.08	6.13	6.19	5.06	5.02	6.30
Sablefish	Head & gut	1.37	1.14	1.30	1.50	1.48	7.86	8.66	9.76	9.35	9.16
	Other products	.01	.37	.01	.01	.01	.23	.52	.21	.38	.58
Flatfish	Whole fish	13.10	10.41	12.02	20.60	20.63	3.42	3.86	2.05	3.08	4.96
	Head & gut	45.84	49.27	54.93	60.72	63.84	4.16	5.41	1.37	6.22	9.22
	Kirimi	2.86	3.68	1.81	1.62	-	-	-	-	-	-
	Fillets	-	.00	-	-	-	1.33	1.02	1.01	.43	.74
	Other products	.74	.74	.83	1.14	1.59	.09	-	.55	-	.26
Rockfish	Whole fish	.71	.67	.33	.40	.43	1.14	.98	2.04	1.76	2.39
	Head & gut	4.58	6.02	5.00	4.63	6.00	5.20	5.08	5.76	6.68	8.77
	Other products	.00	.04	.02	.02	.03	1.71	2.02	1.38	.82	.48
Atka mackerel	Whole fish	3.27	7.13	5.00	.89	2.57	-	-	-	-	-
	Head & gut	18.53	20.72	24.75	32.74	32.39	.02	.18	.15	.25	.35

Notes: These estimates include production resulting from catch from federal and state of Alaska fisheries. A dash indicates that data were not available or were withheld to preserve confidentiality. Confidential data withheld from this table are included in the grand totals in Table 25.

Source: Weekly processor report and commercial operators annual report. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 29. Production of groundfish products in the fisheries off Alaska by species, product and processing mode, 2002-06 (1,000 metric tons product weight).

		At-sea					On-shore				
		2002	2003	2004	2005	2006	2002	2003	2004	2005	2006
Pollock	Whole fish	1.67	2.90	3.34	1.32	.38	.12	1.40	.24	.13	.47
	Head & gut	9.05	8.35	11.17	14.48	15.00	1.45	-	7.10	6.59	7.26
	Roe	13.95	13.41	15.43	13.99	16.34	12.55	9.40	10.95	11.47	13.83
	Fillets	70.29	86.48	82.10	82.71	89.71	54.24	73.13	80.37	73.74	84.26
	Surimi	97.77	99.04	93.33	98.56	92.53	107.04	104.53	93.81	101.79	89.32
	Minced fish	17.13	15.53	19.84	17.41	20.45	7.79	-	-	-	9.10
	Fish meal	21.08	22.84	22.10	21.36	21.43	33.98	24.40	34.13	44.10	33.24
	Other products	1.71	1.82	2.00	2.56	3.67	19.64	18.67	16.52	23.08	25.58
Pacific cod	Whole fish	.94	1.09	1.23	.85	.55	1.32	3.04	1.11	1.20	.56
	Head & gut	63.94	66.37	74.17	69.30	56.72	8.79	5.96	16.41	12.37	15.24
	Salted/split	-	-	-	-	-	-	-	-	-	.98
	Fillets	2.35	2.56	.64	.76	.88	9.96	14.05	8.80	8.58	10.07
	Other products	4.73	4.75	3.47	4.37	4.10	11.09	11.74	7.16	7.29	9.28
Sablefish	Head & gut	1.64	1.67	1.87	1.88	1.53	7.59	8.13	9.18	8.97	9.11
	Other products	.07	.07	.06	.07	.06	.17	.82	.15	.32	.53
Flatfish	Whole fish	16.02	13.93	13.11	22.31	23.11	.51	.34	.97	1.37	2.49
	Head & gut	50.00	54.67	56.29	63.35	67.08	-	-	-	3.60	5.98
	Kirimi	2.86	3.68	1.81	1.62	-	-	-	-	-	-
	Fillets	-	.00	-	-	-	1.33	1.02	1.01	.43	.74
	Other products	.75	.74	.83	1.14	1.59	.08	-	.55	-	.26
Rockfish	Whole fish	1.06	1.26	.90	.67	.72	.79	.39	1.47	1.50	2.10
	Head & gut	9.35	10.48	9.67	9.59	12.07	.43	.61	1.09	1.71	2.70
	Other products	.02	.09	.03	.03	.03	1.69	1.97	1.37	.81	.48
Atka mackerel	Whole fish	3.27	7.13	5.00	.89	2.57	-	-	-	-	-
	Head & gut	18.55	20.89	24.90	32.99	32.74	-	-	-	-	-
	Other products	.00	.00	.00	.00	.00	-	-	-	-	-

Notes: These estimates include production resulting from catch from federal and state of Alaska fisheries. A dash indicates that data were not available or were withheld to preserve confidentiality. Confidential data withheld from this table are included in the grand totals in Table 25.

Source: Weekly processor report and commercial operators annual report. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 30. Production and gross value of non-groundfish products in the commercial fisheries of Alaska by species group and area of processing, 2002-06 (1,000 metric tons product weight and millions of dollars).

		Bering Sea & Aleutians		Gulf of Alaska		All Alaska	
		Quantity	Value	Quantity	Value	Quantity	Value
2002	Salmon	22.6	103.0	152.9	400.4	175.5	503.5
	Halibut	4.9	25.1	16.5	111.2	21.4	136.3
	Herring	17.3	17.7	7.5	13.0	24.8	30.7
	Crab	12.2	146.7	4.5	47.4	16.7	194.1
	Other	.1	.9	2.1	12.8	2.2	13.7
	Total	57.0	293.4	183.5	584.9	240.5	878.3
2003	Salmon	46.0	135.6	175.8	441.8	221.8	577.4
	Halibut	4.3	31.2	15.0	123.9	19.3	155.1
	Herring	19.9	21.0	6.7	11.4	26.6	32.4
	Crab	12.3	174.2	3.7	48.1	16.0	222.3
	Other	.1	.8	3.7	14.0	3.9	14.8
	Total	82.6	362.7	204.9	639.2	287.6	1,001.9
2004	Salmon	50.1	202.7	181.0	524.4	231.1	727.1
	Halibut	3.4	27.8	17.8	148.7	21.2	176.5
	Herring	16.9	18.7	11.5	19.5	28.4	38.2
	Crab	11.4	158.4	4.0	50.1	15.4	208.5
	Other	11.7	16.3	3.5	16.8	15.1	33.2
	Total	93.5	423.9	217.7	759.6	311.2	1,183.5
2005	Salmon	57.4	256.9	194.7	584.6	252.1	841.5
	Halibut	3.0	29.2	18.7	171.1	21.8	200.3
	Herring	19.8	23.0	12.6	19.6	32.5	42.6
	Crab	12.6	158.3	4.2	46.1	16.9	204.3
	Other	1.2	.4	2.2	19.4	3.5	19.8
	Total	94.1	467.8	232.6	840.8	326.7	1,308.5
2006	Salmon	61.1	280.3	159.3	587.1	220.3	867.3
	Halibut	2.5	29.8	16.6	185.5	19.1	215.3
	Herring	21.2	19.8	11.8	13.9	33.0	33.7
	Crab	15.0	131.1	6.6	65.7	21.6	196.8
	Other	.2	1.0	1.9	20.0	2.0	21.0
	Total	99.9	462.0	196.2	872.1	296.1	1,334.1

Note: These estimates include production resulting from catch in both federal and state of Alaska fisheries. Complete estimates are not available for earlier years because catcher-processors that process only their own catch were not required to file the Commercial Operators Annual Report before 2002.

Source: ADF&G Commercial Operators Annual Report. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 31. Gross product value of Alaska groundfish by area and processing mode, 2000-06 ($ millions).

	Gulf of Alaska		Bering Sea and Aleutians			All Alaska
	At-sea	Shoreside	Motherships	Catcher/ processors	Shoreside	Total
2000	41.8	199.1	79.6	611.0	399.4	1,331.0
2001	31.0	176.9	101.8	774.9	432.6	1,517.2
2002	36.5	170.0	99.0	711.2	466.5	1,483.3
2003	39.5	180.5	90.1	773.6	471.5	1,555.2
2004	32.2	195.1	89.3	863.5	485.7	1,665.8
2005	37.6	225.2	109.0	998.8	592.0	1,962.6
2006	47.7	274.4	105.9	1,039.1	584.2	2,051.3

Note: For shoreside processors, these estimates include production resulting from catch from federal and state of Alaska fisheries. For at-sea processors, they include production only from catch counted against federal TACs. Catcher/processors that at times during a year act like motherships are classified as catcher/processors for the entire year. For shoreside processors the area represents the location of the plant, not necessarily the area of the catch.

Source: NMFS weekly production reports and ADFG Commercial Operators Annual Reports (COAR). National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 32. Gross product value of Alaska groundfish by catcher/processor category, vessel length, and area, 2000-06 ($ millions).

		Gulf of Alaska		Bering Sea and Aleutians		
		Vessel length		Vessel length		
		<125	>=125	<125	125-165	>165
Fixed Gear	2000	11.9	3.8	24.9	55.9	52.1
	2001	9.7	3.9	23.5	57.3	51.1
	2002	11.3	5.5	20.1	51.7	38.4
	2003	9.2	6.0	27.0	69.0	45.4
	2004	9.4	5.6	27.8	70.9	43.6
	2005	7.9	4.0	33.4	87.7	54.2
	2006	8.7	5.8	39.9	77.4	48.1
Fillet Trawl	2000	-	-	-	-	74.6
	2001	-	-	-	-	86.7
	2002	-	-	-	-	97.6
	2003	-	-	-	-	82.7
	2004	-	-	-	-	122.2
	2005	-	-	-	-	133.2
	2006	-	-	-	-	115.7
H&G Trawl	2000	9.5	15.7	24.1	24.0	85.3
	2001	6.7	10.7	19.4	22.0	103.5
	2002	5.6	14.1	26.3	25.8	93.8
	2003	7.9	16.2	27.9	25.0	96.0
	2004	4.1	13.0	28.4	36.4	117.3
	2005	8.0	17.7	30.0	41.6	153.4
	2006	9.9	22.9	45.6	39.5	155.6
Surimi Trawl	2000	-	-	-	-	270.1
	2001	-	-	-	-	411.3
	2002	-	-	-	-	357.5
	2003	-	-	-	-	400.6
	2004	-	-	-	-	417.1
	2005	-	-	-	-	465.4
	2006	-	-	-	-	517.4
All Trawl	2000	9.5	15.7	24.1	24.0	430.0
	2001	6.7	10.7	19.4	22.0	601.6
	2002	5.6	14.1	26.3	25.8	549.0
	2003	7.9	16.2	27.9	25.0	579.3
	2004	4.1	13.0	28.4	36.4	656.5
	2005	8.0	17.7	30.0	41.6	752.0
	2006	9.9	22.9	45.6	39.5	788.7

Note: These estimates include only catch counted against federal TACs.

Source: NMFS weekly production reports, Commercial Operators Annual Reports (COAR), and NMFS permits. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 33. Gross product value per vessel of Alaska groundfish by catcher/processor category, vessel length, and area 2000-06 ($ millions).

		Gulf of Alaska		Bering Sea and Aleutians		
		<125	>=125	<125	125-165	>165
Fixed Gear	2000	.8	.4	1.8	2.7	3.7
	2001	.8	.4	1.5	3.0	3.4
	2002	.9	.5	1.4	2.6	3.0
	2003	.8	.4	2.1	3.6	4.1
	2004	.9	.6	2.5	3.5	4.0
	2005	.8	.4	3.0	4.4	4.9
	2006	1.0	.5	3.3	4.1	4.4
Fillet Trawl	2000	-	-	-	-	18.7
	2001	-	-	-	-	21.7
	2002	-	-	-	-	19.5
	2003	-	-	-	-	20.7
	2004	-	-	-	-	24.4
	2005	-	-	-	-	26.6
	2006	-	-	-	-	28.9
H&G Trawl	2000	1.9	1.2	3.0	6.0	7.8
	2001	1.1	.9	2.8	5.5	9.4
	2002	1.4	1.2	3.8	6.5	8.5
	2003	1.1	1.2	4.0	6.2	8.7
	2004	1.0	1.1	4.1	7.3	10.7
	2005	2.0	1.6	5.0	8.3	13.9
	2006	1.6	2.3	6.5	9.9	14.1
Surimi Trawl	2000	-	-	-	-	24.6
	2001	-	-	-	-	34.3
	2002	-	-	-	-	29.8
	2003	-	-	-	-	30.8
	2004	-	-	-	-	34.8
	2005	-	-	-	-	38.8
	2006	-	-	-	-	39.8
All Trawl	2000	1.9	1.2	3.0	6.0	16.5
	2001	1.1	.9	2.8	5.5	22.3
	2002	1.4	1.2	3.8	6.5	19.6
	2003	1.1	1.2	4.0	6.2	20.7
	2004	1.0	1.1	4.1	7.3	23.4
	2005	2.0	1.6	5.0	8.3	26.9
	2006	1.6	2.3	6.5	9.9	28.2

Note: These estimates include only catch counted against federal TACs.

Source: NMFS weekly production reports, Commercial Operators Annual Reports (COAR), and NMFS permits. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 34. Gross product value of groundfish processed by shoreside processors by processor group, 2000-06. ($ millions)

	2000	2001	2002	2003	2004	2005	2006
Bering Sea Pollock	396.7	421.8	450.5	454.3	468.0	557.8	553.8
AK Peninsula/Aleutians	46.3	49.6	61.8	67.9	65.6	90.8	115.6
Kodiak	73.9	69.1	58.9	53.4	67.0	88.9	109.1
South Central	29.5	28.0	24.4	29.8	27.7	33.8	41.2
Southeastern	52.1	41.1	41.0	46.6	52.6	45.9	38.9
TOTAL	598.5	609.5	636.5	652.0	680.9	817.2	858.6

Table 35. Groundfish gross product value as a percentage of all-species gross product value by shoreside processor group, 2000-06. (percent)

	2000	2001	2002	2003	2004	2005	2006
Bering Sea Pollock	86.8	89.0	87.3	86.0	86.3	88.3	89.3
AK Peninsula/Aleutians	15.8	21.4	25.6	22.4	18.6	20.8	24.8
Kodiak	46.4	44.6	48.1	40.1	41.5	39.9	43.4
South Central	13.9	15.3	12.2	15.2	12.1	11.8	15.3
Southeastern	16.4	12.8	14.5	16.2	14.6	14.2	10.5
TOTAL	40.4	43.7	46.1	44.3	40.4	42.0	42.3

Note: The data are for catch from the EEZ and State waters. The processor groups are defined as follows:
"Bering Sea Pollock" are the AFA inshore pollock processors including the two AFA floating processors.
"AK Peninsula/Aleutian" are other processors on the Alaska Peninsula or in the Aleutian Islands.
"Kodiak" are processors on Kodiak Island.
"South Central" are processors west of Yakutat and on the Kenai Peninsula.
"Southeastern" are processors located from Yakutat south.

Source: ADFG Commercial Operators Annual Report, ADFG intent to process. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 36. Number of groundfish vessels that caught or caught and processed more than $4.0 million ex-vessel value or product value of groundfish and other species by area, vessel type and gear, 2002-06.

		Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
		Catcher Vessels	Catcher/ Process	All Vessels	Catcher Vessels	Catcher/ Process	All Vessels	Catcher Vessels	Catcher/ Process	All Vessels
2002	All gear	0	20	20	11	48	59	11	48	59
	Hook & line	0	7	7	0	12	12	0	12	12
	Trawl	0	13	13	11	36	47	11	36	47
2003	All gear	0	33	33	5	65	70	5	65	70
	Hook & line	0	15	15	0	27	27	0	27	27
	Trawl	0	18	18	5	38	43	5	38	43
2004	All gear	0	27	27	7	66	73	7	66	73
	Hook & line	0	14	14	0	28	28	0	28	28
	Pot	0	0	0	0	2	2	0	2	2
	Trawl	0	13	13	7	37	44	7	37	44
2005	All gear	1	27	28	12	70	82	12	70	82
	Hook & line	0	14	14	0	32	32	0	32	32
	Pot	0	0	0	0	2	2	0	2	2
	Trawl	1	13	14	12	37	49	12	37	49
2006	All gear	0	34	34	7	73	80	7	74	81
	Hook & line	0	19	19	0	34	34	0	34	34
	Pot	0	0	0	0	3	3	0	3	3
	Trawl	0	15	15	7	38	45	7	39	46

Note: Includes only vessels that fished part of federal groundfish TACs. Determination that a vessel was above the $4.0 million threshold was based on total revenue from catching or processing all species, not just groundfish.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, Commercial Operators Annual Report (COAR), ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 37. Number of groundfish vessels that caught or caught and processed less than $4.0 million ex-vessel value or product value of groundfish and other species by area, vessel type and gear, 2002-06.

		Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
		Catcher Vessels	Catcher/ Process	All Vessels	Catcher Vessels	Catcher/ Process	All Vessels	Catcher Vessels	Catcher/ Process	All Vessels
2002	All gear	795	22	817	255	38	293	926	39	965
	Hook & line	628	15	643	80	30	110	644	30	674
	Pot	130	4	134	63	5	68	173	6	179
	Trawl	109	3	112	116	3	119	184	3	187
2003	All gear	795	14	809	267	18	285	938	21	959
	Hook & line	651	10	661	74	13	87	673	15	688
	Pot	134	1	135	84	3	87	194	3	197
	Trawl	90	3	93	116	2	118	158	3	161
2004	All gear	785	9	794	246	16	262	918	17	935
	Hook & line	621	5	626	63	12	75	644	13	657
	Pot	151	1	152	82	2	84	203	2	205
	Trawl	78	3	81	109	3	112	145	3	148
2005	All gear	724	8	732	220	11	231	842	13	855
	Hook & line	566	4	570	64	8	72	584	9	593
	Pot	147	1	148	69	1	70	196	1	197
	Trawl	77	3	80	96	2	98	137	3	140
2006	All gear	648	6	654	214	10	224	776	11	787
	Hook & line	486	4	490	52	6	58	505	7	512
	Pot	143	1	144	68	3	71	190	3	193
	Trawl	76	1	77	101	1	102	147	1	148

Note: Includes only vessels that fished part of federal groundfish TACs. Determination that a vessel was below the $4.0 million threshold was based on total revenue from catching or processing all species, not just groundfish.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, Commercial Operators Annual Report (COAR), ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 38. Average revenue of groundfish vessels that caught or caught and processed more than $4.0 million ex-vessel value or product value of groundfish and other species, by area, vessel type, and gear, 2002-06. ($ millions)

		Gulf of Alaska		Bering Sea & Aleutians			All Alaska		
		Catcher/ Process	All Vessels	Catcher Vessels	Catcher/ Process	All Vessels	Catcher Vessels	Catcher/ Process	All Vessels
2002	All gear	7.56	7.56	4.89	14.55	12.75	4.89	14.55	12.75
	Hook & line	4.80	4.80	-	4.69	4.69	-	4.69	4.69
	Trawl	9.04	9.04	4.89	17.83	14.81	4.89	17.83	14.81
2003	All gear	7.16	7.16	4.65	13.38	12.76	4.65	13.38	12.76
	Hook & line	5.16	5.16	-	5.42	5.42	-	5.42	5.42
	Trawl	8.82	8.82	4.65	19.04	17.36	4.65	19.04	17.36
2004	All gear	7.78	7.78	5.24	14.11	13.25	5.24	14.11	13.25
	Hook & line	5.26	5.26	-	5.05	5.05	-	5.05	5.05
	Trawl	10.49	10.49	5.24	20.97	18.47	5.24	20.97	18.47
2005	All gear	9.46	9.46	5.79	15.31	13.90	5.79	15.31	13.90
	Hook & line	5.79	5.79	-	5.54	5.54	-	5.54	5.54
	Trawl	13.43	13.43	5.79	23.76	19.36	5.79	23.76	19.36
2006	All gear	8.17	8.17	5.04	15.69	14.75	5.04	15.53	14.62
	Hook & line	5.68	5.68	-	5.82	5.82	-	5.82	5.82
	Trawl	11.32	11.32	5.04	24.52	21.49	5.04	24.00	21.11

Notes: Includes only vessels that fished part of federal groundfish TACs. Categories with fewer than four vessels are not reported. Averages are obtained by adding the total revenues, across all areas and gear types, of all the vessels in the category, and dividing that sum by the number of vessels in the category. Averages include revenue realized from catching or processing all species, not just groundfish.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, commercial operators annual report (COAR), ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 39. Average revenue of groundfish vessels that caught or caught and processed less than $4.0 million ex-vessel value or product value of groundfish and other species, by area, vessel type and gear, 2002-06. ($ millions)

		Gulf of Alaska			Bering Sea & Aleutians			All Alaska		
		Catcher Vessels	Catcher/ Process	All Vessels	Catcher Vessels	Catcher/ Process	All Vessels	Catcher Vessels	Catcher/ Process	All Vessels
2002	All gear	.31	2.25	.36	.99	2.39	1.16	.44	2.34	.51
	Hook & line	.27	2.59	.33	.52	2.55	1.07	.27	2.55	.37
	Pot	.36	1.00	.38	.72	1.45	.78	.44	1.27	.47
	Trawl	.59	-	.59	1.43	-	1.43	1.03	-	1.03
2003	All gear	.38	2.30	.41	1.07	2.69	1.15	.51	2.46	.54
	Hook & line	.33	2.30	.36	.71	2.69	1.01	.34	2.46	.38
	Pot	.42	-	.42	.88	-	.88	.57	-	.57
	Trawl	.75	-	.75	1.44	-	1.44	1.19	-	1.19
2004	All gear	.42	2.67	.43	1.15	2.75	1.22	.55	2.68	.58
	Hook & line	.36	2.67	.38	.63	2.75	.97	.36	2.68	.40
	Pot	.46	-	.46	.82	-	.82	.56	-	.56
	Trawl	.93	-	.93	1.69	-	1.69	1.43	-	1.43
2005	All gear	.47	2.38	.48	1.32	2.96	1.38	.63	2.86	.65
	Hook & line	.40	2.38	.41	.70	2.96	.95	.40	2.86	.44
	Pot	.53	-	.53	1.10	-	1.10	.69	-	.69
	Trawl	1.08	-	1.08	1.89	-	1.89	1.57	-	1.57
2006	All gear	.38	2.67	.40	1.14	3.33	1.20	.53	2.99	.55
	Hook & line	.30	2.67	.32	.48	3.33	.77	.30	2.99	.33
	Pot	.47	-	.47	.98	-	.98	.58	-	.58
	Trawl	.91	-	.91	1.60	-	1.60	1.31	-	1.31

Notes: Includes only vessels that fished part of federal groundfish TACs. Categories with fewer than four vessels are not reported. Averages are obtained by adding the total revenues, across all areas and gear types, of all the vessels in the category, and dividing that sum by the number of vessels in the category. Averages include revenue realized from catching or processing all species, not just groundfish.

Source: CFEC fish tickets, weekly processor reports, NMFS permits, commercial operators annual report (COAR), ADFG intent-to-operate listings. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 40. Number and total registered net tons of vessels that caught groundfish off Alaska by area and gear, 2000-06.

		Gulf of Alaska		Bering Sea and Aleutians		All Alaska	
		Number of Vessels	Registered net tons	Number of Vessels	Registered net tons	Number of Vessels	Registered net tons
Hook & Line	2000	754	25,087	124	17,258	806	35,107
	2001	677	24,003	137	16,194	735	32,872
	2002	650	24,262	122	16,167	686	32,510
	2003	676	26,346	114	14,695	715	32,475
	2004	640	24,447	103	14,536	685	31,698
	2005	584	23,232	104	14,637	625	30,651
	2006	509	23,299	92	14,529	546	29,937
Pot	2000	263	20,395	126	18,230	341	30,768
	2001	164	9,211	85	11,901	227	18,666
	2002	134	7,964	68	9,214	179	14,556
	2003	135	7,708	87	10,947	197	15,877
	2004	152	9,066	86	11,086	207	17,249
	2005	148	8,875	72	9,488	199	16,396
	2006	144	8,841	74	9,084	196	15,553
Trawl	2000	143	19,510	153	53,571	244	59,932
	2001	137	18,537	163	52,016	241	57,491
	2002	125	16,657	166	52,648	234	57,189
	2003	111	17,851	161	54,540	204	57,902
	2004	94	15,246	156	52,931	192	55,814
	2005	94	15,386	147	51,871	189	55,219
	2006	92	13,574	147	51,113	194	54,736
All gear	2000	1,051	58,437	388	86,263	1,265	116,315
	2001	900	47,133	380	79,685	1,119	103,860
	2002	837	44,773	352	77,837	1,024	100,040
	2003	842	47,997	355	79,746	1,029	101,844
	2004	821	45,264	335	77,434	1,008	99,994
	2005	760	43,705	313	74,908	937	97,334
	2006	688	42,201	304	73,636	868	95,422

Note: These estimates include only vessels fishing federal TACs. Registered net tons totals exclude mainly smaller vessels for which data were unavailable. The percent of vessels missing are: 2000 - 6%, 2001 - 5%, 2002 - 5%, 2003 - 3%, 2004 - 2%, 2005 - 2%, 2006 - 2%.

Source: Blend estimates, Catch Accounting System, fish tickets, Norpac data, federal permit file, CFEC vessel data, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 41. Number of vessels that caught groundfish off Alaska by area, vessel category, gear and target, 2002-06.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher/ processors	Total	Catcher vessels	Catcher/ processors	Total	Catcher vessels	Catcher/ processors	Total
All Gear	All groundfish	2002	795	42	837	266	86	352	937	87	1,024
		2003	795	47	842	272	83	355	943	86	1,029
		2004	785	35	820	253	82	335	925	83	1,008
		2005	725	35	760	232	81	313	854	83	937
		2006	648	40	688	221	83	304	783	85	868
Hook & Line	Sablefish	2002	402	11	413	48	12	60	415	16	431
		2003	375	14	389	52	8	60	391	16	407
		2004	364	12	376	41	6	47	377	14	391
		2005	337	15	352	41	11	52	352	17	369
		2006	350	12	362	31	10	41	354	15	369
	Pacific cod	2002	243	16	259	37	40	77	259	40	299
		2003	271	16	287	32	39	71	290	39	329
		2004	263	11	274	31	39	70	283	39	322
		2005	250	6	256	34	39	73	267	39	306
		2006	172	15	187	30	39	69	193	39	232
	Flatfish	2002	0	1	1	2	17	19	2	17	19
		2003	1	1	2	7	13	20	7	13	20
		2004	0	0	0	1	13	14	1	13	14
		2005	0	2	2	1	12	13	1	14	15
		2006	1	1	2	2	13	15	3	14	17
	Rockfish	2002	131	2	133	5	2	7	134	4	138
		2003	125	1	126	4	2	6	128	3	131
		2004	121	0	121	1	2	3	122	2	124
		2005	103	0	103	1	3	4	104	3	107
		2006	79	1	80	1	3	4	79	4	83
	All groundfish	2002	628	22	650	80	42	122	644	42	686
		2003	651	25	676	74	40	114	673	42	715
		2004	621	18	639	63	40	103	644	41	685
		2005	566	18	584	64	40	104	584	41	625
		2006	486	23	509	52	40	92	505	41	546
Pot	Pacific cod	2002	129	4	133	60	5	65	171	6	177
		2003	134	1	135	74	3	77	184	3	187
		2004	151	1	152	73	3	76	194	3	197
		2005	147	1	148	59	2	61	187	2	189
		2006	143	1	144	63	5	68	185	5	190

Table 41. Continued.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher/ processors	Total	Catcher vessels	Catcher/ processors	Total	Catcher vessels	Catcher/ processors	Total
Trawl	Pollock	2002	80	0	80	98	31	129	155	31	186
		2003	74	0	74	91	18	109	141	18	159
		2004	69	0	69	93	19	112	139	19	158
		2005	69	0	69	90	22	112	135	22	157
		2006	66	0	66	90	19	109	137	19	156
	Pacific cod	2002	83	5	88	76	22	98	144	22	166
		2003	66	6	72	83	20	103	121	21	142
		2004	60	6	66	75	21	96	114	21	135
		2005	63	4	67	61	19	80	107	20	127
		2006	59	3	62	54	19	73	104	19	123
	Flatfish	2002	41	9	50	1	26	27	41	26	67
		2003	30	16	46	1	26	27	31	27	58
		2004	29	8	37	4	27	31	33	27	60
		2005	27	8	35	2	27	29	28	28	56
		2006	28	10	38	5	28	33	32	29	61
	Rockfish	2002	34	12	46	0	8	8	34	15	49
		2003	33	13	46	1	11	12	33	17	50
		2004	33	13	46	1	10	11	33	16	49
		2005	26	10	36	0	6	6	26	13	39
		2006	25	11	36	0	8	8	25	16	41
	Atka mackerel	2002	0	0	0	0	11	11	0	11	11
		2003	0	0	0	0	15	15	0	15	15
		2004	0	0	0	1	19	20	1	19	20
		2005	0	0	0	0	19	19	0	19	19
		2006	0	0	0	0	21	21	0	21	21
	All groundfish	2002	109	16	125	127	39	166	195	39	234
		2003	90	21	111	121	40	161	163	41	204
		2004	78	16	94	116	40	156	152	40	192
		2005	78	16	94	108	39	147	149	40	189
		2006	76	16	92	108	39	147	154	40	194

Note: The target is determined based on vessel, week, catching mode, NMFS area, and gear. These estimates include only vessels that fished part of federal TACs.

Source: Blend and Catch Accounting System estimates, fish tickets, Norpac data, federal permit file, CFEC vessel data, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 42. Number of vessels, mean length and mean net tonnage for vessels that caught groundfish off Alaska by area, vessel-length class (feet), and gear, 2002-06 (excluding catcher-processors).

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			<60	60-125	>=125	<60	60-125	>=125	<60	60-125	>=125
Number of vessels	Hook & Line	2002	546	82	0	62	17	1	560	83	1
		2003	570	81	0	59	15	0	588	85	0
		2004	542	79	0	49	13	1	562	81	1
		2005	491	75	0	49	15	0	506	78	0
		2006	411	75	0	40	11	1	426	78	1
	Pot	2002	98	31	1	9	40	14	102	57	14
		2003	101	30	3	11	57	16	106	72	16
		2004	106	44	1	14	51	17	111	75	17
		2005	105	41	1	13	43	13	109	74	13
		2006	101	40	2	15	43	10	112	68	10
	Trawl	2002	49	59	1	19	83	25	58	112	25
		2003	30	59	1	14	82	25	31	107	25
		2004	22	55	1	8	82	26	24	102	26
		2005	25	51	2	5	78	25	25	99	25
		2006	27	49	0	5	78	25	29	100	25

Note: If the permit files do not report a length for a vessel, the vessel is counted in the "less than 60 feet" class.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			<60	60-125	>=125	<60	60-125	>=125	<60	60-125	>=125
Mean vessel length (feet)	Hook & Line	2002	46	74	-	47	73	126	46	74	126
		2003	45	73	-	47	76	-	45	74	-
		2004	45	74	-	49	75	177	45	74	177
		2005	46	74	-	48	78	-	46	75	-
		2006	47	75	-	51	77	144	46	76	144
	Pot	2002	54	91	126	54	101	134	53	97	134
		2003	53	90	132	49	102	133	53	98	133
		2004	53	95	126	57	102	134	53	99	134
		2005	53	95	126	55	104	132	53	98	132
		2006	53	94	134	53	103	131	53	98	131
	Trawl	2002	56	90	149	49	104	158	55	99	158
		2003	57	92	155	58	105	158	57	100	158
		2004	58	91	149	58	106	158	58	101	158
		2005	58	92	152	58	106	158	58	101	158
		2006	57	93	-	58	106	158	57	102	158

Table 42. Continued.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			<60	60-125	>=125	<60	60-125	>=125	<60	60-125	>=125
Mean registered net tons	Hook & Line	2002	26	65	-	29	74	134	26	65	134
		2003	25	64	-	30	83	-	25	66	-
		2004	25	66	-	33	77	172	25	67	172
		2005	26	68	-	32	82	-	26	70	-
		2006	28	73	-	34	81	191	28	74	191
	Pot	2002	41	107	134	53	126	158	40	118	158
		2003	39	102	178	40	120	164	39	113	164
		2004	40	104	134	50	121	160	40	115	160
		2005	39	110	134	50	125	164	39	117	164
		2006	39	112	147	46	119	159	40	115	159
	Trawl	2002	56	94	130	49	117	238	53	111	238
		2003	62	98	267	65	117	238	61	111	238
		2004	67	97	130	68	118	241	66	113	241
		2005	64	99	221	64	118	238	64	113	238
		2006	60	101	-	55	117	238	60	112	238

Note: These estimates include only vessels that fished part of federal TACs.

Source: Blend estimates (2002), Catch Accounting System (2003-06), ADFG fish tickets, Norpac, NMFS permits. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115- 0070.

Table 43. Number of smaller hook-and-line vessels that caught groundfish off Alaska, by area and vessel-length class (feet), 2002-06 (excluding catcher-processors).

			Vessel length class							
			<26	26-30	30-35	35-40	40-45	45-50	50-55	55-60
Number of vessels	Gulf of Alaska	2002	22	4	53	54	121	102	66	124
		2003	16	4	60	58	129	109	67	127
		2004	12	5	70	51	108	105	67	124
		2005	12	3	60	49	95	93	57	122
		2006	9	1	44	36	86	66	54	115
	Bering Sea and Aleutian Islands	2002	5	0	11	3	5	8	7	23
		2003	1	0	12	4	7	4	4	27
		2004	2	0	9	3	4	4	4	23
		2005	2	0	8	1	6	2	6	24
		2006	0	0	6	1	4	1	5	23
	All Alaska	2002	26	4	58	54	122	102	68	126
		2003	17	4	64	60	132	110	68	133
		2004	14	5	75	53	109	107	69	130
		2005	13	3	66	49	96	94	59	126
		2006	9	1	50	37	87	67	55	120

Note: If the permit files do not report a length for a vessel, the vessel is counted in the "<26" class.

Source: Blend estimates (2002), Catch Accounting System (2003-06), ADFG fish tickets, Norpac, NMFS permits. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115- 0070.

Table 44. Number of vessels, mean length and mean net tonnage for vessels that caught and processed groundfish off Alaska by area, vessel-length class (feet), and gear, 2002-06.

			Gulf of Alaska					Bering Sea and Aleutians					All Alaska				
			Vessel length class					Vessel length class					Vessel length class				
			<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260
Number of vessels	Hook & Line	2002	11	5	6	0	0	12	18	12	0	0	12	18	12	0	0
		2003	11	6	8	0	0	11	18	11	0	0	13	18	11	0	0
		2004	9	3	7	0	0	10	19	11	0	0	11	19	11	0	0
		2005	9	4	5	0	0	10	19	11	0	0	11	19	11	0	0
		2006	10	7	6	0	0	11	18	11	0	0	12	18	11	0	0
	Pot	2002	2	1	1	0	0	2	2	1	0	0	2	3	1	0	0
		2003	1	0	0	0	0	2	1	0	0	0	2	1	0	0	0
		2004	1	0	0	0	0	1	2	1	0	0	1	2	1	0	0
		2005	1	0	0	0	0	1	1	1	0	0	1	1	1	0	0
		2006	1	0	0	0	0	2	2	2	0	0	2	2	2	0	0
	Trawl	2002	4	2	8	1	1	7	4	10	3	15	7	4	10	3	15
		2003	7	3	9	1	1	7	4	10	3	16	8	4	10	3	16
		2004	4	2	8	1	1	7	5	10	3	15	7	5	10	3	15
		2005	4	2	8	1	1	6	5	10	3	15	7	5	10	3	15
		2006	6	2	7	1	0	7	4	10	3	15	8	4	10	3	15

Note: If the permit files do not report a length for a vessel, the vessel is counted in the "less than 125 feet" class.

Table 44. Continued.

			Gulf of Alaska					Bering Sea and Aleutians					All Alaska				
			Vessel length class					Vessel length class					Vessel length class				
			<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260
Mean vessel length (feet)	Hook & Line	2002	111	140	175	-	-	107	145	178	-	-	107	145	178	-	-
		2003	104	146	176	-	-	111	145	178	-	-	107	145	178	-	-
		2004	103	158	175	-	-	112	145	178	-	-	107	145	178	-	-
		2005	103	154	175	-	-	112	145	178	-	-	107	145	178	-	-
		2006	112	145	180	-	-	119	146	178	-	-	114	146	178	-	-
	Pot	2002	96	126	180	-	-	96	163	180	-	-	96	150	180	-	-
		2003	76	-	-	-	-	96	165	-	-	-	96	165	-	-	-
		2004	76	-	-	-	-	76	165	174	-	-	76	165	174	-	-
		2005	76	-	-	-	-	76	165	174	-	-	76	165	174	-	-
		2006	103	-	-	-	-	104	165	170	-	-	104	165	170	-	-
	Trawl	2002	113	155	211	238	295	117	152	207	245	303	117	152	207	245	303
		2003	115	150	208	238	295	117	152	207	245	306	116	152	207	245	306
		2004	111	146	207	238	295	116	148	207	245	303	116	148	207	245	303
		2005	111	146	207	238	295	118	148	207	245	303	116	148	207	245	303
		2006	115	150	203	238	-	117	152	207	245	303	116	152	207	245	303

Table 44. Continued.

			Gulf of Alaska					Bering Sea and Aleutians					All Alaska				
			Vessel length class					Vessel length class					Vessel length class				
			<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260
Mean registered net tons	Hook & Line	2002	129	223	454	-	-	130	302	508	-	-	130	302	508	-	-
		2003	159	233	481	-	-	128	302	442	-	-	153	302	442	-	-
		2004	133	261	513	-	-	134	296	442	-	-	136	296	442	-	-
		2005	140	269	583	-	-	134	296	442	-	-	136	296	442	-	-
		2006	146	295	476	-	-	145	314	440	-	-	146	314	440	-	-
	Pot	2002	132	147	243	-	-	132	546	243	-	-	132	413	243	-	-
		2003	134	-	-	-	-	132	793	-	-	-	132	793	-	-	-
		2004	134	-	-	-	-	134	464	414	-	-	134	464	414	-	-
		2005	134	-	-	-	-	134	793	414	-	-	134	793	414	-	-
		2006	70	-	-	-	-	91	464	303	-	-	91	464	303	-	-
	Trawl	2002	123	256	732	611	1085	143	194	724	1156	1590	143	194	724	1156	1590
		2003	144	214	735	611	1085	150	194	724	1156	1598	143	194	724	1156	1598
		2004	125	256	702	611	1085	144	181	724	1156	1590	144	181	724	1156	1590
		2005	125	256	702	611	1085	153	181	724	1156	1590	144	181	724	1156	1590
		2006	146	255	718	611	-	150	194	724	985	1590	143	194	724	985	1590

Note: These estimates include only vessels that fished part of federal TACs.

Source: Blend estimates (2002), Catch Accounting System (2003-06), NMFS permits. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 45. Number of vessels that caught groundfish off Alaska by area, tonnage caught, and gear, 2000-06.

		Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
		Tonnage caught			Tonnage caught			Tonnage caught		
		Less than 2t	2t to 25t	More than 25t	Less than 2t	2t to 25t	More than 25t	Less than 2t	2t to 25t	More than 25t
Hook & Line	2000	157	352	245	27	38	59	170	359	277
	2001	129	297	251	27	44	66	139	309	287
	2002	125	292	233	24	37	61	125	296	265
	2003	106	306	264	24	35	55	112	317	286
	2004	95	284	261	19	31	53	101	292	292
	2005	84	255	245	21	28	55	91	257	277
	2006	82	215	212	11	27	54	86	220	240
Pot	2000	13	54	196	3	21	102	15	54	272
	2001	10	37	117	3	10	72	10	41	176
	2002	7	19	108	2	5	61	8	22	149
	2003	5	20	110	3	9	75	7	26	164
	2004	3	16	133	2	12	72	5	20	182
	2005	2	26	120	4	5	63	6	30	163
	2006	6	15	123	3	13	58	9	25	162
Trawl	2000	0	9	134	1	3	149	1	10	233
	2001	0	7	130	0	3	160	0	5	236
	2002	1	11	113	0	3	163	1	9	224
	2003	2	2	107	1	0	160	0	1	203
	2004	1	1	92	0	4	152	0	2	190
	2005	0	2	92	0	1	146	0	2	187
	2006	0	1	91	0	0	147	0	1	193
All gear	2000	151	381	519	27	53	308	163	380	722
	2001	124	316	460	28	55	297	133	328	658
	2002	121	300	416	24	44	284	120	305	599
	2003	100	295	447	24	42	289	102	309	618
	2004	94	270	457	18	42	275	100	276	632
	2005	72	257	431	18	32	263	79	258	600
	2006	79	215	394	12	37	255	84	228	556

Note: These estimates include only vessels fishing part of federal TACs.

Source: Blend estimates, Catch Accounting System, fish tickets, Norpac data, federal permi file, CFEC vessel data. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 46. Number of vessels that caught groundfish off Alaska by area, residency, gear, and target, 2002-06.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Alaska	Other	Unk.	Alaska	Other	Unk.	Alaska	Other	Unk.
All Gear	All groundfish	2002	590	224	23	94	247	11	616	375	33
		2003	612	230	0	95	260	0	641	388	0
		2004	600	220	1	79	254	2	625	380	3
		2005	552	208	0	78	235	0	571	366	0
		2006	485	202	1	68	232	4	513	350	5
Hook & Line	Sablefish	2002	296	112	5	30	28	2	304	120	7
		2003	273	116	0	34	26	0	284	123	0
		2004	270	106	0	27	20	0	281	110	0
		2005	244	108	0	27	25	0	256	113	0
		2006	256	105	1	18	23	0	260	108	1
	Pacific cod	2002	205	45	9	33	44	0	219	71	9
		2003	239	48	0	27	44	0	254	75	0
		2004	230	44	0	21	47	2	244	76	2
		2005	219	37	0	32	41	0	235	71	0
		2006	147	40	0	27	42	0	168	64	0
	Flatfish	2002	0	1	0	4	14	1	4	14	1
		2003	1	1	0	4	16	0	4	16	0
		2004	0	0	0	4	10	0	4	10	0
		2005	1	1	0	2	11	0	3	12	0
		2006	1	1	0	4	11	0	5	12	0
	Rockfish	2002	114	19	0	4	3	0	116	22	0
		2003	108	18	0	3	3	0	110	21	0
		2004	106	15	0	2	1	0	108	16	0
		2005	85	18	0	1	3	0	86	21	0
		2006	70	10	0	1	3	0	70	13	0
	All groundfish	2002	485	151	14	58	61	3	498	171	17
		2003	523	153	0	55	59	0	542	173	0
		2004	500	140	0	44	57	2	519	164	2
		2005	447	137	0	49	55	0	461	164	0
		2006	378	130	1	39	53	0	396	149	1
Pot	Pacific cod	2002	107	23	3	19	44	2	116	56	5
		2003	117	18	0	26	51	0	128	59	0
		2004	122	29	1	25	51	0	128	68	1
		2005	130	18	0	22	39	0	136	53	0
		2006	119	25	0	27	40	1	133	56	1
	All groundfish	2002	108	23	3	20	46	2	117	57	5
		2003	117	18	0	29	58	0	131	66	0
		2004	122	29	1	26	60	0	129	77	1
		2005	130	18	0	27	45	0	140	59	0
		2006	119	25	0	29	44	1	135	60	1

Table 46. Continued.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Alaska	Other	Unk.	Alaska	Other	Unk.	Alaska	Other	Unk.
Trawl	Pollock	2002	33	45	2	11	114	4	37	143	6
		2003	30	44	0	7	102	0	31	128	0
		2004	26	43	0	7	105	0	27	131	0
		2005	25	44	0	5	107	0	25	132	0
		2006	24	42	0	4	102	3	24	129	3
	Pacific cod	2002	46	39	3	8	88	2	50	111	5
		2003	27	45	0	12	91	0	30	112	0
		2004	26	40	0	7	89	0	27	108	0
		2005	27	40	0	5	75	0	27	100	0
		2006	27	35	0	1	72	0	27	96	0
	Flatfish	2002	19	30	1	2	25	0	19	47	1
		2003	14	32	0	2	25	0	14	44	0
		2004	12	25	0	2	29	0	12	48	0
		2005	7	28	0	0	29	0	7	49	0
		2006	8	30	0	0	33	0	8	53	0
	Rockfish	2002	17	29	0	0	8	0	17	32	0
		2003	17	29	0	1	11	0	17	33	0
		2004	14	32	0	1	10	0	14	35	0
		2005	9	27	0	0	6	0	9	30	0
		2006	10	26	0	0	8	0	10	31	0
	Atka mackerel	2002	0	0	0	0	11	0	0	11	0
		2003	0	0	0	2	13	0	2	13	0
		2004	0	0	0	2	18	0	2	18	0
		2005	0	0	0	0	19	0	0	19	0
		2006	0	0	0	0	21	0	0	21	0
	All groundfish	2002	54	65	6	17	143	6	58	165	11
		2003	40	71	0	16	145	0	40	164	0
		2004	32	62	0	12	144	0	33	159	0
		2005	31	63	0	8	139	0	31	158	0
		2006	30	62	0	5	139	3	30	161	3

Note: The target is determined based on vessel, week, processing mode, NMFS area, and gear. Vessels are classified by the residency of the owner of the fishing vessel. These estimates include only vessels fishing part of federal TACs.

Source: Blend estimates, Catch Accounting System, fish tickets, Norpac data, federal permit file, CFEC vessel data. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 47. Number of vessels that caught groundfish off Alaska by month, area, vessel type, and gear, 2002-06.

				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Gulf of Alaska	Catcher-vessels (excluding C/Ps)	Hook & line	2002	90	73	159	244	237	211	106	112	167	82	78	7	628
			2003	94	71	181	298	310	139	103	119	144	80	82	1	651
			2004	126	92	228	302	241	129	121	103	159	124	53	3	621
			2005	93	69	183	308	201	138	111	90	136	107	60	24	566
			2006	64	61	93	210	222	177	138	101	162	113	75	31	486
		Pot	2002	37	69	99	36	29	5	0	0	19	12	25	17	130
			2003	53	87	103	15	0	0	0	0	40	5	1	1	134
			2004	86	117	60	17	15	0	0	0	29	25	22	6	151
			2005	56	114	58	26	12	0	0	0	38	33	15	12	147
			2006	58	84	118	88	9	0	0	0	13	15	20	26	143
		Trawl	2002	32	78	79	33	21	0	35	59	34	56	15	0	109
			2003	63	63	37	37	16	8	35	50	43	47	0	0	90
			2004	58	48	50	27	16	9	32	49	58	46	1	0	78
			2005	57	51	54	24	11	6	26	35	54	45	1	0	78
			2006	56	56	68	29	12	5	25	15	48	44	10	0	76
		All gear	2002	156	214	315	311	284	216	141	171	218	149	118	24	795
			2003	202	219	305	348	326	147	138	169	225	131	83	2	795
			2004	256	248	329	346	269	138	153	152	244	191	76	9	785
			2005	203	221	285	358	224	144	136	125	227	180	75	36	725
			2006	167	193	259	318	243	182	162	116	222	169	104	57	648
	Catcher/ Processors	Hook & line	2002	6	9	13	10	7	1	3	3	2	4	5	0	22
			2003	9	6	15	7	8	4	3	3	3	0	0	0	25
			2004	8	2	9	10	9	5	2	2	5	4	1	0	19
			2005	2	2	9	14	4	2	2	2	5	0	0	2	18
			2006	1	8	10	10	7	2	3	2	2	12	13	0	23
		Pot	2002	0	0	2	1	0	0	0	0	2	3	1	0	4
			2003	1	1	1	0	0	0	0	0	1	0	0	0	1
			2004	1	1	0	0	0	0	0	0	0	0	1	1	1
			2005	1	1	0	0	0	0	0	0	0	0	0	0	1
			2006	0	1	0	0	0	0	0	0	0	0	0	0	1
		Trawl	2002	1	2	4	6	8	1	14	7	0	6	1	0	16
			2003	0	3	2	10	9	0	13	6	7	13	0	0	21
			2004	1	1	4	6	4	2	15	2	6	0	0	0	16
			2005	0	2	7	5	4	2	15	2	5	0	0	0	16
			2006	0	3	2	5	3	1	12	5	7	4	0	0	16
		All gear	2002	7	11	19	17	15	2	17	10	4	13	7	0	42
			2003	10	10	18	17	17	4	16	9	11	13	0	0	47
			2004	10	4	13	16	13	7	17	4	11	4	2	1	36
			2005	3	5	16	19	8	4	17	4	10	0	0	2	35
			2006	1	12	12	15	10	3	15	7	9	16	13	0	40

Table 47. Continued.

				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Bering Sea & Aleutian Islands	Catcher-vessels (excluding C/Ps)	Hook & line	2002	2	3	4	12	27	37	27	35	20	11	5	0	80
			2003	0	0	6	9	26	34	27	33	29	17	6	0	74
			2004	0	8	9	14	25	24	28	22	16	11	8	2	63
			2005	3	5	10	17	17	17	27	20	19	12	14	4	64
			2006	4	7	8	10	20	23	21	17	15	14	10	5	52
		Pot	2002	5	30	45	6	7	8	5	5	20	21	6	1	63
			2003	9	51	60	10	7	8	10	8	30	39	21	5	84
			2004	21	55	10	16	18	9	7	5	28	31	8	0	82
			2005	19	44	9	14	6	3	3	5	20	24	6	3	69
			2006	36	38	8	13	11	5	5	4	25	30	12	8	68
		Trawl	2002	65	109	108	57	6	19	60	92	81	52	6	0	127
			2003	66	109	115	71	13	31	73	91	76	47	0	0	121
			2004	77	100	105	45	2	39	70	82	79	58	15	0	116
			2005	78	100	96	39	1	48	72	74	63	51	10	0	108
			2006	75	100	96	47	2	45	66	70	66	58	19	0	108
		All gear	2002	72	142	157	75	40	64	92	132	121	84	17	1	266
			2003	75	160	181	90	46	73	109	130	135	102	27	5	272
			2004	98	163	122	75	45	72	105	109	123	100	31	2	253
			2005	99	149	115	70	24	67	101	97	102	87	30	7	232
			2006	115	144	112	67	33	73	92	91	106	102	41	13	221
	Catcher/ Processors	Hook & line	2002	34	35	37	13	11	5	11	37	39	40	39	18	42
			2003	32	39	39	14	11	11	15	35	37	37	37	31	40
			2004	34	37	37	13	12	9	16	38	38	39	38	37	40
			2005	38	39	14	9	5	8	17	38	39	38	38	38	40
			2006	38	39	17	10	6	6	19	39	40	39	6	13	40
		Pot	2002	0	3	4	0	0	0	0	0	3	3	3	0	5
			2003	0	2	2	0	0	0	0	0	3	2	2	1	3
			2004	2	2	3	0	1	0	0	0	1	1	1	0	4
			2005	1	1	2	2	1	0	0	0	1	1	1	0	3
			2006	0	1	3	3	0	1	1	1	2	3	1	0	6
		Trawl	2002	35	38	37	22	18	22	32	37	36	26	6	0	39
			2003	37	38	38	24	16	29	34	37	37	15	3	1	40
			2004	38	39	39	24	23	32	37	31	32	18	3	0	40
			2005	38	39	38	25	22	27	37	36	24	18	3	0	39
			2006	38	39	37	28	20	27	35	36	33	20	3	1	39
		All gear	2002	69	76	78	35	29	27	43	74	78	69	48	18	86
			2003	69	79	79	38	27	40	49	72	77	54	42	33	83
			2004	74	78	78	37	35	41	53	69	71	58	42	37	82
			2005	77	79	54	36	27	35	54	74	64	57	42	38	81
			2006	76	79	57	40	26	34	55	76	75	62	10	14	83

Table 47. Continued.

				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
All Alaska	Catcher-vessels (excluding C/Ps)	Hook & line	2002	92	76	162	252	259	240	128	137	184	91	81	7	644
			2003	94	71	186	305	332	171	123	144	167	94	88	1	673
			2004	126	99	236	314	259	149	143	121	170	129	59	5	644
			2005	96	71	191	321	214	153	129	108	147	112	71	25	584
			2006	68	65	98	217	237	193	154	114	174	123	82	34	505
		Pot	2002	42	96	137	42	36	12	5	5	39	33	31	18	173
			2003	62	134	157	25	7	8	10	8	63	42	22	6	194
			2004	105	160	70	33	33	9	7	5	52	53	30	6	203
			2005	75	152	67	37	18	3	3	5	54	55	21	15	196
			2006	90	114	124	100	20	5	5	4	37	45	32	34	190
		Trawl	2002	97	170	169	90	27	19	88	130	108	104	21	0	195
			2003	128	150	138	104	28	39	98	125	112	90	0	0	163
			2004	133	139	139	71	18	47	91	118	127	100	16	0	152
			2005	135	144	137	63	12	53	92	106	112	96	11	0	149
			2006	131	147	146	72	14	50	84	85	112	101	29	0	154
		All gear	2002	228	336	446	379	319	270	221	272	329	227	133	25	937
			2003	276	353	465	431	367	218	230	275	340	224	110	7	943
			2004	350	389	434	418	306	205	241	244	347	278	105	11	925
			2005	302	354	385	421	244	208	222	217	312	257	102	40	854
			2006	278	316	348	377	271	248	242	203	322	266	142	68	783
	Catcher/ Processors	Hook & line	2002	36	38	39	18	14	6	14	38	39	41	39	18	42
			2003	40	39	40	18	14	14	16	35	38	37	37	31	42
			2004	36	37	38	18	16	13	17	38	39	39	39	37	41
			2005	39	39	20	17	8	10	18	39	40	38	38	38	41
			2006	38	39	22	14	11	7	21	39	41	39	17	13	41
		Pot	2002	0	3	5	1	0	0	0	0	4	4	3	0	6
			2003	1	3	3	0	0	0	0	0	3	2	2	1	3
			2004	2	2	3	0	1	0	0	0	1	1	2	1	4
			2005	2	2	2	2	1	0	0	0	1	1	1	0	3
			2006	0	2	3	3	0	1	1	1	2	3	1	0	6
		Trawl	2002	35	39	39	25	21	22	37	37	36	27	6	0	39
			2003	37	39	39	28	19	29	37	38	38	27	3	1	41
			2004	39	39	39	26	23	32	38	32	34	18	3	0	40
			2005	38	40	40	26	23	28	38	38	28	18	3	0	40
			2006	38	40	39	30	21	28	37	39	36	21	3	1	40
		All gear	2002	71	80	83	44	35	28	51	75	79	72	48	18	87
			2003	78	81	82	46	33	43	53	73	79	66	42	33	86
			2004	77	78	79	44	39	45	55	70	74	58	44	38	83
			2005	79	81	62	45	31	38	56	77	69	57	42	38	83
			2006	76	81	64	46	32	36	59	79	79	63	21	14	85

Note: These estimates include only vessels fishing part of federal TACs.

Source: Blend estimates, Catch Accounting System, fish tickets, Norpac data, federal permit file, CFEC vessel data. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 48. Catcher vessel (excluding catcher-processors) weeks of fishing groundfish off Alaska by area, vessel-length class (feet), gear, and target, 2002-06.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			<60	60-124	>=125	<60	60-124	>=125	<60	60-124	>=125
Hook & line	Sablefish	2002	1097	329	-	144	49	-	1241	378	-
		2003	1090	340	-	174	27	-	1264	367	-
		2004	1123	349	-	115	25	1	1238	374	1
		2005	1104	323	-	102	39	-	1205	362	-
		2006	1115	345	-	86	11	-	1201	356	-
	Pacific cod	2002	1071	20	-	98	10	1	1169	30	1
		2003	1073	21	-	92	4	-	1165	25	-
		2004	1359	45	-	147	4	-	1506	49	-
		2005	1209	46	-	142	3	-	1351	49	-
		2006	961	52	-	138	3	-	1099	55	-
	Rockfish	2002	261	26	-	4	1	-	265	27	-
		2003	240	18	-	3	1	-	243	19	-
		2004	258	15	-	1	-	-	259	15	-
		2005	168	13	-	1	-	-	169	13	-
		2006	135	4	-	0	-	-	135	4	-
	All groundfish	2002	2429	375	-	247	59	1	2676	434	1
		2003	2560	388	-	275	38	-	2835	426	-
		2004	2808	412	-	264	29	1	3073	441	1
		2005	2504	383	-	246	42	-	2750	425	-
		2006	2222	403	-	227	17	0	2448	420	0
Pot	Pacific cod	2002	754	206	3	35	190	66	789	396	69
		2003	630	144	10	42	241	77	672	385	87
		2004	831	227	3	87	206	70	918	433	73
		2005	687	286	1	50	171	58	737	457	59
		2006	768	291	7	79	218	62	847	509	69
	All groundfish	2002	755	207	3	48	247	66	803	454	69
		2003	630	144	10	57	348	77	687	492	87
		2004	831	228	3	88	305	77	919	533	80
		2005	687	286	1	63	243	58	750	529	59
		2006	770	291	7	97	286	62	867	577	69

Table 48. Continued.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			<60	60-124	>=125	<60	60-124	>=125	<60	60-124	>=125
Trawl	Pollock	2002	87	289	0	3	953	476	90	1242	476
		2003	69	259	0	-	1009	524	69	1268	524
		2004	92	309	-	-	1014	531	92	1323	531
		2005	133	343	0	-	997	574	133	1340	574
		2006	135	387	-	-	980	629	135	1367	629
	Pacific cod	2002	117	159	-	68	405	29	185	564	29
		2003	57	160	-	91	443	40	148	603	40
		2004	40	139	-	31	283	35	71	422	35
		2005	56	102	-	15	261	30	71	363	30
		2006	102	104	-	8	247	20	110	351	20
	Flatfish	2002	11	211	-	-	0	-	11	212	-
		2003	4	149	-	2	0	-	6	149	-
		2004	5	145	-	-	4	-	5	149	-
		2005	1	140	-	-	7	-	1	147	-
		2006	-	208	-	-	12	-	-	219	-
	Rockfish	2002	1	87	-	-	-	-	1	87	-
		2003	3	110	-	-	1	-	3	111	-
		2004	2	94	0	-	1	-	2	95	0
		2005	-	76	-	-	-	-	-	76	-
		2006	-	62	-	-	-	-	-	62	-
	All groundfish	2002	217	746	0	71	1358	505	288	2105	505
		2003	133	691	0	93	1454	564	226	2145	564
		2004	140	696	0	31	1311	566	171	2007	566
		2005	191	662	0	15	1265	604	205	1927	604
		2006	238	763	-	8	1239	650	246	2002	650
All gear	All groundfish	2002	3401	1329	3	366	1664	572	3767	2993	575
		2003	3323	1224	10	425	1839	641	3748	3063	651
		2004	3779	1335	3	383	1646	644	4162	2981	647
		2005	3382	1331	1	323	1550	662	3705	2881	663
		2006	3230	1458	7	332	1541	712	3562	2999	719

Notes: A vessel that fished more than one category in a week is apportioned a partial week based on catch weight. A target is determined based on vessel, week, processing mode, NMFS area, and gear. All groundfish include additional target categories.

Source: Blend estimates (2002), Catch Accounting System (2003-06), fish tickets, Norpac data, federal permit file, CFEC vessel data, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 49. Catcher/processor vessel weeks of fishing groundfish off Alaska by area, vessel-length class (feet), gear, and target, 2002-06.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			<60	60-124	125-230	<60	60-124	125-230	<60	60-124	125-230
Hook & line	Sablefish	2002	7	37	18	1	35	6	8	72	25
		2003	3	44	24	-	28	8	3	72	33
		2004	7	53	21	-	30	6	7	83	27
		2005	7	46	25	-	23	11	7	68	36
		2006	4	41	21	-	26	9	4	67	30
	Pacific cod	2002	-	52	21	22	186	775	22	238	797
		2003	7	31	23	5	241	867	12	272	890
		2004	4	24	16	7	229	840	11	253	856
		2005	4	6	4	4	244	858	8	250	862
		2006	-	32	22	-	211	570	-	242	591
	Flatfish	2002	-	-	1	2	25	34	2	25	35
		2003	-	0	-	-	11	46	-	11	46
		2004	-	-	-	-	22	31	-	22	31
		2005	-	0	2	-	23	34	-	23	36
		2006	-	-	2	-	14	43	-	14	45
	All groundfish	2002	7	89	41	25	246	817	32	335	858
		2003	10	78	48	5	280	924	15	358	972
		2004	12	77	37	7	281	882	19	358	919
		2005	11	52	31	4	290	907	15	342	938
		2006	4	74	47	-	252	625	4	326	673
Pot	Pacific cod	2002	-	3	9	-	14	24	-	17	33
		2003	-	7	-	-	12	13	-	19	13
		2004	-	10	-	-	6	20	-	16	20
		2005	-	6	-	-	2	22	-	8	22
		2006	-	3	-	-	5	29	-	8	29
	All groundfish	2002	-	3	9	-	14	24	-	17	33
		2003	-	7	-	-	12	13	-	19	13
		2004	-	10	-	-	6	21	-	16	21
		2005	-	6	-	-	2	22	-	8	22
		2006	-	3	-	-	13	33	-	16	33

Table 49. Continued.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Vessel length class			Vessel length class			Vessel length class		
			60-124	125-230	>230	60-124	125-230	>230	60-124	125-230	>230
Trawl	Pollock	2002	-	-	-	2	42	333	2	42	333
		2003	-	-	-	0	30	353	0	30	353
		2004	-	-	-	0	27	335	0	27	335
		2005	-	-	-	2	27	325	2	27	325
		2006	-	-	-	1	28	347	1	28	347
	Pacific cod	2002	4	0	-	61	57	16	65	57	16
		2003	5	1	-	61	55	17	66	56	17
		2004	8	4	-	89	101	14	97	104	14
		2005	3	-	-	56	71	12	60	71	12
		2006	2	-	-	65	66	15	68	66	15
	Flatfish	2002	57	24	5	121	286	47	177	310	53
		2003	72	38	4	103	243	41	175	281	45
		2004	29	8	0	87	256	44	116	264	44
		2005	56	10	2	79	276	55	135	286	57
		2006	59	12	-	113	212	66	172	224	66
	Rockfish	2002	3	20	0	-	8	6	3	29	6
		2003	3	22	0	0	14	6	3	36	7
		2004	3	20	1	-	8	4	3	28	5
		2005	2	21	1	-	6	5	2	27	5
		2006	1	27	1	2	11	5	3	38	6
	Atka mackerel.	2002	-	-	-	0	54	16	0	54	16
		2003	-	-	-	2	67	24	2	67	24
		2004	-	-	-	4	75	23	4	75	23
		2005	-	-	-	6	84	23	6	84	23
		2006	-	-	-	5	81	24	5	81	24
	All groundfish	2002	63	44	5	184	448	419	247	492	424
		2003	83	61	4	168	411	441	252	472	445
		2004	41	31	1	180	467	421	221	498	422
		2005	61	31	3	144	465	419	205	496	422
		2006	62	39	1	186	400	456	248	439	457

Table 49. Continued.

			Gulf of Alaska				Bering Sea and Aleutians				All Alaska			
			Vessel length class				Vessel length class				Vessel length class			
			<60	60-124	125-230	>230	<60	60-124	125-230	>230	<60	60-124	125-230	>230
All gear	All groundfish	2002	7	155	95	5	25	444	1288	419	32	599	1383	424
		2003	10	168	109	4	5	461	1348	441	15	629	1457	445
		2004	12	128	68	1	7	467	1370	421	19	595	1438	422
		2005	11	119	62	3	4	436	1394	419	15	555	1456	422
		2006	4	139	86	1	-	451	1058	456	4	590	1144	457

Notes: A vessel that fished more than one category in a week is apportioned a partial week based on catch weight. A target is determined based on vessel, week, processing mode, NMFS area, and gear. All groundfish include additional target categories.

Source: Blend estimates (2002), Catch Accounting System (2003-06), fish tickets, Norpac data, federal permit file, CFEC vessel data, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 50. Total at-sea processor vessel crew weeks in the groundfish fisheries off Alaska by month and area, 2002-06.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Gulf of Alaska	2002	234	431	582	783	790	-	1,425	311	88	426	189	-	5,287
	2003	470	265	493	991	1,023	101	922	417	279	631	-	-	5,591
	2004	452	155	348	629	366	95	1,097	96	304	33	-	-	3,599
	2005	76	72	618	919	144	77	1,306	68	264	-	-	-	3,580
	2006	-	267	429	629	293	62	1,372	345	234	371	418	-	4,429
Bering Sea and Aleutian Islands	2002	5,639	16,502	16,514	3,634	1,785	3,593	9,680	15,570	12,997	7,028	3,607	894	97,440
	2003	5,830	16,110	18,259	3,771	2,255	5,263	10,479	15,807	12,408	5,579	4,236	1,778	101,775
	2004	9,596	16,032	12,849	3,855	4,393	5,098	13,020	11,495	11,468	6,877	3,450	1,446	99,577
	2005	10,252	16,293	11,127	4,305	2,807	4,889	13,048	12,101	10,861	7,175	3,377	2,602	98,835
	2006	9,447	15,654	11,898	5,602	2,110	3,526	12,423	12,649	14,310	6,583	806	526	95,531
All Alaska	2002	5,872	16,933	17,095	4,417	2,575	3,606	11,104	15,880	13,085	7,453	3,795	912	102,727
	2003	6,300	16,375	18,751	4,761	3,278	5,364	11,400	16,224	12,687	6,210	4,236	1,778	107,365
	2004	10,047	16,187	13,196	4,484	4,758	5,192	14,117	11,590	11,772	6,910	3,465	1,458	103,175
	2005	10,327	16,364	11,745	5,224	2,951	4,966	14,353	12,169	11,124	7,175	3,377	2,639	102,414
	2006	9,458	15,921	12,326	6,231	2,402	3,588	13,794	12,994	14,543	6,953	1,224	526	99,960

Note: Crew weeks are calculated by summing weekly reported crew size over vessels and time period. These estimates include only vessels targeting groundfish counted toward federal TACs. Catcher processors accounted for the following proportions of the total crew weeks in all areas: 2002 - 89%, 2003 - 92%, 2004 - 91%, 2005 - 92%, 2006 - 92%.

Source: Weekly Processor Reports. National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 51. Numbers of vessels and plants with observers, observer-deployment days, and estimated observer costs ($1,000) by year, type of operation, gear and vessel length, 2005-06.

			2005			2006		
			Count	Obs. days	Cost	Count	Obs. days	Cost
Catcher vessels	Hook & line	60-125	42	623	218	42	679	238
	Pot	60-125	48	1,130	396	50	1,240	434
		>=125	12	114	40	9	127	44
		Total	60	1,244	435	59	1,367	478
	Trawl	60-125	92	3,534	1,237	90	3,782	1,324
		>=125	26	4,578	1,602	26	4,833	1,692
		Total	118	8,112	2,839	116	8,615	3,015
CV Total			220	9,979	3,493	217	10,661	3,731
Catcher/ processors	Hook & line	60-125	9	1,601	560	10	1,580	553
		>=125	30	7,185	2,515	30	5,461	1,911
		Total	39	8,786	3,075	40	7,041	2,464
	Pot	>60	-	-	-	3	196	69
	Surimi trawler	>=125	12	3,719	1,302	13	4,470	1,565
	Fillet trawler	>=125	5	1,496	524	4	1,198	419
	H&G trawler	60-125	7	674	236	7	718	251
		>=125	16	4,676	1,637	16	4,354	1,524
		Total	23	5,350	1,873	23	5,072	1,775
	Trawl Total		40	10,565	3,698	40	10,740	3,759
C/P Total			79	19,351	6,773	83	17,977	6,292
Motherships			3	1,006	352	3	1,017	356
All vessels			302	30,336	10,618	303	29,655	10,379
Shore plants			24	4,713	1,650	24	5,000	1,750
Grand totals			326	35,049	12,267	327	34,655	12,129

Note: The cost estimates are based on an estimated average cost per day of $350. This includes the payment to observer providers and the cost of transportation and board.

Source: Fisheries Monitoring and Analysis Division (FMA) observer data, Alaska Fisheries Science Center, National Marine Fisheries Service, P.O. Box 15700, Seattle, WA 98115-0070.

Table 52. Monthly Japanese landing market price of selected groundfish by species, 1992-2006, in yen/kilogram (weighted average).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flatfish, fresh	1992	739	799	749	687	567	558	605	584	556	587	600	570
	1993	638	746	681	611	487	515	475	651	486	576	512	490
	1994	603	592	534	573	585	467	541	542	508	474	454	505
	1995	499	510	485	540	478	473	523	511	464	362	415	424
	1996	501	556	543	472	431	385	477	550	419	403	418	490
	1997	473	500	424	417	472	405	445	605	438	476	387	474
	1998	434	482	403	337	391	432	505	567	451	397	404	486
	1999	433	446	427	397	372	394	417	506	366	346	365	467
	2000	447	469	474	391	335	323	446	497	436	464	441	490
	2001	567	587	565	459	398	401	452	506	466	495	483	572
	2002	596	531	523	477	417	441	541	526	405	532	547	499
	2003	643	562	508	420	335	314	379	349	327	366	395	445
	2004	484	573	451	346	344	268	265	373	316	359	465	459
	2005	439	498	446	403	326	247	332	374	373	410	535	572
	2006	429	440	452	454	328	268	336	427	457	406	502	467
Cod, fresh	1992	332	316	180	164	128	119	135	134	175	221	366	299
	1993	281	285	207	167	118	128	154	215	175	305	319	366
	1994	261	272	170	132	98	129	117	115	204	311	288	287
	1995	244	185	188	103	64	110	146	146	197	257	401	315
	1996	296	235	153	83	68	72	176	149	205	273	304	289
	1997	235	174	157	111	105	82	192	177	134	330	269	311
	1998	234	167	150	104	88	94	173	172	115	211	289	368
	1999	284	276	180	153	109	115	148	154	103	225	315	352
	2000	299	256	205	146	104	103	169	162	143	238	329	370
	2001	418	246	176	134	96	91	124	254	195	305	387	499
	2002	453	398	253	156	135	142	216	185	223	434	542	476
	2003	407	335	293	203	126	166	218	180	232	309	306	462
	2004	402	261	200	151	130	95	215	247	202	341	358	447
	2005	257	169	165	185	130	110	192	178	175	300	347	458
	2006	297	246	249	229	165	201	249	271	186	365	365	362
Cod, frozen	1992	369	324	281	251	264	270	298	322	339	348	315	163
	1993	278	148	171	164	206	288	259	148	329	387	260	278
	1994	309	258	112	245	264	124	217	258	258	246	264	228
	1995	232	182	154	177	196	109	135	184	138	134	259	249
	1996	265	220	183	211	146	201	247	326	213	292	299	262
	1997	199	210	200	184	131	211	223	133	214	225	195	148
	1998	185	137	137	217	138	231	239	401	333	296	266	249
	1999	298	257	215	302	220	237	218	266	315	266	283	243
	2000	241	202	179	203	199	211	208	283	247	298	273	212

Note: Prices for frozen cod are not reported after year 2000.

Table 52. Continued.

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alaska pollock, fresh	1992	144	201	132	68	35	33	59	64	51	57	64	74
	1993	107	157	141	91	54	56	51	51	37	60	62	72
	1994	76	125	118	88	45	46	52	51	44	55	67	74
	1995	104	132	131	101	40	38	66	59	40	47	74	72
	1996	90	120	110	77	33	27	63	46	42	41	54	91
	1997	126	122	110	97	69	65	55	48	33	45	51	70
	1998	80	85	91	86	35	26	37	35	26	33	56	52
	1999	73	86	76	78	42	36	40	24	21	31	46	53
	2000	96	79	96	87	51	51	81	55	27	46	109	129
	2001	109	127	91	90	60	46	60	80	34	62	105	111
	2002	93	108	104	64	56	56	100	106	36	60	93	105
	2003	114	99	71	61	59	69	116	82	35	46	55	79
	2004	91	112	64	48	46	48	141	119	36	49	76	95
	2005	142	112	76	79	71	64	159	121	47	60	86	121
	2006	128	109	87	94	83	85	144	75	49	69	98	127
Atka mackerel, fresh	1992	47	36	65	85	88	91	136	95	87	94	84	48
	1993	66	41	33	33	24	44	57	56	40	66	46	26
	1994	25	28	21	20	28	30	49	50	42	49	35	30
	1995	35	31	29	29	37	49	109	98	39	36	27	19
	1996	21	22	29	40	51	40	95	69	40	46	69	28
	1997	36	40	40	44	55	59	114	79	48	44	27	30
	1998	23	31	23	22	26	26	25	28	23	32	35	27
	1999	43	44	32	36	38	57	78	88	40	35	29	17
	2000	26	23	22	20	27	34	52	44	42	43	47	49
	2001	44	38	32	32	51	58	106	75	54	35	34	31
	2002	28	28	29	38	57	60	67	66	32	30	36	28
	2003	30	28	28	26	40	47	55	32	20	21	20	15
	2004	16	21	20	26	37	33	26	28	33	17	25	27
	2005	47	29	33	38	70	105	133	80	39	35	36	35
	2006	37	41	41	47	69	80	111	115	61	73	43	40
Rockfish, fresh	1992	2992	2653	3281	2204	1951	2174	2383	2307	1786	2177	2808	2613
	1993	2847	2987	2452	2480	2053	2004	2050	2140	1783	2010	2445	2633
	1994	2687	2861	1944	2363	2205	2433	2230	2118	2069	2075	2323	2778
	1995	3214	2725	2360	2545	2142	1993	2234	2189	2149	2373	3179	3119
	1996	3471	3586	3510	2630	2321	2188	2234	2374	2419	3012	3073	3414
	1997	3770	4240	3281	2699	2760	2384	2472	2475	2873	3117	2943	3433
	1998	3348	3753	3365	2721	2729	2790	2675	2574	2636	2831	2238	2181
	1999	4518	3750	3872	2935	2992	3041	3324	2634	2951	2512	1736	3035
	2000	4049	3932	2934	3061	2645	2620	3292	2419	2734	2777	3112	3270

Note: Prices for fresh rockish are not reported after year 2000.

Source: Monthly Statistics of Agriculture, Forestry & Fisheries, Stat. and Info. Dept., Ministry of Agriculture, Forestry & Fisheries, Government of Japan. Available from Alaska Fisheries Science Center P.O. Box 15700, Seattle, WA 98115-0070.

Table 53. Monthly Tokyo wholesale prices of selected products, 1993-2006, in yen/kilogram (weighted average).

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flatfish, frozen	1993	412	386	404	427	431	447	431	406	418	423	407	414
	1994	423	426	403	450	460	433	470	394	414	433	422	455
	1995	446	435	450	455	427	443	447	464	440	466	475	500
	1996	478	478	467	520	532	544	575	550	562	550	565	580
	1997	538	535	535	536	506	533	512	530	509	508	528	540
	1998	482	473	511	505	519	514	509	544	524	518	457	447
	1999	471	460	475	516	516	490	524	533	469	484	507	514
	2000	468	467	456	491	483	483	522	448	492	470	476	509
	2001	464	466	470	486	478	477	505	530	513	499	509	521
	2002	467	493	516	521	527	531	507	547	546	504	521	530
	2003	544	522	563	551	580	606	603	607	610	600	626	632
	2004	579	593	567	604	610	586	585	612	596	578	602	599
	2005	586	598	595	596	598	604	648	653	670	691	684	677
	2006	604	625	643	689	704	693	716	748	704	731	683	757
Cod, frozen	1993	643	663	670	671	666	707	614	602	604	587	639	644
	1994	610	612	635	648	625	614	665	700	633	652	656	656
	1995	644	646	628	649	623	583	571	605	614	527	458	567
	1996	586	603	636	689	657	677	715	561	584	624	545	590
	1997	484	539	598	613	651	560	610	638	609	555	484	503
	1998	452	469	508	532	578	596	589	616	598	571	520	565
	1999	603	574	624	678	691	751	728	667	567	559	520	542
	2000	477	545	616	629	610	621	628	555	641	516	508	512
	2001	489	501	582	609	634	573	606	627	619	573	618	530
	2002	579	589	641	756	674	625	761	806	814	714	671	710
	2003	670	679	591	599	657	620	706	796	717	684	669	719
	2004	216	442	558	719	252	314	712	737	733	655	515	603
	2005	620	576	733	837	872	972	984	925	810	826	814	727
	2006	731	708	762	702	689	792	812	767	872	886	914	943
Surimi	1993	360	340	347	348	364	350	367	326	332	295	295	309
	1994	322	315	309	302	311	320	309	316	310	319	333	350
	1995	340	337	332	335	338	341	356	343	368	353	348	335
	1996	334	319	314	330	303	342	334	286	308	309	347	321
	1997	356	345	340	351	374	388	383	381	402	391	401	402
	1998	389	339	354	337	329	339	333	328	313	313	319	334
	1999	315	331	328	339	340	346	337	323	339	351	339	330
	2000	321	312	298	307	303	297	304	275	289	276	286	294
	2001	276	281	282	273	271	272	275	267	268	290	297	298
	2002	301	299	303	299	311	317	303	316	302	318	324	339
	2003	313	294	295	296	285	272	276	274	272	272	282	271
	2004	275	275	262	258	269	266	278	262	257	275	273	297
	2005	282	291	295	303	310	297	300	310	319	345	381	357
	2006	343	331	311	337	325	317	325	323	316	327	330	339

Note: From 1993-95 prices are for six large cities wholesale market, and from 1996-2006 prices are for ten large cities wholesale market.

Source: Monthly Statistics of Agriculture, Forestry & Fisheries, Stat. and Info. Dept., Ministry of Agriculture, Forestry & Fisheries, Government of Japan. Available from Alaska Fisheries Science Center P.O. Box 15700, Seattle, WA 98115-0070.

Table 54. U.S. imports of groundfish fillets, steaks and blocks, 1976-2006, quantity in million lb. product weight, and value in million dollars.

Year	Fillets & Steaks		Blocks		Total	
	Quantity	Value	Quantity	Value	Quantity	Value
1976	337	$273	379	$211	716	$484
1977	321	305	385	292	706	597
1978	333	341	406	325	739	666
1979	340	385	408	337	748	722
1980	297	341	336	289	633	630
1981	346	415	344	301	690	716
1982	371	458	319	274	690	732
1983	355	449	384	339	739	788
1984	373	459	316	263	689	722
1985	388	500	334	275	722	775
1986	366	542	364	380	730	922
1987	408	759	403	539	812	1,298
1988	323	568	303	382	626	950
1989	333	578	282	325	616	903
1990	262	482	264	373	526	856
1991	255	526	290	444	545	970
1992	221	437	229	304	450	741
1993	236	452	212	219	447	671
1994	229	433	200	184	428	617
1995	232	437	210	213	442	650
1996	223	407	234	213	457	620
1997	219	426	234	231	453	657
1998	236	460	233	271	469	731
1999	272	550	214	250	486	801
2000	284	545	204	209	488	753
2001	243	462	147	159	389	621
2002	283	531	147	165	430	695
2003	292	531	129	139	422	670
2004	326	571	135	153	462	724
2005	341	615	139	169	480	784
2006	327	635	117	145	444	780

Source: National Marine Fisheries Service, Office of Science and Technology, Fisheries Statistics Division. www.st.nmfs.noaa.gov/st1/trade/documents/TRADE2006.pdf

Table 55. U.S. per capita consumption of fish and shellfish, 1974-2006, population in millions and consumption in pounds, edible weight.

Year	Total civilian population	Per capita consumption			
		Fresh and Frozen	Canned	Cured	Total
1974	211.6	6.9	4.7	.5	12.1
1975	213.8	7.5	4.3	.4	12.2
1976	215.9	8.2	4.2	.5	12.9
1977	218.1	7.7	4.6	.4	12.7
1978	220.5	8.1	5.0	.3	13.4
1979	223.0	7.8	4.8	.4	13.0
1980	225.6	7.9	4.3	.3	12.5
1981	227.8	7.8	4.6	.3	12.7
1982	230.0	7.9	4.3	.3	12.5
1983	232.1	8.4	4.7	.3	13.4
1984	234.1	9.0	4.9	.3	14.2
1985	236.2	9.8	5.0	.3	15.1
1986	238.4	9.8	5.4	.3	15.5
1987	240.6	10.7	5.2	.3	16.2
1988	242.8	10.0	4.9	.3	15.2
1989	245.1	10.2	5.1	.3	15.6
1990	247.8	9.6	5.1	.3	15.0
1991	250.5	9.7	4.9	.3	14.9
1992	253.5	9.9	4.6	.3	14.8
1993	256.4	10.2	4.5	.3	15.0
1994	259.2	10.4	4.5	.3	15.2
1995	261.4	10.0	4.7	.3	15.0
1996	264.0	10.0	4.5	.3	14.8
1997	266.4	9.9	4.4	.3	14.6
1998	269.1	10.2	4.4	.3	14.9
1999	271.5	10.4	4.7	.3	15.4
2000	280.9	10.2	4.7	.3	15.2
2001	283.6	10.3	4.2	.3	14.8
2002	287.1	11.0	4.3	.3	15.6
2003	289.6	11.4	4.6	.3	16.3
2004	292.4	11.8	4.5	.3	16.6
2005	295.3	11.6	4.3	.3	16.2
2006	298.2	12.3	3.9	.3	16.5

Note: Per capita consumption represents pounds of edible meat consumed from domestically caught and imported fish and shellfish adjusted for beginning and ending inventories (through 2002) and exports, divided by the civilian resident population of the United States as of 1 July of each year. Population estimates for 1980-91 were revised to reflect changes from the 1990 decennial population enumeration. Changes did not significantly alter pounds per capita.

Source: U.S. Department of Commerce, Bureau of the Census, Washington, D.C. 20233; and Fisheries of the United States, National Marine Fisheries Service, Fisheries Statistics Division, 1315 East-West Highway, Silver Spring, MD 20910, various issues.

Table 56. U.S. consumption of all fillets and steaks, and fish sticks and portions, total in 1,000 lb. and per capita in pounds, product weight, 1980-2006.

Year	Fillets and steaks[1]		Fish sticks and portions	
	Total[2]	Per capita	Total[2]	Per capita
1980	541,440	2.4	451,200	2.0
1981	546,720	2.4	410,040	1.8
1982	575,000	2.5	391,000	1.7
1983	626,670	2.7	417,780	1.8
1984	702,300	3.0	421,380	1.8
1985	755,840	3.2	425,160	1.8
1986	810,560	3.4	429,120	1.8
1987	866,160	3.6	409,020	1.7
1988	776,960	3.2	364,200	1.5
1989	759,810	3.1	367,650	1.5
1990	768,180	3.1	371,700	1.5
1991	751,500	3.0	300,600	1.2
1992	735,150	2.9	228,150	0.9
1993	743,560	2.9	256,400	1.0
1994	803,520	3.1	233,280	0.9
1995	758,060	2.9	313,680	1.2
1996	792,000	3.0	264,000	1.0
1997	799,200	3.0	266,400	1.0
1998	861,120	3.2	242,190	0.9
1999	868,800	3.2	271,500	1.0
2000	1,011,240	3.6	252,810	0.9
2001	1,049,320	3.7	226,880	0.8
2002	1,177,110	4.1	229,680	0.8
2003	1,245,280	4.3	202,720	0.7
2004	1,345,040	4.6	204,680	0.7
2005	1,476,500	5.0	265,770	0.9
2006	1,550,640	5.2	268,380	0.9

[1]Series revised in 1993 to reflect deduction of fillet production used to produce blocks, exports of foreign fillets and steaks, and changes in population estimates from 1990 decennial population enumeration.

[2]Per capita multiplied by total U.S. population.

Source: Computed from data from U.S. Department of Commerce, Bureau of the Census; and Fisheries of the United States, National Marine Fisheries Service, Fisheries Statistics Division, 1315 East-West Highway, Silver Spring, MD 20910, various issues.

Table 57. Annual U.S. economic indicators: Selected producer and consumer price indexes and gross domestic product implicit price deflator, 1976-2006.

Year	Producer Price Index[1]					Consumer Price Index[2]				GDP Deflator[3]
	All items	Meat	Poultry	Fish	Petrol. Products	All Items	Meat	Poultry	Fish	
1976	61.1	69.3	93.0	64.5	36.3	56.9	66.4	76.4	60.2	40.39
1977	64.9	68.1	97.0	69.7	40.5	60.6	64.9	76.9	66.6	42.92
1978	69.9	83.6	108.6	74.1	42.2	65.2	77.0	84.9	73.0	46.07
1979	78.7	93.3	105.6	90.9	58.4	72.6	90.1	89.1	80.1	50.12
1980	89.8	94.1	108.2	87.8	88.6	82.4	92.7	93.7	87.5	54.56
1981	98.0	95.4	108.2	89.4	105.9	90.9	96.0	97.5	94.8	59.64
1982	100.0	100.0	100.0	100.0	100.0	96.5	100.7	95.8	98.2	63.18
1983	101.3	94.3	103.7	105.4	89.9	99.6	99.5	97.0	99.3	65.52
1984	103.7	94.5	115.3	112.7	87.4	103.9	99.8	107.3	102.5	67.95
1985	103.2	90.9	110.4	114.6	83.2	107.6	98.9	106.2	107.5	69.84
1986	100.2	93.9	116.8	124.9	53.2	109.6	102.0	114.2	117.4	71.43
1987	102.8	100.4	103.5	140.0	56.8	113.6	109.6	112.6	129.9	73.43
1988	106.9	99.9	111.6	148.7	53.9	118.3	112.2	120.7	139.4	76.14
1989	112.2	104.8	120.4	142.9	61.2	124.0	116.7	132.7	143.6	78.88
1990	116.3	117.0	113.6	147.2	74.8	130.7	128.5	132.5	146.7	82.03
1991	116.5	113.5	109.9	149.5	67.2	136.2	132.5	131.5	148.3	84.76
1992	117.2	106.7	109.0	156.1	64.7	140.3	130.7	131.4	151.7	86.58
1993	118.9	110.6	111.7	156.5	62.0	144.5	134.6	136.9	156.6	88.57
1994	120.4	104.7	114.7	161.4	59.1	148.2	135.4	141.5	163.7	90.53
1995	124.7	102.9	114.2	170.8	60.8	152.4	135.5	143.5	171.6	92.29
1996	127.7	109.0	119.7	165.9	70.1	156.9	140.2	152.4	173.1	93.95
1997	127.6	111.6	117.4	178.1	68.0	160.5	144.4	156.6	177.1	95.53
1998	124.4	101.3	120.8	183.2	51.3	163.0	141.6	157.1	181.7	96.60
1999	125.5	104.6	114.0	190.9	60.9	166.6	142.3	157.9	185.3	98.01
2000	132.7	114.3	112.9	198.1	91.3	172.2	150.7	159.8	190.4	100.26
2001	134.2	120.3	116.8	190.8	85.3	177.1	159.3	164.9	191.1	102.68
2002	131.1	113.4	111.3	191.2	79.5	179.9	160.3	167.0	188.1	104.33
2003	138.1	128.2	116.6	195.3	97.7	184.0	169.0	169.1	190.0	106.61
2004	146.7	134.9	130.2	206.3	119.9	188.9	183.2	181.7	194.3	109.79
2005	157.4	139.0	128.6	222.6	165.0	195.3	187.5	185.3	200.1	113.41
2006	164.7	135.3	118.1	237.4	193.2	201.6	188.8	182.0	209.5	117.03

[1]Index 1982 = 100.
[2]Index 1982-84 = 100.
[3]Index 2000 = 100. GDP deflators are the values published for 1 July (second quarter) of each year.

Source: Producer prices and price indexes, and consumer price indexes: U.S. Department of Labor, Bureau of Labor Statistics, http://www.bls.gov/data/sa.htm; GDP deflators: U.S. Department of Commerce, Bureau of Economic Analysis, http://research.stlouisfed.org/fred2/series/GDPDEF

Table 58. Monthly U.S. economic indicators: Selected producer and consumer price indexes, 2004-06.

	Producer Price Index[1]					Consumer Price Index[2]			
Month	All Items	Meat	Poultry	Fish	Petrol. Products	All Items	Meat	Poultry	Fish
2004									
Jan	141.4	124.8	122.5	208.5	103.6	185.2	180.6	174.5	194.1
Feb	142.1	124.5	130.9	207.2	103.7	186.2	180.2	174.1	193.2
Mar	143.1	128.6	132.5	215.8	108.0	187.4	179.0	177.8	190.6
Apr	144.8	134.5	133.6	201.2	114.2	188.0	179.0	178.1	192.8
May	146.8	141.8	137.8	197.2	123.4	189.1	182.1	181.6	193.9
Jun	147.2	143.8	137.7	189.9	115.7	189.7	184.2	182.6	193.4
Jul	147.4	138.6	136.7	198.6	122.2	189.4	185.8	184.9	195.6
Aug	148.0	136.5	132.7	206.6	122.9	189.5	185.7	186.8	194.1
Sep	147.7	133.7	127.5	205.6	125.2	189.9	185.9	186.4	195.1
Oct	150.0	137.5	123.8	207.3	142.8	190.9	185.0	186.9	195.8
Nov	151.4	136.0	123.1	219.2	136.6	191.0	185.2	183.4	196.5
Dec	150.2	138.8	124.1	218.9	120.8	190.3	185.6	183.3	196.9
2005									
Jan	150.9	139.5	124.0	209.1	126.2	190.7	185.9	183.8	199.4
Feb	151.6	141.5	128.6	226.2	133.0	191.8	187.2	182.0	196.9
Mar	153.7	143.0	128.4	236.1	148.6	193.3	187.6	185.0	196.2
Apr	155.0	141.9	127.9	221.3	155.3	194.6	188.3	184.1	199.4
May	154.3	145.5	130.0	222.9	151.3	194.4	189.1	183.7	198.6
Jun	154.3	139.9	129.5	200.3	156.9	194.5	189.2	184.9	199.5
Jul	156.3	135.4	131.5	210.1	169.6	195.4	187.7	185.9	199.7
Aug	157.6	134.2	131.4	212.1	179.5	196.4	187.0	186.9	200.4
Sep	162.2	135.0	132.7	220.4	200.7	198.8	186.8	188.9	200.4
Oct	166.2	137.3	131.5	241.8	214.9	199.2	186.6	186.5	202.0
Nov	163.7	136.6	126.2	229.1	171.5	197.6	187.3	187.6	204.1
Dec	163.0	138.2	121.5	242.3	172.1	196.8	187.8	183.8	204.4
2006									
Jan	164.3	138.2	117.1	229.4	177.2	198.3	187.9	181.5	206.3
Feb	161.8	133.7	115.0	249.5	169.3	198.7	188.2	181.4	206.1
Mar	162.2	135.3	112.6	244.3	184.6	199.8	188.6	182.1	205.2
Apr	164.3	131.4	109.7	278.9	207.4	201.5	188.4	180.5	206.4
May	165.8	134.3	111.2	253.1	215.5	202.5	187.5	180.1	208.1
Jun	166.1	135.9	118.9	254.0	220.4	202.9	187.9	182.4	210.2
Jul	166.8	139.5	120.6	228.0	219.7	203.5	187.8	180.9	208.7
Aug	167.9	137.4	123.7	208.9	219.0	203.9	189.0	183.8	212.3
Sep	165.4	137.7	124.7	222.9	185.1	202.9	190.0	183.9	213.7
Oct	162.2	134.7	120.7	224.7	172.3	201.8	190.5	182.9	213.7
Nov	164.6	133.7	120.1	221.7	172.2	201.5	190.7	181.8	211.8
Dec	165.6	131.4	122.9	233.3	175.2	201.8	189.4	182.5	211.6

[1]Index 1982 = 100.
[2]Index 1982-84 = 100.

Source: U.S. Department of Labor, Bureau of Labor Statistics, http://www.bls.gov/data/sa.htm

Table 59. Annual foreign exchange rates for selected countries, 1976-2006, in national currency units per U.S.dollar.

Year	Canada (dollar)	Denmark (kroner)	Japan (yen)	ROK (won)	New Zealand (dollar)	Iceland (kronur)	Norway (kroner)	U.K. (pound)
1976	0.9860	6.0450	296.55	484.00	1.0036	1.822	5.4565	0.5536
1977	1.0635	6.0032	268.51	484.00	1.0301	1.989	5.3235	.5729
1978	1.1407	5.5146	210.44	484.00	.9636	2.711	5.2423	.5210
1979	1.1714	5.2610	219.14	484.00	.9776	3.526	5.0641	.4713
1980	1.1692	5.6359	226.74	607.43	1.0265	4.798	4.9392	.4299
1981	1.1989	7.1234	220.54	681.03	1.4194	7.224	5.7395	.4931
1982	1.2337	8.3324	249.08	731.08	1.3300	12.352	6.4540	.5713
1983	1.2324	9.1450	237.51	775.75	1.4952	24.843	7.2964	.6592
1984	1.2951	10.3566	237.52	805.98	1.7286	31.694	8.1615	.7483
1985	1.3655	10.5964	238.54	870.02	2.0064	41.508	8.5970	.7714
1986	1.3895	8.0910	168.52	881.45	1.9088	41.104	7.3947	.6971
1987	1.3260	6.8400	144.64	822.57	1.6886	38.677	6.7375	.6102
1988	1.2307	6.7320	128.15	731.47	1.5244	43.104	6.5170	.5614
1989	1.1840	7.3100	137.96	671.46	1.6708	57.042	6.9045	.6099
1990	1.1668	6.1890	144.79	707.76	1.6750	58.284	6.2597	.5603
1991	1.1457	6.3960	134.71	733.35	1.7265	58.996	6.4829	.5652
1992	1.2087	6.0360	126.65	780.65	1.8580	57.546	6.2145	.5664
1993	1.2901	6.4840	111.20	802.67	1.8494	67.603	7.0941	.6658
1994	1.3656	6.3610	102.21	803.44	1.6844	69.944	7.0576	.6529
1995	1.3724	5.6020	94.06	771.27	1.5235	64.692	6.3352	.6335
1996	1.3635	5.7990	108.78	804.45	1.4540	66.500	6.4498	.6400
1997	1.3849	6.6092	121.06	950.77	1.5094	70.904	7.0857	.6106
1998	1.4835	6.7008	130.91	1401.44	1.8683	70.958	7.5451	.6038
1999	1.4858	6.9900	113.73	1189.84	1.8889	72.474	7.8071	.6184
2000	1.4855	8.0953	107.80	1130.90	2.1805	78.896	8.8131	.6598
2001	1.5487	8.3323	121.57	1292.01	2.3798	97.690	8.9964	.6946
2002	1.5704	7.8862	125.22	1250.31	2.1529	91.669	7.9839	.6656
2003	1.4013	6.5800	115.97	1192.08	1.7185	76.780	7.0819	.6120
2004	1.3017	5.9891	108.15	1145.24	1.5053	70.261	6.7399	.5456
2005	1.2115	5.9953	110.11	1023.75	1.4186	62.919	6.4412	.5493
2006	1.1340	5.9422	116.31	954.32	1.5404	70.102	6.4095	.5425

ROK – Republic of Korea; U.K. – United Kingdom.

Source: Through 1998: International Financial Statistics, International Monetary Fund, Washington, D.C.; 1999-2006 (except Iceland): U.S. Federal Reserve Board, www.federalreserve.gov; Iceland, 1999-2006: www.oanda.com

Table 60. Monthly foreign exchange rates for selected countries, 2004-06, in national currency units per U.S. dollar.

Month	Canada (dollar)	Denmark (kroner)	Japan (yen)	ROK (won)	New Zealand (dollar)	Iceland (kronur)	Norway (kroner)	U.K. (pound)
2004								
Jan	1.2958	5.8952	106.27	1183.4	1.484	69.71	6.81	.548
Feb	1.3299	5.8956	106.71	1167.5	1.446	68.73	6.95	.536
Mar	1.3286	6.0757	108.52	1166.3	1.514	71.28	6.96	.548
Apr	1.3420	6.2104	107.66	1152.9	1.559	72.91	6.93	.555
May	1.3789	6.2021	112.20	1177.9	1.626	73.48	6.84	.560
Jun	1.3578	6.1220	109.43	1159.0	1.591	72.12	6.83	.547
Jul	1.3225	6.0631	109.49	1158.7	1.546	71.56	6.91	.542
Aug	1.3127	6.1007	110.23	1158.0	1.524	71.50	6.84	.549
Sep	1.2881	6.0866	110.09	1148.7	1.517	71.83	6.84	.558
Oct	1.2469	5.9486	108.78	1141.6	1.461	70.10	6.58	.553
Nov	1.1968	5.7178	104.70	1086.4	1.427	67.09	6.27	.537
Dec	1.2189	5.5449	103.81	1050.4	1.399	62.83	6.14	.519
2005								
Jan	1.2248	5.6699	103.34	1038.0	1.415	62.56	6.27	.532
Feb	1.2401	5.7195	104.94	1023.1	1.398	62.16	6.40	.530
Mar	1.2160	5.6488	105.25	1007.8	1.370	60.07	6.21	.525
Apr	1.2359	5.7554	107.19	1010.1	1.387	62.24	6.31	.527
May	1.2555	5.8628	106.60	1001.8	1.391	64.90	6.37	.539
Jun	1.2402	6.1247	108.75	1012.5	1.412	65.26	6.49	.550
Jul	1.2229	6.1943	111.95	1036.6	1.473	65.21	6.58	.571
Aug	1.2043	6.0665	110.61	1021.7	1.438	63.82	6.44	.557
Sep	1.1777	6.0973	111.24	1029.8	1.431	62.20	6.38	.554
Oct	1.1774	6.2064	114.87	1045.9	1.432	60.98	6.51	.567
Nov	1.1815	6.3277	118.45	1040.8	1.450	61.87	6.64	.576
Dec	1.1615	6.2844	118.46	1022.4	1.439	63.68	6.72	.573
2006								
Jan	1.1572	6.1530	115.48	981.44	1.455	61.82	6.63	.565
Feb	1.1489	6.2514	117.86	969.84	1.485	64.26	6.75	.572
Mar	1.1573	6.2025	117.28	974.71	1.577	69.64	6.63	.573
Apr	1.1441	6.0798	117.07	952.60	1.608	74.97	6.39	.566
May	1.1100	5.8398	111.73	940.82	1.585	72.22	6.10	.535
Jun	1.1137	5.8897	114.63	954.45	1.616	74.40	6.21	.542
Jul	1.1294	5.8826	115.77	950.81	1.619	74.73	6.26	.542
Aug	1.1182	5.8236	115.92	960.95	1.575	70.62	6.24	.528
Sep	1.1161	5.8633	117.21	952.29	1.526	70.40	6.50	.531
Oct	1.1285	5.9085	118.61	952.64	1.510	68.79	6.66	.533
Nov	1.1359	5.7858	117.32	935.41	1.494	69.31	6.40	.523
Dec	1.1532	5.6452	117.32	924.98	1.442	69.80	6.18	.509

ROK – Republic of Korea; U.K. – United Kingdom.

Source: U.S. Federal Reserve Board, www.federalreserve.gov, except that exchange rates for Iceland are from www.oanda.com

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Fleet Profiles for Walleye Pollock and Pacific Cod

October 2007

Kathleen Herrmann
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Ron Felthoven, Mike Dalton, and Mary Furuness were invaluable to the completion of this report. They supported the process in many ways including answering questions, reviewing and editing content of the document, and providing general guidance as to the overall goal of this project. Emilie Springer also assisted in data collection in a previous year.

INTRODUCTION:

History of Alaska Fishing

Commercial harvesting began in Alaska in1864 using handlines and setlines to catch cod, salmon, sablefish, and halibut (NPFMCa, 2006). Salmon and herring fishing began in the late 1880's (Woody, 2005). This harvesting was mainly conducted by foreign fleets. Groundfish and crab commercial harvesting began in the late 1950's, primarily by Japanese and Soviet fleets. By 1963, over 240 Japanese and Soviet trawl vessels and motherships were operating plus 60 Japanese longline vessels. Until 1965, these foreign fishing efforts were virtually unregulated. During this time period prior to the passage of the Magnuson-Stevens Act, bilateral agreements were made between the US and Japan, USSR, South Korea, and Taiwan. The purpose of these agreements was to address allocation issues and minimize gear conflicts in addition to protecting domestic fisheries (NPFMCa, 2006).

Even with these agreements, the groundfish fisheries off Alaska primarily operated as open access fisheries. Open access is defined as a "condition in which access to a fishery is not restricted (i.e. no license limitation, quotas, or other measure that would limit the amount of fish that an individual fisher can harvest" (NOAA, 2005). The Magnuson Fishery Conservation and Management Act of 1976 (renamed the Magnuson-Stevens Act in 1996, hereafter referred to as MSA) gave federal authority over the exclusive economic zone (EEZ) between 3 and 200 nm from shore (federal waters). This is the primary law governing fisheries in the US. The states have jurisdiction over the fisheries less than 3 nm from shore (state waters). The MSA allowed the US to make a sovereign claim over the fishery resources of the EEZ and to transition fishery resources from an open access system to a common property system. It also gave the US exclusive fishery management authority in these federal waters. The MSA was also enacted to promote commercial fisheries in the United States, to eventually eliminate joint venture fishing, and to create the eight regional fishery management councils (FMC).

One of these FMC, the North Pacific Fisheries Management Council (NPFMC), was tasked with creating preliminary fishery management plans (FMP) covering all fisheries in the United States North Pacific EEZ. The NPFMC published its first Statement of Organization, Practices, and Procedures (SOPP) on March 1, 1977. The first FMPs in Alaska were created in 1979 for GOA Groundfish and in 1982 for BSAI Groundfish. Both FMPs were most recently updated in June 2006.

The Alaskan EEZ fisheries transitioned from a state of being prosecuted almost exclusively by foreign vessels to one in which "joint ventures" between foreigners and Americans were predominant and finally to an "Americanized" fishery in which Americans were required to have majority ownership in harvesting enterprises (Queirolo, 1989). This effort was successful largely because of government support and loan programs. "However as the resources were "Americanized" in the late 1980s, the size and exclusivity of user groups and associated catch rights were not tightly controlled. Although groundfish stocks and harvests were maintained at relatively high and steady levels through limits on total allowable catch (TAC), a "race for fish" and accompanying "race to process" led to dissipation of resource rents through overcapitalization and reduction in product value. Over time, the industry and the North Pacific Fisheries Management Council have implemented a variety of measures that more clearly delineate the catch rights of groups or individuals enabling them to curtail or eliminate the "race for fish" and to increase efficiency at the individual and industry level. These management measures include sectoral catch allocations, license limitation programs, individual fishing quota systems, community development quotas, and harvest cooperatives" (Holland, 2000, p. 2). These measures are discussed in greater detail throughout this report.

One of the most significant management changes in Alaska occurred in the late 1990s in the pollock fishery -- the largest groundfish fishery in Alaska and the US. The American Fisheries Act (AFA) of October 1998 was enacted to provide the BSAI pollock fleet a system in which to conduct their fishery in a more rational manner (NPFMC, 2002). See the section on walleye pollock for more information.

Harvesting and processing limitations imposed by the AFA are referred to as sideboards. The sideboard limit is a collective fishing quota for all AFA vessels for targeting species other than pollock. Sideboards are intended to lessen the impact of the AFA on non-AFA vessels. The sideboard prevents AFA vessels involved in directed fishing for pollock from also fishing other species beyond their historical level of participation. According to 50 CFR 680b22, revised August 7, 2006, these sideboard restrictions also apply to State of Alaska parallel groundfish fisheries. The following quote describes how sideboards are determined. "The sideboard ratios for groundfish species and species groups other than Pacific cod and fixed-gear sablefish are calculated by dividing the aggregate landed catch by vessels subject to sideboard directed fishing closures under paragraph (a)(1) of this section by the total landed catch of that species by all groundfish vessels between 1996 and 2000 (50 CFR 680b22)". The NPFMC approves these limits on a yearly basis.

License Limitation Program (LLP)

The LLP was created to replace a 1996 vessel moratorium implemented by the NPFMC which banned the entry of new vessels into the groundfish fisheries. The vessel moratorium had served as a stop-gap measure to curb entry and participation in many of the Alaska fisheries. As of January 1, 2000, any person wishing to fish in Federal LLP Groundfish areas must hold a valid groundfish license issued under the LLP. This license is required for any person who wishes to deploy a fishing vessel in the GOA or a catcher vessel or catcher/processor in the BSAI for all groundfish other than fixed gear sablefish. Fishing vessels in State of Alaska waters (0-3 miles offshore) are exempt, and additional exemptions apply in the EEZ:

GOA Exemptions:

- Vessels targeting demersal shelf rockfish in the Southeast Outside area are exempt
- Vessels less than 26 ft LOA are exempt

BSAI Exemptions:

- Vessels less than 32 ft LOA are exempt.
- Jig gear vessels less than 60 ft LOA using a maximum of 5 jig machines, one line per machine, and a maximum of 15 hooks per line are exempt

Individual Fishing Quota (IFQ)

An IFQ program was implemented for halibut and sablefish in 1995. "It intended to address a variety of problems stemming from the "race for fish" including: allocation conflicts, gear conflicts, dead loss due to ghost fishing by lost gear, excessive bycatch and discards, excess harvesting capacity, reduced product quality as reflected in prices, poor safety, lack of economic stability for fishery participants and communities, and a lack of rural coastal community development" (Holland, 2000, p. 5)

"The halibut IFQ program applies to all commercial hook-and-line harvests of halibut in state and federal waters off Alaska. The program does not apply to subsistence, treaty, or sport fisheries or to bycatch with trawl or pot gear. The sablefish IFQ program is limited to longline and pot gear fisheries in federal waters off Alaska and does not apply to sablefish harvested in state waters or in the trawl fisheries" (NRC, 1999, p. 308).

Community Development Quota (CDQ) Program

The Community Development Quota (CDQ) Program was implemented in 1992 by the North Pacific Fishery Management Council. The CDQ Program allocates a percentage of all Bering Sea and Aleutian Islands quotas for groundfish, prohibited species, halibut, and crab to eligible communities. The purpose of the CDQ Program is to (i) to provide eligible western Alaska villages with the opportunity to participate and invest in fisheries in the Bering Sea and Aleutian Islands Management Area; (ii) to support economic development in western Alaska; (iii) to alleviate poverty and provide economic and social benefits for residents of western Alaska; and (iv) to achieve sustainable and diversified local economies in western Alaska.[3]

[3] NOAA CDQ Website http://www.fakr.noaa.gov/cdq/default.htm

Prohibited and Incidental Species Bycatch and Retention Policies

Both the Gulf of Alaska and Bering Sea Aleutian Islands FMPs have prohibited species catch (PSC) limits in place. The PSC limit is the amount of non-retainable fish allocated to a fishery for bycatch purposes. These species must be avoided by the groundfish fishing fleet and must be returned to the sea with minimum injury unless another law is applicable. Should the PSC limit be reached for a species, this will result in the closure of the appropriate fishery as determined by the NPFMC. Pacific salmon and Pacific halibut can be donated to economically disadvantaged individuals through the rules in place in the Prohibited Species Donation Program[4].

EXCERPTS FROM GOA FMP (p. 33-34):
The NPFMC believes that discarding incidental catches of fish is wasteful and should be minimized. However, recognizing that in the groundfish fisheries halibut incidentally caught are managed outside this FMP, the treatment of halibut as a prohibited species is appropriate in the short term. Except as provided under the prohibited species donation program, retention of prohibited species captured while harvesting groundfish is prohibited to prevent covert targeting on these species. The prohibition removes the incentive that groundfish fishers might otherwise have to target on the relatively high valued prohibited species, and thereby, results in a lower incidental catch. It also eliminates the market competition that might otherwise exist between halibut fishers and groundfish fishers who might land halibut in the absence of the prohibition.

Halibut that are taken as bycatch in the trawl and fixed gear fisheries result in fishing mortality even though the FMP requires that these species be discarded. Bycatch survival rates of halibut are typically less than 100 percent and may approach zero for some fisheries and some gear.

Prohibited Species in the GOA & BSAI[5]:

- Pacific halibut
- Pacific herring
- Pacific salmon
- Steelhead trout
- King crab
- Tanner crab

Further regulations restrict the way in which target species can be utilized once harvested. In 1990, roe stripping of pollock (in which

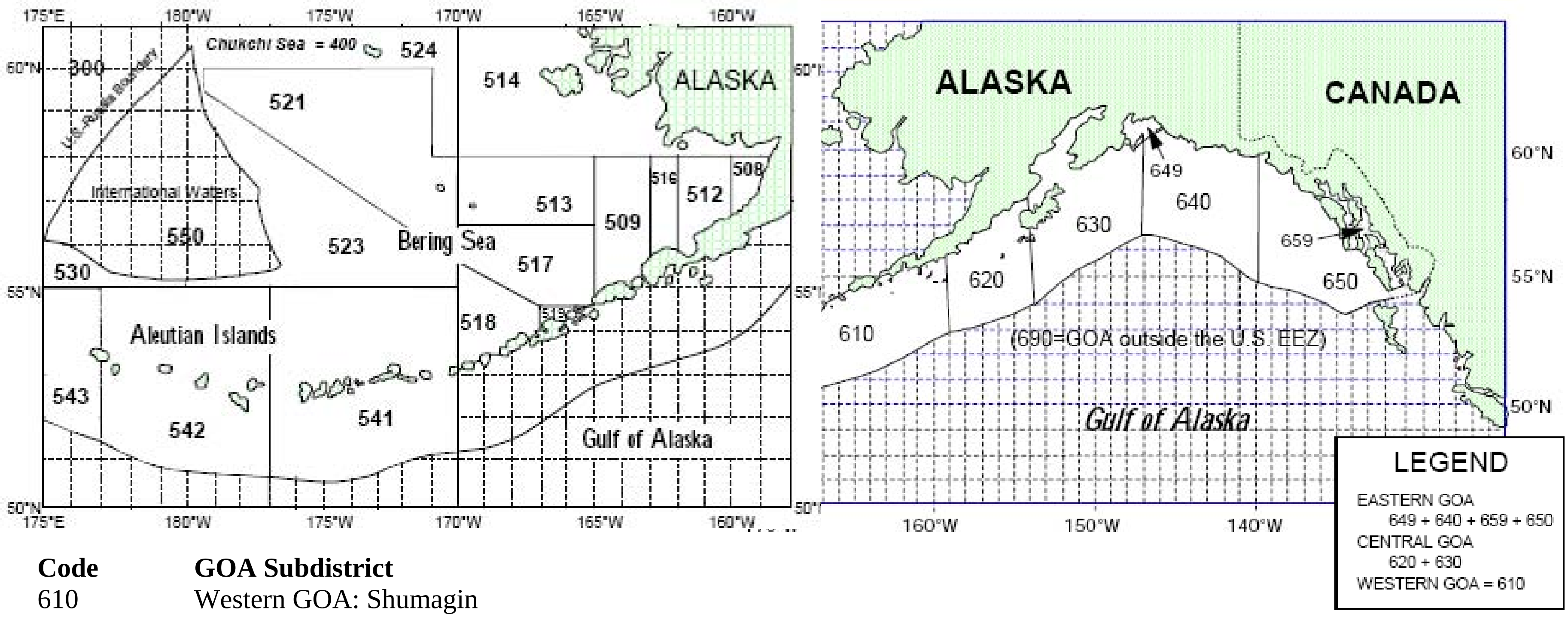
[4] BSAI FMP http://www.fakr.noaa.gov/npfmc/fmp/bsai/BSAI.pdf & GOA FMP http://www.fakr.noaa.gov/npfmc/fmp/goa/GOA.pdf
[5] In the BSAI these species have individual species limits.

the carcass is discarded after only the roe is removed) was prohibited in both the GOA and the BSAI. The prohibition was implemented because the practice was considered wasteful.

In addition, a 1998 improved retention/improved utilization (IR/IU) program requires 100 percent retention of pollock and Pacific cod in the GOA and the BSAI as well as shallow water flatfish in the GOA. “All vessels participating in the groundfish fisheries are required to retain all catch of pollock, Pacific cod, and shallow water flatfish (GOA only) when directed fishing for those species is open, regardless of gear type employed and target fishery. When directed fishing for pollock, Pacific cod, or shallow water flatfish is prohibited, retention of those species is required up to any maximum retainable amount in effect for these species, and these retention requirements are superseded if retention of pollock, Pacific cod, or shallow water flatfish is prohibited by other regulations. No discarding of whole fish of these species is allowed, either prior to or subsequent to that species being brought on board the vessel, except as permitted in the regulations. At-sea discarding of any processed product from pollock, Pacific cod, or shallow water flatfish is also prohibited, unless required by other regulations” (NPFMC, 2006c)

Maps of Management Areas for BSAI and GOA[6]

Figure 1: Management Area in BSAI and GOA



Code	GOA Subdistrict
610	Western GOA: Shumagin
620	Central GOA: Chirikof
630	Central GOA: Kodiak
640	Eastern GOA: Western Yakutat (WYK)
649	Eastern GOA: Prince William Sound
650	Eastern GOA: Southeast Outside Alaska
659	Eastern GOA: Southeast Inside District

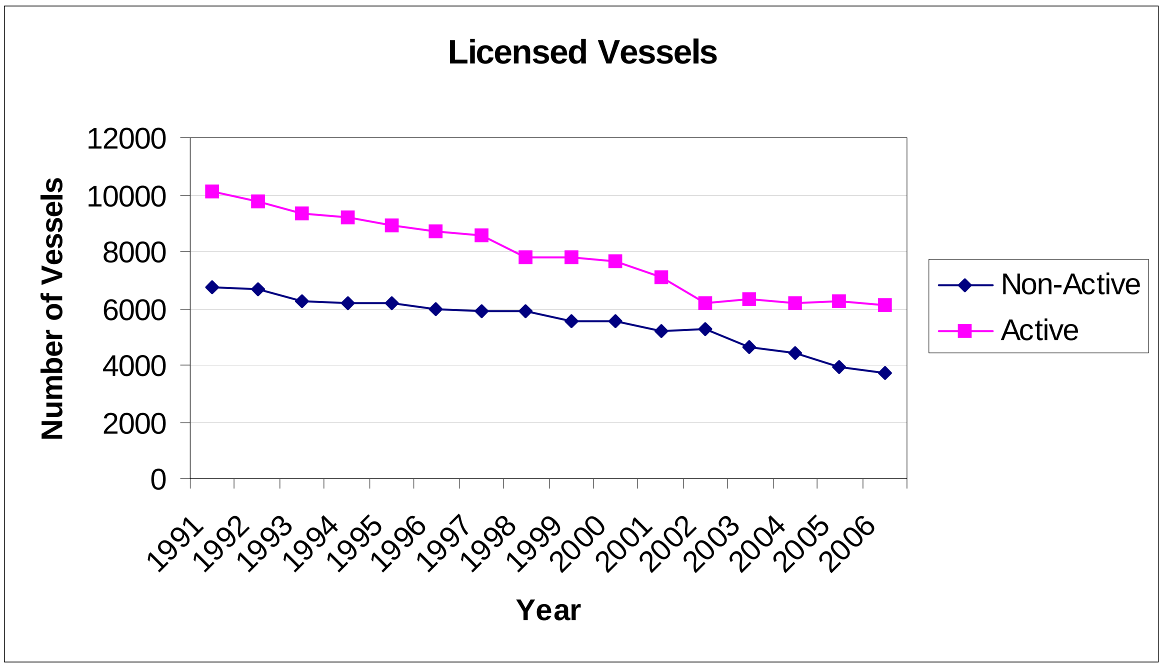
[6] Maps accessed August, 2007 http://www.fakr.noaa.gov/rr/figures.htm

Vessel Counts: Active v. Non-Active Vessels

Figure 2: Licensed Vessels shows the number of vessels (active and non-active) licensed to fish in Alaska from 1991 to 2006. Data on Alaska state vessel registration were obtained from the Alaska Commercial Fisheries Entry Commission (CFEC)[7] website and data on Federal vessel registration were obtained from Federal Fisheries Permit listings maintained by the NMFS Alaska Regional Office. A vessel is considered active if it appeared in either federal catch records (blend/catch-accounting system) or Alaska state catch records (CFEC fish tickets) during the year for any fishery or species (not just groundfish).

The overall number of licensed vessels has declined from approximately 10,000 vessels in 1991 to just above 6,000 vessels in 2006. The number of non-active vessels has also declined, dropping from 6,500 in 1991 to approximately 3,800 in 2006. The average difference between active and non-active in Alaska averaged for this time period is 2,360 vessels. The average percentage of total licensed vessels that were non-active over this time period is 41%.

Figure 2: Licensed Vessels (1991-2006)



[7] Data accessed August 2007 http://www.cfec.state.ak.us/fishery_statistics/vessels.htm

SPECIES: WALLEYE POLLOCK, (RATIONALIZED IN 1999 FOR CATCHER/PROCESSORS AND MOTHERSHIPS, AND IN 2000 FOR CATCHER VESSELS).

Location of Fishery

BSAI, GOA (subdistricts: Shumagin, Chirikof, Kodiak, Western Yakutat (WYK), South East Outside (SEO)). The vast majority of pollock fishing occurs in the Eastern Bering Sea.

Brief History

"Following early exploratory fishing in the Bering Sea in 1930, Japan fished for pollock during 1933-1937. By the early 1960's Japanese trawlers began targeting pollock. Bering Sea foreign (Japan, Russia, Korea) fisheries reached a record 4.8 billion lb (2.2 million mt) of pollock, flatfish, rockfish, cod, and other groundfish in 1972. Thereafter, total groundfish harvests dropped sharply in the BSAI. In 1995, a state-managed directed pollock fishery was initiated in Prince William Sound and harvest have average 4.98 million lb (2,259 mt) annually" (Woody, 2005, p. 48).

"Rationalization" is a term used to describe a fishery management plan that "results in an allocation of labor and capital between fishing and other industries that maximizes the net value of production" (Fina, 2003). The passage of the American Fisheries Act (AFA) in October 1998 was a form of rationalization for the pollock fishery with implications for other groundfish fisheries. The AFA required that a vessel must have a minimum of 75% US ownership to participate in fisheries off Alaska. The AFA also specifies that a TAC must be set for the directed pollock fishery with an automatic 10% of the TAC allocated to the Community Development Quota (CDQ) Program (Oliver, 1999). The AFA addresses issues of overcapacity by retiring certain catcher/processors, limiting the entry of additional harvesting vessels, authorizing cooperatives, and preventing pollock fishery participants from expanding beyond historical activities to other fisheries. The AFA goes on to name specific catcher/processors, catcher vessels and motherships that will be allowed to continue to participate in the fishery. Some specific vessels were named for removal from the industry and these vessels were compensated, with the remaining vessels re-paying the loan used to fund the compensation through a landings tax. The AFA-named catcher/processors and catcher vessels are referred to as AFA-vessels. Ten pollock cooperatives were developed as a result of the AFA; seven inshore co-ops, two offshore co-ops, and one mothership co-op. The first cooperative was formed in 1999 by a private-sector initiative, Pollock Conservation Cooperative (PCC)[8], and is made up of nine catcher/processor companies that divide the sector's overall quota allowance among the companies. The cooperatives each year make inter-cooperative agreements to address some matters of fishery regulation, such as the sharing of information about salmon bycatch.

Gear Types

Pelagic trawl has consistently been the main gear type used to fish for Walleye pollock since bottom trawling was banned in the BSAI

[8] Website accesses August 2007 http://www.atsea.org/fishing_coops.php

in 1999. There are three main sectors involved in pollock fishing: the catcher/processor (CP), catcher vessel (CV), and mothership sectors.

TAC & ABC (per area)[9]

Table 1 TAC & ABC (metric tons)

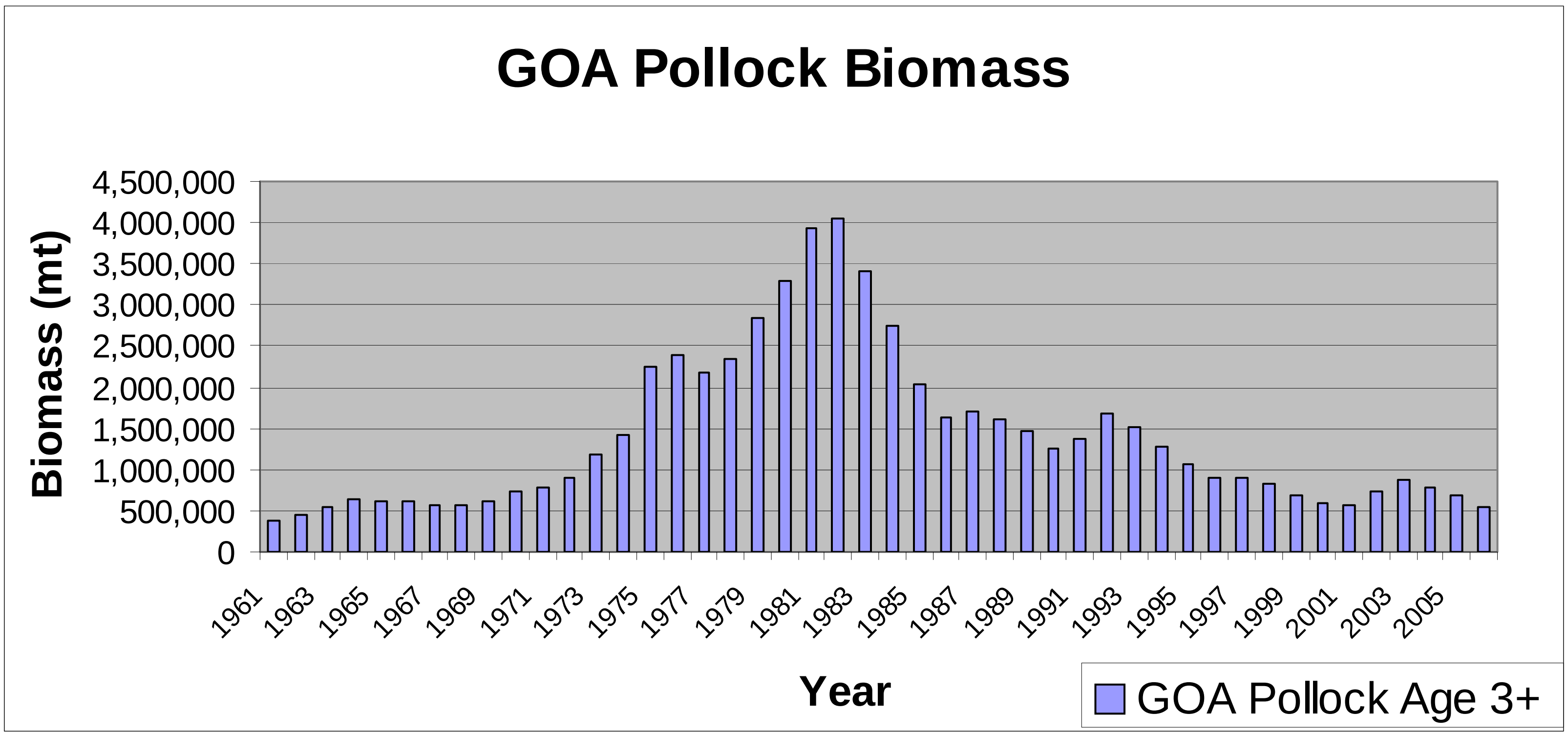
	2004		**2005**		**2006**		**2007**		**2008 (proposed 3-2-07)**	
BSAI	ABC	TAC	ABC	TAC	ABC	TAC	ABC	TAC	ABC	TAC
BS:	2,560,000	1,492,000	1,960,000	1,478,500	1,930,000	1,487,756	1,394,000	1,394,000	1,318,000	1,318,000
AI:	39,400	1,000	19,000	19,000	29,400	19,000	44,500	19,000	41,000	19,000
Bogoslof:	2,570	50	10	10	5,500	10	5,220	10	5,220	10
BS CDQ: 10%		149,200		147,850		148,776		139,400		131,800
All BSAI	2,601,970	1,493,050	1,979,010	1,497,510	1,964,900	1,506,766	1,443,720	1,413,010	1,364,220	1,337,010
GOA	ABC	TAC	ABC	TAC	ABC	TAC	ABC	TAC	ABC	TAC
Shumagin	22,930	22,930	30,380	30,380	28,918	28,918	25,012	25,012	30,308	30,308
Chirikof:	26,490	26,490	34,404	34,404	30,492	30,492	20,980	20,980	25,313	25,313
Kodiak:	14,040	14,040	18,718	18,718	18,448	18,448	14,850	14,850	17,995	17,995
WYK:	1,280	1,280	1,688	1,688	1,792	1,792	1,398	1,398	1,694	1,694
SEO:	6,520	6,520	6,520	6,520	6,157	6,157	6,157	6,157	6,157	6,157
All GOA	71,260	71,260	91,710	91,710	85,807	85,807	68,397	68,397	81,467	81,467

[9] http://www.fakr.noaa.gov/frules/fr9242.pdf (BSAI 2004)
http://www.fakr.noaa.gov/frules/70fr8679.pdf (BSAI 2005-2006)
http://www.fakr.noaa.gov/frules/72fr9451.pdf (BSAI 2007-2008)
http://www.fakr.noaa.gov/frules/fr961.pdf (GOA 2004-2005)
http://www.fakr.noaa.gov/frules/70fr8958.pdf (GOA 2005-2006)
http://www.fakr.noaa.gov/frules/71fr10870.pdf (GOA 2006-2007)

GOA Biomass

GOA pollock are managed as a single stock, unlike the BSAI stocks (NPFMCc, 2006). This single stock TAC has been divided spatially and temporally since 1992 to reduce the potential impact on Stellar Sea Lions and ensure that the substocks are not disproportionately harvested (NPFMCe, 2006). In the GOA, reserves are set at 20 percent of the TAC for pollock. Since the mid-1980s, overall biomass has declined as shown in Figure 3. Since 2004 the ABC for GOA pollock has been between approximately 68,000 and 91,000 metric tons.

Figure 3: GOA Pollock Biomass (1961-2006)[10]

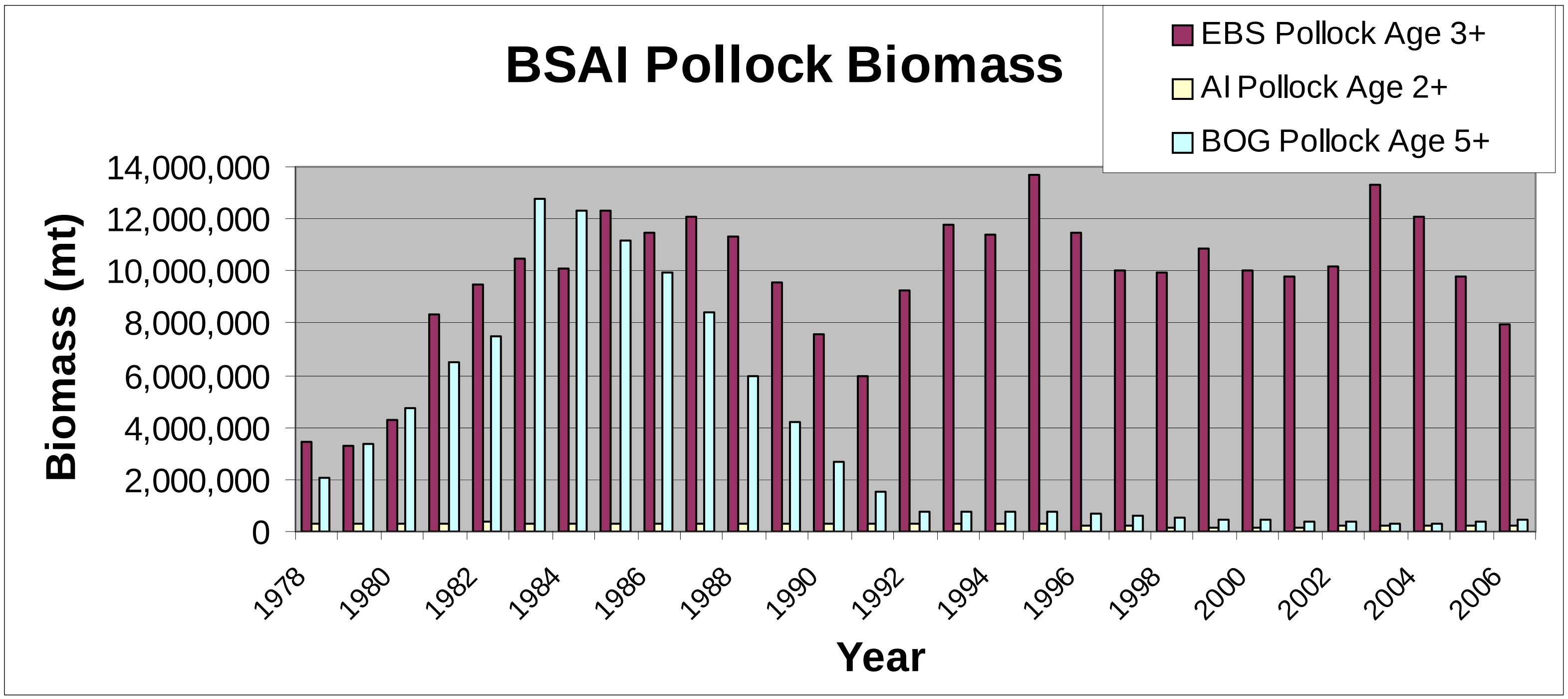


[10] Data taken from http://www.afsc.noaa.gov/refm/stocks/estimates.htm September 5, 2007

BSAI Biomass

In the BSAI area there are three stocks of pollock: the Eastern Bering Sea (EBS), Aleutian Islands and Aleutian Basin (Bogoslof). The largest of these by far is the EBS stock, which has recently been at historically high biomass levels. The Aleutian Island pollock stock was closed for directed fishing between 1999 and 2003; in 2004, however, the TAC was reopened to provide economic development in Adak. The Aleutian Basin (Bogoslof) pollock stock has been closed to directed fishing since 1991 due to low biomass levels (NPFMCd, 2006). See Figure 4 for more information.

Figure 4: BSAI Pollock Biomass (1978-2006)[11]



[11] Data taken from http://www.afsc.noaa.gov/refm/stocks/estimates.htm September 5, 2007

Description of Fleets

The demographic characteristics of the fishery participants provide additional information about the make-up of the pollock fleet. For instance, there is a marked difference in the residency of vessels fishing in the GOA vs. the BSAI. In the GOA approximately 40% of the catch is harvested by vessels owned by residents of Alaska. It is important to note that this is only a very small portion of the total Alaska pollock fishery. In the BSAI, less than 1% of the catch is harvested by vessels owned by Alaska residents. These percentages have remained stable since 2002 for both the BSAI and GOA. See Table 5 of the Economic SAFE for additional information.

The vast majority of inshore pollock landings take place in the ports of Dutch Harbor/Akutan. “The port of Dutch Harbor-Unalaska alone, located in the middle of the Aleutian Island chain in the heart of the world’s largest groundfish fishery, reported 699.8 million pounds in landings for 2000, the highest landings by pound of any port in the United States” (Sepez et al, 2005, p. 49). In the GOA, the port with the highest volume of pollock landings is Kodiak. For additional information, see the Section entitled “Ports of Delivery.”

Many of the catcher/processors that target pollock also target hake, or Pacific whiting in Washington or Oregon. This is evident in the descriptions many of the pollock cooperatives provide on their websites. For example, the At-sea Processors Association (APA) represents “US-flag catcher/processor vessels that participate in the healthy and abundant groundfish fisheries of the Bering Sea/Aleutian Islands management areas and in the west coast Pacific whiting fishery. Our principal fishery is the mid-water pollock fishery.” (APA website). [12]

There are and have been many restrictions of vessel activity for those vessels participating in the BSAI fishery that also seek to fish in the GOA. According to the GOA FMP, “vessels or processors participating in the Bering Sea and Aleutian Islands pollock fishery authorized under the AFA are subject to harvesting and processing sideboard restrictions on GOA groundfish” (NPFMCc, 2006, p. ES-3). In 1992, management measures were implemented to protect the Steller sea lion population. These involved “the creation of fishery exclusion zones around rookeries or haulout sites, phased in reduction in seasonal proportions of TAC taken in Steller sea lion critical habitat, and additional seasonal TAC allocations” (NPFMCb, 2006 p. 58).

Concerns about bycatch and the effects of trawling on the seafloor habitat have also led to action by the NPFMC. The Council divided the BSAI TAC between pelagic (88%) and non-pelagic trawling (12%) in 1990. Even though most vessels were voluntarily using pelagic trawls by the mid-1990s, the impact of the non-pelagic trawls still led to a much larger percentage of the bycatch than was desirable. The NPFMC took action again, and in 1999 banned non-pelagic trawling for pollock fishing in the Bering Sea (National Research Council, 2002).

[12] www.atsea.org

<u>Ports of Delivery</u>

Table 2 shows the major ports of delivery for pollock in the GOA and BSAI. Ports with fewer than 4 processors have been grouped into the "Other" category to preserve confidentiality.

Table 2: Ports of Delivery by Area in 2006

Area	Port	Processors	Tons	Vessels
GOA	Kodiak	8	45,322	119
GOA	Other (includes floating processors & catcher/processors)	33	26,109	99
BSAI	Other (includes floating processors)	8	173,682	96
BSAI	Dutch Harbor/Akutan	7	615,768	139
BSAI	Catcher/Processors	80	678,174	80

GOA Pollock Start Date(s)/ Seasons

In GOA, the TAC for the Western and Central Regulatory Areas is equally apportioned between the following seasons[13]:

- "A" season = 1/20-3/10
- "B" season = 3/10-5/31
- "C" season = 8/25-10/1
- "D" season = 10/1-11/1

Table 3: GOA Pollock Seasons (2004-2006)[14]

	2004 Trawl			2005 Trawl			2006 Trawl		
Area	**Open**	**Closed**	**Days**	**Open**	**Closed**	**Days**	**Open**	**Closed**	**Days**
610	1/20/2004	1/22/2004	2	1/20/2005	1/23/2005	3	1/20/2006	1/22/2006	2
	3/10/2004	3/13/2004	3	3/10/2005	3/12/2005	2	3/10/2006	3/14/2006	4
	8/25/2004	8/30/2004	5	8/25/2005	9/3/2005	9	8/25/2006	8/28/2006	4
	10/1/2004	10/6/2004	5	10/1/2005	10/14/2005	13	8/31/2006	9/3/2006	4
	10/10/2004	10/11/2004	1				9/6/2006	9/27/2006	22
							10/1/2006	11/1/2006	32
Total			**16**			**27**			**68**
620	1/20/2004	2/25/2004	36	1/20/2005	3/2/2005	41	1/20/2006	3/10/2006	49
	3/10/2004	2/25/2004	11	3/10/2005	3/20/2005	10	3/10/2006	3/21/2006	11
	8/25/2024	8/29/2004	4	8/25/2005	8/29/2005	4	8/25/2006	8/28/2006	4
	9/11/2004	9/15/2004	4	9/8/2005	9/12/2005	4	8/31/2006	9/3/2006	4
	10/1/2004	11/1/2004	31	9/15/2005	9/19/2005	4	9/6/2006	11/1/2006	57
				10/1/2005	11/1/2005				
Total			**86**			**63**			**125**
630	1/20/2004	1/21/2004	1	1/20/2005	1/29/2005	9	1/20/2006	2/15/2006	26
	2/4/2004	2/4/2004	0.5	2/6/2014	2/14/2005	8	3/10/2006	3/10/2006	0
	2/15/2004	2/15/2004	0.5	3/10/2005	3/10/2005	0.5	8/25/2006	9/27/2006	34
	3/10/2004	2/24/2004	0.5	8/25/2005	8/27/2005	2	10/1/2006	11/1/2006	32
	8/25/2004	3/11/2004	1	9/8/2007	9/10/2005	2			
	9/12/2004	8/29/2004	4	9/15/2005	9/16/2005	1			
	10/1/2004	10/2/2004	3	10/1/2005	10/8/2005	7			
	10/7/2004	11/1/2004	1	10/17/2005	10/19/2005	2			
				10/27/2005	10/28/2005	1			
Total			**13.5**			**32.5**			**92**
640	1/20/2004	11/1/2004	286	1/20/2005	3/26/2005		1/20/2006	4/10/2005	
Total			**286**			**66**			**81**

[13] Federal Register @ http://www.fakr.noaa.gov/frules/72fr9676.pdf

[14] http://www.fakr.noaa.gov/sustainablefisheries/goaplcks.pdf

BSAI Pollock Start Date(s)/ Seasons

Directed fishing for pollock in the Bering Sea subarea, the AI directed pollock fishery, or for CDQ pollock in the BSAI is authorized only during the following two seasons. The proportion of the TAC for each season will be determined annually[15].

- "A" season allowances = roe-bearing: January 20th- June 10th
- "B" season = non roe-bearing: June 10th- November 1st

Table 4: BSAI Pollock Seasons (2004-2006)[16]

Location	Gear	2004	Open	Closed	Days
Bering Sea	Trawl	Pollock – Inshore: co-op vessels	1/20/2004	11/1/2004	285
Bering Sea	Trawl	Pollock – Inshore: non co-op vessels	1/20/2004	11/1/2004	285
Bering Sea	Trawl	Pollock - AFA CP	1/20/2004	11/1/2004	285
Bering Sea	Trawl	Pollock - AFA Mothership	1/20/2004	11/1/2004	285
Bering Sea	Trawl	Pollock - Incidental Catch	1/1/2004	1/20/2004	19
Aleutian Islands/ Bogoslof	Trawl	Pollock - Incidental Catch	1/1/2004	1/20/2004	19
Location	**Gear**	**2005**	**Open**	**Closed**	**Days**
Bering Sea	Trawl	Pollock – Inshore: co-op vessels	1/20/2005	11/1/2005	285
Bering Sea	Trawl	Pollock - AFA CP	1/20/2005	11/1/2005	285
Bering Sea	Trawl	Pollock - AFA Mothership	1/20/2005	11/1/2005	285
Bering Sea	Trawl	Pollock - Incidental Catch	1/1/2005	Bycatch	n/a
Aleutian Islands/ Bogoslof	Trawl	Pollock - Incidental Catch	1/1/2005	Bycatch	n/a
Location	**Gear**	**2006**	**Open**	**Closed**	**Days**
Bering Sea	Trawl	Pollock - Inshore	1/20/2006	11/1/2006	285
Bering Sea	Trawl	Pollock - AFA CP	1/20/2006	11/1/2006	285
Bering Sea	Trawl	Pollock - AFA Mothership	1/20/2006	11/1/2206	285
Bering Sea	Trawl	Pollock - Incidental Catch	1/1/2006	Bycatch	n/a
Aleutian Islands/ Bogoslof	Trawl	Pollock - Incidental Catch	1/1/2006	Bycatch	n/a

[15] Federal Register @ http://www.fakr.noaa.gov/frules/72fr9451.pdf
[16] http://www.fakr.noaa.gov/sustainablefisheries/plckseas.pdf Data accessed on September 7, 2007

2007-2008 Pollock Allocations

BSAI Allocation[17]:

Pollock is apportioned in the BSAI between inshore, offshore, and mothership sectors after allocations are subtracted for the CDQ program and incidental catch allowances. The BSAI pollock fishery is further divided into two seasons – the winter "A" roe season and the summer "B" season, which is largely non-roe.

The 2007-2008 allocation of the TAC in the BSAI is as follows:

- 10% of TAC is reserved for the CDQ program.
- 2.8% of TAC is reserved for the incidental catch allowance
- The remaining TAC is divided between:
  - CV delivering inshore: 50%
  - C/P processing offshore: 40%
  - Delivery to mothership: 10%

GOA Pollock Allocation[18]:

Pollock is apportioned in the Western/Central Regulatory Areas among three statistical areas (SA): 610, 620, and 630. In the Eastern Regulatory Area including the West Yakutat and Southeast Outside Districts, pollock is not divided into seasonal allowances. According to the GOA FMP, "The Regional Administrator may assess these fisheries and apportion to them any amounts from the reserves that is determined will be harvested" (NPFMCc, 2006, p.18).

The 2007-2008 allocation of the TAC in the GOA is as follows:

- A Season: SA 610- 30%, SA 620- 48%, SA 630-22%
- B Season: SA 610- 30%, SA 620- 59%, SA 630-11%
- C & D Seasons: SA 610- 53%, SA 620- 15%, SA 630-32%

EXCERPTS FROM GOA FMP: "The GOA pollock and Pacific cod TACs will be allocated between the inshore and offshore components of industry in specific shares in order to lessen or resolve resource use conflicts and preemption of one segment of the groundfish industry by another, to promote stability between and within industry sectors and affected communities, and to enhance conservation and management of groundfish and other fish resources." (pg. 19)

"One hundred percent of the allowed harvest of pollock is allocated to inshore catcher/processors or to harvesting vessels which deliver their catch to the inshore component, with the exception that offshore catcher/processors, and vessels delivering to the offshore component, will be able to take pollock incidentally as bycatch in other directed fisheries. All pollock caught as bycatch in other fisheries will be attributed to the sector which processes the remainder of the catch." (pg. 20)

[17] http://209.112.168.2/sustainablefisheries/specs07_08/BSAItable1.pdf
[18] http://209.112.168.2/sustainablefisheries/specs07_08/GOAtable1.pdf

Number of Pollock Vessels

The number of catcher vessels targeting pollock in the GOA has been declining since 2002, starting at 80 and dropping to 66 in 2006. There are no catcher/processors currently operating in the GOA. The number of catcher vessels in the BSAI has also declined slightly during the same period from 98 to 90 vessels. In 2002, there were 31 catcher/processors operating the BSAI but participation declined to 19 by 2006. See Table 41 of the Economic SAFE for additional information.

It is interesting to note that while the BSAI comprises a far larger proportion of the pollock catch than the GOA, the number of catcher vessels operating in each area is nearly equivalent. This result is due to the difference in size of vessels and the length of the season. For example, between the years 2002 and 2006 only 2 trawl vessels greater than 234 ft in length were fishing in the GOA compared to approximately 15 trawl vessels of this size fishing in the BSAI. See Table 44 of the Economic SAFE for additional information.

Table 41. Number of vessels that caught groundfish off Alaska by area, vessel category, gear and target, 2002-06.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher/ processo rs	Total	Catcher vessels	Catcher/ processo rs	Total	Catcher vessels	Catcher/ processo rs	Total
Trawl	Pollock	2002	80	0	80	98	31	129	155	31	186
		2003	74	0	74	91	18	109	141	18	159
		2004	69	0	69	93	19	112	139	19	158
		2005	69	0	69	90	22	112	135	22	157
		2006	66	0	66	90	19	109	137	19	156
	Pacific cod	2002	83	5	88	76	22	98	144	22	166
		2003	66	6	72	83	20	103	121	21	142
		2004	60	6	66	75	21	96	114	21	135
		2005	63	4	67	61	19	80	107	20	127
		2006	59	3	62	54	19	73	104	19	123

Table 44. Number of vessels, mean length and mean net tonnage for vessels that caught and processed groundfish off Alaska by area, vessel-length class (feet), and gear, 2002-06.

			Gulf of Alaska					Bering Sea and Aleutians					All Alaska				
			Vessel length class					Vessel length class					Vessel length class				
			<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260
Number of vessels	Hook & Line	2002	11	5	6	0	0	12	18	12	0	0	12	18	12	0	0
		2003	11	6	8	0	0	11	18	11	0	0	13	18	11	0	0
		2004	9	3	7	0	0	10	19	11	0	0	11	19	11	0	0
		2005	9	4	5	0	0	10	19	11	0	0	11	19	11	0	0
		2006	10	7	6	0	0	11	18	11	0	0	12	18	11	0	0
	Pot	2002	2	1	1	0	0	2	2	1	0	0	2	3	1	0	0
		2003	1	0	0	0	0	2	1	0	0	0	2	1	0	0	0
		2004	1	0	0	0	0	1	2	1	0	0	1	2	1	0	0
		2005	1	0	0	0	0	1	1	1	0	0	1	1	1	0	0
		2006	1	0	0	0	0	2	2	2	0	0	2	2	2	0	0
	Trawl	2002	4	2	8	1	1	7	4	10	3	15	7	4	10	3	15
		2003	7	3	9	1	1	7	4	10	3	16	8	4	10	3	16
		2004	4	2	8	1	1	7	5	10	3	15	7	5	10	3	15
		2005	4	2	8	1	1	6	5	10	3	15	7	5	10	3	15
		2006	6	2	7	1	0	7	4	10	3	15	8	4	10	3	15

Note: If the permit files do not report a length for a vessel, the vessel is counted in the "less than 125 feet" class.

Catch (including federal and state fisheries)

Most of the pollock catch (approximately 95%) occurs in the BSAI (
Table 5). In 2006, for example, 72 thousand metric tons were caught in the GOA compared to 1,485 thousand metric tons in the BSAI. This proportion has remained stable over the past five years. See Table 2 of the Economic SAFE for additional information.

Table 5 Total Pollock Catch by Area (1,000 metric tons)[19]

	2004	2005	2006
BSAI	1,481.7	1,484.9	1,488.1
GOA[20]	63.9	80.9	72.0

Table 6 Total Catch and % Taken by Year, Area, and Sector (metric tons)[21]

Year	Location	Species	Total Catch	Quota	Remaining Quota	% Taken
2004	Bering Sea	Pollock, AFA Catcher/Processor	519,570	519,664	94	100%
2004	Bering Sea	Pollock, AFA Inshore	637,971	649,580	11,609	98%
2004	Bering Sea	Pollock, AFA Mothership	129,222	129,916	694	99%
2004	Bering Sea	Pollock, CDQ	149,173	149,200	27	100%
2004	Bering Sea	Pollock, Incidental Catch, Bogoslof (includes CDQ)	0	50	50	0%
2004	Bering Sea	Pollock, Incidental Catch, non-Bogoslof (includes CDQ)	44,614	43,641	-973	102%
2004	Aleutian Islands	Pollock, Incidental Catch (includes CDQ)	1,158	1,000	-158	116%
2004	Southeast	Pollock	0	6,520	6,520	0%
2004	West Yakutat	Pollock	226	1,280	1,054	18%
2004	Western, Central	Pollock, 610 Shumagin	23,455	22,930	-525	102%

[19] SAFE REPORT Table 2 pg. 21
[20] Different numbers are provided in SAFE p. 21 and NOAA generated catch report, likely due to rounding.
[21] http://209.112.168.2/2004/car110_goa.pdf, http://209.112.168.2/2005/car110_goa.pdf, http://209.112.168.2/2006/car110_goa.pdf, http://209.112.168.2/2004/car110_bsai_with_cdq.pdf, http://209.112.168.2/2005/car110_bsai_with_cdq.pdf, http://209.112.168.2/2006/car110_bsai_with_cdq.pdf

2004	Western, Central	Pollock, 620 Chirikof	24,661	26,490	1,829	93%
2004	Western, Central	Pollock, 630 Kodiak	14,444	14,040	-404	103%
2005	Bering Sea	Pollock, AFA Catcher/Processor	517,699	523,029	5,330	99%
2005	Bering Sea	Pollock, AFA Inshore	648,117	653,787	5,670	99%
2005	Bering Sea	Pollock, AFA Mothership	130,669	130,757	88	100%
2005	Bering Sea	Pollock, CDQ	149,715	149,750	35	100%
2005	Bering Sea	Pollock, Incidental Catch, Bogoslof (includes CDQ)	0	10	10	0%
2005	Bering Sea	Pollock, Incidental Catch, non-Bogoslof (includes CDQ)	37,072	37,577	505	99%
2005	Aleutian Islands	Pollock	195	1,200	1,005	16%
2005	Aleutian Islands	Pollock CDQ	12	0	-12	0%
2005	Aleutian Islands	Pollock, Incidental Catch (includes CDQ)	1,414	1,400	-14	101%
2005	Southeast	Pollock	0	6,520	6,520	0%
2005	West Yakutat	Pollock	1,880	1,688	-192	111%

2005	Western, Central	Pollock, 610 Shumagin	30,973	30,380	-593	102%
2005	Western, Central	Pollock, 620 Chirikof	27,904	34,404	6,500	81%
2005	Western, Central	Pollock, 630 Kodiak	19,329	18,718	-611	103%
2006	Bering Sea	Pollock, AFA Catcher/Processor	527,134	528,254	1,120	100%
2006	Bering Sea	Pollock, AFA Inshore	645,599	660,318	14,719	98%
2006	Bering Sea	Pollock, AFA Mothership	131,404	132,063	659	100%
2006	Bering Sea	Pollock, CDQ	150,374	150,400	26	100%
2006	Bering Sea	Pollock, Incidental Catch, Bogoslof (includes CDQ)	0	10	10	0%
2006	Bering Sea	Pollock, Incidental Catch, non-Bogoslof (includes CDQ)	31,864	30,967	-897	103%
2006	Aleutian Islands	Pollock	897	897	0	100%
2006	Aleutian Islands	Pollock CDQ	0	0	0	0%
2006	Aleutian Islands	Pollock, Incidental Catch (includes CDQ)	839	1,100	261	76%
2006	Southeast	Pollock	0	6,157	6,157	0%
2006	West Yakutat	Pollock	1,572	1,792	220	88%
2006	Western, Central	Pollock, 610 Shumagin	24,738	28,918	4,180	86%
2006	Western, Central	Pollock, 620 Chirikof	27,156	30,492	3,336	89%
2006	Western, Central	Pollock, 630 Kodiak	17,056	18,448	1,392	92%

Ex-Vessel Value & Prices

In this section **Figure 5** and

Figure 6 illustrate trends in value and price in the pollock fisheries in both federal and state waters.

Figure 5 shows the ex-vessel value of the groundfish catch off Alaska by area, vessel category, gear and species for 2002-2006. The highest ex-vessel value since 2002 was in 2005; however the value remained high in 2006. The total ex-vessel value of pollock in 2006 was $376.5 million dollars.

Figure 6 shows the ex-vessel price of the groundfish catch off Alaska by area, gear, and species for 2002-2006. Both fixed and trawl prices have increased in the GOA and BSAI since 2004.

The State of Alaska manages pollock fishing in state waters. This activity only accounts for a very small portion of the overall pollock harvest and value. For example, in 2006 the ex-vessel value of state-harvested pollock was $418,451, which is the highest value since 2001. This revenue represents approximately 0.1% of the value of the entire fishery in both federal and state waters.[22]

[22] For detailed information on the state fishery, check the Alaska Department of Fish and Game, Division of Commercial Fishing website http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/catchval/06grndf.php.

Figure 5 Federal Ex-Vessel Value: [23]

Table 19. Ex-vessel value of the groundfish catch off Alaska by area, vessel category, gear, and species, 2002-06, ($ millions).

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total
Trawl	All species	2002	25.0	7.4	32.4	209.6	210.1	419.7	234.6	217.6	452.1
		2003	31.9	8.1	40.0	200.2	187.3	387.5	232.1	195.3	427.5
		2004	27.6	6.7	34.3	198.5	222.3	420.8	226.1	228.9	455.1
		2005	36.4	9.3	45.7	229.1	266.3	495.4	265.6	275.5	541.1
		2006	41.0	11.7	52.7	231.1	246.0	477.1	272.1	257.7	529.8
	Pollock	2002	11.9	.0	12.0	197.5	148.1	345.7	209.5	148.2	357.6
		2003	10.3	.1	10.3	181.3	119.6	300.8	191.5	119.7	311.2
		2004	12.1	.0	12.2	185.5	148.6	334.0	197.6	148.6	346.2
		2005	21.5	.1	21.6	216.8	174.7	391.4	238.2	174.7	413.0
		2006	19.8	.1	19.8	214.4	142.2	356.6	234.2	142.3	376.5

Figure 6 Federal Ex-Vessel Prices: [24]

Table 18. Ex-vessel prices in the groundfish fisheries off Alaska by area, gear, and species, 2002-06 ($/lb, round weight).

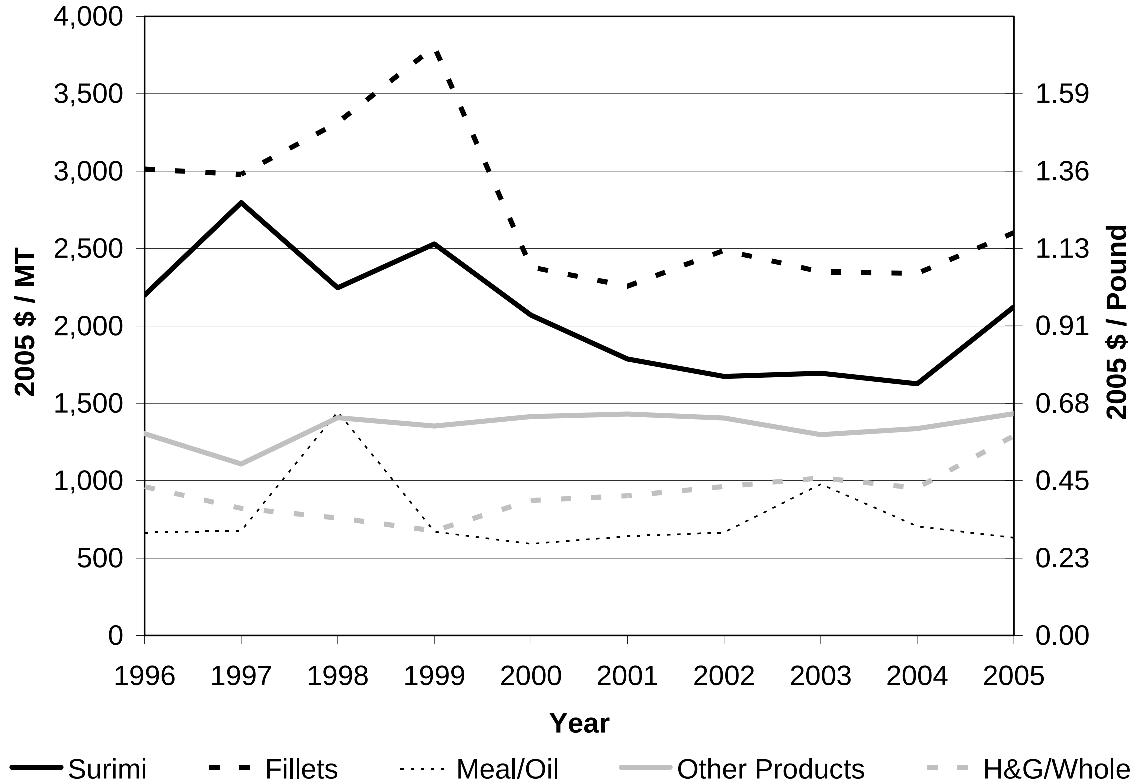
		Gulf of Alaska		Bering Sea and Aleutians		All Alaska
		Fixed	Trawl	Fixed	Trawl	All gear
Pollock	2002	.068	.107	-	.116	.115
	2003	.081	.095	.049	.107	.106
	2004	.060	.102	-	.106	.106
	2005	.086	.124	.074	.125	.125
	2006	.081	.135	-	.128	.129

[23] See Economic SAFE Table 19
[24] See Economic SAFE Table 18

Products

Figure 7 shows the wholesale prices for primary production of pollock products by product type excluding roe from 1996-2005. Excluding highest value roe, fillets consistently bring the highest price, followed by surimi, other products, headed and gutted/whole fish, and meal/oil. In order to view these products in a reasonable scale, roe is excluded and shown in another graph.

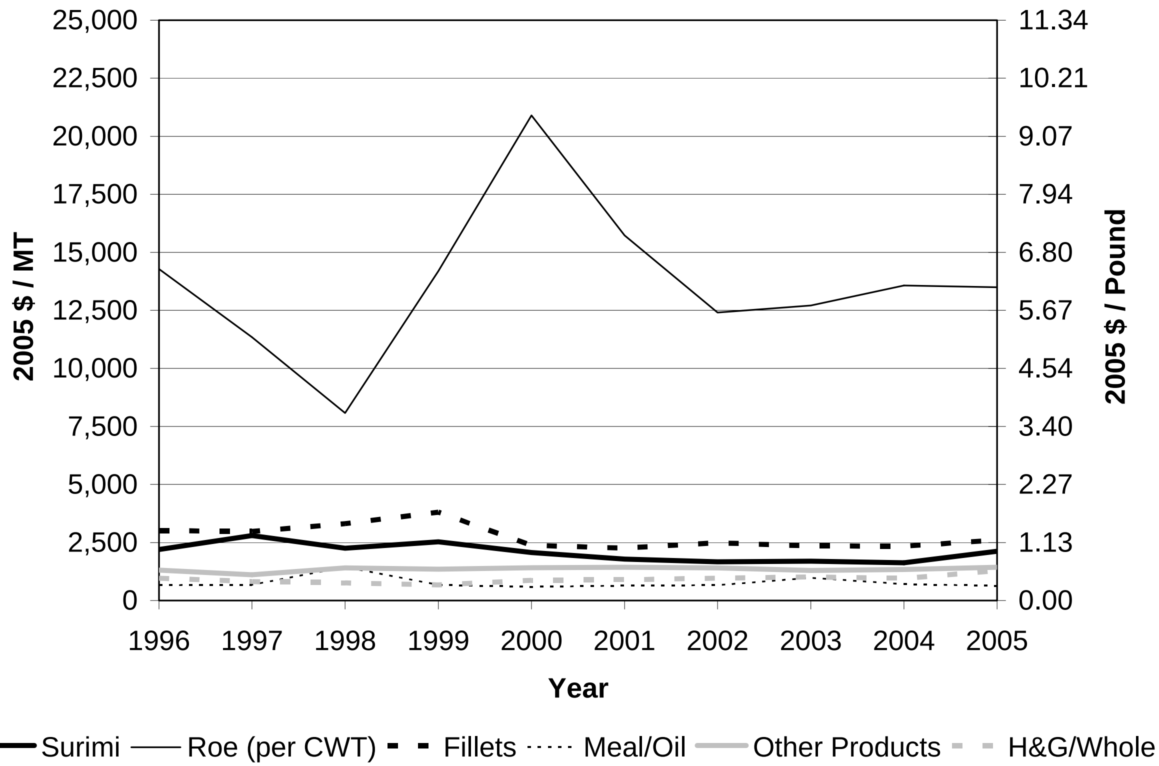
Figure 7 Wholesale Prices for Primary Production of Alaska Pollock Products (excluding Roe) by Product Type, 1996 – 2005



Adapted from Alaska Groundfish Market Profiles: Preliminary Draft. August 2007. Northern Economics Inc.
Data Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 8 shows the same products as Figure 7, however it also includes roe. The average price/pound for roe has been relatively stable since 2002 hovering between \$5.67/lb and \$6.00/lb. The price/lb for roe peaked in 2000 at almost \$10.00/lb. As a caveat on how this market works, most of the roe from Alaska fisheries is sold at roe auctions held in Seattle several times per year.

Figure 8 Wholesale Prices for Primary Production of Pollock by Product Types, 1996 – 2005



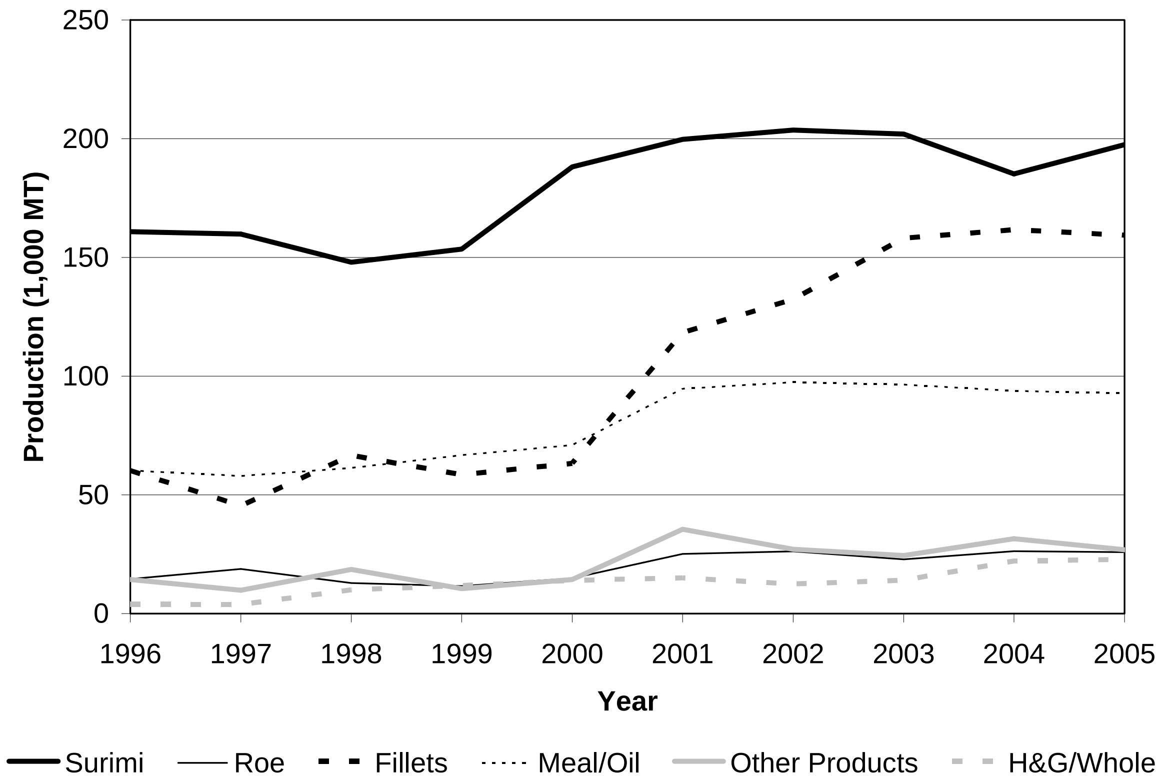
Note: For the convenience of the reader vertical scales are shown in value per MT (left side) and value per pound (right side). Product types may include several more specific products.

Adapted from Alaska Groundfish Market Profiles: Preliminary Draft. August 2007. Northern Economics Inc.

Data Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 9 shows the primary production of pollock by product type from 1996-2005. In terms of volume, surimi has the highest production. Fillets are second in production since 2000, followed by meal/oil, other products, roe, and H&G/whole fish.

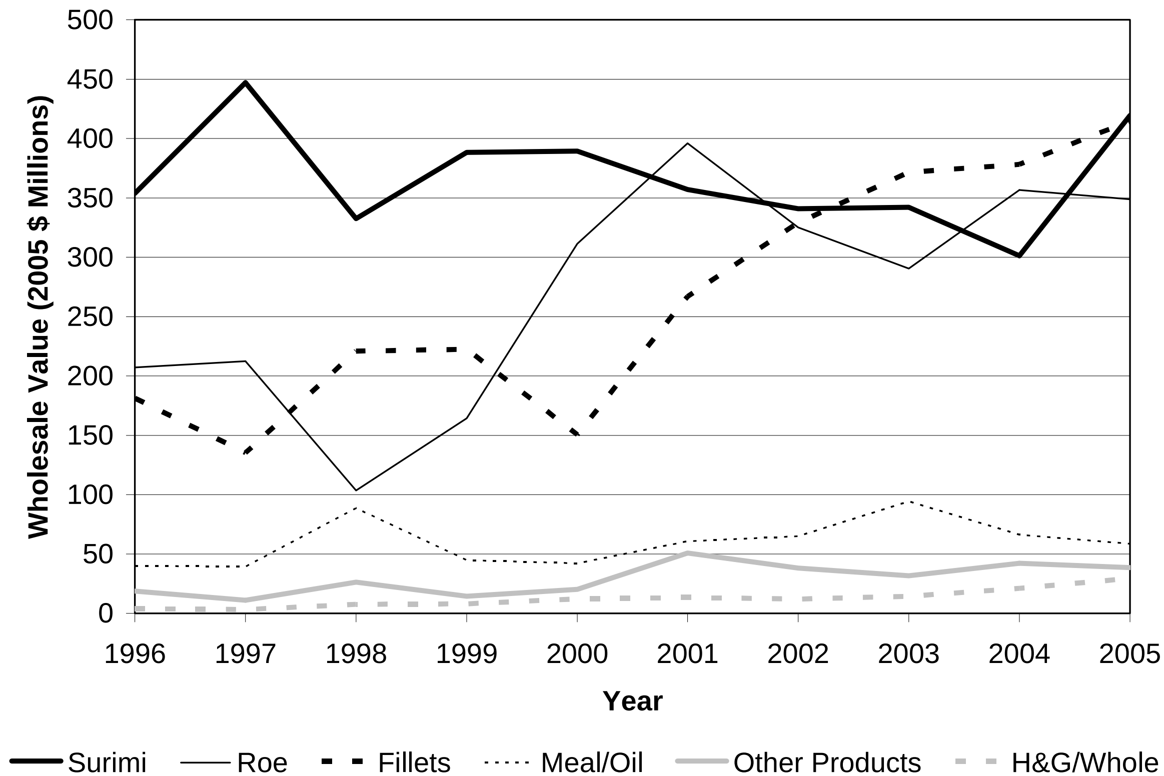
Figure 9 Primary Production of Alaska Pollock by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Adapted from Alaska Groundfish Market Profiles: Preliminary Draft. August 2007. Northern Economics Inc.
Data Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005.

Figure 10 shows the wholesale value of primary pollock production by product type from 1996-2005.

Figure 10: Wholesale Value of Primary Alaska Pollock Production by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Adapted from Alaska Groundfish Market Profiles: Preliminary Draft. August 2007. Northern Economics Inc.
Data Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

SPECIES: PACIFIC COD

Location of Fishery

BSAI, GOA (Western, Central, Eastern). The majority of Pacific cod fishing occurs in the Eastern Bering Sea.

Brief History of Pacific Cod Fishery

> **HISTORY:** **"**The oldest groundfish fishery off Alaska targets Pacific cod. The developing fishery peaked during 1916–1920 and steadily declined to 1950 (Kruse et al. 2000). Pacific cod supported large foreign fisheries in the Bering Sea during the 1960s and early 1970s. In the 1970s, foreign fishing fleets focused on sablefish and Pacific cod in the GOA. (Kruse et al. 2000). In the early 1980s a U.S. domestic trawl fishery and joint venture fisheries were operating in the BSAI, with the domestic fishery playing an increasingly dominant role over time. By 1991 the Pacific cod fishery was a completely domestic fishery (NPFMC 2004)".
>
> http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/pcod/pcodhome.php

Gear Types

Pacific cod is caught primarily using trawl, pot and longline.   Longline and trawl both account for approximately 35-45% of the catch with pot gear accounting for about 10% of the catch. A small portion of the catch is also caught by jig gear.

TAC & ABC (per area)[25]

Table 7 TAC & ABC (metric tons)

	2004		2005		2006		2007		2008 (proposed 3-2-07)	
	ABC	TAC	ABC	TAC	ABC	TAC	ABC	TAC	ABC	TAC
BSAI	223,000	215,500	206,000	206,000	194,000	189,76	176,000	170,72	131,000	127,070
GOA: W	22,610	16,957	20,916	15,687	26,855	20,141	26,855	20,141	27,846	20,885
GOA: C	35,800	27,116	33,117	25,086	37,873	28,405	37,873	28,405	39,270	29,453
GOA: E	4,400	3,960	4,067	3,660	4,131	3,718	4,131	3,718	4,284	3,856
GOA Total	62,810	48,033	58,100	28,746	68,859	52,264	68,859	52,264	71,400	54,194

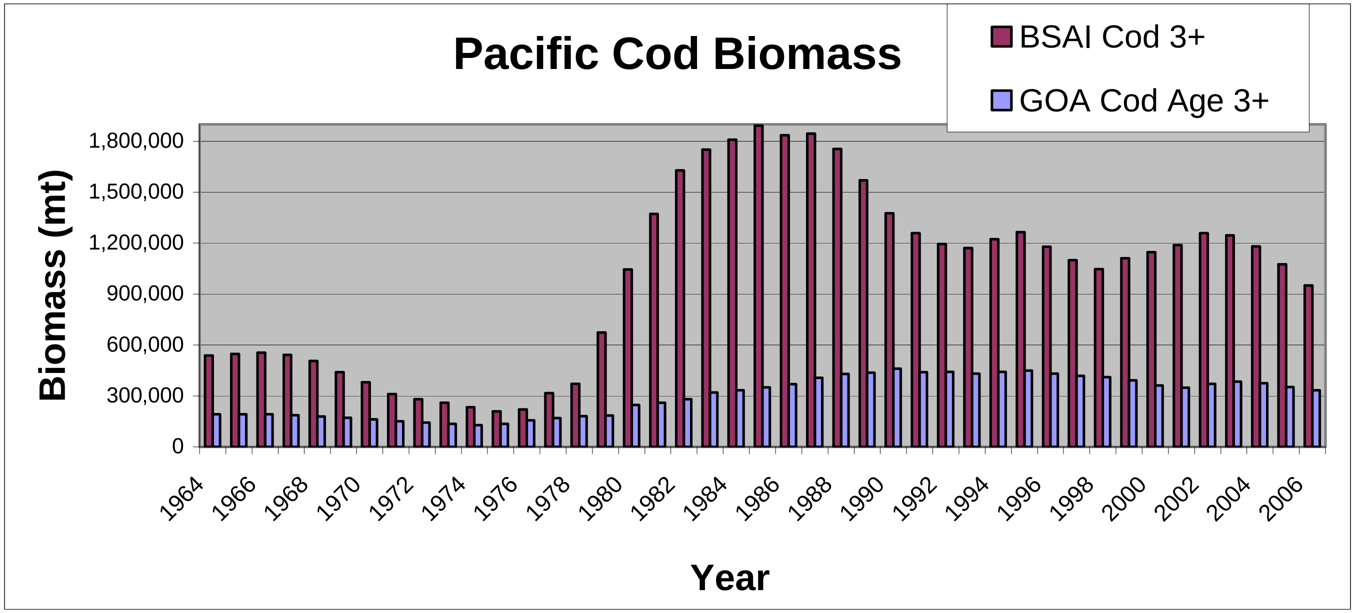
BSAI/GOA Biomass

According to the BSAI FMP for Pacific cod, “Pacific cod is distributed widely over the eastern Bering Sea and the Aleutian Islands area, and in the BSAI is managed as a single unit. Tagging studies (e.g. Shimada and Kimura 1994) have demonstrated significant migration both within and between the eastern Bering Sea, Aleutian Islands, and Gulf of Alaska, and genetic studies (e.g., Grant *et al.* 1987) have failed to show significant evidence of stock structure within these areas” (BSAI FMP p. 55)

Since1985, overall biomass has declined as shown in Figure 11. As can be seen in Table 7, the TAC for BSAI Pacific cod has been declining since 2004. The TAC for GOA Pacific cod has varied between 48 thousand metric tons in 2004 and 54 thousand metric tons proposed for 2008.

[25] http://www.fakr.noaa.gov/frules/fr9242.pdf (BSAI 2004)
http://www.fakr.noaa.gov/frules/70fr8679.pdf (BSAI 2005-2006)
http://www.fakr.noaa.gov/frules/72fr9451.pdf (BSAI 2007-2008)
http://www.fakr.noaa.gov/frules/fr9261.pdf (GOA 2004-2005)
http://www.fakr.noaa.gov/frules/70fr8958.pdf (GOA 2005-2006)
http://www.fakr.noaa.gov/frules/71fr10870.pdf (GOA 2006-2007)

Figure 11: Pacific cod Biomass by Area (1964-2006)[26]



<u>Description of Pacific Cod Fleets</u>

The demographic characteristics of the fishery participants provide additional information about the make-up of the Pacific cod fleet. For instance, there is a marked difference in the residency of vessels fishing in the GOA vs. the BSAI. Averages for the years 2002-2006 indicate that in the GOA approximately 60% of the GOA catch is harvested by vessels owned by residents of Alaska. As with pollock, it is important to note that this is only a very small portion of the overall Alaska Pacific cod fishery. In the BSAI, approximately 8% of the catch is harvested by vessels owned by Alaska residents; again this number is the average for the years 2002-2006. These percentages have remained stable since 2002 for both the BSAI and GOA. See Table 5 of the Economic SAFE for additional information.

In the GOA, the port with the highest volume of Pacific cod landings is Kodiak. In the BSAI, the highest volume of Pacific cod landings is retained by catcher/processors. For additional information, see the section called Ports of Delivery.

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[26] Data taken from http://www.afsc.noaa.gov/refm/stocks/estimates.htm September 5, 2007

Many of the catcher/processors that target Pacific cod also target flatfish, pollock, Atka mackerel, and rockfish. Table 8 shows Pacific cod catcher/processors top four target species by metric ton for the years 2000 to 2006. Flatfish have been a close second to Pacific cod in the amount of metric tons caught by this fleet.

Table 8 Pacific Cod Catcher/Processors Top Four Target Species by Metric Tons, 2000-2006

Year	Target	Species	Metric Tons	Vessel Count
2000	Pacific cod	Pacific cod	120,794	75
2000	Flatfish	Flatfish	109,430	50
2000	Pollock	Pollock	91,280	14
2000	Atka mackerel	Atka mackerel	34,801	12
2001	Pacific cod	Pacific cod	130,819	68
2001	Flatfish	Flatfish	61,540	37
2001	Pollock	Pollock	28,590	11
2001	Atka mackerel	Atka mackerel	21,329	8
2002	Pacific cod	Pacific cod	134,941	69
2002	Flatfish	Flatfish	101,680	36
2002	Pollock	Pollock	49,809	9
2002	Atka mackerel	Atka mackerel	32,207	10
2003	Pacific cod	Pacific cod	138,429	63
2003	Flatfish	Flatfish	82,080	32
2003	Atka mackerel	Atka mackerel	23,253	10
2003	Rockfish	Rockfish	12,693	15
2004	Pacific cod	Pacific cod	144,129	62
2004	Flatfish	Flatfish	75,673	33
2004	Pollock	Pollock	40,154	5
2004	Atka mackerel	Atka mackerel	27,595	15
2005	Pacific cod	Pacific cod	137,475	61
2005	Flatfish	Flatfish	96,114	34
2005	Atka mackerel	Atka mackerel	31,132	15
2005	Rockfish	Rockfish	10,271	12
2006	Pacific cod	Pacific cod	127,582	62
2006	Flatfish	Flatfish	94,063	33
2006	Atka mackerel	Atka mackerel	30,884	17
2006	Rockfish	Rockfish	14,103	15

Ports of Delivery for Pacific Cod

Table 9 shows the major ports of delivery for Pacific cod in the GOA and BSAI. Ports with fewer than 4 processors have been grouped into the "Other" category to preserve confidentiality.

Table 9: Pacific Cod Ports of Delivery by Area in 2006

Area	Port	Processors	Tons	Vessels
GOA	Dutch Harbor/Akutan	6	2,155	58
GOA	Kodiak	9	23,035	277
GOA	CP	32	4,875	32
GOA	FP	16	1,072	24
GOA	Other	37	16,222	565
BSAI	Dutch Harbor/Akutan	8	25,265	221
BSAI	CP	82	138,265	82
BSAI	FP	6	17,479	68
BSAI	Other	9	8,398	89

GOA Pacific Cod Start Date(s)/ Seasons[27]

The following section is comprised of excerpts from the Federal Register as referenced in the footnote.

Pacific cod fishing is divided into A and B seasons (by gear type) for the Western and Central Regulatory Areas of the GOA.

- For hook and line, pot, and jig gear:
  - A season: January 1 - June 10, 60% of the TAC is apportioned between inshore and offshore components
  - B season: September 1 - December 31, 40% of the TAC is apportioned between inshore and offshore components

- For trawl gear:
  - A season: January 20-June 10, 60% of the TAC is apportioned between inshore and offshore components
  - B season: September 1- November 1, 40% of the TAC is apportioned between inshore and offshore components

After subtracting the incidental catch allowances provided to the inshore and offshore components of other directed fisheries from the total amount of cod available for the year, 60 percent of the remaining TAC will be available as a directed fishing allowance during the A season for the inshore and offshore components. The remaining 40 percent of the annual TAC will be available for harvest

[27] Gulf of Alaska; 2007 and 2008 Final Harvest Specifications for Groundfish http://www.fakr.noaa.gov/frules/72fr9676.pdf

during the B season and will be apportioned between the inshore and offshore components. Any amount of the A season apportionment of Pacific cod TAC under- or over-harvested will be added to or subtracted from the B season apportionment of Pacific cod TAC (§ 679.20(a)(11)(ii)).

The TAC apportionments of Pacific cod in all regulatory areas to vessels catching Pacific cod are explicitly divided between the inshore and offshore processing sectors. Specifically, ninety percent of the Pacific cod TAC in each regulatory area is allocated to vessels delivering Pacific cod for inshore processing and 10 percent is allocated to vessels delivering to offshore processors.

BSAI Pacific Cod Start Date(s)/ Seasons[28]

The following section is comprised of excerpts from the Federal Register as referenced in the footnote.

Due to concerns about the potential impact of the Pacific cod fishery on Steller sea lions and their critical habitat, the Pacific cod initial TAC (ITAC) is apportioned into seasonal allowances to disperse the Pacific cod fisheries over the fishing year. No seasonal harvest constraints are imposed for the Pacific cod fishery by catcher vessels less than 60 ft (18.3 m) LOA using hook-and-line or pot gear.

- For pot and most hook-and-line gear:
  - January 1- June 10, 60% of the ITAC
  - June 10 (September 1 for pot gear) - December 31, 40% of the ITAC

- For trawl gear:
  - January 20 - April 1, 60% of the ITAC
  - April 1 to June 10, 20% of the ITAC
  - June 10 to November 1, 20% of the ITAC
    - The trawl gear allocation is further divided between CVs and CPs. The trawl catcher vessel allocation is further allocated as 70 percent in the first season, 10 percent in the second season and 20 percent in the third season. The trawl catcher/processor allocation is allocated 50 percent in the first season, 30 percent in the second season, and 20 percent in the third season.

- For jig gear:
  - January 1- April 30, 40% of the ITAC

[28] Bering Sea and Aleutian Islands; 2007 and 2008 Final Harvest Specifications for Groundfish http://www.fakr.noaa.gov/frules/72fr9451.pdf Gulf of Alaska;

- o April 30- August 31, 20% of the ITAC
- o August 31- December 31, 40% of the ITAC

Table 10: GOA Pacific Cod Seasons (2004-2006)[29]

	2004 Trawl				2005 Trawl				2006 Trawl			
Area	**Location**	**Open**	**Closed**	**Days**	**Location**	**Open**	**Closed**	**Days**	**Location**	**Open**	**Closed**	**Days**
610	Inshore	20-Jan	24-Feb	35	Inshore	20-Jan	24-Feb	35	Inshore	20-Jan	23-Feb	34
		1-Sep	10-Sep	9		1-Sep	4-Sep	3		27-Feb	2-Mar	3
		1-Oct	1-Oct	0.5		1-Oct	1-Oct	0.5		1-Sep	1-Sep	0.5
	Offshore	20-Jan	8-Mar	48	Offshore	20-Jan	22-Feb	33		6-Sep	6-Sep	0.5
		1-Sep	10-Sep	9		1-Sep	4-Sep	3		20-Sep	20-Sep	0.5
		1-Oct	1-Oct	0.5		1-Oct	1-Oct	0.5		25-Sep	25-Sep	0.5
										1-Oct	8-Oct	7
									Offshore	20-Jan	19-Feb	30
										1-Sep	1-Sep	0.5
										6-Sep	6-Sep	0.5
										20-Sep	20-Sep	0.5
										25-Sep	25-Sep	0.5
										1-Oct	8-Oct	7

[29] Current year data available at http://www.fakr.noaa.gov/sustainablefisheries/closure.html; data accessed on September 7, 2007.

	2004 Trawl				2005 Trawl				2006 Trawl			
Area	**Location**	**Open**	**Closed**	**Days**	**Location**	**Open**	**Closed**	**Days**	**Location**	**Open**	**Closed**	**Days**
620, 630	Inshore	20-Jan	31-Jan	11	Inshore	20-Jan	26-Jan	6	Inshore	20-Jan	23-Feb	34
		1-Sep	10-Sep	9		1-Sep	4-Sep	3		27-Feb	28-Feb	1
	Offshore	20-Jan	2-Feb	13		1-Oct	1-Oct	0.5		1-Sep	1-Sep	0.5
		1-Sep	10-Sep	9	Offshore	20-Jan	22-Feb	33		6-Sep	6-Sep	0.5
		1-Oct	1-Oct	0.5		1-Sep	4-Sep	3		20-Sep	20-Sep	0.5
						1-Oct	1-Oct	0.5		25-Sep	25-Sep	0.5
										1-Oct	8-Oct	7
									Offshore	20-Jan	19-Feb	30
										1-Sep	1-Sep	0.5
										6-Sep	6-Sep	0.5
										20-Sep	20-Sep	0.5
										25-Sep	25-Sep	0.5
										1-Oct	8-Oct	7
640,650	Inshore	20-Jan	10-Sep	234	Inshore	20-Jan	19-Aug	211	Inshore	20-Jan	23-Feb	34
		1-Oct	1-Oct	0.5		1-Sep	4-Sep	3		27-Feb	10-Jun	103
	Offshore	20-Jan	10-Sep	234		1-Oct	1-Oct	0.5		1-Jul	1-Sep	62
		1-Oct	1-Oct	0.5	Offshore	20-Jan	19-Aug	211		1-Sep	1-Sep	0.5
						1-Sep	4-Sep	3		6-Sep	6-Sep	0.5
						1-Oct	1-Oct	0.5		20-Sep	20-Sep	0.5
										25-Sep	25-Sep	0.5
										1-Oct	8-Oct	7
									Offshore	20-Jan	23-Feb	34
										27-Feb	10-Jun	103
										1-Jul	1-Sep	62
										6-Sep	6-Sep	0.5
										20-Sep	20-Sep	0.5
										25-Sep	25-Sep	0.5
										1-Oct	8-Oct	7

	2004 Hook & Line				2005 Hook & Line				2006 Hook & Line			
H&L	**Location**	**Open**	**Closed**	**Days**	**Location**	**Open**	**Closed**	**Days**	**Location**	**Open**	**Closed**	**Days**
610	Inshore	1-Jan	24-Feb	54	Inshore	1-Jan	24-Feb	54	Inshore	1-Jan	2-Mar	60
		1-Sep	2-Oct	31		1-Sep	31-Dec	121		1-Sep	31-Dec	121
	Offshore	1-Jan	8-Mar	67	Offshore	1-Jan	22-Feb	52	Offshore	1-Jan	19-Feb	49
		1-Sep	2-Oct	31		1-Sep	31-Dec	121		1-Sep	31-Dec	121
620,630	Inshore	1-Jan	31-Jan	30	Inshore	1-Jan	26-Jan	25	Inshore	1-Jan	28-Feb	58
		1-Sep	10-Sep	9		1-Sep	31-Dec	121		1-Sep	31-Dec	121
		28-Sep	2-Oct	4	Offshore	1-Jan	22-Feb	52	Offshore	1-Jan	19-Feb	49
	Offshore	1-Jan	2-Feb	32		1-Sep	31-Dec	121		1-Sep	31-Dec	121
		1-Sep	2-Oct	31								
640,650	Inshore	1-Jan	2-Oct	275	Inshore	1-Jan	31-Dec	365	Inshore	1-Jan	31-Dec	365
	Offshore	1-Jan	2-Oct	275	Offshore	1-Jan	31-Dec	365	Offshore	1-Jan	31-Dec	365

Table 11: BSAI Pacific Cod Seasons (2005-2006)[30]

2005				2006			
Trawl	**Open**	**Closed**	**Days**	**Trawl**	**Open**	**Closed**	**Days**
CP	20-Jan	13-Mar	52	CP	20-Jan	12-Mar	51
	1-Apr	18-Aug	139		1-Apr	8-Jun	68
					19-Jul	31-Aug	43
CV	20-Jan	13-Mar	52	CV	20-Jan	8-Mar	47
	29-Mar	18-Aug	142		1-Apr	6-Apr	5
					19-Jul	31-Aug	43
H&L				**H&L**			
CP	1-Jan	22-Feb	52	CP	1-Jan	18-Feb	48
	15-Aug	12-Dec	119		15-Aug	21-Oct	67
CV <60 ft.	1-Jan	19-Apr	108	CV <60 ft.	1-Jan	7-Apr	96
	15-Aug	31-Dec	138		1-May	23-May	22
					15-Aug	31-Dec	138
CV >=60 ft.	1-Jan	10-Mar	68	CV >=60 ft.	1-Jan	24-Feb	54
	15-Aug	7-Dec	114		15-Aug	31-Dec	138

[30] Current year data available at http://www.fakr.noaa.gov/sustainablefisheries/closure.html; data accessed on September 7, 2007

2007-2008 Allocations

BSAI Pacific Cod Allocation[31]:

Pacific cod is apportioned between gear groups in the BSAI as follows:

- Jig gear: 2 %
- Hook-and-line or pot gear: 51 %
    - 80 percent to catcher/processor vessels using hook-and-line gear;
    - 0.3 percent to catcher vessels using hook-and-line gear;
    - 3.3 percent to catcher/processor vessels using pot gear;
    - 15 percent to catcher vessels using pot gear; and
    - 1.4 percent to catcher vessels less than 60 ft length overall that uses either hook-and-line gear or pot gear.
- Trawl gear: 47 % (divided 50 percent to catcher vessels and 50 percent to catcher/processors)

The TAC for Pacific cod is reduced by 3 percent from the ABC to account for the State of Alaska's (State) guideline harvest level in State waters of the Aleutian Islands subarea.

GOA Pacific Cod Allocation[32]

The TAC is allocated 90% to the inshore sector and 10% to the offshore sector. There are three regulatory areas for which Pacific cod is apportioned, Western, Central and Eastern regulatory areas. The Western and Central Regulatory Areas both have an A (60%) and B (40%) season. In the Eastern Regulatory Area Pacific cod is not divided into seasonal allowances.

EXCERPTS FROM GOA FMP: "The GOA pollock and Pacific cod TACs will be allocated between the inshore and offshore components of industry in specific shares in order to lessen or resolve resource use conflicts and preemption of one segment of the groundfish industry by another, to promote stability between and within industry sectors and affected communities, and to enhance conservation and management of groundfish and other fish resources." (pg. 19)

[31] http://209.112.168.2/sustainablefisheries/specs07_08/BSAItable1.pdf
[32] http://209.112.168.2/sustainablefisheries/specs07_08/GOAtable1.pdf

Number of Pacific Cod Vessels

Trawl

The number of catcher vessels targeting Pacific cod in the GOA has been declining since 2002, starting at 83 and dropping to 59 in 2006. Between 2002 and 2006, the number of catcher/processors operating in the GOA has fluctuated between 6 and 3. The number of catcher vessels targeting Pacific cod in the BSAI has also declined slightly during the same period from 76 to 54 vessels. In 2002 there were 22 catcher/processors targeting Pacific cod in the BSAI but participation declined to 19 in 2006. See Table 41 of the Economic SAFE for additional information.

While catch levels of BSAI cod far exceed GOA cod, the number of catcher vessels operating in each area is nearly equivalent. This result is due to the difference in size of vessels and the length of the season. For example, between the years 2002 and 2006 only 1 trawl vessel greater than 234 ft in length fished in the GOA compared to approximately 15 trawl vessels of this size in the BSAI. See Table 44 of the Economic SAFE for additional information.

Hook and Line

The number of catcher vessels using hook and line gear to target Pacific cod in the GOA and BSAI remained relatively stable from 2002-2005, but reached a recent low in 2006.

Pot

The number of catcher vessels using pot gear to target Pacific cod in the GOA and BSAI has been trending upward from 2002-2006. Within this time period, the highest number of vessels occurred in 2004 for both areas.

Table 41. Number of vessels that caught groundfish off Alaska by area, vessel category, gear and target, 2002-06.

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher/ processo rs	Total	Catcher vessels	Catcher/ processo rs	Total	Catcher vessels	Catcher/ processo rs	Total
Trawl	Pollock	2002	80	0	80	98	31	129	155	31	186
		2003	74	0	74	91	18	109	141	18	159
		2004	69	0	69	93	19	112	139	19	158
		2005	69	0	69	90	22	112	135	22	157
		2006	66	0	66	90	19	109	137	19	156
	Pacific cod	2002	83	5	88	76	22	98	144	22	166
		2003	66	6	72	83	20	103	121	21	142
		2004	60	6	66	75	21	96	114	21	135
		2005	63	4	67	61	19	80	107	20	127
		2006	59	3	62	54	19	73	104	19	123
Hook & Line	Sablefish	2002	402	11	413	48	12	60	415	16	431
		2003	375	14	389	52	8	60	391	16	407
		2004	364	12	376	41	6	47	377	14	391
		2005	337	15	352	41	11	52	352	17	369
		2006	350	12	362	31	10	41	354	15	369
	Pacific cod	2002	243	16	259	37	40	77	259	40	299
		2003	271	16	287	32	39	71	290	39	329
		2004	263	11	274	31	39	70	283	39	322
		2005	250	6	256	34	39	73	267	39	306
		2006	172	15	187	30	39	69	193	39	232
	Flatfish	2002	0	1	1	2	17	19	2	17	19
		2003	1	1	2	7	13	20	7	13	20
		2004	0	0	0	1	13	14	1	13	14
		2005	0	2	2	1	12	13	1	14	15
		2006	1	1	2	2	13	15	3	14	17
	Rockfish	2002	131	2	133	5	2	7	134	4	138
		2003	125	1	126	4	2	6	128	3	131
		2004	121	0	121	1	2	3	122	2	124
		2005	103	0	103	1	3	4	104	3	107
		2006	79	1	80	1	3	4	79	4	83
	All groundfish	2002	628	22	650	80	42	122	644	42	686
		2003	651	25	676	74	40	114	673	42	715
		2004	621	18	639	63	40	103	644	41	685
		2005	566	18	584	64	40	104	584	41	625
		2006	486	23	509	52	40	92	505	41	546
Pot	Pacific cod	2002	129	4	133	60	5	65	171	6	177
		2003	134	1	135	74	3	77	184	3	187
		2004	151	1	152	73	3	76	194	3	197
		2005	147	1	148	59	2	61	187	2	189
		2006	143	1	144	63	5	68	185	5	190

Table 44. Number of vessels, mean length and mean net tonnage for vessels that caught and processed groundfish off Alaska by area, vessel-length class (feet), and gear, 2002-06.

			Gulf of Alaska					Bering Sea and Aleutians					All Alaska				
			Vessel length class					Vessel length class					Vessel length class				
			<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260	<125	125-164	165-234	235-259	>260
Number of vessels	Hook & Line	2002	11	5	6	0	0	12	18	12	0	0	12	18	12	0	0
		2003	11	6	8	0	0	11	18	11	0	0	13	18	11	0	0
		2004	9	3	7	0	0	10	19	11	0	0	11	19	11	0	0
		2005	9	4	5	0	0	10	19	11	0	0	11	19	11	0	0
		2006	10	7	6	0	0	11	18	11	0	0	12	18	11	0	0
	Pot	2002	2	1	1	0	0	2	2	1	0	0	2	3	1	0	0
		2003	1	0	0	0	0	2	1	0	0	0	2	1	0	0	0
		2004	1	0	0	0	0	1	2	1	0	0	1	2	1	0	0
		2005	1	0	0	0	0	1	1	1	0	0	1	1	1	0	0
		2006	1	0	0	0	0	2	2	2	0	0	2	2	2	0	0
	Trawl	2002	4	2	8	1	1	7	4	10	3	15	7	4	10	3	15
		2003	7	3	9	1	1	7	4	10	3	16	8	4	10	3	16
		2004	4	2	8	1	1	7	5	10	3	15	7	5	10	3	15
		2005	4	2	8	1	1	6	5	10	3	15	7	5	10	3	15
		2006	6	2	7	1	0	7	4	10	3	15	8	4	10	3	15

Note: If the permit files do not report a length for a vessel, the vessel is counted in the "less than 125 feet" class.

Catch (including federal and state fisheries)

Most of the Pacific cod catch occurs in the BSAI (Table 12 Total Cod Catch by Area (1,000 metric tons)). In 2006, for example, 99 thousand metric tons were caught via hook and line in the BSAI compared to 10 thousand metric tons caught via hook and line in the GOA. This proportion has remained stable over the past five years. See Table 2 of the Economic SAFE for additional information.

Table 12 Total Cod Catch by Area (1,000 metric tons)[33]

Area	Sector	2004	2005	2006
BSAI	Trawl	84	72	73
BSAI	Pot	17	14	19
BSAI	Hook & Line	111	116	99
GOA	Trawl	18	15	13
GOA	Pot	15	15	14
GOA	Hook & Line	11	6	10

Table 13 Total Catch and % Taken by Year, Area, and Sector (metric tons)[34]

Year	Location	Species	Total Catch	Quota	Remaining Quota	% Taken
2004	BSAI	Pacific Cod (Jig)	231	442	211	52%
2004	BSAI	Pacific Cod CDQ	16,026	16,163	137	99%
2004	BSAI	Pacific Cod, Catcher/Processor (Hook-and-Line)	95,090	97,795	2,705	97%
2004	BSAI	Pacific Cod, Catcher/Processor (Pot)	3,234	3,452	218	94%
2004	BSAI	Pacific Cod, Catcher/Processor (Trawl)	41,335	41,431	96	100%
2004	BSAI	Pacific Cod, Catcher Vessel (Hook-and-Line)	289	303	14	95%
2004	BSAI	Pacific Cod, Catcher Vessel (Pot)	12,311	11,735	-576	105%
2004	BSAI	Pacific Cod, Catcher Vessel (Trawl)	41,098	40,717	-381	101%
2004	BSAI	Pacific Cod, Incidental Catch (Hook-and-Line and Pot)	497	500	3	99%
2004	Central Gulf	Pacific Cod, Inshore	25,533	24,404	-1,129	105%

33 Economic SAFE Table 2

34 http://209.112.168.2/2004/car110_goa.pdf
http://209.112.168.2/2005/car110_goa.pdf
http://209.112.168.2/2006/car110_goa.pdf
http://209.112.168.2/2004/car110_bsai_with_cdq.pdf
http://209.112.168.2/2005/car110_bsai_with_cdq.pdf
http://209.112.168.2/2006/car110_bsai_with_cdq.pdf

2004	Eastern Gulf	Pacific Cod, Inshore	113	3,564	3,451	3%
2004	Western Gulf	Pacific Cod, Inshore	14,273	15,261	988	94%
2004	Central Gulf	Pacific Cod, Offshore	1,931	2,712	781	71%
2004	Eastern Gulf	Pacific Cod, Offshore	0	396	396	0%
2004	Western Gulf	Pacific Cod, Offshore	1,281	1,696	415	76%
2005	BSAI	Pacific Cod (Hook-and-Line and Pot < 60 ft)	2,356	2,601	245	91%
2005	BSAI	Pacific Cod (Jig)	117	166	49	70%
2005	BSAI	Pacific Cod CDQ	14,581	15,450	869	94%
2005	BSAI	Pacific Cod, Catcher/Processor (Hook-and-Line)	100,066	99,519	-547	101%
2005	BSAI	Pacific Cod, Catcher/Processor (Pot)	3,339	3,352	13	100%
2005	BSAI	Pacific Cod, Catcher/Processor (Trawl)	35,453	35,506	53	100%
2005	BSAI	Pacific Cod, Catcher Vessel (Hook-and-Line)	228	230	2	99%
2005	BSAI	Pacific Cod, Catcher Vessel (Pot)	12,208	12,828	620	95%
2005	BSAI	Pacific Cod, Catcher Vessel (Trawl)	35,748	35,847	99	100%
2005	BSAI	Pacific Cod, Incidental Catch (Hook-and-Line and Pot)	1,010	500	-510	202%
2005	Central Gulf	Pacific Cod, Inshore	22,348	22,577	229	99%
2005	Eastern Gulf	Pacific Cod, Inshore	14	3,294	3,280	0%
2005	Western Gulf	Pacific Cod, Inshore	11,982	14,118	2,136	85%
2005	Central Gulf	Pacific Cod, Offshore	361	2,509	2,148	14%
2005	Eastern Gulf	Pacific Cod, Offshore	0	366	366	0%
2005	Western Gulf	Pacific Cod, Offshore	424	1,569	1,145	27%
2006	BSAI	Pacific Cod (Hook-and-Line and Pot < 60 ft)	3,200	3,242	42	99%
2006	BSAI	Pacific Cod (Jig)	87	214	127	41%
2006	BSAI	Pacific Cod CDQ	14,005	14,233	228	98%
2006	BSAI	Pacific Cod, Catcher/Processor (Hook-and-Line)	84,813	84,709	-104	100%
2006	BSAI	Pacific Cod, Catcher/Processor (Pot)	3,149	3,053	-96	103%
2006	BSAI	Pacific Cod, Catcher/Processor (Trawl)	35,323	35,845	522	99%
2006	BSAI	Pacific Cod, Catcher Vessel (Hook-and-Line)	245	267	22	92%
2006	BSAI	Pacific Cod, Catcher Vessel (Pot)	13,250	13,880	630	95%
2006	BSAI	Pacific Cod, Catcher Vessel (Trawl)	33,651	33,824	173	99%
2006	BSAI	Pacific Cod, Incidental Catch (Hook-and-Line and Pot)	334	500	166	67%
2006	Central Gulf	Pacific Cod, Inshore	21,612	25,565	3,953	85%
2006	Eastern Gulf	Pacific Cod, Inshore	35	3,346	3,311	1%
2006	Western Gulf	Pacific Cod, Inshore	13,647	18,127	4,480	75%
2006	Central Gulf	Pacific Cod, Offshore	1,402	2,840	1,438	49%
2006	Eastern Gulf	Pacific Cod, Offshore	0	372	372	0%
2006	Western Gulf	Pacific Cod, Offshore	1,095	2,014	919	54%

Ex-Vessel Value & Prices

In this section, Figure 12 and Figure 13 illustrate trends in value and price in the Pacific cod fisheries in both federal and state waters.

Figure 12 shows the ex-vessel value of the groundfish catch off Alaska by area, vessel category, gear and species for 2002-2006. The highest ex-vessel value since 2002 was in 2003; however, the 2006 value is near that peak. The total ex-vessel value of Pacific cod in 2006 was $45.3 million dollars.

Figure 13 shows the ex-vessel price of the groundfish catch off Alaska by area, gear, and species for 2002-2006. Both fixed and trawl prices have generally increased in the GOA and BSAI since 2002.

The State of Alaska manages Pacific cod fishing in state waters. This activity accounts for approximately 20% of the overall Pacific cod harvest and value. For example, in 2006 the ex-vessel value of state-harvested cod was $11,033,401 which is the highest value since 2001.[35]

[35] For detailed information on the state fishery, check the Alaska Department of Fish and Game, Division of Commercial Fishing website http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/catchval/06grndf.php.

Figure 12 Federal Ex-Vessel Value: [36]

Table 19. Ex-vessel value of the groundfish catch off Alaska by area, vessel category, gear, and species, 2002-06, ($ millions).

			Gulf of Alaska			Bering Sea and Aleutians			All Alaska		
			Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total	Catcher vessels	Catcher processors	Total
Trawl	All species	2002	25.0	7.4	32.4	209.6	210.1	419.7	234.6	217.6	452.1
		2003	31.9	8.1	40.0	200.2	187.3	387.5	232.1	195.3	427.5
		2004	27.6	6.7	34.3	198.5	222.3	420.8	226.1	228.9	455.1
		2005	36.4	9.3	45.7	229.1	266.3	495.4	265.6	275.5	541.1
		2006	41.0	11.7	52.7	231.1	246.0	477.1	272.1	257.7	529.8
	Pollock	2002	11.9	.0	12.0	197.5	148.1	345.7	209.5	148.2	357.6
		2003	10.3	.1	10.3	181.3	119.6	300.8	191.5	119.7	311.2
		2004	12.1	.0	12.2	185.5	148.6	334.0	197.6	148.6	346.2
		2005	21.5	.1	21.6	216.8	174.7	391.4	238.2	174.7	413.0
		2006	19.8	.1	19.8	214.4	142.2	356.6	234.2	142.3	376.5
	Sablefish	2002	1.0	2.4	3.3	.0	.5	.6	1.0	2.9	3.9
		2003	1.9	1.8	3.7	.0	.3	.4	1.9	2.2	4.1
		2004	2.6	1.6	4.1	.0	.4	.4	2.6	2.0	4.6
		2005	1.9	1.6	3.5	.0	.7	.7	1.9	2.3	4.2
		2006	2.6	1.5	4.1	.0	.3	.3	2.6	1.8	4.4
	Pacific cod	2002	7.6	.5	8.1	11.5	14.8	26.3	19.0	15.4	34.4
		2003	14.6	.9	15.5	18.2	20.6	38.8	32.8	21.5	54.3
		2004	8.2	.7	9.0	11.9	18.7	30.7	20.2	19.5	39.6
		2005	6.1	.5	6.7	10.9	14.6	25.5	17.1	15.1	32.1
		2006	8.9	.8	9.7	14.0	21.5	35.5	22.9	22.3	45.3

Figure 13 Federal Ex-Vessel Prices: [37]

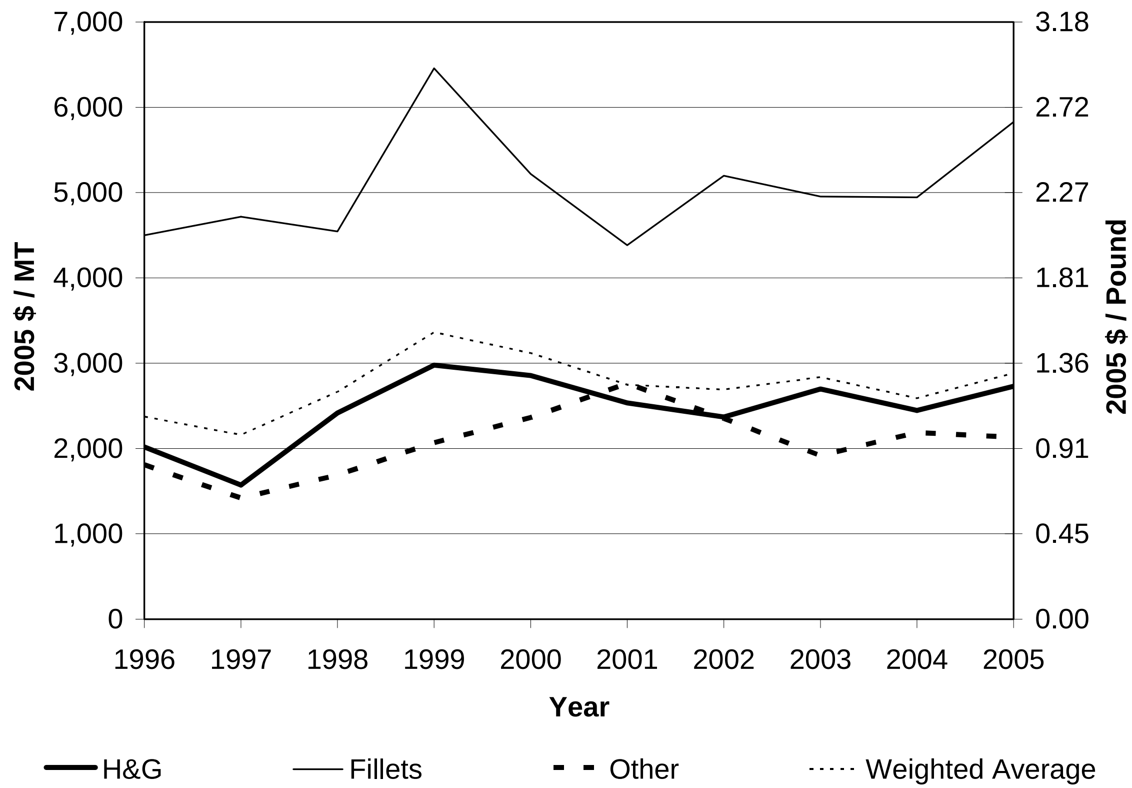
Table 18. Ex-vessel prices in the groundfish fisheries off Alaska by area, gear, and species, 2002-06 ($/lb, round weight).

		Gulf of Alaska		Bering Sea and Aleutians		All Alaska
		Fixed	Trawl	Fixed	Trawl	All gear
Pollock	2002	.068	.107	-	.116	.115
	2003	.081	.095	.049	.107	.106
	2004	.060	.102	-	.106	.106
	2005	.086	.124	.074	.125	.125
	2006	.081	.135	-	.128	.129
Sablefish	2002	2.148	1.682	2.177	.934	2.112
	2003	2.435	1.749	2.229	.951	2.369
	2004	2.122	1.691	1.827	.837	2.056
	2005	2.258	1.708	2.033	.900	2.183
	2006	2.710	2.048	2.302	1.083	2.621
Pacific cod	2002	.287	.234	.213	.193	.245
	2003	.307	.283	.292	.268	.283
	2004	.267	.251	.254	.219	.245
	2005	.297	.269	.294	.232	.269
	2006	.396	.369	.444	.346	.384

[36] See Economic SAFE Table 19
[37] See Economic SAFE Table 18

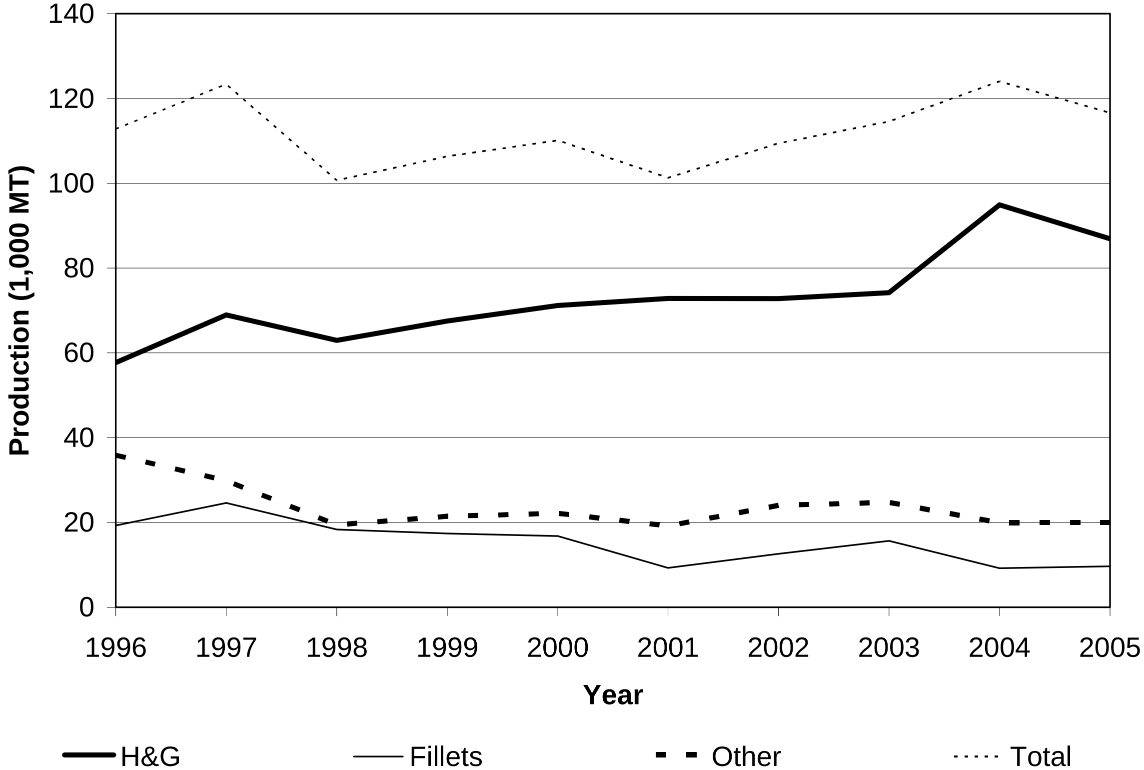
Pacific Cod Products

Figure 14 Wholesale Prices for Primary Production of Pacific Cod by Product Type, 1996 – 2005



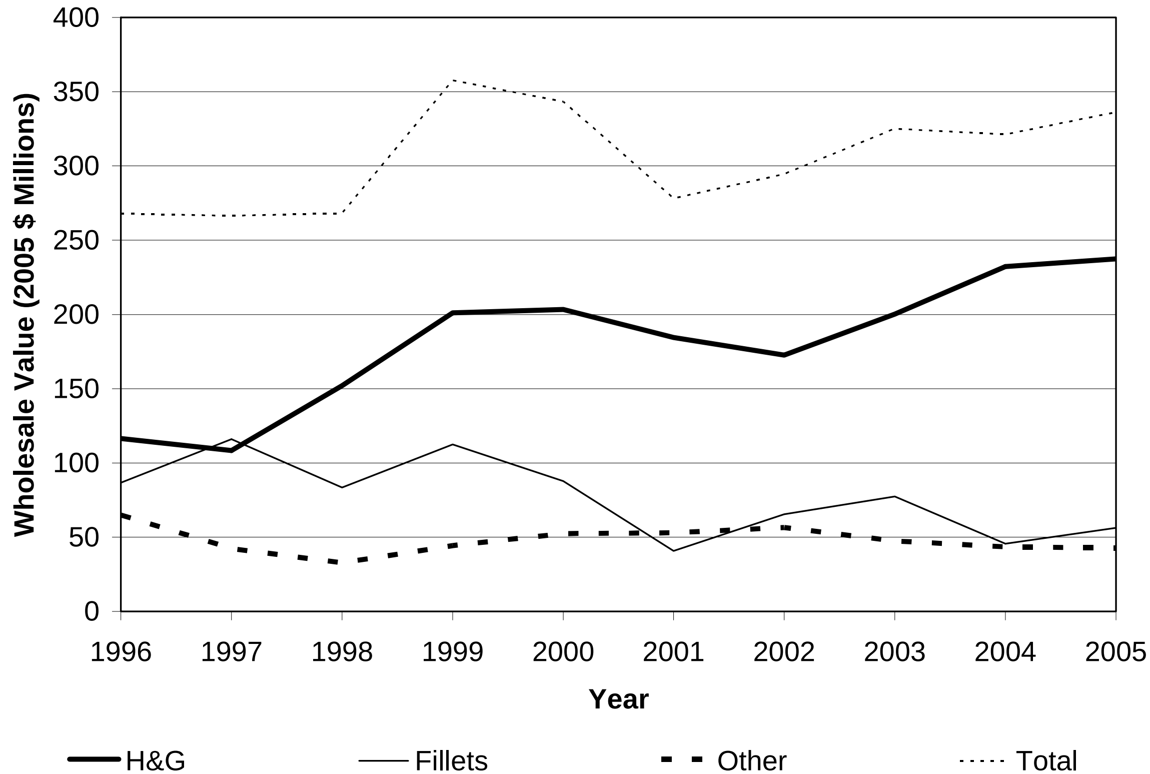
Notes: Product types may include several more specific products.
Adapted from Alaska Groundfish Market Profiles: Preliminary Draft. August 2007. Northern Economics Inc.
Data Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 15 Primary Production of Pacific Cod by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Adapted from Alaska Groundfish Market Profiles: Preliminary Draft. August 2007. Northern Economics Inc.
Data Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 16 Wholesale Value of Primary Production of Pacific Cod by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Adapted from Alaska Groundfish Market Profiles: Preliminary Draft. August 2007. Northern Economics Inc.
Data Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Useful Web Links for Information about Alaska Groundfish Fleets

2006 North Pacific Groundfish Stock Assessment and Fishery Evaluation (SAFE)
http://www.afsc.noaa.gov/refm/stocks/assessments.htm

NOAA Groundfish Fisheries News, Outlook, Reports and Catch Statistics http://209.112.168.2/sustainablefisheries/default.htm

Information Bulletins: Groundfish Fisheries News http://209.112.168.2/index/infobulletins/infobulletins.asp?Yr=2007

Catch Statistics: Total Catch, Quotas, Closure Summary, Gear and Discard Reports, Products and Product Codes
http://209.112.168.2/sustainablefisheries/catchstats.htm

Effort Report: Distribution of At-Sea Processors http://209.112.168.2/sustainablefisheries/reports/aeffort.txt

Fisheries Outlook: BSAI and GOA http://209.112.168.2/sustainablefisheries/reports/outlook.txt

IFQ/CDQ Reports: Harvest and Landing Reports http://209.112.168.2/ram/ifqreports.htm

Status of 2007 Fisheries: Areas Open and Bycatch http://209.112.168.2/2007/status.htm

Groundfish Harvest Specification Tables: http://209.112.168.2/sustainablefisheries/2007_08hrvstspecs.htm
- AK Groundfish Harvest Specifications EIS http://209.112.168.2/analyses/specs/eis/default.htm

Fisheries Regulations: CFR 680, 679, 600, 356, & 300 http://209.112.168.2/regs/summary.htm

Alaska Fisheries Science Center/NMFS: http://www.afsc.noaa.gov/#

Alaska Department of Fish and Game: Division of Commercial Fisheries
Main Page http://www.cf.adfg.state.ak.us/
Groundfish Harvest and Values http://www.cf.adfg.state.ak.us/geninfo/finfish/grndfish/catchval/06grndf.php

North Pacific Fishery Management Council http://www.fakr.noaa.gov/npfmc/

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North Pacific Fishery Management Council. 2006a. Celebrating 30 Years of Sustainable Fisheries.

North Pacific Fishery Management Council. 2006b. Fishery Management Plan for Groundfish of the Bering Sea and Aleutian Islands

Management Area

North Pacific Fishery Management Council. 2006c. Fishery Management Plan for Groundfish of the Gulf of Alaska.

North Pacific Fishery Management Council. 2006d. Appendix A: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Bering Sea/Aleutian Islands Regions. Chapter 1. Assessment of Alaska Pollock Stock in the Eastern Bering Sea

North Pacific Fishery Management Council. 2006e. Appendix B: Stock Assessment and Fishery Evaluation Report for the Groundfish Resources of the Gulf of Alaska. Chapter 1. Assessment of Walleye Pollock in the Gulf of Alaska

Oliver, C. 1999. Implementing the American Fisheries Act of 1998: Current and Future Actions by the North Pacific Fishery Management Council. *National Fishery Law Symposium, University of Washington School of Law, Seattle, Washington, March 25-25, 1999.*

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Alaska Groundfish Market Profiles

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Alaska Fisheries Science Center

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Preface

Contributors

The primary author of this document was Donald M. Schug of Northern Economics, Inc. Other contributors from Northern Economics were Marcus L. Hartley and Anne Bunger. James L. Anderson of J.L. Anderson & Associates provided export data summaries and forecasts. Quentin Fong of the Fishery Information and Technology Center, University of Alaska Fairbanks assisted with gathering information on seafood processors in the People's Republic of China.

Seafood industry representatives were interviewed during the preparation of this document. These individuals participated with the assurance that information they provided would not be directly attributed to them. The information they offered provided new insights in seafood markets and was also used to cross-check published material. Listed in no specific order, the industry participants are as follows:

Dave Little and Paul Gilliland, Bering Select Seafoods Company

Rick Kruger, Summit Seafood Company

Joe Plesha, Trident Seafoods Corporation

John Gauvin, independent consultant

Nancy Kercheval, Cascade Fishing, Inc.

Merle Knapp, Glacier Fish Company

Torunn Halhjem, Trident Seafoods Corporation

George Souza, Endeavor Seafood, Inc.

William Guo, Qingdao Fortune Seafoods, Inc.

Methods

For the most recent updates on seafood markets, the following online sources were regularly consulted:

- Seafood.com News, a seafood industry daily news service. This service also publishes BANR JAPAN REPORTS, selected articles and statistical data originally sourced and translated from the Japanese Fisheries Press.
- GLOBEFISH, a non-governmental seafood market and trade organization associated with the United Nations.
- FAS Worldwide, a magazine from the U.S. Department of Agriculture's Foreign Agricultural Service.
- IntraFish.com, a seafood industry daily news service.
- SeaFood Business, a trade magazine for seafood buyers.

Archival information from these sources was also reviewed in order to obtain a broader perspective of market trends. Other news services consulted were FISHupdate.com and Fishnet.ru.

For a general overview of Alaska pollock and Pacific cod markets, the analysis relied primarily on the following reports:

- Studies of Alaska pollock and Pacific cod markets prepared by Gunnar Knapp, Institute of Social and Economic Research, University of Alaska Anchorage for the North Pacific Fisheries Management Council.
- A description of markets for Alaska pollock and Pacific cod prepared by the National Marine Fisheries Service for the 2001 *Steller Sea Lion Protection Measures Final Supplemental Environmental Impact Statement*.

Information from the above news services and reports was supplemented with market facts found in various reports and articles identified through Web searches. In sifting through the extensive information garnered from these searches, the following precautionary advice offered by Gunnar Knapp was considered:

> *In reading trade press articles about market conditions, it is important to keep in mind that individual articles tend to be narrowly focused on particular topics—such as a particular auction or supply or product quality from a particular fishery. A "bigger picture" view of market conditions only emerges after reading articles over a long period of time—ideally several years.*
>
> *In addition, it is important to keep in mind that … seafood trade press articles—like any press analysis of any topic--are not necessarily objective or accurate. Some articles reflect the point of view of particular market participants.*[1]

Several sources of fishery statistics were used to prepare the figures presented in this document, including databases maintained by the National Marine Fisheries Service (NMFS) Alaska Regional Office, Alaska Department of Fish and Game (ADF&G), Pacific Fisheries Information Network (PacFIN), and U.N. Food and Agriculture Organization (FAO).

[1] Knapp, G. 2005. An Overview of Markets for Alaska Pollock Roe. Paper prepared for the North Pacific Fisheries Management Council, Anchorage, AK. p.34.

Alaska Pollock Fillets Summary Profile

Description of the Fishery

Alaska pollock or walleye pollock (*Theragra chalcogramma*) is widely distributed in the temperate to boreal North Pacific, from Central California into the eastern Bering Sea, along the Aleutian arc, around Kamchatka, in the Okhotsk Sea and into the southern Sea of Japan.

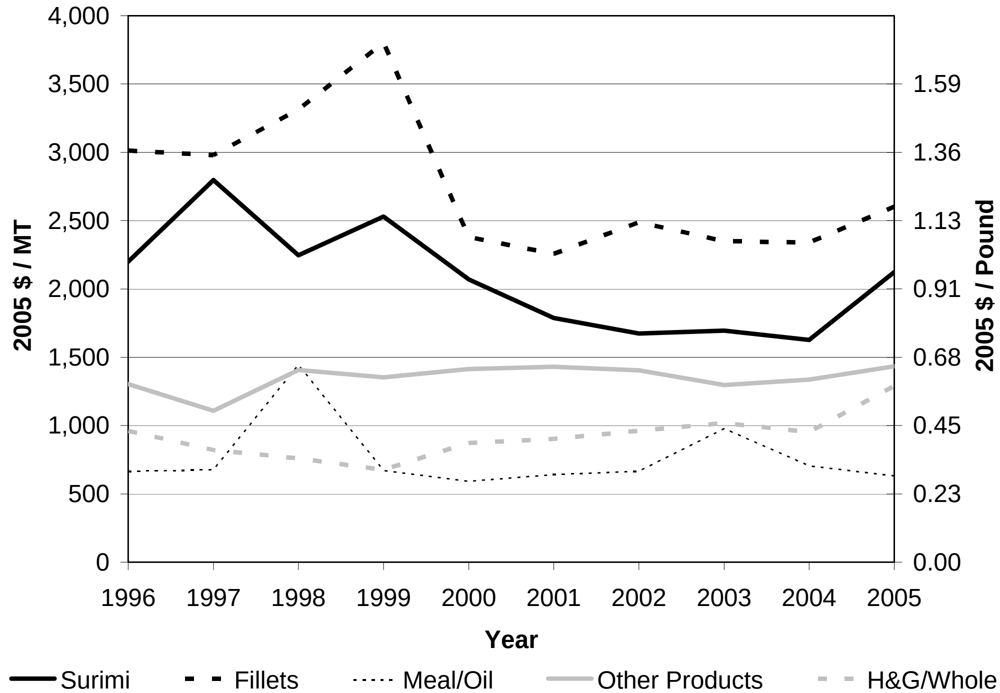
The Alaska pollock fishery in the waters off Alaska is among the world's largest fisheries. Under U.S. federal law, the fishery is subject to total allowable catch (TAC) limitations, quota allocations among the different sectors of participants in the fishery, and rules that give exclusive harvesting rights to specifically identified vessels, with the result that any potential new competitors face significant barriers to entry. In recent years, approximately 95 percent of the Alaska pollock fishery has been harvested in the Bering Sea and Aleutian Islands (BSAI) with the remaining 5 percent harvested in the Gulf of Alaska (GOA).

The American Fisheries Act (AFA) specifies how the TAC is allocated annually among the three sectors of the BSAI pollock fishery (inshore, catcher processors, and motherships) and community development (CDQ) quota groups. The AFA also specifically identifies the catcher/processors and catcher vessels that are eligible to participate in the Bering Sea-Aleutian Islands (BSAI) pollock fishery, and provides for the formation of cooperatives that effectively eliminates the race for fish. Under the cooperative agreements, members limit their individual catches to a specific percentage of the TAC allocated to their sector. Once the catch is allocated, members can freely transfer their quota to other members.

The BSAI pollock fishery is also split into two distinct seasons, known as the “A” and “B” seasons. The “A” season opens in January and typically ends in April. The “A” season accounts for 40% of the annual quota, while the “B” season accounts for the remaining 60%. During the “A” season, pollock carry their maximum quantities of high-value roe, making this season the more profitable one for some producers. During the “A” season other primary products, such as surimi and fillet blocks, are also produced although yields on these products are slightly lower in “A” season compared to “B” season due to the high roe content of pollock harvested in the “A” season. The “B” season occurs in the latter half of the year, typically beginning in July and extending through the end of October. The primary products produced in the “B” season are surimi and fillet blocks. Figure 1 shows the wholesale prices for U.S. primary production of Alaska pollock products. Roe prices are not included because the per unit value of roe is so much higher than other products; for example, in 2005, the wholesale price of Alaska pollock roe was about $13,000 per mt.

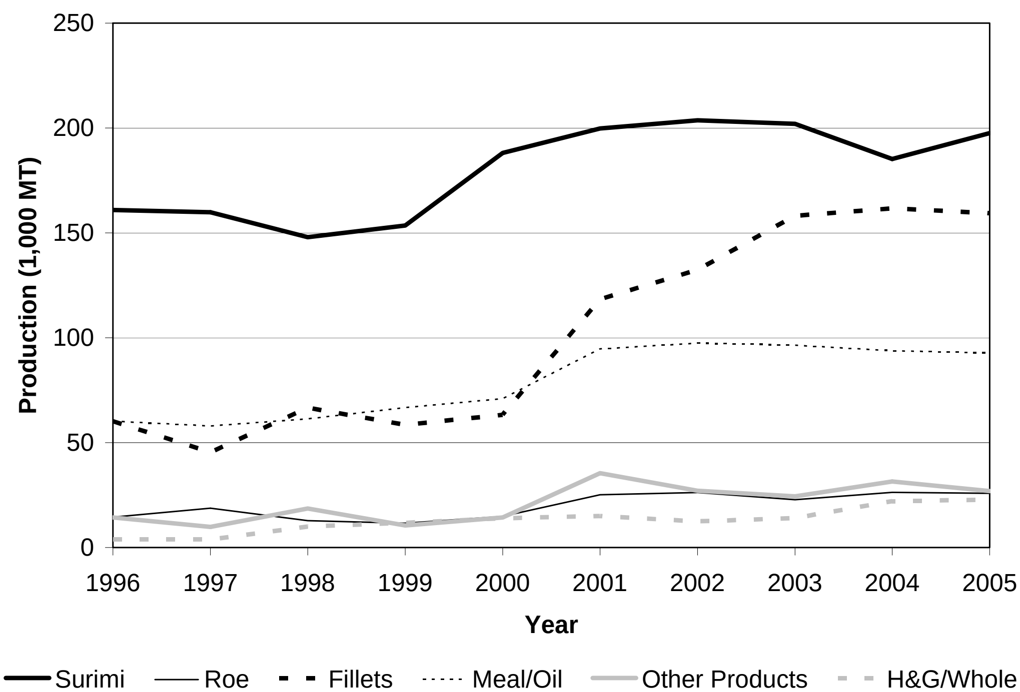
Prior to the implementation of the American Fisheries Act, most of the U.S. Alaska pollock catches were processed into surimi. Since the BSAI fishery was managed as an “open-access” fishery, the focus was on obtaining as large a share of the TAC as possible. Surimi production can handle more raw material in a short period of time than fillet and fillet block production. With the establishment of the quota allocation program and cooperative, the companies involved were given more time to produce products according to the current market situation (Sjøholt 1998). As the global decrease in the supply of traditional whitefish strengthened the demand for other product forms made from Alaska pollock, the share of fillets in total Alaska pollock production increased (Knapp 2006; Guenneugues and Morrissey 2005). The increase in the quantity and wholesale value of fillet production is shown in Figure 2 and Figure 3.

Figure 1. Wholesale Prices for Alaska Primary Production of Alaska Pollock Products (excluding Roe) by Product Type, 1996 – 2005



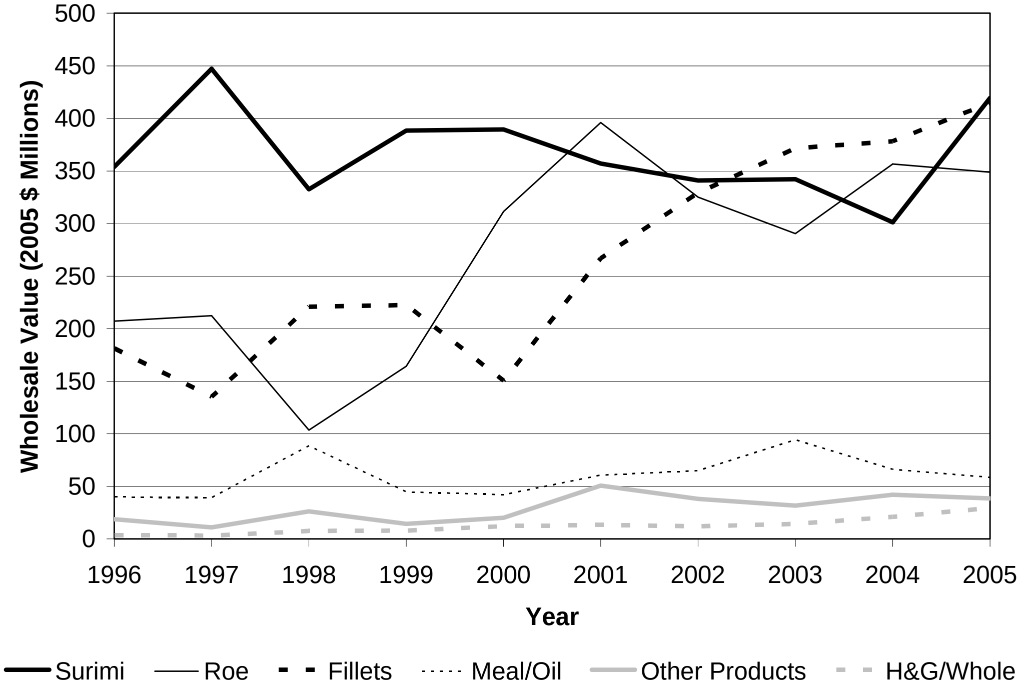
Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 2. Alaska Primary Production of Alaska Pollock by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005.

Figure 3. Wholesale Value of Alaska Primary Alaska Pollock Production by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

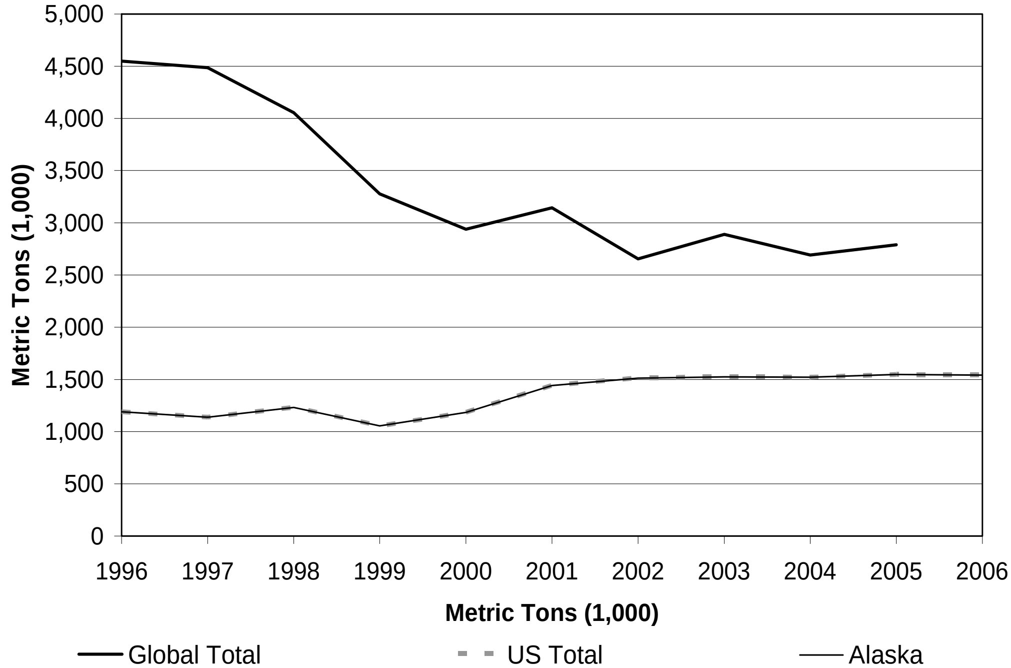
Production

The Alaska pollock is the most abundant groundfish/whitefish species in the world (Sjøholt 1998), and it is the world's highest-volume groundfish harvested for human consumption. With the exception of a small portion caught in Washington State, all of the Alaska pollock landed in the United States is harvested in the fishery off the coast of Alaska (Figure 4). This fishery is the largest U.S. fishery by volume. Of all the products made from Alaska-caught pollock, fillet production has increased particularly rapidly due to increased harvests, increased yields, and the aforementioned shift by processors from surimi to fillet production (Knapp 2006).

U.S. Alaska pollock fillet producers face competition from Russian Alaska pollock processed in China. Catches in Russia's pollock fishery in the Sea of Okhotsk, which used to be twice the size of catches in the U.S. Bering Sea-Aleutian Islands pollock fishery, have shown a declining trend. This decrease accounts for the falling global production of Alaska pollock shown in Figure 4.

In the early 1990s, the spike in cod pricing that followed the decrease in the Atlantic cod supply led to the conversion of most fillet customers to lower-priced, relatively more abundant pollock as a primary source of groundfish. (American Seafoods Group LLC 2002).

Figure 4. Alaska, Total U.S. and Global Retained Harvests of Alaska Pollock, 1996 – 2006



Note: Data for 2006 were unavailable for Global totals.

Source: Alaska data from NMFS Blend and Catch Accounting System Data. Other U.S. data from PacFIN, available at http://www.psmfc.org/pacfin/pfmc.html; Global data from FAO, "FishStat" database available at http://www.fao.org/fi/website/FIRetrieveAction.do?dom=topic&fid=16073.

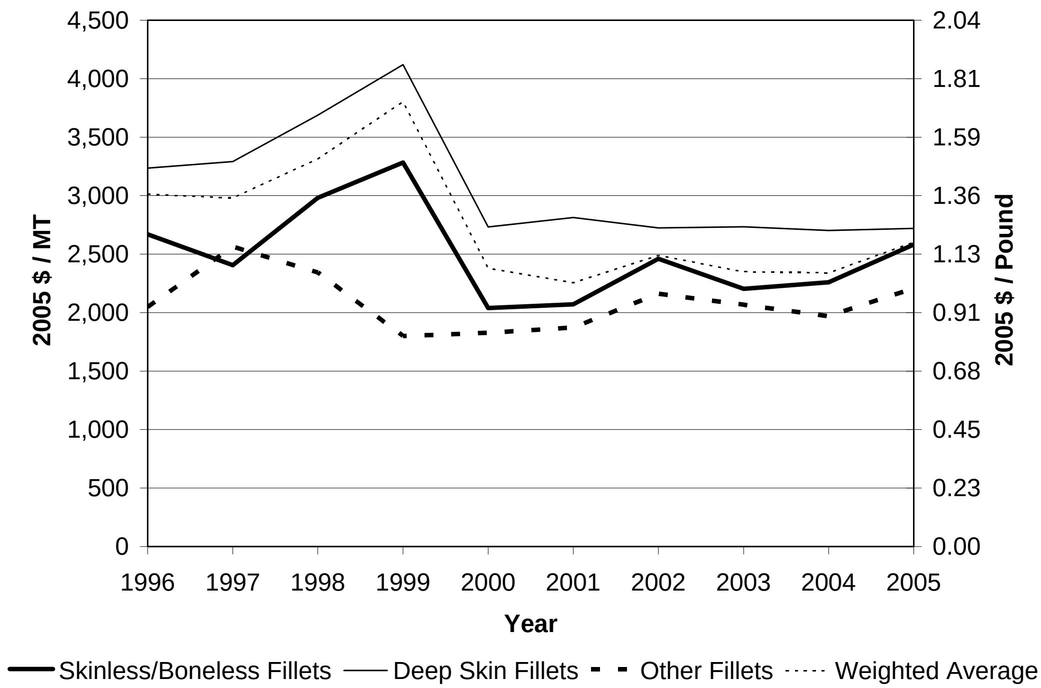
Product Composition and Flow

Pollock fillets are typically sold as fillets and fillet blocks (frozen, compressed slabs of fillets used as raw material for value-added products such as breaded items, including nuggets, fish sticks, and fish burgers), either as pin bone out fillets, pin bone in fillets, or deep-skinned fillets. Deep-skinned fillets are generally leaner and whiter than other fillets and command the highest wholesale price (Figure 5).

The price of pollock fillets also varies according to the freezing process. The highest-priced pollock fillets are single-frozen, frozen at sea (FAS), product produced by Alaska and Russian catcher/processors. Next would be single-frozen fillets processed by Alaska shoreside plants. Twice-frozen (also referred to as double-frozen or refrozen) pollock fillets, most of which are processed in China, have traditionally been considered the lowest grade of fillets and have sold at a discount, especially in comparison to FAS single-frozen fillets (Pacific Seafood Group undated). Twice-frozen fillets can be stored for a maximum of six months, whereas single-frozen can be stored for nine to 12 months; moreover, twice-frozen fillets are reportedly greyer in color and often have a fishy aroma (Eurofish 2003). However, industry representatives note that the acceptability of twice-frozen fillets is increasing in many markets, and the quality of this product is now considered by some to be similar to that of land-frozen fillets (GSGislason & Associates Ltd. 2003). Pollock is a fragile fish that deteriorates rather quickly after harvest, so little is sold fresh (NMFS 2001).

Historically, the primary market for pollock fillets has been the domestic market. Fillets made into deep-skin blocks were destined primarily for U.S. foodservice industry, including fast food restaurants such as McDonald's, Long John Silver's, and Burger King. (NMFS 2001). According to an industry representative, these high-volume buyers utilize enough product that they can cut it into portion sizes while still semi-frozen for re-processing as battered fish fillets or fish sticks. In recent years, however, the U.S market has shown more interest in skinless/boneless fillets than in deep-skin blocks (Figure 6 and Figure 7). Regular-skinned fillets are sold as individually quick frozen (IQF), shatterpack (layered frozen fillets that separate individually when struck upon a hard surface) or layer pack. In the past five years, groundfish block imports were cut by half, while fillet imports expanded by 30% during the same period. The market is thus demanding more value addition rather than a commodity product (GLOBEFISH 2007).

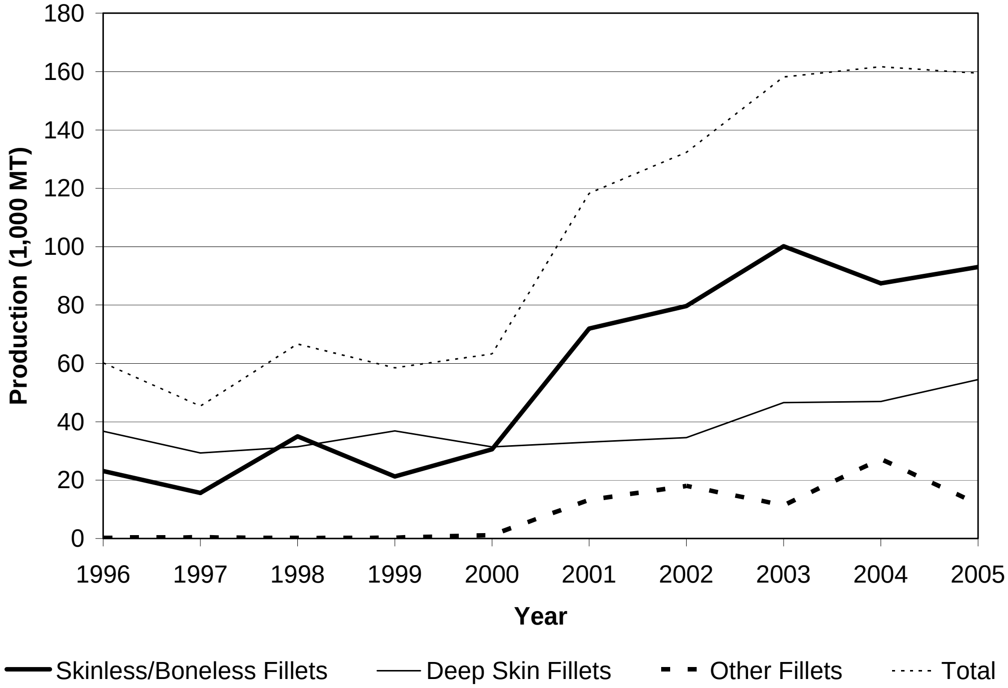
Figure 5. Wholesale Prices for Alaska Primary Production of Alaska Pollock Fillets by Fillet Type, 1996 – 2005



Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

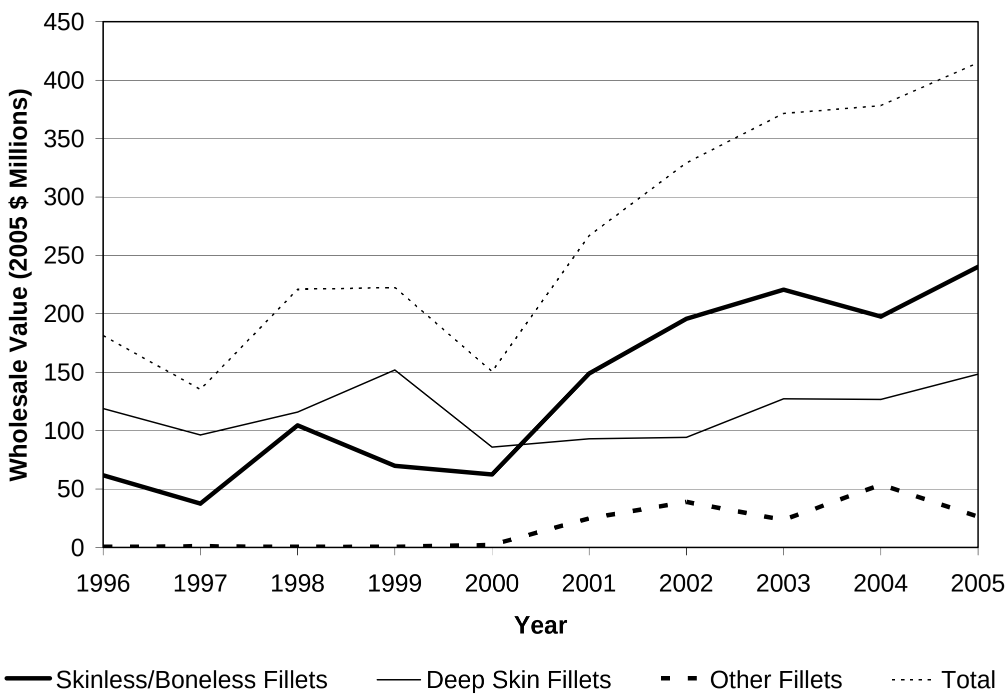
Alaska Groundfish Market Profiles

Figure 6. Alaska Primary Production of Alaska Pollock Fillets by Fillet Type, 1995 – 2005



Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 7. Wholesale Value of Alaska Primary Production of Alaska Pollock Fillets by Fillet Type, 1995 – 2005



Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005.

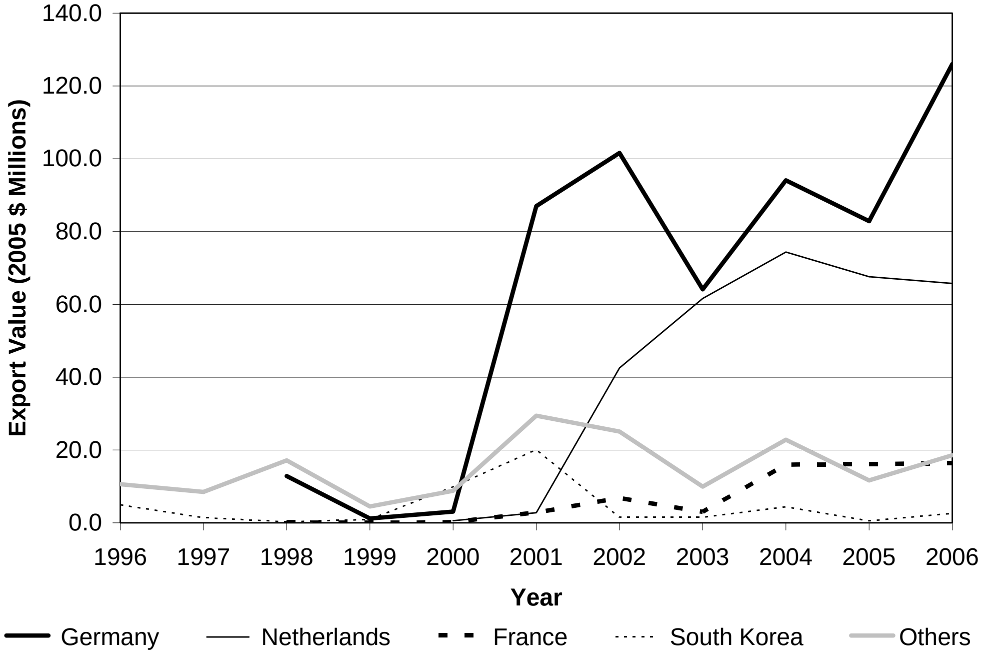
International Trade

As Russian pollock stocks and harvests decreased, U.S. producers of pollock were provided with a competitive advantage in implementing their strategy to increase their presence in the European and United Kingdom markets (American Seafoods Group LLC 2002). In addition, the declining catch quotas available for whitefish species in European Union waters, coupled with the depreciation of the dollar against the Euro, led to an increase of U.S. exports of pollock fillets to the European market (GLOBEFISH 2006; EU Fish Processors' Association 2006). As shown in Figure 8, the single most important export market for pollock fillets has been Germany since 2001. Another important European destination for Alaska-caught pollock is the Netherlands because it has two of Europe's leading ports (Rotterdam and Amsterdam) and is close proximity to other countries in Western Europe; most product imported by the Netherlands is further processed and re-exported to other EU countries (Chetrick 2007).

An increasing amount of headed and gutted pollock is being exported to China, which has been rapidly expanding imports of raw material fish as the world's "seafood processing plant" since the latter half of the 1990s. Transport costs to China can be offset by significant presentational and yield improvements achieved by use of a highly skilled labor force (EU Fish Processors' Association 2006). This is in contrast to the need for mainly mechanical filleting and preparation by U.S. processors, with consequent yield loss. It is estimated that American at-sea processors require 69% more fish to produce the same quantity of pollock fillets as compared to Chinese processors (Ng 2007). To avoid paying high import duties and going through formal customs procedures some Chinese processors process and store raw material delivered from overseas in a free-trade or "bonded" zone (Retherford 2007; pers. comm., Tom Asakawa, Commercial Specialist, NMFS, September 20, 2007). The twice-frozen pollock fillets are exported to markets in North America, Europe and elsewhere. A negligible amount of Alaska-caught pollock and other groundfish is sold in the domestic Chinese market.

U.S. seafood companies are increasingly taking advantage of the higher recovery rates and lower labor costs associated with outsourcing some fish processing operations. For example, Premier Pacific Seafoods built a new facility on its 680-ft. mothership M/V *Ocean Phoenix* to prepare Alaska pollock for sale to re-processors in China. The fish are headed and gutted, then frozen and sent to China for further processing (Choy 2005). According to Premier Pacific Seafoods' president, supermarket chains and nationwide retailers are helping to drive the practice of outsourcing: "You're dealing with national retail chains that have strict product specifications that are so exacting that they require hand processing" (Choy 2005).

Figure 8. U.S. Exports of Alaska Pollock Fillets to Leading Importing Countries, 1996 - 2006



Note: Data include all exports of Alaska pollock from all U.S. Customs Districts
Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/

Market Position

One significant advantage that U.S. producers of pollock have over competitors who harvest pollock and other groundfish in other fisheries is a relatively abundant and stable fishery (American Seafoods Group LLC 2002).

The delicate texture, white color and mild flavor of the pollock's flesh have proven ideal for every segment of the foodservice market from fast food to "white tablecloth" restaurants. What's more, its relatively stable supply enables restaurants to maintain consistent menu pricing throughout the year (NMFS 2001).

European and United Kingdom whitefish supplies are tight, strengthening demand for Alaska whitefish such as pollock. In addition, the dollar is depreciating against the euro, making it less expensive for Europeans to buy U.S. seafood (Hedlund 2007). This cost advantage is driving increased European purchases of whitefish from Alaska and is one of the reasons for the growth of whitefish consumption in Europe despite the increasing prices. On a currency weighted basis, the cost of pollock fillets are not increasing in Europe (SeafoodNews.com 2007a).

Pollock fillet producers in Alaska face competition in the U.S. domestic market from imported twice-frozen pollock fillets and fillet blocks—caught in Russia and reprocessed in China (Knapp 2006). One challenge for pollock marketers is the use of the term "Alaska pollock" to refer to Russian-produced pollock, as well as its Alaska counterpart (Seafood Market Bulletin 2005). Because Alaska pollock is the correct species name for any pollock harvested in the Bering Sea, regardless of national boundaries, Russian pollock is not technically misbranded. But pollock companies are compelled to differentiate the product from that which is produced in Russia. With federal funding from the Alaska Fisheries Marketing Board, US pollock producers have begun a "Genuine Alaska Pollock Producers" marketing campaign to promote Alaska-harvested pollock as sustainably managed and superior to twice-frozen Russian pollock (Association of Genuine Alaska Pollock Producers 2004; Knapp 2006).

This marketing campaign was bolstered by Marine Stewardship Council certification of the U.S. Bering Sea-Aleutian Islands pollock fishery as a “well managed and sustainable fishery.” The MSC certification is expected to boost Alaska-harvested pollock sales and help develop the already strong European market for pollock (Van Zile 2005). Consumers in Western Europe are generally perceived by the seafood industry as having more familiarity with the MSC certification than those in the United States (Van Zile 2005). For example, Young’s Bluecrest, the largest seafood producer in Britain, having recognized the potential value of the MSC label, has embarked on a major brand redesign that highlights fish which have been independently assessed as coming from properly managed and sustainable sources (FISHupdate.com 2007). In 2006, the company began using MSC-accredited Alaska-caught pollock in the UK’s best-selling battered fish product (Young's Bluecrest Seafood Holdings Ltd 2006). Similarly, Birds Eye (Europe) announced in 2007 that its new line of fish fingers, the company's staple product, will be made from pollock sourced from the Alaska fishery rather than from Atlantic cod, and the MSC label will be affixed on the consumer package (Marine Stewardship Council 2007),

American exposure to eco-labeled seafood products is expected to increase as major U.S. retail chains begin to more aggressively market these products; for example, Wal-Mart Stores, Inc. is planning to fulfill its seafood needs from MSC-certified products where possible; these products currently include “wild Alaskan pollock fillets” (Marine Stewardship Council 2006; Wal-Mart Stores, Inc. 2006).

With Russian pollock in short supply due to declining catches, twice-frozen fillets from China have become more expensive and imports have dropped. Trade press reports point to an increased Russian Alaska pollock quota (GLOBEFISH 2007), but the U.S. quota is expected to decline. The North Pacific Fisheries Management Council set the Bering Sea subarea TAC for Alaska pollock at 1.394 million mt for 2007—a 5.8% reduction. The 2008 TAC will likely be even lower—projections in the BSAI Pollock Stock Assessment and Fishery Evaluation (SAFE) are 1.318 million mt. It is not clear how these quota adjustments will translate into changes in pollock fillet production, and hence prices (GLOBEFISH 2007). If producers shift production from surimi to fillets, reduced catch levels do not necessarily mean increased prices (Sjøholt 1998). However, the high prices for pollock harvested in Alaska are generally expected to hold due to the continuing questions about the health of Russia’s pollock resource, together with the growing demand from Europe and strength of the euro relative to the dollar (GLOBEFISH 2007). As shown in Figure 9 and Figure 10, export prices and volumes of Alaska pollock fillets are predicted to continue to show an increasing trend.[2] Germany is expected to remain a growing market for U.S. pollock fillets because of consumer preferences shifting toward healthy, low-fat foods (Figure 11 and Figure 12). The effects of having two distinct pollock seasons cause the within year variation of pollock exports seen in Figure 10 and Figure 12.

With high pollock prices, some species substitution is inevitable. Alaska-caught pollock also competes in world fillet markets with numerous other traditional whitefish marine species, such as Pacific and Atlantic cod, hake (whiting), hoki (blue grenadiers), and saithe (Atlantic pollock). Price competitive whitefish fillets and products can also be prepared from freshwater species such as pangasius (basa catfish), Nile perch, and tilapia, so that while freshwater whitefish currently represent a relatively small sector of the total market, it can be anticipated that they will be used to both substitute for traditional whitefish marine species as well as to be used to grow the overall market (EU Fish Processors’ Association 2006).

Another long term development that could affect the market position of U.S. pollock fillets is the possible participation of Russia’s Alaska pollock fishery in the MSC certification program. In late 2006, the Vladivostok-based Alaska pollock Fishing Association, which claims to represent 70% of the

[2] The methodology used to develop forecasts shown in Figure 9 through Figure 12 is described in Appendix A.

Russian pollock fishery, decided to request a preliminary assessment of the fishery's compliance with the environmental standards set by the MSC (Fishnet.ru 2006; SeafoodNews.com 2007b). The Russian producers note that MSC-certified Alaska-caught pollock are preferred by a number of large international buyers and are selling at $200 per mt more than the uncertified product (Fishnet.ru 2006; Fishnet.ru 2007). The Alaska Seafood Marketing Institute has indicated that the market for Alaska-processed pollock is strong and that MSC certification of the Russian fishery is unlikely to hurt Alaskan companies (Rogers 2007); however, some Alaska producers have gone on the marketing offensive, arguing that the Russian fishery should not be certified because the fishery has a history of overfishing (Fishnet.ru 2007; Sackton 2007). An additional concern expressed by industry representatives is that Russian pollock harvests may rebound over the next few years, while the U.S. TAC for pollock continues to be reduced. Some observers believe that climate change is shifting Bering Sea pollock resources northward into Russian fishing grounds (Eaton 2007). Over time, this would provide Russian processors an opportunity to re-capture market share from U.S. processors.

Finally, the short and long term effects of food safety issues in China on the market position of Alaska-caught pollock and other groundfish must be considered given the increasing amount of Alaska groundfish sent to China for processing and re-export. In 2007, the U.S. Food and Drug Administration (FDA) announced a broader import control of all farm-raised catfish, basa, shrimp, dace and eel from China, to protect U.S. consumers from unsafe residues that have been detected in these products (U.S. Food and Drug Administration 2007). These products will be detained at the border until shipments are proven to be free of residues of drugs not approved in the United States for use in farm-raised aquatic animals. The European Union banned the import of all products of animal origin from China in 2002 over similar concerns about the safety of Chinese aquaculture and fishery products; this embargo was gradually lifted after the Chinese government agreed to implement stricter testing (EUROPA 2002).

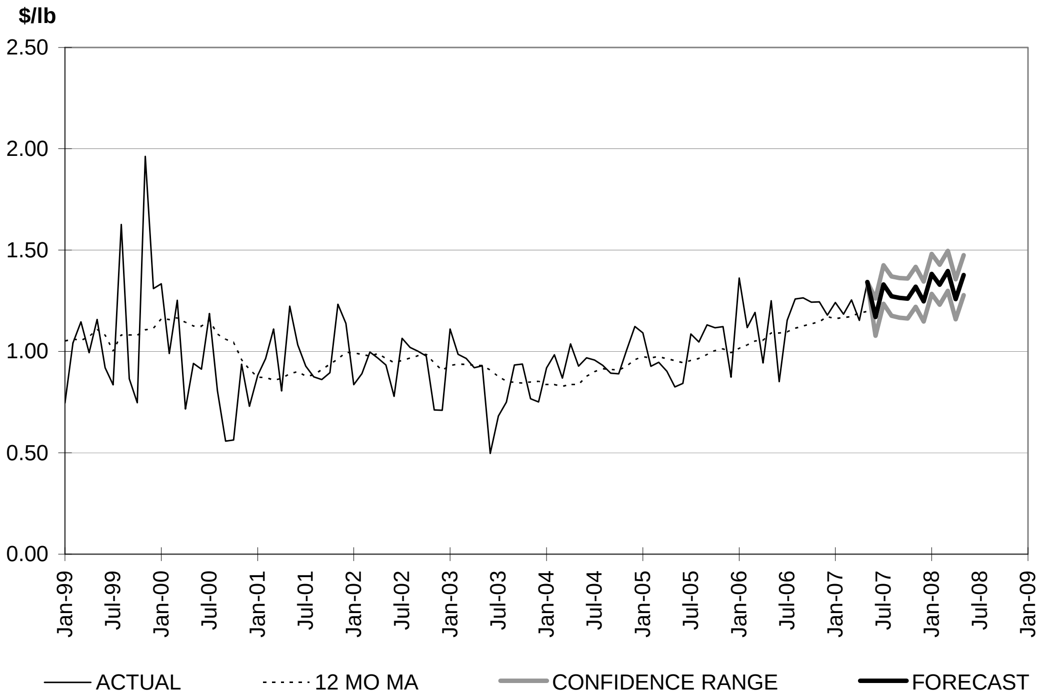
Although U.S.-caught fish sent to China for processing are not covered by FDA's import alert, the concern within the seafood industry is that customers will tend to lump all China seafood products together (Schmit 2007). Consumer market research indicates that the FDA's action, together with media attention China received for safety problems relating to other consumer goods, has led to rising distrust among American consumers in seafood imported from China. For example, a recent consumer survey found that China was by far the country most often targeted for respondents' personal food safety concerns (Pirog and Larson 2007).

Furthermore, an industry representative noted that there has been criticism among some buyers about a too high content of polyphosphates in frozen Alaska pollock fillets from China. Soluble salts of phosphoric acids have many functional uses in fresh and frozen fillets and other seafood products, including, but not limited to, natural moisture and flavor retention, color and lipid oxidation inhibition, drip reduction and shelf-life extension (Lampila and Godber 2002). However, protracted soaking in a phosphate-based solution leads to sensory defects (a soapy taste), texture deterioration and the potential for charges of economic fraud due to dramatic increases in the ratio of water to protein (Aitken 1975; Lampila and Godber 2002).

In response to concerns raised about the quality of seafood imported from China, spokesmen for Ocean Beauty Seafoods LLC and Trident Seafoods Corporation, two major Seattle-based processors of Alaska seafood, have publicly stated that no matter where their companies process fish, the processing is done to the same strict quality control standards (Bauman 2007). Moreover, some seafood industry analysts have expressed confidence that, although a few customers have temporarily stopped buying Chinese seafood products, that response will quickly fade as headlines shift and buyers get assurance that the products are of good quality (Schmit 2007). However, it is not yet certain how, if at all, the market for Alaska groundfish products produced in China will be affected by the on-going controversy over China's quality control practices.

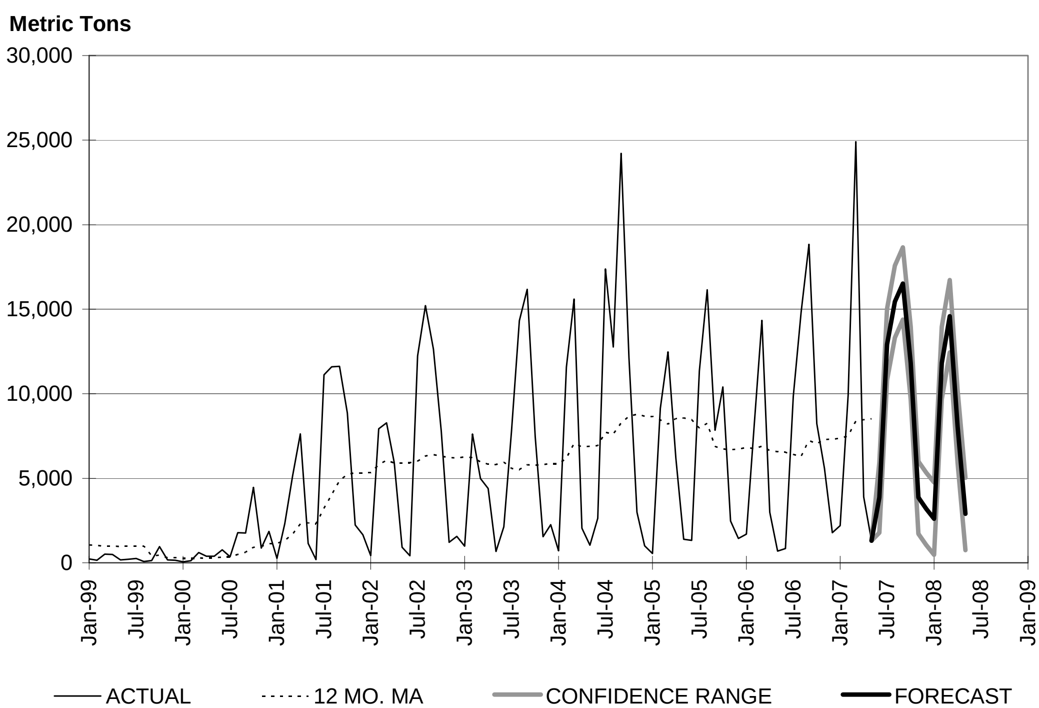
Alaska Groundfish Market Profiles

Figure 9. Actual and Forecast Nominal U.S. Export Prices of Alaska Pollock Fillets to All Countries, 1999 - 2008



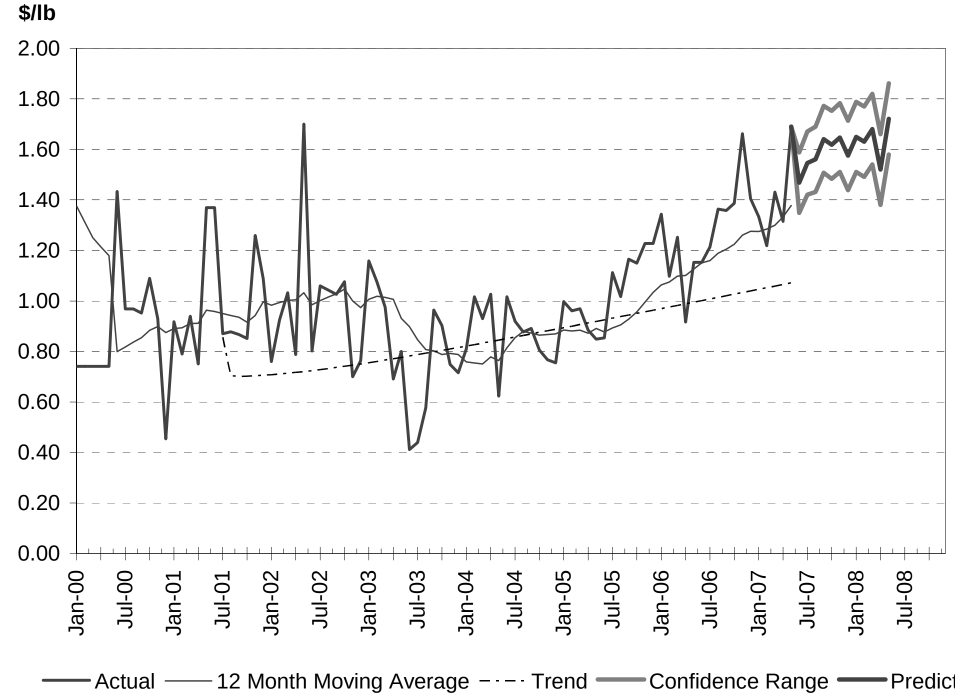
Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 10. Actual and Forecast U.S. Export Volumes of Alaska Pollock Fillets to All Countries, 1999 - 2008



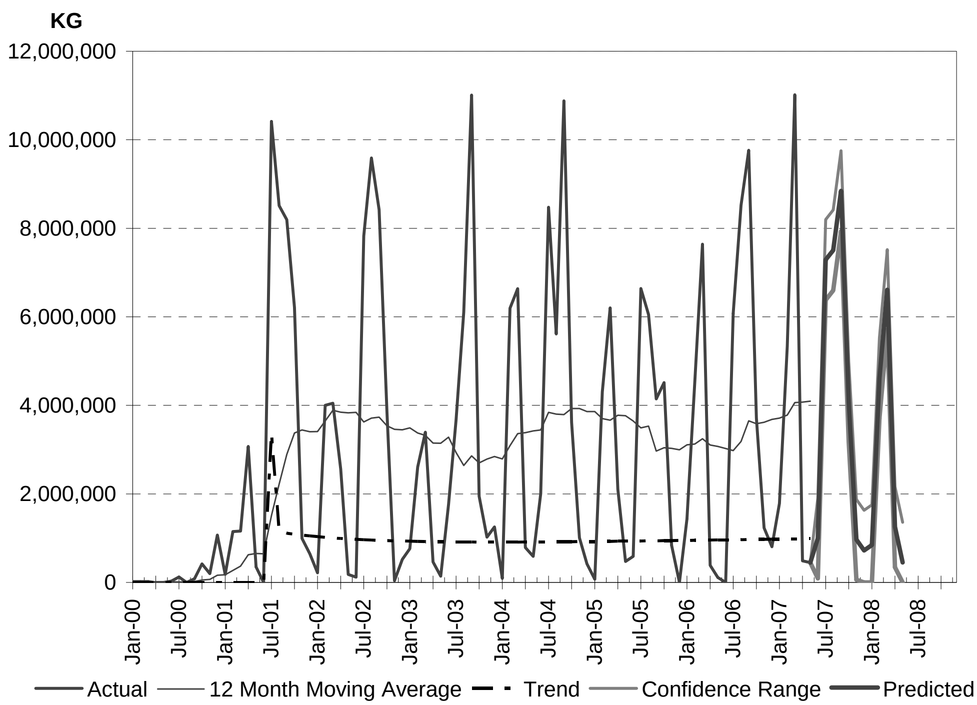
Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 11. Actual and Forecast Nominal U.S. Export Prices of Alaska Pollock Fillets to Germany, 2000-2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 12. Actual and Forecast U.S. Exports Volumes of Alaska Pollock Fillets to Germany, 2000-2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

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Alaska Pollock Surimi Market Profile

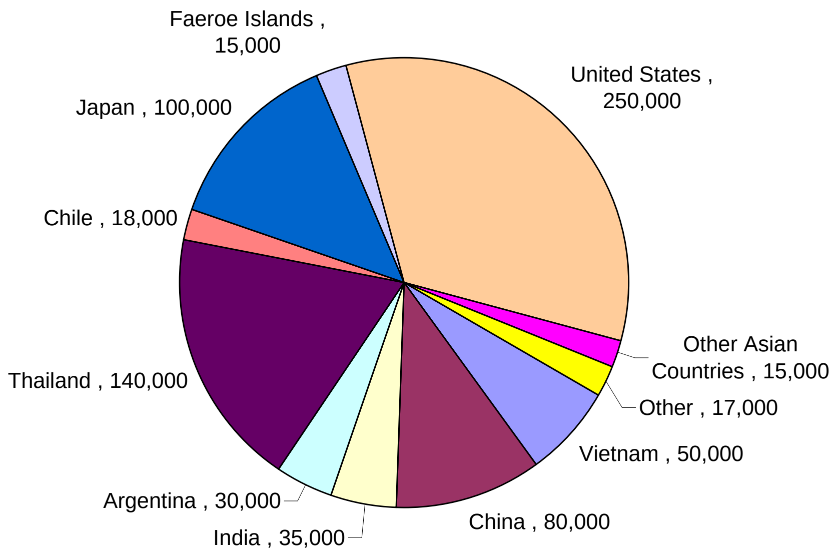
Description of the Fishery

See *Alaska Pollock Fillets Market Profile*

Production

Surimi production has almost doubled in the last 10 years (GLOBEFISH 2006). In 2005, two to three million mt of fish from around the world, amounting to 2 to 3% of the world fisheries supply, were used for the production of about 750,000 mt of surimi (GLOBEFISH 2006; GLOBEFISH 2007a).

Figure 13. Estimated World Surimi Production (MT), 2005



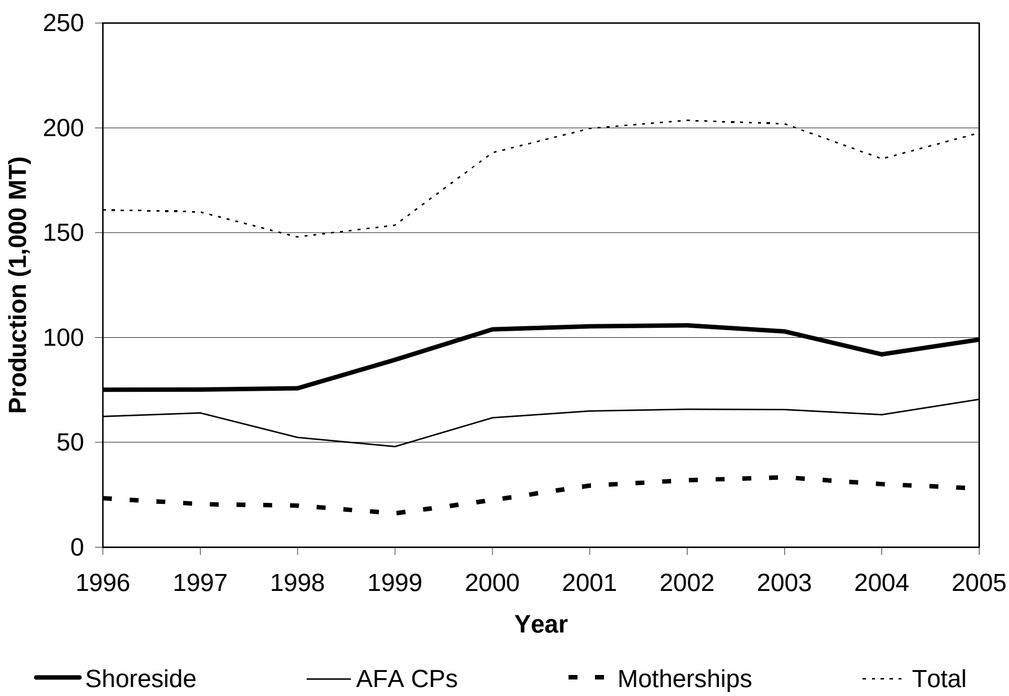
Source: GLOBEFISH (2006)

Most of the surimi is produced for Asian markets, with Japan being the single largest market. The United States is by far the leading country providing Alaska pollock surimi to the Japanese market. Although Alaska pollock continues to account for a large proportion of the surimi supply, new sources of production, such as Chile, India, and China, have taken the opportunity of the surimi market's growth to greatly increase their production using alternative types of whitefish. Southeast Asia initiated the expansion by utilizing threadfin bream to make surimi (known as *itoyori*), which now represents 25% of the total volume of surimi production (Guenneugues and Morrissey 2005).

The successful growth of the surimi industry was initially based on Alaska pollock, and approximately half of the surimi produced continues to be based on this species. However, Alaska pollock surimi production rose only slightly in the late 1990s (Knapp 2006). Rising harvests and yields of Alaska pollock were offset by a shift from surimi to fillet and fillet block production. Particularly significant was the product shift by catcher/processors active in the Bering Sea/Aleutian Islands (BSAI) pollock fishery, as these at-sea operations were critical to the production of surimi for world markets (Guenneugues and Morrissey 2005). In 1998, the passage of the American Fisheries Act (AFA) ended the "race-for-fish" in the BSAI fishery, and AFA-eligible catcher/processors (AFA CPs) were given more time to produce products according to the current market situation (Sjøholt 1998). As the demand for other product forms made from Alaska pollock increased, the vessels reduced the share of harvests going to surimi production (Knapp 2006; Guenneugues and Morrissey 2005). This reduction has been partially offset by the significant increase in yields in pollock surimi processing that occurred from 1998 onward, particularly as a result of better cutting of the fish and implementation of the recovery of meat from the frames and washwater (Guenneugues and Morrissey 2005).

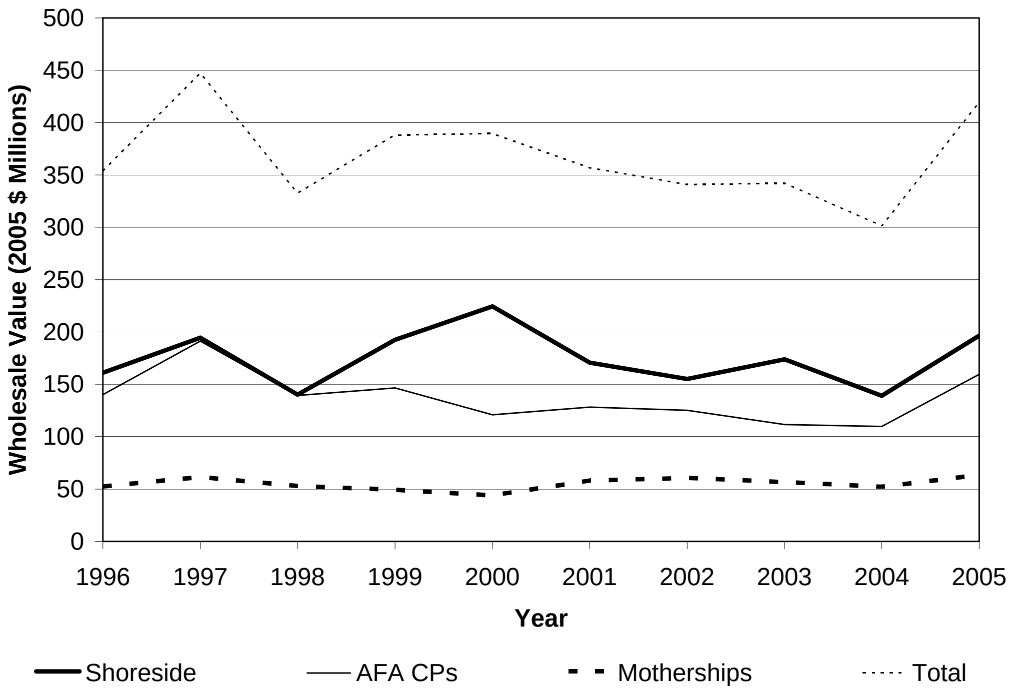
The result of this more efficient processing is that the volume and value of surimi produced from Alaska-harvested pollock has remained fairly stable (Figure 14 and Figure 15) even though fillet production has increased. Alaska pollock surimi wholesale prices spiked in 1999, possibly due to the decrease in the total allowable catch for Alaska pollock in the BSAI. Wholesale prices declined between 1999 and 2001, but have since been relatively stable (Figure 16). Industry representatives note that fluctuations in wholesale prices may be due to changes in the grade of surimi being produced as well as differences in the prices by grade. Data indicating the grades of pollock surimi produced are not generally available. Industry representatives indicate that overall, the pollock surimi produced in the United States has shifted toward lower levels of quality ("recovery grades"), as a greater portion of surimi production utilizes flesh trimmed during the production of fillets.

Figure 14. Alaska Primary Production of Alaska Pollock Surimi by Sector, 1995 – 2005



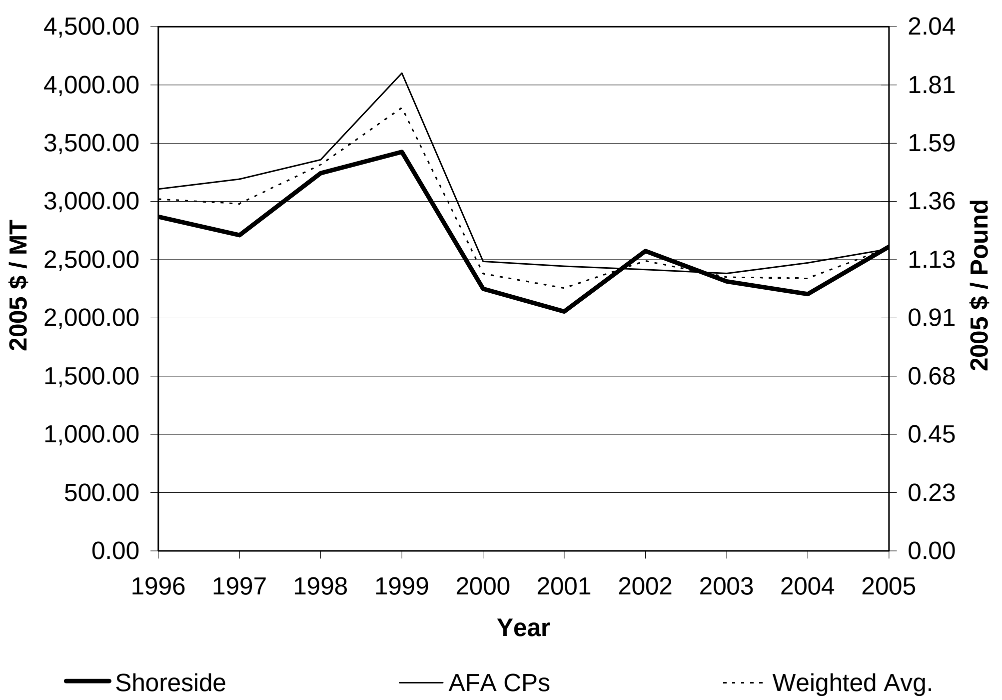
Note: Reported surimi production and value do not specify the grade of products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 15. Wholesale Value of Alaska Primary Production of Alaska Pollock Surimi by Sector, 1996 – 2005



Note: Reported surimi production and value do not specify the grade of products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 16. Wholesale Prices for Alaska Primary Production of Alaska Pollock Surimi by Sector, 1996 – 2005



Note: Reported surimi production and value do not specify the grade of products. AFA-eligible catcher/processors and motherships are treated as a single sector for the purpose of price calculations.

Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Product Composition and Flow

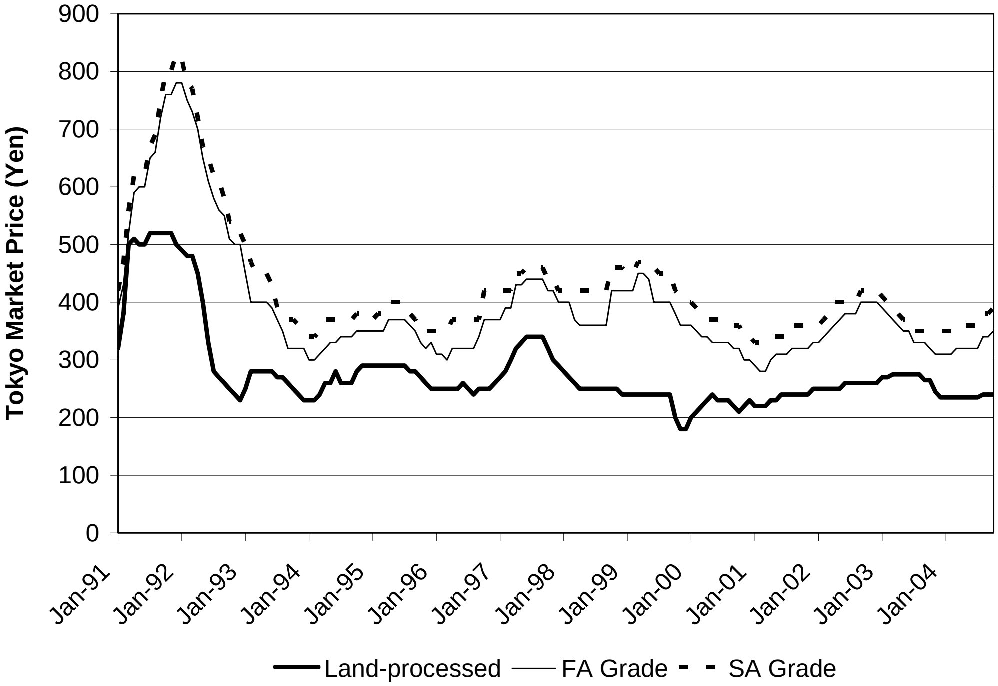
Surimi is the generic name for a processed white paste made from whitefish. In the case of Alaska pollock surimi, the fish are first filleted and then minced. Fat, blood, pigments and odorous substances are removed through repeated washing and dewatering. As washings continue, lower-quality product is funneled out; thus, higher quality surimi is more costly to produce since it requires additional water, time and fish (Hawco and Reimer 1987 cited in Larkin and Sylvia 2000). Cryoprotectants, such as sugar and/or sorbitol, are then added to maintain important gel strength during frozen storage. The resulting surimi is an odorless, high protein, white paste that is an intermediate product used in the preparation of a variety of seafood products. Analog shellfish products are made from surimi that has been thawed, blended with flavorings, stabilizers and colorings and then heat processed to make fibrous, flake, chunk and composite molded products, most commonly imitating crab meat, lobster tails, and shrimp. Higher-end surimi is mixed with actual crab, lobster or shrimp. In Japan, surimi is also used to make a wide range of *neriseihin* products, including fish hams and sausages and *kamaboko*, a traditional Japanese food typically shaped into loaves, and then steamed until fully cooked and firm in texture (NMFS 2001).

The demand for surimi-based products in Japan is highest during the winter season as a result of the increased consumption of *kamaboko* during the New Year holidays. In the United States, the demand is highest during the simmer months when artificial crab meat and other surimi-based products are popular as salad ingredients (Park 2005).

Producers assign commercial grades to surimi based on the level of color, texture, water content, gelling ability, pH level, impurities and bacterial load (Park and Morrissey 1994). However, there is not necessarily a close direct correlation between surimi grade and surimi price. This could be because there is no common grading schedule for surimi, implying that each manufacturer decides which characteristics to include, how they are measured, and the levels and nomenclature that define each grade (Burden et al. 2004; Park and Morrissey 1994). Although there are no uniform grades among companies, many suppliers have adopted the general nomenclature and relative rankings of the grades developed by the National Surimi Association in Japan (Larkin and Sylvia 2000). The highest quality surimi is given the SA grade, and the FA grade is typically applied to the second highest quality (Park and Morrissey 1994). For lower grades the nomenclature becomes more variable. Either "AA" or "A" often denote third grade surimi, and the labels "KA" or "K" are frequently applied to the fourth grade of surimi. The lowest grade products may be designated "RA" or "B."

Figure 17 shows the wholesale price trend for three grades of frozen surimi delivered to processors of surimi-based products in Japan. To achieve the SA grade, which as noted above is the highest grade product, the gel-strength and the product's color must meet certain levels. The prices of surimi in the Japanese market normally increase with greater gel strength. This reflects the preferences of Japanese buyers, who demand the highest possible gel strength in their products (Trondsen 1998). In Japan, first grade SA quality yields a price that is approximately 10% higher than the price of second (FA) quality grade. The quality of a given lot of surimi is also assessed from information on production location, i.e., shoreside versus at-sea. Sproul and Queirolo (1994) note that the Japanese generally believe that, due to faster conversion from live fish to frozen surimi, ship-processed surimi is of higher quality than land-processed surimi. Hence, surimi produced by shoreside processors commands a lower price than either the SA or FA grade produced by at-sea operations. On average, the price of surimi from land-processed pollock is about 65% that of grade SA.

Figure 17. Wholesale Price of Frozen Surimi by Grade in Japan, 1991-2004



Note: Prices of SA and FA grades are for surimi from ship-processed pollock. Grade designations can have variable meanings depending upon the supplier. No grade designation for land-processed surimi is given.

Source: Minato Shinbun Sha [Japanese daily fisheries and food news in Japanese]. 2004. Shimonoseki, Japan. Provided by Sunee C. Sonu, International Trade Specialist, National Marine Fisheries Service, Southwest Regional Office.

World demand for lower-quality surimi has allowed processors to market recovery grade or to blend it with primary grades to produce medium/low-quality surimi (Guenneugues and Morrissey 2005). In a survey of U.S. and EU surimi buyers, which account for more than half of the total surimi purchases in their markets, Trondsen (1998) found that most mainly use the second, third and fourth quality grades in their product mixes. SA and FA grades are only used as a part of the raw material mix. AA is the grade most used, both with respect to the number of users and to the share of the product mix. A lower grade product allows the use of protein that was formerly lost in surimi processing waste and used for fish meal production (Guenneugues and Morrissey 2005). In addition, industry representatives noted that it allows the use of flesh trimmed during the production of fillets.

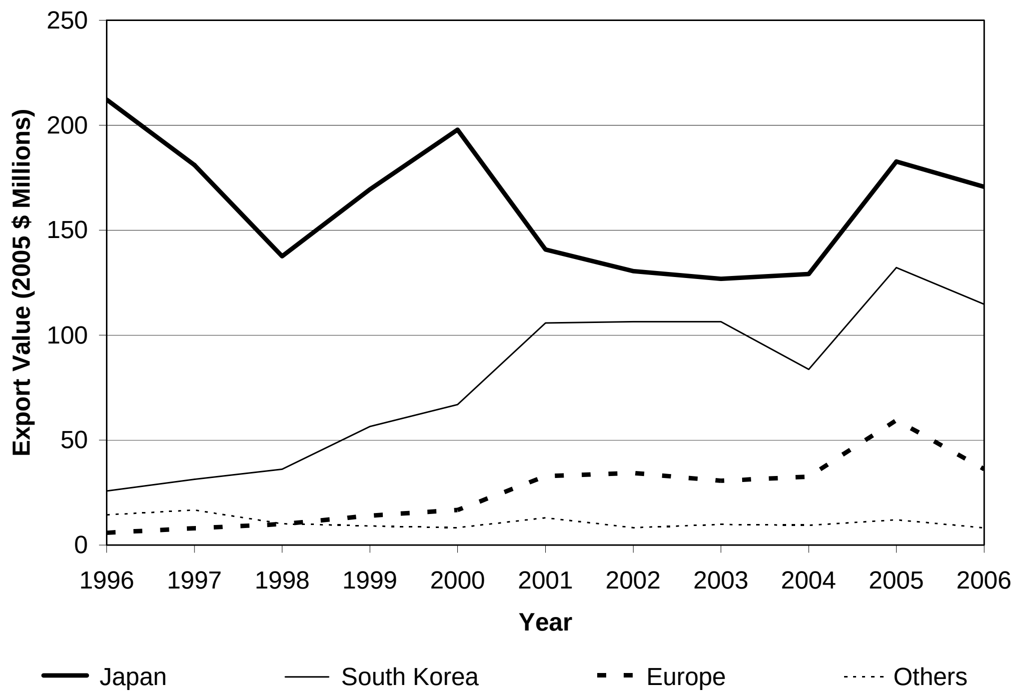
International Trade

As shown in Figure 18, most U.S. Alaska pollock surimi production is exported, the primary buyers being Japan and South Korea. Most of the balance of exports reach European countries. Over the past few years, greater amounts of American-produced surimi have been exported to Korea, as the demand for seafood in Korea is strong and Korea's local catch is shrinking. However, the amount delivered to Korea includes not only that directed to Korean domestic market but also the amount kept in custody at the bonded warehouse in Busan, which is an international hub port. The surimi products deposited at Busan are finally destined to the Japanese market in most cases. In the early part of this decade, U.S. Alaska pollock surimi exports to EU markets also grew. Several factors played a role in the growing U.S. exports to the EU, including seafood’s popularity due to interest in healthy eating and the great variety of surimi-based convenience foods sold in the retail sector (Chetrick

2005). According to an industry representative, exports to EU markets consisted mainly of recovery grades of pollock surimi.

In 2006, however, U.S. Alaska pollock surimi exports to countries other than Japan fell (Figure 18). The decline in imports occurred despite the dollar's weakening versus the won, euro, and yuan. The reason for the decline is deemed to have been the relatively high prices for U.S. surimi. U.S. surimi is replaced by lower-priced Asian-produced surimi in Korea, by Chilean horse-mackerel surimi in the EU, and by domestically-produced mixed surimi in China (Seafood.com News 2007a).

Figure 18. U.S. Exports of Alaska Pollock Surimi to Leading Importing Countries, 1996 - 2006



Note: Data include all exports of Alaska pollock from the U.S. Customs Pacific District.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/.

Market Position

In addition to grade mix, the price for U.S. Alaska pollock surimi is influenced by factors such as Japanese inventory levels and seasonal production from the U.S. and Russian pollock fisheries. Over the longer term, prices depend on changing demand for surimi-based products in Japan and other markets, and the supply of surimi from other sources.

In Japan, where heavy surimi consumption is a tradition, rising prices of Alaska pollock surimi raw material, dwindling birth rates and changing food habits are challenging surimi-based products consumption. In 2005, surimi products sales at wholesale markets in Japan saw a decrease of 5% in volume—confirming a continuous decrease (GLOBEFISH 2006). Among Japanese consumers surimi made from Alaska pollock is considered to be superior to most, if not all, other surimi; there are no close substitutes (NMFS 2001). Consequently, Alaska pollock surimi exports to Japan have tended to be price inelastic—the demand for this surimi does not soften much in response to a modest price increase. The effects of price for intermediate products such as surimi may also be cushioned by supply contracts and vertical integration among surimi processors, wholesalers, and retailers in Japan

(NMFS 2001). For example, both Maruha Group Inc. and Nippon Suisan Kaisha Ltd. are extremely vertically integrated, with ownership of firms all along the surimi supply chain (Fell 2005). However, the demand for traditional surimi products, such as *kamaboko*, may be declining in Japan. One possible reason is that much of the demand comes from older Japanese. The younger generation in Japan and many other Asian countries appears to prefer Western foods (NMFS 2001).

Despite changing market conditions in Japan, Alaska pollock surimi prices have remained firm as international supply-demand for Alaska pollock surimi has become tighter (GLOBEFISH 2006; Seafood.com News 2007b). The high demand for pollock as whitefish fillets in Europe, cuts in the U.S. pollock quota and declining Russian production have contributed to a stringent surimi purchase environment. In addition, in countries having recently become surimi consumers, especially Western countries, changing food habits are fueling the development of surimi consumption. The domestic surimi market received a boost in 2006, when the U.S. Food and Drug Administration began allowing surimi to be labeled as “crab-flavored seafood” or whatever seafood it is made to resemble, rather than as “imitation.” In addition, producers are presenting wider surimi-based product ranges. New consumption trends are now targeted: development of fresh products, snacks, food for children, organic products, high value products, and inexpensive products (GLOBEFISH 2006).

Marine Stewardship Council certification of the U.S. Bering Sea-Aleutian Islands pollock fishery as a “well managed and sustainable fishery” is also expected to boost sales of surimi products made from Alaska-harvested pollock. In 2006, the large U.S. retail chain, Wal-Mart Stores, Inc., began marketing the world's first MSC-labeled surimi products, all of which are made from Alaska-caught pollock (Wal-Mart Stores, Inc. 2006). In 2007, Coraya, Europe’s leading surimi brand, launched a range of MSC-labeled surimi products made from Alaska-harvested pollock; the products will be initially distributed in Switzerland (Marine Stewardship Council 2007).

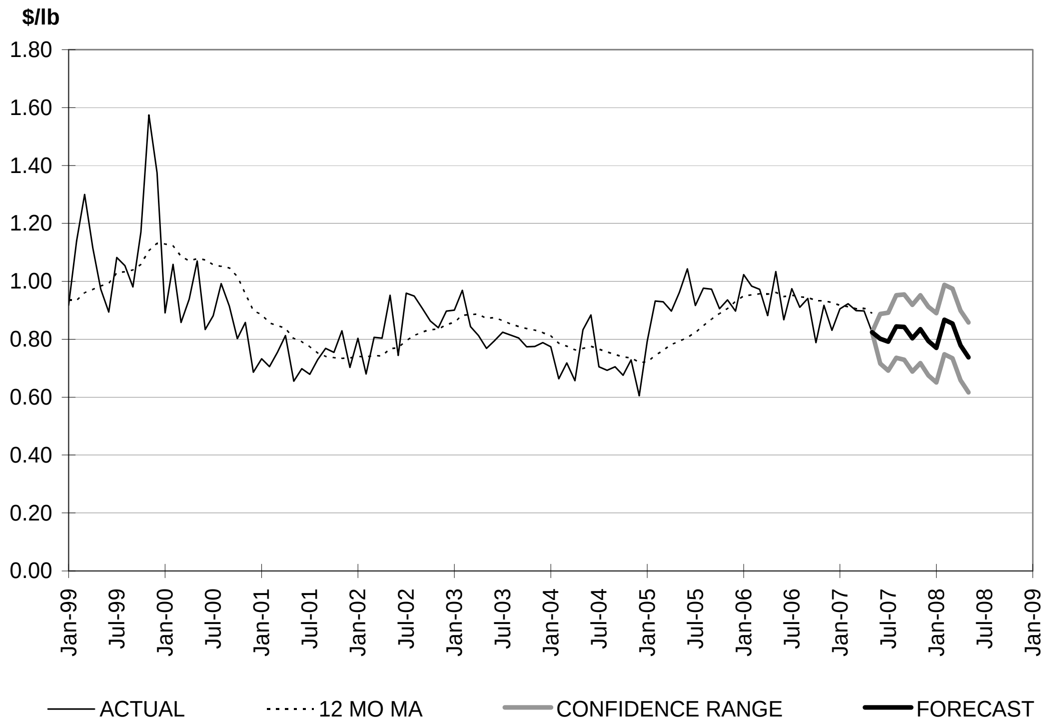
A seafood market report summarized the current market situation for surimi made from Alaska-caught pollock by stating that, with the increasing demand for surimi-based products in many markets and the reduction in the supply of Alaska pollock for these products, there appear to be good reasons for U.S. producers to be able to keep a “bullish posture” over the short term (Seafood.com News 2007c). By grade, the Japanese wholesale price of SA grade frozen Alaska pollock surimi is expected to come to the level of ¥400 per kg, with FA standing at ¥380, A at ¥350, KA at ¥290, and B at ¥270, according to major U.S. surimi producers (Seafood.com News 2007d). Forecasts of U.S. export prices predict a drop in price (Figure 19); however, the forecast model does not adjust for exogenous factors such as cuts in the U.S. pollock quota.[3]

Over the longer term, however, the proportion of use of non-pollock materials in surimi production is expected to continue to rise. New origins are generally offering lower prices in comparison with Alaska pollock surimi. According to GLOBEFISH (2007b), the use of low-quality fish has already had its effect on prices and quality of surimi. In the future, the market is expected to become even more dichotomized between Alaska pollock-based surimi products and cheap surimi products processed from low-quality species. Currently, over 50% of global production is based on non-Alaska pollock fish species that are caught all over the world. These products can be derived from either coldwater whitefish species (for example, Pacific whiting, hoki (blue grenadier), northern and southern blue whiting), or coldwater pelagic fishes (for example, Peruvian anchovy, Atka mackerel, jack mackerel), but more importantly tropical fish species such as threadfin bream, lizard fish, and big eye (Guenneugues and Morrissey 2005). Further, to meet the world’s developing demand for surimi, the seafood industry is constantly working to adapt surimi production technologies to new aquatic species, including to cephalopods, like squid (GLOBEFISH 2006). The search for surimi raw material

[3] The methodology used to develop forecasts shown in Figure 19 through Figure 20 is described in Appendix A: Alaska Groundfish Export Market Forecast Methodology and Details.

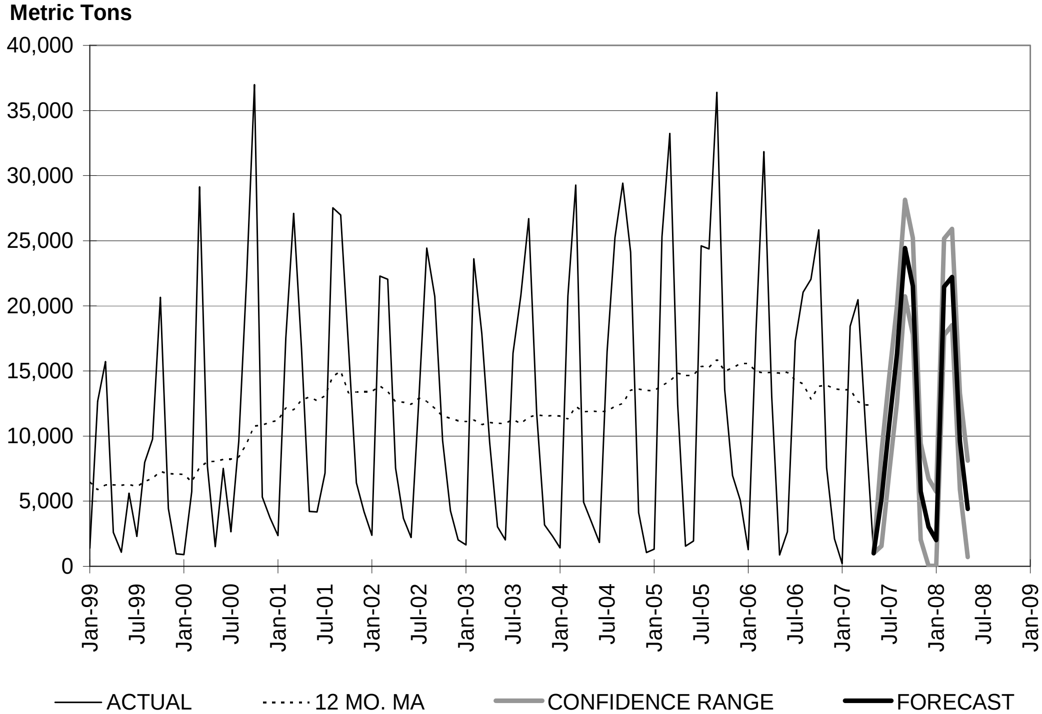
is already a strategic issue for large multinational firms producing either surimi or surimi-based items. Numerous investments and joint ventures in countries with such resources are being actively carried out for that purpose (GLOBEFISH 2006).

Figure 19. Actual and Forecast Nominal U.S. Export Prices of Alaska Pollock Surimi to All Countries, 1999 - 2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 20. Actual and Forecast U.S. Export Volumes of Alaska Pollock Surimi to All Countries, 1999 - 2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

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Alaska Pollock Roe Market Profile

Description of the Fishery

See *Alaska Pollock Fillets Market Profile*

Production

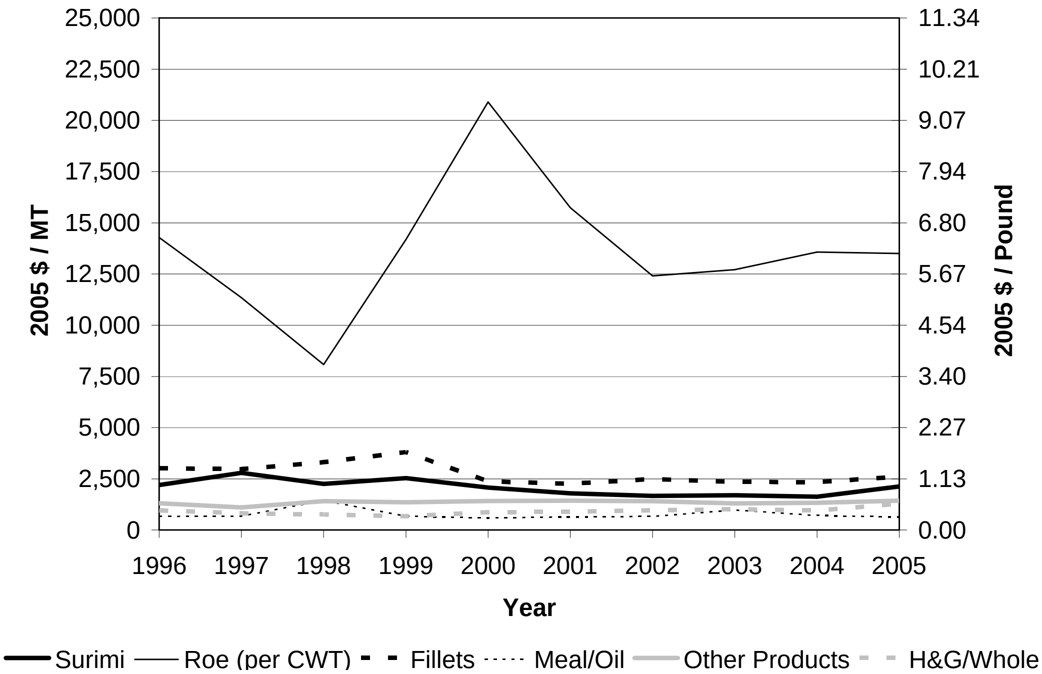
The two major sources of Alaska pollock roe are the United States and Russia. U.S. pollock roe production since 2001 has been significantly higher than in prior years, reflecting both an increase in pollock harvests as well as an increase in pollock roe yields—the latter a result of AFA according to industry representatives interviewed for this assessment. However, increasing U.S. production of pollock roe has been offset in world markets by a decline in Russian pollock harvests. Despite increased U.S. production, total Japanese pollock roe imports since 2001 have been lower than in the previous decade, because of reduced imports of Russian pollock roe (Knapp 2005).

The best time for harvesting pollock for roe production is in winter, just before the pollock spawn, which is when the eggs are largest. Most U.S. pollock roe production is from the "A" season, when yields are significantly higher (Knapp 2005).

Roe is one of the most important products made from Alaska pollock. Although pollock roe accounts for only a small share of the volume of Alaska pollock products, it is a high-priced product that accounts for a high share of the total value. The wholesale prices of pollock roe and other pollock products are compared in Figure 21. For some producers the sale of pollock roe is their highest margin business (American Seafoods Group LLC 2002). Production of pollock roe by Alaska processors has increased due to an increase in pollock harvests and increase in pollock roe yields that correspond to the implementation of AFA in 2000 (Figure 22).

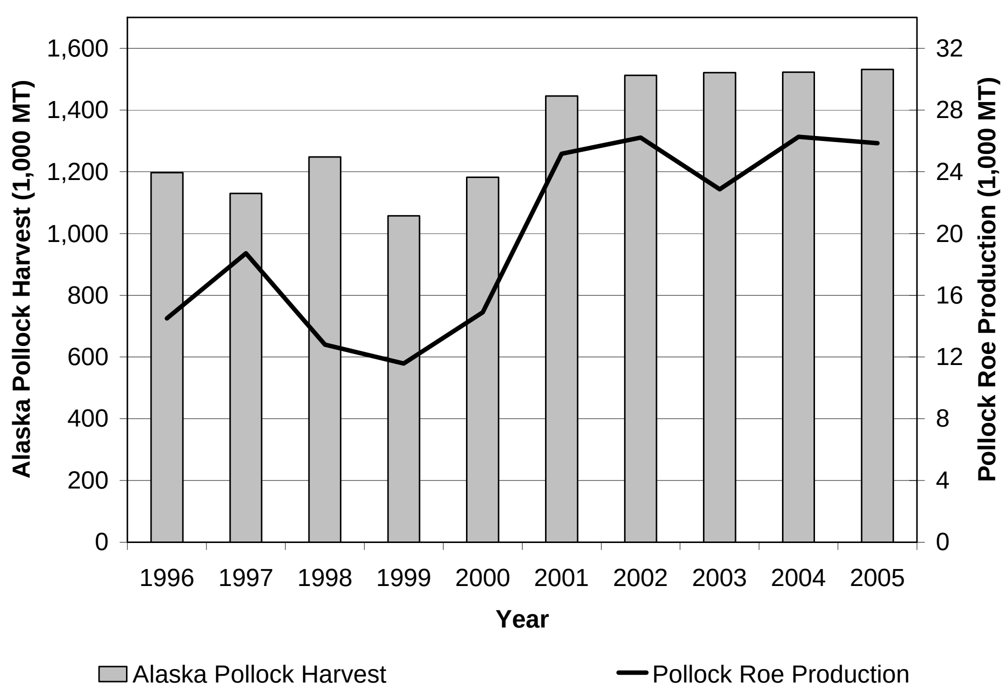
Knapp's (2005) caution that averaging prices across many different grades of pollock roe can make an interpretation of trends difficult applies to Figure 21 and Figure 23. Knapp notes that "a change in average prices may reflect not only a change in prices paid for a given grade, but also a change in the mix of products sold. For example, even if the prices for 'low grade' and 'high grade' pollock roe remain unchanged, the average price will decline if the relative percentage of lower-priced low grade roe increases, and the average price will increase if the relative percentage of higher-priced high grade roe increases" (p. 20). Due to averaging prices across grades, it is uncertain if the changes in wholesale prices in Figure 21 are due to differences in the mix of grades sold or differences in the prices by grade.

Figure 21. Wholesale Prices for Alaska Primary Production of Pollock by Product Types, 1996 – 2005



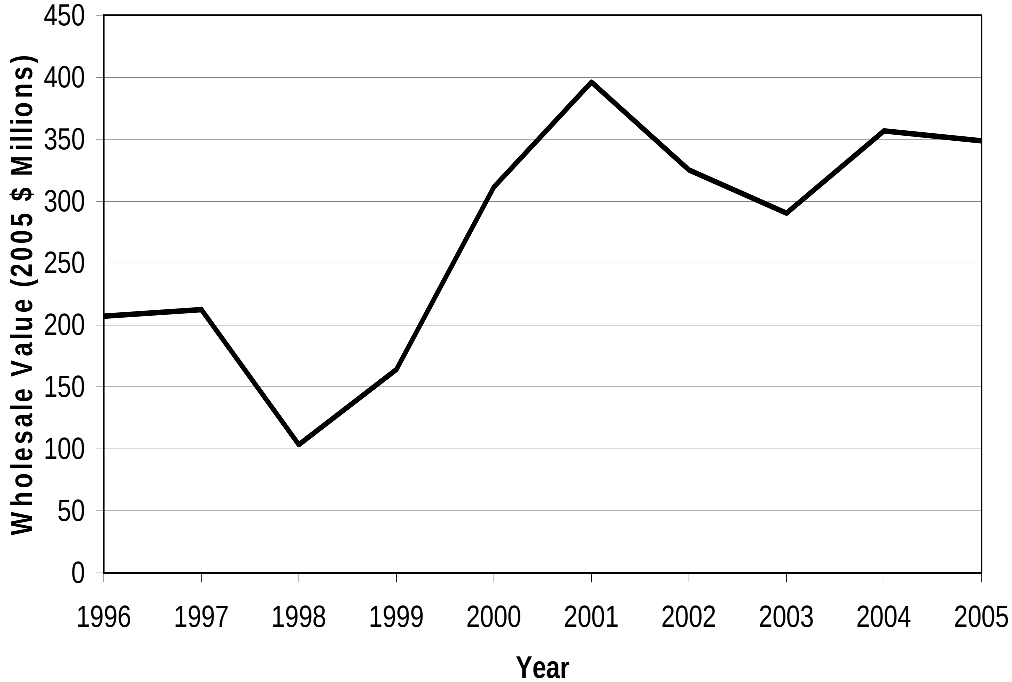
Note: Reported roe production and value do not specify the grade of products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 22. Alaska Pollock Harvest and Primary Production of Pollock Roe, 1996 – 2005



Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 23. Wholesale Value of Alaska Primary Production of Pollock Roe, 1996 – 2005



Note: Reported roe production and value do not specify the grade of products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Product Composition and Flow

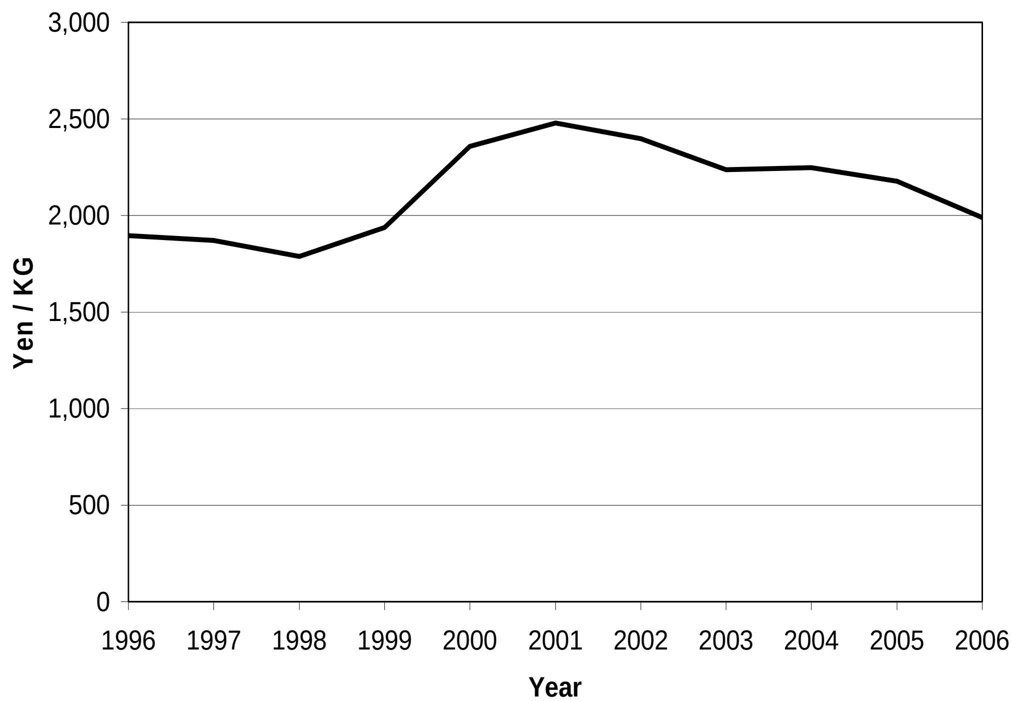
The roe is extracted from the fish after heading, separated from the other viscera, washed, sorted, and frozen. After the roe is stripped from the pollock, the fish can be further processed into surimi or fillets (NMFS 2001). There are dozens of different grades of pollock roe, which command widely varying prices. The grade is determined by the size and condition of the roe skeins (egg sacs), color and freshness of the roe, and the maturity of the fish caught. The highest quality is defect-free matched skeins in which both ovaries are of uniform size with the oviduct intact, with no bruises, no prominent dark veins, no discolorations, and no cuts. Intact skeins of pollock roe, which include defects, are of lower value, and broken skeins of roe are of the lowest value (Bledsoe et al. 2003). According to Knapp (2005), different producers have different grading system—there is no standardized industry-wide grading system. However, Bledsoe et al. (2003) note that *mako* is the grade of pollock roe with no defects. Important defects include defective (generally, *kireko*), broken skeins, skeins with cuts or tears, discolorations (*aoko* for a blue green discoloration from contact with bile; *kuroko* for dark colored roe; *iroko* for orange stains from contact with digestive fluids), hemorrhages or bruising, crushed roe skeins, large veins or unattractive veining, immature (*gamako*), overly mature (*mizuko*), soft (*yawoko*), fracture of the oviduct connection between the two skeins, paired skeins of non-uniform size, and skeins that are not uniform in color or no longer connected together (Bledsoe et al. 2003).

Most U.S. pollock roe is sold at auctions held each year in Seattle and Busan, South Korea, in which numerous pollock roe producers and buyers participate (Knapp 2005). The buyers must fill their individual product needs, and their keen sight and sense of smell are critical to setting the price. Once the pollock roe is purchased and exported to Japan or Korea, it is processed into two main types of products: salted pollock roe, which is often used in rice ball sushi or mixed with side dishes, and seasoned or "spicy" pollock roe (Knapp 2005). Lower-grade pollock roe is commonly used for producing spicy pollock roe. Examples of seasonings include salt, sugar, monosodium glutamate, garlic and other spices, sesame, soy sauce, and sake. Spicy roe is sold as a condiment in Korean markets (Bledsoe et al. 2003).

Pollock roe may also be used as an ingredient in a variety of other products including salad dressings, pastes, spreads, and soup seasonings (Bledsoe et al. 2003). Retail packages of intact skeins can be as small as a single vacuum-packaged pack containing a set of matched skeins. Other product forms include 4, 8, and 16 oz. plastic trays (traditionally black in color with a clear lid), 500 g or larger boxes of attractively-arranged skeins, or marinated products sold in glass jars. Pollock roe may also be packaged in flat 100-g (3.5 oz) cans for retail sale (Bledsoe et al. 2003). Roe products sold as whole skeins are considered a high-end gourmet food product in Japan and are traditionally used for gift giving. However, demand for pollock roe as a gift product may be declining (Fukuoka Now 2006). Instead, processed pollock roe is increasingly becoming more mainstream in Japan and available in supermarkets as varying qualities enter the market (American Seafoods Group LLC 2002).

Catcher/processors are more likely to produce higher quality roe because they process the fish within hours of being caught, rather than days, as is typically the case with shoreside processors (American Seafoods Group LLC 2002). Knapp (2005) notes that prices for pollock roe produced at sea were generally \$1.50-\$2.00/lb higher than pollock roe produced by shoreside processors, presumably reflecting higher roe quality for at-sea production. Figure 24 shows average annual wholesale prices of salted pollock roe at ten central wholesale markets in major cities in Japan. The similarities in pollock roe price trends shown in Figure 21 and Figure 24 indicate that there is a linkage between U.S. and Japanese prices.

Figure 24. Average Wholesale Prices of Salted Pollock Roe at Ten Major Central Wholesale Markets in Japan, 1996 - 2006

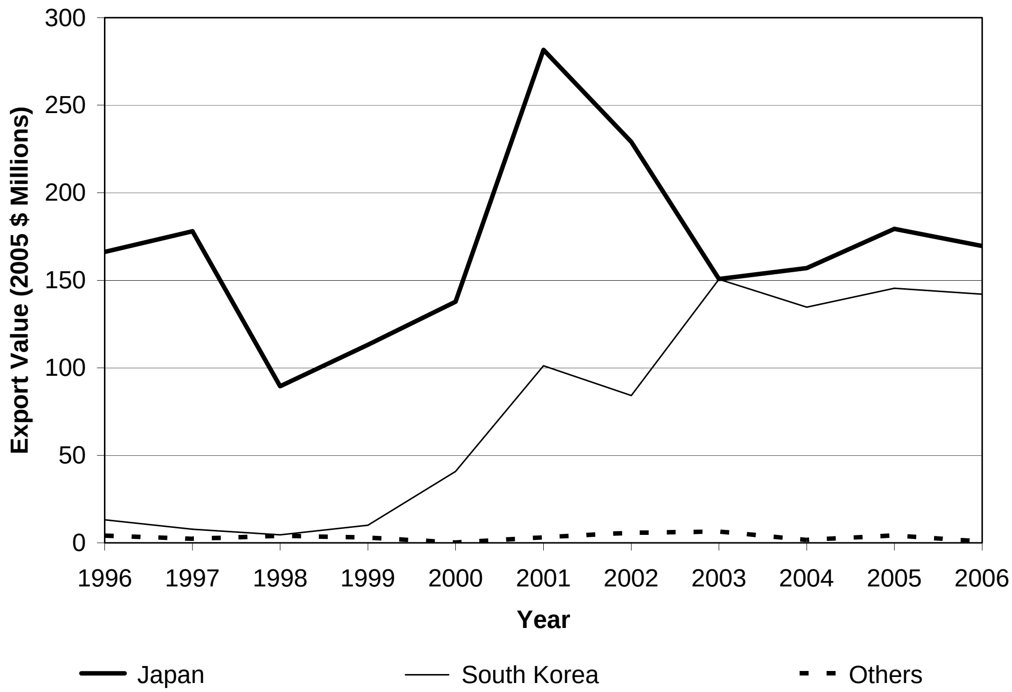


Source: NMFS Foreign Trade Data available at http://swr.nmfs.noaa.gov/fmd/sunee/salesvol/svw.htm

International Trade

Almost all U.S. pollock roe production is exported, the primary buyers being Japan and South Korea (Figure 25). It is possible that a substantial amount of the pollock roe exported to Korea is subsequently re-exported from Korea to Japan. Most Japanese pollock roe imports occur between March and July, with imports being highest in May and April (Knapp 2005).

Figure 25. U.S. Exports of Alaska Pollock Roe to Leading Importing Countries, 1996 - 2006



Note: Data include all exports of Alaska pollock from the U.S. Customs Pacific District.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/.

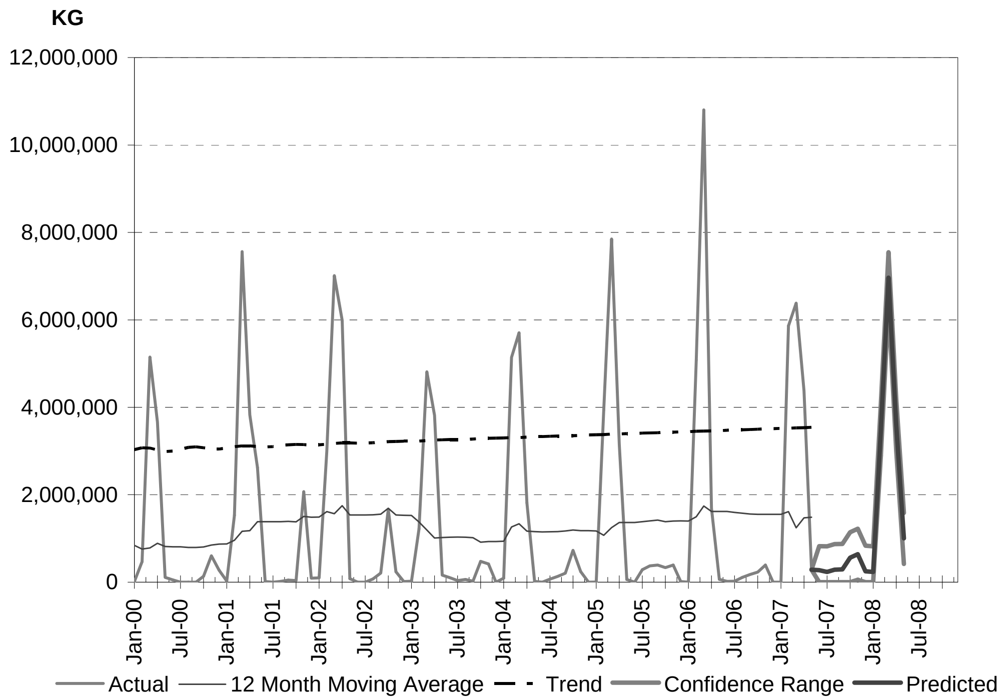
Market Position

U.S. pollock roe commands premium prices in Japan because of its consistent quality, and the volume of U.S. exports is expected to remain high over the short term (Figure 26 and Figure 28).[4] However, U.S. pollock roe also competes in Asian markets with Russian pollock roe. In general, the decline in Russian pollock production has generally reduced competition for U.S. pollock roe producers and helped to strengthen markets for pollock roe (SeafoodNews.com 2007). What happens to Russian production in the future will be an important factor affecting markets for pollock roe (Knapp 2005). Another factor that will affect future pollock roe markets is even more difficult to predict: Japanese and Korean consumer tastes for traditional and new pollock roe products (Knapp 2006). As roe products in these markets become more mainstream and demand for pollock roe as a gourmet gift product declines consumers may become less discriminating among different types and qualities of roe. For example, spicy roe can also be made from Pacific cod, Atlantic cod, capelin, herring, mullet, whiting, hoki, flying fish, or lumpfish roe (Bledsoe et al. 2003).

[4] The methodology used to develop forecasts shown in Figure 26 through Figure 29 is described in Appendix A: Alaska Groundfish Export Market Forecast Methodology and Details.

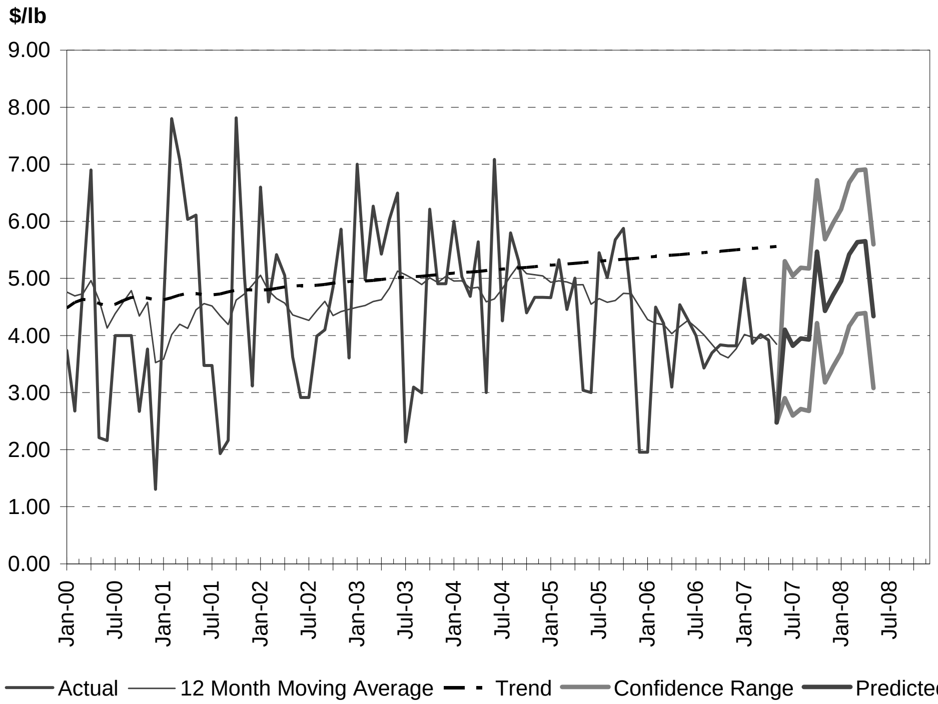
Historically, Japanese wholesale prices for pollock roe have been inversely related to total supply. However, the price of pollock roe is also heavily influenced by the size and condition of roe skeins, color and freshness and the maturity of the fish caught. In addition, prices are influenced by anticipated Russian and U.S. production and Japanese inventory carryover. As a result, pollock roe prices have experienced significant volatility in recent years (American Seafoods Group LLC 2002), and price forecasts indicate that they will continue to do so in the future (Figure 27 and Figure 29).

Figure 26. Actual and Forecast U.S. Exports Volumes of Pollock Roe to Japan, 2000-2008



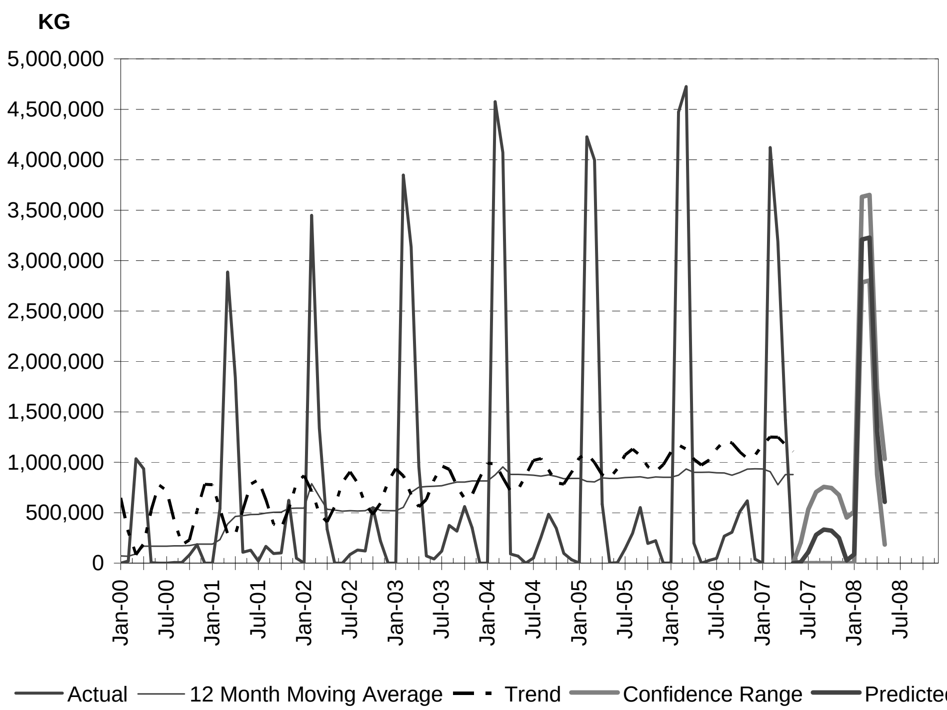
Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 27. Actual and Forecast Nominal U.S. Export Prices of Pollock Roe to Japan, 2000-2008



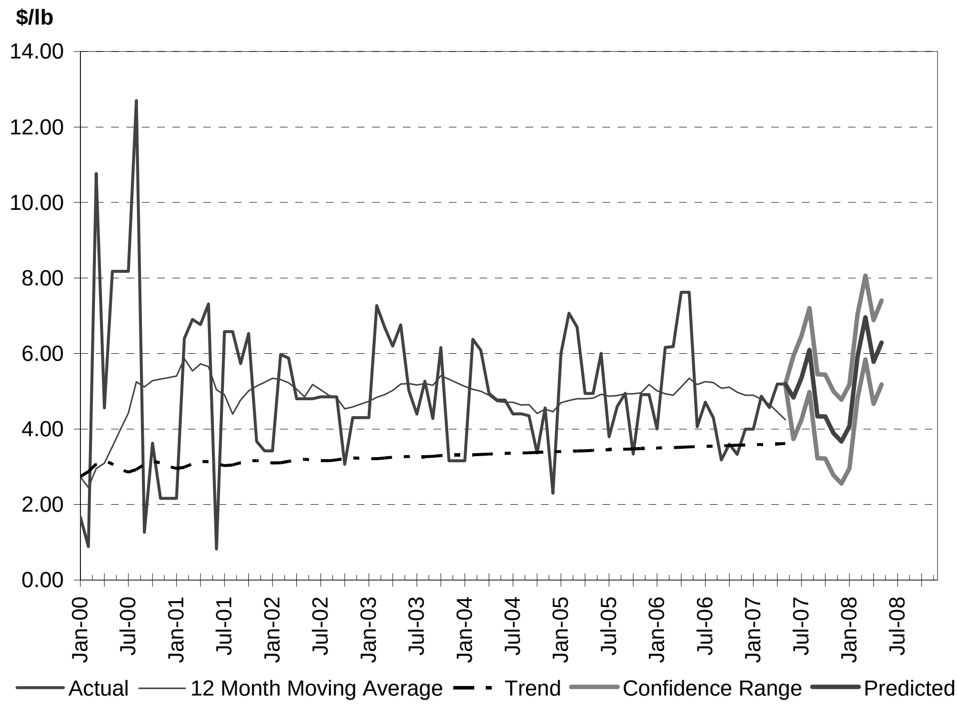
Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 28. Actual and Forecast U.S. Exports Volumes of Pollock Roe to Korea, 2000-2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 29. Actual and Forecast Nominal U.S. Export Prices of Pollock Roe to Korea, 2000-2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

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SeafoodNews.com. 2007. Higher Pollock Roe Prices Seen by Mass Retailers in Response to Drop in Russian Production. BANR Japan Reports, May 22, 2007.

Pacific Cod Market Profile

Description of the Fishery

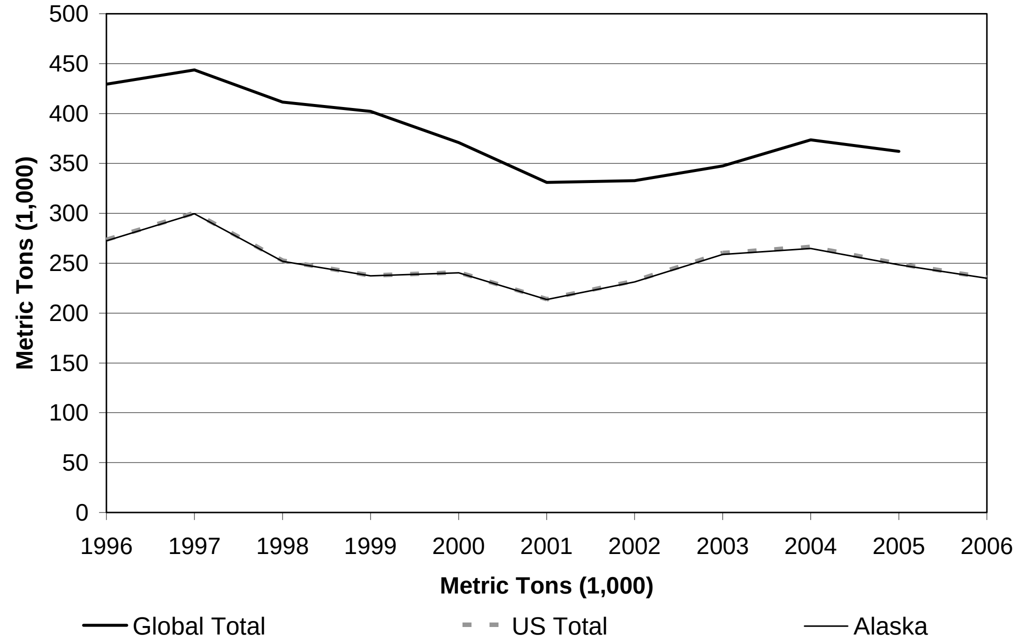
Pacific cod (*Gadus macrocephalus*) is widely distributed over the eastern Bering Sea and Aleutian Islands (BSAI) areas. Behind Alaska pollock, Pacific cod is the second most dominant species in the commercial groundfish catch off Alaska. The BSAI Pacific cod fishery is targeted by multiple gear types, primarily trawl gear and hook-and-line catcher/processors, and smaller amounts by hook-and-line catcher vessels, jig vessels, and pot gear. The BSAI Pacific cod TAC has been apportioned among the different gear sectors since 1994, and the CDQ Program has received a BSAI Pacific cod allocation since 1998.

The Gulf of Alaska (GOA) Pacific cod fishery is also targeted by multiple gear types, including trawl, longline, pot, and jig components. In addition to area allocations, GOA Pacific cod is also allocated on the basis of processor component (inshore/offshore) and season. The longline and trawl fisheries are also associated with a Pacific halibut mortality limit which sometimes constrains the magnitude and timing of harvests taken by these two gear types.

Production

Until the 1980s, Japan accounted for most of the world harvests of Pacific cod. In the 1980s, harvests of both the Soviet Union and the United States increased rapidly. Since the late 1980s, harvests of both Japan and the Soviet Union/Russia have fallen by about half, while U.S. harvests have remained relatively stable. As a result, the United States now accounts for more than two-thirds of the world Pacific cod supply (Knapp 2006). As seen in Figure 30, virtually all of the U.S. Pacific cod catches are from Alaska waters—Pacific cod harvests from the US West coast were on average only 1 percent of the total US harvest.

Figure 30. Alaska, Total U.S. and Global Retained Harvests of Pacific Cod, 1996 – 2006



Note: Data for 2006 were unavailable for global total. The fish landing statistics of some countries may not distinguish between Pacific cod and other cod species.

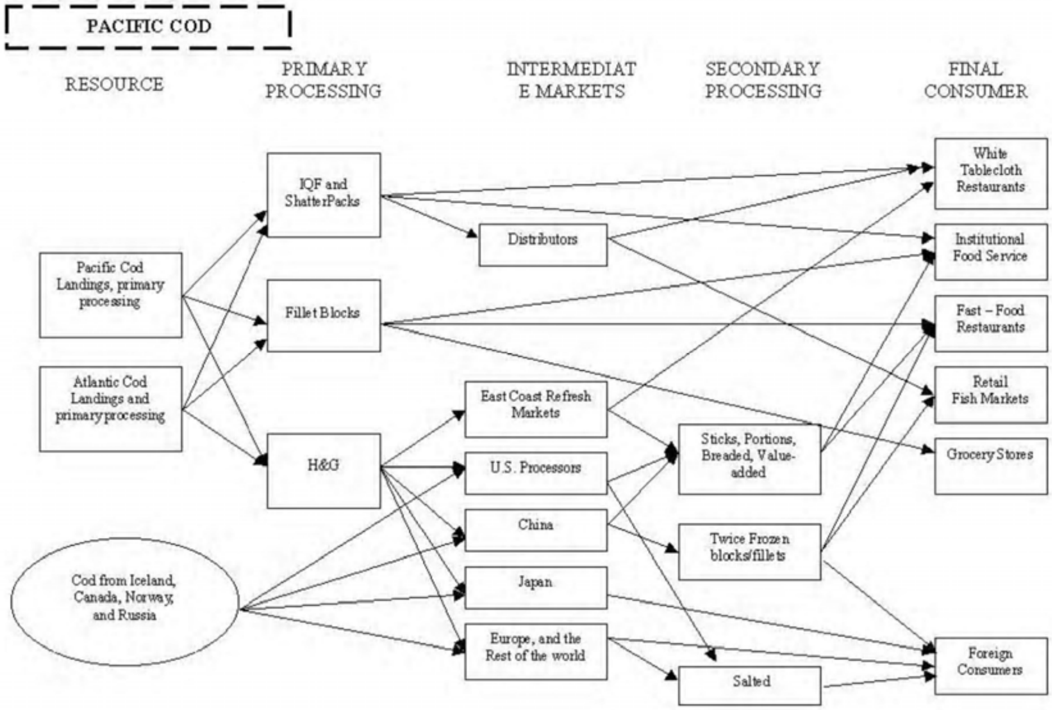
Source: Alaska data from NMFS Blend and Catch Accounting System Data. Other U.S. data from PacFIN, available at http://www.psmfc.org/pacfin/pfmc.html; Global data from FAO, "FishStat" database available at http://www.fao.org/fi/website/FIRetrieveAction.do?dom=topic&fid=16073.

Product Composition and Flow

Product flows for Pacific cod have changed dramatically in recent years, following the decline of Atlantic cod (*G. morhua*) harvests. For example, buyers from Norway and Portugal are now purchasing Pacific cod from Alaska for the first time. Historically, Pacific cod has been considered an inferior product compared to Atlantic cod, but the lack of Atlantic cod has made Pacific cod more acceptable. As a result, Pacific cod harvests, while still lower than Atlantic cod harvests, have in recent years represented about one-fourth to one-third of total world cod supply (Knapp 2006). Pacific cod now accounts for more than 95% of the U.S. domestic cod harvest, and more than 99% of this harvest is from Alaska waters (Knapp 2006).

As shown in Figure 31, Pacific cod, and its close substitute, Atlantic cod, are processed as either headed and gutted (H&G), fillet blocks, or individually frozen fillets, which are either individually quick-frozen (IFQ) or processed into shatterpack (layered frozen fillets that separate individually when struck upon a hard surface) or layer pack.

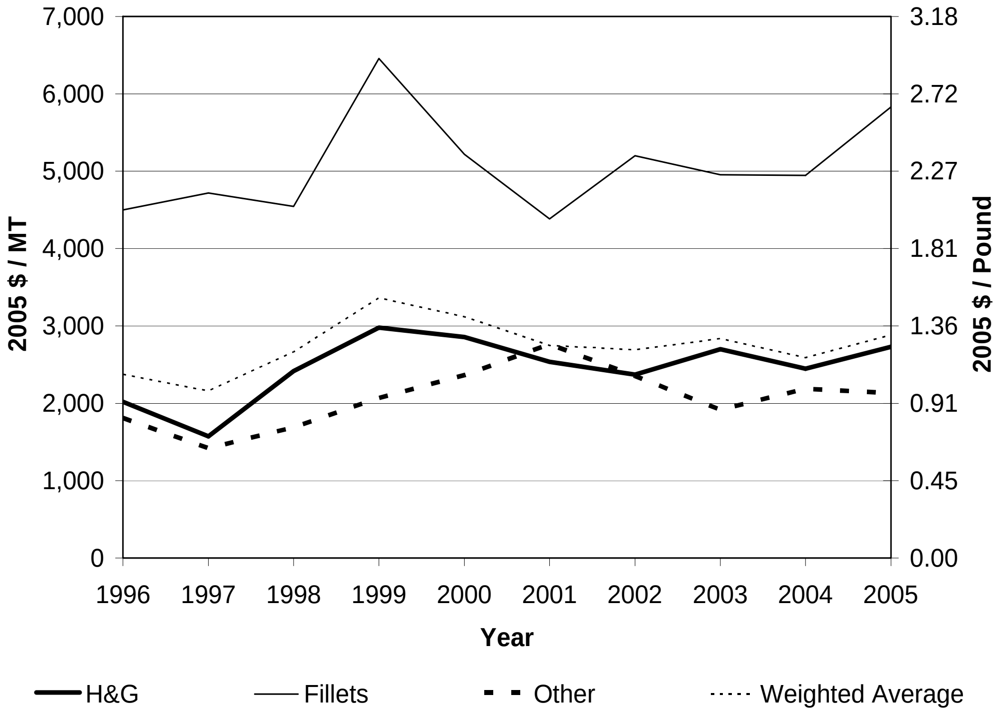
Figure 31. Product Flow and Market Channels for Pacific Cod.



Source: NMFS (2001)

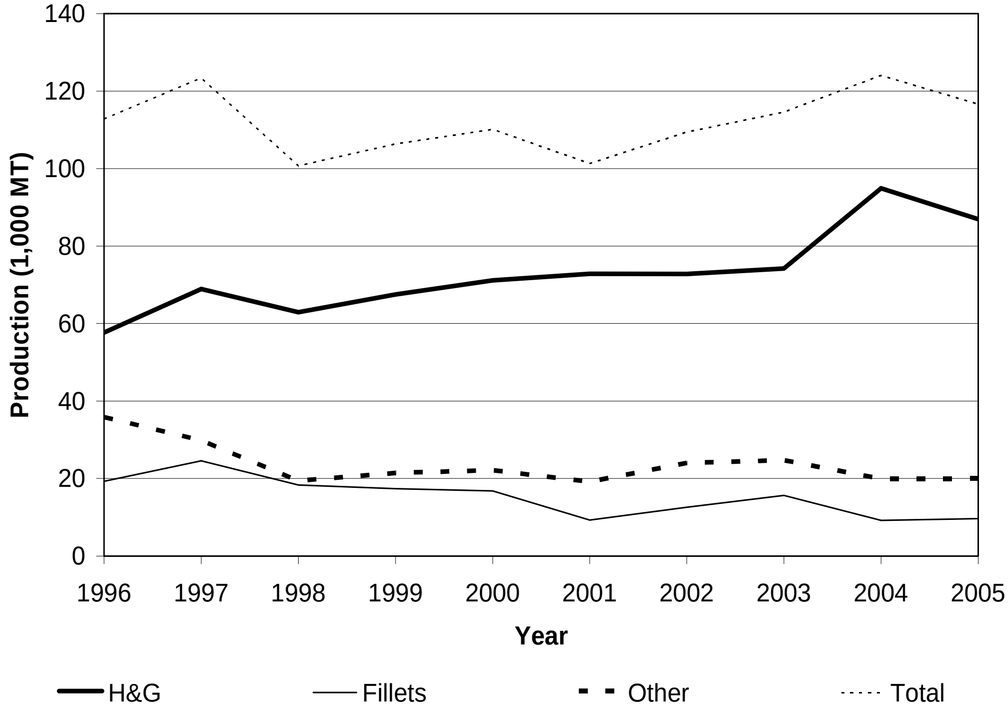
Wholesale prices are highest for fillet products, but H&G fish account for by far the largest share of Alaska Pacific cod production. This share has been increasing over time, from just over 50% in 1996 to around 75% in 2006. Over the same period, the product share of skinless-boneless fillets has declined from approximately 17% to about 8%. The shift from fillets to H&G product is likely due to a combination of factors, including increased exports of H&G product to China where it is filleted and re-exported, and regulations that led to a redistribution of the Pacific cod harvest among sectors, with trawl "head-and-gut" catcher/processors accounting for a larger share of the total catch.

Figure 32. Wholesale Prices for Alaska Primary Production of Pacific Cod by Product Type, 1996 – 2005



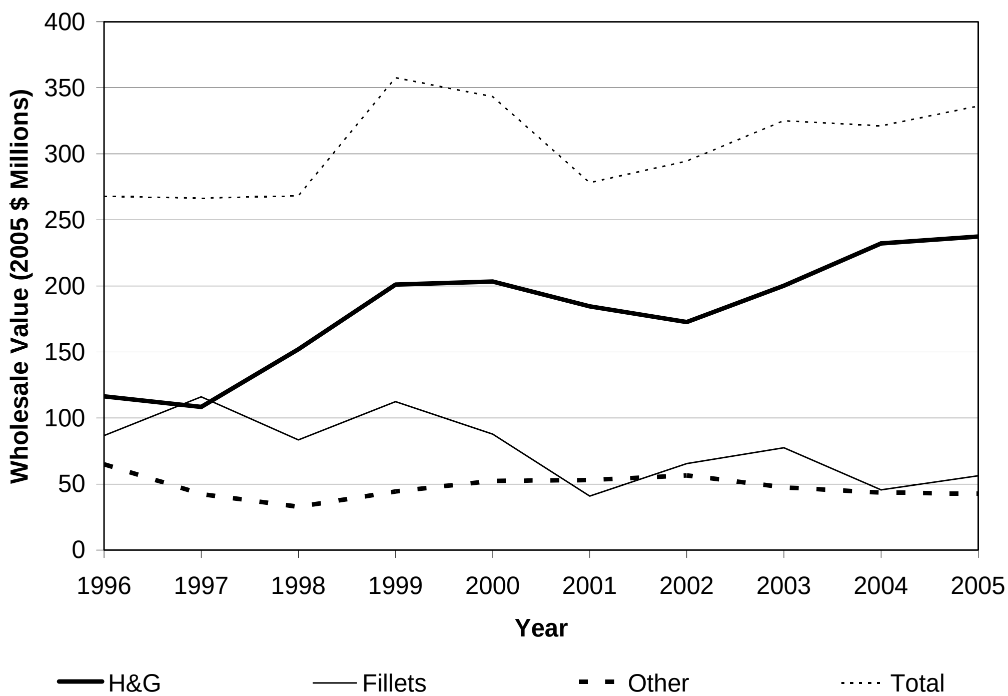
Notes: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 33. Alaska Primary Production of Pacific Cod by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 34. Wholesale Value of Alaska Primary Production of Pacific Cod by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

The three product types proceed through various market channels to several different final markets. The final markets, shown at the right of Figure 31, include: fine or "white tablecloth" restaurants, institutional food service, quick-service restaurants, retail fish markets, grocery stores, and overseas markets. The following brief description of the flow for each of the basic product types is based largely on NMFS (2001).

IQF and shatterpack fillets of Pacific cod are graded as 4-8 ounce, 8-16 ounce, 16-32 ounce, and 32+ ounce. They are used by both white tablecloth restaurants, by institutional food service, and by retail fish markets. In most cases, these products are used with the fillet still intact; hence the processing requires preservation of individual fillets. Larger institutional buyers or retail fish markets may buy the products directly from the processors, while smaller buyers typically purchase through a distributor.

Fillet blocks are used when the customer desires a product that requires a high degree of uniformity. Blocks are typically cut into smaller portions of uniform size and weight. Breaded fish portions as used in fish sandwiches or casual "fish and chips" style restaurants are typical of this type of use. Institutions, including hospitals, prisons, and schools, also purchase fillet blocks, as do some grocery retailers.

H&G Pacific cod is frozen after the first processing, and then proceeds to another processor within the U.S., or is exported for secondary processing. Some domestic H&G Pacific cod is sent to the East Coast refresh market, where it is thawed and filleted before being processed further, or sold as refreshed. Other U.S. processors may purchase H&G Pacific cod and further process it by cutting it into sticks and portions, or breading it for sale in grocery stores or food services. Foreign consumers, especially China, Japan, and Europe, also purchase H&G Pacific cod for further processing, including the production of salt cod. According to industry representatives, large H&G Pacific cod command the highest price, and it is these fish that are processed into salt cod. Salt cod is a high-value product popular in Europe, parts of Africa, and Latin America (Chetrick 2007). Early Easter is the peak consumption period for salt cod, and Brazil is the largest market for salted Pacific cod. Most of the Pacific cod that becomes salt cod is processed outside the U.S.; for example, Alaska-caught Pacific cod is finding a large and growing market with re-processors in Portugal (Chetrick 2007).

H&G cod obtained by China from the United States and other countries is further processed and re-exported to the United States, Europe and other overseas markets. Since the latter half of the 1990s, China has consolidated its leading position as a supplier of frozen Pacific cod fillets to international markets, a development which reflects the country's success as a re-processor of seafood raw materials. Thailand has also achieved a sizeable increase in imports due to shifts in processing sites caused by concerns about potential food safety risks in China (SeafoodNews.com 2007a).

Overseas processors either bread and portion the H&G cod or thaw and refreeze it into blocks, referred to as "twice-frozen fillet blocks." These twice-frozen blocks from China have gained considerable popularity in the United States. Traditionally, the quality of the fish was considered to be lower than the quality of fish in single-frozen, U.S.-produced fillet blocks and commanded a lower price. However, industry representatives note that the quality and workmanship of overseas processors has improved; as a result, twice-frozen is more acceptable, and in some cases has become the standard (GSGislason & Associates Ltd. 2003).

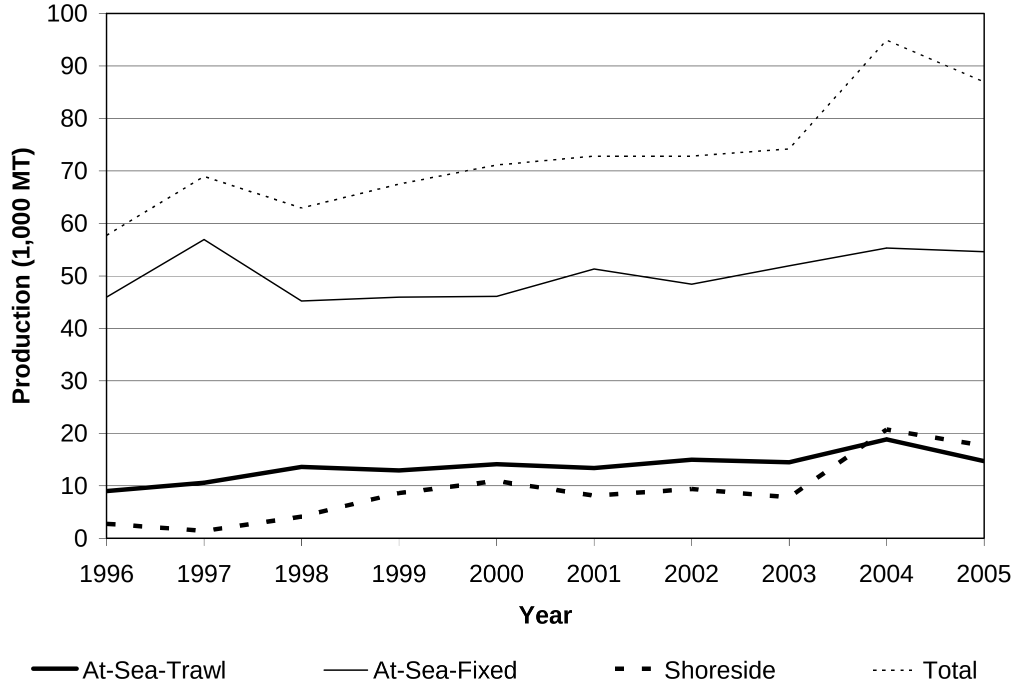
Figure 35 shows that wholesale prices for H&G Pacific cod caught and processed by fixed gear (freezer longline) vessels have been consistently higher than the prices received by trawl vessels. According to an industry representative, this price difference occurs because fish caught by longline gear can be bled while still alive, which results in a better color fish, and there is less skin damage and scale loss than if they are caught in nets. Shoreside processors obtain fish from both fixed gear and trawl vessels. Two factors may contribute to the lower prices received by these processors for H&G Pacific cod: 1) the fish have been dead for many hours before they are processed (although they are generally kept in refrigerated saltwater holds; and 2) the fish delivered are from near-shore fishing grounds, and these fish tend to be more infected with parasitic nematodes ("codworms"). Labor intensive ''candling'' of fillets for these and other parasites can account for approximately half of the production cost for Pacific cod from the BSAI and GOA (Bublitz and Choudhury 1992).

Figure 35. Wholesale Prices for Alaska Primary Production of H&G Cod by Sector Type, 1996 – 2005

Note: Product type may include several more specific products. Data are not available to calculate separate prices for the two at-sea sectors prior to 2001.

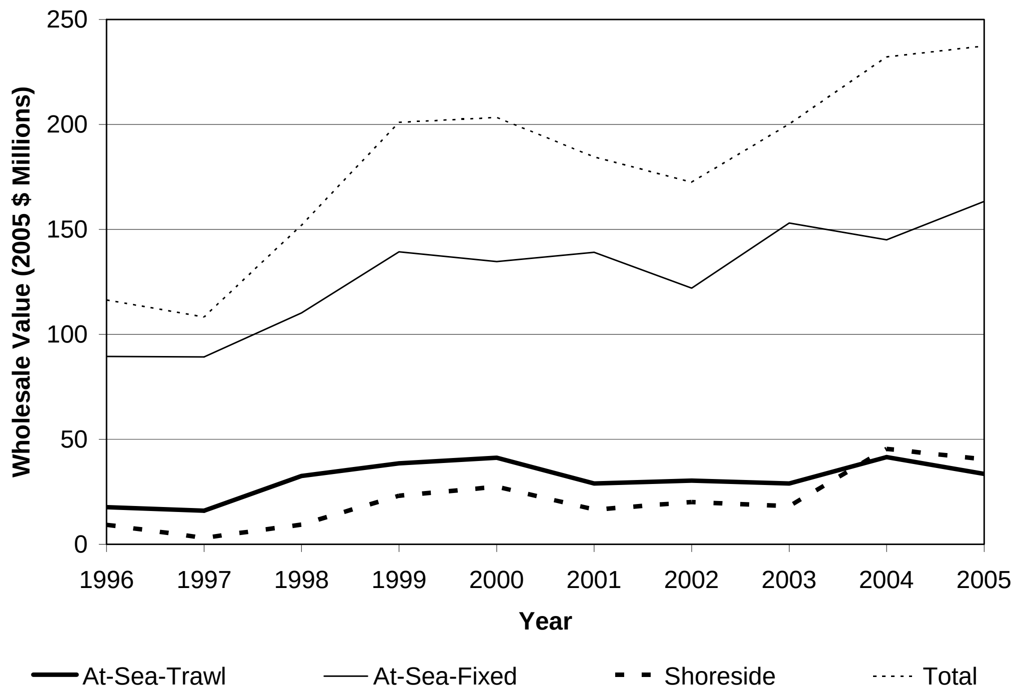
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 36. Alaska Primary Production of H&G Pacific Cod by Sector, 1996-2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 37. Wholesale Value of Alaska Primary Production of H&G Pacific Cod by Sector, 1996 – 2005



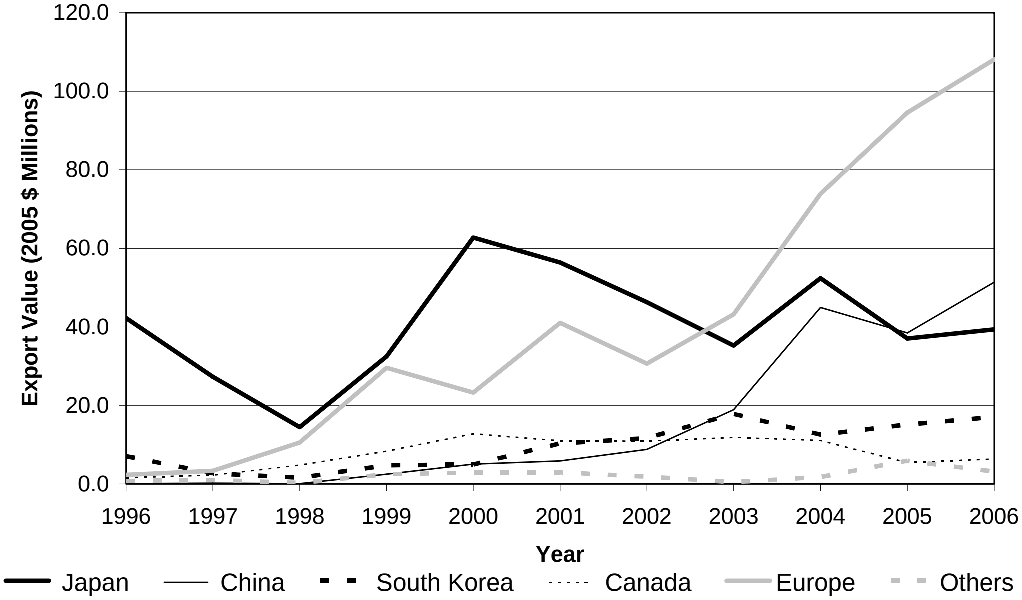
Note: Product type may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

International Trade

Most Pacific domestically produced cod fillets are destined primarily for the domestic market for use in the foodservice industry. However, Pacific cod harvested in Alaska groundfish fisheries and processed as H&G primarily enters the international market. U.S. foreign trade statistics do not differentiate between Pacific and Atlantic cod, Exports of both species are coded as "cod." However, given the preponderance of Pacific cod in total U.S. landings, it is likely that exports are also overwhelmingly Pacific Cod (Knapp 2006). Furthermore, the fact that over 97% of this product category is exported from the U.S. West Coast indicates that Pacific cod dominates U.S. production. Little, if any, of the U.S. Atlantic cod harvest is exported as it is mainly sold in distinct market niches for fresh cod on the East Coast (NMFS 2001; pers. comm., Todd Clark, Endeavor Seafood, Inc., September 26, 2007). U.S. foreign trade records also do not specify an "H&G" product form for exports. In Figure 38 H&G product is included in "frozen cod (not fillets)."

The volume of Pacific cod moving into European markets has increased steadily since 2002 (Figure 38). Industry representative indicate the growth of exports to Europe is a function of stock declines of Atlantic cod and the growing acceptance of Pacific cod as an acceptable substitute. Leading importers in Europe are Norway, Portugal and the Netherlands, although industry sources indicate that the UK has become more important in recent years. As noted earlier, Alaska-caught Pacific cod is finding a large and growing market with re-processors in Portugal where it is made into salt cod destined for domestic markets and re-exported to Spain. Other significant European re-processors of Pacific cod are located in the Netherlands and Norway (Seafood Market Bulletin 2007). In Norway, according to industry sources, Pacific cod is processed as salt cod and re-exported Brazil and Caribbean countries. Exports to China also increased markedly—this is consistent with trends across many fisheries products, with the seafood industry looking to the Asian country for low-cost processing of value-added products (Seafood Market Bulletin 2006a). Meanwhile, Japan's share of "frozen cod (excluding fillets)" exports has declined, though data are not available to assess the re-export destinations of China's processed product. Exports of Pacific cod fillets to Japan have also fallen, although they rebounded in 2006 (Figure 39).

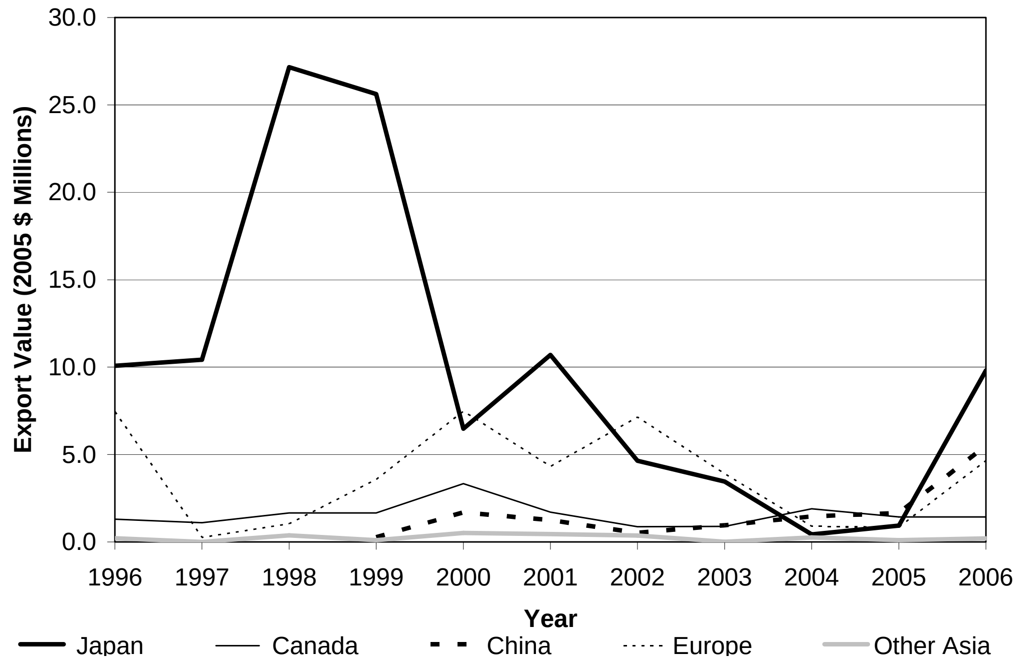
Figure 38. U.S. Exports of Frozen Pacific Cod (excluding Fillets) to Leading Importing Countries, 1996 - 2006



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/.

Figure 39. U.S. Exports of Pacific Cod Fillets to Leading Importing Countries, 1996 - 2006



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: “Monthly Trade Data by Product through U.S. Customs Districts,” NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/.

Market Position

According to Halhjem (2006), 2006 was a turning point in the market for Pacific cod; in that year the price of Pacific cod exceeded that of Atlantic cod. Given worldwide shortages of Atlantic cod and acceptance of Pacific cod in overseas and domestic markets, the outlook is a continuing strong market demand for Alaska Pacific cod. Pacific cod is a popular item in the foodservice sector because of its versatility, abundance and year-round availability (NMFS 2001; Seafood Market Bulletin 2006a). In addition, the product is used in finer and casual restaurants, institutions, and retail fish markets. The upward trend in U.S. export prices and volumes of Pacific cod fillets is expected to continue over the short term (Figure 40 and Figure 41).[5]

U.S. export prices and volumes of "frozen cod (excluding fillets)" are also expected to continue to climb in the near future (Figure 42 and Figure 43), with much of the product destined for re-processors in China and Europe (Figure 44 through Figure 47). The demand for Pacific cod fillets processed from H&G product is especially increasing in EU markets, as the dollar is depreciating against the euro, making it less expensive for Europeans to buy U.S. seafood (Hedlund 2007). In addition, European whitefish supplies are tight due to declining stocks—for example, Iceland has cut its Atlantic cod harvest quota by 32% for the 2008-2009 fishing year (Evans and Cherry 2007). In 2007, the EU reduced tariffs further on cod to aid local processors (SeafoodNews.com 2007b).

The market for Alaska-caught Pacific cod is expected to receive an additional boost from certification by the Marine Stewardship Council of the Bering Sea and Aleutian Islands freezer longline Pacific cod fishery in February 2006. This fishery became the first cod fishery in the world to be certified by the MSC as a "well managed and sustainable fishery." However, this certification does not apply to all Pacific Cod longliners; to be certified vessels and companies must opt in by paying the required fees. To date, 9 of the 36 vessels that comprise this fishery have signed up to participate in the MSC certification program (Bering Select Seafoods Company 2007a). As the demand for MSC-certified Pacific cod products grows it is expected that more vessels will join the program. In 2006, Pacific cod products with the MSC label sold at a 3% premium (Halhjem 2006).

Marketing seafood from well-managed fisheries, such as Pacific cod, is especially important to EU seafood processors (Chetrick 2005). Some U.S. companies have also begun to shift their seafood purchases toward species caught in fisheries considered sustainable. In 2006, for example, Compass Group USA, a large food service company, announced that it would replace Atlantic cod with Pacific cod and other more "environmentally-sound" alternatives (Compass Group North America 2006). A potential complication is that environmental organizations have produced "fish lists" of "good and bad fish species" that consumers should select or reject according to the state of the stocks. These lists are usually generic in nature, so that cod, for example, is black-listed because of the state of the North Sea stock, but without considering the healthy stocks around Alaska (EU Fish Processors' Association 2006). A partial solution to this problem is that only companies that have obtained MSC chain-of-custody certification are eligible to display the MSC eco-label on packaging of seafood products (Bering Select Seafoods Company 2007b; Marine Stewardship Council 2007).

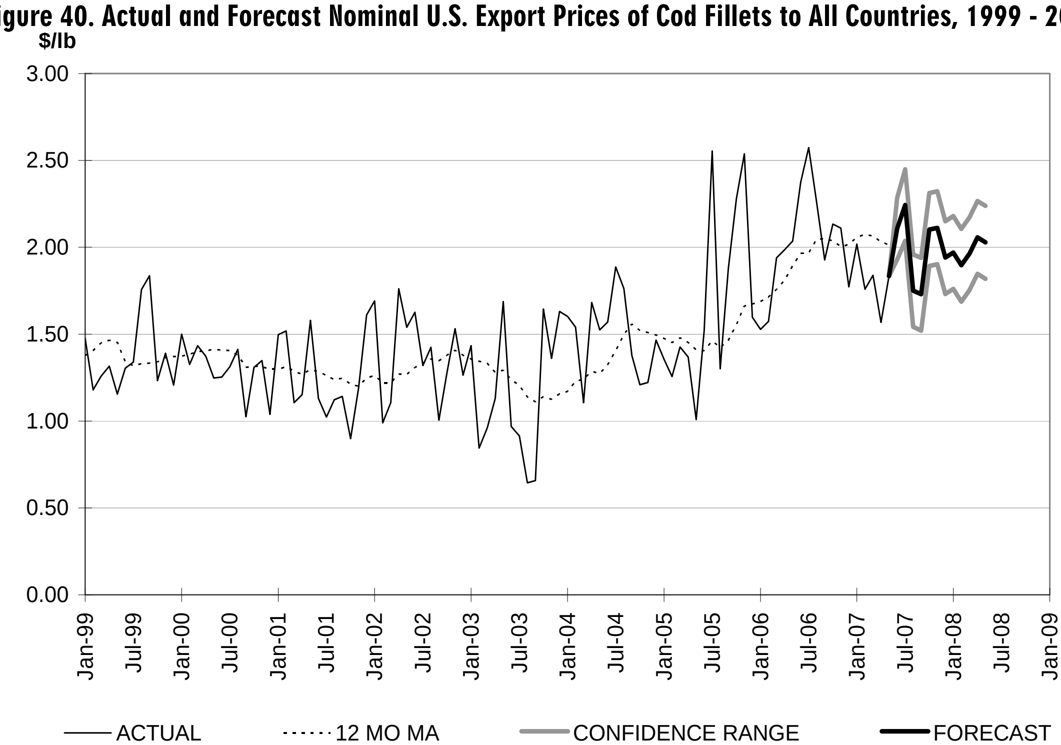
Industry representatives also noted that they expect to benefit from expanded use of the name "Alaska cod" to market Pacific cod products. The term "Alaska" conjures up a positive flavor and quality image in seafood consumers' minds due to the branding efforts of organizations such as the Alaska Seafood Marketing Institute (Munson 2004). "Alaska cod" is one of the existing acceptable market names for Pacific cod according to the U.S. Food and Drug Administration (2005).

[5] The methodology used to develop forecasts shown in Figure 40 through Figure 47 is described in Appendix A: Alaska Groundfish Export Market Forecast Methodology and Details.

The continuing strong demand for whitefish, particularly in the United States and Europe because of consumers' preference for healthy food, is anticipated to maintain the upward pressure on Pacific cod prices. As Pacific cod prices rise, some species substitution is inevitable. Alaska Pacific cod also competes in world fillet markets with numerous other traditional whitefish marine species, such as Atlantic cod, hake (whiting), Alaska pollock, hoki (grenadiers), and saithe (Atlantic pollock). Attractively priced whitefish fillets and products can also be prepared from freshwater species such as pangasius (basa catfish), Nile perch, and tilapia, so that while freshwater whitefish represent a relatively small sector of the total market at this time, it can be anticipated that they will be used to both substitute for traditional whitefish marine species as well as to be used to grow the overall market (EU Fish Processors' Association 2006).

In the future Alaska-caught Pacific cod may be in direct competition with farmed cod. Cod farming looks set to rival salmon farming in terms of the number of operations and level of production. Several experienced seafood aquaculture firms are involved in farmed cod development, and significant volumes of cultured cod are already being raised in Norway. In 2004, 3,000 mt of cod were produced by 200 farms in Norway, and the production increased to 5,000 mt in 2005 (Moe et al. 2005). Cod aquaculture is also a developing industry in Scotland, Ireland, and Canada. Because the development of farmed cod is occurring largely in the private sector, comprehensive third-party data on projected farmed cod production does not exist. However, the available data point toward a significant trend—substantial growth in farmed cod, and a likelihood that cod farming will surpass wild harvest of cod as the most significant source of cod in the next two decades (Seafood Market Bulletin 2006b).

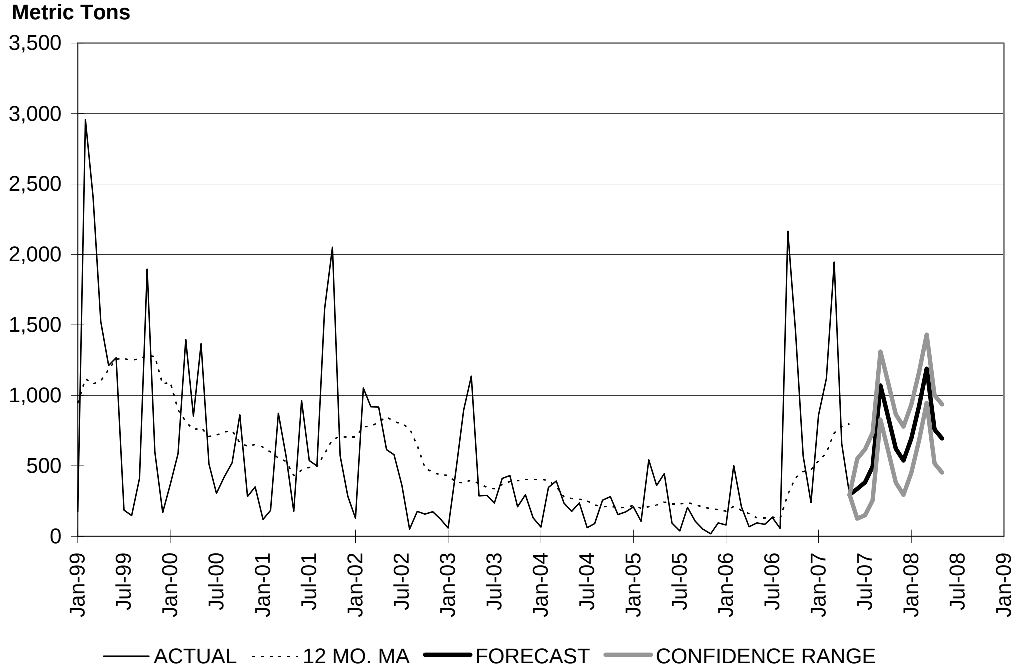
Figure 40. Actual and Forecast Nominal U.S. Export Prices of Cod Fillets to All Countries, 1999 - 2008.



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod..

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

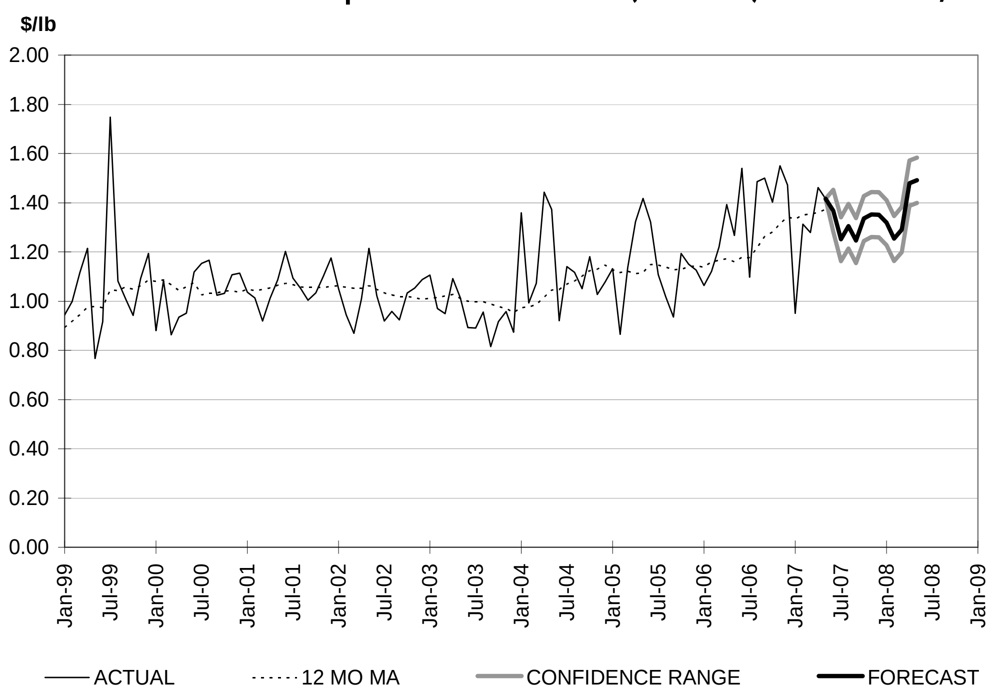
Figure 41. Actual and Forecast U.S. Export Volumes of Cod Fillets to All Countries, 1999 - 2008



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

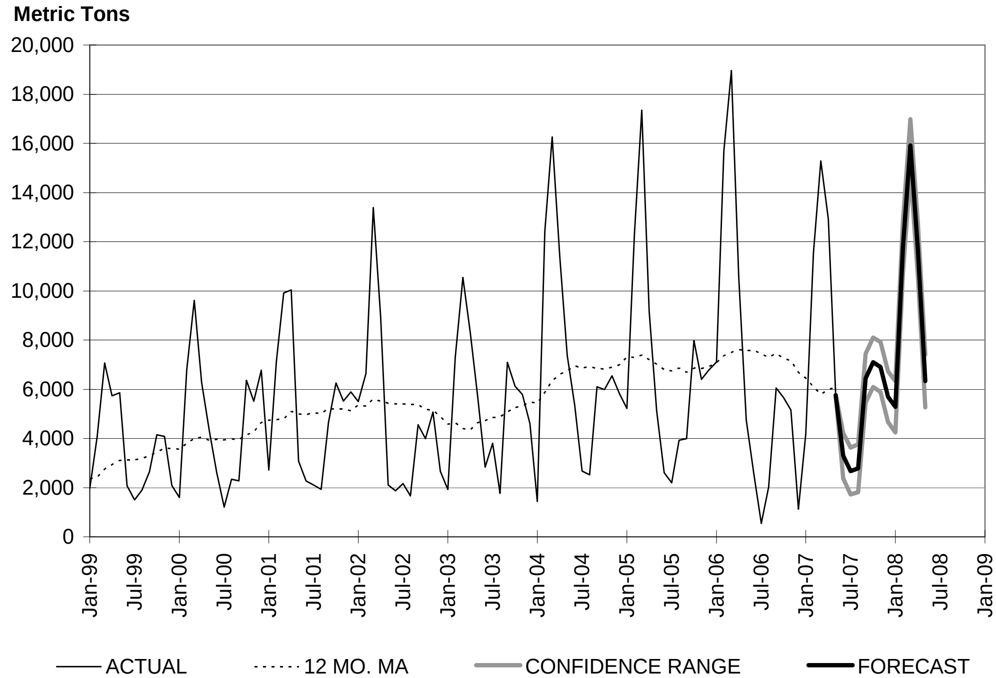
Figure 42. Actual and Forecast U.S. Export Prices of Frozen Cod (Not Fillets) to All Countries, 1999-2008



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

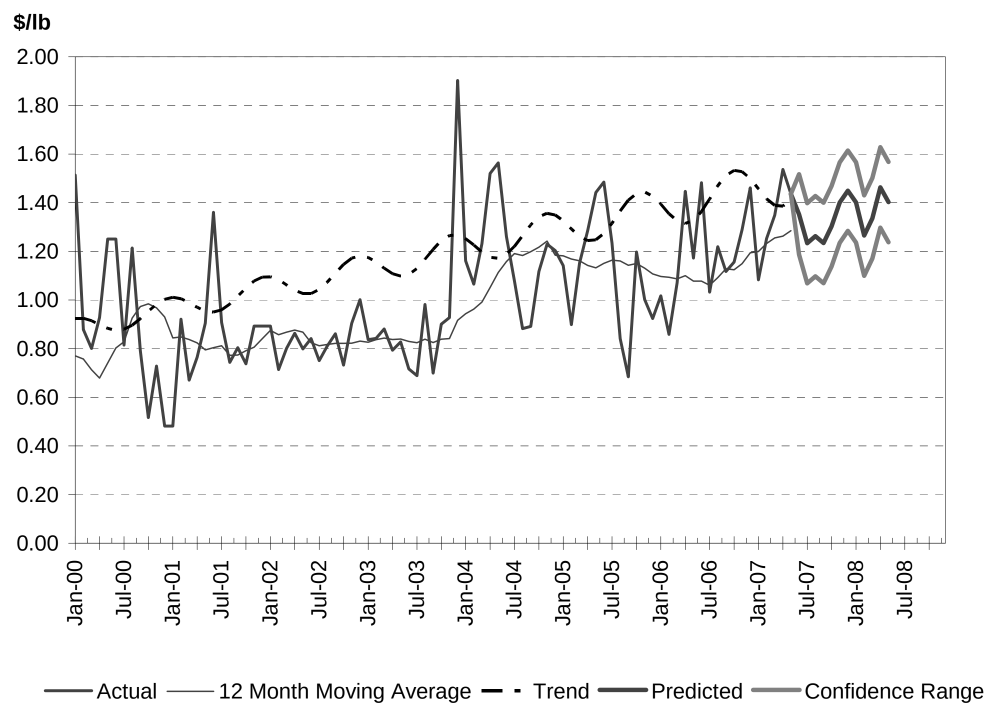
Figure 43. Actual and Forecast U.S. Export Volumes of Frozen Cod (Not Fillets) to All Countries, 1999-2008



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

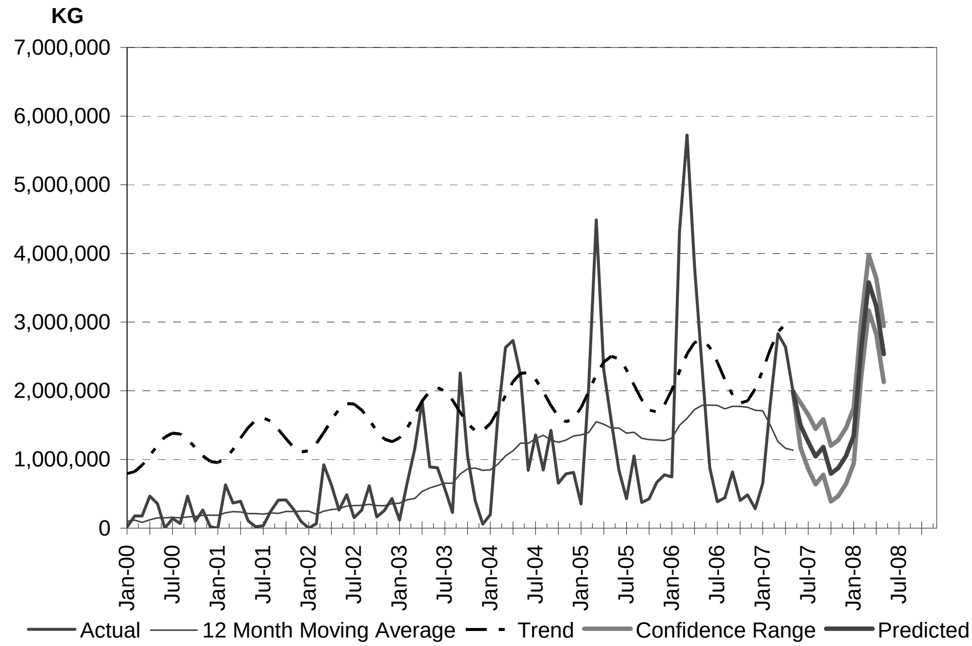
Figure 44. Actual and Forecast Nominal U.S. Export Prices of Frozen Cod (Not Fillets) to China, 2000-2008



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

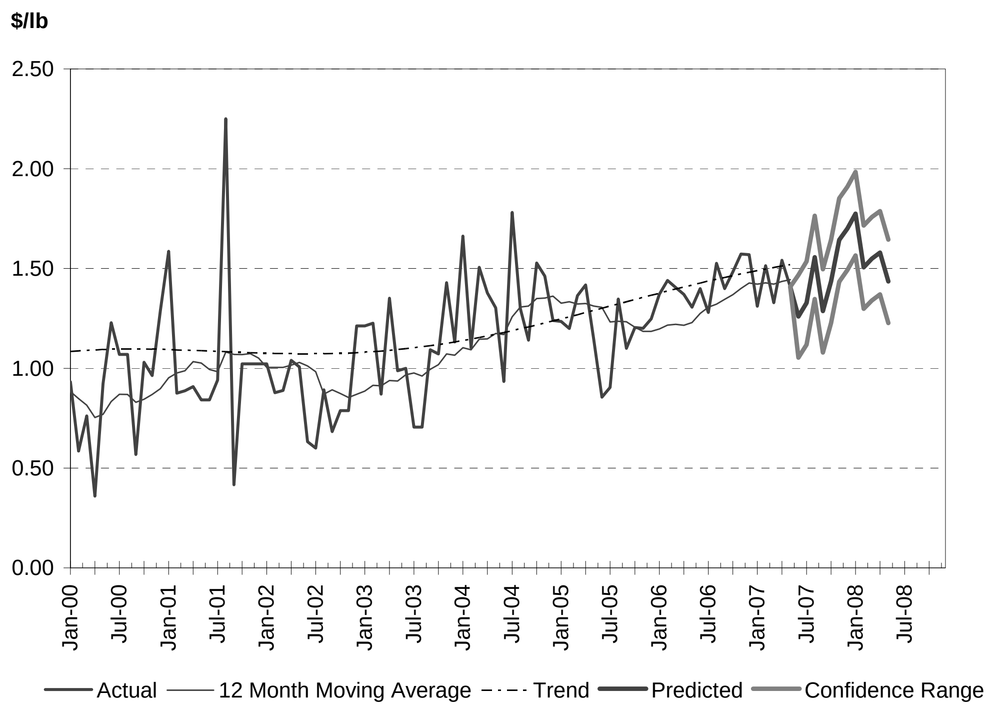
Figure 45. Actual and Forecast U.S. Export Volumes of Frozen Cod (Not Fillets) to China, 2000-2008



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

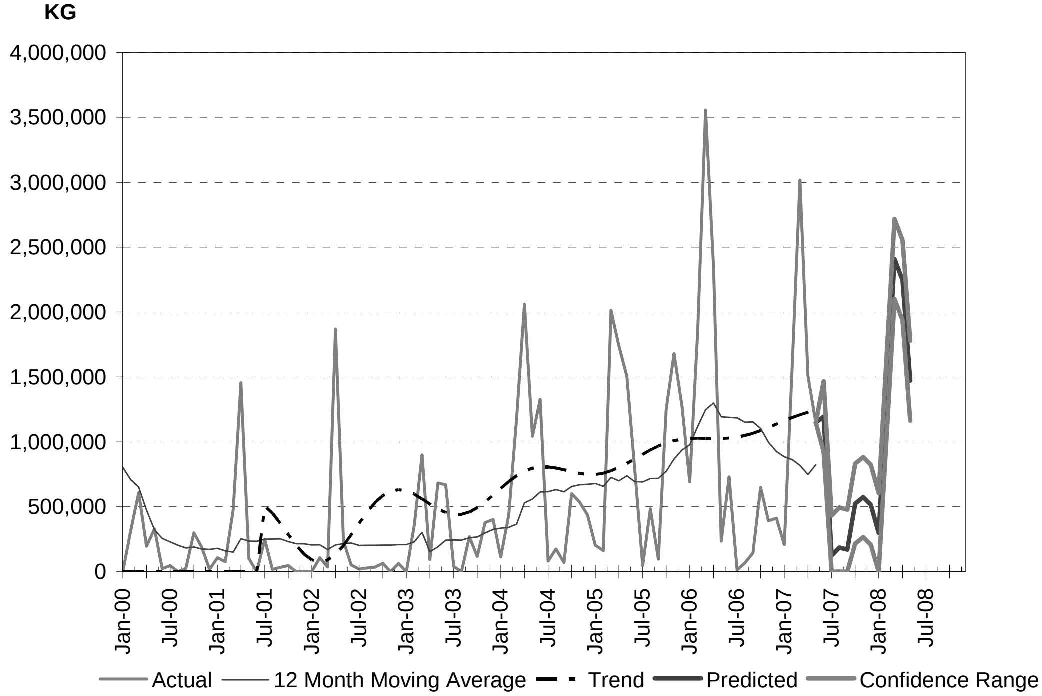
Figure 46. Actual and Forecast Nominal U.S. Export Prices of Frozen Cod (Not Fillets) to Portugal, 2000-2008



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 47. Actual and Forecast U.S. Export Volumes of Frozen Cod (Excluding Fillets) to Portugal, 2000-2008



Note: U.S. foreign trade data do not differentiate Pacific and Atlantic cod; however, as discussed in the text, nearly all of this product category is Pacific cod.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

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Sablefish Market Profile

Description of the Fishery

Sablefish (*Anoplopoma fimbria*) are distributed along the continental shelf and slope of the North Pacific Ocean from Baja California through Alaska and the Bering Sea, and westward to Japan. The greatest abundance of sablefish is found in the Gulf of Alaska and Bering Sea. In Federal waters off Alaska, the total allowable catch for Bering Sea and Aleutian Islands sablefish is typically about one-third of that for Gulf of Alaska sablefish.

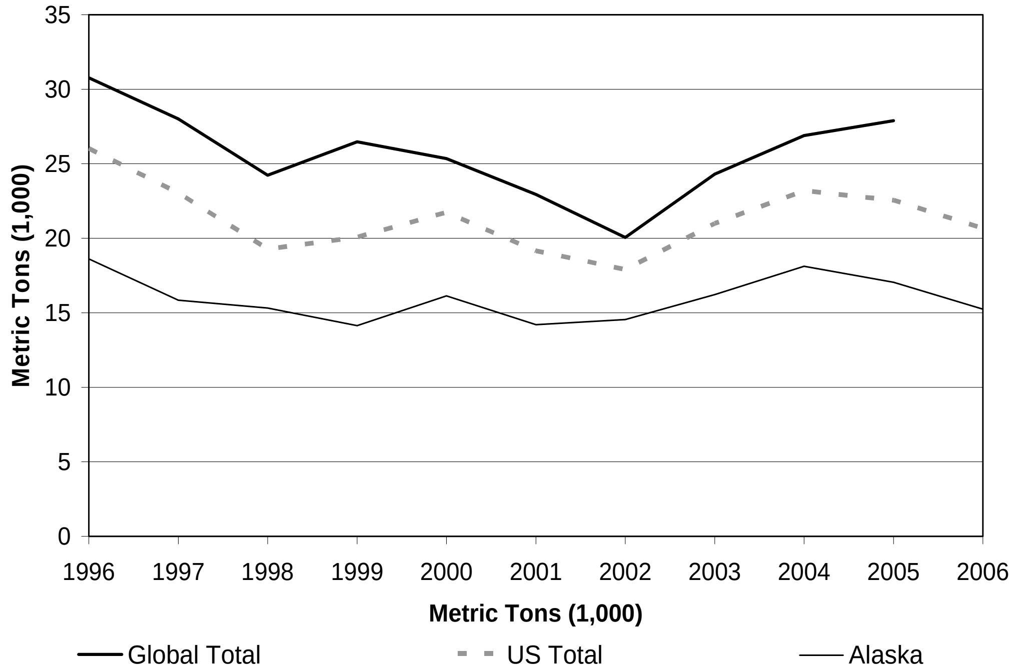
The fishing fleet for sablefish is primarily composed of owner-operated vessels that use hook-and-line or pot (fish trap) gear. An IFQ program for the Alaska sablefish and halibut fisheries was developed by the North Pacific Fishery Management Council and implemented by NMFS in 1995. The program was designed, in part, to help improve safety for fishermen, enhance efficiency, reduce excessive investment in fishing capacity, and protect the owner-operator character of the fleet. The program set caps on the amount of quota that any one person may hold, limited transfers to bona fide fishermen, issued quota in four vessel categories, and prohibited quota transfers across vessel categories.

The IFQ system has allowed fishers to time their catch to receive the best prices. In a survey of sablefish fishers in the first year of the program, more than 75 percent said that price was important in determining when to fish IFQs (Knapp and Hull 1996).

Production

Most of the total world catch of sablefish comes from Alaska (Figure 48). Oregon, Washington and California generally account for less than one-third of the U.S. harvest. Outside of the United States, sablefish are caught along the British Columbia coast, from the Vancouver area north to the Alaskan border (Cascorbi 2007).

Figure 48. Alaska, Total U.S. and Global Production of Sablefish, 1996 – 2006



Note: Data for 2006 were unavailable for Global totals.

Source: Alaska data from NMFS Blend and Catch Accounting System Data. Other U.S. data from PacFIN, available at http://www.psmfc.org/pacfin/pfmc.html; Global data from FAO, "FishStat" database available at http://www.fao.org/fi/website/FIRetrieveAction.do?dom=topic&fid=16073.

Product Composition and Flow

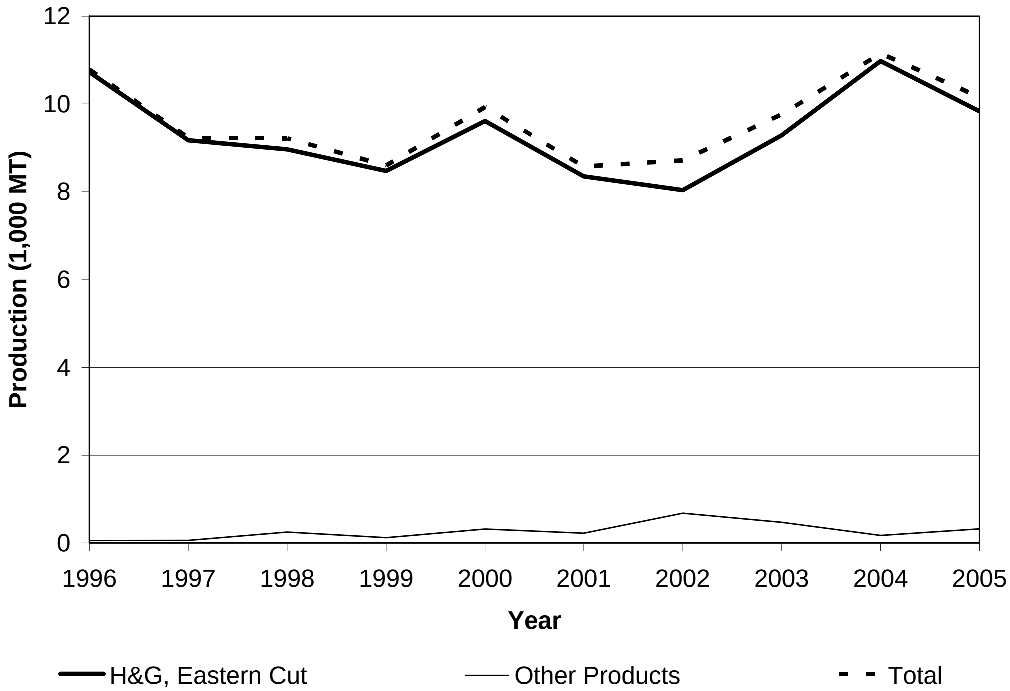
Until recently, about 90 percent of sablefish delivered by catcher vessels to shoreside processors was already headed and gutted (H&G) in an eastern cut—head removed just behind the collar bone (Heltzel, 2007). In 2006, however, the percentage of eastern cut H&G deliveries declined to 75 percent, and as of September 2007, eastern cut H&G represented only 55 percent of deliveries, with almost all the remaining sablefish harvest delivered in the round (Heltzel, 2007; Gharrett, 2007). At the shoreside plants the fish are graded by size into small (less than 4¼ or 5 pounds), medium (4¼ or 5 to 7 pounds), and large (over 7 pounds), with larger sablefish garnering higher prices per pound (Flick et al. 1990). As shown in Figure 49, most sablefish are sold as H&G product, eastern cut.

As a result of its high oil content, sablefish is an excellent fish for smoking. Smoked "sable" has long been a working-class Jewish deli staple in New York City (Cascorbi 2007). It is normally hot-smoked and requires additional cooking. In addition, as a premium-quality whitefish with a delicate texture and moderate flavor, sablefish is prized in up-scale restaurants (Cascorbi 2007). Sablefish has several market names in its processed forms. The U.S. consumer may see smoked sablefish as smoked Alaskan cod or sable, and fresh and frozen fillets as butterfish or black cod (Flick et al. 1990).

Sonu (2000) states that in Japan, sablefish is sold in retail stores for home consumption in steak and fillet form, and as *kasuzuke* (marinated in Japanese rice wine lees). The most popular sablefish dish is fish stew, which typically consists of sliced fish, vegetables, and soup stock. The dish is consumed primarily during the winter months. Sablefish steaks and fillet, as well as *kasuzuke*, are also used in grilled, broiled, or baked form. Sablefish may also be used as *sashimi* (thinly sliced raw fish).

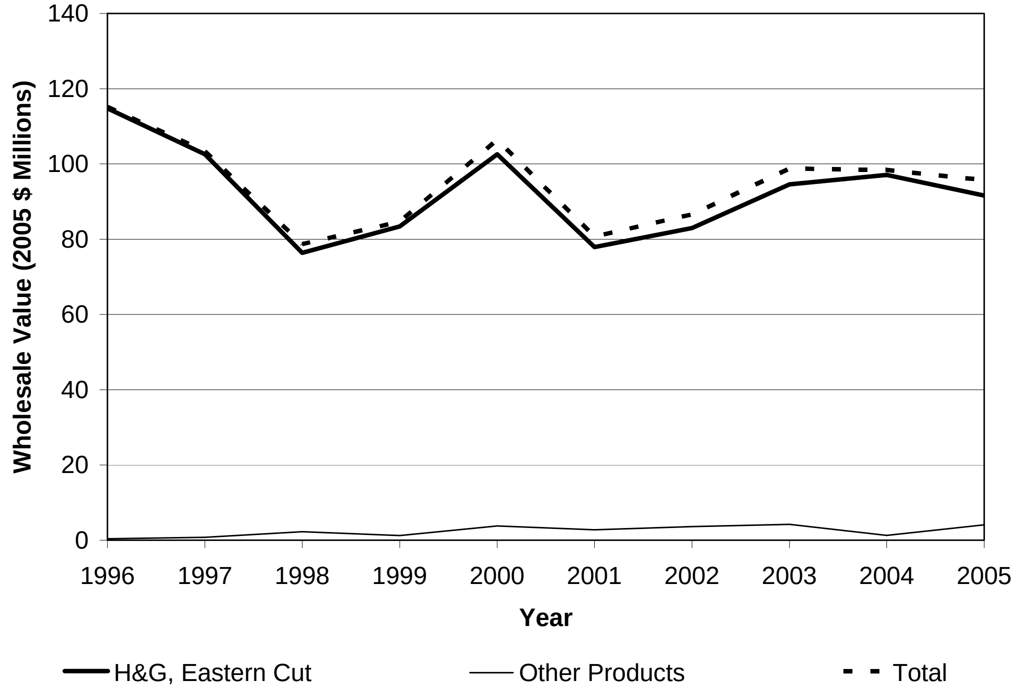
Sablefish is a mature market that is sensitive to relatively minor changes in supply, indicated by prices which respond inversely to fluctuations in the Alaska sablefish harvest (Seafood Market Bulletin 2006; Sonu 2000) (Figure 51).

Figure 49. Alaska Primary Production of Sablefish by Product Type, 1996 – 2005



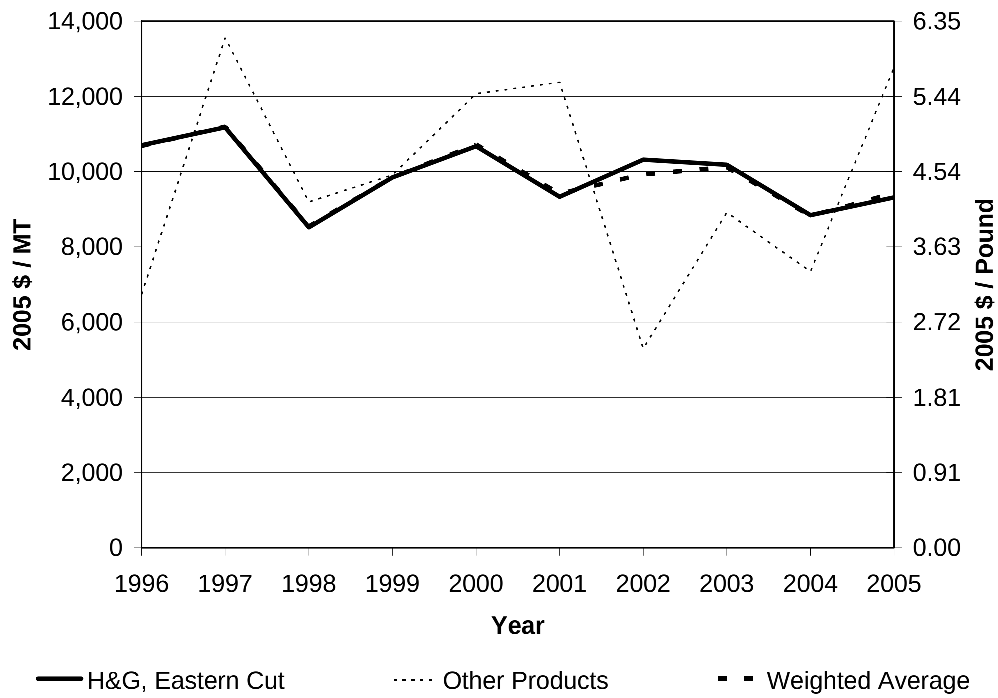
Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 50. Wholesale Value of Alaska Primary Production of Sablefish by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 51. Wholesale Prices for Alaska Primary Production of Sablefish by Product Type, 1996 – 2005

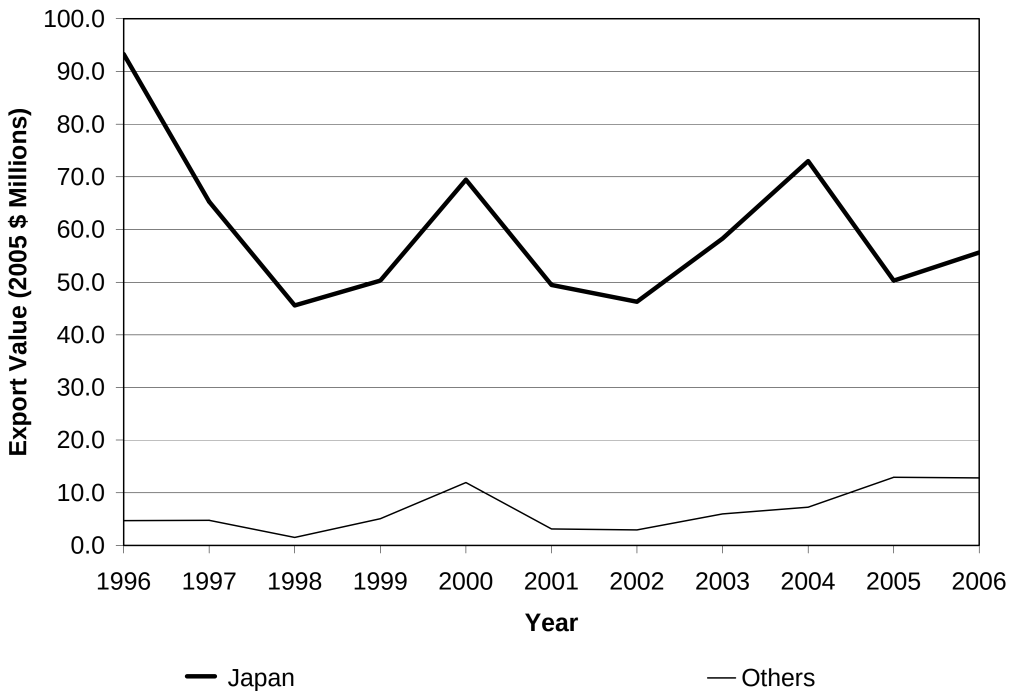


Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

International Trade

Although smoked sable has long been a traditional item in the U.S. deli trade, most of the Alaska sablefish catch has historically been exported to Japan, where it is a popular fish that is primarily consumed during the winter months (Niemeier 1989). While Japan continues to be the major market, the product has gained considerable popularity in other markets over the past several years, as is evident from U.S. export data (Figure 52). With the increased interest from other markets Japan's share of the sablefish supply has declined. In particular, export sales to other Asian markets have increased in recent years. While there was a dramatic increase in the amount of sablefish shipped to China, it is believed that the majority of this product was re-exported to Japan, rather than for domestic Chinese consumption. Product shipped to other Asian (e.g., South Korea) and European markets was largely for local consumption.

Figure 52. U.S. Exports of Frozen Sablefish to Leading Importing Countries, 1996 - 2006



Note: Data include all exports of frozen sablefish recorded at the Anchorage and Seattle offices of the U.S. Customs Pacific District. It should be noted that sablefish are also harvested on the West Coast and that it is likely that some of this sablefish may be from West Coast harvests.

Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Market Position

Historically, sablefish has competed with species such as rockfish and turbot, which have similar seasons and prices, and has sometimes substituted for salmon when salmon prices are high (Niemeier 1989). In addition, sablefish has been marketed as a substitute for Chilean sea bass (*Dissostichus eleginoides*) because of its similar taste and texture. Chilean sea bass is currently over-fished in all oceans, and the "Take a Pass on Chilean Sea Bass" media campaign of environmental groups bolstered the consumption of sablefish in the United States, although it is unlikely to replace the sales of Chilean sea bass (Redmayne 2002). Sablefish has also gained popularity in the growing number of U.S. restaurants that feature Asian or Pan Asian cuisine (Burros 2001; Redmayne 2002).

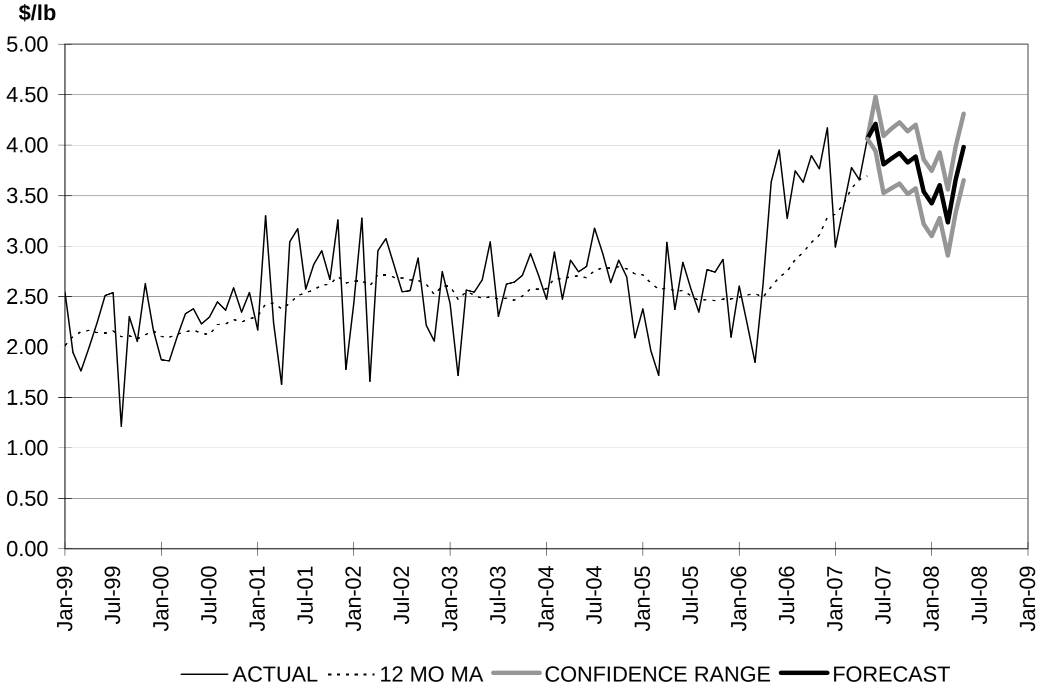
Japan remains the primary market destination for Alaska sablefish. Forecasts of U.S. export prices predict a drop in price over the short term (Figure 53).[6] However, the forecast model does not adjust for exogenous factors such as cuts in the Alaska sablefish quota. As noted above, sablefish market prices respond inversely to fluctuations in the Alaska sablefish harvest. The anticipated reduction in the Alaska sablefish catch due to a decreasing TAC (from 20.10 thousand mt in 2007 to 20.00 thousand mt in 2008), combined with growing demand for sablefish in alternative markets, is expected to create upward pressure for sablefish prices.

Marine Stewardship Council certification of the Alaska sablefish longline fishery as a “well managed and sustainable fishery” in 2006 is expected to further expand the demand for Alaska sablefish. To capitalize on the MSC certification, the Fishing Vessel Owners’ Association, which spearheaded and paid for the fishery assessment that led to the eco-friendly seafood label, has partnered with the Deep Sea Fishermen’s Union to form a tax exempt corporation called Eat on the Wild Side to expand the sablefish market beyond Japan (Welch 2006). In 2007, FreshDirect, one of the leading online fresh food grocers in the United States, began to offer Alaska-caught sablefish and other MSC-certified seafood (IntraFish Media 2007). The MSC certification may also bolster sales in Japan—Alaska sablefish products with the MSC’s distinctive blue logo have already appeared in Japanese retail outlets (Inoue 2007).

In the near future, Alaska sablefish may face competition from farmed sablefish. Over the past several years, a number of firms have developed hatchery technology for the production of sablefish juveniles, with the goal of commercially raising sablefish in large-scale, ocean or onshore farms. Currently, however, there is only one sablefish hatchery in North America, Sablefin Hatcheries Ltd. located on Salt Spring Island, British Columbia; this facility produces juvenile sablefish for various grow-out farms within British Columbia (DiPietro 2005).

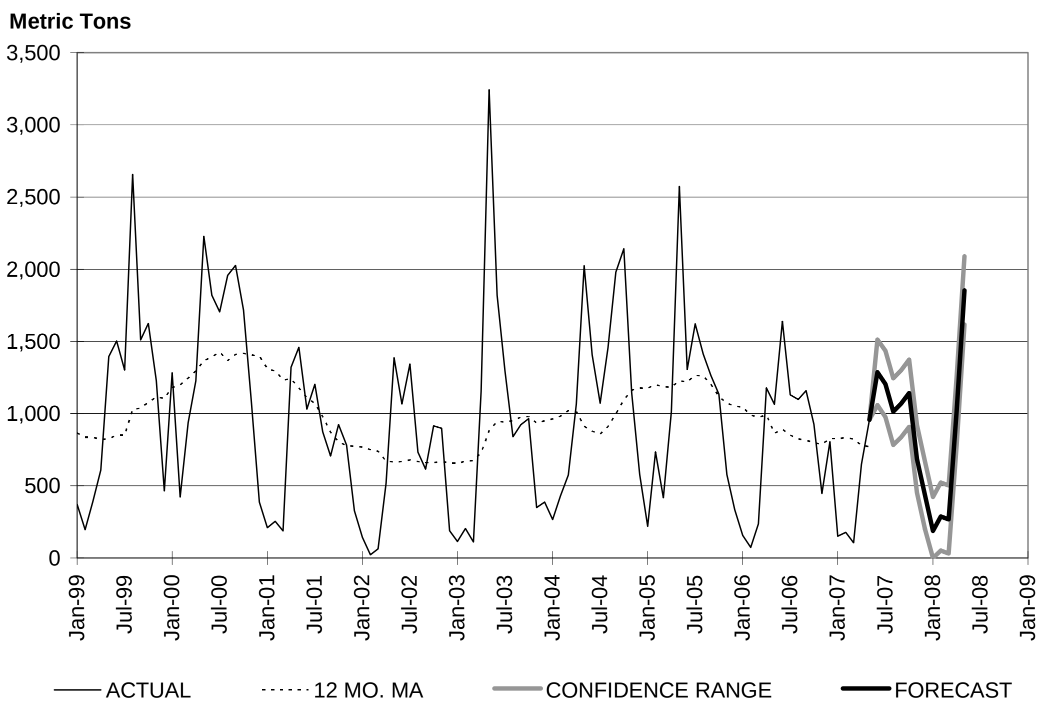
[6] The methodology used to develop forecasts shown in Figure 53 through Figure 54 is described in Appendix A: Alaska Groundfish Export Market Forecast Methodology and Details.

Figure 53. Actual and Forecast Nominal U.S. Export Prices of Sablefish to All Countries, 1999 - 2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 54. Actual and Forecast U.S. Export Volumes of Sablefish to All Countries, 1999 - 2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

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Yellowfin and Rock Sole Market Profile

Description of the Fishery

The yellowfin sole (*Limanda aspera*) is one of the most abundant flatfish species in the eastern Bering Sea. Yellowfin sole are targeted primarily by trawl catcher/processors, and the directed fishery typically occurs from spring through December. Seasons are generally limited by closures to prevent exceeding the Pacific halibut apportionment or red king crab bycatch allowance.

The northern rock sole (*Lepidopsetta polyxystra* n. sp.) is distributed primarily on the eastern Bering Sea continental shelf and in much lesser amounts in the Aleutian Islands region. Rock sole are important as the target of a high value roe fishery, which has historically accounted for the majority of the annual catch. There is no prohibition on roe-stripping in this fishery. The fishery is conducted as a "race-for-fish" wherein fishers compete for roe-bearing rock sole before the prohibited species catch allowance for halibut or red king crab are exhausted or the prime roe period is over, the former being more likely to occur before the latter (Gauvin and Blum 1994). Historically, large amounts of male rock sole were discarded overboard because of their relatively low value; in recent years, however, a larger percentage of these fish has been retained as a result of development of markets for male rock sole. Retention is expected to increase in the future due to enactment of improved retention/utilization regulations by the North Pacific Fishery Council.

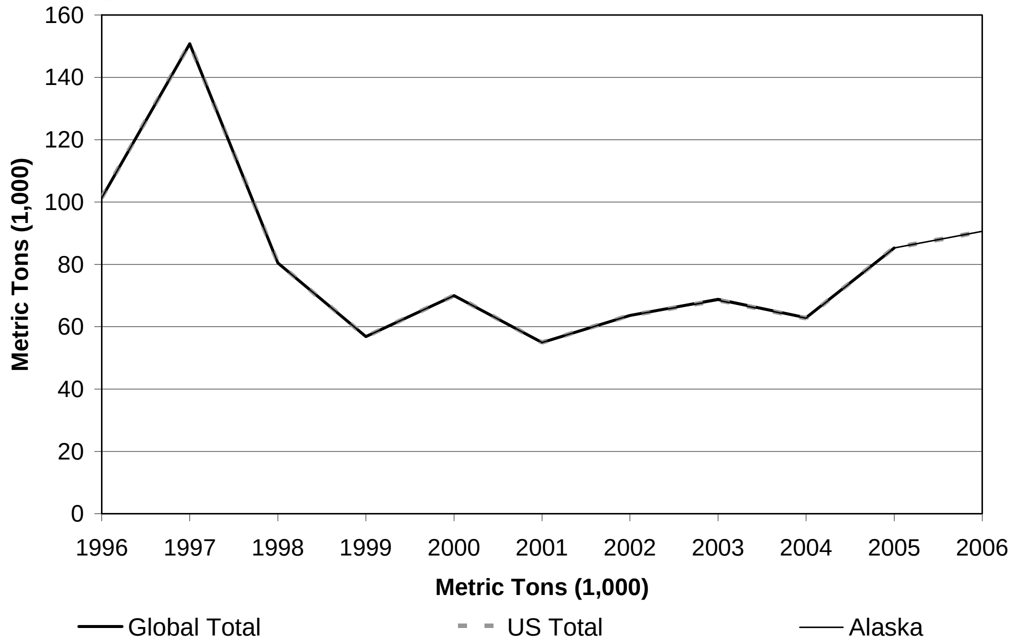
Production

The yellowfin sole and rock sole fisheries off Alaska are the largest flatfish fisheries in the United States. These species together account for approximately 50% of U.S. flatfish landings from the Pacific and Atlantic Oceans combined. U.S. catches of yellowfin sole occur only in the waters off Alaska, and rock sole catches almost entirely so (Figure 55 and Figure 56). West Coast landings comprise less than 1% of total U.S. landings for rock sole (Roberts and Stevens 2006).

Most of the yellowfin sole is landed in the summer when the Pacific cod fishery is closed. Rock sole, on the other hand, is fished in February and March, when females are ripe with roe (SeaFood Business undated).

The fish landings statistics available indicate that Alaska fisheries account for the entire worldwide production of yellowfin and rock sole (Figure 55 and Figure 56). However, the catch reporting standards and fisheries landings data available from some countries may be inadequate, and commonly used groupings for similar species lead to difficulties in isolating species-specific landings (NMFS 2001). For example, seafood market reports (e.g., IntraFish Media 2004; SeaFood Business undated), seafood supplier Web sites (e.g., Siam Canadian Foods Company, Ltd. 2004), scientific articles (e.g., Kupriyanov 1996) and other information sources (e.g., Vaisman 2001) refer to Russian harvests of yellowfin sole in the western Bering Sea. However, no records of these catches are found in fishery statistics compiled by the U.N. Food and Agriculture Organization.

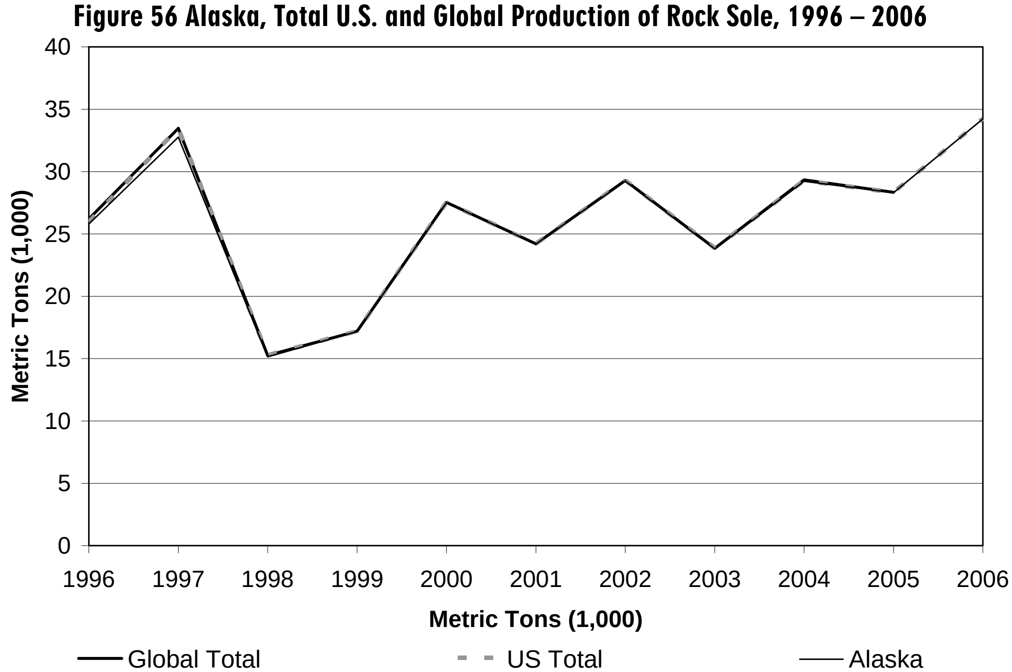
Figure 55. Alaska, Total U.S. and Global Retained Harvest of Yellowfin Sole, 1996 – 2006



Note: The global harvest estimate may not be accurate because the fish landing statistics of some countries may not distinguish between yellowfin sole and other flatfish species. The global total in the figure is the higher of the FAO estimate or U.S. total.

Source: Alaska data from NMFS Blend and Catch Accounting System Data. Other U.S. data from PacFIN, available at http://www.psmfc.org/pacfin/pfmc.html; Global data from FAO, "FishStat" database available at http://www.fao.org/fi/website/FIRetrieveAction.do?dom=topic&fid=16073.

Figure 56 Alaska, Total U.S. and Global Production of Rock Sole, 1996 – 2006



Note: The global harvest estimate may not be accurate because the fish landing statistics of some countries may not distinguish between rock sole and other flatfish species. The global total in the figure is the higher of the FAO estimate or U.S. total.

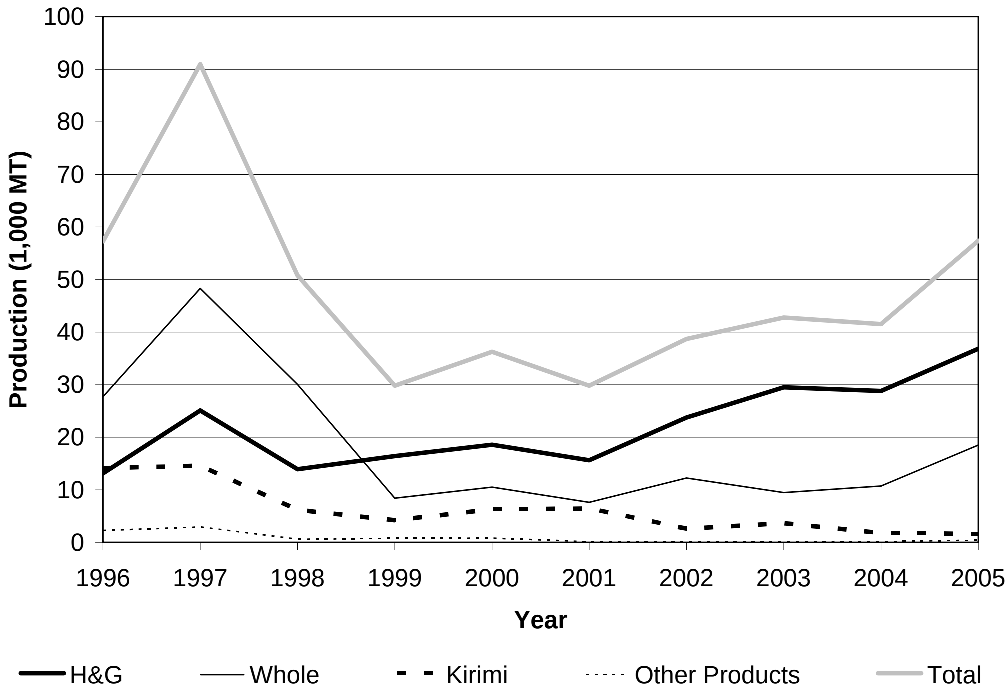
Source: Alaska data from NMFS Blend and Catch Accounting System Data. Other U.S. data from PacFIN, available at http://www.psmfc.org/pacfin/pfmc.html. Global data from FAO, "FishStat" database available at http://www.fao.org/fi/website/FIRetrieveAction.do?dom=topic&fid=16073.

Product Composition and Flow

Yellowfin sole products processed offshore are sold as whole fish and headed and gutted (H&G) fish (Figure 57). Industry representatives indicate that fish that yield a fillet of 3 oz. or more receive a higher price. H&G fish is primarily sold to re-processors in China for conversion into individual frozen skinless, boneless fillets. A relatively low percentage of yellowfin sole products are sold as *kirimi*, a steak-like product with head and tail off. Smaller fish tend to be used in the production of *kirimi*.

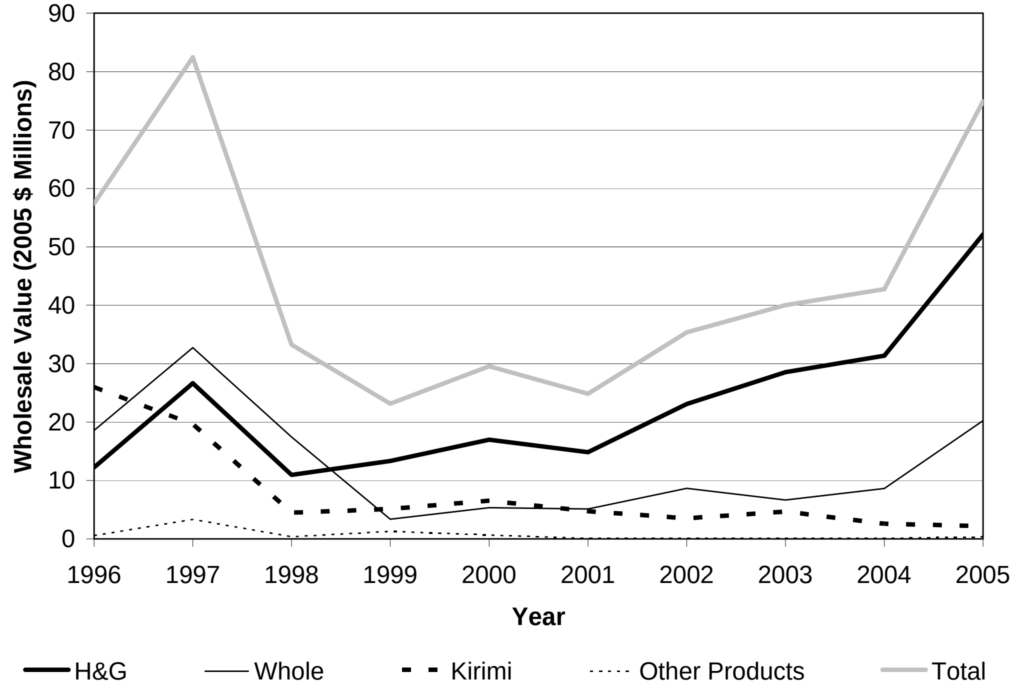
Rock sole with roe are exported to Japan, where whole, roe-in rock sole is a supermarket staple (SeaFood Business undated). Fish may also be sliced diagonally in strips containing both flesh and roe, or the roe may be removed and processed separately on-board (Bledsoe et al. 2003). Male rock sole are exported to China, where it is filleted and exported back to the United States (SeaFood Business undated). As with yellowfin sole, larger fish receive a higher price. An industry representative noted that Chinese re-processors tend to export fillets of small rock sole and yellowfin sole in the same pack. Consequently, market prices for fillets of the two species have tended to follow the same trend in recent years (compare the prices of H&G fish in Figure 59 and Figure 62). The wholesale market price of rock sole with roe shows a decreasing trend (Figure 62). However, industry representatives state that sales of this product remain an important source of early season cash flow for the trawl "head-and-gut" fleet.

Figure 57. Alaska Primary Production of Yellowfin Sole by Product Type, 1996 – 2005



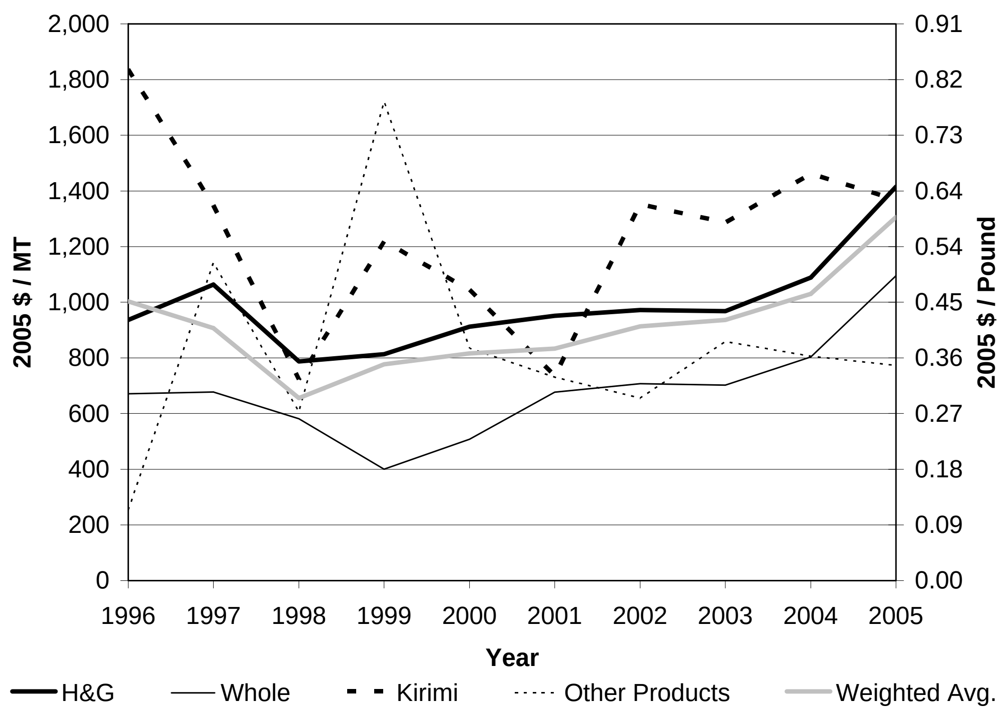
Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 58. Wholesale Value of Alaska Primary Production of Yellowfin Sole by Product Type, 1996 – 2005



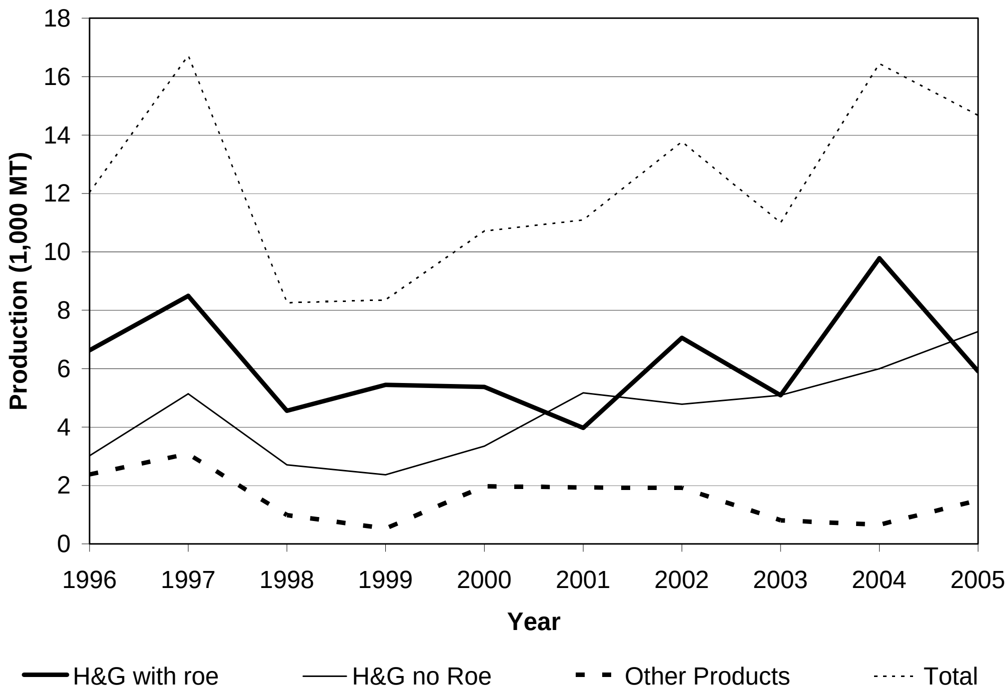
Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 59. Wholesale Prices for Alaska Primary Production of Yellowfin Sole by Product Type, 1996 - 2005



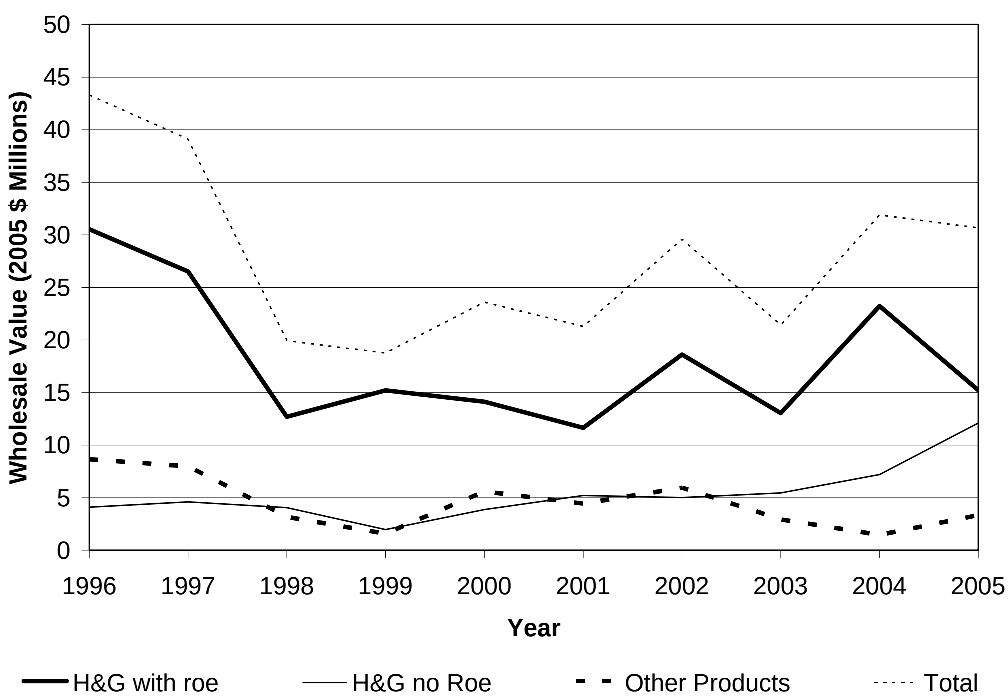
Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 60. Alaska Primary Production of Rock Sole by Product Type, 1996 - 2005



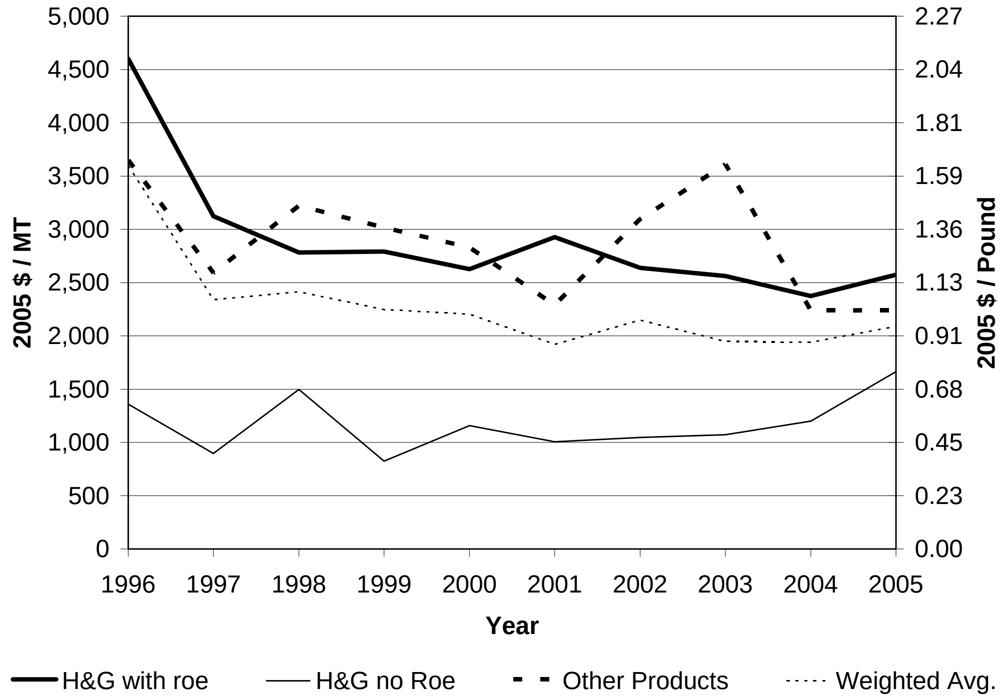
Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 61. Wholesale Value of Alaska Primary Production of Rock Sole by Product Type, 1996 - 2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 62. Wholesale Prices for Alaska Primary Production of Rock Sole by Product Type, 1996 – 2005



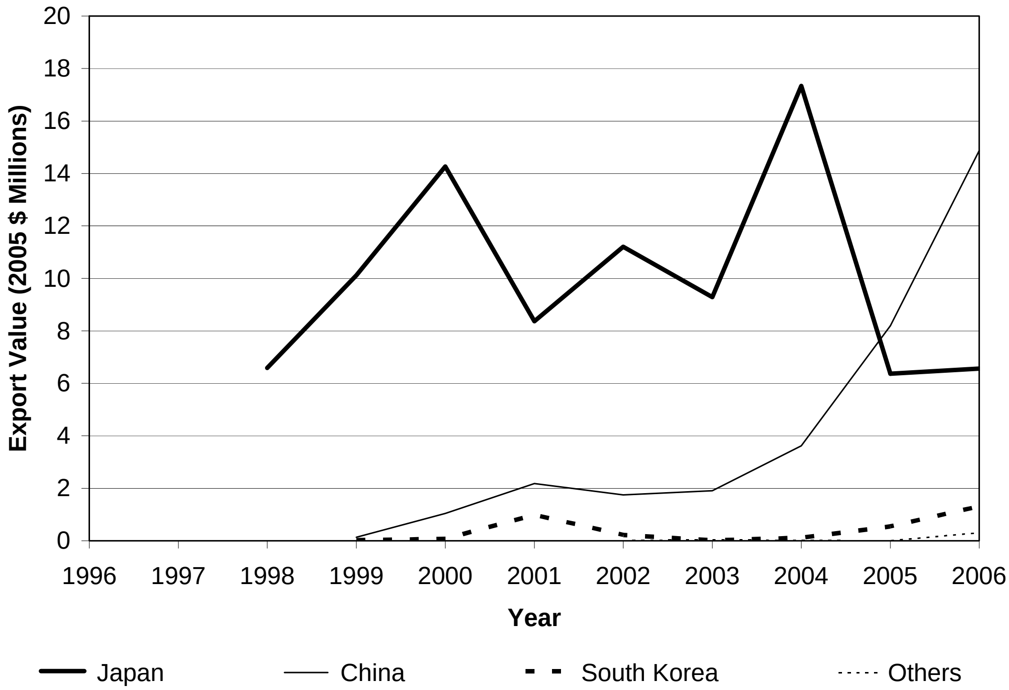
Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

International Trade

Approximately 80 to 90% of the sole harvested in the Alaska groundfish fisheries is shipped to Asia. As discussed previously, rock sole females are exported to Japan, while males are increasingly exported to China, where they are filleted and exported back to the United States (Figure 63). In recent years exports of rock sole with roe to Japan have been declining due to decreasing demand for this product.

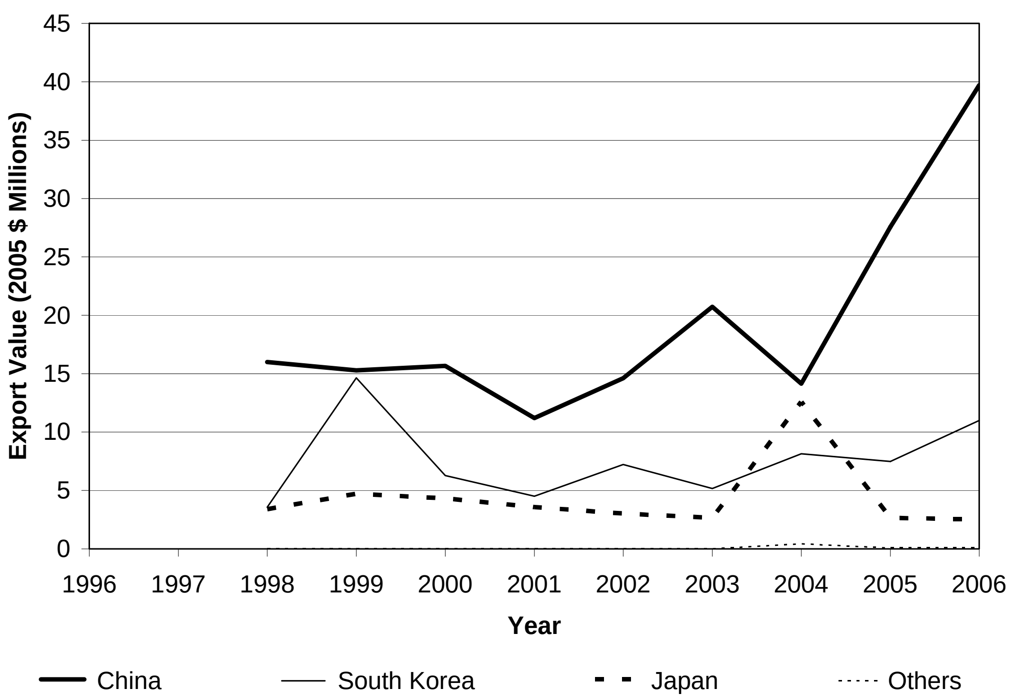
Whole and H&G yellowfin sole have separate and distinct markets (Figure 64). Whole round fish is generally sold to South Korea for domestic consumption (American Seafoods Group LLC 2002). As noted above, headed and gutted fish is primarily sold to re-processors in China for conversion into individual frozen skinless, boneless fillets. The majority of these fillets are eventually exported from China to the United States and Canada for use in foodservice applications (American Seafoods Group LLC 2002). U.S. shoreside processors produce some fillets as well as other products, with some products going to Asia and others remaining in the United States. However, the relatively small fillets of yellowfin sole have a high labor cost per pound. This high labor cost makes it more attractive to ship the fish to China, where labor costs tend to be relatively low for secondary processing (NMFS 2001). Yellowfin sole processed into *kirimi* is exported to Japan.

Figure 63. U.S. Exports of Rock Sole to Leading Importing Countries, 1998 - 2006



Note: Data include all exports of rock sole from the U.S. Customs Pacific District.
Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/.

Figure 64. U.S. Exports of Yellowfin Sole to Leading Importing Countries, 1998 - 2006



Note: Data include all exports of yellowfin sole from the U.S. Customs Pacific District.
Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/.

Market Position

Yellowfin and rock sole harvested off Alaska compete in international markets with other flatfish species caught in fisheries off Alaska and the U.S. West and East Coasts and in foreign fisheries. Landings off the U.S. West Coast are likely to remain low for the foreseeable future as allowable catches have been drastically cut to protect overfished rockfish stocks (Roberts and Stevens 2006). After years of strict conservation the New England flatfish harvest has bounced back; according to a seafood market report, Alaska processors are finding it harder to market their H&G frozen flatfish to New England processors for "refreshing" (thawing and filleting) (SeaFood Business undated). The market in Europe for Alaska-harvested yellowfin sole is expected to remain strong due to quota cuts by the EU's Fishing Council for plaice, the most commercially valuable European flatfish. Value-added flatfish processors in the Netherlands, which is a major supplier of sole products to other EU countries, are increasing their purchases of frozen skinless, boneless yellowfin sole fillets from re-processors in China (Saulnier 2005). In general, the export prices and volumes of yellowfin and rock sole are expected to remain stable over the short term (Figure 65 through Figure 68).[7]

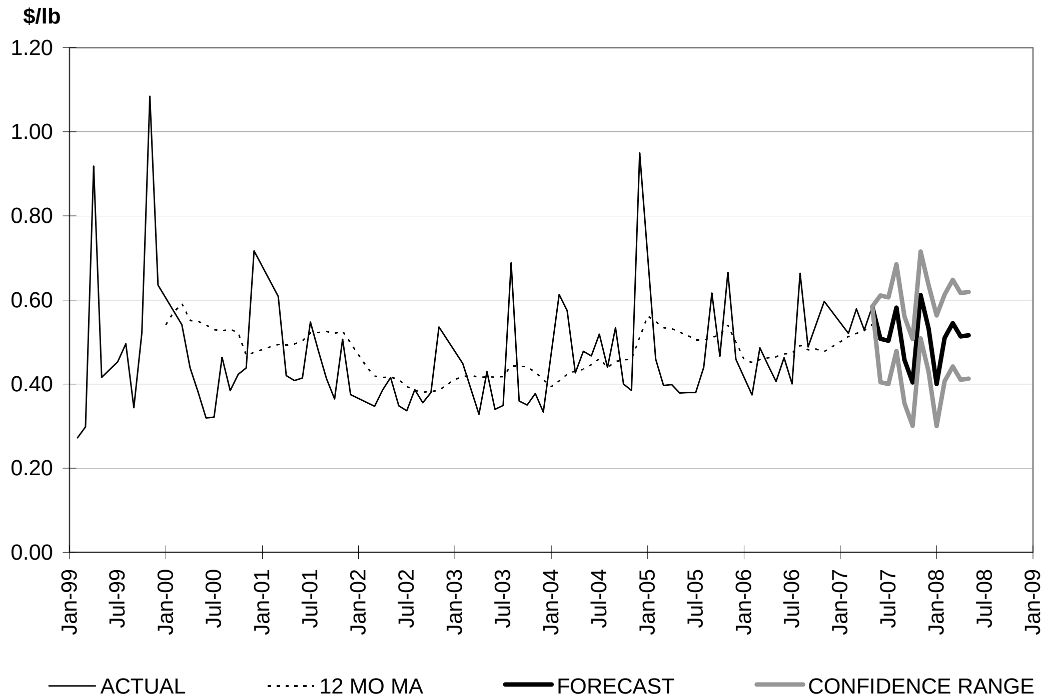
It is likely that Alaska-harvested yellowfin sole also competes in international markets with yellowfin sole harvested by Russian trawlers operating in the western Bering Sea. However, as discussed earlier, the harvest levels in the Russian fishery are uncertain. Similar to the Alaska harvest, most of the Russian yellowfin sole catch is likely imported by China as H&G, thawed, reprocessed as fillets and re-exported.

As indicated above, the Japanese market for rock sole with roe has been gradually decreasing, and this decrease is expected to continue (Figure 69). The declining demand is likely due to changing food preferences, especially among the younger generation in Japan. Over the short term the primary market for rock sole in Japan will continue to be for roe-in females; however, new products are occasionally tested in the Japanese market. In 2004, for example, the large Japanese processor, Nichirei Corporation, started to market a new product line of fish products where the bones could be eaten; among the species used in the products are yellowfin and rock sole from U.S. and Russian fisheries (IntraFish Media 2004).

Alaska-harvested yellowfin and rock sole compete in domestic and foreign markets with farmed flatfish as well as other wild-caught flatfish species. At present, fish farms account for a small percentage of the worldwide flatfish production. However, that percentage is expected to steadily increase because of the declining trends in wild catches, and because of the high prices paid for many flatfish species (Sjøholt 2000). For example, European turbot is currently farmed extensively in France, Spain, Portugal and Chile, and significantly the farmed tonnage now exceeds the wild catch. Flatfish are also cultured in coastal areas of South Korea, Japan, and China. According to United Nations Food and Agriculture Organization data, most of the flatfish production in China is from aquaculture (Roberts and Stevens 2006). In the United States, summer flounder is farmed commercially in Massachusetts and New Hampshire, and experimental work is being conducted into commercial production of Southern flounder (Brown 2002).

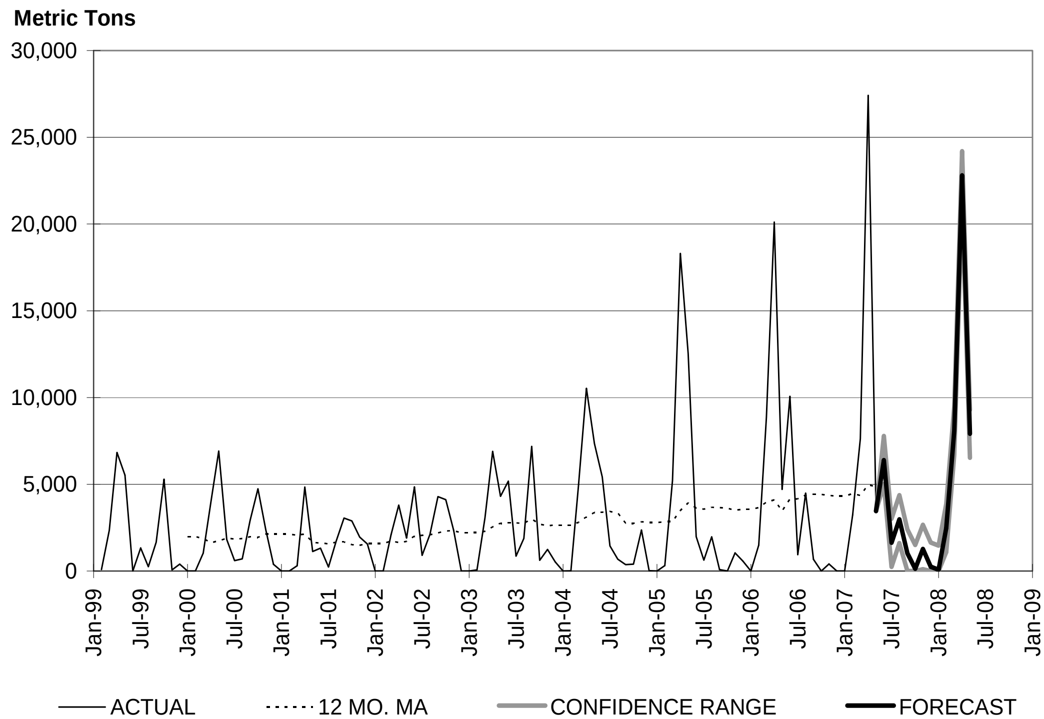
[7] The methodology used to develop forecasts shown in Figure 65 through Figure 70 is described in Appendix A: Alaska Groundfish Export Market Forecast Methodology and Details.

Figure 65. Actual and Forecast Nominal U.S. Export Prices of Yellowfin Sole to All Countries, 1999 - 2008.



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

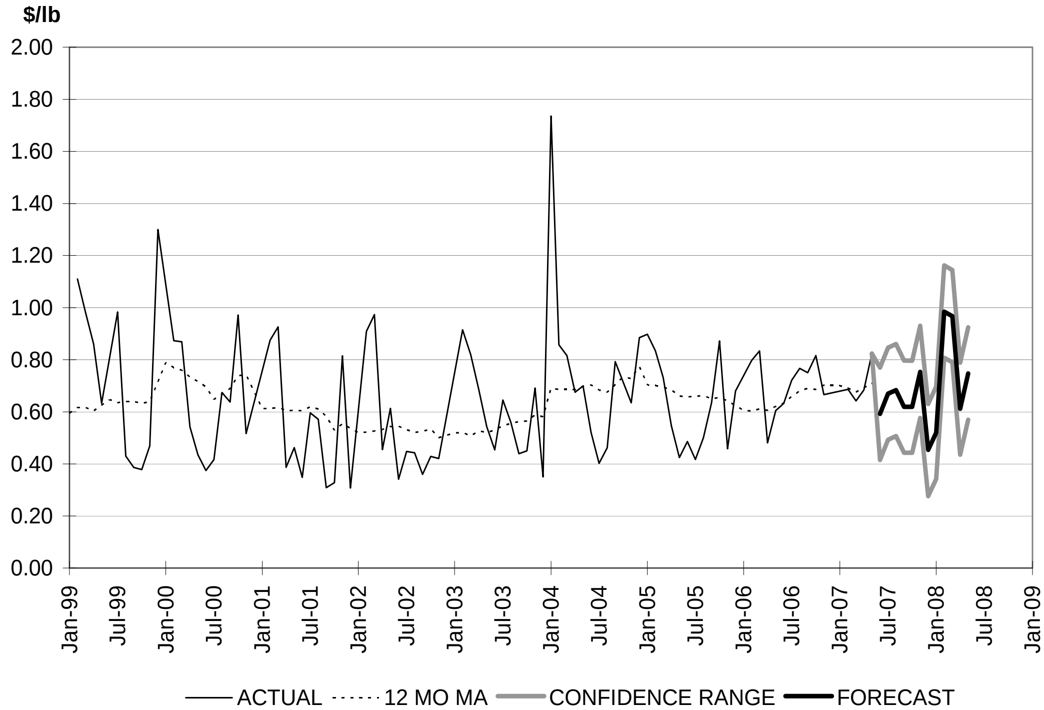
Figure 66. Actual and Forecast U.S. Export Volumes of Yellowfin Sole to All Countries, 1999 - 2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

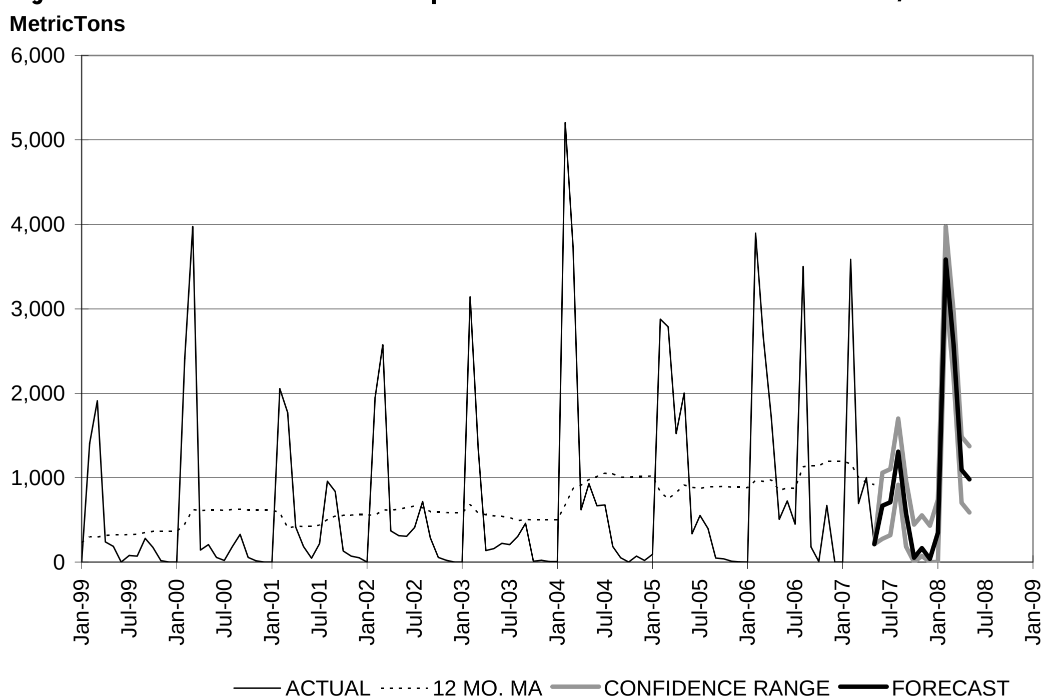
Alaska Groundfish Market Profiles

Figure 67. Actual and Forecast Nominal U.S. Export Prices of Rock Sole to All Countries, 1999 - 2008.



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

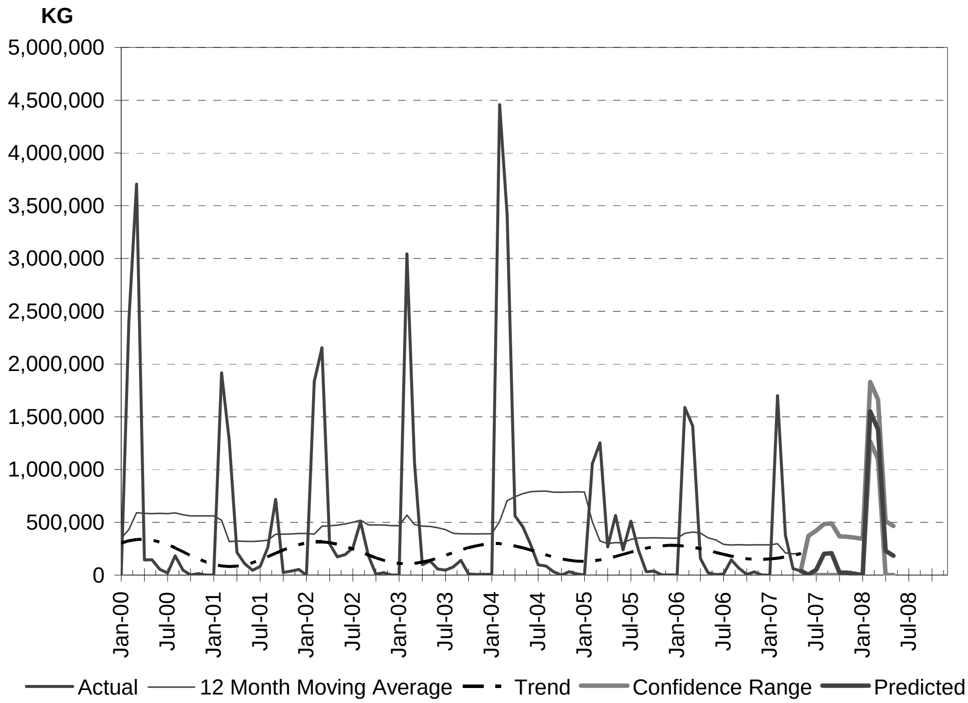
Figure 68. Actual and Forecast U.S. Export Volumes of Rock Sole to All Countries, 1999 - 2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

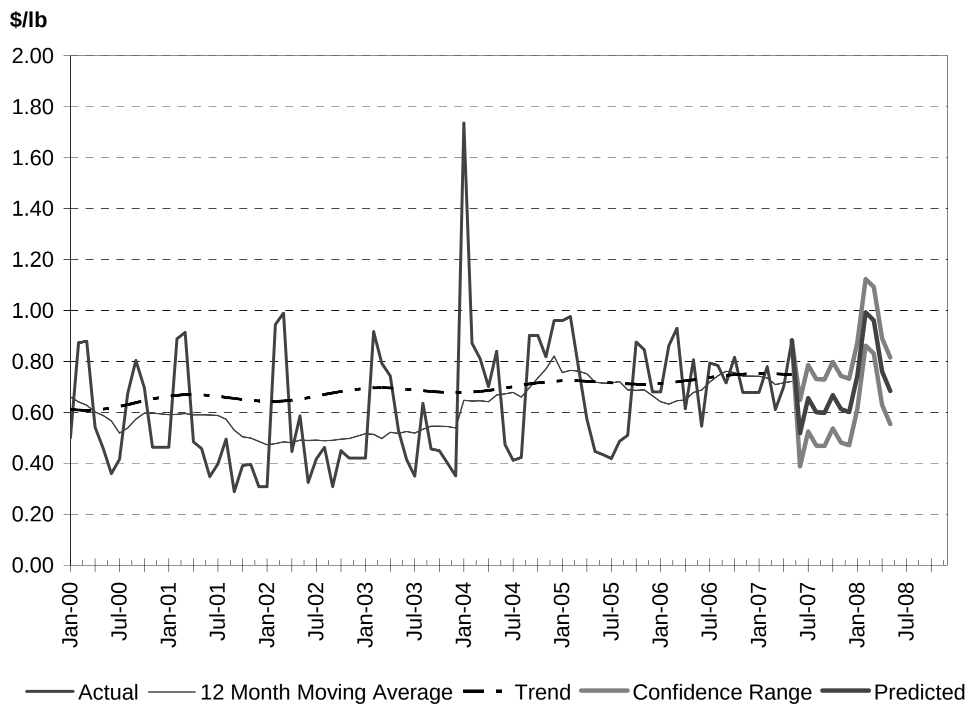
Alaska Groundfish Market Profiles

Figure 69. Actual & Forecast U.S. Exports Volumes of Rock Sole to Japan, 2000-2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

Figure 70. Actual & Forecast Nominal U.S. Export Prices of Rock Sole to Japan, 2000-2008



Source: NMFS Foreign Trade Data available at www.st.nmfs.gov/st1/trade/. Forecasts developed by J.L. Anderson Associates.

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Siam Canadian Foods Company, Ltd. 2004. Yellowfin sole. Available at: http://www.siamcanadian.com/yellowfin-sole/index.htm. Accessed August 20, 2007.

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Arrowtooth Flounder Market Profile

Description of the Fishery

Arrowtooth flounder (*Atheresthes stomias)* range from central California to the eastern Bering Sea and are currently the most abundant groundfish species in the Gulf of Alaska (GOA).

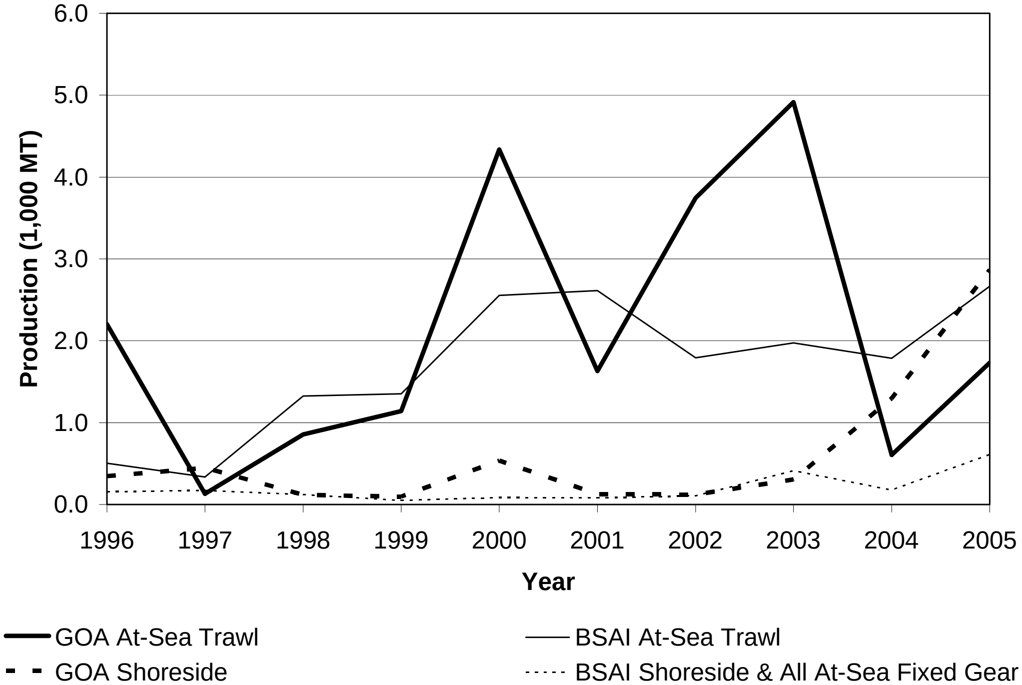
In the GOA the arrowtooth flounder fishery is almost exclusively prosecuted by catcher vessels and catcher/processors using bottom trawl gear (NMFS 2007). Although the arrowtooth flounder fishery is open to other vessel categories and gear types, very small amounts of arrowtooth flounder are harvested by other gear types and then only as incidental catch (Figure 71). In recent years catcher vessels participating in the arrowtooth flounder fishery generally fish for Pacific cod and pollock during the roe season. Following the seasonal closure of these fisheries, vessels target arrowtooth flounder until the second seasonal halibut bycatch cap for the deepwater complex is reached (usually in May). The catcher vessels deliver most of their arrowtooth flounder harvest to shoreside processors in Kodiak.

The catcher/processors participating in the GOA arrowtooth flounder fishery enter the fishery following the closure of rock sole and yellowfin sole in the Bering Sea (NMFS 2007). Most of the harvest of arrowtooth flounder occurs from March through May. Depending upon the availability of the halibut prohibited species catch allowance for the deep-water complex vessels may also target arrowtooth flounder in October and November. After the arrowtooth flounder fishery closes, these vessels generally shift to several different targets; notably flatfish species in the shallow-water complex, rockfish, pollock, and Pacific cod as the seasonal allowances of these targets become available. The implementation of the Rockfish Pilot Program in the Central GOA in 2007 may result in shifts in effort and timing of the arrowtooth flounder fishery (NMFS 2007).

There is no target fishery for arrowtooth flounder in the Bering Sea and Aleutian Islands (BSAI) region. The species is primarily captured by catcher/processors in pursuit of other high value species, and the arrowtooth flounder caught are often discarded. In 2005, about half of the arrowtooth flounder catch in the BSAI region was discarded. Retention is expected to increase in the future due to the reauthorization of improved retention/utilization regulations in the GOA and BSAI, and the passage of amendments setting groundfish retention standards and authorizing the formation of cooperatives for the H&G catcher/processor fleet operating in the BSAI.

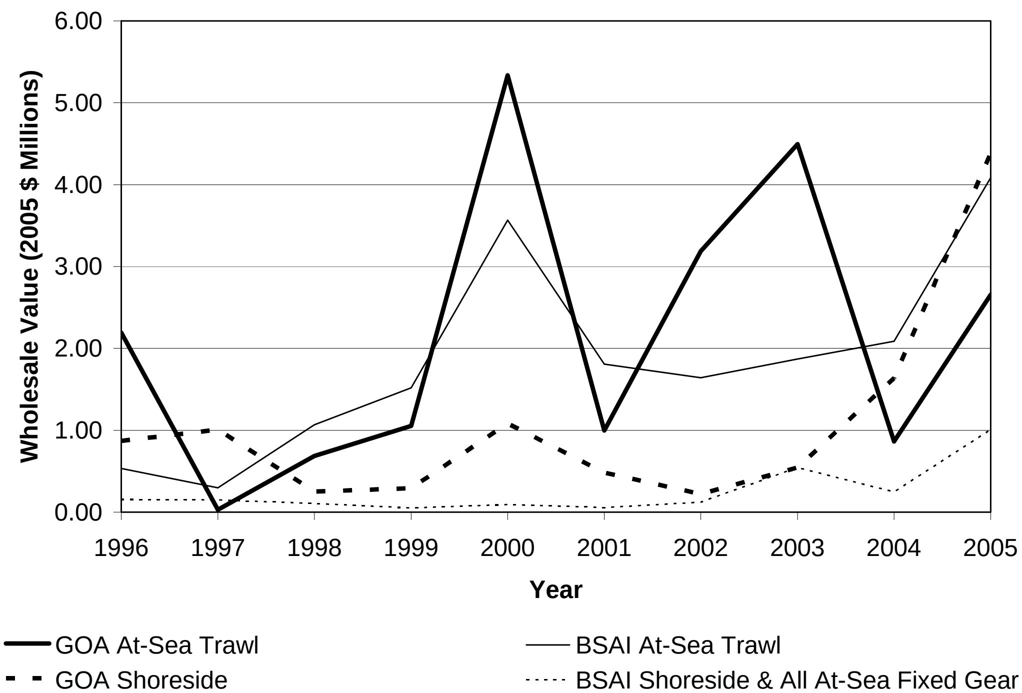
Alaska Groundfish Market Profiles

Figure 71. Alaska Primary Production of Arrowtooth Flounder by Sector, 1996-2005



Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

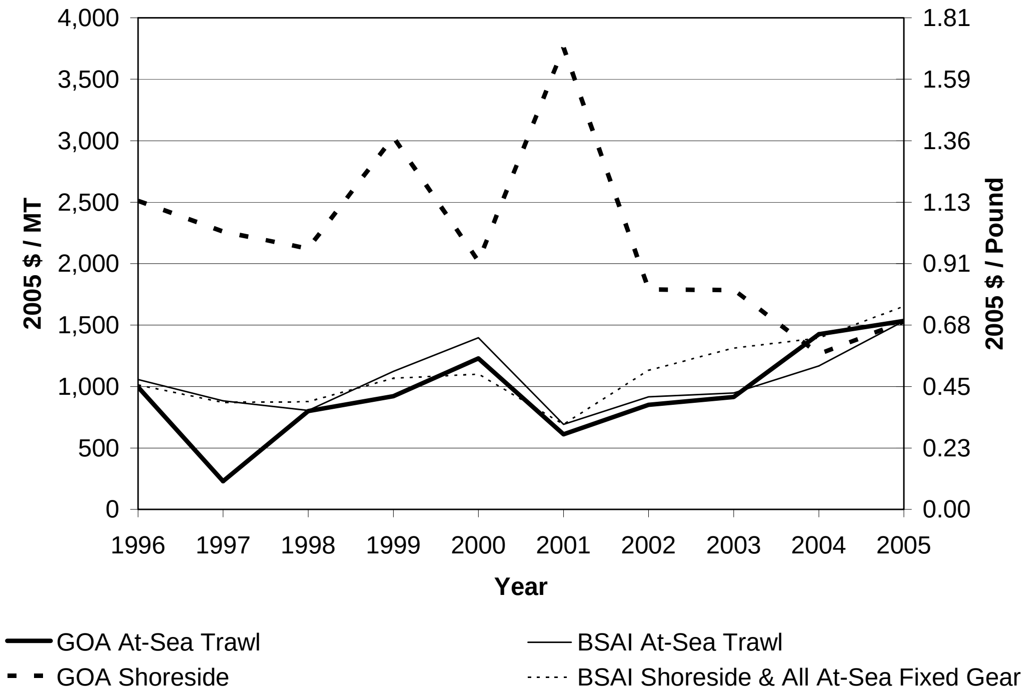
Figure 72. Wholesale Value of Alaska Primary Production of Arrowtooth Flounder by Sector, 1996-2005



Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Alaska Groundfish Market Profiles

Figure 73. Wholesale Prices for Alaska Primary Production of Arrowtooth Flounder by Sector, 1996-2005

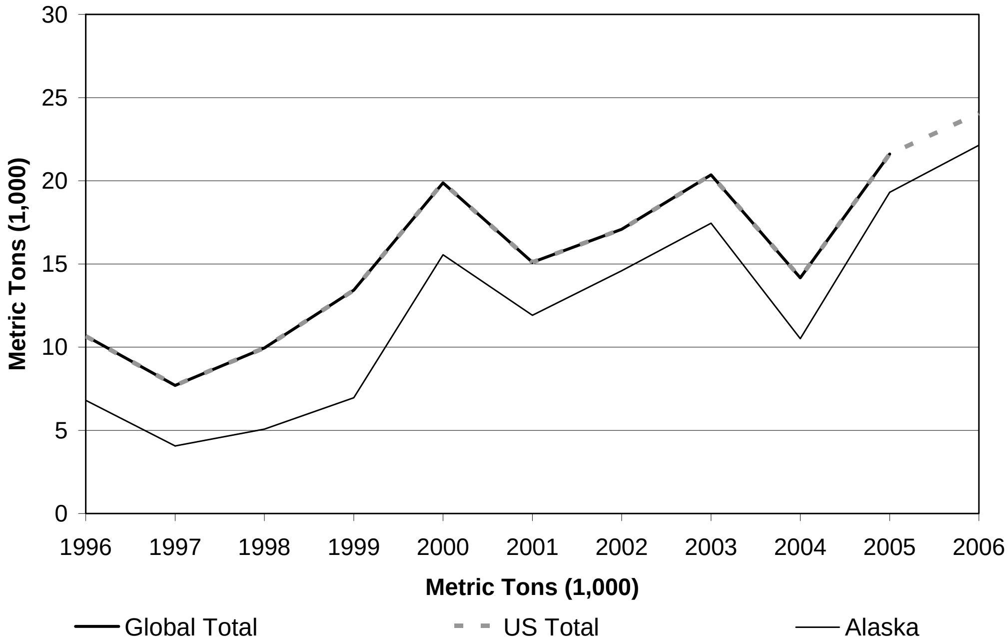


Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Production

Most of the total world catch of arrowtooth flounder comes from Alaska fisheries (Figure 74). Around 2,000-4,000 mt of arrowtooth flounder are annually harvested off the U.S. West Coast. In particular, it is an abundant and commercially important groundfish species off Washington; however, the catch is constrained by efforts to rebuild canary rockfish, an overfished species.

Figure 74. Alaska, Total U.S. and Global Production of Arrowtooth Flounder, 1996 – 2005



Note: The global harvest estimate may not be accurate because the fish landing statistics of some countries may not distinguish between arrowtooth flounder and other flatfish species. The global total in the figure is the higher of the FAO estimate or U.S. total.

Source: Alaska data from NMFS Blend and Catch Accounting System Data. Other U.S. data from PacFIN, available at http://www.psmfc.org/pacfin/pfmc.html. Global data from FAO, “FishStat” database available at http://www.fao.org/fi/website/FIRetrieveAction.do?dom=topic&fid=16073.

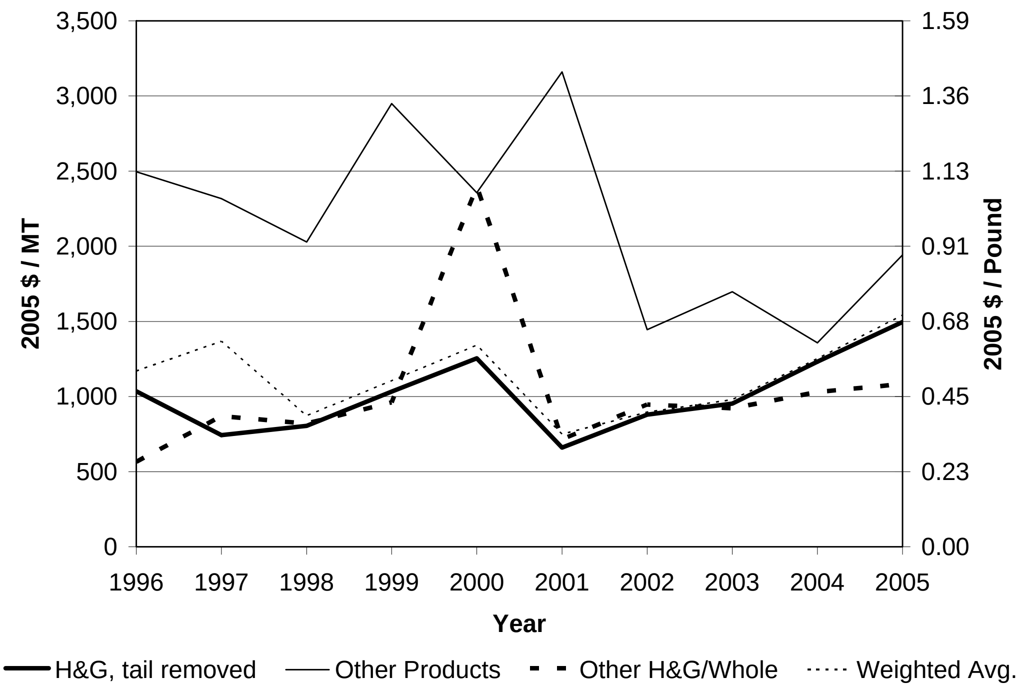
Product Composition and Flow

Arrowtooth flounder muscle rapidly degrades at cooking temperature resulting in a paste-like texture of the cooked product. This severe textural breakdown frustrated efforts to develop a market for this fish. Harvested arrowtooth flounder were either sent to a meal plant or discarded. Recently, several food grade additives have been successfully used that inhibit the enzymatic breakdown of the muscle tissue. These discoveries have enabled a targeted fishery in the Kodiak Island area for marketable products, including whole fish, surimi, headed and gutted (both with and without the tail on), fillets, frills (fleshy fins used for sashimi and soup stock), bait, and meal (NMFS 2007).

Most arrowtooth flounder are processed as headed and gutted (H&G) (Figure 76). NMFS trade records do not report U.S. exports of arrowtooth flounder. However, industry representatives indicate that all of the H&G fish are sent to China for re-processing. The primary product for arrowtooth flounder is the frill, which is the fleshy fins used for *engawa*, a type of sushi (NMFS 2007). *Engawa*, normally a premium sushi made from halibut or Greenland turbot, is more affordable using arrowtooth flounder. Unlike most other flatfish, the frill of the arrowtooth flounder is sufficiently sized to cover the rice on sushi, which is critical in sushi markets. The primary market for arrowtooth flounder *engawa* is Japan.

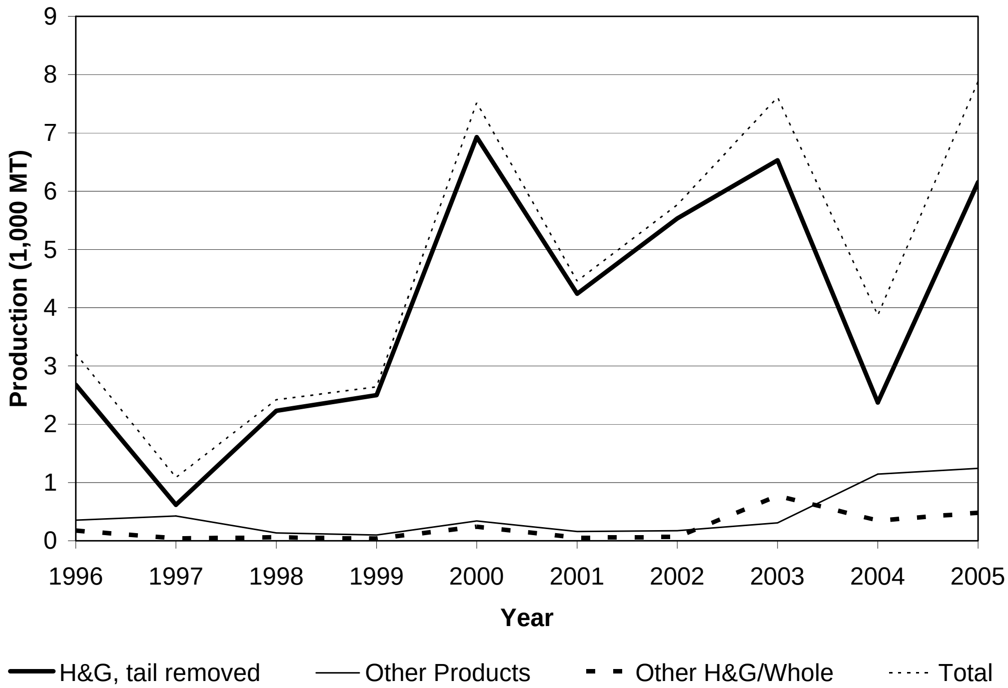
A secondary product for arrowtooth flounder is fillets (NMFS 2007). A large portion of the arrowtooth flounder exported to China are processed into fillets and re-imported to U.S. markets as inexpensive flounder. Some arrowtooth flounder processed in Japan is also sold as fillets in the Japanese market. Recently, some arrowtooth flounder fillets have shown up in European markets.

Figure 75. Wholesale Prices for Alaska Primary Production of Arrowtooth Flounder by Product Type, 1996 - 2005



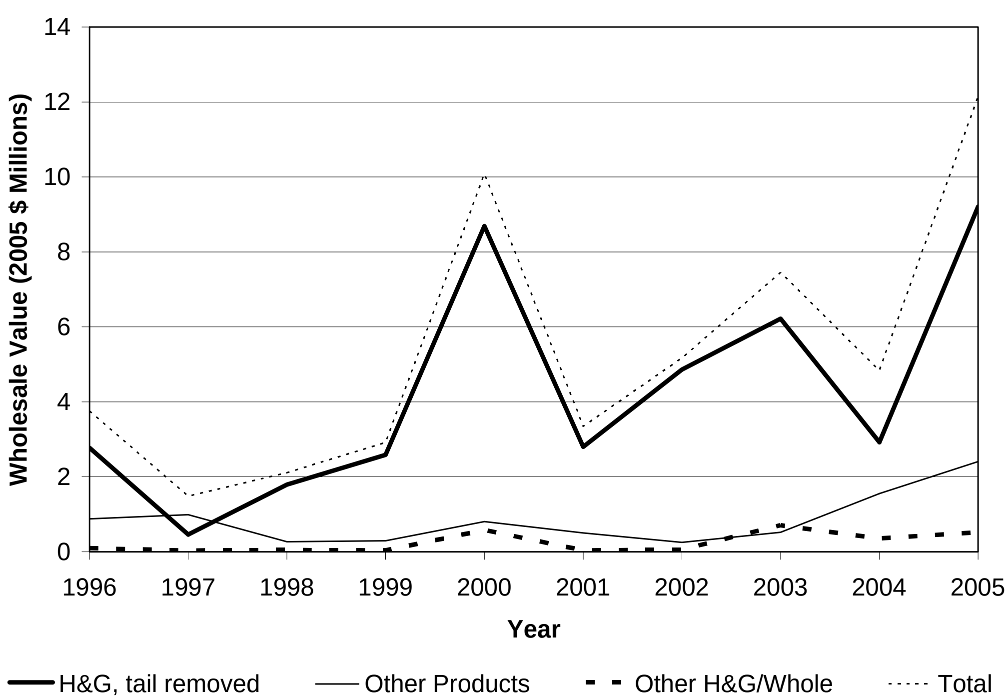
Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 76. Alaska Primary Production of Arrowtooth Flounder by Product Type, 1996 - 2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Figure 77. Wholesale Value of Alaska Primary Production of Arrowtooth Flounder by Product Type, 1996 – 2005



Note: Product types may include several more specific products.
Source: NMFS Weekly Product Reports and ADF&G Commercial Operator Annual Reports 1996-2005

Market Position

Since 1997, markets for arrowtooth flounder have been developed, although prices for this fish fluctuate widely (NMFS 2007). The absence of trade data for this species precludes forecasting export quantities and prices.

A major hurdle in marketing arrowtooth flounder is its name. The fish was long associated with soft flesh that was unpalatable to many consumers. Different methods of processing have converted the fish into more marketable forms. However, there is a lingering stigma about the quality of the fish, and a name change, the use of a regionally recognized name and selling directly to secondary processors have all been tried as solutions to the problem. For example, to make it more marketable, arrowtooth is usually sold on the West Coast as turbot, although it is not related to the true turbot (*Psetta maxima*), a highly-valued fish caught off Europe.

The population of arrowtooth flounder in Alaska waters has increased substantially since the late 1970s, possibly due to warm ocean conditions caused by global warming (Kruse 2007), and efforts are being made to develop new marketable products from this abundant species. For example, researchers at the University of Alaska-Fairbanks have found that soluble and insoluble protein powder from arrowtooth flounder has desirable essential amino acid and mineral contents and functional properties that make it suitable as a nutrition supplement and emulsifier (Sathivel et al. 2004). Attempts have also been made to expand production levels of surimi from arrowtooth flounder (Wu et al. 1996); however, with the increasing number of fish species available for surimi production, the economic feasibility for large-scale commercial production of arrowtooth surimi is doubtful.

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Appendix A: Alaska Groundfish Export Market Forecast Methodology and Details

Introduction

Export market forecasts for selected Alaska groundfish products were developed by Dr. James L. Anderson of J.L. Anderson Associates.[8]

The following is a formal explanation of the underlining features of technical model used in forecasting groundfish export quantities and prices. The raw data set included monthly groundfish export quantities and prices from January 1990 to May 2007. The approach used is based on Gu and Anderson (1995).

Several of the forecasts are included in the sections above. Additional summaries of the data and forecasts follow the discussion of the methodology.

The Model

The model explanation is largely excerpted from Gu and Anderson (1995). The multivariate, state-space innovations model (Aoki, 1987) used is of the form:

$$x_{t+1} = Ax_t + Be_t$$
$$w_t = Cx_t + e_t, \tag{1}$$

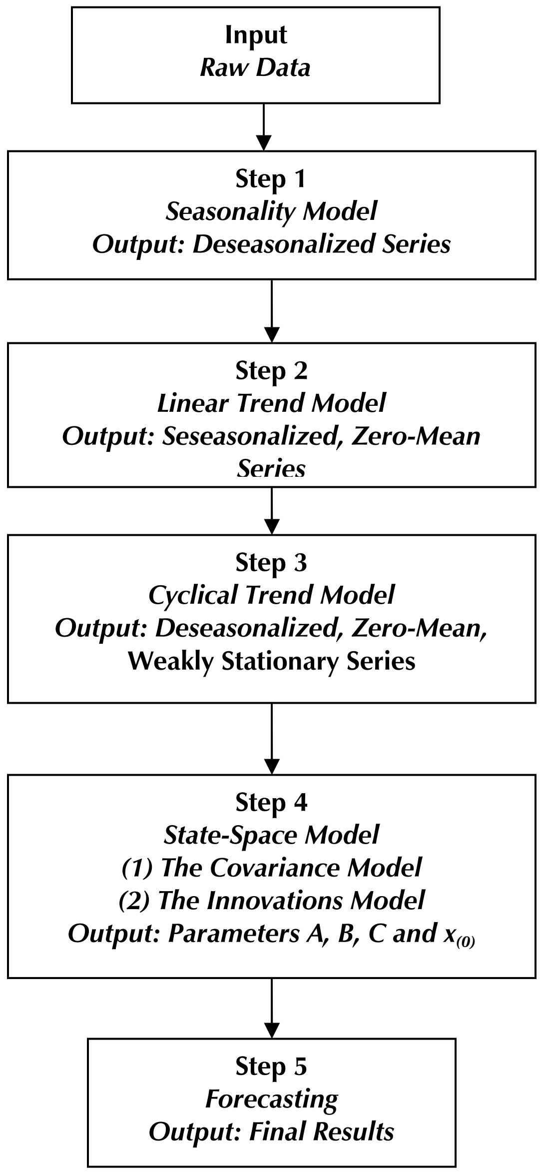
where x_t is the unobservable state vector, input, e_t, is the white noise and w_t is a zero-mean, weakly stationary, stochastic process (a system that generates the observed time series). Matrices A, B, C and the initial state vector, x_0, are parameters of the system which can be estimated directly from the raw data by a two-step procedure. The raw data set included monthly groundfish export quantities and prices from 1990 to May 2007. However, generally only the past 120 months of data were used in estimating the models. The two-step procedure involves: (1) obtaining a model that estimates the covariance sequence of the process (i.e., $E[w_{t+j}\, w_t']$, where t is the time index, j = ± 1,2, …), and (2) deriving the innovations model from the covariance model parameters (for derivations see Vukina, 1991 and Flint, *et al*., 1994). The covariance model is further specified by two parameters: the number of lags (j) and the number of the states (n). The number of lags provides a "window," outside of which the covariances between the data at time t = k and the data at time t> [k + j] are assumed to be insignificant. The number of lags was set at 25, which should be more than enough under most conditions. The number of states, which is determined by the singular value decomposition (SVD) method (Strang, 1988), indicates the number of linearly independent random variables that generate the process (analogous to bases in a vector space).

The state-space modeling approach assumes that the input to the model is stationary (or time-invariant), since parameters A, B and C are not a function of time. However, this condition can rarely be met in practice. The deterministic component of an economic time series may consist of linear,

[8] Dr. Anderson is also a professor and chair of the Department of Environmental and Natural Resource Economics at the University of Rhode Island, and is the editor of Marine Resource Economics and SeafoodReport.com.

cyclical, seasonal and possibly other exogenous factors. In this example, a linear model is applied to estimate the seasonal effect from the raw data. The deseasonalized time series is further detrended via an approach used by Vukina and Anderson (1994), in which the linear and cyclical components are removed from the time series before state-space modeling. This modeling approach is schematically represented in Figure A 1.

Figure A 1. Deseasonalized State-Space Forecasting Model Procedures



The procedure is illustrated (in the univariate case for simplicity) by the following steps:

(1) The seasonality is modeled by the ordinary least squared (OLS) regression:

$$yt = \alpha_0 + \sum_{j=1}^{11} \alpha_j D_j + \in_t$$

$$Dj = \{1, \text{ if during month } j, 0, \text{ otherwise} \qquad (2)$$

$$\forall t = 1, \ldots, T,\ j = 1, \ldots, 11,$$

where y_t is the raw data, α_0 is the intercept and α_j is the coefficient for the monthly dummy variable, D_j. The residual, $\in_t$, is the raw data with seasonality removed, t is the time index, T is the number of observations and j is the index for month (1 for January, 2 for February, etc.).

(2) The output of (2), $\in_t$, is used as input to a linear trend model:

$$\in_t = \beta_0 + \beta_1 t + \gamma_t, \qquad (3)$$

where β_0 is the intercept, and β_1 is the coefficient for the time index, t. The output, γ_t, becomes the deseasonalized, zero-mean series.

(3) Using the output from (3) as input, the remaining cyclical component is modeled as:

$$\gamma_t = C^* A^{*t-1} B^* + \eta_t, \qquad t \geq 1, \qquad (4)$$

where $C^* A^{*t-1} B^*$ represents the cyclical component of the input, γ_t, which can be estimated from γ_t by a combination of the singular value decomposition (SVD) and least squared methods (similar to the method used to obtain parameters in (1)). For detailed discussion regarding the theoretical basis upon which the cyclical model of time series is constructed, see Vukina and Anderson (1994). By rearranging terms, (4) becomes:

$$\eta_t = \gamma_t - (C^* A^{*t-1} B^*)$$

$$= \in_t - (\beta_0 + \beta_1 t) - (C^* A^{*t-1} B^*) \qquad (5)$$

$$= y_t - (\alpha_0 + \sum_{j=1}^{11} a_j D_j) - (\beta_0 + \beta_1 t) - (C^* A^{*t-1} B^*),$$

where output, η_t, becomes deseasonalized, zero-mean and weakly stationary (constant mean and variance), and γ_t is the raw data. All variables and parameters are defined in equations (2) through (4).

(4) using η_t from (5) as input, the state-space innovations model (1) parameters A, B, C and the initial state vector, x_0, can now be estimated.

(5) Out-of-sample forecast can then be generated using the formula:

$$\hat{y}_{T+k+1} = \hat{C}\hat{A}^k \hat{x}_{T+1} + (\hat{\alpha}_0 + \sum_{j=1}^{11} \hat{a}_1 D_j) + (\hat{\beta}_0 + \hat{\beta}_1 (T + k + 1)) + (\hat{C}^* \hat{A}^{*T+k} \hat{B}^*), \qquad (6)$$

where $\hat{y}_{T+k+1}$ is the out-of sample prediction, $\hat{x}_{T+1}$ is the last updated state vector calculated in (6), T is the number of observations and k represents the prediction steps (k = 0,1,2 …). The parameters for deterministic components (α's, β's and matrices, C^*, A^*, B^*) are estimated by equations (2) through (4).

As a caveat, it should be noted that these models tends to over estimate export quantities during periods of season closures. Therefore, in forecasts where exports during such periods some forecasts are subjectively adjusted. For example, with pollock the distinct A and B seasons create periods of virtually zero exports. The model tends to overestimate exports during those closed periods. Therefore the model forecasts of pollock volumes when the forecast should have been close to zero have been adjusted to reflect the closed seasons. Similarly rock sole forecast volumes were adjusted.

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List of Forecast Details

The following pages contain details of the Alaska Groundfish Export Market Forecasts as indicated in the list below. The first part of each forecast set provides a summary of all exports. Where applicable these are followed by forecasts for top importing companies. It should be noted that U.S. export data do not specifically identify exports of arrowtooth flounder, and therefore no forecasts of arrowtooth exports are included.

1) Alaska Pollock Fillet Export Forecasts
2) Alaska Pollock Surimi Export Forecasts
3) Alaska Pollock Roe Export Forecasts
4) West Coast Cod Fillet Export Forecasts
5) West Coast Cod Frozen (Except Fillets) Export Forecasts
6) Sablefish Frozen Export Forecasts
7) Rock Sole Frozen Export Forecasts
8) Yellowfin Sole Frozen Export Forecasts

U.S. Exports

Alaska Pollock

SMA Export Code

304207000

Frozen - Fillet

EX 10321

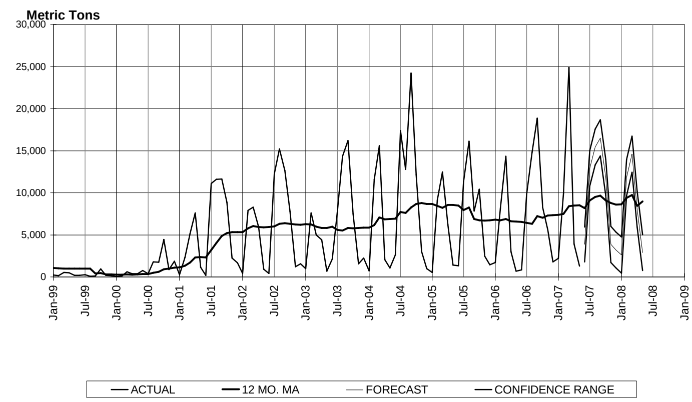
HIGHLIGHTS

- 2007 quantity is forecasted to be 28% HIGHER, & unit value is forecasted to be 4% HIGHER compared to 2006.
- 2007 year to date quantity is 51.5% HIGHER, and total value is 61.3% HIGHER compared to 2006.
- 2007 year to date exports to FR GERM are 35.2% HIGHER, and total value is 53.7% HIGHER compared to 2006.

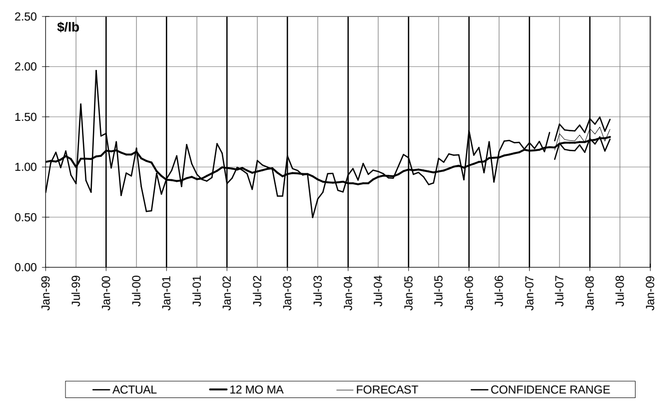
				ACTUAL	QUARTERLY FORECAST								ANNUAL	
	MAR 2007	APR 2007	MAY 2007	2007 1st QTR	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	Full Year 2007	07 vs. 06
Quantity (MT)	24,901	3,907	1,309	37,020	9,080		44,870		18,870		29,000		109,800	
% Chg Prev Yr	73.6%	30.6%	89.9%	53%	100%		3%		21%		-22%		28%	
12 Month MA*	8,388	8,464	8,515	23,260	25,140		28,250		26,460		27,790		103,100	
Value ($/LB)	$1.25	$1.15	$1.34	$1.23	$1.19		$1.29		$1.27		$1.37		$1.26	
% Chg Prev Yr	5.2%	22.3%	7.3%	5%	22%		4%		3%		11%		4%	
12 Month MA*	$1.17	$1.19	$1.20	$1.17	$1.19		$1.24		$1.25		$1.27		$1.21	
Rel Strength**	0.83	0.84	0.83	0.83	0.83		0.86		0.86		0.91		0.85	

* 12 Month Moving Average
** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

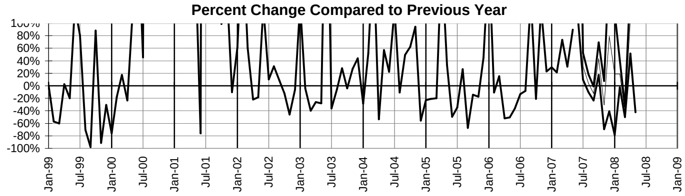
Quantity



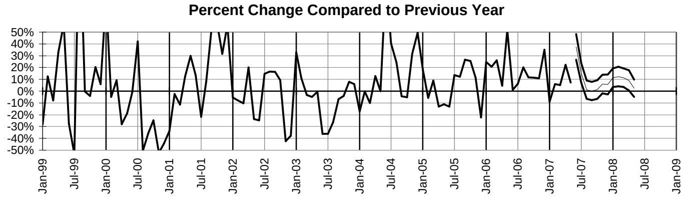
Unit Value



Percent Change Compared to Previous Year

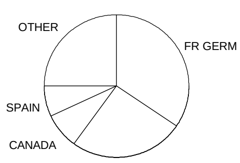


Percent Change Compared to Previous Year



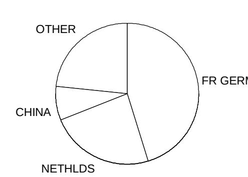
	May-07				2007 Year to Date						2006 Total			
Export Destination	Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
FR GERM	449,507	34.3%	293.6%	$1.69	19,079,714	45.2%	35.2%	$57,445	53.7%	$1.37	44,220,943	50.3%	$126,840	$1.30
MALAYSA	337,099	25.8%	>1000%	$0.92	1,486,236	3.5%	66.5%	$2,550	88.4%	$0.78	1,457,190	1.7%	$2,225	$0.69
CANADA	105,934	8.1%	-61.8%	$1.51	285,388	0.7%	-47.9%	$972	-42.9%	$1.55	978,572	1.1%	$2,982	$1.38
SPAIN	87,423	6.7%	307.9%	$1.66	319,050	0.8%	-23.6%	$831	12.3%	$1.18	1,120,032	1.3%	$1,957	$0.79
TAIWAN	64,663	4.9%	-5.9%	$1.20	332,389	0.8%	75.3%	$665	120.1%	$0.91	487,704	0.6%	$783	$0.73
PORTUGL	63,040	4.8%	NA	$1.50	1,468,455	3.5%	596.7%	$3,308	755.2%	$1.02	425,823	0.5%	$820	$0.87
CHINA	45,594	3.5%	-59.5%	$1.20	3,275,335	7.8%	594.7%	$7,841	608.6%	$1.09	1,997,237	2.3%	$4,506	$1.02
AUSTRAL	45,352	3.5%	NA	$0.69	159,862	0.4%	NA	$246	NA	$0.70	251,424	0.3%	$430	$0.78
KOR REP	44,671	3.4%	95.1%	$0.90	1,475,883	3.5%	787.3%	$4,001	>1000%	$1.23	1,158,596	1.3%	$2,621	$1.03
OTHER	65,692	5.0%	33.0%	$1.29	14,354,214	34.0%	32.0%	$36,724	32.5%	$1.16	35,737,317	40.7%	$90,648	$1.15
TOTAL	1,308,975	100.0%	89.9%	$1.34	42,236,526	100.0%	51.5%	$114,584	61.3%	$1.23	87,834,838	100.0%	$233,812	$1.21

Export Destination Quantity (May 2007)



	2007 Year to Date					
Export District	Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
ALASKA	38,582,011	91.3%	43.8%	$102,993	50.4%	$1.21
SEATTLE	3,199,242	7.6%	547.7%	$10,261	988.9%	$1.45
NY CITY	321,061	0.8%	NA	$1,081	>1000%	$1.53
TAMPA	43,023	0.1%	>1000%	$60	>1000%	$0.63
BOSTON	42,855	0.1%	-90.7%	$59	-95.9%	$0.62
OTHER	48,334	0.1%	-55.3%	$130	-39.7%	$1.22
TOTAL	42,236,526	100.0%	51.5%	$114,584	61.3%	$1.23

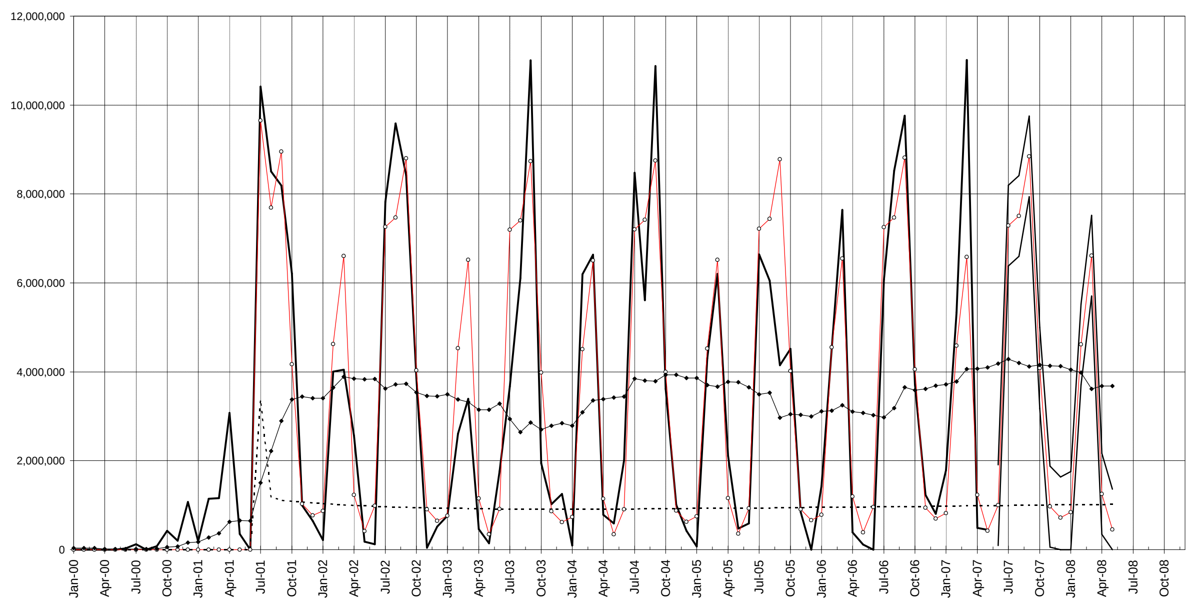
Export Destination Quantity (Year to Date 2007)

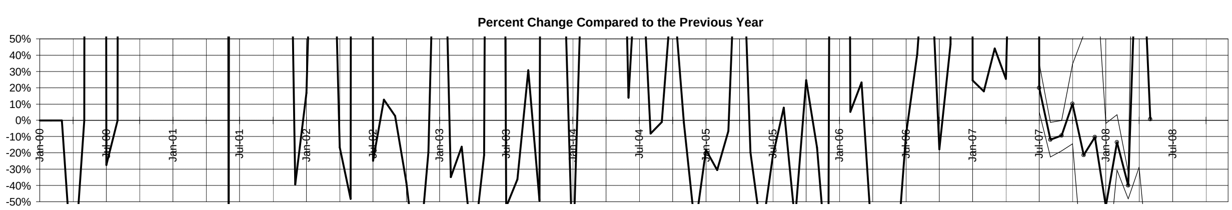


PLK112: Alaska Pollock, Frozen Fillet - Export Qty (KG), Germany

PLK112	ACTUAL FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	44,220,943		19,079,714		11,016,490		487,526		449,507	
% Change from Previous Year	23%		35%		44%		25%		294%	
12 Month Moving Average	3,282,661		3,945,790		4,062,860		4,071,101		4,099,044	
3 Month Moving Average	3,629,372		3,913,178		6,047,560		5,614,336		3,984,508	

PLK112	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	Annual FULL YEAR 2007 2007	07 vs. 06
Value	1,936,640		23,637,167		5,779,607		12,073,551		49,496,095	
% Change from Previous Year	285%		-3%		0%		-33%		12%	
12 Month Moving Average	4,117,497		4,201,554		4,136,560		3,883,685		4,077,137	
3 Month Moving Average	3,414,797		5,352,062		4,457,030		2,310,852		4,136,560	





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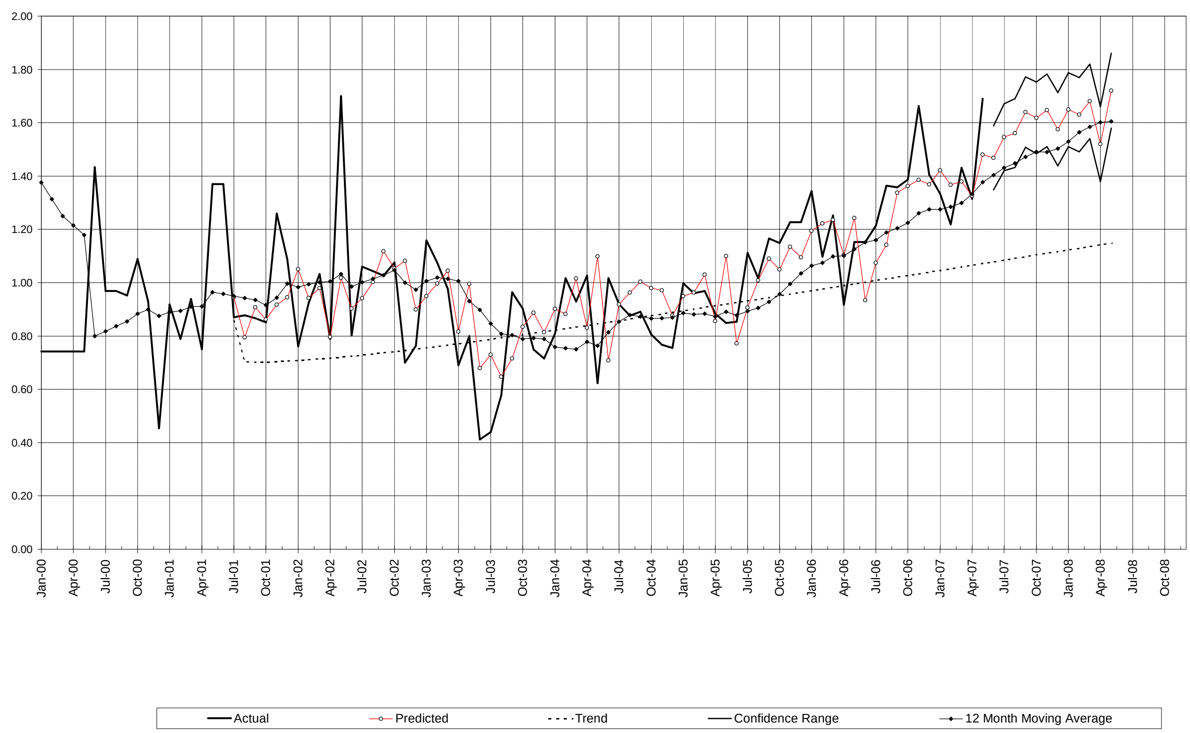
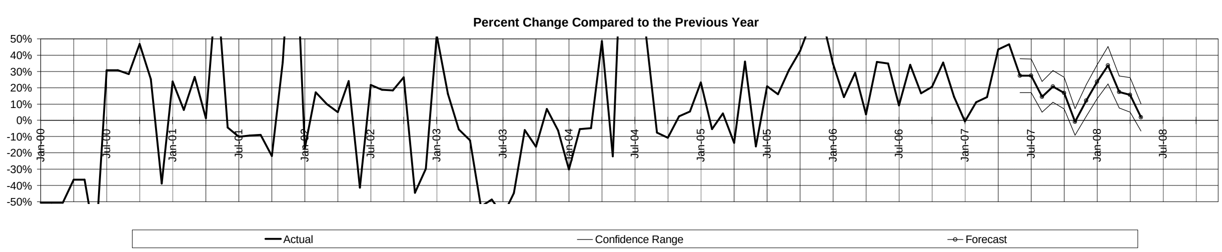
PLK114: Alaska Pollock, Frozen Fillet - Export Price ($/LB), Germany

PLK114	ACTUAL									
	FULL YEAR		2007		MAR		APR		MAY	
	2006	06 vs. 05	Yr-to-Date	07 vs. 06	2007	07 vs. 06	2007	07 vs. 06	2007	07 vs. 06
Value	1.28		1.40		1.43		1.31		1.69	
% Change from Previous Year	23%		21%		14%		43%		47%	
12 Month Moving Average	1.16		1.31		1.30		1.33		1.38	
3 Month Moving Average	1.25		1.38		1.33		1.32		1.48	

PLK114	QUARTERLY FORECAST								Annual	
	2007		2007		2007		2008		FULL YEAR 2007	
	2nd QTR	07 vs. 06	3rd QTR	07 vs. 06	4th QTR	07 vs. 06	1st QTR	08 vs. 07	2007	07 vs. 06
Value	1.49		1.58		1.61		1.65		1.50	
% Change from Previous Year	39%		21%		9%		25%		18%	
12 Month Moving Average	1.37		1.45		1.49		1.56		1.40	
3 Month Moving Average	1.43		1.56		1.62		1.63		1.49	





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U.S. Exports

Alaska Pollock Surimi

SMA Export Code

304901003 **Frozen (Prior to 1995 Includes all Frozen Surimi)** **EX 19030**

HIGHLIGHTS

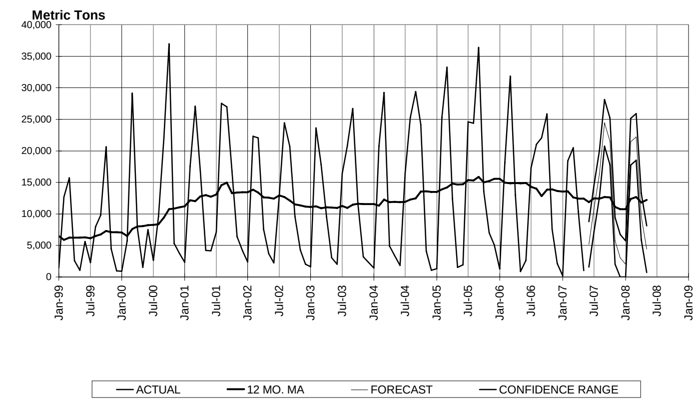
- 2007 quantity is forecasted to be 15% LOWER, & unit value is forecasted to be 7% LOWER compared to 2006.
- 2007 year to date quantity is 22.5% LOWER, and total value is 26.8% LOWER compared to 2006.
- 2007 year to date exports to JAPAN are 28.3% LOWER, and total value is 31.6% LOWER compared to 2006.

	MAR 2007	APR 2007	MAY 2007	ACTUAL 2007 1st QTR	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	ANNUAL Full Year 2007	07 vs. 06
Quantity (MT)	20,465	10,347	995	39,090	16,500		51,610		30,260		45,680		137,500	
% Chg Prev Yr	-35.7%	-20.4%	14.2%	-24%	0%		-14%		-15%		17%		-15%	
12 Month MA*	12,622	12,401	12,411	39,740	36,670		37,570		34,450		35,750		148,400	
Value ($/LB)	$0.90	$0.90	$0.82	$0.91	$0.86		$0.83		$0.81		$0.86		$0.85	
% Chg Prev Yr	-7.6%	1.8%	-20.2%	-7%	-3%		-11%		-1%		-6%		-7%	
12 Month MA*	$0.91	$0.91	$0.89	$0.91	$0.89		$0.87		$0.85		$0.84		$0.88	
Rel Strength**	0.65	0.64	0.62	0.66	0.63		0.60		0.59		0.60		0.62	

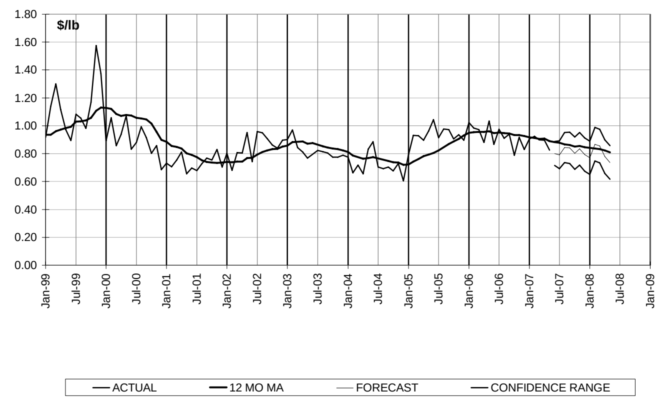
* 12 Month Moving Average

** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

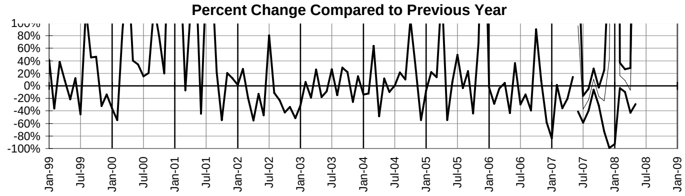
Quantity



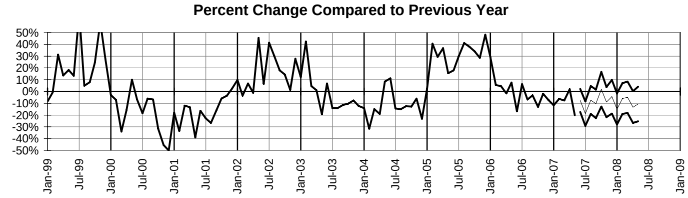
Unit Value



Percent Change Compared to Previous Year

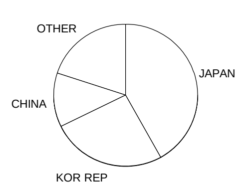


Percent Change Compared to Previous Year



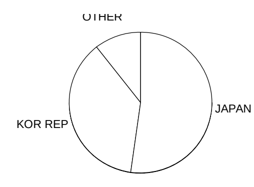
Export Destination	May-07 Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	2006 Total Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
JAPAN	417,860	42.0%	-5.4%	$0.83	26,329,375	52.2%	-28.3%	$51,331	-31.6%	$0.88	83,591,758	51.1%	$171,737	$0.93
KOR REP	255,400	25.7%	83.6%	$0.81	18,756,549	37.2%	-10.4%	$39,926	-14.4%	$0.97	57,864,324	35.4%	$115,482	$0.91
CHINA	123,000	12.4%	25.6%	$0.79	591,515	1.2%	2.5%	$1,063	-4.9%	$0.82	1,701,484	1.0%	$3,174	$0.85
NETHLDS	46,000	4.6%	NA	$0.95	46,000	0.1%	-95.1%	$97	-95.6%	$0.95	5,478,241	3.3%	$10,700	$0.89
MALAYSA	45,804	4.6%	NA	$0.70	45,804	0.1%	NA	$71	NA	$0.70	21,554	0.0%	$33	$0.70
AUSTRAL	43,620	4.4%	NA	$0.95	43,620	0.1%	-69.2%	$92	-80.4%	$0.95	237,435	0.1%	$669	$1.28
TAIWAN	41,760	4.2%	-74.0%	$0.90	315,860	0.6%	-28.6%	$624	-36.5%	$0.90	1,331,422	0.8%	$2,699	$0.92
SPAIN	21,600	2.2%	NA	$0.77	694,180	1.4%	-61.8%	$1,479	-61.4%	$0.97	2,119,603	1.3%	$4,445	$0.95
FR GERM	NA	NA	NA	NA	883,700	1.8%	-22.9%	$1,212	-54.2%	$0.62	4,803,748	2.9%	$10,256	$0.97
OTHER	NA	NA	-100.0%	NA	2,729,020	5.4%	NA	$4,837	1.7%	$0.80	6,462,043	3.9%	$12,584	$0.88
TOTAL	995,044	100.0%	14.2%	$0.82	50,435,623	100.0%	-22.5%	$100,731	-26.8%	$0.91	163,611,612	100.0%	$331,780	$0.92

Export Destination Quantity (May 2007)



Export District	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
ALASKA	44,971,020	89.2%	-22.7%	$88,759	-27.7%	$0.90
SEATTLE	5,459,780	10.8%	-19.3%	$11,962	-17.4%	$0.99
MIAMI	4,823	0.0%	-83.7%	$11	-88.1%	$1.04
ARB DST	NA	NA	NA	NA	NA	NA
BOSTON	NA	NA	NA	NA	>1000%	NA
OTHER	NA	NA	-100.0%	NA	-100.0%	NA
TOTAL	50,435,623	100.0%	-22.5%	$100,731	-26.8%	$0.91

Export Destination Quantity (Year to Date 2007)



U.S. Exports

Alaska Pollock Roe

SMA Export Code

303804050 **Frozen** **EX 8080**

HIGHLIGHTS

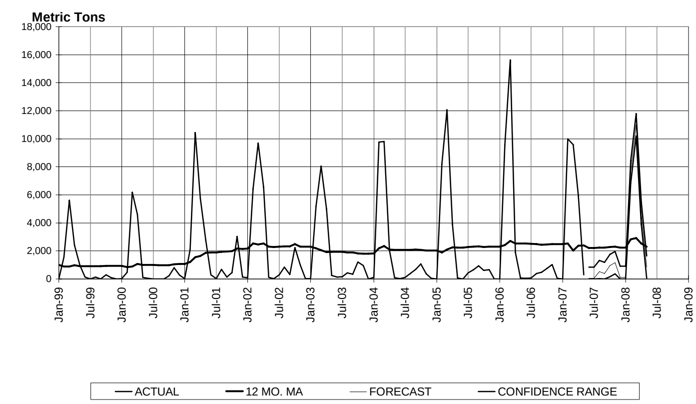
- 2007 quantity is forecasted to be 3% LOWER, & unit value is forecasted to be 13% LOWER compared to 2006.
- 2007 year to date quantity is 4.8% LOWER, and total value is 17.8% LOWER compared to 2006.
- 2007 year to date exports to JAPAN are 4.1% LOWER, and total value is 10.4% LOWER compared to 2006.

	MAR 2007	APR 2007	MAY 2007	ACTUAL 2007 1st QTR	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	ANNUAL Full Year 2007	07 vs. 06
Quantity (MT)	9,579	5,957	287	19,570	6,290		960		2,250		18,760		29,100	
% Chg Prev Yr	-38.7%	215.1%	351.5%	-22%	214%		3%		24%		-4%		-3%	
12 Month MA*	2,027	2,366	2,385	7,050	6,960		6,690		6,830		7,990		27,500	
Value ($/LB)	$4.20	$4.22	$2.48	$4.24	$4.13		$3.70		$3.68		$5.14		$4.15	
% Chg Prev Yr	-12.5%	18.1%	-45.4%	-15%	14%		-1%		3%		21%		-13%	
12 Month MA*	$4.07	$4.12	$3.95	$4.13	$3.98		$3.80		$3.80		$3.88		$3.93	
Rel Strength**	2.93	2.93	2.75	2.98	2.79		2.63		2.64		2.78		2.76	

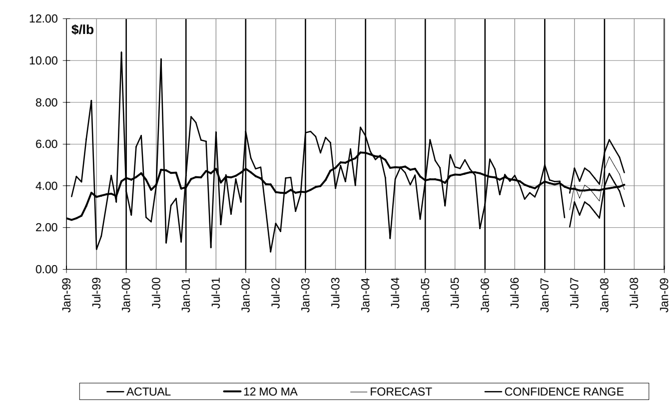
* 12 Month Moving Average

** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

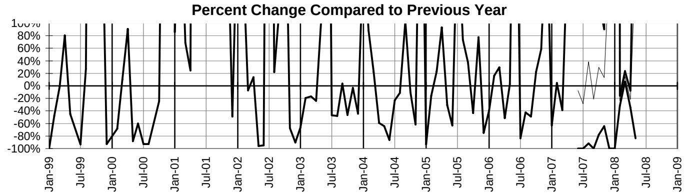
Quantity



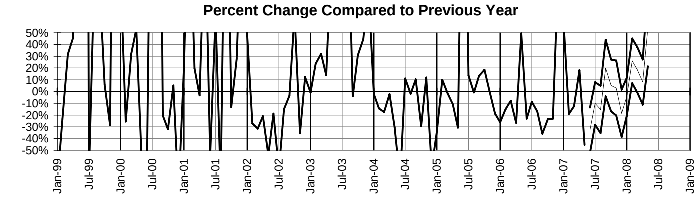
Unit Value



Percent Change Compared to Previous Year

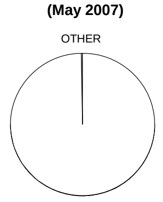


Percent Change Compared to Previous Year



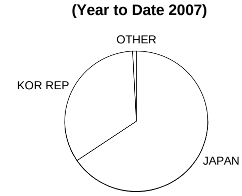
Export Destination	May-07 Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	2006 Total Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
JAPAN	285,621	99.7%	350.0%	$2.48	16,910,387	65.5%	-4.1%	$145,850	-10.4%	$3.91	18,582,532	62.1%	$170,645	$4.17
CHINA	969	0.3%	NA	$2.27	138,947	0.5%	188.8%	$1,222	542.9%	$3.99	70,120	0.2%	$243	$1.57
KOR REP	NA	NA	NA	NA	8,724,095	33.8%	-7.2%	$92,555	-28.0%	$4.81	11,222,767	37.5%	$142,940	$5.78
VIETNAM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43,436	0.1%	$383	$4.00
BAHAMAS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6,657	0.0%	$29	$1.97
SPAIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4,929	0.0%	$54	$5.00
BARBADO	NA	NA	NA	NA	8,015	0.0%	NA	$32	NA	$1.81	2,268	0.0%	$10	$1.99
MEXICO	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,434	0.0%	$16	$5.00
CAYMAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	725	0.0%	$3	$1.98
OTHER	NA	NA	NA	NA	36,312	0.1%	NA	$228	NA	$2.85	NA	NA	NA	NA
TOTAL	286,590	100.0%	351.5%	$2.48	25,817,756	100.0%	-4.8%	$239,886	-17.8%	$4.21	29,934,868	100.0%	$314,323	$4.76

Export Destination Quantity (May 2007)



Export District	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
ALASKA	23,484,621	91.0%	-7.8%	$218,380	-20.9%	$4.22
SEATTLE	2,325,120	9.0%	41.0%	$21,474	34.2%	$4.19
P. R.	8,015	0.0%	NA	$32	>1000%	$1.81
BALT.	NA	NA	NA	NA	>1000%	NA
BOSTON	NA	NA	NA	NA	>1000%	NA
OTHER	NA	NA	-100.0%	NA	-100.0%	NA
TOTAL	25,817,756	100.0%	-4.8%	$239,886	-17.8%	$4.21

Export Destination Quantity (Year to Date 2007)



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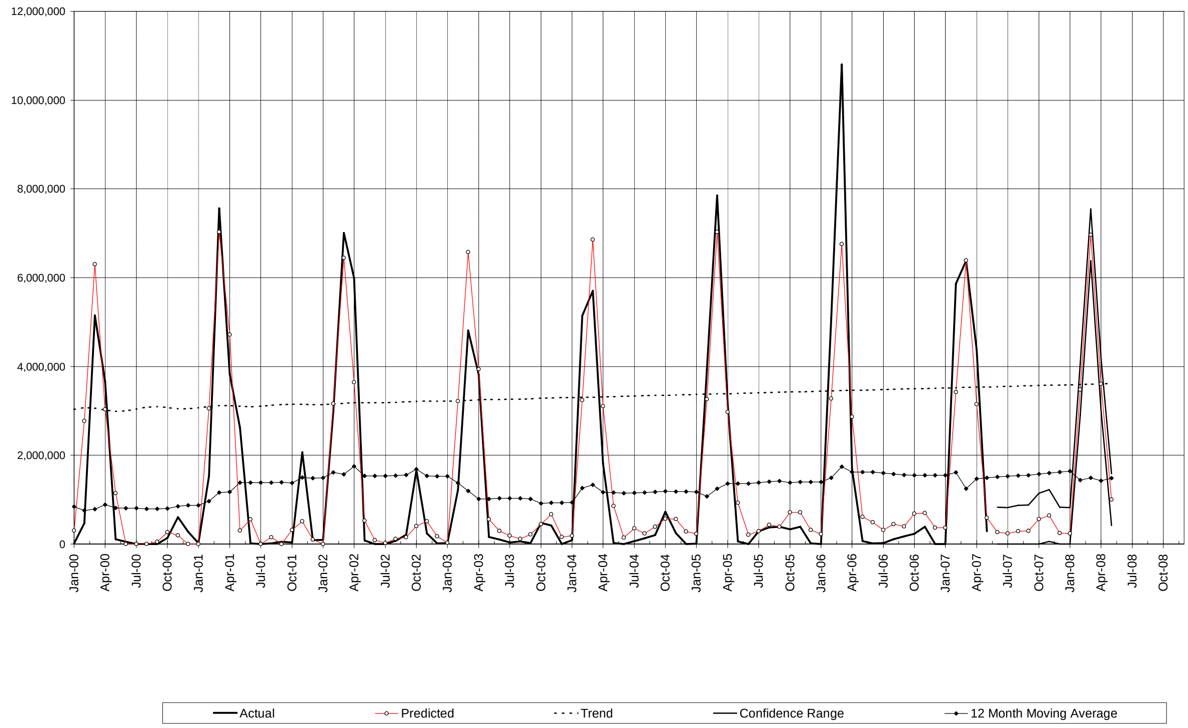
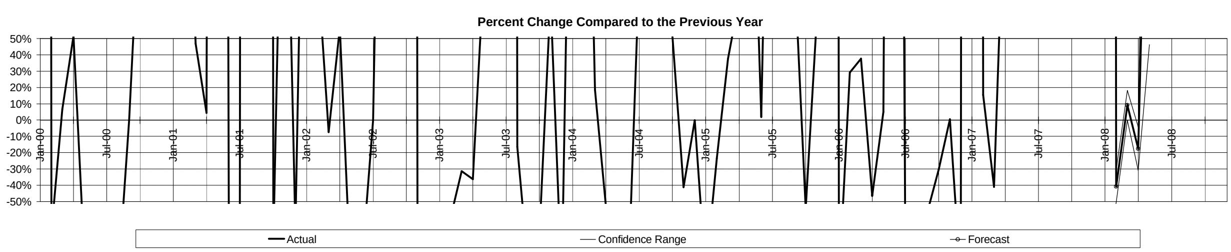
PLK103: Alaska Pollock Roe, Frozen - Export Qty (KG), Japan

PLK103	ACTUAL									
	FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	18,582,532		16,910,387		6,381,775		4,376,006		285,621	
% Change from Previous Year	11%		-4%		-41%		159%		350%	
12 Month Moving Average	1,572,420		1,473,081		1,245,642		1,469,306		1,487,818	
3 Month Moving Average	1,549,122		3,078,359		4,082,920		5,541,056		3,681,134	

PLK103	QUARTERLY FORECAST								Annual	
	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	FULL YEAR 2007 2007	07 vs. 06
Value	4,931,608		813,100		1,445,184		10,676,413		19,438,653	
% Change from Previous Year	179%		166%		132%		-13%		5%	
12 Month Moving Average	1,488,727		1,539,825		1,599,290		1,522,897		1,524,317	
3 Month Moving Average	3,622,020		266,041		452,564		1,750,964		1,599,290	





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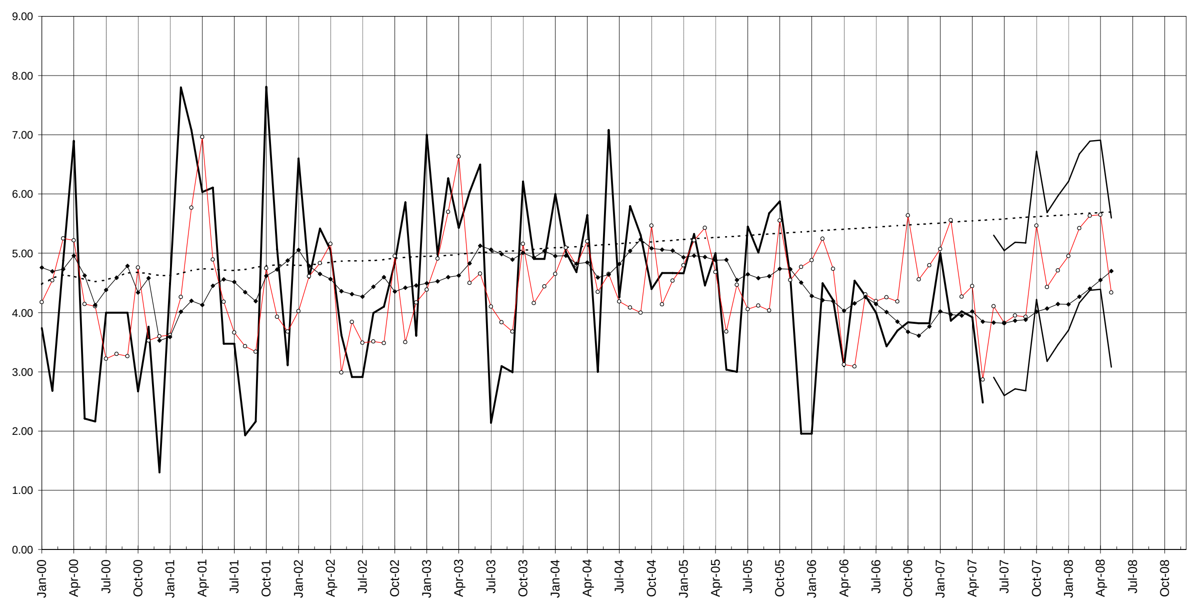
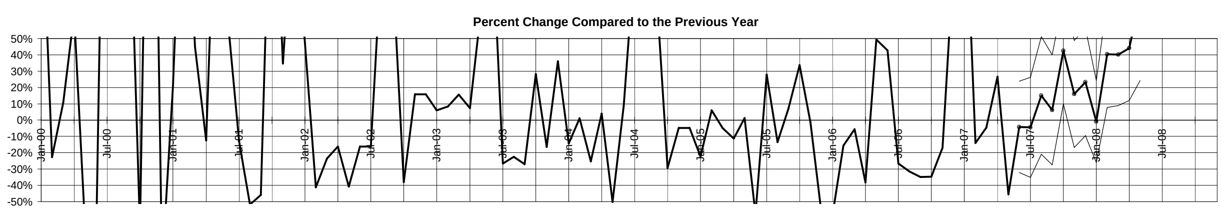
PLK105: Alaska Pollock Roe, Frozen - Export Price ($/LB), Japan

PLK105	ACTUAL									
	FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	3.77		3.86		4.02		3.92		2.48	
% Change from Previous Year	-16%		5%		-5%		27%		-45%	
12 Month Moving Average	4.01		3.96		3.95		4.02		3.85	
3 Month Moving Average	3.68		4.03		4.29		3.93		3.47	

PLK105	QUARTERLY FORECAST								Annual	
	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	FULL YEAR 2007	07 vs. 06
Value	3.50		3.90		4.87		5.34		4.14	
% Change from Previous Year	-12%		5%		27%		24%		10%	
12 Month Moving Average	3.90		3.85		4.07		4.27		3.95	
3 Month Moving Average	3.64		3.78		4.64		5.02		4.07	





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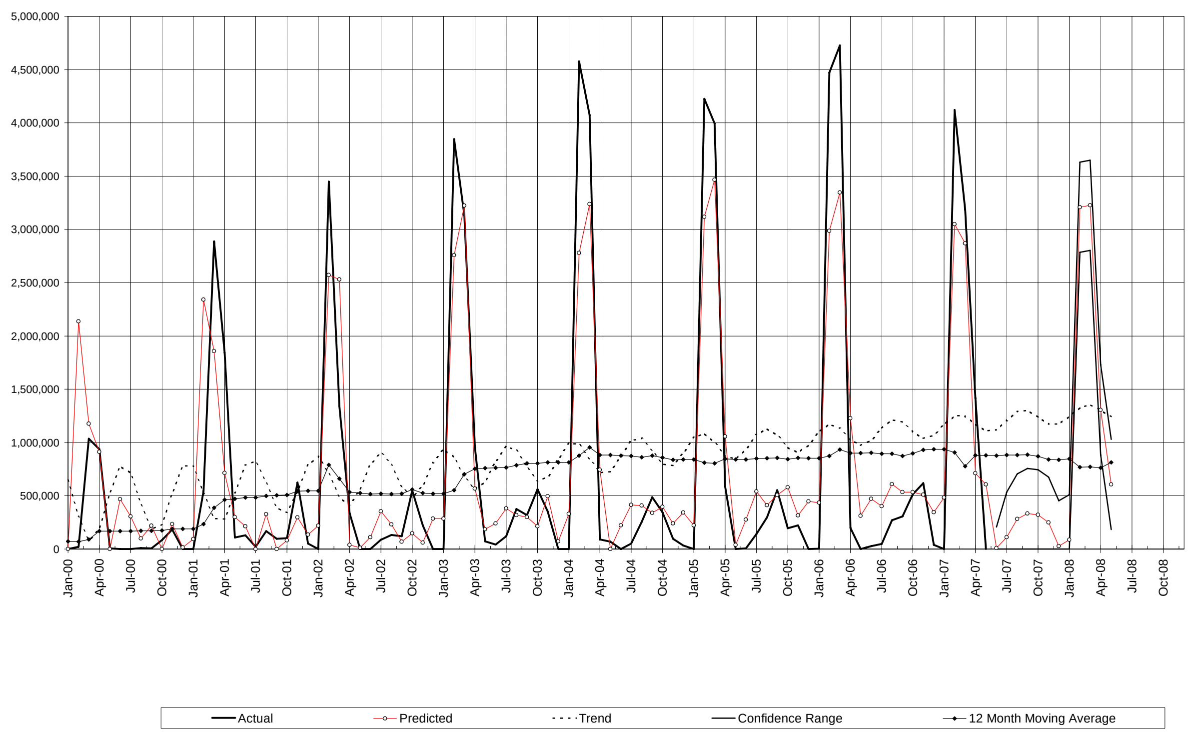
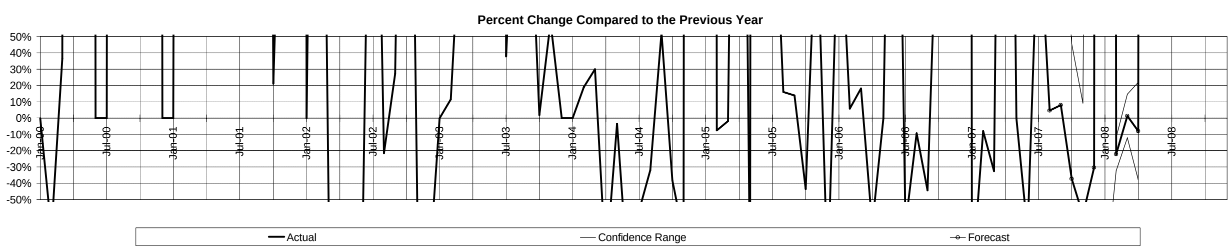
PLK106: Alaska Pollock Roe, Frozen - Export Qty (KG), Korea

PLK106	ACTUAL									
	FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	11,222,767		8,724,095		3,186,216		1,417,604		0	
% Change from Previous Year	10%		-7%		-33%		614%		0%	
12 Month Moving Average	899,098		875,212		777,395		878,982		878,982	
3 Month Moving Average	921,981		1,696,907		2,435,497		2,908,032		1,534,607	

PLK106	QUARTERLY FORECAST								Annual	
	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	FULL YEAR 2007	07 vs. 06
Value	1,426,113		723,459		599,629		6,522,822		10,055,693	
% Change from Previous Year	528%		16%		-49%		-11%		-10%	
12 Month Moving Average	878,428		883,819		848,869		795,751		870,953	
3 Month Moving Average	1,639,336		137,958		270,881		1,134,829		848,869	



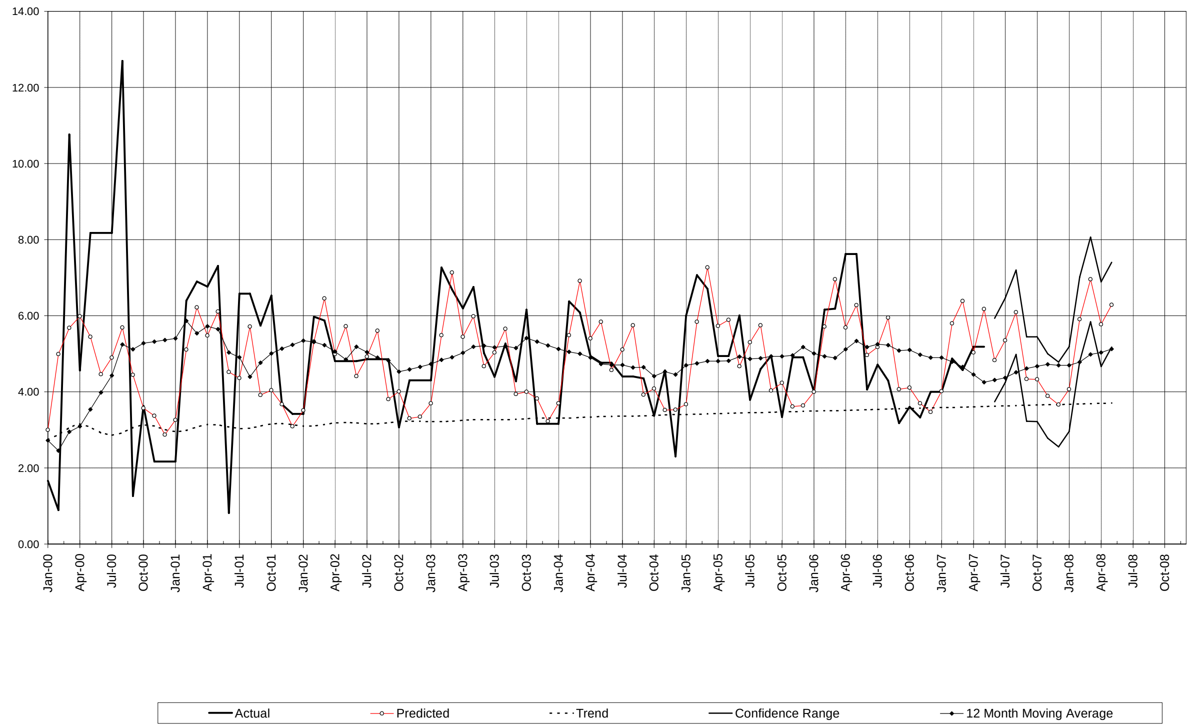


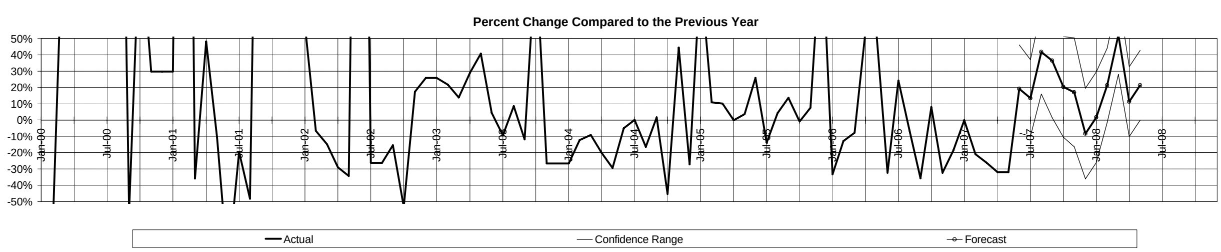
* The information contained herein is based upon proprietary research and statistical sources believed to be reliable. Data Sources: U.S. Bureau of Census, NMFS, Urner Barry, Tokyo Central Wholesale Market, Japanese Ministry of Agriculture, Forestry and Fishery, Japan Tariff Association, Central Bureau of Statistics, Norway, French Ministry of Agriculture, SNM, Rungis. Any statement non-factual in nature constitutes only current opinion, which is subject to change. Neither the information, nor any opinion expressed, should be construed to be an order to sell or to buy any seafood commodities. This report is made available on the condition that errors or omissions shall not be made the basis for any claims, demands, or cause of action. Forecasts presented should not be viewed as a guarantee of profits by the buying or selling of any commodity.

PLK108: Alaska Pollock Roe, Frozen - Export Price ($/LB), Korea

PLK108	FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
	ACTUAL									
Value	4.90		4.76		4.57		5.19		5.19	
% Change from Previous Year	-5%		-25%		-26%		-32%		-32%	
12 Month Moving Average	5.09		4.61		4.66		4.45		4.25	
3 Month Moving Average	4.99		4.48		4.48		4.88		4.98	

PLK108	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	Annual FULL YEAR 2007	07 vs. 06
	QUARTERLY FORECAST									
Value	5.07		5.26		3.96		5.64		4.69	
% Change from Previous Year	-21%		29%		9%		26%		-4%	
12 Month Moving Average	4.34		4.50		4.70		4.82		4.58	
3 Month Moving Average	4.98		5.27		4.36		4.69		4.70	





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U.S. Exports

Cod Fillet

SMA Export Code

304293025 **Frozen** **EX 10086**

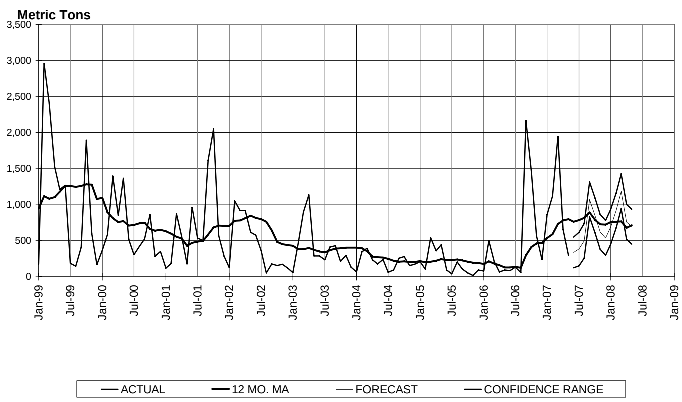
HIGHLIGHTS

- 2007 quantity is forecasted to be 70% HIGHER, & unit value is forecasted to be 5% LOWER compared to 2006.
- 2007 year to date quantity is 410.1% HIGHER, and total value is 437.0% HIGHER compared to 2006.
- 2007 year to date exports to CANADA are 8.1% LOWER, and total value is 26.7% HIGHER compared to 2006.

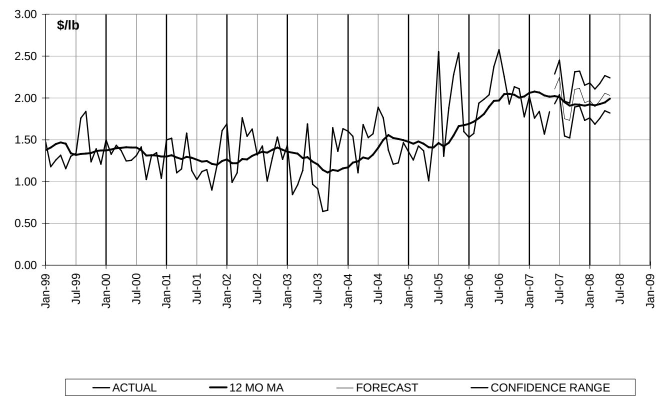
	MAR 2007	APR 2007	MAY 2007	ACTUAL 2007 1st QTR	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	ANNUAL Full Year 2007	07 vs. 06
Quantity (MT)	1,946	658	295	3,920	1,290		1,950		2,010		2,810		9,200	
% Chg Prev Yr	823.8%	874.6%	212.0%	394%	422%		-17%		-11%		-28%		70%	
12 Month MA*	733	782	799	1,860	2,340		2,490		2,240		2,290		8,900	
Value ($/LB)	$1.84	$1.57	$1.83	$1.86	$1.77		$1.84		$2.06		$1.94		$1.88	
% Chg Prev Yr	-5.1%	-21.0%	-9.9%	12%	-17%		-7%		-1%		5%		-5%	
12 Month MA*	$2.07	$2.03	$2.01	$2.07	$2.02		$1.96		$1.91		$1.92		$1.99	
Rel Strength**	1.48	1.44	1.40	1.49	1.41		1.35		1.32		1.36		1.39	

* 12 Month Moving Average
** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

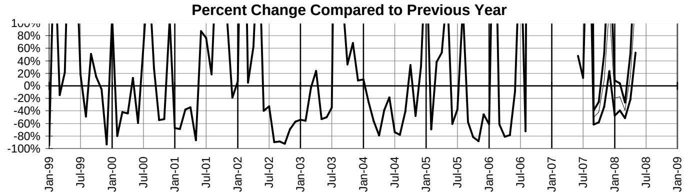
Quantity



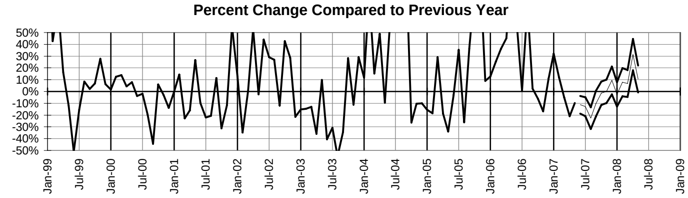
Unit Value



Percent Change Compared to Previous Year

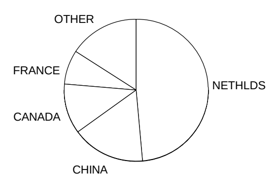


Percent Change Compared to Previous Year



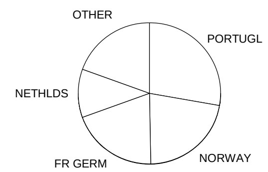
Export Destination	May-07 Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	2006 Total Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
NETHLDS	143,276	48.5%	NA	$0.83	549,489	11.3%	NA	$1,963	NA	$1.62	17,064	0.3%	$151	$4.02
CHINA	48,796	16.5%	NA	$2.55	220,934	4.5%	958.9%	$839	>1000%	$1.72	1,513,866	26.7%	$5,843	$1.75
CANADA	33,977	11.5%	-39.3%	$3.39	189,953	3.9%	-8.1%	$1,258	26.7%	$3.00	434,089	7.7%	$2,244	$2.34
FRANCE	22,396	7.6%	NA	$0.91	65,483	1.3%	NA	$132	NA	$0.92	44,300	0.8%	$85	$0.87
U KING	13,612	4.6%	NA	$5.48	13,612	0.3%	NA	$164	NA	$5.48	41,916	0.7%	$267	$2.89
KOR REP	9,072	3.1%	NA	$4.58	67,510	1.4%	NA	$345	NA	$2.32	NA	NA	NA	NA
SINGAPR	8,528	2.9%	NA	$1.49	8,528	0.2%	>1000%	$28	409.1%	$1.49	7,135	0.1%	$37	$2.35
TAIWAN	7,518	2.5%	NA	$1.39	11,663	0.2%	NA	$36	NA	$1.39	NA	NA	NA	NA
JAPAN	4,738	1.6%	NA	$2.00	4,738	0.1%	NA	$21	NA	$2.00	2,029,704	35.8%	$9,874	$2.21
OTHER	3,558	1.2%	-90.8%	$4.15	3,745,207	76.8%	414.3%	$14,731	471.7%	$1.78	1,576,079	27.8%	$6,260	$1.80
TOTAL	295,471	100.0%	212.0%	$1.83	4,877,117	100.0%	410.1%	$19,517	437.0%	$1.82	5,664,153	100.0%	$24,760	$1.98

Export Destination Quantity (May 2007)



Export District	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
SEATTLE	3,534,704	72.5%	>1000%	$13,752	>1000%	$1.76
ALASKA	1,010,173	20.7%	163.5%	$4,557	194.1%	$2.05
NY CITY	66,320	1.4%	NA	$140	>1000%	$0.96
BOSTON	63,947	1.3%	-33.5%	$165	4.2%	$1.17
MAINE	57,577	1.2%	-5.1%	$252	9.6%	$1.98
OTHER	144,396	3.0%	-35.0%	$651	-15.2%	$2.05
TOTAL	4,877,117	100.0%	410.1%	$19,517	437.0%	$1.82

Export Destination Quantity (Year to Date 2007)



U.S. Exports

Cod

SMA Export Code

302500000 **Fresh or Chilled - Except Fillet, Liver, or Roe** **EX 10241**

HIGHLIGHTS

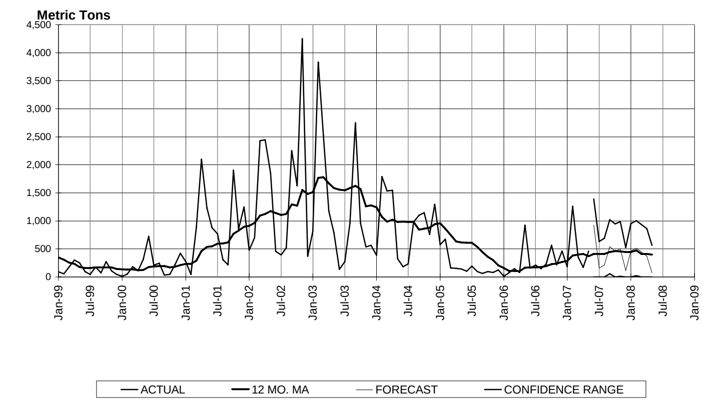
- 2007 quantity is forecasted to be 94% HIGHER, & unit value is forecasted to be 2% LOWER compared to 2006.
- 2007 year to date quantity is 96.1% HIGHER, and total value is 81.1% HIGHER compared to 2006.
- 2007 year to date exports to PORTUGL are >1000.0% HIGHER, and total value is >1000.0% HIGHER compared to 20

	MAR 2007	APR 2007	MAY 2007	ACTUAL 2007 1st QTR	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	ANNUAL Full Year 2007	07 vs. 06
Quantity (MT)	360	171	461	1,810	1,560		910		1,070		1,420		5,400	
% Chg Prev Yr	146.5%	107.7%	-50.2%	665%	34%		54%		-14%		-21%		94%	
12 Month MA*	401	408	369	1,070	1,190		1,270		1,360		1,330		4,900	
Value ($/LB)	$0.93	$1.33	$1.32	$1.05	$1.43		$1.46		$1.53		$1.43		$1.31	
% Chg Prev Yr	-20.0%	-25.2%	11.6%	-8%	9%		-6%		19%		36%		-2%	
12 Month MA*	$1.39	$1.35	$1.37	$1.40	$1.36		$1.34		$1.35		$1.39		$1.36	
Rel Strength**	1.01	0.96	0.95	1.01	0.96		0.93		0.93		0.99		0.96	

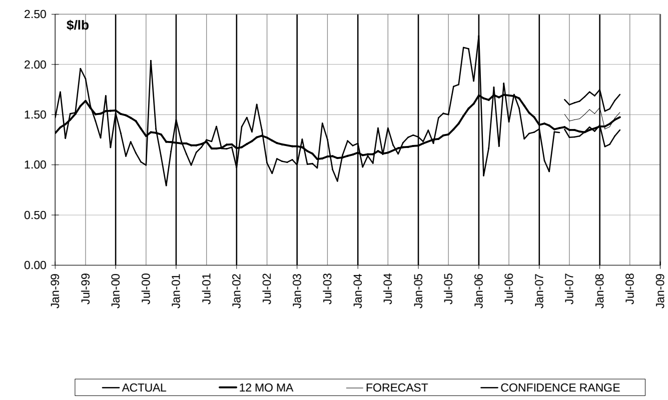
* 12 Month Moving Average

** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

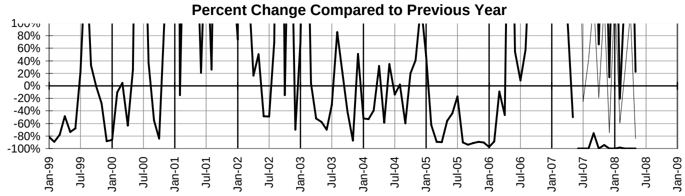
Quantity



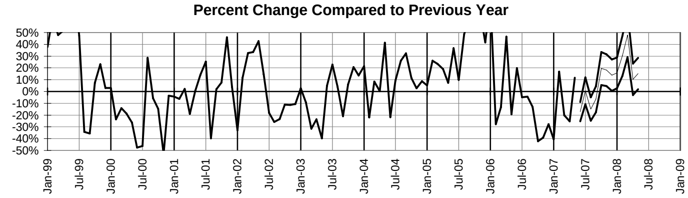
Unit Value



Percent Change Compared to Previous Year

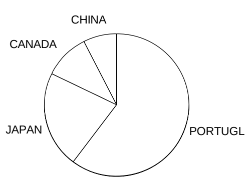


Percent Change Compared to Previous Year



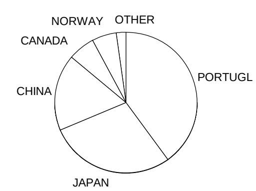
Export Destination	May-07 Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	2006 Total Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
PORTUGL	278,315	60.4%	523.5%	$1.26	978,083	40.1%	>1000%	$2,684	>1000%	$1.24	592,328	18.3%	$1,643	$1.26
JAPAN	100,856	21.9%	-33.2%	$1.47	696,193	28.5%	173.9%	$1,760	107.2%	$1.15	1,267,451	39.1%	$4,165	$1.49
CANADA	47,361	10.3%	-93.5%	$1.74	146,276	6.0%	-81.2%	$557	-73.1%	$1.73	934,401	28.9%	$2,592	$1.26
CHINA	34,563	7.5%	NA	$0.86	427,268	17.5%	NA	$483	NA	$0.51	207,529	6.4%	$498	$1.09
SPAIN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	127,418	3.9%	$286	$1.02
FR GERM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	43,454	1.3%	$198	$2.07
KOR REP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	38,601	1.2%	$26	$0.31
NORWAY	NA	NA	NA	NA	134,985	5.5%	NA	$374	NA	$1.26	22,838	0.7%	$92	$1.83
ST K N	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,010	0.1%	$22	$4.99
OTHER	NA	NA	NA	NA	56,268	2.3%	NA	$179	NA	$1.44	2,050	0.1%	$11	$2.49
TOTAL	461,095	100.0%	-50.2%	$1.32	2,439,073	100.0%	96.1%	$6,037	81.1%	$1.12	3,238,080	100.0%	$9,534	$1.34

Export Destination Quantity (May 2007)



Export District	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
ALASKA	1,926,294	79.0%	587.8%	$4,374	578.0%	$1.03
SEATTLE	276,503	11.3%	-64.1%	$817	-60.0%	$1.34
SAN FRN	169,601	7.0%	-6.8%	$592	3.0%	$1.58
ARB DST	39,835	1.6%	469.2%	$134	250.6%	$1.53
MIAMI	10,843	0.4%	>1000%	$28	982.7%	$1.16
OTHER	15,997	0.7%	208.5%	$91	218.0%	$2.58
TOTAL	2,439,073	100.0%	96.1%	$6,037	81.1%	$1.12

Export Destination Quantity (Year to Date 2007)



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U.S. Exports

Cod

SMA Export Code

303600000 **Frozen - Except Fillet, Liver, or Roe** **EX 10251**

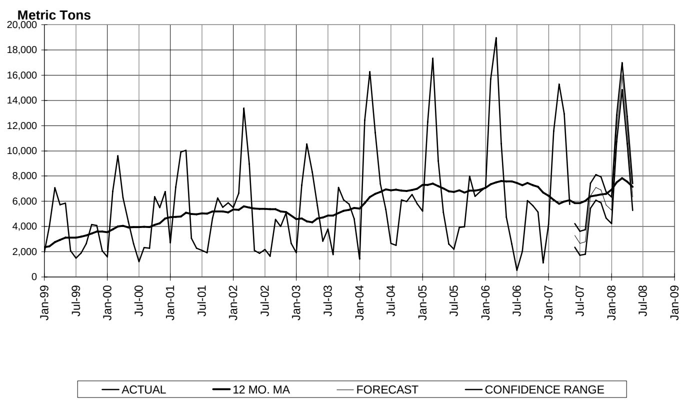
HIGHLIGHTS

- 2007 quantity is forecasted to be 7% HIGHER, & unit value is forecasted to be 3% HIGHER compared to 2006.
- 2007 year to date quantity is 12.9% LOWER, and total value is 4.7% LOWER compared to 2006.
- 2007 year to date exports to CHINA are 41.3% LOWER, and total value is 27.1% LOWER compared to 2006.

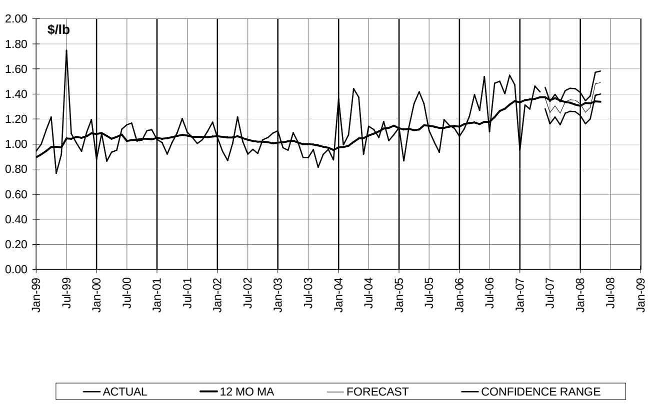
	MAR 2007	APR 2007	MAY 2007	ACTUAL 2007 1st QTR	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	ANNUAL Full Year 2007	07 vs. 06
Quantity (MT)	15,289	12,917	5,761	31,030	21,970		11,900		19,700		32,970		84,600	
% Chg Prev Yr	-19.4%	22.2%	21.3%	-26%	22%		38%		65%		6%		7%	
12 Month MA*	5,794	5,990	6,074	18,340	17,920		18,280		19,600		22,250		74,100	
Value ($/LB)	$1.28	$1.46	$1.42	$1.25	$1.44		$1.26		$1.35		$1.28		$1.32	
% Chg Prev Yr	4.8%	4.9%	11.7%	8%	4%		-14%		-9%		3%		3%	
12 Month MA*	$1.35	$1.36	$1.37	$1.35	$1.37		$1.35		$1.33		$1.32		$1.35	
Rel Strength**	0.97	0.96	0.95	0.96	0.95		0.93		0.92		0.94		0.94	

* 12 Month Moving Average
** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

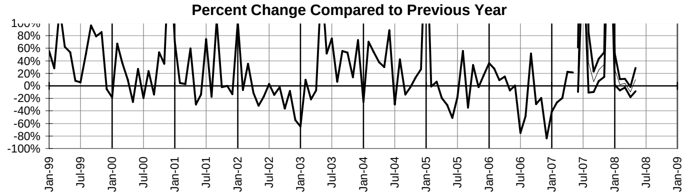
Quantity



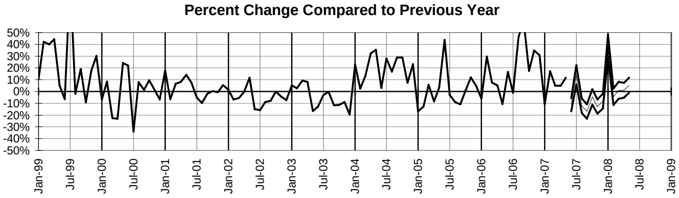
Unit Value



Percent Change Compared to Previous Year

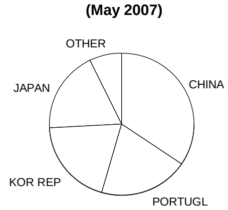


Percent Change Compared to Previous Year



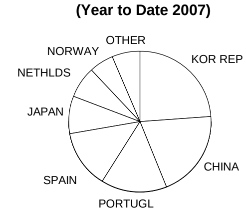
Export Destination	May-07 Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	2006 Total Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
CHINA	1,992,124	34.6%	-13.8%	$1.44	9,923,654	20.0%	-41.3%	$30,215	-27.1%	$1.38	20,604,648	25.7%	$51,752	$1.14
PORTUGL	1,148,623	19.9%	388.1%	$1.41	7,477,226	15.0%	-13.9%	$23,451	-12.4%	$1.42	11,096,595	13.8%	$34,634	$1.42
KOR REP	1,136,775	19.7%	82.5%	$1.43	11,871,916	23.9%	117.2%	$26,334	98.4%	$1.01	6,768,764	8.4%	$17,196	$1.15
JAPAN	1,064,159	18.5%	62.7%	$1.36	4,285,343	8.6%	-57.6%	$9,999	-59.6%	$1.06	14,959,587	18.6%	$39,639	$1.20
NORWAY	250,848	4.4%	-6.0%	$1.32	2,748,019	5.5%	-15.5%	$9,698	9.9%	$1.60	7,166,074	8.9%	$21,298	$1.35
CANADA	123,175	2.1%	-2.1%	$1.81	679,198	1.4%	-52.0%	$2,736	-44.4%	$1.83	2,089,923	2.6%	$7,140	$1.55
DENMARK	22,400	0.4%	-92.2%	$0.67	157,310	0.3%	-94.4%	$626	-92.8%	$1.81	3,048,037	3.8%	$9,472	$1.41
SPAIN	22,227	0.4%	-2.2%	$2.00	6,684,446	13.4%	829.5%	$20,547	792.9%	$1.39	911,176	1.1%	$3,000	$1.49
MEXICO	454	0.0%	NA	$6.45	726	0.0%	NA	$10	NA	$6.52	23,337	0.0%	$101	$1.97
OTHER	NA	NA	-100.0%	NA	5,877,559	11.8%	NA	$21,343	0.6%	$1.65	13,591,894	16.9%	$43,576	$1.45
TOTAL	5,760,785	100.0%	21.3%	$1.42	49,705,397	100.0%	-12.9%	$144,960	-4.7%	$1.32	80,260,035	100.0%	$227,810	$1.29

Export Destination Quantity (May 2007)



Export District	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
ALASKA	44,581,662	89.7%	-7.6%	$127,522	1.3%	$1.30
SEATTLE	4,753,884	9.6%	-45.4%	$15,795	-39.0%	$1.51
MAINE	231,217	0.5%	188.8%	$978	236.5%	$1.92
WASH.	115,926	0.2%	NA	$554	>1000%	$2.17
HOU/GAL	21,151	0.0%	NA	$97	>1000%	$2.09
OTHER	1,557	0.0%	-92.0%	$14	-81.5%	$4.03
TOTAL	49,705,397	100.0%	-12.9%	$144,960	-4.7%	$1.32

Export Destination Quantity (Year to Date 2007)



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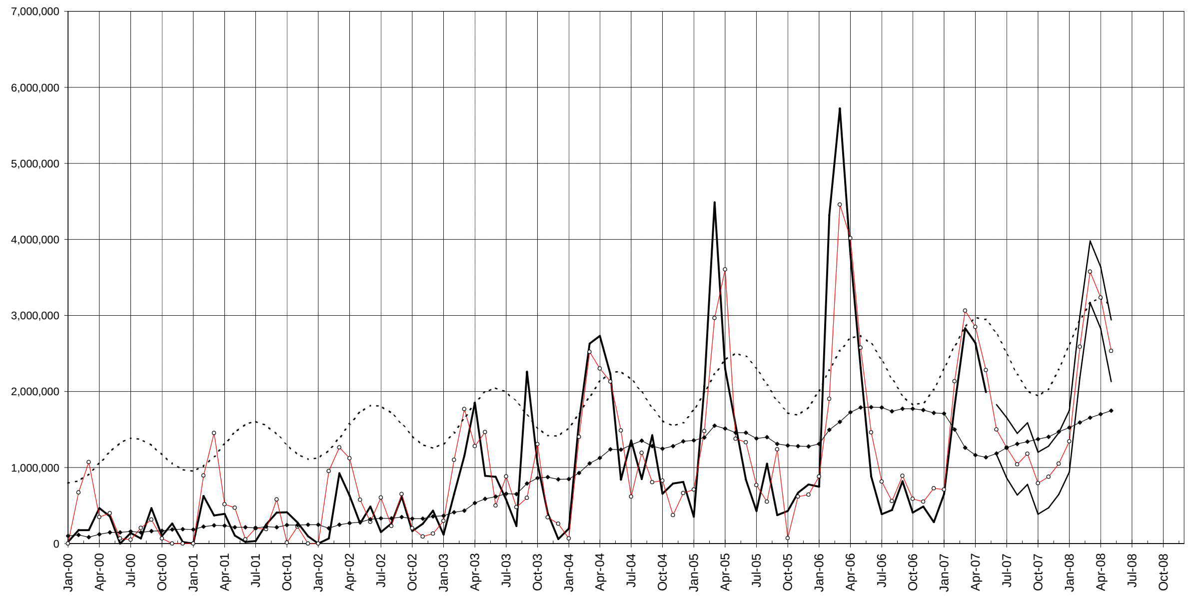
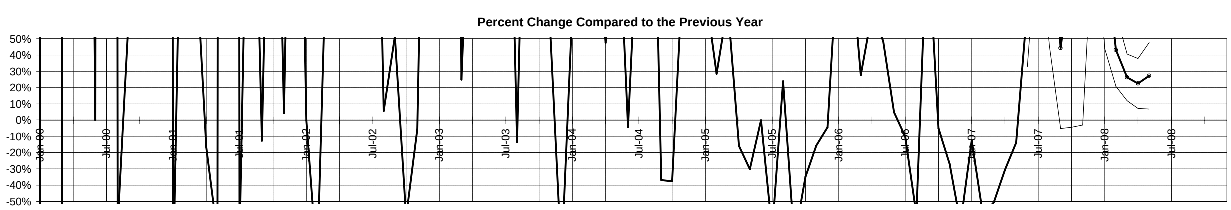
COD112: Cod, Frozen Except Fillet - Export Qty (KG), China

COD112	FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
	ACTUAL									
Value	20,604,648		9,923,654		2,830,568		2,638,950		1,992,124	
% Change from Previous Year	34%		-41%		-51%		-31%		-14%	
12 Month Moving Average	1,688,871		1,353,180		1,259,112		1,161,976		1,135,406	
3 Month Moving Average	1,749,490		1,613,349		1,764,193		2,426,326		2,487,214	

COD112	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	Annual FULL YEAR 2007	07 vs. 06
	QUARTERLY FORECAST									
Value	6,129,827		3,483,801		2,722,289		7,509,071		17,628,497	
% Change from Previous Year	-12%		112%		132%		42%		-14%	
12 Month Moving Average	1,161,412		1,303,130		1,415,498		1,590,760		1,342,386	
3 Month Moving Average	2,318,938		1,337,073		954,913		1,752,114		1,415,498	





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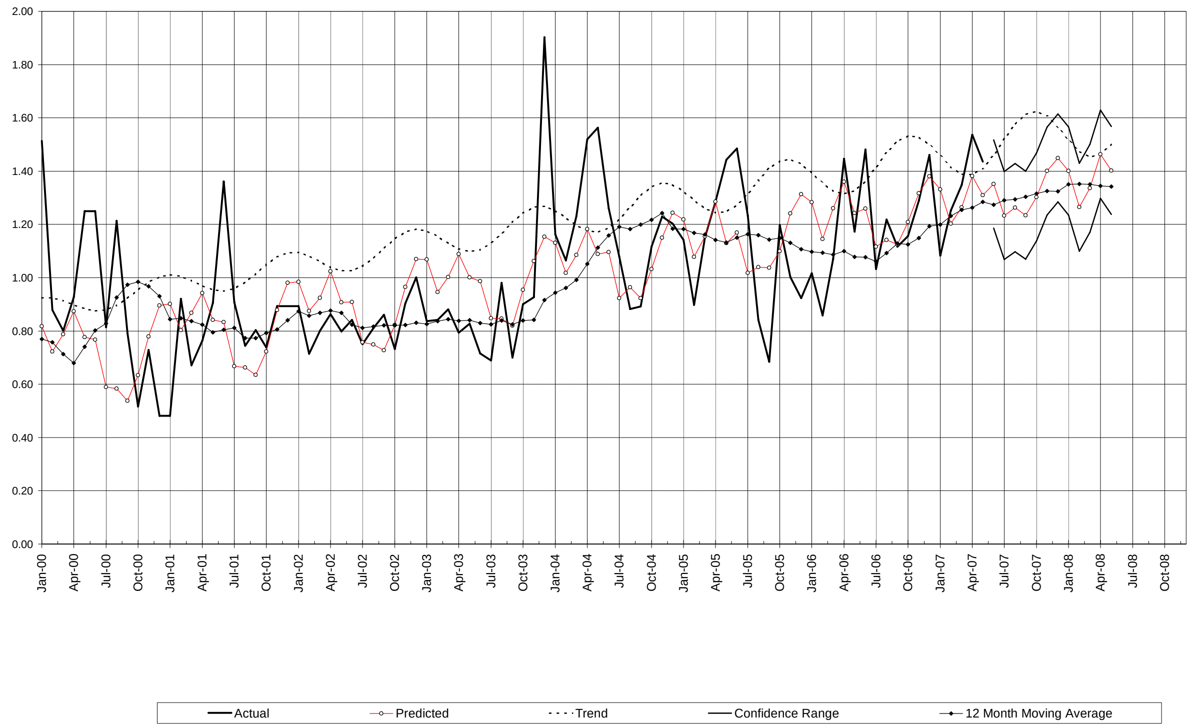
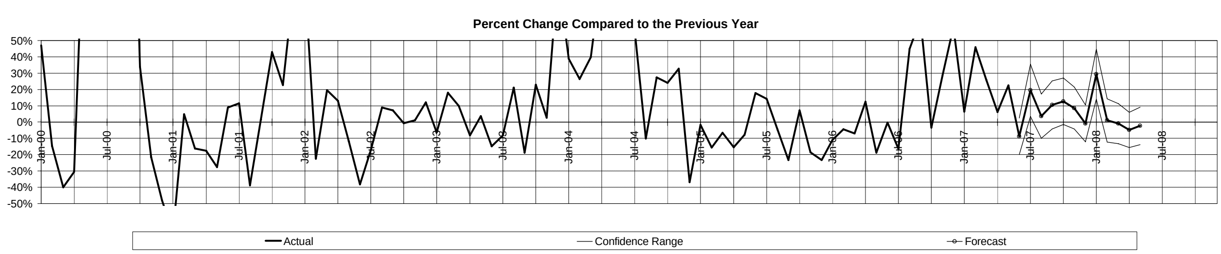
COD114: Cod, Frozen Except Fillet - Export Price ($/LB), China

COD114	ACTUAL									
	FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	1.19		1.33		1.35		1.54		1.44	
% Change from Previous Year	8%		20%		26%		6%		22%	
12 Month Moving Average	1.11		1.25		1.25		1.26		1.28	
3 Month Moving Average	1.16		1.32		1.23		1.38		1.44	

COD114	QUARTERLY FORECAST								Annual	
	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	FULL YEAR 2007 2007	07 vs. 06
Value	1.44		1.24		1.38		1.33		1.32	
% Change from Previous Year	5%		11%		6%		9%		11%	
12 Month Moving Average	1.27		1.30		1.32		1.35		1.28	
3 Month Moving Average	1.42		1.29		1.32		1.37		1.32	





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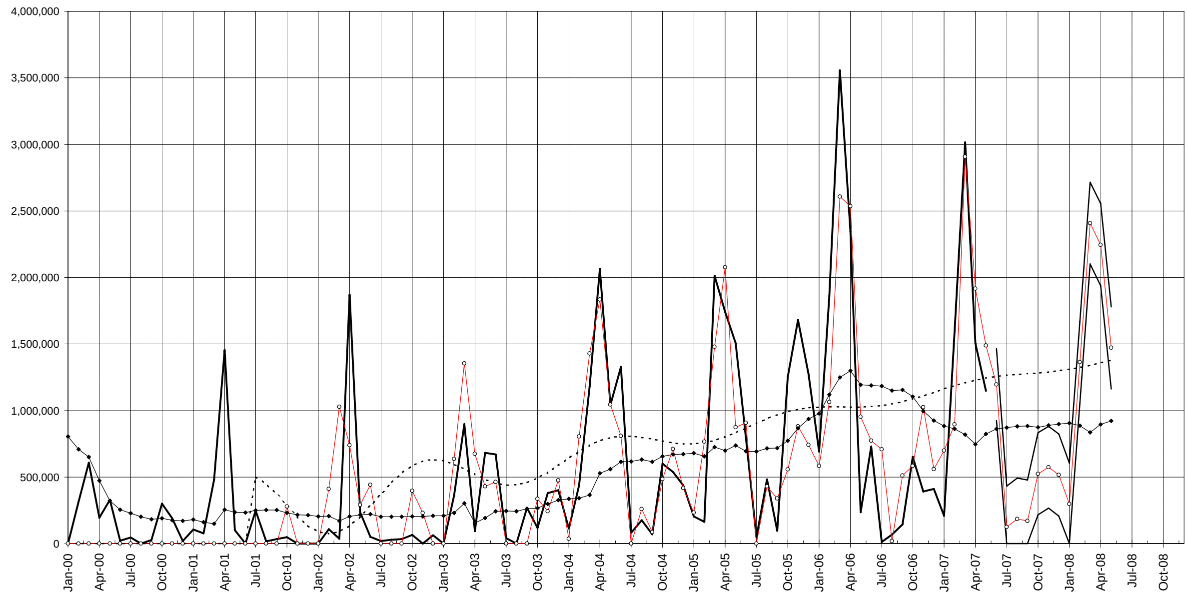
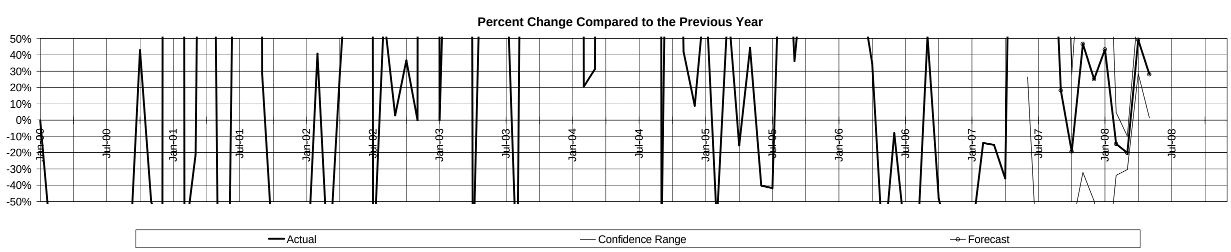
COD115: Cod, Frozen Except Fillet - Export Qty (KG), Portugal

COD115	ACTUAL FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	11,096,595		7,477,226		3,016,182		1,506,035		1,148,623	
% Change from Previous Year	-1%		-14%		-15%		-36%		388%	
12 Month Moving Average	1,128,205		827,197		817,600		747,620		823,729	
3 Month Moving Average	1,008,325		1,322,863		1,607,523		2,040,289		1,890,280	

COD115	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	Annual FULL YEAR 2007 2007	07 vs. 06
Value	3,849,234		479,966		1,612,973		4,070,071		10,764,741	
% Change from Previous Year	16%		114%		11%		-16%		-3%	
12 Month Moving Average	811,250		878,996		886,246		874,638		857,843	
3 Month Moving Average	1,737,882		494,727		417,793		848,151		886,246	





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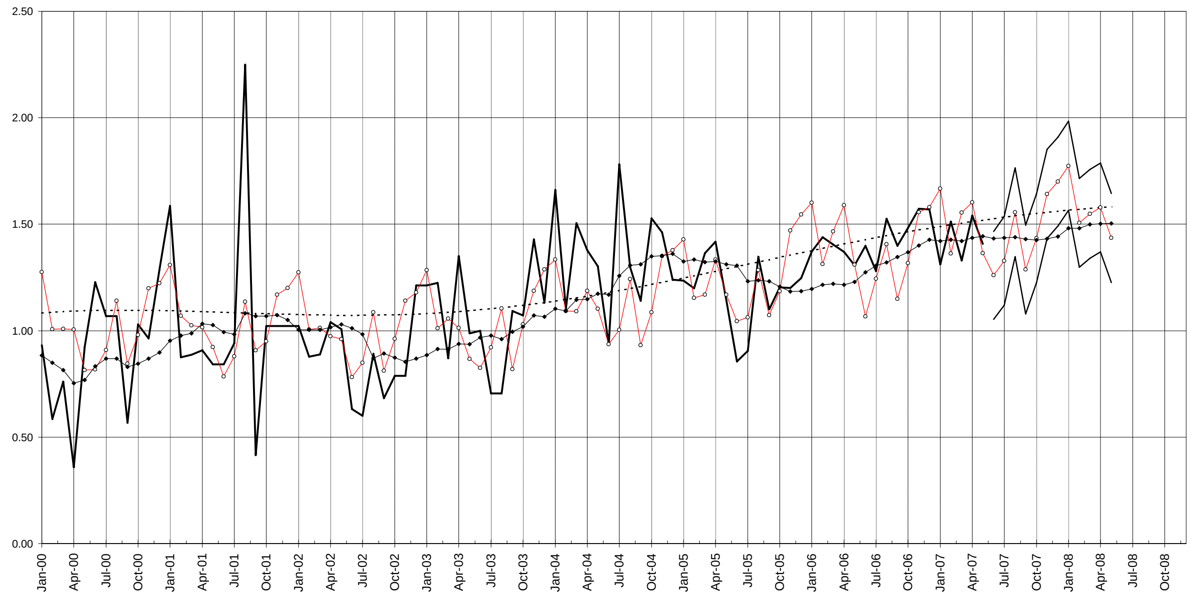
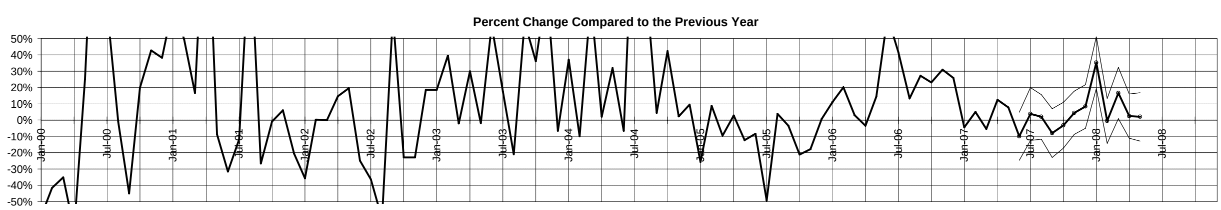
COD117: Cod, Frozen Except Fillet - Export Price ($/LB), Portugal

COD117	ACTUAL									
	FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	1.43		1.42		1.33		1.54		1.41	
% Change from Previous Year	20%		3%		-5%		13%		8%	
12 Month Moving Average	1.29		1.43		1.42		1.44		1.44	
3 Month Moving Average	1.40		1.44		1.38		1.46		1.43	

COD117	QUARTERLY FORECAST								Annual	
	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	FULL YEAR 2007 2007	07 vs. 06
Value	1.40		1.39		1.59		1.61		1.44	
% Change from Previous Year	3%		-1%		3%		16%		1%	
12 Month Moving Average	1.44		1.44		1.43		1.49		1.43	
3 Month Moving Average	1.43		1.37		1.49		1.66		1.43	





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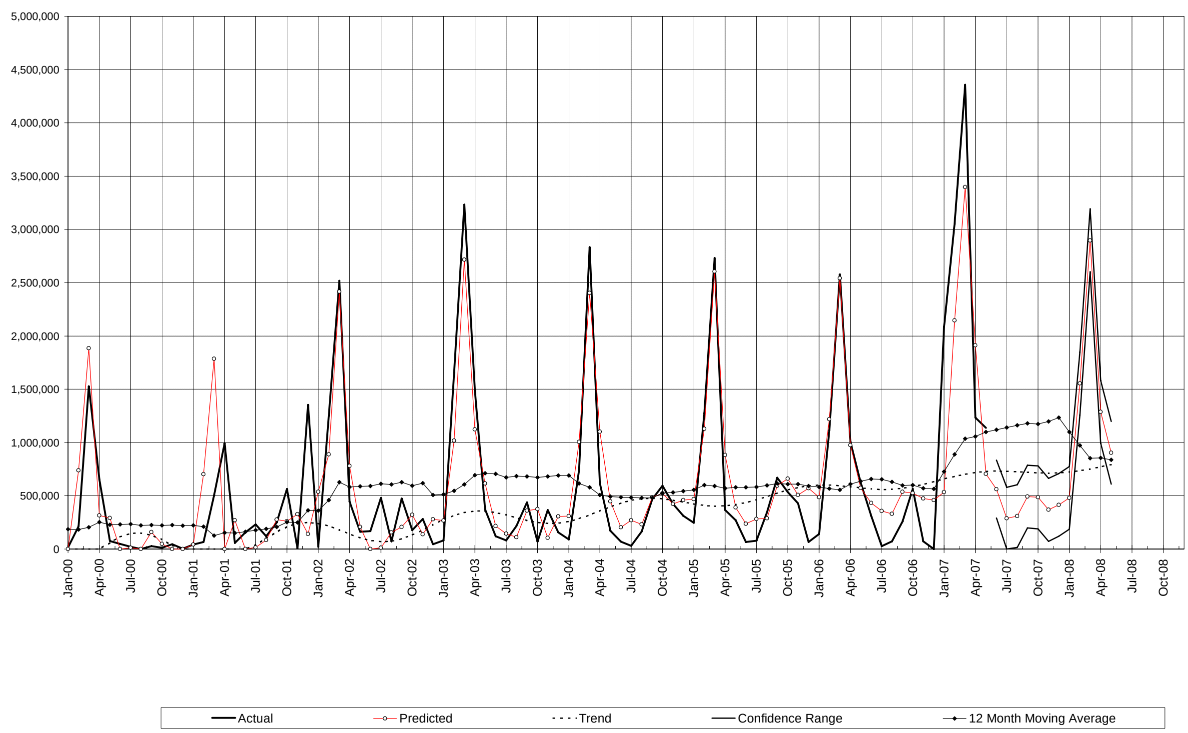
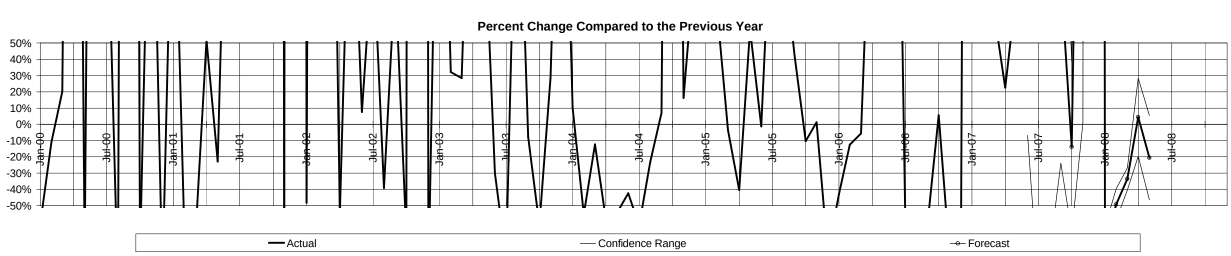
COD118: Cod, Frozen Except Fillet - Export Qty (KG), Korea

COD118	ACTUAL FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	6,768,764		11,871,916		4,359,242		1,233,155		1,136,775	
% Change from Previous Year	-4%		117%		69%		23%		82%	
12 Month Moving Average	601,887		960,666		1,036,203		1,055,129		1,097,939	
3 Month Moving Average	577,667		2,145,406		3,167,329		2,882,758		2,243,057	

COD118	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	Annual FULL YEAR 2007	07 vs. 06
Value	2,931,603		1,089,834		1,267,538		4,930,684		14,790,961	
% Change from Previous Year	51%		206%		99%		-48%		119%	
12 Month Moving Average	1,090,630		1,160,308		1,201,350		974,581		1,083,927	
3 Month Moving Average	2,034,339		470,571		433,418		959,996		1,201,350	





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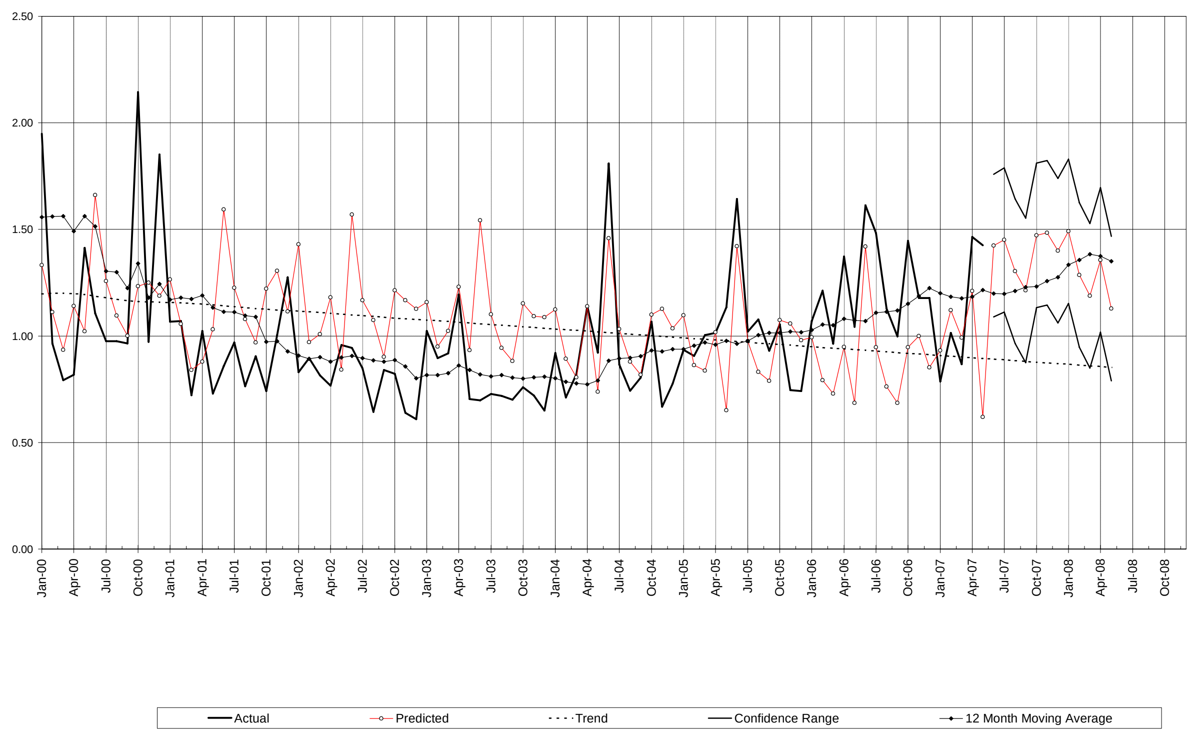
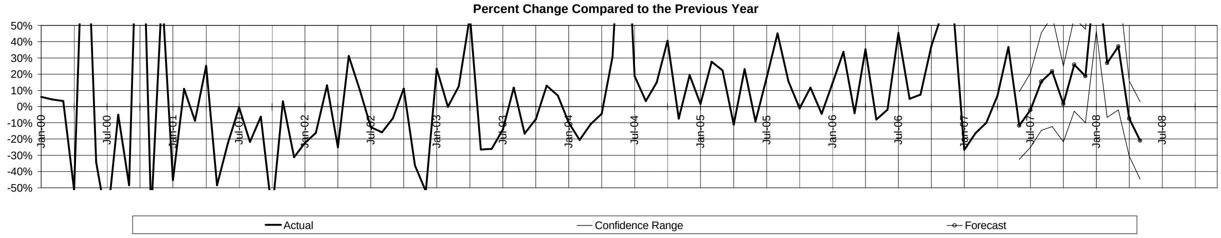
COD120: Cod, Frozen Except Fillet - Export Price ($/LB), Korea

	ACTUAL									
	FULL YEAR		2007		MAR		APR		MAY	
COD120	2006	06 vs. 05	Yr-to-Date	07 vs. 06	2007	07 vs. 06	2007	07 vs. 06	2007	07 vs. 06
Value	1.22		1.11		0.87		1.47		1.43	
% Change from Previous Year	20%		-2%		-10%		7%		37%	
12 Month Moving Average	1.11		1.19		1.18		1.18		1.22	
3 Month Moving Average	1.19		1.06		0.89		1.12		1.25	

	QUARTERLY FORECAST								Annual	
	2007		2007		2007		2008		FULL YEAR 2007	
COD120	2nd QTR	07 vs. 06	3rd QTR	07 vs. 06	4th QTR	07 vs. 06	1st QTR	08 vs. 07	2007	07 vs. 06
Value	1.44		1.32		1.45		1.32		1.28	
% Change from Previous Year	7%		10%		14%		49%		4%	
12 Month Moving Average	1.20		1.21		1.25		1.36		1.21	
3 Month Moving Average	1.27		1.38		1.39		1.39		1.25	



Percent Change Compared to the Previous Year



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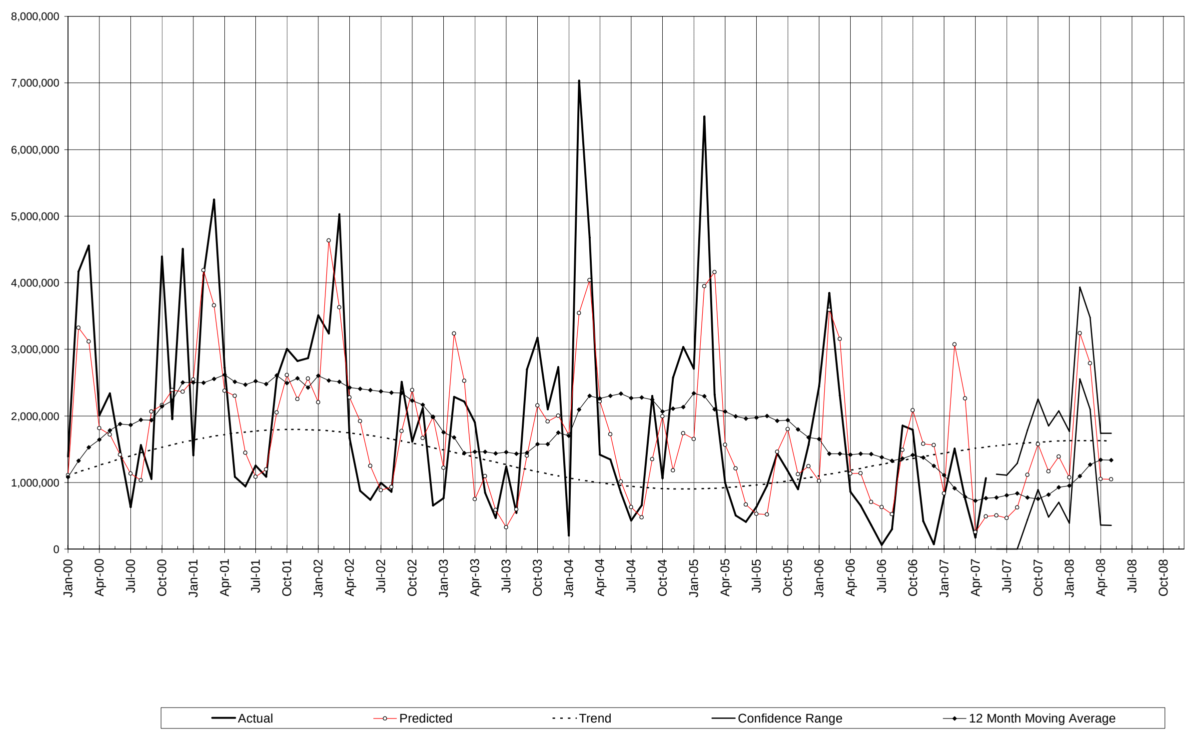
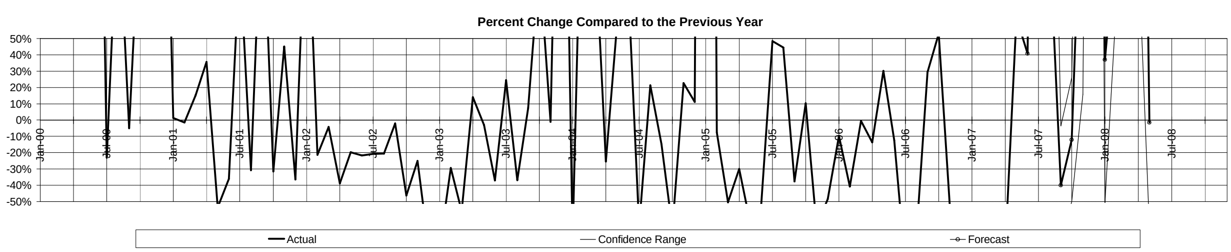
COD121: Cod, Frozen Except Fillet - Export Qty (KG), Japan

COD121	ACTUAL									
	FULL YEAR		2007		MAR		APR		MAY	
	2006	06 vs. 05	Yr-to-Date	07 vs. 06	2007	07 vs. 06	2007	07 vs. 06	2007	07 vs. 06
Value	14,959,587		4,285,343		754,828		173,460		1,064,159	
% Change from Previous Year	-26%		-58%		-67%		-80%		63%	
12 Month Moving Average	1,406,611		858,973		784,270		727,261		761,432	
3 Month Moving Average	1,342,922		741,075		1,015,908		811,475		664,149	

COD121	QUARTERLY FORECAST								Annual	
	2007		2007		2007		2008		FULL YEAR 2007	
	2nd QTR	07 vs. 06	3rd QTR	07 vs. 06	4th QTR	07 vs. 06	1st QTR	08 vs. 07	2007	07 vs. 06
Value	1,742,958		2,203,542		4,127,942		7,109,392		11,122,166	
% Change from Previous Year	-7%		-1%		81%		133%		-26%	
12 Month Moving Average	754,111		804,788		832,940		1,104,107		831,807	
3 Month Moving Average	685,537		648,252		1,254,722		1,827,916		832,940	





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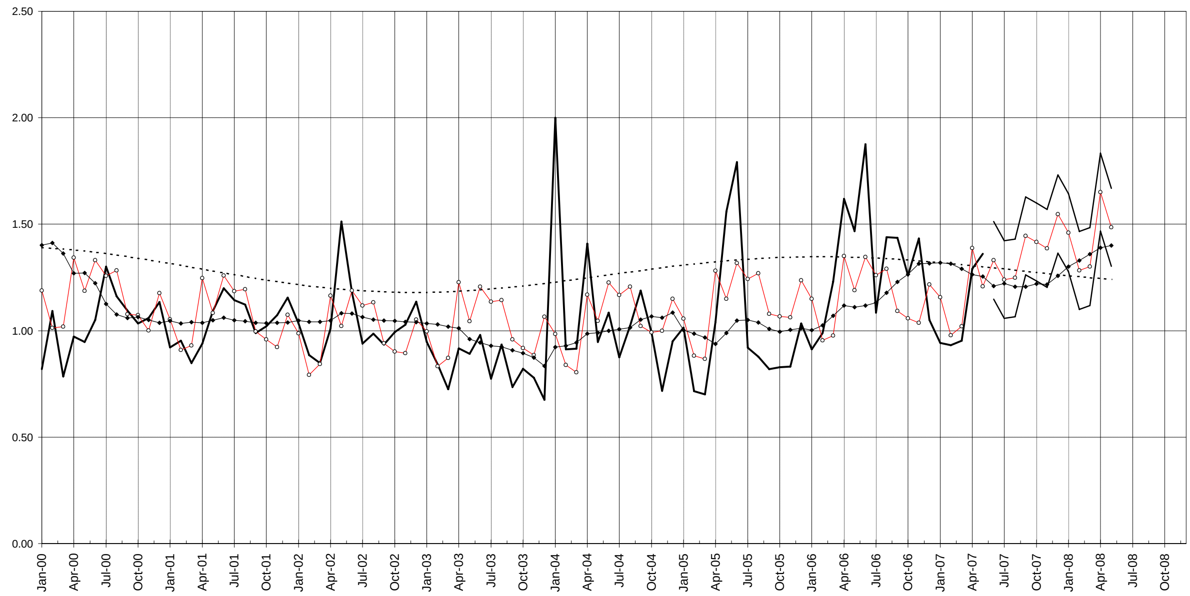
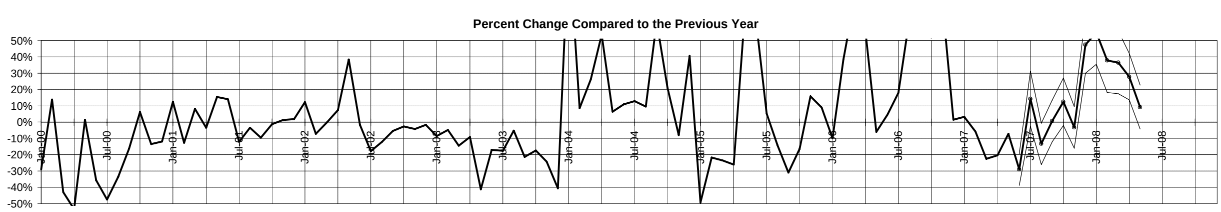
COD123: Cod, Frozen Except Fillet - Export Price ($/LB), Japan

COD123	ACTUAL FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	1.32		1.10		0.95		1.29		1.36	
% Change from Previous Year	30%		-12%		-23%		-20%		-7%	
12 Month Moving Average	1.16		1.29		1.29		1.26		1.25	
3 Month Moving Average	1.30		1.06		0.94		1.06		1.20	

COD123	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	Annual FULL YEAR 2007	07 vs. 06
Value	1.33		1.31		1.45		1.35		1.26	
% Change from Previous Year	-20%		-1%		16%		43%		-4%	
12 Month Moving Average	1.24		1.21		1.23		1.33		1.25	
3 Month Moving Average	1.20		1.30		1.41		1.41		1.23	





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U.S. Exports

Sablefish

SMA Export Code

303794060 **Frozen - Except Fillet, Liver, or Roe** **EX 10910**

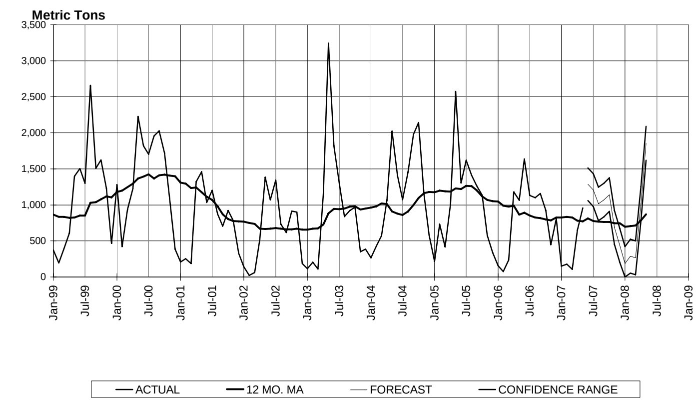
HIGHLIGHTS

- 2007 quantity is forecasted to be 2% LOWER, & unit value is forecasted to be 9% HIGHER compared to 2006.
- 2007 year to date quantity is 24.8% LOWER, and total value is 3.2% LOWER compared to 2006.
- 2007 year to date exports to JAPAN are 24.1% LOWER, and total value is 6.3% LOWER compared to 2006.

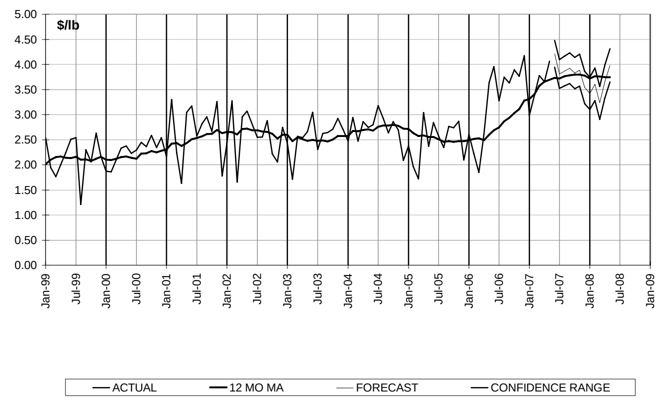
	MAR 2007	APR 2007	MAY 2007	ACTUAL 2007 1st QTR	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	ANNUAL Full Year 2007	07 vs. 06
Quantity (MT)	106	648	957	430	2,890		3,290		2,260		740		8,900	
% Chg Prev Yr	-55.3%	-45.0%	-10.1%	-8%	-26%		-3%		4%		71%		-2%	
12 Month MA*	823	779	770	2,480	2,360		2,310		2,250		2,120		9,400	
Value ($/LB)	$3.78	$3.66	$4.06	$3.36	$4.04		$3.86		$3.79		$3.43		$3.86	
% Chg Prev Yr	104.7%	39.6%	11.8%	56%	17%		9%		-4%		3%		9%	
12 Month MA*	$3.57	$3.66	$3.69	$3.43	$3.69		$3.76		$3.79		$3.75		$3.67	
Rel Strength**	2.54	2.58	2.55	2.44	2.57		2.59		2.62		2.68		2.56	

* 12 Month Moving Average
** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

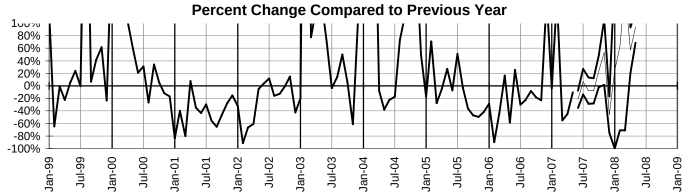
Quantity



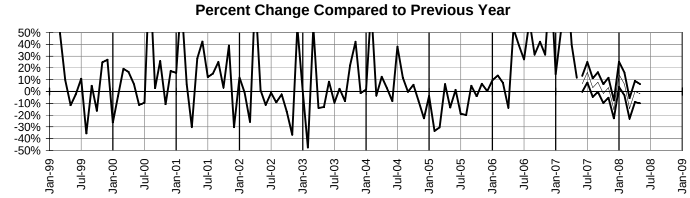
Unit Value



Percent Change Compared to Previous Year

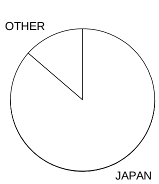


Percent Change Compared to Previous Year



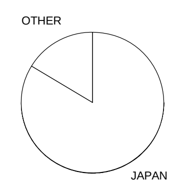
Export Destination	May-07 Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	2006 Total Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
JAPAN	825,820	86.3%	-12.5%	$4.18	1,700,977	83.5%	-24.1%	$14,279	-6.3%	$3.81	7,991,224	80.6%	$63,270	$3.59
CANADA	46,123	4.8%	589.2%	$1.82	99,180	4.9%	468.5%	$385	466.1%	$1.76	90,475	0.9%	$358	$1.80
HG KONG	24,798	2.6%	18.4%	$4.32	63,583	3.1%	-52.9%	$660	-21.4%	$4.71	521,112	5.3%	$4,668	$4.06
MALAYSA	21,098	2.2%	NA	$3.88	21,098	1.0%	2.5%	$181	80.5%	$3.88	39,641	0.4%	$348	$3.99
CHINA	20,412	2.1%	147.3%	$4.80	38,080	1.9%	-44.1%	$372	34.7%	$4.43	500,276	5.0%	$3,364	$3.05
KOR REP	10,390	1.1%	-87.0%	$2.80	42,747	2.1%	-46.4%	$308	-27.1%	$3.27	356,108	3.6%	$1,973	$2.51
SINGAPR	8,165	0.9%	NA	$4.80	24,495	1.2%	-1.1%	$261	38.6%	$4.84	78,885	0.8%	$799	$4.59
U KING	NA	NA	NA	NA	16,692	0.8%	71.6%	$188	297.7%	$5.11	104,276	1.1%	$1,127	$4.90
NORWAY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	57,798	0.6%	$133	$1.04
OTHER	NA	NA	-100.0%	NA	30,498	1.5%	NA	$351	47.7%	$5.22	171,910	1.7%	$1,358	$3.58
TOTAL	956,806	100.0%	-10.1%	$4.06	2,037,350	100.0%	-24.8%	$16,985	-3.2%	$3.78	9,911,705	100.0%	$77,398	$3.54

Export Destination Quantity (May 2007)



Export District	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
SEATTLE	1,430,019	70.2%	-18.5%	$12,597	15.3%	$4.00
ALASKA	535,260	26.3%	-12.1%	$3,944	-7.5%	$3.34
SAN FRN	49,877	2.4%	-11.0%	$314	-25.6%	$2.85
COL-SNK	21,509	1.1%	-91.7%	$119	-93.6%	$2.52
BOSTON	685	0.0%	NA	$11	>1000%	$7.36
OTHER	NA	NA	-100.0%	NA	-100.0%	NA
TOTAL	2,037,350	100.0%	-24.8%	$16,985	-3.2%	$3.78

Export Destination Quantity (Year to Date 2007)



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U.S. Exports

Flatfish, Rock Sole

SMA Export Code

303390020 **Frozen - Except Fillet** **EX 9813**

HIGHLIGHTS

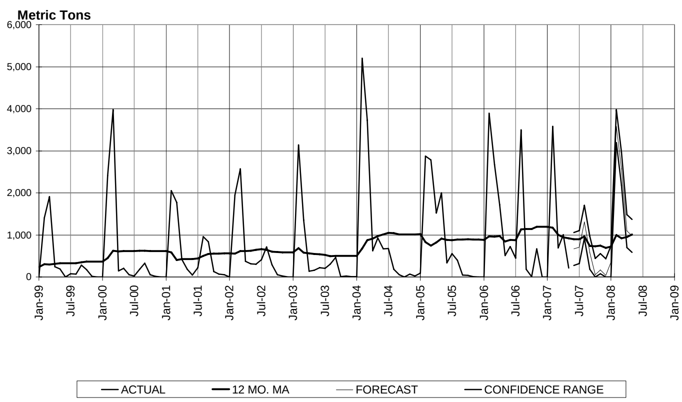
- 2007 quantity is forecasted to be 37% LOWER, & unit value is forecasted to be 8% LOWER compared to 2006.
- 2007 year to date quantity is 37.4% LOWER, and total value is 41.7% LOWER compared to 2006.
- 2007 year to date exports to CHINA are 36.0% LOWER, and total value is 38.6% LOWER compared to 2006.

	MAR 2007	APR 2007	MAY 2007	ACTUAL 2007 1st QTR	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	ANNUAL Full Year 2007	07 vs. 06
Quantity (MT)	694	1,002	214	4,280	1,880		2,590		260		6,510		9,000	
% Chg Prev Yr	-74.0%	-41.6%	-57.7%	-35%	-36%		-37%		-62%		52%		-37%	
12 Month MA*	1,003	943	919	3,360	2,760		2,600		2,170		2,630		10,900	
Value ($/LB)	$0.64	$0.68	$0.82	$0.68	$0.67		$0.67		$0.67		$0.95		$0.67	
% Chg Prev Yr	-23.0%	42.2%	36.2%	-16%	24%		-12%		1%		40%		-8%	
12 Month MA*	$0.67	$0.69	$0.71	$0.69	$0.70		$0.70		$0.67		$0.67		$0.69	
Rel Strength**	0.48	0.49	0.49	0.49	0.49		0.48		0.47		0.48		0.48	

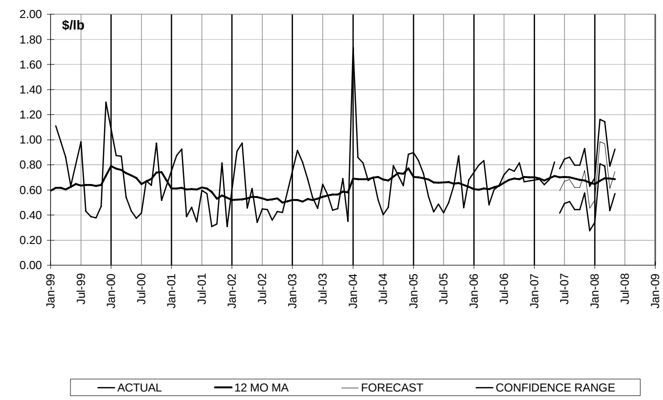
* 12 Month Moving Average

** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

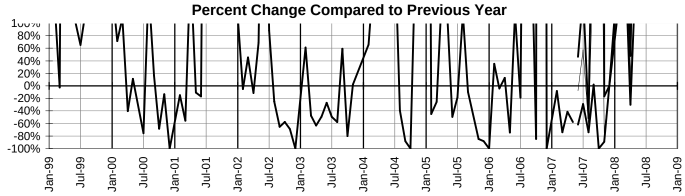
Quantity



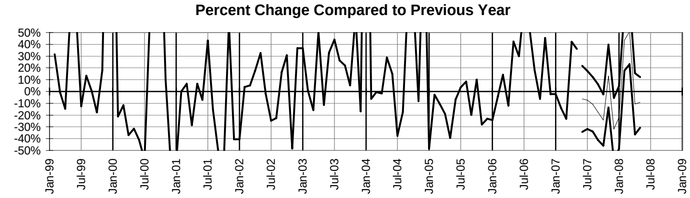
Unit Value



Percent Change Compared to Previous Year

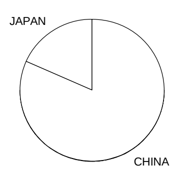


Percent Change Compared to Previous Year



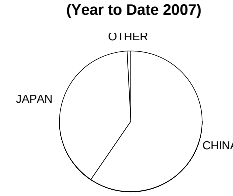
Export Destination	May-07 Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	2006 Total Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
CHINA	174,997	81.7%	-56.5%	$0.81	3,273,222	59.6%	-36.0%	$4,665	-38.6%	$0.65	9,673,444	67.6%	$14,966	$0.70
JAPAN	39,132	18.3%	68.3%	$0.88	2,178,018	39.6%	-31.5%	$3,600	-41.6%	$0.75	3,441,920	24.0%	$6,600	$0.87
KOR REP	NA	NA	NA	NA	44,788	0.8%	-89.9%	$43	-88.7%	$0.43	1,083,996	7.6%	$1,313	$0.55
NETHLDS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	70,527	0.5%	$200	$1.28
FR GERM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	24,676	0.2%	$67	$1.22
CAMROON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20,631	0.1%	$43	$0.94
ITALY	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,796	0.0%	$4	$0.96
TAIWAN	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
SINGAPR	NA	NA	-100.0%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
OTHER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL	214,129	100.0%	-57.7%	$0.82	5,496,028	100.0%	-37.4%	$8,307	-41.7%	$0.69	14,316,990	100.0%	$23,192	$0.73

Export Destination Quantity (May 2007)



Export District	2007 Year to Date Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
ALASKA	5,474,982	99.6%	-37.5%	$8,279	-41.6%	$0.69
SEATTLE	21,046	0.4%	-7.3%	$28	-58.4%	$0.60
CHRLSTN	NA	NA	NA	NA	>1000%	NA
COL-SNK	NA	NA	NA	NA	>1000%	NA
LAREDO	NA	NA	NA	NA	>1000%	NA
OTHER	NA	NA	-100.0%	NA	-100.0%	NA
TOTAL	5,496,028	100.0%	-37.4%	$8,307	-41.7%	$0.69

Export Destination Quantity (Year to Date 2007)



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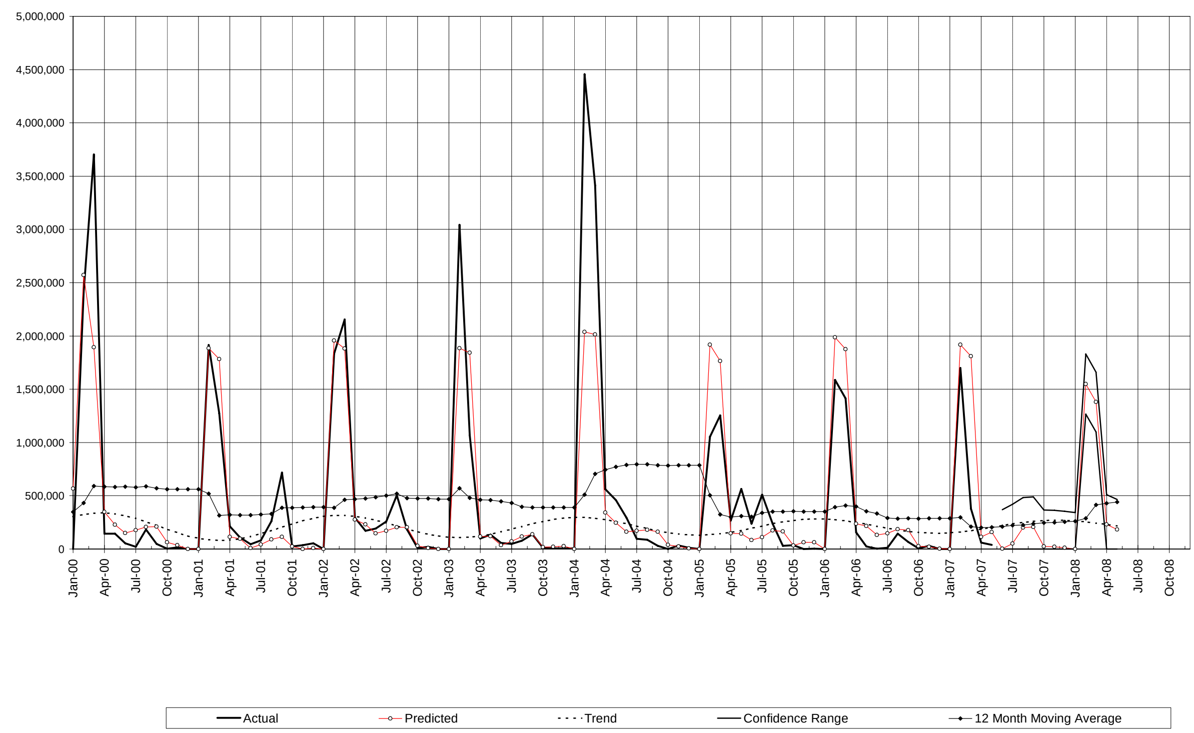
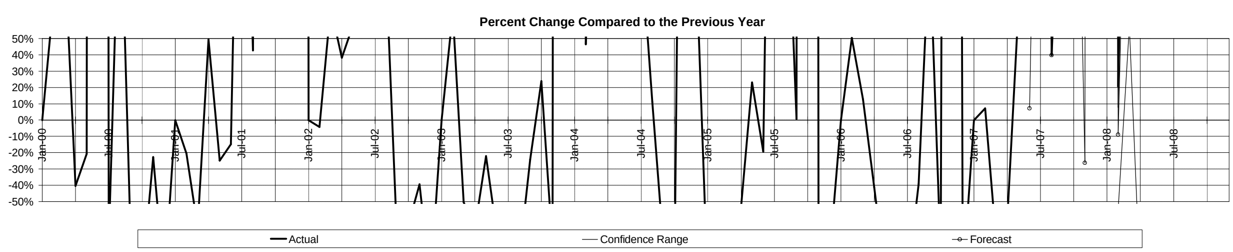
SOLE106: Rock Sole, Frozen Except Fillet - Export Qty (KG), Japan

SOLE106	ACTUAL									
	FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	3,441,920		2,178,018		379,249		60,053		39,132	
% Change from Previous Year	-18%		-32%		-73%		-62%		68%	
12 Month Moving Average	329,954		239,663		210,058		201,950		203,273	
3 Month Moving Average	286,155		428,391		692,944		712,962		159,478	

SOLE106	QUARTERLY FORECAST								Annual	
	2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	FULL YEAR 2007	07 vs. 06
Value	193,249		550,663		239,682		3,987,580		3,062,428	
% Change from Previous Year	5%		149%		561%		92%		-11%	
12 Month Moving Average	205,340		228,769		249,739		321,242		237,053	
3 Month Moving Average	312,285		140,210		123,288		709,184		249,739	





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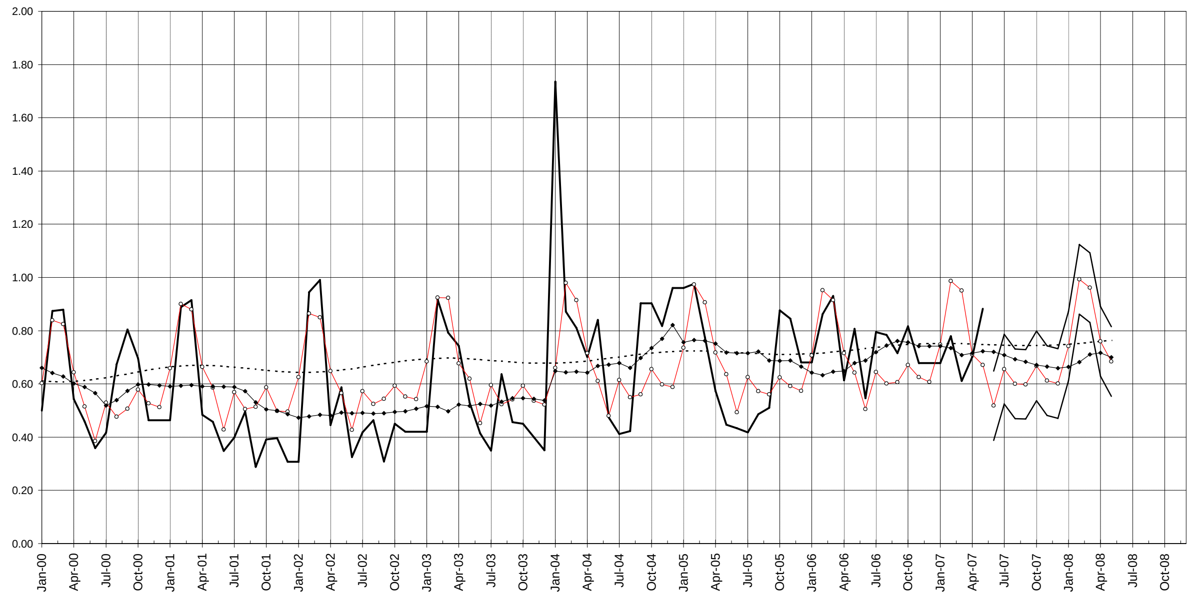
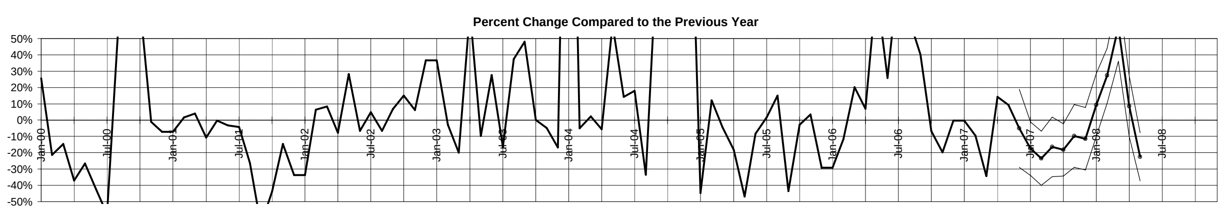
SOLE108: Rock Sole, Frozen Except Fillet - Export Price ($/LB), Japan

SOLE108	ACTUAL FULL YEAR 2006	06 vs. 05	2007 Yr-to-Date	07 vs. 06	MAR 2007	07 vs. 06	APR 2007	07 vs. 06	MAY 2007	07 vs. 06
Value	0.74		0.73		0.61		0.70		0.88	
% Change from Previous Year	12%		-6%		-34%		14%		9%	
12 Month Moving Average	0.70		0.72		0.71		0.72		0.72	
3 Month Moving Average	0.75		0.70		0.69		0.70		0.73	

SOLE108	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	Annual FULL YEAR 2007 2007	07 vs. 06
Value	0.70		0.62		0.63		0.90		0.66	
% Change from Previous Year	7%		-19%		-13%		30%		-11%	
12 Month Moving Average	0.72		0.69		0.67		0.69		0.70	
3 Month Moving Average	0.71		0.63		0.63		0.78		0.67	





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U.S. Exports

Flatfish, Yellowfin Sole

SMA Export Code

303390030 **Frozen - Except Fillet, Liver, or Roe** **EX 9814**

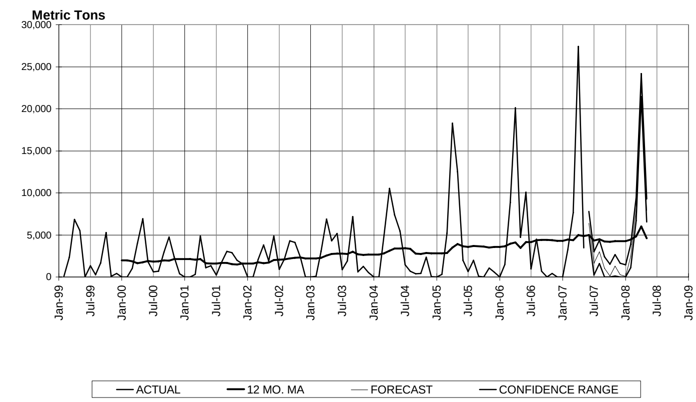
HIGHLIGHTS

- 2007 quantity is forecasted to be 7% HIGHER, & unit value is forecasted to be 15% HIGHER compared to 2006.
- 2007 year to date quantity is 18.6% HIGHER, and total value is 43.6% HIGHER compared to 2006.
- 2007 year to date exports to CHINA are 47.9% HIGHER, and total value is 77.5% HIGHER compared to 2006.

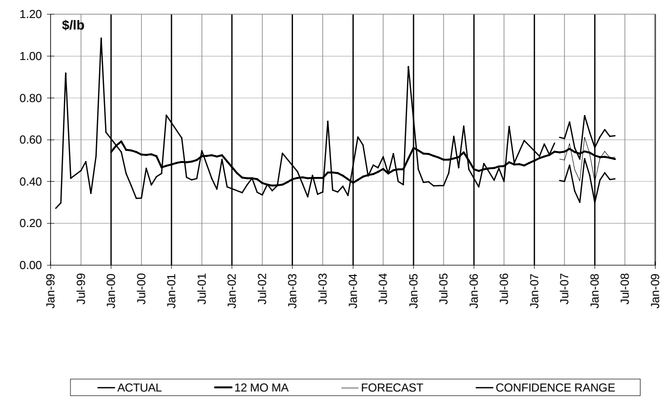
	MAR 2007	APR 2007	MAY 2007	ACTUAL 2007 1st QTR	QUARTERLY FORECAST 2007 2nd QTR	07 vs. 06	2007 3rd QTR	07 vs. 06	2007 4th QTR	07 vs. 06	2008 1st QTR	08 vs. 07	ANNUAL Full Year 2007	07 vs. 06
Quantity (MT)	7,632	27,428	3,454	10,860	37,280		5,640		1,670		10,660		55,400	
% Chg Prev Yr	-14.0%	36.4%	-26.6%	5%	7%		-8%		311%		-2%		7%	
12 Month MA*	4,356	4,966	4,861	13,130	14,810		13,040		12,720		13,570		53,700	
Value ($/LB)	$0.58	$0.53	$0.58	$0.56	$0.53		$0.54		$0.58		$0.54		$0.54	
% Chg Prev Yr	19.0%	18.6%	43.9%	20%	19%		-11%		-2%		-5%		15%	
12 Month MA*	$0.52	$0.53	$0.54	$0.51	$0.54		$0.55		$0.54		$0.52		$0.53	
Rel Strength**	0.37	0.37	0.37	0.36	0.37		0.38		0.37		0.37		0.37	

* 12 Month Moving Average
** Relative Strength is measured by comparing the product or index unit value to the Aggregate Index unit value.

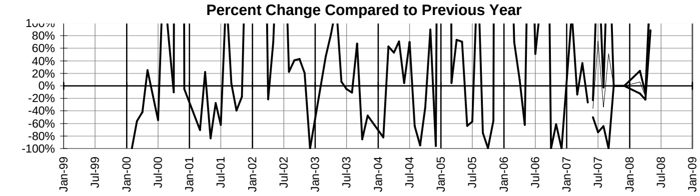
Quantity



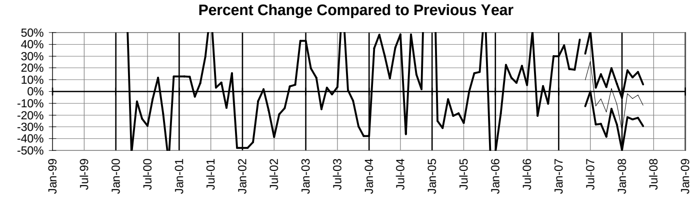
Unit Value



Percent Change Compared to Previous Year

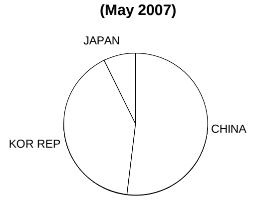


Percent Change Compared to Previous Year



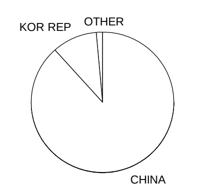
	May-07				2007 Year to Date						2006 Total			
Export Destination	Quantity (KG)	Market Share	Qty. Chg. 2006-07	Unit Value ($/lb)	Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)	Quantity (KG)	Market Share	Value (000's)	Unit Val. ($/lb)
CHINA	1,792,053	51.9%	-47.9%	$0.54	36,857,975	88.3%	47.9%	$43,965	77.5%	$0.54	38,016,123	73.4%	$39,958	$0.48
KOR REP	1,409,011	40.8%	11.2%	$0.65	4,279,196	10.3%	-52.8%	$5,199	-36.8%	$0.55	11,927,304	23.0%	$11,068	$0.42
JAPAN	253,016	7.3%	NA	$0.55	609,709	1.5%	-44.3%	$691	-57.9%	$0.51	1,720,696	3.3%	$2,544	$0.67
CAMROON	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	117,530	0.2%	$98	$0.38
SWITZLD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NIGER	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
INDNSIA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GUATMAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BELGIUM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TOTAL	3,454,080	100.0%	-26.6%	$0.58	41,746,880	100.0%	18.6%	$49,856	43.6%	$0.54	51,781,653	100.0%	$53,669	$0.47

Export Destination Quantity (May 2007)



	2007 Year to Date					
Export District	Quantity (KG)	Market Share	Qty. Chg. 2006-07	Value (000's)	Val. Chg. 2006-07	Unit Val. ($/lb)
ALASKA	40,265,799	96.5%	15.3%	$48,167	39.8%	$0.54
SEATTLE	1,481,081	3.5%	454.2%	$1,689	545.4%	$0.52
BOSTON	NA	NA	NA	NA	>1000%	NA
CHRLSTN	NA	NA	NA	NA	>1000%	NA
COL-SNK	NA	NA	NA	NA	>1000%	NA
OTHER	NA	NA	NA	NA	NA	NA
TOTAL	41,746,880	100.0%	18.6%	$49,856	43.6%	$0.54

Export Destination Quantity (Year to Date 2007)



Involvement in North Pacific Fisheries for Alaska's Top Ten Ports, 2000-2006

By Jennifer Sepez and Leila Sievanen
Alaska Fisheries Science Center

Introduction

This report displays preliminary time series data on population and fisheries participation that is designed to update key community-level fisheries indicators from the *Community Profiles for North Pacific Fisheries – Alaska* (Sepez et al. 2005). It is the first report from a project being developed by the Alaska Fisheries Science Center (AFSC) in cooperation with the Alaska Fisheries Information Network (AKFIN) to compile this data annually for all communities that participate in North Pacific Fisheries. These ten communities were selected for this pilot project because they are the top ten commercial fishing ports in Alaska (defined by volume of landings in 2006) and will be featured on the Alaska page of the forthcoming NOAA Fisheries publication *Our Living Oceans.* They are (in alphabetical order): Akutan, Dillingham, Dutch Harbor, Ketchikan, King Cove, Kodiak, Naknek, Petersburg, Sand Point, and Sitka.

Data

The data in this report were generated from a database compiled for the Alaska Fisheries Science Center by the Alaska Fisheries Information Network (AKFIN). The data compiled for each community are as follows:

Population – Total population of the community for 2000-2006 from annual estimates by the Alaska Department of Labor and Workforce Management.

Landings – 1) Total landings in the community for 2000-2005 (2006 was not available for our purposes. The 2006 data used to determine the top ten ports came from another source). Landings were not reported for communities with 4 or fewer processors due to confidentiality requirements. Landings are also reported by fishery where possible, including the following fisheries: BSAI groundfish, Gulf groundfish, crab, halibut, other invertebrates, salmon, and scallops.
2) Total weight of landings delivered by the local fleet, defined as those vessels registered to residents of the community. These deliveries may have been to any port, though in practice the vast majority was delivered to the port of residence.

Vessels – 1) The total number of local commercial fishing vessels (those registered to community residents), 2000-2005, and the fisheries in which they participated.
2) The number of vessels delivering to the port by fishery, 2000-2005 (including non-local vessels).

Permits – 1) The number of permits issued to community residents 2000-2005, the number of those permits that were actually fished, the number of individuals in the community holding one or more fishing permits, 2000-2005, and the number of those individuals who actually fished. 2) The number of permits held by residents of the community in each fishery in 2000 compared to 2005.

Crew - The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in 2000 compared to 2005.

Several of the data series provided concern local fleets (defined as vessels or permits registered to residents of the community). For many of these top ports, the delivering fleet (vessels from anywhere delivering fish to the port community) is much larger than the local fleet. In later stages of this project, we will be including communities that do not have commercial processing and for whom the local fleet and crew constitute their primary participation in North Pacific fisheries.

Trends

The purpose of compiling and reporting time series data is to monitor trends in key fisheries participation indicators for communities. The data compiled for the ten communities indicate several notable trends, each of which may warrant additional research.

1) Population is lower in 2006 than in 2000 in 8 of the 10 communities, in contrast to the statewide trend showing an increase over the same period. However, in most cases the decrease is fairly small and may be within a normal range of variation for communities with shore-based seafood processing.

2) In all four of the ten communities, the number of crab fishery permits owned by local residents, and the number of vessels owned by local residents participating in crab fisheries, increased between 2000 and 2005. In some case, the increase is dramatic. The four communities are Dutch Harbor/Unalaska, King Cove, Kodiak and Sand Point. Further analysis is needed to verify and understand this interesting trend.

3) In all ten communities, the number of crew licenses issued to local residents has decreased between 2000 and 2005, continuing a trend described by the Alaska Fisheries Science Center for statewide crew license holdings between 1993 and 2003 in ftp://ftp.afsc.noaa.gov/posters/pCarothers01_comm-fish-crew-demographics.pdf.

4) Comparison of the number of CFEC commercial fishing permits issued to local residents to the number of those permits that were active (reported landings for the year) expressed as a percentage, varied widely between communities (range 49% to 81%, with most near 60%). However, the ratios varied little over the time period within each community.

Because of the preliminary status of this report, these trends are offered not as a full analysis of the data, but as examples of the types of trends that may be identified by compiling this data.

Next Steps

The next steps in this project include continuing to compile data for communities, the integration of the most recent years of data for the indicators used in this report, compilation of the same data for additional communities, and compilation of data for additional indicators of fisheries participation. We will also continue to develop possible methods for displaying these data (future SAFE reports, a web-based interface, a NOAA technical report) and to develop analyses of the data.

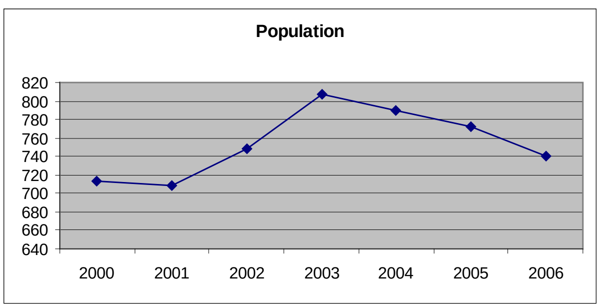
Acknowledgments

All of the graphs in this report were created by Leila Sievanen. The data were compiled and provided to us by Brandon Andrews of the Alaska Fisheries Information Network, with support from Rob Ryznar of the Alaska Fisheries Information Network, Dave Colpo of the Pacific States Marine Fisheries Commission, and Ron Felthoven of the Alaska Fisheries Science Center.

Akutan

Population

The 2006 population of Akutan was 741 people, 90% of whom are seafood processing workers housed in group quarters. The population is slightly higher than it was in 2000 (713). The population increased sharply between 2001 and 2003 (+100) and then decreased by about 70 people between 2003 and 2006. The permanent population of Akutan is estimated to be only about 75 people.

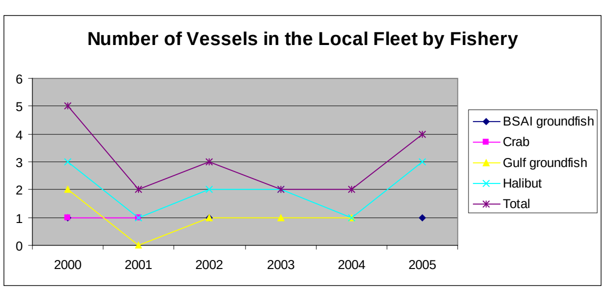


Landings

The amount of landings in Akutan cannot be reported due to confidentiality requirements.

Vessels

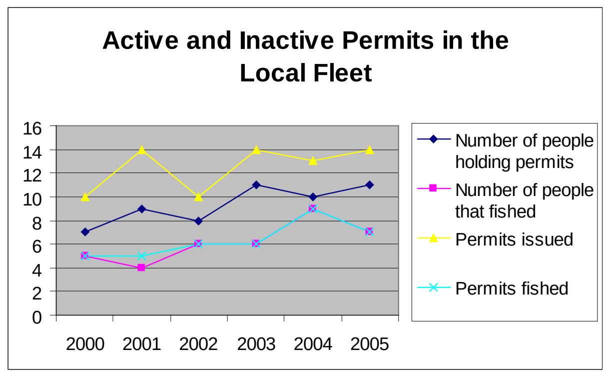
The total number of commercial fishing vessels registered to residents of Akutan decreased from 5 in 2000 to 4 in 2005. Most vessels participate in the halibut fisheries.



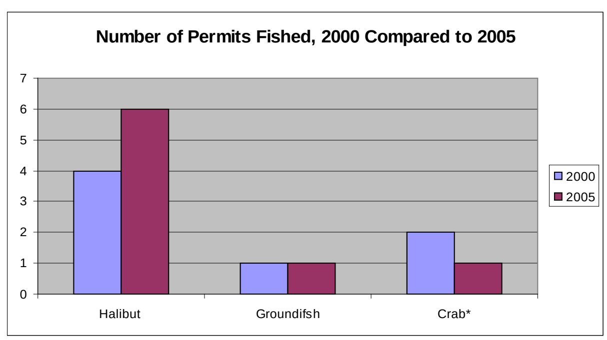
The total number of vessels delivering to processors in Akutan (including the non-local fleet) could not be reported due to confidentiality requirements.

Permits

There were 10 commercial fishing permits issued to residents of Akutan in 2000 and 14 in 2005, an increase of 40%. Of the total permits issued, 50% were fished in 2000 and 50% were fished in 2005 (with some variation in between). The number of residents who fished commercially (not including crew) rose from 5 to 7.



The only decrease in permits fished occurred in the crab fisheries, dropping from 2 in 2001 to 1 in 2004. The number of groundfish permits fished remained stable. The number of halibut permits fished increased from 4 to 6.

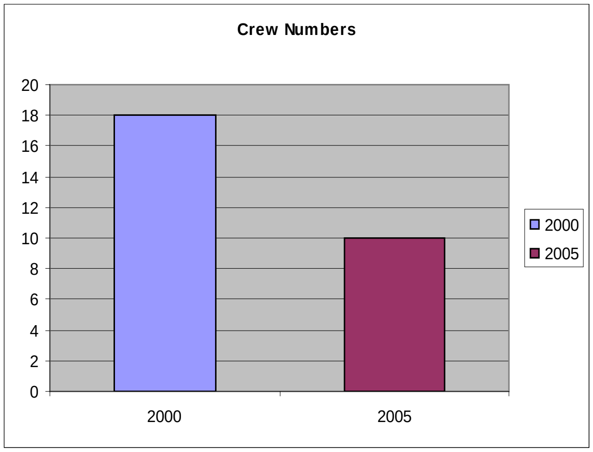


* In the crab category, we have data only for 2001 and 2004.

Akutan

Crew

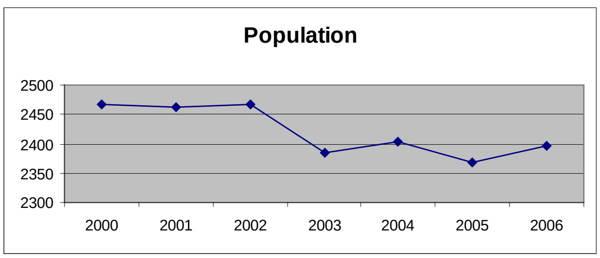
The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in Akutan dropped from 18 in 2000 to 10 in 2005.



Dillingham

Population

The 2006 population of Dillingham was almost 2,400 people. It remained steady between 2000 and 2002 and then dropped by 84 people between 2002 and 2003. Since this time it was marked by changes between -36 and +29.

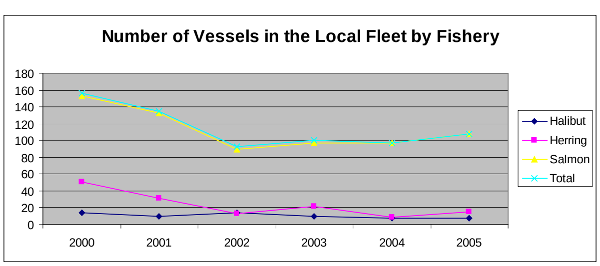


Landings

The amount of landings in Dillingham cannot be reported due to confidentiality requirements.

Vessels

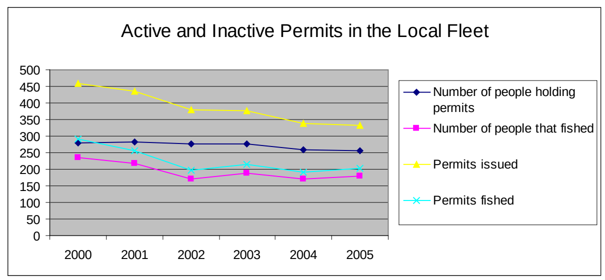
The total number of commercial fishing vessels registered to Dillingham residents dropped from 156 in 2000 to 108 in 2005. Almost all vessels in the local fleet participate in salmon fisheries. The number of Dillingham vessels in salmon fisheries decreased by 30% between 2000 and 2005. The fishery with the greatest decrease in participating boats was the herring fisheries, which dropped by 70%.



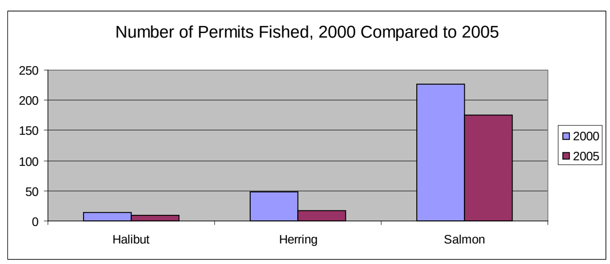
The total number of vessels (including the non-local fleet) delivering to Dillingham could not be reported due to confidentiality requirements.

Permits

There were 458 commercial fishing permits issued to residents of Dillingham in 2000 and 333 in 2005, a decrease of 27%. Of the total permits issued, 290 (or 63%) were fished in 2000 compared to 202 (or 61%) in 2005. The number of residents who fished commercially (not including crew) decreased by 25% from 236 to 179.

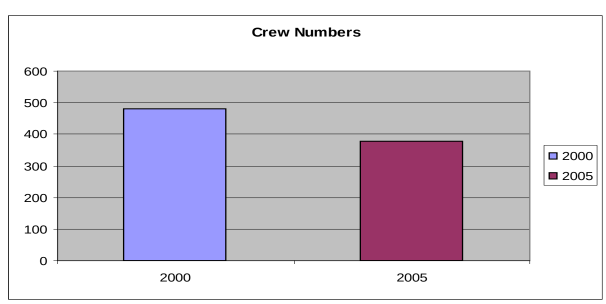


The number of permits fished decreased in all fisheries in Dillingham. The most dramatic decrease occurred in the herring fisheries which dropped from 48 to 17 permits.



Crew

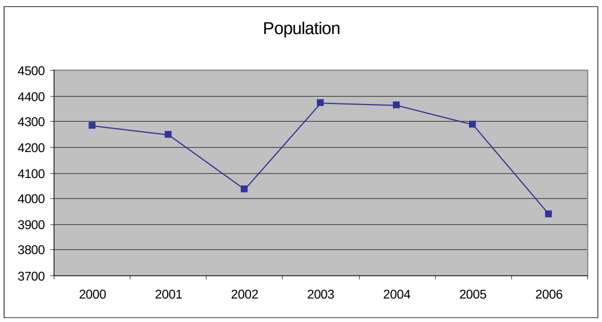
The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in Dillingham dropped from 481 in 2000 to 377 in 2005.



Dutch Harbor/Unalaska

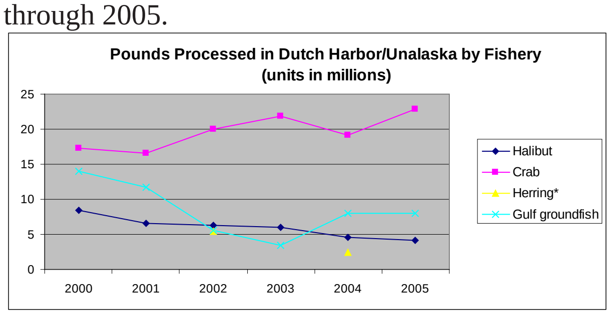
Population

The 2006 population of Dutch Harbor/Unalaska was 3,940. This is slightly less than its 2000 population (4,283). The intervening period was marked by changes between -215 and +336.

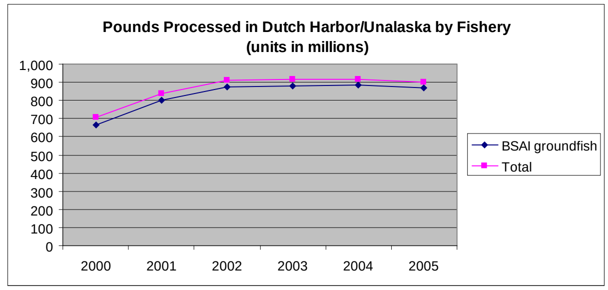


Landings

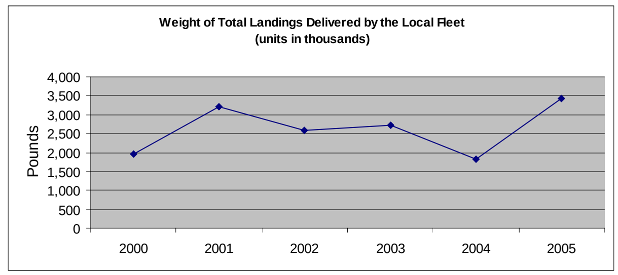
The number of processors in Dutch Harbor/ Unalaska dropped from 33 in 2000 to 23 in 2005. The amount of fish processed has increased from 704.3 million pounds in 2000 to 903.3 million pounds in 2005. Most of the fish processed is BSAI groundfish. The amount of total fish processed increased by almost 200 million pounds between 2000 and 2002, and then remained relatively steady through 2005.



* Herring landings could only be reported for 2002 and 2004 due to confidentiality requirements. Scallops and "Other invertebrates" could not be reported for any years.

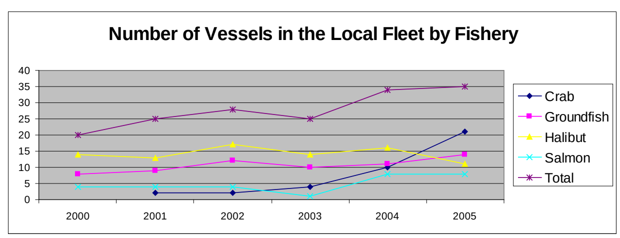


The local fleet caught a total of 1.9 million pounds in 2000 and 3.4 million pounds in 2005.



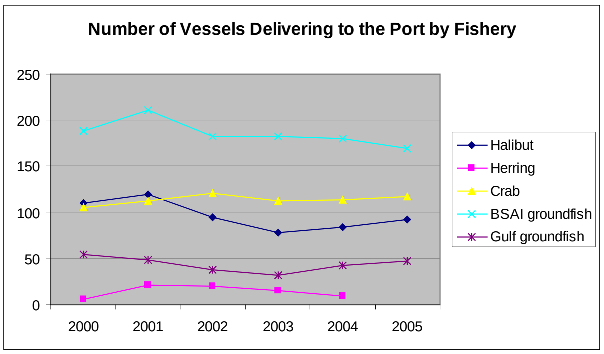
Vessels

The total number of commercial fishing vessels registered to Dutch Harbor/Unalaska residents climbed from 20 in 2000 to 35 in 2005. The number of vessels in the groundfish fisheries has been the most stable over the last five years. The fishery with the greatest increase in participating boats is the crab fisheries, which grew by 1000%.



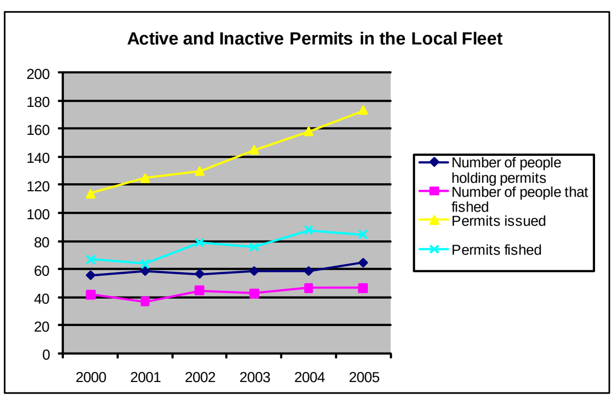
Dutch Harbor/Unalaska

Most vessels delivering to Dutch Harbor/Unalaska (including the non-local fleet) brought BSAI groundfish. The number of vessels delivering fish from most fisheries decreased slightly between 2000 and 2005 with the exception of the crab and herring fisheries, which increased. Vessels delivering herring increased from 6 to 10 boats in this time period.

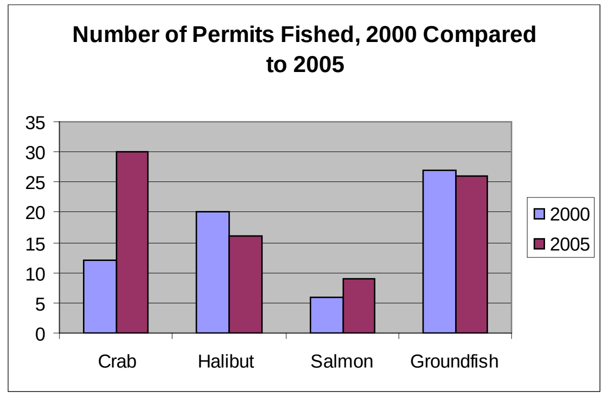


Permits

There were 114 commercial fishing permits issued to residents of Dutch Harbor/Unalaska in 2000 and 170 in 2005. Of the total permits issued, 67 (or 59%) were fished in 2000 compared to 83 (or 49%) in 2005. The number of residents who fished commercially (not including crew) rose from 40 to 47.

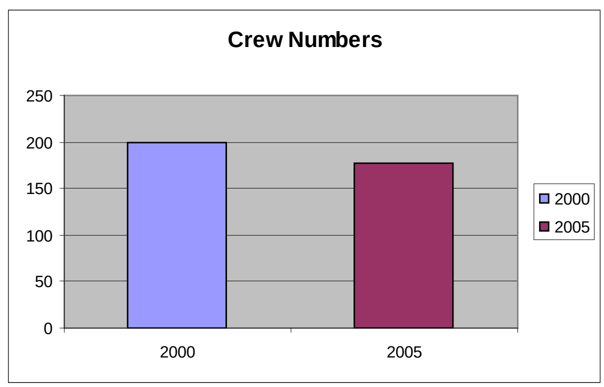


The crab fisheries had the greatest increase in the number of permits fished by residents of Dutch Harbor/Unalaska between 2000 and 2005, with permits fished increasing from from 12 to 30. The fishery with the least change was the groundfish fisheries which remained close to 25 local permits.

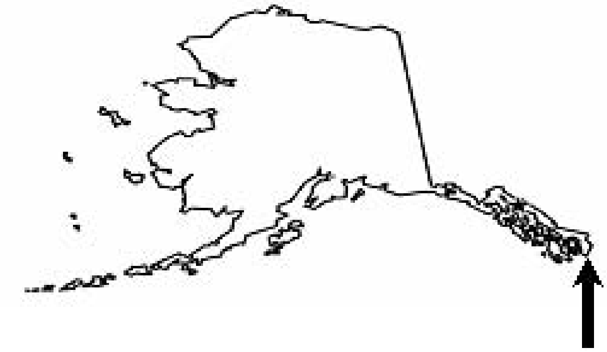


Crew

The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in Dutch Harbor/Unalaska dropped from 200 in 2000 to 177 in 2005.

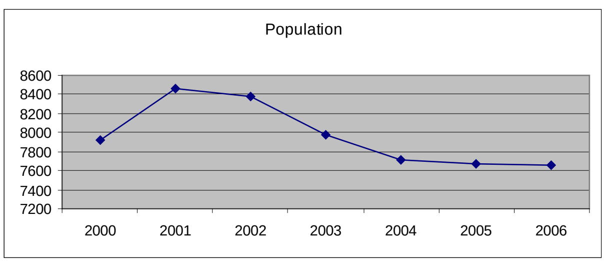


Ketchikan



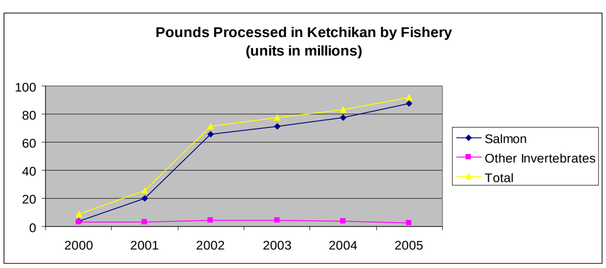
Population

The 2006 population of Ketchikan was almost 7,700 people. It dropped by about 260 people (or 3%) between 2000 and 2006. The intervening period was marked by changes between +537 and -396.

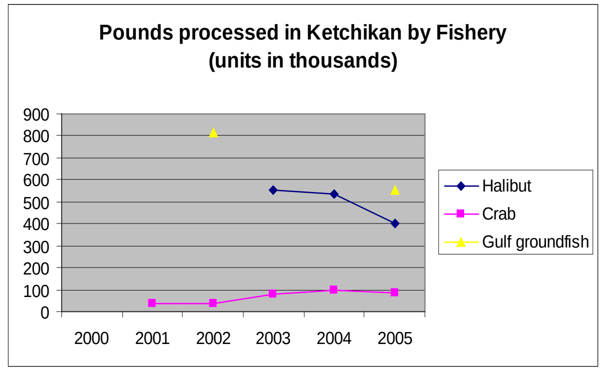


Landings

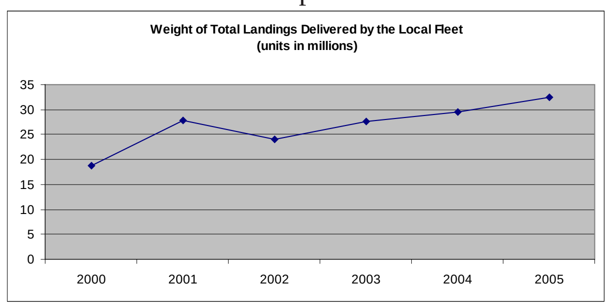
The number of processors in Ketchikan increased from 75 in 2000 to 82 in 2005. The amount of fish processed increased from 8.5 million pounds in 2000 to 91.9 million pounds in 2005. Most of the fish processed is salmon, with other invertebrates contributing slightly to the total weight.



* For confidentiality reasons, landings for the following species groups could not be reported: halibut (2000-2002), crab (2000), Gulf groundfish (2000, 2001, 2003, 2004), and herring (2000-2005).

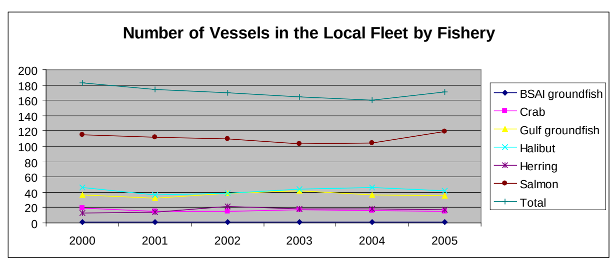


The local fleet caught a total of 18.8 million pounds in 2000 and 32.4 million pounds in 2005.



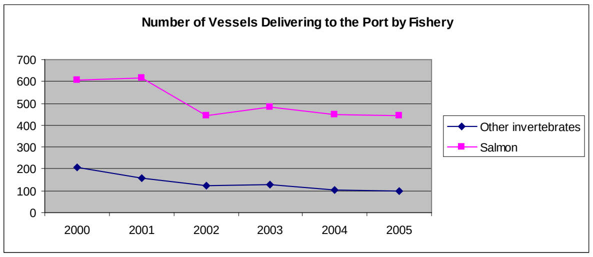
Vessels

The total number of commercial fishing vessels registered to Ketchikan residents decreased from 183 in 2000 to 171 in 2005. The number of local vessels participating in all of the fisheries has been relatively stable over time.



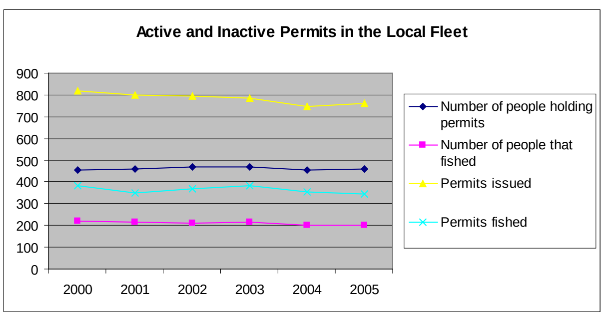
Ketchikan

The number of vessels (including the non-local fleet) delivering both salmon and other invertebrates decreased between 2000 and 2005. For salmon, the number of vessels decreased by around 150 (or 25%) and for other invertebrates, by about 50% from 200 to 100 vessels.

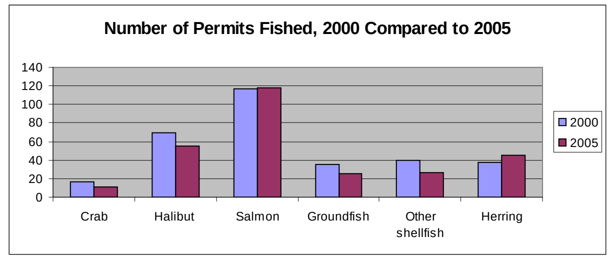


Permits

There were 817 commercial fishing permits issued to residents of Ketchikan in 2000 and 762 in 2005. Of the total permits issued, 382 (or 47%) were fished in 2000 compared to 344 (or 45%) in 2005. The number of residents who fished commercially (not including crew) decreased slightly from 218 in 2000 to 203 in 2005.

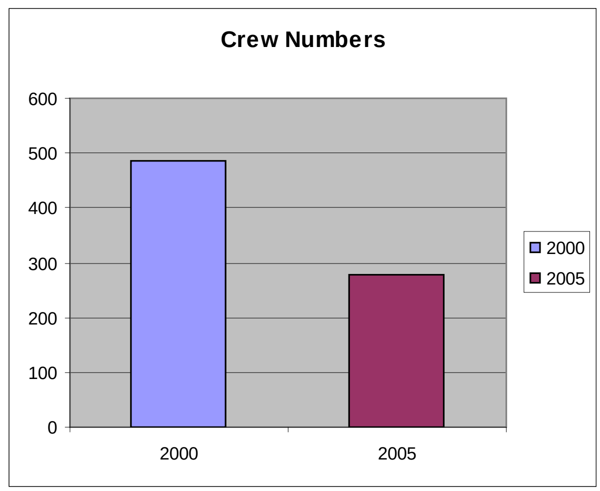


The number of permits fished by residents of Ketchikan decreased in all fisheries between 2000 and 2005, except for the herring fisheries which increased slightly and the salmon fisheries which remained stable.

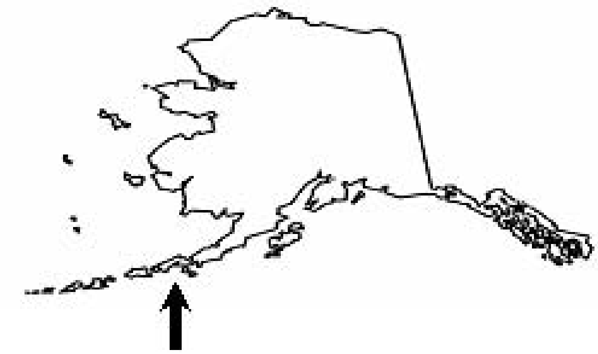


Crew

The number of registered crew members in Ketchikan dropped from 485 in 2000 to 278 in 2005.

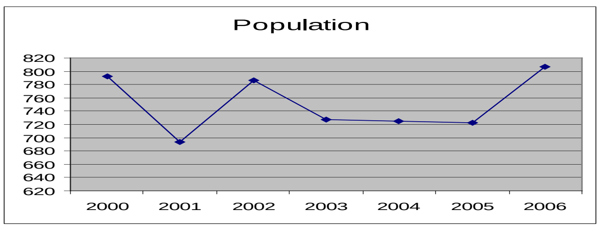


King Cove



Population

The 2006 population of King Cove was around 810 people. This is only slightly higher than it was in 2000 (792). The intervening period was marked by changes between -98 and +92.

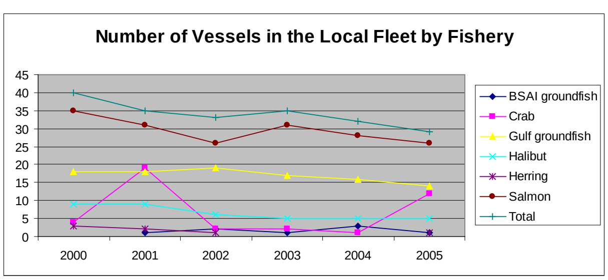


Landings

The amount of landings in King Cove cannot be reported due to confidentiality requirements.

Vessels

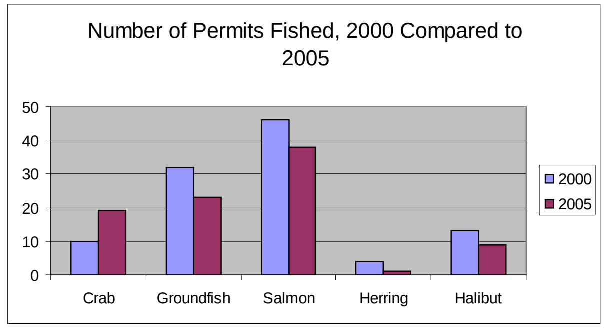
The total number of commercial fishing vessels registered to residents of King Cove dropped from 40 in 2000 to 29 in 2005. Most vessels participate in the salmon fisheries. The number of local vessels participating in the crab fisheries increased from around 5 to 20 between 2000 and 2001 and increased again between 2004 and 2005.



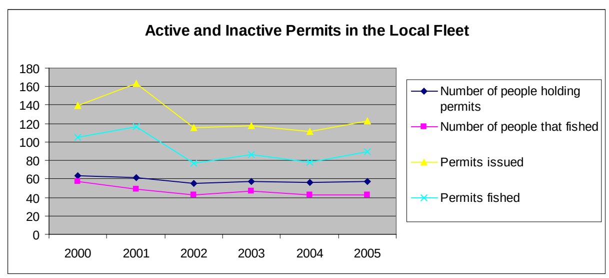
The total number of vessels (including the non-local fleet) delivering to King Cove could not be reported due to confidentiality requirements.

Permits

Every fishery in King Cove saw a slight decrease in number of permits fished between 2000 and 2005 except for the crab fisheries, which increased by almost 100% from 10 to 19.

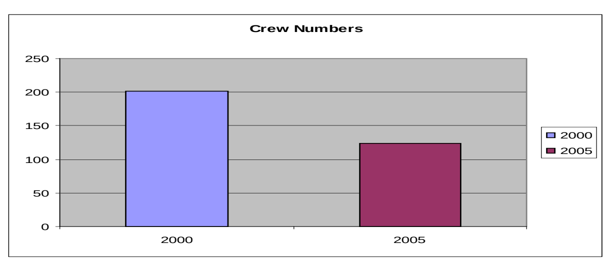


There were 139 commercial fishing permits issued to residents of King Cove in 2000 and 123 in 2005. Of the total permits issued, 105 (or 76%) were fished in 2000 compared to 90 (or 73%) in 2005. The number of residents who fished commercially (not including crew) dropped from 57 to 43.

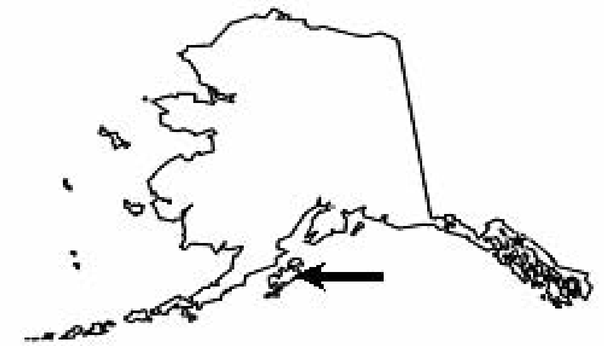


Crew

The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in King Cove dropped from 201 in 2000 to 124 in 2005.

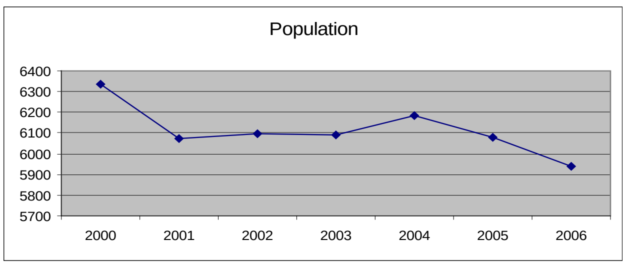


Kodiak



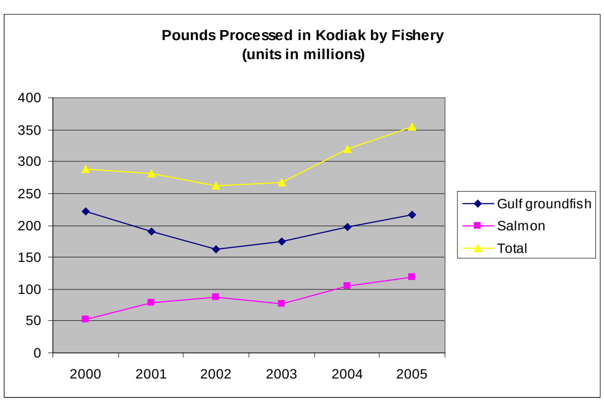
Population

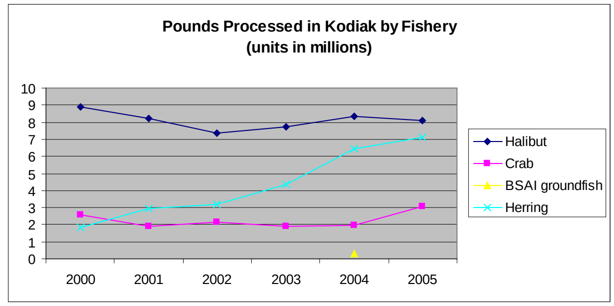
The 2006 population of Kodiak was just over 5,900 people. It dropped by about 250 people (or 5%) between 2000 and 2006. The intervening period was marked by changes between -258 and +96.



Landings

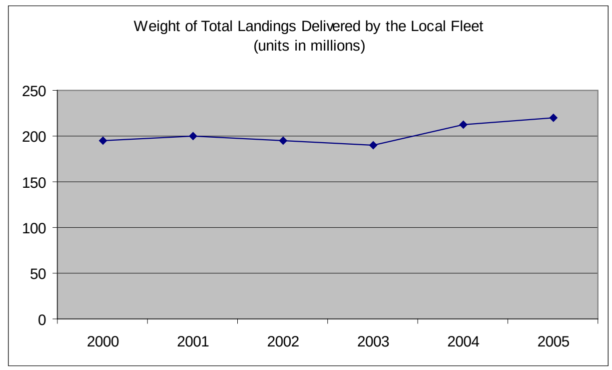
The number of processors in Kodiak increased from 26 in 2000 to 39 in 2005. The amount of fish processed has increased from 287.4 million pounds in 2000 to slightly over 354.6 million pounds in 2005. Most of the fish processed were Gulf groundfish and salmon. The amount of herring, crab, and salmon processed increased between 2000 and 2005. The greatest increase occurred with herring, increasing by 74% between 2000 and 2005.





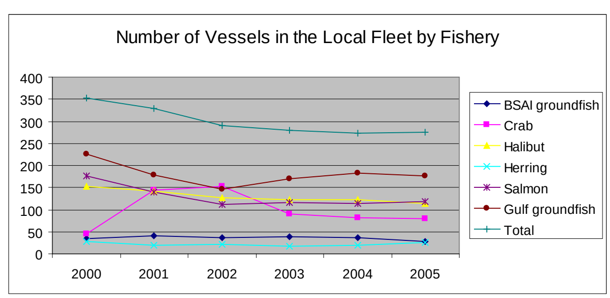
*Only BSAI groundfish in 2004 could be reported due to confidentiality reasons. Scallops and "Other invertebrates" could not be reported for any years.

The local fleet caught a total of 194.9 million pounds in 2000 and 219.9 million pounds in 2005.



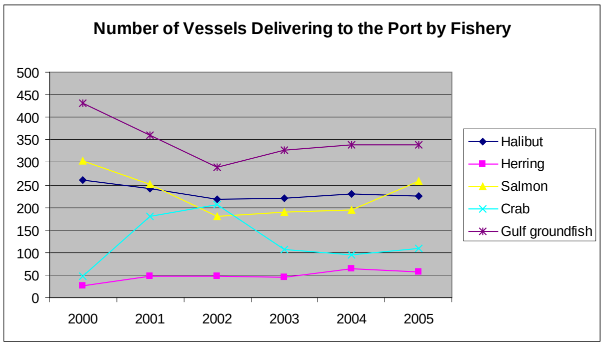
Vessels

The total number of commercial fishing vessels registered to Kodiak residents decreased from 353 in 2000 to 276 in 2005. Most vessels participate in the Gulf groundfish fisheries. The number of Kodiak vessels in the BSAI groundfish fisheries and herring fisheries has been stable over the last five years. The number of local vessels participating in the crab fisheries increased from 50 to 150 between 2000 and 2001 and then decreased by about 50% between 2002 and 2005. However, the number of local vessels in the crab fisheries in 2005 was higher than in 2000.



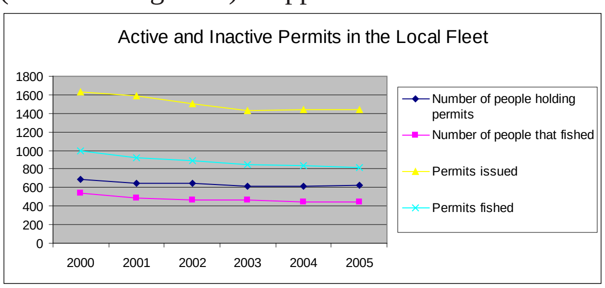
Kodiak

The Gulf groundfish fisheries had the most vessels (including the non-local fleet) delivering to Kodiak but the number decreased between 2000 and 2005 by approximately 100 vessels (or about 20%). The number of vessels delivering to Kodiak between 2000 and 2005 decreased in all fisheries except crab and herring.

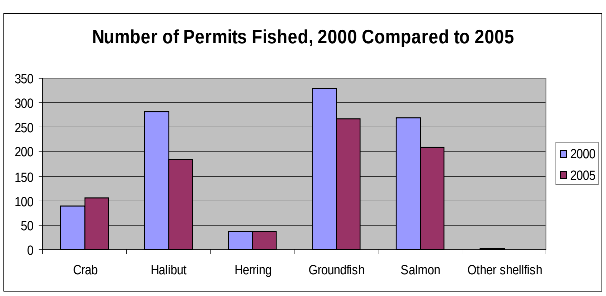


Permits

There were 1634 commercial fishing permits issued to residents of Kodiak in 2000 and 1442 in 2005. Of the total permits issued, 991 (or 61%) were fished in 2000 compared to 818 (or 57%) in 2005. The number of residents who fished commercially (not including crew) dropped from 540 to 445.

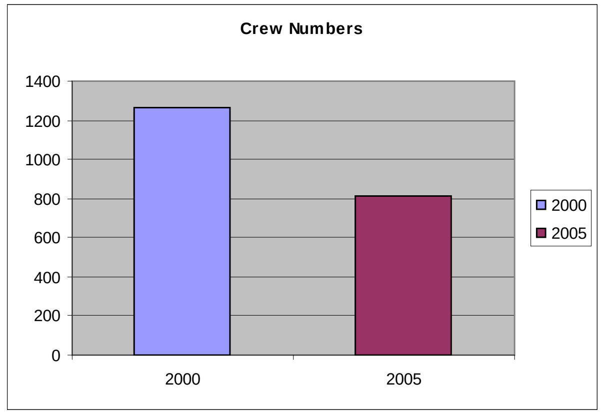


The number of permits fished by Kodiak residents decreased in each fishery except for the crab fisheries, which increased from 89 in 2000 to 106 in 2005, and the herring fisheries, which remained the same.



Crew

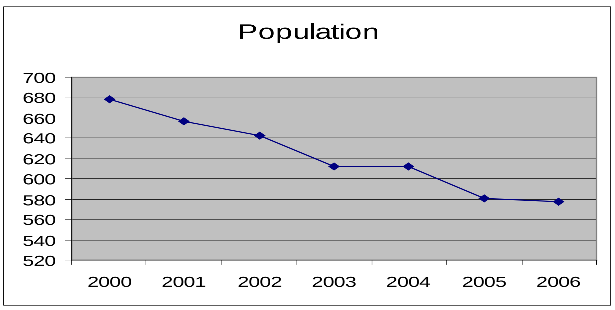
The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in Kodiak dropped from 1263 in 2000 to 814 in 2005.



Naknek

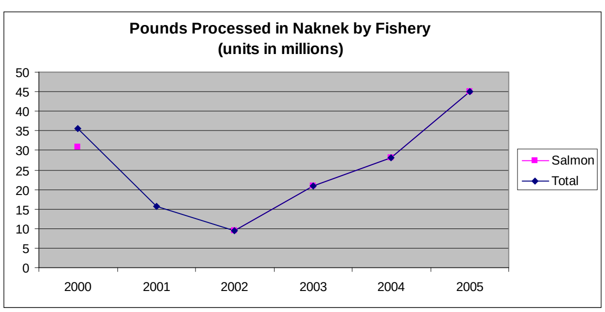
Population

The 2006 population of Naknek was almost 580 people. It has decreased consistently since 2000 by 4 to 30 people each year except for 2003-2004 and 2005-2006 when it was relatively stable.



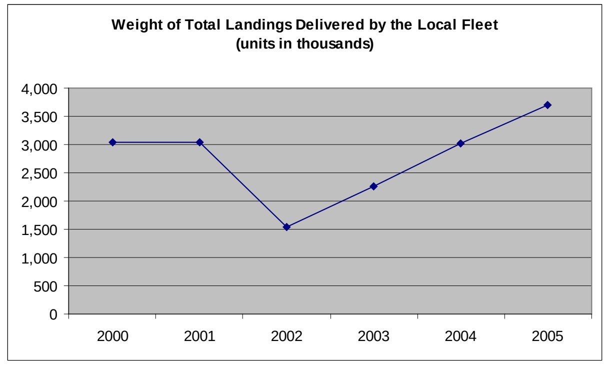
Landings

The number of processors in Naknek increased from 17 in 2000 to 22 in 2005. The amount of fish processed has increased from 35.5 million pounds in 2000 to slightly over 45 million pounds in 2005. Most of the fish processed is salmon. In 2000, herring was also processed.



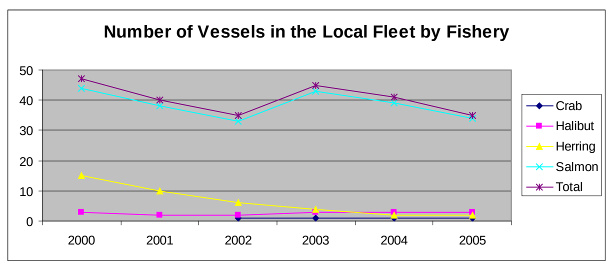
* Due to confidentiality requirements, the amount of herring (processed in 2000) or salmon processed in 2001 could not be reported.

The local fleet caught a total of 3 million pounds in 2000 and 3.7 million pounds in 2005.

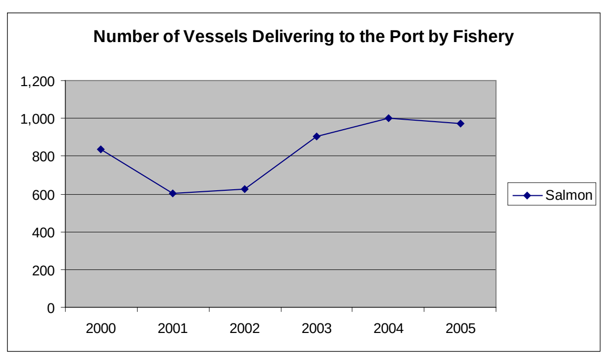


Vessels

The total number of commercial fishing vessels registered to Naknek residents dropped from 47 in 2000 to 35 in 2005. Most vessels participate in the salmon fisheries. The number of vessels in the halibut fisheries has been the most stable over the last five years. The fishery with the greatest decrease in participating boats is the herring fisheries, which dropped from 15 to 2 vessels.



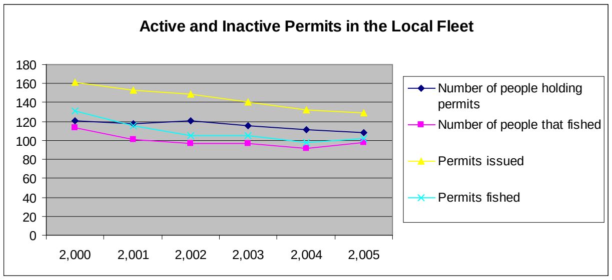
The number of vessels (including the non-local fleet) delivering salmon to Naknek increased slightly between 2000 and 2005, from just over 800 vessels to just under 1,000 (an increase of over 20%).



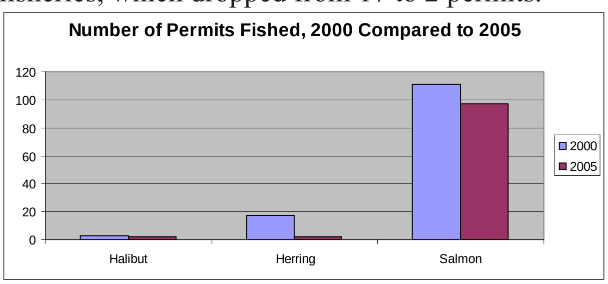
Naknek

Permits

161 commercial fishing permits were issued to residents of Naknek in 2000 and 129 were issued in 2005. Of these permits, 131 (or 81%) were fished in 2000 compared to 102 (or 79%) in 2005. The number of residents who fished commercially (not including crew) dropped from 113 to 98.

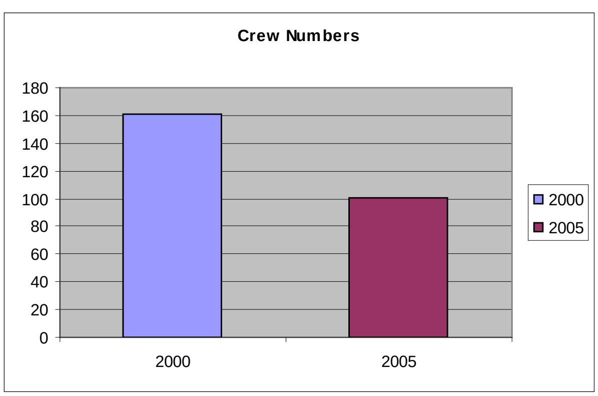


The number of permits fished by residents of Naknek decreased in each fishery between 2000 and 2005, except for halibut which remained the same. The greatest decrease occurred in the herring fisheries, which dropped from 17 to 2 permits.

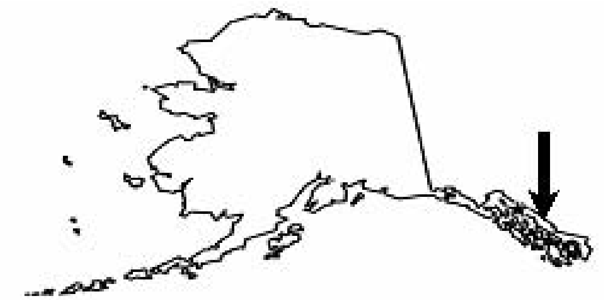


Crew

The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in Naknek dropped from 161 in 2000 to 101 in 2005.

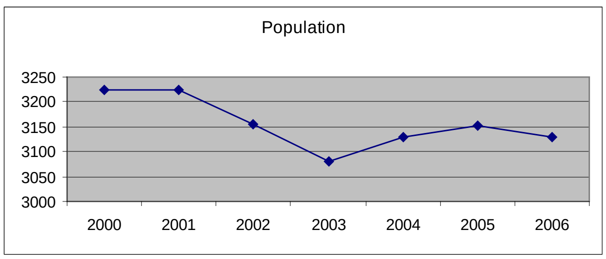


Petersburg



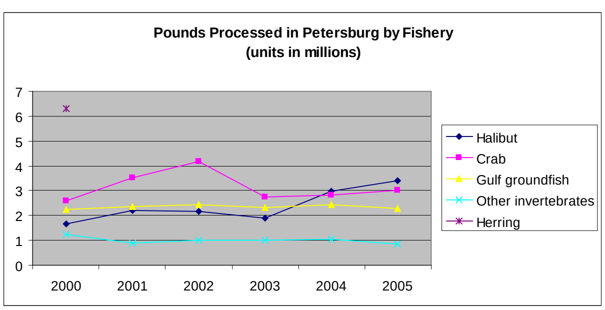
Population

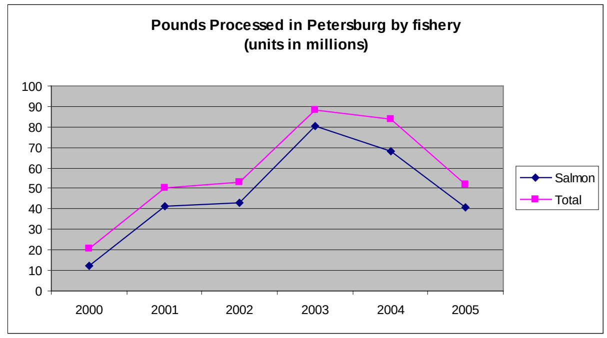
The population of Petersburg is almost 3,130 people. It dropped by around 95 people (about 3%) between 2000 and 2006. The intervening period was marked by a decrease of 145 between 2001 and 2003, and a partial rebound to 3,129 in 2006.



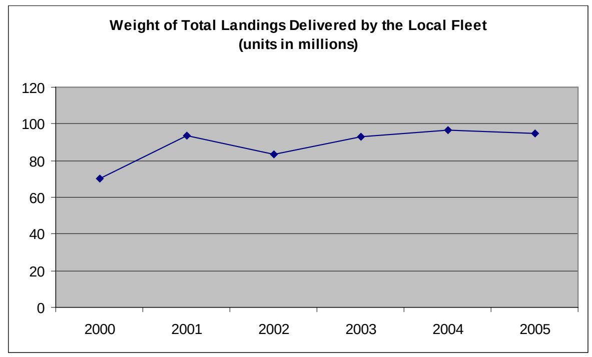
Landings

The number of processors in Petersburg increased from 36 in 2000 to 50 in 2005. The total amount of fish processed has increased from 20.9 million pounds in 2000 to 51.7 million pounds in 2005. The amount of total fish processed increased between 2000 and 2003 and then decreased through 2005. Most seafood processed in Petersburg is salmon which increased sharply from 10 million to 80 million pounds between 2000 and 2003 and since then has decreased by 50%. Since 2004, slightly more halibut has been processed than crab.



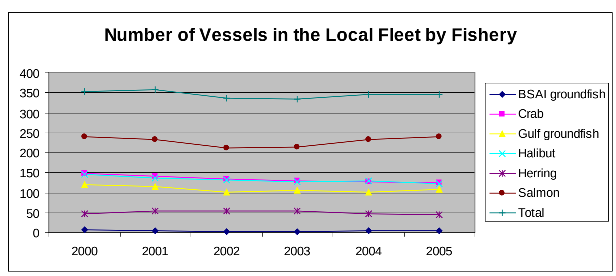


The local fleet caught a total of 70 million pounds in 2000 and 95 million pounds in 2005.



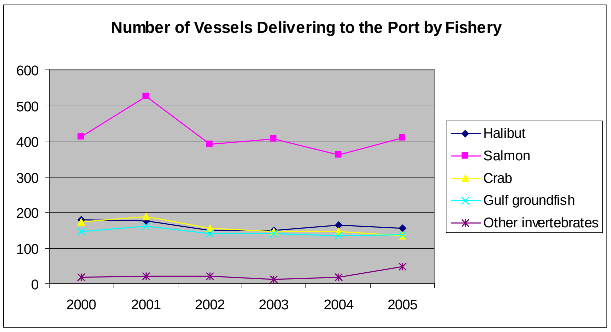
Vessels

The total number of commercial fishing vessels registered to Petersburg residents decreased only slightly from 354 in 2000 to 345 in 2005. Most vessels participate in the salmon fisheries. The vessel numbers in most fisheries remained fairly constant between 2000 and 2005. The biggest changes were seen in crab fisheries, which decreased from 148 local vessels in 2000 to 125 in 2005 and halibut, which decreased from 146 local vessels in 2000 to 123 in 2005.



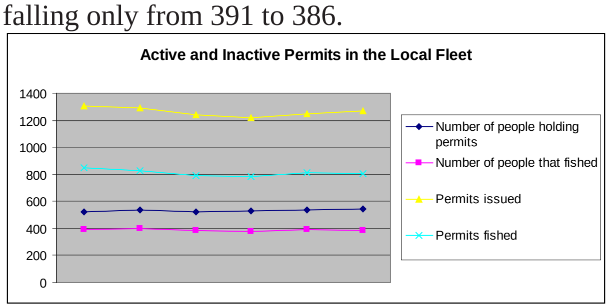
Petersburg

Most vessels (including the non-local fleet) delivered salmon to Petersburg. The number of vessels delivering in each fishery decreased slightly between 2000 and 2005 with the exception of vessels delivering "other invertebrates," which increased by around 150% from 18 to 49 vessels.

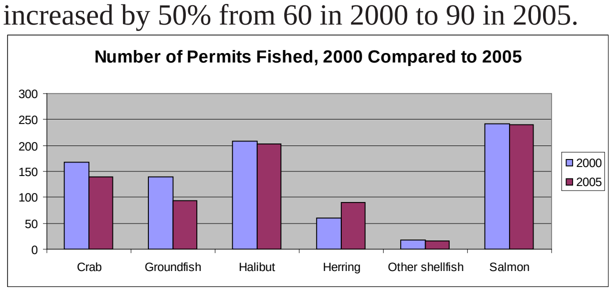


Permits

There were 1306 commercial fishing permits issued to residents of Petersburg in 2000 and 1269 in 2005. Of the total permits issued, 852 (or 65%) were fished in 2000 compared to 806 (or 64%) in 2005. The number of residents who fished commercially (not including crew) was stable, falling only from 391 to 386.

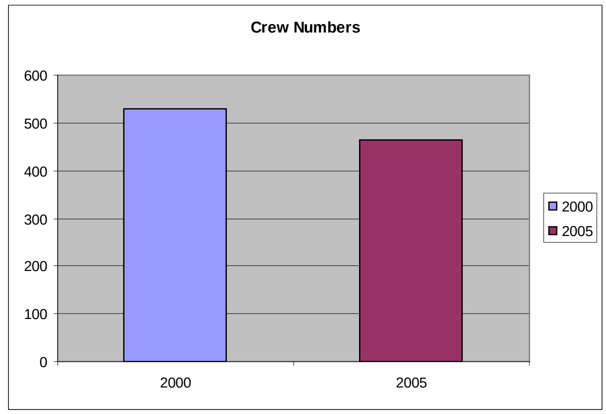


The number of permits fished by residents of Petersburg decreased slightly between 2000 and 2005, except for the herring fisheries, which increased by 50% from 60 in 2000 to 90 in 2005.

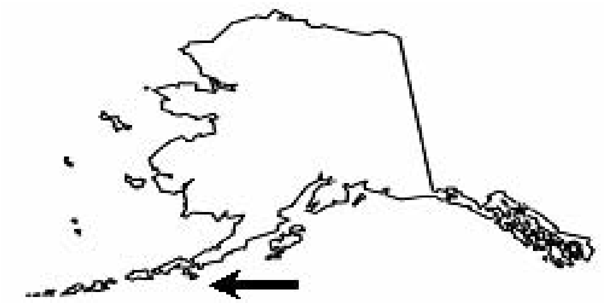


Crew

The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in Petersburg dropped from 530 in 2000 to 463 in 2005.

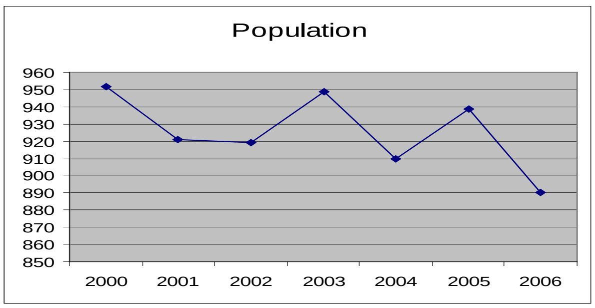


Sand Point



Population

The population of Sand Point is around 890 people, around 60 people (7%) less than it was in 2000. The intervening period was marked by changes between -49 and +30.

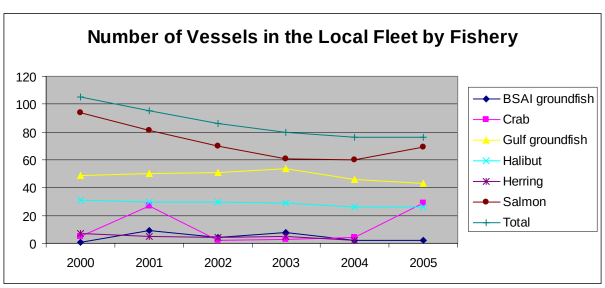


Landings

The amount of landings in Sand Point cannot be reported due to confidentiality requirements.

Vessels

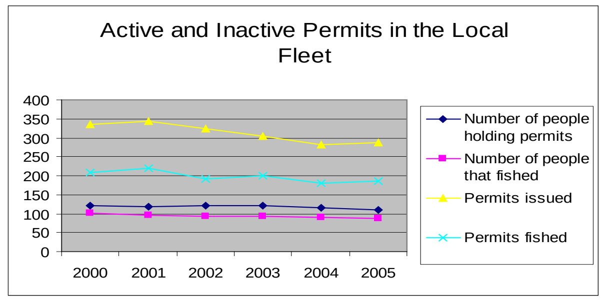
The total number of commercial fishing vessels registered to residents of Sand Point decreased from over 100 in 2000 to under 80 in 2005. The most stable fishery between 2000 and 2005 was the Gulf groundfish fisheries. The number of crab vessels increased by 480% between 2000 and 2005 (from 5 to 29).



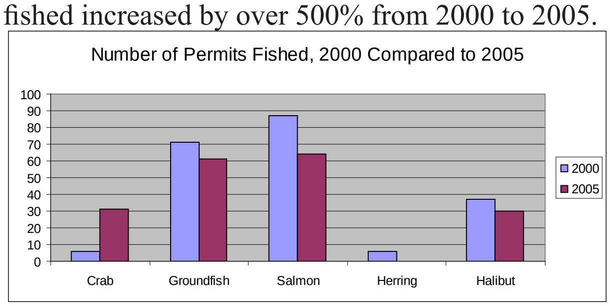
The total number of vessels (including the non-local fleet) delivering to Sand Point could not be reported due to confidentiality requirements.

Permits

There were 334 commercial fishing permits issued to residents of Sand Point in 2000 and 287 in 2005. Of the total permits issued, 208 (or 62%) were fished in 2000 compared to 187 (or 65%) in 2005. The number of residents who fished commercially (not including crew) decreased from 102 to 87.

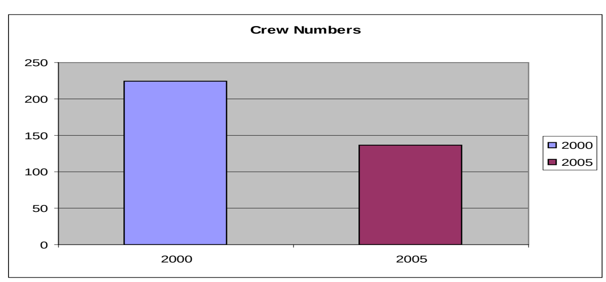


For all fisheries in Sand Point except for the crab fisheries, the number of permits fished in 2000 was fewer than in 2005. The number of crab permits fished increased by over 500% from 2000 to 2005.

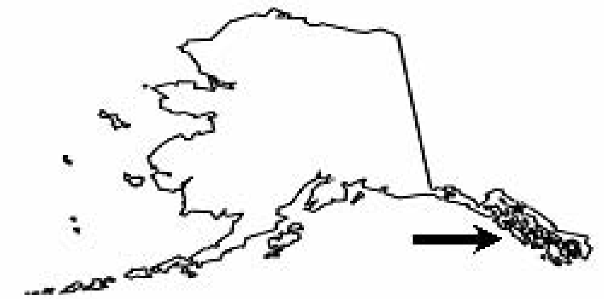


Crew

The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in Sand Point dropped from 225 in 2000 to 136 in 2005.

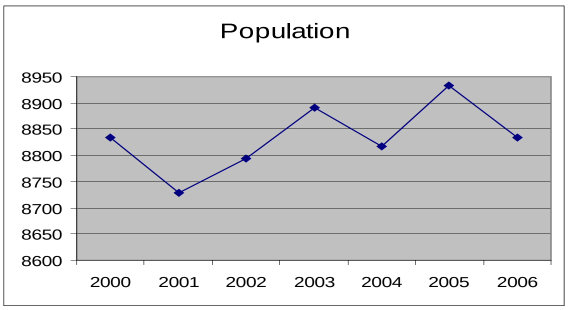


Sitka



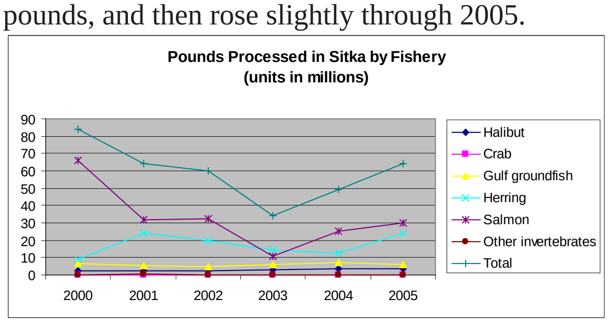
Population

The population of Sitka is around 8,830 people. It was nearly the same in 2000 (8,835), although the intervening period was marked by changes between -107 and +116.



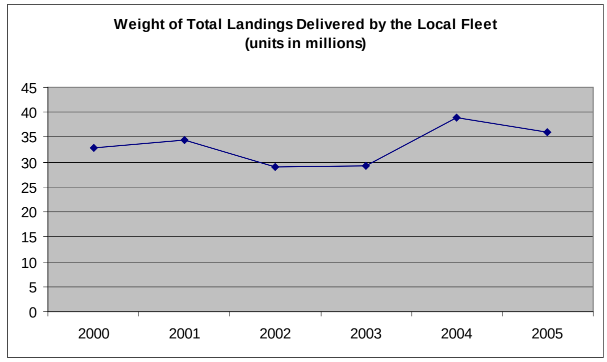
Landings

The number of processors in Sitka dropped from 141 in 2000 to 98 in 2001. The number continued to drop to 78 in 2005. The amount of fish processed decreased from 84.2 million pounds in 2000 to 64.3 million pounds in 2005. Most of the fish processed is salmon. The amount of salmon processed decreased sharply between 2000 and 2003 from almost 7 million pounds to just 10 million pounds, and then rose slightly through 2005.



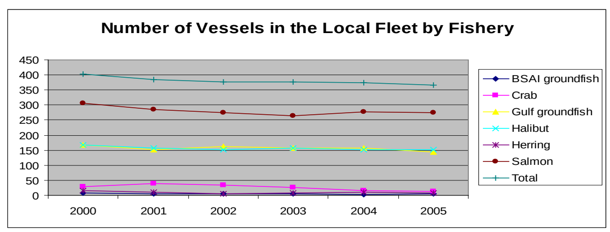
* The amount of scallops (only available for 2003) or "other finfish" could not be reported due to confidentiality requirements.

The local fleet caught a total of 32.8 million pounds in 2000 and 36 million pounds in 2005.

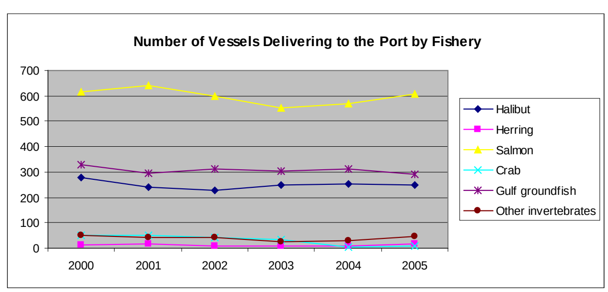


Vessels

The total number of commercial fishing vessels registered to Sitka residents dropped from 404 in 2000 to 367 in 2005. The largest fleet is the salmon fleet. Vessel numbers in all fisheries decreased slightly. The biggest drops were seen in the small local fleets fishing crab, BSAI groundfish, and herring fisheries, each decreasing by around 50%.



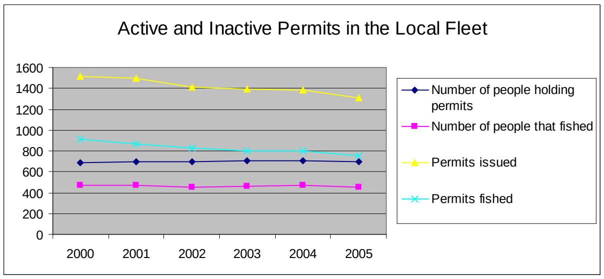
The majority of vessels delivering to Sitka processors participated in the salmon fisheries. The number of vessels delivering to Sitka remained fairly stable between 2000 and 2005 for all fisheries with the exception of the crab fisheries which decreased from 51 vessels in 2000 to 8 vessels in 2005.



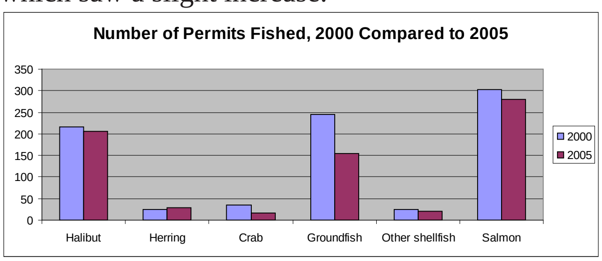
Sitka

Permits

There were 1516 commercial fishing permits issued to residents of Sitka in 2000 and 1309 in 2005. Of the total permits issued, 910 (or 60%) were fished in 2000 compared to 754 (or 58%) in 2005. The number of residents who fished commercially (not including crew) dropped from 471 to 449.

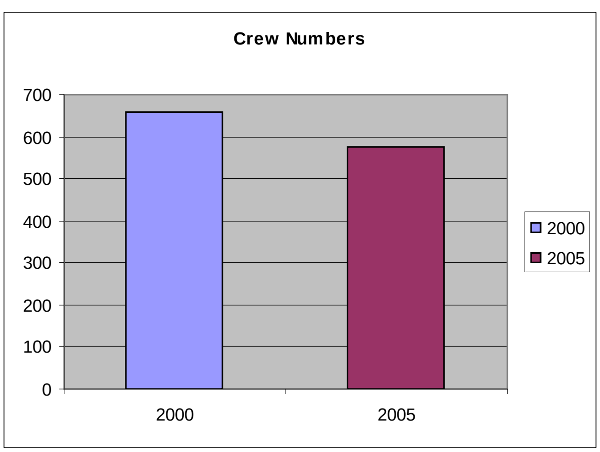


The number of permits fished by residents of Sitka decreased slightly between 2000 and 2005 in all fisheries with the exception of the herring fisheries, which saw a slight increase.



Crew

The number of residents holding Alaska Commercial Fishing Vessel Crewmember licenses in Sitka dropped from 658 in 2000 to 574 in 2005.



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Research and Data Collection Project Summaries and Updates, 2007

Alaska Recreational Fisheries Demographic Data

Jennifer Sepez
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Recreational fishing draws significant participation in Alaska by in-state and out-of-state participants. The activity generates considerable revenue, may have substantive ecosystem impacts, and adds further complexity to allocation decisions. In this research a demographic profile of recreational fishing in Alaska is presented, based on data from the Alaska Department of Fish and Game's license sales database from 1993-2005 and a NOAA Fisheries survey of licensed marine anglers in Alaska in 2002. Information such as age, gender, race/ethnicity, education, income, and number of days fished were evaluated. Alaska resident anglers differ from out-of-state anglers in all of these categories. Expansion in the recreational fishery over the last decade, as indicated by increase in license sales, was driven almost entirely by out-of-state participants. These demographic differences and growth trends help shape a fuller understanding of the fishery that is the basis for informed management decisions. Presentations of these data so far include:

Little, J. and J. Sepez. 2006. "Demographics of Recreational Fisheries in Alaska." Poster presented at Society for Human Ecology meetings, Bar Harbor, October 2006. ftp://ftp.afsc.noaa.gov/posters/pLittle01_demographics.pdf

Little, J. and J. Sepez. 2007. "Demographics of Recreational Fisheries in Alaska." Poster presented at American Fisheries Society meetings, San Francisco, September 2007. ftp://ftp.afsc.noaa.gov/posters/pLittle01_demographics.pdf

Sepez, J. and J. Little, 2007. "Residency as a Key Demographic Variable in Analysis of Recreational Fisheries in the North Pacific." Paper presented at Coastal Zone 07, Portland, OR, July 2007.
http://www.csc.noaa.gov/cz/2007/Coastal_Zone_07_Proceedings/Main_Menu.pdf

Amendment 80 Head and Gut Catcher/Processor Sector Economic Data Collection

Brian Garber-Yonts and Ron Felthoven
**For further information, contact Brian.Garber-Yonts@NOAA.gov or Ron.Felthoven@NOAA.gov*

Beginning in 2008, the non-AFA Trawl catcher/processing (CP) sector will be rationalized under a fishery cooperative program. Under the terms of the June 2006 Council motion, a mandatory socioeconomic data collection program will be implemented for the entire sector. Key elements of the Amendment 80 problem statement are the reduction of bycatch and improved utilization of groundfish. Socioeconomic data are needed to assess whether the cooperative formation addresses the goal of mitigating the costs associated with bycatch reduction, to understand the economic effects of the Amendment 80 program on vessels or entities regulated by this action, and to inform future management actions. The program will collect cost, revenue, ownership, and employment data on an annual basis. During 2nd Quarter, 2007, ESSRP scientists developed draft data collection instruments and, in collaboration with NMFS Alaska Region staff, prepared regulatory text and draft Paper Reduction Act (PRA) documentation to support the data collection program. Data collection for the H&G fleet is expected to begin in 2009.

BSAI Crab EDR Validation Audit

Ron Felthoven and Brian Garber-Yonts

**For further information, contact Ron.Felthoven@NOAA.gov or Brian.Garber-Yonts@NOAA.gov*

In collaboration with Pacific States Marine Fisheries Commission, ESSRP scientists have overseen a validation review of BSAI Crab EDR data by the accounting firm Aldrich, Kilbride and Tatone, LLC (AKT). Principal objectives of the validation exercise are to assess and quantify the measurement error associated with the EDR instruments and provide an incentive to maintain accuracy and rigor in reporting cost and earnings information. The validation review includes both random audits, based on a statistical sample of the EDR population, and non-random audits of EDRs identified on the basis of missing variables or outliers in reported information. As of March 2007, a portion of the audits remained incomplete due to non-response from submitters, who were referred to NMFS Alaska Region enforcement. AKT selected vessels or processors for audit based upon a statistical sample; for each vessel or processor selected for audit, detailed support was requested and examined for each year in which the selected vessel or processor submitted an EDR. Variables for audit were selected from those that could be validated by documented support. For each data variable requested, AKT critically evaluated the support provided against third party support, such as invoices or fish tickets; internally-generated information, such as crew settlement sheets, general ledger details, detailed internal reports, or financial statements; and estimates made, including the reasonableness of assumptions. AKT also noted when no support was available to evaluate the information. Preliminary results of the audit indicated that the information submitted in EDRs was generally well-supported by documentation and records. However, despite the specific definitions included in the EDRs, there is still variability in how information is reported based upon the ability to break down information in the manner requested in EDR forms. In addition, there is significant variability in the quality of supporting documentation to information submitted in the EDRs. A final revision of the audit report was completed in early 3rd quarter FY07 and used in development of data quality protocols for the crab EDR data and revisions to the EDR forms.

BSAI Crab EDR Data: Protocols for Confidentiality and Data Quality

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Based on public testimony and a recommendation from the Advisory Panel at the December 2006 meeting, the NPFMC passed a motion directing staff to develop protocols concerning data collected under the BSAI crab rationalization Economic Data Reporting (EDR) program. The protocols apply to two general areas: 1) maintaining data confidentiality and 2) assessing the quality of the data to ensure accuracy. ESSRP scientists prepared a discussion paper to outline the legal, regulatory, and administrative standards that apply to confidentiality and data quality, and remaining issues to be resolved in regard to crab EDR data. The paper sets forth the process that AFSC staff, in collaboration with Council and NMFS Alaska Region staff, will undertake to develop both sets of protocols to ensure that industry and Council concerns regarding the crab EDR program are addressed. The paper was presented at the March/April Council meeting and received the endorsement of the AP and Council (time limitations did not allow the SSC to receive a presentation of the paper). The protocols will be developed with public, industry, and scientific peer input, with workshops to be held during fall 2007.

Collecting Regional Economic Data for Alaska Fisheries

Hans Geier and Chang Seung*
For further information, contact Chang.Seung@NOAA.gov

Regional or community economic analysis of proposed fishery management policies is required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA), National Environmental Policy Act (NEPA), and Executive Order 12866, among others. For example, National Standard 8 (MSA Section 301[a][8]) explicitly requires that, to the extent practicable, fishery management actions minimize economic impacts on fishing communities. To satisfy these mandates and inform policymakers and the public of the likely regional economic impacts associated with fishery management policies, economists need appropriate economic models and data to be used for implementing the models.

While there exist many regional economic models that can be used for regional economic impact analysis for fisheries (Seung and Waters 2006), much of the data required for regional economic analysis of fisheries are either unavailable or unreliable. IMPLAN (IMpact analysis for PLANning) is widely used by economists for implementing various regional economic models. However, for several reasons, it is not advisable to use unrevised IMPLAN data for analyzing U.S. fishery industries in general and Alaska fishery industries in particular. First, IMPLAN applies national-level production functions to regional industries, including fisheries. While this assumption may not be problematic for many regional industries, use of average production relationships may not accurately depict regional harvesting and processing technologies. Therefore, to correctly specify industry production functions, it is necessary to obtain primary data on harvesting and processing sector expenditures through detailed surveys or other methods. Second, the employment and earnings of many crew members in the commercial fishing sector are not included in the IMPLAN data because IMPLAN is based on state unemployment insurance program data which excludes those who are self-employed and casual or part-time workers. Therefore, IMPLAN understates employment in the commercial fishing sectors. Processing sector data is also problematic because of the nature of the industry. Geographical separation between processing plants and company headquarters often leads to confusion as to the actual location of reported employment. Finally, fishery sector data in IMPLAN are highly aggregated. Models using aggregate data cannot estimate the potential impacts of fishery management actions on individual harvesting and processing sectors. To estimate these types of impacts, IMPLAN commercial fishery-related sectors must be disaggregated into subsectors by vessel and processor type. This requires data on employment, labor income, revenues and expenditures (intermediate inputs) by vessels and processors. An additional problem with IMPLAN data in small rural economies like Alaska fishing communities is that data are often inaccurate because of the nature of rural enterprises and populations. Much of rural Alaska operates on a cash or exchange basis, thus much economic activity is not accounted for in conventional data sources. Community surveys are to be used to correct this anomaly in rural Alaska fishing communities (Holland *et al*. 1997).

In sum, while regional economic models for analysis of fisheries do exist, reliable data on fisheries-related economic sectors necessary to implement the models are lacking. The absence and/or deficiencies of these data have severely limited development of viable regional economic models for fisheries. Currently, two data collection projects are underway in the Southwest and Gulf Coast regions of Alaska.

In the two projects, we will collect data on employment, labor income, and costs for fishery industries. For information on employment and labor income, we will use mailout surveys to the fleet. For estimating information on costs, we will use two different methods. First, for much of the operating and ownership costs for vessels, we will use a “cost-engineering” approach in which boat builders and suppliers will be contacted with average vessel specifications, and asked to provide information on costs that these boats will incur. Second, interview and telephone calls will be made to suppliers of inputs to vessels (i.e., local businesses and fish processors).

To date, the following tasks have been completed for the two data collection projects. First, mailout survey questions for three different classes of vessels were developed. Also, the phone interview scripts for vessel owners were developed. Second, the procedures for sampling (unequal probability sampling and determining sample size) were constructed; using the sampling procedures, the optimal sample sizes for the three different vessel classes for each region were derived using Poisson variance. Third, the phone interview scripts for local businesses and fish processors were finalized. Fourth, the paper reduction act (PRA) packets (which include supporting statement) were prepared and submitted to OMB. Fifth, interviews were made with, or telephone calls were made to, boat builders/dealers (for cost engineering). Sixth, visits to processing plants (headquarters) were made to maintain the relationships that are important for data collection. Seventh, community visits were made to groundtruth the IMPLAN information.

The PRA packet for Southwest project was approved by OMB on July 30, 2007. The packet for the Gulf Coast project is still under review at OMB. Once the PRA packet for Gulf Coast project is approved, the schedule for the two projects is as follows: (1) conduct interviews and telephone calls to suppliers of inputs (local businesses and fish processors), (2) conduct Pareto sampling to determine the vessels to which the surveys will be sent, (3) mail out the surveys to vessels, (4) examine the statistical validity of the survey results, (5) revise IMPLAN data with the primary data estimated as above and balance the social accounting matrix (SAM), and (6) develop regional economic models such as input-output (IO) or computable general equilibrium (CGE) models.

It should be emphasized that a good deal of effort has gone into developing an appropriate sampling methodology for the ongoing regional economic data collection projects. Since the majority of gross revenue within each harvesting sector comes from a small number of boats, a simple random sampling (SRS) of boats would only include a small portion of the total ex-vessel values, and therefore, would be misleading. Therefore, an unequal probability sampling (UPS) method without replacement will be used. The objective of implementing the sampling task is to estimate the employment and labor income information for each of three disaggregated harvesting sectors using the ex-vessel revenue information provided by CFEC earnings data. Since each sector will be used as a separate economic sector in the IMPLAN model, we face three separate problems for three different sectors in sampling (and thus must use a UPS without replacement for each sector). Many methods exist in the literature for conducting UPS without replacement. One critical weakness with most of these methods is that the variance estimation is very difficult because the structure of the 2nd order inclusion probabilities is complicated. One method that overcomes this problem is Poisson sampling. However, the problem with Poisson sampling is that the sample size is a random variable, which increases the variability of the estimates produced. An alternative method that is similar to Poisson sampling but overcomes its weaknesses is Pareto sampling (which yields a fixed sample size).

As a result, there are two tasks that we need to accomplish to estimate the population parameters using the UPS. First, the optimal sample size needs to be determined. Second, once the optimal sample size is determined, the population parameters and confidence intervals need to be estimated. For the first task, we will use the Poisson *variance* (not Poisson sampling). For the second task, we will use a Pareto sampling method. In determining the optimal sample size, we will use information on an auxiliary variable (ex-vessel revenue). To estimate the population parameters, we will use actual response sample information on the variables of interest (employment and labor income). With inputs from experts in UPS sampling, a document detailing these sampling procedures has been completed and an Excel program has been developed to show these procedures using example data (2002 ex-vessel value data for the small boat sector).

When these two regional data collection projects are completed, another data collection project for the Southeast region will be conducted. The regional economic models developed with the data obtained via these projects as well as other available data are expected to provide policy-makers with useful information on the effects of fishery management policies on fishery-dependent communities.

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Common Property, Information, and Cooperation: Commercial Fishing in the Bering Sea

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A substantial theoretical and experimental literature has focused on the conditions under which cooperative behavior among actors providing public goods or extracting common-property natural resources is likely to occur. The literature identifies the importance of coercion, small groups of actors, or the existence of social norms as being conducive to cooperation. In this paper we investigate a natural experiment in which information on extractive activities with respect to a common property resource is relayed to all players. These players operate under an overall harvest total allowable catch (TAC), and consequently, one player's actions can have a deleterious effect on all players. The case we investigate is incidental catch (termed bycatch) of halibut by the Alaskan flatfish fishery, where participants voluntarily report bycatch information to an agent who then distributes data to the fleet. Consequently, fishermen know the extent to which other fishermen are avoiding bycatch, and are thereby able to observe efforts by other fishermen to avoid bycatch and to extend the fishing season for marketable fish species. Using a mixed logit model of spatial fishing behavior our results show that cooperative behavior is prevalent early in the season, but significant heterogeneity with respect to bycatch avoidance arises as bycatch TACs tighten.

Comprehensive Socioeconomic Data Collection for Alaskan Fisheries

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Many of the fishery management actions taken by the North Pacific Fishery Management Council (NPFMC) require various types of socioeconomic analyses before they can be implemented. Typically these analyses must examine a range of alternatives, and the associated nature, magnitude, and distribution of the economic, welfare, and sociocultural impacts of the proposed action(s). Specifically, economic analyses, including "benefit/cost" analysis, as well as regional and/or community impact analysis of proposed fishery management policies are required by the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Endangered Species Act, the Marine Mammal Protection Act, the National Environmental Policy Act (NEPA), and Executive Order 12866, and other applicable Federal laws.

In addition, the 2006 reauthorization of the Magnuson-Stevens Fishery Management and Conservation Act (MSA) includes heightened requirements for the analysis of socioeconomic impacts and the collection of economic and social data. These changes eliminate the previous restrictions on collecting economic data, clarify and expand the economic and social information that is required, and make it explicit that the Councils *and* the Secretary of Commerce have the authority and/or responsibility to collect the economic and social information necessary to meet requirements of the MSA (and that either the Councils or the Secretary can initiate the collection of said socioeconomic data).

For these reasons satisfactory socioeconomic analyses are integral to myriad procedural requirements that help the NPFMC achieve their fishery management goals and abide by federal laws. It is clear that without access to the information needed to support many of the aforementioned analyses the associated legal documents may fail to meet established standards. In order to better address these concerns, as well as others pertaining to community impacts, the NPFMC passed an October 2006 motion to draft a comprehensive program for collecting revenue, ownership, employment, cost, and expenditure data for fisheries in and off Alaska.

In response, the Economic and Social Sciences Research Program (ESSRP) at the Alaska Fisheries Science Center (AFSC) coordinated a working group to propose a core set of data that is currently unavailable yet important for answering many of the questions raised when evaluating past and future management decisions, and conducting regulatory and legally mandated analyses. The working group was comprised of individuals representing the National Marine Fisheries Service (NMFS), Alaska Department of Fish and Game (ADF&G) and Commercial Fisheries Entry Commission (CFEC), NPFMC, NOAA GC, and Alaska Department of Commerce (ADOC). As with any working group, there were differences of opinion within the group. For this group, the differences were primarily over the level of detail that should be required in the data collection. However, all involved basically shared the same frustration over the lack of social and economic data and felt that we need to develop a comprehensive program. In an attempt to propose a feasible program and to decrease the perceived reporting burden, and taking into consideration what we've learned in collecting such information in the BSAI crab fisheries, the suggestions included in this paper are typically consistent with the minimum necessary level of detail/information requested by the group (some individuals or agencies requested that much more detailed information be collected). In the discussion paper we lay out these proposed data collection elements and provide a detailed discussion on the need for improved socioeconomic data collection for fisheries in and off Alaska.

Demand for Halibut Sport Fishing Trips in Alaska

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The halibut sport fishery in Alaska is quite large. In 2000, for instance, over 400,000 halibut were harvested by sport anglers in the state (Jennings, et al., 2006). In recent years, harvest in the recreational charter boat sector has exceeded the guideline harvest limit (GHL) in Area 2C (Southeast Alaska). In response, the North Pacific Fishery Management Council (Council) is considering several regulatory changes including, among other options, reducing the allowable catch in the charter boat recreational sector. Catch by non-charter boat recreational halibut anglers are not subject to the GHL and are accommodated through reductions in the commercial TAC. To assess the impacts of pending and potential regulatory changes on sport angler behavior, it is necessary to have estimates of the baseline demand for halibut fishing trips and an understanding of the factors that affect it.

To this end, Dan Lew has been working with Doug Larson (University of California, Davis) to develop and implement a survey that collects information about saltwater recreational fishing trips in Alaska. The project consists of three major phases. The first phase involves developing and pretesting the survey instrument. This phase includes testing the survey instrument using focus groups, cognitive interviews, and a formal pretest survey implementation. These activities were completed in 2006 following OMB approval. During the second phase, final versions of the survey are developed and implemented through a mail survey of Alaska sport anglers. The survey implementation followed a modified Dillman Tailored Design Method to maximize response. This phase of the project was completed in August 2007. The final phase of the project, in which data will be analyzed and results reported, is currently in progress.

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Effects of Rationalization on Processor Competition

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A vital step in predicting how communities will be impacted by fishery rationalization is to understand how rationalization will affect the landing port selection decision of fishers. To accomplish this one must first know how the competitive balance between spatially differentiated processors will change under rationalization. While spatial impacts on competition have been examined in the economics literature from both theoretical and empirical perspectives for a variety of industries, the issue has remained largely untouched with respect to the fish processing industry. The goal of this research is to develop a theoretical model of spatial competition for a fish processing sector and, through the use of simulation analysis, examine how rationalization is expected to impact the competitive behavior of processors under different assumed market and cost structures. In subsequent research, this theoretical model will form the basis for the development of an econometric methodology that will allow applied researchers to empirically estimate spatially weighted price response functions to determine how rationalization has impacted the competition in processing sectors for fisheries that have changed management from regulated open-access to some form of rights-based management.

The relationship between spatial location and pricing behavior has been analyzed for many decades. Ex-vessel pricing, however, introduces interesting market features that are not encountered in more traditional location models. First, location models are often framed as a competitive monopolist situation with no quantity constraints. Ex-vessel markets are often better characterized as monopsonistic markets and the markets are quantity-constrained by total allowable catch measures (TAC). Second, where more traditional location models consider the situation to be one of optimal location choice by competing monopolists, ex-vessel markets present situations where the competing monopsonists (processors) are stationary while the fishers are mobile. Therefore, the goal of this theoretical approach is to determine what pricing behavior processors are likely to exhibit under different assumptions about how fishers choose their fishing location. Monte Carlo simulations will be conducted to identify pricing paths under different model parameter values. Using these simulations we can also assess how our results are affected by assumed cost and market structures of the processor, the spatial abundance of resources, changes in climate, or area closures.

Experimental Design Construction for Stated Preference Choice Experiments

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Stated preference choice experiments, which involve respondents choosing between alternatives that differ in attributes, have been used primarily in the marketing literature to understand consumer preferences for market goods. In recent years, however, their usefulness for gaining insights into preferences for non-market goods has become apparent, and stated preference researchers are increasingly turning to choice experiments to value public goods (Alpizar, Carlsson, and Martinsson, 2001).

Adamowicz, Louviere, and Williams (1994) were the first to apply choice experiments to value public goods in a study of recreational opportunities in Canada. Since then, several studies have used choice experiment approaches to estimate use values for activities like hunting (Adamowicz, et al., 1997), climbing (Hanley, Wright, and Koop, 2002) and recreational fishing (Hicks, 2002; Oh, Ditton, Gentner, and Riechers, 2005). Choice experiments have also been used to estimate non-consumptive use values associated with forests in the United Kingdom (Hanley, Wright, and Adamowicz, 1998), forest loss due to global climate change (Layton and Brown, 2000) and Woodland caribou habitat in Canada (Adamowicz, et al., 1998).

A typical CE involves presenting respondents with two or more choice questions, each having a set of alternatives that differ in attributes. For each question, respondents are asked to select the alternative they like best. The choice responses are used to estimate a preference function that depends upon the levels of the attributes.

In constructing choice experiment questions, researchers must determine the set of attributes and attribute levels that respondents see in each question. This is a critical judgment, as a poor experimental design can preclude estimating important marginal effects, or conversely, a good design can significantly increase the precision of estimated parameters or provide justification for reducing the sample size. The latter is particularly important in light of the cost of carefully-constructed and tested stated preference surveys.

Dan Lew has been working with David Layton (University of Washington) and Bob Rowe (Stratus Consulting) to explore the role of model and parameter uncertainty and their effects on the statistical efficiency of stated preference choice question experimental designs. In July 2006, preliminary results from this research were presented at the Association of Environmental and Resource Economists (AERE) sessions at the 2006 annual conference of the American Agricultural Economics Association (AAEA) meeting in Long Beach, California. During 2007, this research was extended to explore the role of other design assumptions, such as the number of choices, sample size, and numbers of attribute levels, on efficiency of stated preference choice experiment designs.

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Estimating Global Trade from Pacific Fisheries for Regional Economic Models

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Products from Alaska fisheries are consumed around the world. Global demand for these products is an important source of income to Alaska fishermen, processors, and traders. The U.S. regional economic accounts (i.e. IMPLAN) distinguish between domestic versus foreign trade, but do not identify bilateral trade flows between partners. However, information about the volume and value of trade between partners is important for understanding the current, and historic, economic status of a fishery, and thus, for making reasonable projections about future economic conditions. A case in point is the recent surge in U.S. imports of Russian King crab. This goal of this project is to fill gaps in the U.S. regional economic accounts with a set of consistent benchmark data on bilateral trade in select fish products among the U.S., Canada, Mexico, Japan, China, South Korea, Russia, and Vietnam. These benchmark data were obtained or estimated using international trade data from 3 sources: i) U.S. Merchandise Trade Statistics, ii) U.N.

Merchandise Trade Statistics, and iii) U.N. FAO Fisheries Statistics for Commodity Production and Trade.

The U.S. and U.N. merchandise trade accounts are classified according to the Harmonized Commodity Description and Coding System (HS), administered by the World Customs Organization in Brussels. The U.S. data are managed by the Foreign Trade Statistics Division of the U.S. Census Bureau. The U.S. data subdivide the 4 and 6 digit HS codes into 10-digit statistical reporting categories. The 10-digit categories (http://www.census.gov/foreign-trade/reference/codes/index.html#concordance) contain many specific categories for U.S. and Alaska fisheries, such as pollock roe and fillets; frozen king, snow, and other crabs; yellowfin sole, Pacific ocean perch, sablefish, lingcod, several types of salmon, and others. In particular, the U.S. data have the volume and value of exports and imports, over time, from each U.S. customs district to each country that is a U.S. trade partner. The FAO data have a similar, or in some instances, a more refined level of detail for fish commodities, and contain information on production and trade for all of the world's fisheries over time. However, the FAO data only give volume and value of aggregate exports and imports for each country, and thus, do not identify bilateral trade flows.

The U.N. Merchandise data are the global source for identifying bilateral trade flows, but these are available only at the HS 6-digit level. For example, a HS 6-digit code identifies frozen crabs, but not the species composition that is identified in the U.S. In addition, while the FAO and U.S. trade data appear to be fairly consistent, the U.N. Merchandise data do not always match well with the other sources. They also appear in some cases to be internally inconsistent in some cases with large differences between exports reported by one country, and corresponding imports reported by another. This type of consistency problem is almost always encountered with input-output (IO) data, and resolving inconsistencies in the international trade data was the primary analytical task in this project.

This project used HS 10-digit U.S. Merchandise data to quantify trade volume and value between the U.S. and each of its trade partners, with emphasis given to Canada, China, Japan, South Korea, Mexico, Russia, and the emerging markets of Vietnam. The 6-digit U.N. Merchandise data was used to construct a set of initial IO matrices of trade flows (with columns of exporting countries and rows of importing countries). A tested and appropriate numerical procedure was then applied to 'balance' these matrices, thus estimating a set of consistent bilateral trade flows from the initial IO matrices using the FAO export/import data as constraints. The next step in this research is to develop a dynamic CGE model with global trade among these countries, which is ongoing work.

Estimating Heterogeneous Capacity and Capacity Utilization in a Multi-Species Fishery

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Ron Felthoven at the AFSC has been working with Professors Kurt Schnier and Bill Horrace at the University of Rhode Island and Syracuse University, respectively, to develop a stochastic production frontier model that accommodates heterogeneous fishing production technologies within a fishery and internally partitions these different technologies into identifiable groups. One of the goals of this research is to investigate the impact of this more flexible model on measures of fleet capacity and capacity utilization in a multi-species fishery. In our research we propose a new fleet capacity estimate that incorporates complete information on the stochastic differences between each vessel-specific technical efficiency distribution. Results indicate that ignoring heterogeneity in production technologies within a multi-species fishery, as well as the complete distribution of a vessel's technical efficiency score, may yield erroneous fleet-wide production profiles and estimates of capacity. Furthermore, our new estimate of capacity enables out-of-sample production predictions predicated on either homogeneity or heterogeneity modeling which may be utilized to inform policy makers. This paper was submitted for publication at the *American Journal of Agricultural Economics*.

Estimating Economic Impacts of Alaska Fisheries Using a CGE Model

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Fixed-price models such as input-output (IO) and social accounting matrix (SAM) models are often used for analysis of fisheries. However, these models have several important limitations. In these models, prices are assumed to be fixed, and no substitution is allowed between factors in production or commodities in consumption. As a result, in cases where the fixed-price assumption may not be realistic, these models tend to overestimate impacts. Computable General Equilibrium (CGE) models overcome these limitations. In CGE models, prices are allowed to vary, triggering substitution effects in production and consumption. The CGE model therefore enables analysts to easily examine the economic welfare implications of a policy change. Furthermore, the CGE approach is generally more appropriate than other regional economic models for analyzing the impacts of a change in productive capacity of resource-based industries.

This project will build a CGE model of the Alaska economy with explicit recognition of the fishery sectors. The investigators will use IMPLAN and other available data. Once developed, the CGE model will be used to estimate the distribution and magnitude of economic impacts associated with harvesting, processing and support activities related to Alaska fisheries. Implementation will include the following steps:

1. Gather recent annual catch for Alaska fisheries from PacFIN, AKFIN, NORPAC and related data systems.
2. Gather summary data on the residence of owners and crews of vessels operating

in Alaska fisheries and labor employed by Alaska seafood processors. Data sources include NOAA permits databases, Alaska Department of Labor reports, and other sources. (This information is important for determining “leakage” of factor income paid to non-residents working in the Alaska economy.)

3. Gather information on cost structures and the locus of input purchases by vessels and processors involved in Alaska fisheries. Major sources of data will include review of relevant literature, and interviews with researchers and key industry informants.
4. Generate a Social Accounting Matrix (SAM) of the Alaska economy using IMPLAN, REIS data, and the information gathered in steps 1–3. The SAM will incorporate the latest comprehensive economic data available and will update and build on earlier work by Seung and Waters (see below).
5. Obtain estimates of the values of key parameters and elasticities governing economic relationships in the Alaska economy. These include aggregate industry supply functions, aggregate household demand functions, and aggregate commodity import and export propensities. The focus will be on those factors, commodities and services of particular importance to commercial fisheries-related economic activity. Sources of information include review of relevant literature and interviews with researchers.
6. Develop a CGE model of the Alaska economy using data assembled in steps 1–5.
7. Use the CGE model to estimate economic impacts of selected, relevant policy issues affecting commercial fishing and related activities in Alaska.
8. Prepare final report and develop drafts for possible publication.

Currently, steps 1-3 above have been completed; the fishery-related data needed to develop the CGE model are ready. The sub-contractors (Shannon Davis and Dr. Hans Radtke) prepared a draft report which documents data sources, summarizes the fishery-related data, and describes the procedures used for preparing the data. This report was reviewed by Dr. Edward Waters and Dr. Chang Seung. The remaining steps will be implemented beginning with development of the SAM and incorporation of the fisheries-related data into the SAM.

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Examining Dynamic Impacts of Alaska Fisheries within Time Series Modeling Framework

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Virtually all regional economic impact models developed so far for analysis of U.S. fisheries are static models. For example, frequently used input-output (IO) models, which have been implemented with IMPLAN for calculating regional economic impacts of fisheries, are static models. However, when the regional economic impacts of fishery management actions are calculated using single period, static models the results can be misleading since most of fishery management policies have permanent effects over time as the impacts occur over a number of periods. With static models, it is impossible to address *the timing of the impacts*, which needs to be considered in formulating fishery management policies. In addition, IO models predict always positive (negative) impacts with positive (negative) shocks to seafood industries. Fishery managers may be misled by relying on only one type of model (IO) in understating regional economic aspects of fisheries. An alternative approach that avoids these weaknesses of an IO model is to instead choose among time series models such as the vector autoregression (VAR) model, Bayesian VAR (BVAR) model, or cointegration model. Developing a time series model for Alaska fisheries will be an important milestone in research on estimating the regional dynamic impacts of fisheries. It will contribute to fishery managers' understanding of how the impacts of fishery policies will be distributed across time and better satisfy the requirements of National Standard 8.

Using borough-level historical monthly NAICS employment data (1991-2005) from the Alaska Department of Labor (ADOL), Chang Seung prepared several different datasets for each of eleven fishery-dependent boroughs or census areas and for each of two fishery-dependent regions (Southwest and Gulf Coast regions). In addition, state-level data from Bureau of Labor Statistics (BLS) was added to the datasets. Professor Ahn, a time series modeler at Washington State University, has conducted preliminary analyses of the borough-level, regional level, and state-level data. The preliminary analyses show that there are not many sectors or industries that exhibit unit root behavior. This led the investigators to analyze the state-level data within a VAR or BVAR framework. Currently, Professor Ahn and Chang Seung are trying to examine the forecasting performance using a VAR model with slightly different assumptions. Later in the project they will incorporate Bayesian information (i.e., relationships between industries obtained from IMPLAN data) in the estimation of the model to see if the forecasting performance improves. Using the model that produces the best forecasting performance, they plan to calculate the impulse response functions and multipliers to measure the impacts of industries including seafood industry.

A previous study at the AFSC did use a similar time series framework for regional economic analysis of Alaska fisheries (Seung 2007). However, the data available for the study covered a shorter time period (1990-2000) and did not perform comprehensive out-of-sample forecasts to validate the model. The results from the time series model to be developed will also be compared with those from economic impacts (multipliers) derived from IMPLAN, indicating the differences between the two alternative models (the IO model and the time series model).

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Fishing Revenue, Productivity and Product Choice in the Alaskan Pollock Fishery

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Economic performance measurement is a key element in evaluating the impacts of fishery management decisions, yet relatively little attention has been paid to this area in the fishery economics literature. The existing studies tend to focus on fish harvesting and technical efficiency, capacity utilization or quotas. Another important aspect of fishery performance, however, pertains to the revenue generated through fish processing, which is linked to both the way in which fish are harvested as well as the products produced from the fish.

In this study Ron Felthoven at the AFSC and Dr. Catherine Morrison Paul at the University of California, Davis econometrically estimate a revenue function, recognizing potential endogeneity and a variety of fishing inputs and conditions, to evaluate the factors underlying fishing revenues in the Alaskan pollock fishery. The authors find significant own-price supply responses and product substitutability, and enhanced revenues from the increases in season length and the number and duration of tows induced by the American Fisheries Act. They also find significant growth in economic productivity – higher revenues over time after controlling for observed productive factors and price changes, which exceeds that attributable to increased harvests. This paper was submitted for publication to the *American Journal of Agricultural Economics*.

Gulf of Alaska Halibut IFQ and Small Remote Fishing Communities

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Individual fishing quota programs, like other dedicated access privilege programs, are often criticized for their distributional consequences. In the Gulf of Alaska halibut fishery, many regulatory precautions were taken to preserve the character of the fishery. However, there is concern that fishing quota holdings are being reduced in small, remote Alaska fishing communities (SRFCs). Jennifer Sepez and Dan Lew have been working with University of Washington Ph.D. student Courtney Carothers to analyze quota share transactions from 1994 to 1999 to assess whether halibut fishing quota holdings are migrating away from SRFCs.

In this study, a community is a SRFC if it meets criteria based on population size, proximity to the coast, historical participation in Alaska fisheries, and designation as a rural area, which is a proxy for remoteness. Several size-based SRFC definitions are developed to account for sensitivity to population size threshold assumptions. The data show that quota share did leave the smallest SRFC communities over the five-year period, as evidenced by the net quota share change in these communities during that time. In more populated SRFC communities, the trend is generally reversed; that is, more quota share entered these communities than left. These results suggest the size of a SRFC community may influence whether its residents will sell or buy halibut IFQ and hence whether we see quota share leaving or entering the community in aggregate.

To more formally investigate the role of SRFC residency in decisions to buy or sell halibut quota share, the probability that an individual is a buyer or seller is modeled as a function of characteristics of the individual and analyzed using logit techniques. In this way, the influence of individual characteristics, such as age and the community's population, on buying and selling behavior can be separated from effects due to residency specifically in SRFCs. The logit results indicate that the marginal effect due to SRFC residency influences the decision to buy or sell more than one's age (other individual and transaction-specific effects were precluded from the model due to data limitations). The size of SRFC communities matters as well. Additional analysis is planned to explore the extent to which specific characteristics of communities contribute to buying and selling behavior more generally and to investigate the reasons underlying the observed buying and selling trends in SRFCs.

Integrating Bering Sea and Gulf of Alaska Climate Data for Socioeconomic Research

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Economists and social scientists at AFSC apply a variety of models to different socioeconomic problems and issues that affect Alaskan fisheries and communities. Researchers have begun to directly incorporate the effects of climate change into a number of these models, but do not have a straight-forward means for finding and evaluating climate data collected, organized, and analyzed by NOAA and other government agencies. As AFSC fisheries scientists better understand the relationship between changing climate and fish populations, we will be able to evaluate and predict the socioeconomic impacts of these changes. The goal of this project is to integrate spatial time-series data for several climate variables (e.g. sea surface temperature) into formats (e.g. comma delimited, MS Access, GIS) amenable to estimation with spatial econometric (i.e. predictive) models of fleet behavior. For example, one area where climate data will be immediately utilized is in fisher location choice models. These models incorporate observable information on the vessel characteristics, expected returns from choosing an area, and travel costs. The models can be significantly improved by augmenting them with area-specific information on ice coverage, winds, sea surface height, and potentially primary productivity. A second area of research will be to examine spatial correlation of economic fishery productivity and fine-scaled climate data. Another research area is to utilize the long time series of climate data that exhibit a high degree of spatial coherence, such as sea surface temperatures, into economic models of fishery dynamics. Our data sources include: 1) ocean temperatures and other information from satellite observations and multiple mooring sites in the Bering Sea and Gulf of Alaska, 2) air temperature and precipitation from terrestrial weather stations throughout the coastal areas of Alaska, and 3) the distribution of sea ice extent over time. The oceanographic and climate data are being georeferenced by latitude and longitude, and incorporated into a geographical information system (GIS). This GIS will be used by economists at AFSC, along with spatial time series for fishing effort, catch, and landings, to provide an empirical foundation for model development, estimation, and eventually, simulations of alternative management and climate scenarios.

Integrating Trip and Haul-Level Fishing Data

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An important area of work for the AFSC ESSRP is the collection of economic data that allows us to better understand and predict the behavior of fishermen and fishing enterprises. One area of data improvement that we have been pursuing over the last few years is an effort to integrate Observer Program data, which is at the haul level, with other sources of data on fishing trips such as where vessels choose to go when they depart and return to port. The following three projects briefly describe our recent efforts in this area.

Combining fish ticket and observer data to describe trips for pollock catcher vessels
One component of these efforts involves linking observer and fish ticket data for observed catcher vessels. Since 2000, the Observer Program database has contained an indicator that has facilitated data integration. We have worked with AKFIN to integrate observer and fish ticket data for all trips since 2000. Over the next year, we will work with AKFIN to integrate data for 1991-1999, which will allow for better historical analysis of vessel behavior in the context of changing environmental and regulatory conditions.

Trip-level data now available in the Observer Program database
For the first time, in 2007 the observer database now contains data on vessel trips. This information will allow us to better understand fishing location choices and how vessel behavior differs among season and fisheries. It will also allow us to track factors such as mechanical difficulties that lead to lost fishing time.

Examining fleet behavior with Vessel Monitoring System (VMS) data
VMS are required for vessels fishing for pollock, Pacific cod, and Atka mackerel and those vessels fishing in critical habitat in the Aleutians. VMS data provide very precise time-stamped location data that allows us to observe when vessels enter and depart port and how long they stay in port. Because there is such a large volume of data transmitted by the vessels it is a significant challenge to process the data. We have acquired funding from NMFS Office of Science and Technology to analyze the VMS data. This analysis will allow us to know the time spent and distance traveled for all trips, whether observed trips differ significantly from unobserved trips, and how long vessels remain in port during offloads. Additionally, we are working to examine whether we can systematically determine where fishing occurs from the analysis of VMS tracks. A publication summarizing this research is expected in 2008.

Interactive Metadata Project

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We have completed the prototype of a web-based, interactive metadata system that is available for use by ESSRP scientists. The system provides access to metadata for the most important fisheries databases that the ESSRP uses in its analysis and allows users to search the metadata both by categories of data and by specific keywords. The databases for which metadata are currently available include the blend, catch-accounting system, weekly production reports (WPR), and Federal Fisheries Permit listings maintained by the NMFS Alaska Regional Office; CFEC fish tickets from the AKFIN database; and commercial operators' annual reports (COAR) and commercial-vessel license listings collected and maintained by ADF&G. The system also provides access to some of the forms used to collect the various data and lists contacts at the agencies that maintain the data. The next phase of the project will expand the system to allow users at the AFSC to make data requests online, and for those with access to confidential data to be able to query the underlying data described by the metadata.

Modeling Spatial Location Choice with a Generalized Nested Logit Model

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A significant challenge in discrete choice modeling is developing high dimensional choice models that embed spatial correlation structure in the unobservables yet remain computationally tractable. In the economics literature two main points of departure in lower dimensional non-spatial choice models have been explored – Multinomial Probit models based on the multivariate normal distribution and mixed logit (or random parameters logit) which uses a basic conditional logit model and adds in random parameters that induce correlation across the alternatives. A third route exists that is based on McFadden's GEV model. This approach has seen relatively little research in economics beyond the family of nested logit models. In recent years there has been a resurgence in research activity in the transportation area, culminating in a variety of generalized nested logit (GNL) models in which the dependence of the unobservables can be modeled by allowing the nests to overlap each other. While there has been little work in modeling high dimensional spatial correlation, it turns out GEV models based on particular kinds of overlapping nesting structures are well-suited to capturing the type of spatial correlation structure commonly used in linear spatial models. Importantly, this model is tractable for a larger number of alternatives and can be run on available software packages. Here we develop a GNL with spatial correlation and apply the model to fisher location choice in the Alaska Bering Sea pollock fishery.

Nonconsumptive Value of Steller Sea Lion Protection

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Steller sea lions (*Eumetopias jubatus*) live in the North Pacific Ocean and consist of two distinct populations, the Western stock and the Eastern stock, which are separated at 144° W longitude. As a result of large declines in the populations since at least the early 1970s, in April 1990 the Steller sea lion (SSL) was listed as threatened throughout its range under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 35). The decline continued through 2000 for the Western stock in Alaska, which was declared endangered in 1997, while the Eastern stock remains listed as threatened. Both the Western and Eastern stocks are also listed as depleted under the Marine Mammal Protection Act (MMPA) of 1972 (16 U.S.C. 1362).

NMFS is the primary agency responsible for the protection of marine mammals, including Steller sea lions. Multiple management actions have been taken (e.g., 68 FR 204, 68 FR 24615, 69 FR 75865), and are being contemplated, by NMFS and the North Pacific Fishery Management Council to protect and aid the recovery of the SSL populations. These actions differ in the form they take (limits on fishing to increase the stock of fish available for Steller sea lions to eat, area restrictions to minimize disturbances, etc.), which stock is helped, when and how much is done, and their costs. In deciding between these management actions, policy makers must balance the ESA and MMPA goals of protecting Steller sea lions from further declines with providing for sustainable and economically viable fisheries under the Magnuson-Stevens Fishery Conservation Act (P.L. 94-265). Since Steller sea lion protection is linked to fishery regulations, decision makers must comply with several federal laws and executive orders in addition to the ESA and MMPA, including Executive Order 12866 (58 FR 51735), which requires regulatory agencies to consider costs and benefits in deciding among alternative management actions, including changes to fishery management plans made to protect Steller sea lions.

Public preferences for providing protection to the endangered Western and threatened Eastern stocks of Steller sea lions are primarily the result of the non-consumptive value people attribute to Stellar sea lions. Little is known about these preferences, yet such information is needed for decision makers to more fully understand the trade-offs involved in choosing between management alternatives. The amount the public is willing to pay for increased Steller sea lion stock sizes or changes in listing status is information that can aid decision makers to evaluate protection actions and more efficiently manage and protect these resources, but is not currently known.

NMFS is conducting a study to collect information that can provide insights into public values for protecting Steller sea lions. During 2004 and 2005, a survey instrument was developed with the assistance of experts in non-market valuation, environmental economics, and survey research, as well as fisheries scientists and researchers who study Steller sea lions. It was extensively tested using qualitative focus groups and one-on-one cognitive interviews conducted in Seattle, WA, Denver, CO, Sacramento, CA, Rockville, MD, and Anchorage, AK. Two formal pretests were conducted during Fall 2005 and Spring 2006 to assess the survey protocols. Subsequently, the survey instruments were revised to reflect updated information about Steller sea lions. The final survey implementation followed a modified Dillman Tailored Design Method to maximize response. It was completed during 2007 following Office of Management and Budget (OMB) approval.

Since threatened and endangered (T&E) species, like Steller sea lions, are not traded in observable markets, standard market-based approaches to estimate their economic value cannot be applied. As a result, studies that attempt to estimate these values must rely on survey-based non-market valuation methods, which involve asking individuals to reveal their preferences or values for non-market goods, such as the protection of T&E species, through their responses to questions in hypothetical market situations. One particular SP method, the contingent valuation (CV) method, has been the dominant approach for valuing T&E species. Although contingent valuation has been subject to much criticism, the NOAA Panel on Contingent Valuation found that despite its problems, "a well-conducted CV study provides an adequately reliable benchmark" (Arrow *et al.*, 1993) to begin discussions on appropriate values.

This study employs a choice experiment (CE), or stated choice, approach for eliciting economic values for Steller sea lions. CE methods are relatively new to the valuation of environmental goods, despite having a long history in the marketing and transportation fields (e.g., Louviere [1992]).[1] A typical CE involves presenting respondents with two or more choice questions, each having a set of alternatives that differ in attributes. For each question, respondents are asked to select the alternative they like best. The choice responses are used to estimate a preference function that depends upon the levels of the attributes.

In this study, the stated choice questions take the following form: respondents are asked to choose between the status quo level of protection and two alternative protection programs that embody more protection, but at added costs. Each alternative program is described in terms of their results on each stock's population size and ESA status in 60 years. Since population and status projections are uncertain, three survey versions that embody different assumptions about the likely future Western population and ESA status were developed. One version assumes an increasing Western stock population, another assumes a stable one, and the final one assumes a decreasing population. Use of these alternative versions of the survey allows us to account for the uncertainty surrounding future stock sizes within our analytic framework.

Stated choice data collected through the survey are currently being analyzed and models are being developed to estimate preference functions for explaining choices between protection programs that differ in the levels of population sizes, ESA listing statuses, and costs. The estimated functions will provide NMFS and the NPFMC with information on public preferences and values for alternative Steller sea lion protection programs, and

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[1] Hanley, Wright, and Adamowicz (1998), Alpizar, Carlsson, and Martinsson (2001), and Hanley, Mourato, and Wright (2001) provide useful overviews of choice experiments in non-market valuation.

how several factors affect these values. This information can then be compared with program costs and other impacts when evaluating protection alternatives.

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North Pacific and West Coast Fisheries Community Profiles

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Community Profiles for West Coast and North Pacific Fisheries – Washington, Oregon, California, and other U.S. States by Norman, Sepez, Lazrus, Milne, Package, Russell, Grant, Petersen, Primo, Styles, Tilt, and Vaccaro has been released for public review in draft form. The individual profiles of 125 communities, along with introductory and methodological information, are currently available on the Northwest Fisheries Science Center's website at http://www.nwfsc.noaa.gov/research/divisions/sd/communityprofiles/index.cfm. The project is a joint effort between the Alaska Fisheries Science Center and Northwest Fisheries Science Center (NWFSC), with additional support from the Southwest Fisheries Science Center.

This is the follow up document to NOAA Technical Memorandum NMFS-AFSC-160, *Community Profiles for North Pacific Fisheries – Alaska*, which describes 136 communities located in the State of Alaska with involvement in North Pacific fisheries. AFSC community profiles for North Pacific Fishing Communities located in Alaska are available online at http://www.afsc.noaa.gov/Publications/techmemos.htm. Because a large number of communities that participate in North Pacific fisheries are located on the West Coast, it was more efficient to jointly profile these communities along with the other communities involved in fishing along the West Coast.

One hundred and twenty-five predominately West Coast communities were selected for profiling, from over 1500 communities in the contiguous United States and Hawaii which had some involvement in either commercial fishing in the North Pacific or along the West Coast, or some involvement in both regions. The 125 selected communities primarily include U.S. Census Places from: Washington (40 communities), Oregon (31 communities), California (52 communities), New Jersey (1 community), and Virginia (1 community). All of the profiled communities except for one (Valleyford, CA), had some involvement in North Pacific fisheries, either commercial, recreational, or both. Two communities, Seaford, Virginia, and Pleasantville, New Jersey, were selected for profiling solely because of their involvement in North Pacific fisheries.

The narrative profiles follow an outline nearly identical to the preceding Alaska profiles and include sections titled *People and Place* and *Infrastructure,* but distinguish between *Involvement in West Coast Fisheries* and *Involvement in North Pacific Fisheries. Involvement in West Coast Fisheries* details community activities in West Coast commercial fishing (landings delivered to community, processing, vessels, and permit holdings), sportfishing (sportfishing operators, license vendors and revenue, and landings), and subsistence fishing. *Involvement in North Pacific Fisheries* details community activities in North Pacific commercial fishing (landings delivered by community residents, crew member licenses, and permit holdings), and sportfishing (businesses and licenses).

The profiles were reviewed by community representatives and volunteers affiliated with the Port Liaison Project (PLP). The PLP, administered by Oregon Sea Grant and funded by the NWFSC, is designed to connect members of the commercial fishing industry with fisheries researchers. Other members of the public who are knowledgeable about these communities reviewed and suggested corrections to the draft profiles.

Together with the Alaska profiles, this document provides a consolidated source for baseline social and fisheries information for the communities most involved in North Pacific fisheries. Consideration and analysis of fishing communities is mandated under National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act. The profiles are in the final stages of publication as a NOAA NWFSC Technical Memorandum.

The article appears as Sepez, J. K Norman, A. Poole and B. Tilt. 2006. Fish Scales: Scale and Method in Social Science Research for North Pacific and West Coast Fishing Communities. *Human Organization* 65(3)280-293.

Post-Rationalization Restructuring of Alaska Crab Fishery Crew Opportunities

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Rationalization of the Bering Sea crab fishery in 2005 resulted in swift consolidation of the fleet from over 250 vessels to just 89. A large reduction in the ex-vessel prices paid for crab also occurred at this time. Among the most important impacts on communities has been the loss of crew jobs, estimated to be approximately 1350 positions in a University of Alaska study.

As the initial effects of the rationalization program begin to stabilize, it is important to understand the actual impacts of this program on crewmembers. Loss of crew jobs was a predicted effect, but the specifics of crew impacts are not understood in great detail. Beginning in the fall of 2007, this project will use ethnographic techniques to study current and former crewmembers, how they have been affected, and how their communities have been affected. This study will take place in Seattle, Dutch Harbor, Kodiak, and additional communities. Interviews will include specific issues (e.g., alternative income sources for displaced crew and what factors enable crewmembers to retain their jobs) that may be useful in understanding how crewmembers might be affected in other rationalization initiatives. Decision theory and occupational communities theory will provide the preliminary analytical framework for this research.

Promoting Key Economic and Social Scientific Concepts to Fisheries Managers

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NOAA Fisheries has recognized that the agency will benefit from increasing the role that social scientists play in fisheries management. The number of economists and social scientists in NOAA Fisheries has increased significantly over the last decade, but in many cases economists and other social scientists have not adequately conveyed their insights to fisheries managers with NOAA Fisheries, the fisheries management council community, or the larger academic fisheries science and policy communities.

At the annual meeting of the American Fisheries Society (AFS) in San Francisco, Alan organized a session with David Tomberlin of the NMFS Southwest Fisheries Science Center Santa Cruz lab. The session was titled "Fisher Behavior: State of the Art." This session featured talks from thirteen leading economists and fisheries scientists who focus on fleet dynamics and fisher behavior. The session provided a forum for exchange between researchers who utilize a variety of analytic approaches in a variety of empirical settings. The session was well-attended and allowed policy makers and fisheries scientists to better understand how economists and ecologists model and predict fleet behavior. In the future, we will continue to pursue opportunities to share economic techniques and insights with fisheries managers.

Predicting Fishing with Vessel Monitoring System (VMS) Data

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The National Marine Fisheries Service (NMFS) has expanded requirements that vessels fishing in the Pacific cod, Atka mackerel, pollock, and other fisheries own and operate a vessel monitoring system (VMS). The system sends each vessel's location to NMFS approximately every 20 minutes while the transmitter is operating. The VMS consists of two parts. A transmitter/receiver, installed on the vessel, which queries GPS satellites and downloads vessel position, as well as estimates the heading and speed. The transmitter then sends these data to NMFS via the Argos system of polar orbiting satellites.

Though the VMS tells NMFS the location of each participating vessel, it does not directly determine whether the vessel is fishing or not. However, when a vessel is fishing its course and speed are generally different than when the vessel is simply transiting an area. These differences produce a "signature" that indicates fishing is taking place. The nature of a given vessel's signature depends on many factors, including the gear type being used (trawl, hook-and-line, or pot), the type of vessel deploying the gear, and the length of time the vessel spends fishing. In addition to VMS, many vessels carry a NMFS-certified observer during 30-100 percent of their days at sea. Thus, NMFS can determine directly and independently whether or not fishing is taking place and can thus corroborate whether a given signature indeed demonstrates that fishing is taking place.

AFSC researchers wish to determine the extent to which the signatures can be used to accurately predict whether fishing is occurring are not. To the extent that a given signature can accurately predict whether fishing is taking place, NMFS wishes to use the signatures to develop computer algorithms that will automatically predict whether a given vessel is or was engaged in fishing operations. The predictive power of the developed algorithms should be expressed as a percentage of predicted fishing events that correspond to actual fishing events.

In previous work by Pat Sullivan for the NMFS Alaska Region, a number of techniques were explored to predict fishing for a select number of vessels. This current project builds upon that exploratory work and develops an operational algorithm. We plan to produce a final report suitable for peer-reviewed publication in the coming year.

Protected Marine Species Economic Valuation Survey

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Estimates of the economic benefits of protecting threatened and endangered marine species are often needed by resource managers and policy makers to assess the impacts of alternative management measures and policies that may affect these species. However, few estimates of the benefits of protecting marine species exist, and none exist for many species protected by NMFS. To begin filling this information gap, Dan Lew has begun working with several other NMFS economists on a non-market valuation survey research project to estimate the value of protecting several protected marine species.

Numerous cetacean, pinniped, sea turtle, and fish species have been selected for inclusion in the study, and preliminary survey materials are being developed. The survey will employ stated preference questions to gather information on public preferences for protecting these species. Several sets of focus groups to test preliminary survey materials have been conducted over the last two years. During 2007, changes to the survey and related materials were made based on the results of these groups and input from biologists providing review of the scientific information being presented. Due to the complexity of the issues and the number of species covered in the survey, the project has been divided into two phases, each involving the implementation of an Internet-based survey intended to collect stated preference information about a subset of the total species being studied. It is anticipated that focus group groups and other qualitative pretest activities for the first phase species will conclude in early 2008. The first phase survey implementation is expected to occur in 2008.

AFSC Economics and Social Sciences Research Program Publication List for Full-Time Staff (names in bold), 2002-2007

Branch, T., R. Hilborn, **A.C. Haynie**, G. Fay, L. Flynn, J. Griffiths, K. Marshall, J.K. Randall, J.M. Scheuerell, E.J. Ward, and M. Young. 2006. "Fleet dynamics and Fishermen Behavior: Lessons for Fisheries Managers." *Canadian Journal of Fisheries & Aquatic Sciences*, Vol.63(7): 1647-1668.

We review fleet dynamics and fishermen behavior from an economic and sociological basis in developing fisheries, in mature fisheries near full exploitation, and in senescent fisheries that are overexploited and overcapitalized. In all cases, fishing fleets behave rationally within the imposed regulatory structures. Successful, generalist fishermen who take risks often pioneer developing fisheries. At this stage, regulations and subsidies tend to encourage excessive entry and investments, creating the potential for serial depletion. In mature fisheries, regulations often restrict season length, vessel and gear types, fishing areas, and fleet size, causing or exacerbating the race for fish and excessive investment, and are typically unsuccessful except when combined with dedicated access privileges (e.g., territorial rights, individual quotas). In senescent fisheries, vessel buyback programs must account for the fishing power of individuals and their vessels. Subsidies should be avoided as they prolong the transition towards alternative employment. Fisheries managers need to create individual incentives that align fleet dynamics and fishermen behavior with the intended societal goals. These incentives can be created both through management systems like dedicated access privileges and through market forces.

Carothers, C. and **Sepez, J**. "Commercial Fishing Crew Demographics and Trends in the North Pacific: 1993-2003." Pp. 37-40 in *Managing Fisheries Empowering Communities Conference Proceedings*, Alaska Sea Grant, Anchorage.

This report examines demographic change in Bering Sea and Aleutian Island (BSAI) fishing communities since 1920. We undertook this research in an attempt to begin introducing human population dynamics as an indicator for regional ecosystem analyses. We focus here on human inhabitants of the Bering Sea coast, using total population by community and by Census area as the primary indicator, with some analysis of other population characteristics such as ethnicity. This approach is concordant with research on arctic communities that uses crude population growth or loss as a general measure to determine community viability, as this indicator is easy to understand, locally meaningful, and points to the capacity of people in these places to "dwell and prosper for some period, finding sources of income and meaningful lives" (Aarsaether et al. 2004). An understanding of recent and historic demographic data in the region is a preliminary step to developing models that will attempt to predict demographic effects of changes in fish populations, fisheries management, industry conditions and markets, and climate characteristics. This research project examined birth rates, migration, indigeneity, boom-bust economic cycles, and seasonality as factors in understanding population trends in the region. This report discusses community selection methodology and challenges, describes and analyzes the causes of demographic trends in BSAI fishing communities since 1920, points to the impacts of population decline or growth on local communities, and finally, suggests opportunities for including demographic indicators in future research on fisheries science and policy.

Dalton, M. and S. Ralston. 2004. "The California Rockfish Conservation Area and Groundfish Trawlers at Moss Landing Harbor." *Marine Resource Economics*, Vol.18: 67-83.

This article uses a bioeconomic model and data for groundfish trawlers at Moss Landing Harbor in Central California to analyze effects of spatial closures that were implemented recently by West Coast fishery managers to reduce bycatch of overfished groundfish stocks. The model has a dynamic linear rational expectations structure, and estimates of its parameters exhibit spatial variation in microeconomic and ecological factors that affect decisions about where and when to fish. Test results show that variation in marginal costs of crowding externalities and biological rates of stock productivity are the most significant factors to consider in the spatial management of groundfish trawlers at Moss Landing.

Dalton, M., B. C. O'Neill, A. Prskawetz, L. Jiang, J. Pitkin. 2006. "Population Aging and Future Carbon Emissions in the United States." *Energy Economics* (in press).

Changes in the age composition of U.S. households over the next several decades could affect energy use and carbon dioxide (CO2) emissions, the most important greenhouse gas. This article incorporates population age structure into an energy-economic growth model with multiple dynasties of heterogeneous households. The model is used to estimate and compare effects of population aging and technical change on baseline paths of U.S. energy use and CO2 emissions. Results show that population aging reduces long-term emissions, by almost 40% in a low population scenario, and effects of aging on emissions can be as large, or larger than, effects of technical change in some cases. These results are derived under standard assumptions and functional forms that are used in economic growth models. The model also assumes the economy is closed, that substitution elasticities are fixed and identical across age groups, and that labor supply patterns vary by age group but are fixed over time.

Etnier, M. and **J. Sepez**. 2007. "Ecological, Political, and Cultural Explanations for Changing Patterns of Sea Mammal Exploitation among the Makah." In *Anthropology and Archaeology: Long-Term Perspectives* (in press). Robert Layton and Dimitra Papagianni (eds.). Oxbrow Press, Woodbridge, CT.

The Makah Indians from the outer coast of Washington are renowned for their strong maritime orientation, and have maintained high levels of continuity in resource use over 500 years. However, marine mammal use has declined considerably. Today, the Makah consume less than 30% of the same taxa as their ancestors at Ozette. Comparison between the Ozette archaeofaunas and the modern ecological communities on the coast of Washington indicate major changes in this ecosystem within the past 200-300 years. In the past, northern fur seals (Callorhinus ursinus) appear to have been the dominant pinniped species, with a breeding population perhaps as close as 200 km from Ozette. Among cetaceans, gray whales (Eschrichtius robustus) and humpback whales (Megaptera novaeangliae) were equally abundant. Today, the dominant pinniped species is California sea lion (Zalophus californianus), while cetaceans are dominated by a single species, the gray whale. Thus, most of the differences in Makah consumptive use of marine mammals can be explained by examination of the modern ecological environment. However, the article discusses some case in which political and cultural motivations provide better explanations.

Felthoven, R.G. 2004. "Methods for Estimating Fishing Capacity with Routinely Collected Data: A Comparison." *Review of International Fisheries Law and Policy*, Vol.1(2): 125-137.

In the past three years, the National Marine Fisheries Service (NMFS) has assembled both an internal task force and an external expert panel to suggest methods for computing fishing capacity in U.S. fisheries. The primary difficulty in choosing a suggested methodology has been the lack of economic data required for many of the capacity models developed in the economic literature. In most U.S. fisheries, the available data are limited to catch records, vessel numbers and characteristics, and some indicators of fishing effort, necessitating the use of "primal" models, and measures of "technical" fishing capacity. This paper describes two of the suggested frontier methods for measuring capacity: data envelopment analysis (DEA) and the stochastic production frontier (SPF). We discuss how to implement these models, and various notions of "capacity" that can be computed, depending on the assumptions made regarding potential increases in effort.

Felthoven, R.G. and C.J. Morrison Paul. 2004. "Multi-Output, Non-Frontier Primal Measures of Capacity and Capacity Utilization." *American Journal of Agricultural Economics,* Vol.86(3): 615-629.

This paper offers and implements an econometric approach for generating primal capacity output and utilization measures for fisheries. In situations where regulatory, environmental, and resource conditions affect catch levels but are not independently identified in the data, frontier-based capacity models may interpret such impacts as production inefficiency. However, if such inefficiencies are unlikely to be eliminated, the implied potential output increases may be unrealistic. We develop a multi-output, multi-input stochastic transformation function framework that permits various assumptions about how output composition may change when operating at full capacity. We apply our model to catcher-processor vessels in the Alaskan pollock fishery.

Felthoven, R.G., T. Hiatt, and J.M. Terry. 2004. "Measuring Fishing Capacity and Utilization with Commonly Available Data: An Application to Alaskan Fisheries." *Marine Fisheries Review*, Vol.64(4): 29-39.

Due to a lack of data on vessel costs, earnings, and input use, many of the capacity assessment models developed in the economics literature cannot be applied in U.S. fisheries. This incongruity between available data and model requirements underscores the need for developing applicable methodologies. This paper presents a means of assessing fishing capacity and utilization (for both vessels and fish stocks) with commonly available data, while avoiding some of the shortcomings associated with competing "frontier" approaches (such as data envelopment analysis).

Felthoven, R.G. and C.J. Morrison Paul. 2004. "Directions for Productivity Measurement in Fisheries." *Marine Policy*, Vol.28: 161-169.

Fisheries policy is often aimed at sustaining and improving economic performance, but the use of traditional productivity measurement to assess performance over time has been quite limited. In this paper we review the currently sparse literature on productivity in fisheries, and suggest ways to better account for many of the relevant issues unique to the industry. Specifically, we discuss the need to incorporate bycatch levels, to better account for environmental and stock fluctuations, and to relax some of the restrictive economic assumptions that have been imposed in the research to date. A methodological framework that may be used to incorporate these factors is proposed.

Felthoven, R.G. 2002. "Effects of the American Fisheries Act on Capacity, Utilization and Technical Efficiency." *Marine Resource Economics*, Vol.17(3): 181-205.

The American Fisheries Act (AFA) of 1998 significantly altered the Bering Sea and Aleutian Islands pollock fishery by allowing the formation of harvesting and processing cooperatives and defining exclusive fishing rights. This paper uses data envelopment analysis and stochastic production frontier models to examine effects of the AFA on the fishing capacity, technical harvesting efficiency (TE), and capacity utilization (CU) of pollock catcher-processors. Results from multi-input, multi-output models indicate that fishing capacity fell by more than 30% and that harvesting TE and CU measures increased relative to past years. This work provides examples of how existing data, which is currently devoid of operator costs and provides only general indicators of earnings, may be used to analyze changes in elements of fleet and vessel performance in response to management actions.

Garber-Yonts, B.E.,. J. Kerkvliet, R. Johnson. 2004. "Public Values for Biodiversity Conservation Policies in the Oregon Coast Range." *Forest Science*, Vol.50(5): 589-602.

This study uses a choice experiment framework to estimate Oregonians' willingness to pay (WTP) for changes in levels of biodiversity protection under different conservation programs in the Oregon Coast Range. We present biodiversity policy as an amalgam of four different conservation programs: salmon and aquatic habitat conservation, forest age-class management, endangered species protection, and large-scale conservation reserves. The results indicate substantial support for biodiversity protection, but significant differences in WTP across programs. Oregonians indicate the highest WTP for increasing the amount of forest devoted to achieving old-growth characteristics. On average, respondents indicate an annual household WTP of $380 to increase old-growth forests from 5% to 35% of the age-class distribution. Conversely, WTP for increasing conservation reserves peaks at $45 annually to double the current level to 20% of the landscape, whereas WTP is negative for any increase over 32%. We also find resistance to any change in conservation policy, which substantially offsets WTP for increases in all four conservation programs.

Garber-Yonts, B.E. 2004. “The Economics of Amenities and Migration in the Pacific Northwest: Review of Selected Literature with Implications for National Forest Management.” U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-617. 48 p.

This paper reviews literature on the influence of non-market amenity resources on population migration. Literature reviewed includes migration and demographic studies; urban and regional economics studies of amenities in labor markets, retirement migration, and firm location decisions; non-market valuation studies using hedonic price analysis of amenity resource values; land use change studies; and studies of the economic development influence of forest preservation. A synthesis of the literature finds that the influence of amenities is consistently shown to be a positive factor contributing to population growth in urban and rural areas characterized by proximity to public forest lands. Beyond this broad finding, however, little research has been conducted at an appropriate scale to be directly useful in forest management and planning decisions. Areas for further research are identified.

Garber-Yonts, B.E. 2005. “Conceptualizing and Measuring Demand for Recreation on National Forests: a Review and Synthesis.” U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report PNW-GTR-645.40.

This analysis examines the problem of measuring demand for recreation on national forests and other public lands. Current measures of recreation demand in Forest Service resource assessments and planning emphasize population-level participation rates and activity-based economic values for visitor days. Alternative measures and definitions of recreation demand are presented, including formal economic demand and multi-attribute preferences. Recreation assessments from national-level Renewable Resources Planning Act Assessments to site-level demand studies are reviewed to identify methods used for demand analysis at different spatial scales. A finding throughout the multiple scales of analysis, with the exception of site-level studies, is that demand measures are not integrated with supply measures. Supply analyses, in the context of resource assessments, have taken the form of mapped spatial inventories of recreation resources on the national forests, based on the classification of recreational settings according to the opportunities they produce (e.g., the Recreation Opportunity Spectrum). As such, integration of demand analysis with these measures of supply requires measuring the demand for recreational settings. To support management and planning decisions, recreation demand analysis must also permit projection of changes in visitation at multiple scales as changes in management and policy alter recreational settings, and as the demographics and behavior of the user base changes through time. Although this is currently being done through many formal economic studies of site demand, methods are needed that scale up to higher levels of spatial aggregation. Several areas for research, development and application of improved methods for demand analysis are identified, and improved methods for spatially explicit models of recreation visitation and demand are identified as a priority area for research.

Haynie, A.C. 2005. "The Expected Profit Model: A New Method to Measure the Welfare Impacts of Marine Protected Areas," Ph.D. dissertation, University of Washington.

This dissertation develops, tests, and applies a new type of discrete/continuous model, the expected profit model (EPM), that allows one to make ex-ante welfare estimates of area closures such as marine protected areas, even when the only information that we have about costs is travel distance. Traditionally, the literature has predicted fisher location choice in a two-stage process. In the first stage the average revenue is calculated, and in the second stage average revenue is a predictor of location choice. Here expected catch is endogenously estimated simultaneously with location choice, which, among other benefits, enables one to observe how actors trade off revenue and travel costs. A series of Monte Carlo experiments are conducted to test the efficacy of the EPM and results indicate that the EPM shows a slight increase in performance over the standard approach. Using the EPM the welfare impacts of an emergency closure of the Steller Sea Lion Conservation area (SCA) are assessed using summer, 2000, data on the Bering Sea pollock catcher vessel fishery. A series of EPM models which incorporate the impact of vessel characteristics and functional forms are considered in the welfare calculations.

Ingles, P. and **Sepez, J**. 2007. "Anthropology's Contributions to Fisheries Management." *National Association of Practicing Anthropologists Bulletin*, Vol.28: 1-12.

The collection of articles in this volume of NAPA Bulletin describes various types of social science research currently conducted in support of federal and state fisheries management by anthropologists and sociologists studying fishing-dependent communities and fisheries participants. The contributors work for NOAA, National

Marine Fisheries Service (NMFS); various state fisheries agencies; in academia; or as contract researchers. These articles represent a wide geographical range, employ a diverse set of methods, and demonstrate different research goals ranging from responding to specific statutory or management requirements to establishing broader baseline social information to exploring the theoretical constructs that constrain or advance the field of applied anthropology in fisheries. This introduction provides background to the recent expansion of anthropological capacity in U.S. fisheries management and the divergent methods employed by practitioners. The range of methods includes classic ethnography and survey methods, cultural modeling, participatory research, and quantitative indicators-based assessment. The compilation of articles presents an opportunity to think about standardizing some methodological approaches for certain types of tasks, while expanding the array of accepted methodologies available to anthropologists advising fisheries managers.

Harris, T., **C. Seung**, T. Darden, and W. Riggs. 2002. “Rangeland Fires in Northern Nevada: An Application of Computable General Equilibrium Modeling.” *Western Economics Forum*, Vol.1(2): 3-10.

A dynamic computable general equilibrium model of a five county Northern Nevada economy is used to estimate the business losses and recovery efforts of a 1.6 million acre rangeland fire. In comparison to input-output or social accounting models, the dynamic computable general equilibrium model incorporates the roles of markets and prices in the estimation of this natural catastrophe. Results indicate that fire suppression and rehabilitation expenditures were not enough to offset the losses in public land grazing activities.

Johnson, K.N., P. Bettinger, J. Kline, T. A. Spies, M. Lennette, G. Lettman, **B. Garber-Yonts**, and T. Larsen. 2006. “Simulating Forest Structure, Timber Production, and Socio-Economic Effects in a Multi-Owner Province.” *Ecological Applications*, Vol.17(1): 34-47.

Protecting biodiversity has become a major goal in managing coastal forests in the Pacific Northwest—an area in which human activities have had a significant influence on landscape change. A complex pattern of public and private forest ownership, combined with new regulations for each owner group, raises questions about how well and how efficiently these policies achieve their biodiversity goals. To develop a deeper understanding of the aggregate effect of forest policies, we simulated forest structures, timber production, and socio-economic conditions over time for the mixture of private and public lands in the 2.5-million-ha Coast Range Physiographic Province of Oregon. To make these projections, we recognized both vegetative complexity at the stand level and spatial complexity at the landscape level. We focused on the two major factors influencing landscape change in the forests of the Coast Range: 1) land use, especially development for houses and cities, and 2) forest management, especially clearcutting. Our simulations of current policy suggest major changes in land use on the margins of the

Coast Range, a divergence in forest structure among the different owners, an increase in old-growth forests, and a continuing loss of the structural elements associated with diverse young forests. Our simulations also suggest that current harvest levels can be approximately maintained, with the harvest coming almost entirely from private lands. A policy alternative that increased requirements for retention of live trees for wildlife at final harvest on private lands would be relatively costly (5-7% reduction in timber production) to landowners. Another alternative that precluded thinning of plantations on federal land would significantly reduce the area of very large diameter (>75 cm dbh) conifer forests at 100 years.

Lew, D.K. and D.M. Larson. 2005. "Accounting for Stochastic Shadow Values of Time in Discrete-Choice Recreation Demand Models." *Journal of Environmental Economics and Management*, Vol.50(2): 341-361.

In this paper, a discrete-choice recreation demand model that explicitly accounts for a stochastic shadow value of time function is proposed. Using data from a survey of San Diego beach users, the stochastic shadow value of time, labor supply, and beach choice are jointly estimated. Results from this joint estimation approach are compared with the familiar two-step approach that estimates labor supply first and uses predicted values of time in the recreational site choice model. The approaches produce markedly different welfare measures, with the two-step model, which does not account for unobserved variability of time values, predicting significantly higher values. A Monte Carlo simulation illustrates how ignoring the stochastic nature of shadow value of time in discrete-choice recreation demand models can bias model parameters, and hence, welfare estimates.

Kline J.D., R.J. Alig, **B. Garber-Yonts**. 2004. "Forestland Social Values and Open Space Preservation." *Journal of Forestry,* Vol.102(8): 39-45.

Concerns have grown about the loss of forestland to development, leading to both public and private efforts to preserve forestland as open space. These lands comprise social values-ecological, scenic, recreation, and resource protection values-not typically reflected in market prices for land. When these values are present, it is up to public and private agencies to provide them in sufficient quantity. We discuss non-market social values in the context of forestland market values, to explain the economic rationale for public and private efforts to protect forestland as open space.

Larson, D.M. and **D.K. Lew**. 2005. "Measuring the Utility of Ancillary Travel: Results from a Study of Recreation Demand." *Transportation Research Part A*, Vol.39(2-3): 237-255.

The issues involved in determining economic values of travel as a component of away-from-home trips are discussed. Four distinct concepts are relevant and useful depending on circumstances: marginal and total values of travel, and gross versus net values. A utility-theoretic inverse demand systems approach is implemented to estimate the separate demands for recreation trips and time onsite at the destination, and implemented using data on pink salmon fishing in Alaska. The distance function underlying the demand system is used to determine the net values of travel ancillary to fishing. Some 64% of fishermen had positive net values of travel, and the value of travel per hour traveled averaged $1.64/hour with a median of $3.18/hour.

Lazrus, H. and **Sepez, J**., 2005. "The NOAA Fisheries Alaska Native Traditional Knowledge Database," *Practicing Anthropology,* Vol.27(1): 33-37.

Applications of the Alaska Native Traditional Environmental Knowledge Database were critically examined by Lazrus and Sepez based on interviews with intended users at the AFSC and elsewhere. Comprised of information from pre-existing sources in the literature, the database was a partial response to public comments about the lack of TEK in the Draft Groundfish Programmatic Supplemental Environmental Impact Statement (PSEIS). Lazrus and Sepez review ways in which authors of the revised PSEIS found the database helpful and the challenges they faced using the information. Lazrus and Sepez discuss several issues surrounding how TEK is compiled and cited in agency documents. Because it is passed from one generation to another, TEK can lend a great deal of place-specific temporal depth to scientific investigations that may only have data for a short period of time. Such temporal depth lends historical perspective to environmental phenomena and can facilitate the construction of baselines or indicate rates of change. It can also point to issues that may not have been considered by the agency. However, TEK offers very localized information that does not always correspond to the geographic scope of regional agency interests. Additionally, the Alaska Native Traditional Environmental Knowledge Database does not offer users an easy way to assess the authority of the information source, so it may be difficult to judge the validity of a claim. The article discusses the ways in which TEK and scientific investigation have different paradigms that entail different ways of observing and drawing conclusions about how the world works. This disparity may at times complicate applying information from both paradigms to a single issue. On the other hand, this may also lead to a more multidimensional examination of an issue and a more robust analysis. Of course, ethical issues arise when expert information is taken from a community without addressing issues of compensation and co-management of resources. Lazrus and Sepez also discuss the problem of treating TEK as a series of facts or observations that can be extracted from cultural context. Without the context in which they are developed and understood, fragments of information may be misinterpreted or misapplied. Despite the challenges, NOAA scientists were generally very interested in understanding and incorporating TEK in agency efforts to analyze and manage North Pacific marine resources.

Lew, D.K. and D.M. Larson. 2005. "Valuing Recreation and Amenities at San Diego County Beaches." *Coastal Management,* 33(1): 71-86.

Policymakers and analysts concerned with coastal issues often need economic value information to evaluate policies that affect beach recreation. This paper presents economic values associated with beach recreation in San Diego County generated from a recreation demand model that explains a beach user's choice of which beach to visit. These include estimates of the economic values of a beach day, beach closures, and beach amenities.

Package, C. and Sepez, J. 2004. "Fishing Communities of the North Pacific: Social Science Research at the Alaska Fisheries Science Center." *AFSC Quarterly Report* April-May-June 2004, available online at http://www.afsc.noaa.gov/Quarterly/amj2004/amj04featurelead.htm

NOAA Fisheries is involved in a nationwide effort to profile fishing communities for the purpose of expanding baseline knowledge of people who may be affected by changes in fishery regulations. In 2003 a team of graduate students at the Alaska Fisheries Science Center (AFSC) completed draft short-form profiles for 130 communities located in the state of Alaska. These profiles have been compiled in the upcoming publication Fishing Communities of the North Pacific, Volume I: Alaska. Longer profiles based on in-depth research also are being developed at the AFSC for a more select group of Alaska fishing communities. In mid-2004, the AFSC team joined with a team from the Northwest Fisheries Science Center to begin developing short-form profiles for West Coast communities, many of which are very involved in Alaska fisheries.

Poole A. and **Sepez J**. 2006. "Distribution and Abundance of Human Populations in the Bering Sea and Aleutian Islands." Pp. 255-276 in *2005 North Pacific Groundfish Stock Assessment and Fishery Evaluation Reports for 2006, Economic Status of the Groundfish Fisheries Off Alaska, 2006,* Terry Hiatt (ed.), Alaska Fisheries Science Center, Seattle

This article describes the temporal distribution and abundance of human populations in Bering Sea/Aleutian Island (BSAI) fishing communities, reporting on the status and trends for 94 BSAI fishing communities grouped into regions. It reports decadal Census data from 1920 -2000 and annual population estimates and trends from 1990 – 2005. Seventy-nine BSAI fishing communities (or 84%) had a positive average annual percent change during the period between 1990 and 2005. The 14 communities with a negative annual percent change during this time period appear to be concentrated in the Aleutians East and West regions along with Lake and Peninsula and Bristol Bay Boroughs.

Poole A. and **Sepez J**. 2006. "Historic and Current Human Population Trends in the Bering Sea and Aleutian Islands." Pp. 323-326 in *2005 North Pacific Groundfish Stock Assessment and Fishery Evaluation Reports for 2006***,** *Appendix C. Ecosystem Considerations for 2006*, Jennifer Boldt (ed.), Alaska Fisheries Science Center, Seattle.

This article analyzes and discusses the distribution and abundance over time of human populations in Bering Sea/Aleutian Island (BSAI) fishing communities. This report examines birth rates, migration, indigeneity, boom-bust economic cycles, and seasonality as factors in understanding population trends in the region. Two communities, Cherfornak and Egegik, are examined in greater depth, selected as the closest to the average of those communities showing positive growth rates in the last 15 years, and those showing negative growth rates, respectively. The research suggests that military activity and fisheries economics have the most noticeable affects on recent BSAI demographics.

Sepez, J. 2003. "Makah." In *Dictionary of American History, 3rd Edition.* Charles Scribner's Sons, New York.

This dictionary article briefly describes the history of the Makah Indian Tribe of northwest Washington State, including population history, early contact with European explorers, cultural and subsistence patterns, the excavation of the Ozette archaeological site, and the modern resumption of subsistence whaling.

Sepez, J. 2002. "Treaty Rights and the Right to Culture: Native American Subsistence Issues in US Law." *Cultural Dynamics* 14(2): 143-159.

The interplay of treaty rights with the right to culture has produced a variety of results for Native American subsistence hunting and fishing rights in the United States. Where allocation and conservation measures fail to account for cultural considerations, conflict ensues. This paper discusses three examples: waterfowl hunting in Alaska, Northwest salmon fishing, and Inuit and Makah whaling. Each demonstrates that treaty rights are a more powerful force than cultural rights in the law, but that both play important roles in actual policy outcomes. A more detailed examination of whaling indicates how the insertion of needs-based criteria into a framework of cultural rights shifts the benefit of presumption away from indigenous groups. The cultural revival issues and conflicting paradigms involved in Makah whaling policy debates indicate how notions of tradition, authenticity, and self-determination complicate the process of producing resource policies that recognize cultural diversity.

Sepez, J. 2005. "Introduction to Traditional Environmental Knowledge in Federal Natural Resource Management Agencies," *Practicing Anthropology* 27(1): 2-5.

This introduction summarizes the articles and issues in the special theme issue on traditional environmental knowledge in Federal natural resource management agencies (see issue abstract).

Sepez, J. 2006. Communities Research at the Alaska Fisheries Science Center. Pp. 31-36 in *Managing Fisheries Empowering Communities Conference Proceedings*, Alaska Sea Grant, Anchorage.

This paper describes the Alaska Fisheries Science Center's large-scale approach to conducting social science research on fishing communities. It discusses details of compiling large amounts of pre-existing quantitative data on involvement in fisheries by community, using indicators to assess the relative importance of participation of communities in fisheries. Data have been compiled for fishing communities in Alaska, Washington, Oregon, California, and other US States that participate in North Pacific Fisheries. The paper also describes using key data to select communities for narrative profiling, 136 in Alaska, 129 in other states. It gives the outline of the narrative profiles and describes the process followed for obtaining community feedback. The paper ends with a discussion of the benefits and drawbacks of using such a large-scale approach to study fishing communities, concluding that despite acknowledged limitations, the method is very useful. It provides a consolidated source of information to policy makers, analysts, and community members, attends to a wide range of communities, including many that have never before been explicitly mentioned in fisheries impact analysis, creates a uniform approach to fisheries participation assessment that allows for comparisons between fishing communities and eventually (when other NMFS regions complete their profiles) will allow for comparisons of fisheries participation between regions.

Sepez, J. 2007. If Middens Could Talk: Comparing Ancient, Historic and Contemporary Makah Subsistence Foraging Patterns. *Journal of Ethnobiology,* Volume 27 (In press).

The paper combines archaeological data with data from early ethnography and contemporary harvest surveys to examine consistency and change in Makah Tribe subsistence hunting and fishing practices between 1500 and today. The data indicate a significant shift in contribution of different resource groups to the animal protein diet between 1500 and today, with harvest of marine mammals dropping tremendously (from 92% to less than 1%), and the contemporary diet consisting primarily of fish (50%), shellfish (11%), land mammals (15%), and store-bought meats (24%). However, a high diversity of species used by tribal members prior to Euroamerican colonization are still in use today, from halibut and salmon to harbor seals and sea urchins. Several species no longer used, such as wolves and fur seals, can be explained by ecological factors, such as post-colonial extirpation. Other resources no longer used, such as many small birds and small shellfish, represent a general contraction of the subsistence diet breadth following the introduction of commercial foods. As predicted by optimal foraging theory, the resources most likely to be eliminated from the diet are those that rank low in terms of post-encounter caloric return. Tribal members made use of nearly all available resources in ancient times; additions to the tribe's subsistence base in modern times were due primarily to the introduction of exotic species such as the Pacific oyster, and local population growth of other species, such as the California sea lion. Road building and habitat changes in the forests increased access to land-based resources, such as deer and elk. Land-based resources in general (terrestrial mammals and commercial meats) increased from less than 1% of consumed animal protein prior to 1500 to close to 40% today. However, with over 60% of animal protein still stemming from marine resources, Makah tribal members remain oriented, both nutritionally and culturally, toward the ocean environment.

Sepez, J., K. Norman and **R. Felthoven**. 2007. "A Quantitative Model for Identifying and Ranking Communities Involved in Commercial Fisheries." *National Association of Practicing Anthropologists Bulletin 28:43-56.*

This article proposes a quantitative model for ranking commercial fisheries involvement by communities and describes our experience applying this model to North Pacific and West Coast fisheries. Analysis of recent fishing community profiling projects shows there have been four basic approaches to selecting a manageable number of communities, including focusing on major ports, aggregated regions, representative examples, and the top of a ranked list. Data envelopment analysis (DEA) is presented as a non-parametric, multi-dimensional modeling method appropriate for evaluating and ranking fishing communities based on an array of quantitative indicators of fisheries involvement. The results of applying this model to communities involved in West Coast and North Pacific fisheries are summarized. Nineteen indicators of fisheries dependence and 92 indicators of fisheries engagement were modeled yielding ranked lists of 1564 and 1760 U.S. communities respectively. Comparison of the DEA method's top-ranked communities in Alaska to those selected by an indicators-based threshold-trigger model for Alaska showed 71 percent overlap of selected communities. The strengths and weaknesses of the DEA modeling approach are discussed. DEA modeling is not a substitute for ethnographic analysis of communities based on field work, but it does present an enticing way to consider which communities might be selected for fieldwork or profiling, or as fishing communities, based on quantitative indicators.

Sepez, J. A., B. Tilt, C. Package, H. Lazarus, and I. Vaccaro. 2005. Community Profiles for North Pacific Fisheries - Alaska. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-AFSC-160, 552 p.

This document profiles 136 fishing communities in Alaska with basic information on social and economic characteristics. Various federal statutes, including the Magnuson-Stevens Fishery Conservation and Management Act and the National Environmental Policy Act, among others, require agencies to examine the social and economic impacts of policies and regulations. These profiles can serve as a consolidated source of baseline information for assessing community impacts in Alaska. The profiles are given in a narrative format that includes three sections: People and Place, Infrastructure, and Involvement in North Pacific Fisheries. People and Place includes information on location, demographics (including age and gender structure of the population, racial and ethnic make up), education, housing, and local history. Community Infrastructure covers current economic activity, governance (including city classification, taxation, Native organizations, and proximity to fisheries management and immigration offices) and facilities (transportation options and connectivity, water, waste, electricity, schools, police, and public accommodations). Involvement in North Pacific Fisheries details community activities in commercial fishing (processing, permit holdings, and aid receipts), recreational fishing, and subsistence fishing. To define communities, we relied on Census place-level geographies where possible, grouping communities only when constrained by fisheries data, yielding 128 individual profiles. Regional characteristics and issues are briefly described in regional introductions. The communities were selected by a process which assessed involvement in commercial fisheries using quantitative data from the year 2000, in order to coordinate with 2000 Census data. The quantitative indicators looked at communities that have commercial fisheries landings (indicators: landings, number of processors, number of vessels delivering to a community), communities that are the registered homeports of vessels participating in the fisheries, and communities that are home to documented participants in the fisheries (indicators: crew license holders, state and federal permit holders, and vessel owners). Where appropriate, the indicators were assessed as a ratio to the community's population. Selection of a community was triggered by its surpassing a certain threshold in any one of the indicator categories, or in an aggregated category made up of the individual indicators. The Alaska communities selected and profiled in this document are: Adak, Akhiok, Akiachak, Akutan, Aleknagik, Alitak Bay, Anchor Point, Anchorage/Chugiak/Eagle River/Girdwood, Angoon, Atka, Bethel, Chefornak, Chignik (Bay), Chignik Lagoon, Chignik Lake, Clam Gulch, Clark's Point, Cordova, Craig, Dillingham, Edna Bay, Eek, Egegik, Ekuk, Ekwok, Elfin Cove, Elim, Emmonak, Excursion Inlet, Fairbanks, False Pass, Fritz Creek, Galena, Goodnews Bay, Gustavus, Haines, Halibut Cove, Hobart Bay, Homer, Hoonah, Hooper Bay, Hydaburg, Igiugig, Iliamna, Ivanof Bay, Juneau/Douglas/Auke Bay, Kake, Karluk, Kasilof, Kenai, Ketchikan/Ward Cove, King Cove, King Salmon, Kipnuk, Klawock, Kodiak, Kokhanok, Koliganek, Kongiganak, Kotlik, Kwillingok, Larsen Bay, Levelock, Manokotak, Marshall, Mekoryuk, Metlakatla, Meyers Chuck, Naknek, Napakiak, Nelson Lagoon, New Stuyahok, Newhalen, Newtok, Nightmute, Nikiski, Nikolaevsk, Ninilchik, Nome, Old Harbor, Ouzinkie, Palmer, Pedro Bay, Pelican, Perryville, Petersburg, Pilot Point, Pilot Station, Platinum, Point Baker, Port Alexander, Port Alsworth, Port Graham, Port Heiden, Port Lions, Port Moller, Port Protection, Portage Creek, Prudhoe Bay, Quinhagak, Saint George, Saint Mary's, Saint Paul, Sand Point, Scammon Bay, Seldovia, Seward, Shaktoolik, Sitka, Skwentna, Soldotna, South Naknek, Sterling, Tenakee Springs, Thorne Bay, Togiak, Toksook Bay, Tuntutuliak, Tununak, Twin Hills, Ugashik, Unalakleet, Unalaska/Dutch Harbor, Valdez, Wasilla, Whale Pass, Whittier, Willow, Wrangell, and Yakutat.

Sepez, J. and Lazrus, H. 2005. "Traditional Environmental Knowledge in Federal Natural Resource Management Agencies." *Practicing Anthropology* 27(1): 1-48.

"Traditional Environmental Knowledge (TEK) in Federal Natural Resource Management Agencies" is the theme of this special issue of the journal Practicing Anthropology. The issue features articles from NOAA/NMFS contributors, as well as articles by (or about) other federal agencies, including the Bureau of Land Management, Environmental Protection Agency (EPA), National Park Service, and the U.S. Fish and Wildlife Service. The issue includes two important articles by NMFS authors. Lazrus and Sepez critically examine the application of the Alaska Native Traditional Environmental Knowledge Database developed at the Alaska Fisheries Science Center. They conclude that agency scientists are interested in using traditional environmental knowledge in their work, but that both practical and theoretical issues present serious challenges to meaningful incorporation (see article abstract). The issue also includes an article by Jennifer Isé and Susan Abbott-Jamieson of NMFS describing the Local Fisheries Knowledge Pilot Project http://www.st.nmfs.noaa.gov/lfkproject/, which takes place in two lobstering communities in Maine, and may be expanding to Alaska in the coming years. The project involves high school students in collecting cultural, environmental, and historical knowledge from local fishing families. Other articles in the issue discuss understanding Huna Tlingit traditional harvest management techniques for gull eggs in Glacier Bay National Park, incorporating Swinomish cultural values into wetland valuations, integrating TEK into subsistence fisheries management in Alaska, considering traditional tribal lifeways in EPA decision making, conserving wild medicinal plants that have commercial value, and including TEK in planning processes for the National Petroleum Reserve. The compilation concludes with a cautionary commentary from Preston Hardison of the Indigenous Biodiversity Information Network about international protocols, government-to-government relationships, rules of disclosure for tribal proprietary information, and the spiritual contexts of knowledge production and knowledge sharing. The issue is an important source of information on TEK program possibilities and lessons learned for federal resource scientists and managers interested in incorporating traditional environmental knowledge into their work.

Sepez, J., K. Norman, A. Poole, and B. Tilt. 2005. "Fish Scales: Scale and Method in Social Science Research for North Pacific and West Coast Fishing Communities." *Human Organization* 65(3): 280-293.

Driven by the requirements of the Magnuson-Stevens Fishery Conservation and Management Act and the demand among stakeholders for social science to inform fisheries policy, the need for NMFS to conduct social science research is widely accepted. But how such research should be carried out is not at all well established. This article describes the development of a research program at NMFS--led by anthropologists--designed to understand the interaction between fisheries and communities in the North Pacific and West Coast regions. Specific conceptual and methodological challenges are discussed, including the vast number of communities involved in fishing in these regions, limited government resources, competing definitions of what constitutes a community, and the need for indicators which are comparable across communities and regions. The research program described here takes a multi-method, multi-scale approach, combining social indicators research with ethnographic fieldwork and Rapid Assessment Procedures (RAP). We argue that such an approach is necessary to understand the social and economic aspects of fishery management. As fishery managers and policy makers increasingly recognize that humans play an important role in natural resource issues, the experiences of this research program will influence the course of social science research at NMFS in the years to come.

Sepez, J., C. Package, P. Malcolm, and A. Poole. 2007. "Unalaska, Alaska: Memory and Denial in the Globalization of the Aleutian Landscape." *Polar Geography* (in press).

This paper explores history and globalization as situated in the landscape of Unalaska, Alaska, an island in the Aleutian chain. The history of the area is characterized by successive waves of occupation and resource extraction by the geopolitical powers of Asia and North America that began with Russian colonization. Unalaska's landscape is littered with World War II debris that still echoes of Japanese attacks and the bitter memory of U.S.-ordered evacuation and relocation to distant interment camps of the entire indigenous Aleut population. Unalaska's adjacent Port of Dutch Harbor has grown to become the Nation's busiest commercial fishing port ironically due to the demand of the Japanese market for fishery products and substantial investment by Japanese companies. Applying post-colonial theory to Unalaska's history suggests that territorial acquisition has been succeeded by the dynamics of economic globalization in this American periphery. The Aleutian landscape is shaped by its history of foreign and domestic exploitation, wartime occupation and displacement, economic globalization, and the historical narratives and identities that structure the relationship of past and present through place.

Seung, C. and E. Waters. 2005. "A Review of Regional Economic Models for Alaska fisheries." *Alaska Fisheries Science Center Processed Rep. 2005-01*.

There are many regional economic models in the literature, and a limited number have been used to investigate the impacts of fishery management policies on communities. However, there is no formal study in the literature that provides a thorough, comparative evaluation of the regional economic models that have been, or can be, used for regional impact analysis for fisheries. In Part I, we describe the Alaska seafood industry, discuss the importance of the industry to the state economy, and indicate the importance of regional economic analysis for the Alaska seafood industry. Next a theoretical overview of regional economic models is provided. Specifically, we discuss major features of each type of regional economic model – economic base model (EB), input-output model (IO), social accounting matrix model (SAM), supplied-determined model, and computable general equilibrium model (CGE). Finally, a comparative discussion of these models is also provided. While Part I focuses on a theoretical review of regional economic models, Part II discusses applications of those regional economic models to fisheries. These include input-output (IO) models, which have been used in many previous studies of regional economic impacts for fisheries, the Fisheries Economic Assessment Model (FEAM), which has been one of the major analytical tools used to examine the impacts of fisheries on the West Coast and in Alaska, and the first regional computable general equilibrium (CGE) model used for fisheries in a U.S. region. In addition, some issues related to specifying such models for Alaska fisheries, data needs and availability for modeling regional economic impacts for Alaska fisheries, and perspectives on regional economic modeling for Alaska fisheries are discussed.

Seung, C. and E. Waters. 2006. "A Review of Regional Economic Models for Fisheries Management in the U.S." *Marine Resource Economics,* Vol.21(1): 101-124.

In 1986 Andrews and Rossi reviewed input-output (IO) studies of U.S. fisheries. Since then many more fisheries studies have appeared using IO and other types of regional economic models, such as Fishery Economic Assessment Models, Social Accounting Matrices, and Computable General Equilibrium models. However no updated summary of these studies or models has appeared since 1986. This paper attempts to fill this gap by briefly reviewing the types of regional economic models that have been applied to fisheries; reviewing studies using these models that have been conducted for U.S. fisheries; and identifying data and modeling issues associated with regional economic analysis of fisheries in the U.S. The authors conclude that although economic impact analysis of fisheries policy is required under federal law, development of more representative regional economic models for this purpose is not likely to be forthcoming without increased information obtained through some type of comprehensive data collection program.

Seung, Chang and Edward Waters. 2006. "The Role of the Alaska Seafood Industry: A Social Accounting Matrix (SAM) Model Approach to Economic Base Analysis." *The Annals of Regional Science,* Vol.40(2): 335-360.

A social accounting matrix (SAM) model for Alaska is constructed to investigate the role of the state's seafood processing industry. The SAM model enables incorporation of the unique features of Alaska economy such as (i) the existence of a large nontraditional economic base, (ii) a large leakage of labor income, and (iii) a very large share of intermediate inputs imported from outside the state. The role of an industry in an economy with these features can not be examined correctly within an input-output framework, which is the method most often used for examining the importance of an industry to a region. Taking an export base view of the economy, we found seafood processing to be an important industry, generating 4.5% of the state's total employment. While an important driver of the state's economy, the industry has the smallest SAM multiplier mainly due to a large leakage of labor earnings and a large share of imported intermediate inputs. We also found that non-traditional economic base components such as (i) federal transfers to state and local governments, and (ii) federal transfers, permanent fund dividend (PFD) payments, and other extra-regional income received by households generate about 26 % of the state's total employment and earnings.

Spies, T.A., K.N. Johnson, K.M. Burnett, J.L. Ohmann, B.C. Mccomb, G.H. Reeves, P. Bettinger, J.D. Kline, **B. Garber-Yonts.** 2006. “Cumulative Ecological and Socio-Economic Effects of Forest Policies in Coastal Oregon.” *Ecological Applications*, Vol.17(1): 5-17.

Forest biodiversity policies in multi-ownership landscapes are typically developed in an uncoordinated fashion with little consideration of their interactions or possible unintended cumulative effects. We conducted an assessment of some of the ecological and socio-economic effects of recently-enacted forest management policies in the 2.5-million-ha Coast Range Physiographic Province of Oregon. This mountainous area of conifer and hardwood forests includes a mosaic of landowners with a wide range of goals, from wilderness protection to high-yield timber production. We projected forest changes over 100 years in response to logging and development using models that integrate land use change and forest stand and landscape processes. We then assessed responses to those management activities using GIS models of stand structure and composition, landscape structure, habitat models for focal terrestrial and aquatic species, timber production, employment, and willingness to pay for biodiversity protection. Many of the potential outcomes of recently enacted policies are consistent with intended goals. For example, we project the area of structurally diverse older conifer forest and habitat for late successional wildlife species to strongly increase. Other outcomes might not be consistent with current policies-- for example, hardwoods and vegetation diversity strongly decline within and across owners. Some elements of biodiversity, including streams with high potential habitat for coho salmon (*Oncorhynchus kisutch*) and sites of potential oak woodland, occur predominately outside federal lands and thus were not affected by the strongest biodiversity policies. Except for federal lands, biodiversity policies were not generally characterized in sufficient detail to provide clear benchmarks against which to measure the progress or success. We conclude that land management institutions and policies are not well configured to deal effectively with ecological issues that span broad spatial and temporal scales and that alternative policies could be constructed that more effectively provide for a mix of forest values from this region.

Vaccaro, I. and **Sepez, J**. 2003. "Understanding Fishing Communities: Three Faces of North Pacific Fisheries," pp. 220-221 in Witherall, D. (Ed.) *Managing Our Nation's Fisheries: Past, Present, and Future.* Proceedings of a Conference on Fisheries Management in the United States Held in Washington, DC.

Understanding and managing the impacts of fisheries means understanding fishing, and fishing communities, as much as understanding fish. Fishing communities are human settlements with a substantial level of dependence on or engagement in extraction of living marine resources. In the North Pacific, these communities are shaped by the interaction of productive and consumptive practices, resource availability, markets, and regulatory policies. The protection of these communities and their way of life depends on a careful appraisal of multi-faceted relationships with marine resources. At the Alaska Fisheries Science Center, this means developing techniques for social analyses that recognize how fishing is articulated around three different types of activities:

commercial, subsistence, and recreational. Public policy and science have often considered fisheries management to be almost exclusively concerned with commercial fishing. This perspective is understandable if we consider that commercial fishing accounts for 95% of the catch in Alaska, while subsistence accounts for just 4% and recreational 1%. The implications of this distribution for concerns such as biomass, ecological dynamics, and production of wealth are unambiguous. However, in the terrain of the social landscape, the much smaller catch percentages of subsistence and recreational fishing do not necessarily translate into insignificant social impacts. For example, in some communities, 100% of local households are participating in subsistence fishing, while only a small portion of residents are connected to the commercial fishing industry. In fact, leakage of wealth produced by the commercial fishing industry – through both imported labor forces and externalized corporate functions – is a significant factor attenuating the local impact of the commercial sector. Our analysis of the fishing communities of Alaska, their social context and the productive implications of marine natural resources, indicates that an approach which prioritizes commercial fishing to the exclusion of these other sectors is insufficient, and potentially misleading as to the social dynamics of both the complementary and conflicting interests which make up human communities. Subsistence and recreational fishing are fundamental parts of the social structure, and also the economy of many Alaskan communities, often supplying different segments of the population than commercial fisheries. At the Alaska Fisheries Science Center, anthropologists in the Economics and Social Sciences Research Program are involved in compiling profiles of North Pacific Fishing Communities. For communities located in Alaska, we have endeavored to describe and analyze the triadic relationship between commercial, subsistence and recreational fishing sectors. This is accomplished by characterizing the participation by community members in each type of fishery, and where possible, indicating the kinds of interrelationships that make the triad a dynamic and evolving social framework: competition for fisheries allocation; economic diversification of rural communities; joint production efficiencies; seasonal complementarities and conflicts; ethnicity and immigration issues; and local responses to the forces of globalization. Fisheries management or public policy impact assessment that does not take into account this multiple and complex nature of the relation between fishing communities and marine resources may create substantial unintended impacts on the very same communities they are intending to protect.

Working or Submitted Papers:

Dalton, M. 2006. Simulated Maximum Likelihood Estimation and Analysis of Covariance in a Panel Tobit Model: Some Monte Carlo Results. NOAA/Sea Grant working paper.

Dynamic economic models are often estimated and tested using pooled time series data (e.g. Sargent, 1978; Rosenman, 1987; Dalton, 2001). However, if individual effects are significant, then the use of pooled data can produce biased estimates and potentially incorrect test results. Therefore, when panel data are available, an analysis of covariance is generally recommended to verify whether individual effects are present (Hsiao, 1986). In practice, a complication often encountered with panel data is missing, or zero, values. In many cases, a reasonable assumption is that a positive value for an individual is recorded only if some threshold event occurs, for example when an individual's valuation of a good or service is above an observed price. When this type of censoring occurs, the Tobit model is a standard tool for estimation and testing that gives unbiased results for static models under typical assumptions. Until recently, estimation and testing of dynamic Tobit models under more general conditions has not been feasible because of computational constraints. This paper presents a simple dynamic Tobit model and likelihood simulator for use with panel data, and reports Monte Carlo results of estimation and testing. The panel Tobit model presented in this paper is an extension of the dynamic Tobit model in Lee (1999), for use with panel data, as in Lee (1998). Work in this paper is confined to first-order autocorrelation to facilitate an analysis of covariance that tests for heterogeneity among individuals in a panel. The likelihood simulator used in this paper could be extended to other covariance structures (e.g. ARCH, GARCH) in a straightforward way. However, the preferred interpretation for the model in this paper is a single equation from a reduced-form vector autoregression (VAR), disaggregated to incorporate effects of individual heterogeneity as in a panel VAR (e.g. Holtz-Eakin, Newey and Rosen, 1988; Hsiao, Pesaran and Tahmiscioglu, 2001), and designed to accommodate panels with censored endogenous variables. The ultimate goal, which is beyond the scope of this paper, is to use dynamic Tobit models in panel VARs to test the cross-equation parameter restrictions implied by the rational expectations hypothesis. Monte Carlo simulations in this paper are used to evaluate maximum likelihood estimates, and perform an analysis of covariance that compares panel Tobit models with, and without, individual effects. Results show estimates of the dynamic parameters in the panel Tobit model are generally unbiased, but other parameters exhibit bias, up to 10\% in some cases. The bias-correction procedures described by Lee (1998) could be used to improve estimates in this paper, but these procedures would not affect results from the analysis of covariance. Tests of the analysis of covariance evaluate probabilities for two types of errors. The first type rejects the pooled model when the panel consists of identical individuals. The second type fails to reject the pooled model when the panel consists of heterogeneous individuals. Monte Carlo results indicate the first type of error does not occur in small panels, but 5\% significance levels are approached in larger and longer panels, with at least sixty individuals and eighty or more time-periods. The model performs well in detecting some types of heterogeneity within about twenty periods, even in small panels. However, the autocorrelation coefficient and variance parameter for the stochastic error process require large, and long, panels to detect individual heterogeneity.

Dalton, M. 2006. Simulated Maximum Likelihood Estimation and Analysis of Covariance in a Panel Tobit Model of California's Groundfish Trawl Fishery, 1981-2001. NOAA/Sea Grant working paper.

Spatial management is currently an important issue in fisheries, and a central question for managers is how fishing effort will respond to marine reserves and other types of closures. This paper develops a panel Tobit model to analyze the influence of spatial and dynamic factors on decisions about where and when to fish. The model includes autocorrelation. A simulated maximum likelihood approach is used to compute parameter estimates and conduct hypothesis tests, including an analysis of covariance to detect sources of individual heterogeneity. The model is used with ten panels of data, representing fleets from ports in California's groundfish trawl fishery. Results show that ex-vessel prices are the most important explanatory variable in the model, and affect the spatial distribution of fishing effort. Regulatory variables, in the form of limits on landings for some species, are also important in most cases, and these reveal both spatial and temporal effects of past regulations. Dynamic factors such as autocorrelation, or effects of past fishing effort in a particular area on current effort, are also significant at several ports, but spatial interactions in effort are important in only two cases. Results from the analysis of covariance show that using pooled time series data to analyze effects of spatial management is acceptable practice in some cases.

Dalton, M. 2006. Monte Carlo Simulations of a Linear Rational Expectations Model with Static and Stock Externalities and Dynamically Interrelated Variables. NOAA working paper.

Information about future conditions can influence economic behavior. Lucas (1976) showed that a fundamental conflict exists in models used for policy analysis that do not explicitly consider the microeconomic aspects of how decisions are made when information about future conditions is available. He contended that a major revision of prevailing econometric practice was needed to resolve this conflict with microeconomic theory. Lucas' critique gave way to a new class of econometric models, based on a hypothesis of rational expectations. Typically, externalities associated with common property resources justify limited entry or other regulations, and thus, are a fundamental component of resource management, but effects of these externalities with rational expectations are complicated. Therefore, the level of technical sophistication required to estimate and test rational expectations models has probably been an impediment to their use in natural resource management. This paper presents a linear model of resource use, under rational expectations, with multiple dynamic variables, and considers two types of externalities among resource users. Simulated data from the model are used to compute maximum likelihood estimates, and for conducting tests of rational expectations and other hypotheses. The model in this paper is based on solving the dynamic optimization problem of a single firm that operates in an industry with many identical firms, and quadratic adjustment costs. To enhance the interpretation of renewable resources, the model in this paper includes a static congestion externality among labor variables, and a dynamic externality that operates through productivity of the resource stocks. Because of these externalities, symmetric industry equilibrium with optimizing behavior by individual firms is generally not efficient. The first goal of the paper is to evaluate maximum likelihood estimates and Sargent's (1978) test of rational expectations in the model without dynamically interrelated variables. Performance of the maximum likelihood estimates is evaluated by comparing point estimates from the maximum likelihood procedure with successively longer time series in Monte Carlo simulations.

Estimation results from the Monte Carlo simulations show the limits appear to be unbiased in most cases. Exceptions are limited to a set of parameters that form a nonlinear relationship across equations, which are identified only if each takes a nonzero value. The relationship among these parameters is the most complex in the model, and involves a three-way interaction among exogenous variables, capital, and labor: i) effects of exogenous variables on capital stocks, ii) effects of labor on capital stocks, and iii) direct and indirect influence of these effects on productivity and labor through stock externalities. These interactions highlight the subtle nature of some relationships implied by rational expectations, and demonstrate why a careful numerical approach is needed. However, the stock and congestion externalities are specialized features of the model in this paper, and point estimates for other parameters typically found in linear rational expectations models are accurate to within 10% after one hundred time periods, and some after twenty. The second goal of the paper is to evaluate maximum likelihood estimates and significance tests for dynamically interrelated variables. These results are based on a restricted version of the model, with only parameters related to dynamic adjustment costs allowed to vary, because severe convergence problems were encountered in less restricted versions of the model with dynamically interrelated variables.

Dalton, M. 2006. Effects of Spatial Management on Fishing Effort in California's Groundfish Trawl Fishery: Results from a Rational Expectations Model with Dynamically Interrelated Variables. NOAA working paper.

This paper develops a microeconomic model of groundfish trawlers that is both dynamic and spatial, which is based on a rational expectations competitive equilibrium. Advantages of a rational expectations model for the work in this paper include an explicit representation of information sets held by individuals at each point in time. In addition, this model has an operational, and thus testable, mechanism for translating information sets held by individuals into predictions about the future that can affect aggregate outcomes. Uncertainty is a fundamental part of many fisheries that can affect decisions about fishing effort. In addition, open access is sometimes used to justify an assumption in fisheries models that current decisions do not depend on expectations about future conditions, thus profit maximization for individuals is a static decision. While the assumption of open access is plausible in many fisheries, groundfish trawlers on the West Coast are part of a limited entry program, and ignoring information about future conditions for regulations, stock abundance, or climate would not be optimal. In addition, Rosenman (1986) showed that a type of open access equilibrium can occur with behavior that is forward looking, and the dynamic policy implications for fishery managers in this case are different from those of a static model. Therefore, assumptions about dynamic behavior should be tested. Practical experience supports this type of testing: Fishermen on the West Coast are known to modify behavior based on expectations of future conditions. Therefore, forward looking behavior is a plausible response to uncertainty about future regulations, price changes, climate fluctuations, or other events. The model in this paper is identical to the spatial model of fishing effort and dynamic adjustment costs under rational expectations described in Dalton and Ralston (2004), except that adjustment costs in this paper include a term for dynamically interrelated variables, which is the underlying mechanism for shifts in fishing effort that are analyzed in the paper.

Dalton, M. C. Pomeroy, M. Galligan. 2006. Measuring Impacts on Fishing Communities: A Framework for Integrated Socioeconomic Assessment. NOAA working paper.

An impact assessment with scientific review is typically required before U.S. fishery managers are able to implement new programs or regulations. These assessments may be the primary, or even sole, source of information that managers have about the economic effects of a proposed policy, and thus, are an important part of any policy-making process in which economic tradeoffs are a consideration. Ideally, accurate data and an economic model would be available to analyze tradeoffs among policy alternatives, but in practice, the models usually are not. Instead, fishery analysts often use a simplified approach based on total requirements, or other, multipliers derived from a system of regional economic accounts. Under rigid assumptions, the use of multipliers to analyze economic tradeoffs may be justified, but even so, the multipliers are valid only if the underlying data from the regional accounts are consistent with producers' current expenditures. This paper investigates whether data derived from the regional accounts for a particular county, which has two major ports, diverse fisheries, and a sufficiently large number of fish processors, are realistic, and if not, show how these data can be improved. This paper describes a methodology for two tests that are applicable to commercial fishing industries represented in IMPLAN data for coastal counties with at least one fishing port in Alaska, or along the West Coast of the United States. The first test uses data for ex-vessel revenues and processors' fish purchases that are readily available for each West Coast port from the Pacific Coast Fisheries Information Network (PacFIN) and for each Alaskan port from the AKFIN database. Data for the second test involve expenditure levels on inputs for fishing operations and processors, which are harder to acquire, and must be collected in the field from fishery participants. For the second test, we developed a set of research protocols, and conducted two waves of interviews and surveys in Monterey County, California. Results of both tests imply increases in total requirements multipliers computed from the adjusted SAMs. Total requirements multipliers for raw and processed fish did not change much with the adjustments to ex-vessel revenues and processors' fish purchases, but the cross-multipliers for processed fish in the raw fish industry increase drastically in the 2003 SAM. The reason is that purchases of raw fish at Monterey ports by fish processors located in Monterey County from PacFIN data are about 40 times larger than the corresponding IMPLAN value. Results of the second test include both adjustments to PacFIN, and expenditure shares for raw fish and processed fish that are sample means from the surveys. In this case, the multiplier for raw fish increases modestly, by 10% or 20%, and the multiplier for processed fish decreases, by 100% in 1998, but only 5% in 2003. The cross-multipliers increase dramatically after adjusting to the survey data.

Fell, Harrison and **Alan Haynie**. 2007. "Estimating Time-varying Bargaining Power: An Ex-vessel Fish Market Application." Working paper.

There is a large body of literature outlining the efficiency gains possible by managing common property resources, such as fisheries, under an individual property rights system. Despite these numerous studies, many fisheries in the world do not use rights-based management systems. One of the major obstacles to the further adoption of individual fishing quota (IFQ) management systems is the concern that by giving quota to only fishers there will be a severe rent distribution distortion between relevant processors and fishers. To analyze this rent distribution issue, we propose an unobserved components inspired estimation approach to estimate time-varying bargaining power in a bilateral bargaining framework. We apply the technique to a specific fishery, the Alaska sablefish fishery, which has undergone a change in management from a regulated open-access system to an IFQ management system over the time span analyzed. We find that, after the implementation of IFQ management, fishers do improve their bargaining power and thus accrue more of the rents generated by the fishery. However, unlike previous studies, we find that the fishers do not move to a point of complete rent extraction, but rather the fishers and processors appear to be in a near symmetric bargaining situation after IFQ management is imposed. The method introduced provides an important tool that has the potential to resolve uncertainty about the adoption of rights-based management and also allow empirical estimation of bilateral bargaining power in a variety of market settings.

Felthoven, Ronald G. and C.J. Morrison Paul. 2006. "Measuring Productivity Change and its Components for Fisheries: The Case of the Alaskan Pollock Fishery, 1994-2003." Submitted to the *Natural Resource Modeling.*

Economic and biological performance has been an important focal point in fisheries economics, while traditional productivity measurement has played an ancillary role. In the past two decades, however, it has been increasingly recognized that modeling and measuring fisheries' production relationships is central to understanding, and ultimately correcting, imbalances from market failures and biological constraints. In this paper we use a transformation function production model to estimate productivity and its components for the Bering Sea and Aleutian Islands pollock fishery. We explicitly recognize the roles of externalities present in pollock harvesting by incorporating data on environmental conditions, bycatch, and biomass stock, and capture regulatory impacts through fixed effects and quality indicators. Our approach also relaxes assumptions regarding constant returns to scale, marginal cost pricing, Hicks-neutrality, and homothetic separability that are maintained in the limited literature on fisheries productivity. We find that the productive contributions of environmental conditions, bycatch, and discretionary production processes are statistically significant; that restrictive assumptions common in previous fisheries productivity studies are not supported by our data; and that regulatory changes have had both direct and indirect impacts on catch patterns.

Felthoven, Ronald G., W. Horrace and K. Schnier. 2006. "Estimating Heterogeneous Primal Capacity and Capacity Utilization Measures in a Multi-Species Fishery." Submitted to the *American Journal of Agricultural Economics.*

We use a stochastic production frontier model to investigate the presence of heterogeneous production and its impact on fleet capacity and capacity utilization in a multi-species fishery. Furthermore, we propose a new fleet capacity estimate that incorporates complete information on the stochastic differences between each vessel-specific technical efficiency distribution. Results indicate that ignoring heterogeneity in production technologies within a multi-species fishery, as well as the complete distribution of a vessel's technical efficiency score, may yield erroneous fleet-wide production profiles and estimates of capacity.

Haynie, A. and D. Layton. 2006. "An Expected Profit Model for Predicting the Costs of Creating Protected Areas." To be submitted to the *Journal of Environmental Economics and Management.*

Marine protected areas have expanded rapidly across the globe over the last decade as a means to preserve marine habitat. In these areas, commercial fishing is banned or heavily restricted which creates costs due to the need to travel to and fish in other less desirable areas. We develop a new discrete/continuous model for analyzing spatial location choice which can be used to monetize location choices and to predict the costs of creating protected areas. Utilizing this model with a frequentist model averaging approach, we estimate costs of the Steller sea lion conservation area in the Bering Sea.

Lew, D.K. and D.M. Larson. 2007. "Valuing a Beach Day with a Repeated Nested Logit Model of Participation, Site Choice, and Stochastic Time Value." Submitted to *Marine Resource Economics.*

Beach recreation values are often needed by policy-makers and resource managers to efficiently manage coastal resources, especially in popular coastal areas like Southern California. This article presents welfare values derived from random utility maximization-based recreation demand models that explain an individual's decisions about whether or not to visit a beach and which beach to visit. The models utilize labor market decisions to reveal each individual's opportunity cost of recreation time. The value of having access to the beach in San Diego County is estimated to be between $21 and $26 per day.

Lew, D.K., D.F. Layton, and R.D. Rowe. 2007. "Efficiency and Robustness of Experimental Designs for Economic Valuation Choice Experiments." Working paper.

Stated preference choice experiments, which involve respondents choosing between alternatives that differ in attributes, increasingly have been used in recent years to gain insights into preferences and values for non-market goods, including recreational fisheries and other recreational resources. In constructing choice experiment questions, researchers must determine the set of attributes and attribute levels that respondents see in each question. These experimental designs are commonly based on efficiency criteria, but assume a specific utility specification. As a result, these designs are not necessarily efficient with respect to the true utility specification, which is never known with certainty. In this paper, we investigate the extent to which various efficiency-based experimental designs perform with respect to estimating several true utility models and associated willingness to pay in two Monte Carlo experiments. The experimental designs differ in the assumed underlying true model values used in their construction, and in whether or not model or parameter uncertainty was explicitly accounted for in design construction. The Monte Carlo results suggest that efficiency-based designs are fairly robust to utility misspecification, suggesting that more complicated designs that incorporate uncertainty may not be needed to estimate models and willingness to pay efficiently.

Morrison Paul, C., Marcelo Torres, and **R. Felthoven**. 2007. "Fishing Revenue, Productivity and Product Choice in the Alaskan Pollock Fishery." Submitted to *Marine Resource Economics*.

Performance measurement is important in evaluating the impacts of fishery management, yet little attention has been paid to this area in the fishery economics literature. The few existing studies focus on fish harvesting and technical efficiency, capacity utilization or quotas. Another important aspect of fishery performance, however, pertains to the revenue generated through fish processing, which is linked to both the way fish are harvested and the products produced from the fish. In this study we econometrically estimate a (flexible) revenue function, recognizing potential endogeneity and a variety of fishing inputs and conditions, to evaluate the factors underlying fishing revenues in the Alaskan pollock fishery. We find significant own-price supply responses and product substitutability, and enhanced revenues from the increased days fished and number and duration of tows induced by regulatory change. We also find significant growth in economic productivity – higher revenues over time after controlling for observed productive factors and price changes, which exceeds that attributable to increased harvests.

Norman, Karma, **J. Sepez**, H. Lazrus, N. Milne, C. Package, S. Russell, K. Grant, R. Petersen, J. Primo, M. Styles, B. Tilt, I. Vaccaro. 2007. Community Profiles for West Coast and North Pacific Fisheries - Washington, Oregon, California, and other U.S. States. NOAA Tech. Memorandum (In press).

This document profiles 125 fishing communities in Washington, Oregon, California, and other U.S. states, with basic information on social and economic characteristics. Various federal statutes, including the Magnuson-Stevens Fishery Conservation and Management

Act and the National Environmental Policy Act, among others, require federal agencies to examine the social and economic impacts of policies and regulations. These profiles can serve as a consolidated source of baseline information for assessing community impacts in these states. The profiles are given in a narrative format that includes four sections: *People and Place, Infrastructure, Involvement in West Coast Fisheries,* and *Involvement in North Pacific Fisheries*. *People and Place* includes information on location, demographics (including age and gender structure of the population, racial and ethnic make up), education, housing, and local history. *Infrastructure* covers current economic activity, governance (including city classification, taxation, and proximity to fisheries management and immigration offices) and facilities (transportation options and connectivity, water, waste, electricity, schools, police, public accommodations, and ports). *Involvement in West Coast Fisheries* and *Involvement in North Pacific Fisheries* detail community activities in commercial fishing (processing, permit holdings, and aid receipts), recreational fishing, and subsistence fishing. To define communities, we relied on Census place-level geographies where possible, yielding 125 individual profiles.

The communities were selected by a process that assessed involvement in commercial fisheries using quantitative data from the year 2000, in order to coordinate with 2000 U.S. Census data. The quantitative indicators looked at communities that have commercial fisheries landings (indicators: weight and value of landings, number of unique vessels delivering fish to a community) and communities that are home to documented participants in the fisheries (indicators: state and federal permit holders and vessel owners). Indicators were assessed in two ways, once as a ratio to the community's population, and in another approach, as a ratio of involvement within a particular fishery. The ranked lists generated by these two processes were combined and communities with scores one standard deviation above the mean were selected for profiling.

The communities selected and profiled in this document are, in Washington: Aberdeen, Anacortes, Bay Center, Bellingham, Blaine, Bothell, Cathlamet, Chinook, Edmonds, Everett, Ferndale, Fox Island, Friday Harbor, Gig Harbor, Grayland, Ilwaco, La Conner, La Push, Lakewood, Long Beach, Lopez, Mount Vernon, Naselle, Neah Bay, Olympia, Port Angeles, Port Townsend, Raymond, Seattle, Seaview, Sedro-Woolley, Sequim, Shelton, Silvana, South Bend, Stanwood, Tacoma, Tokeland, Westport, and Woodinville; in Oregon: Astoria, Bandon, Beaver, Brookings, Charleston, Clatskanie, Cloverdale, Coos Bay, Depoe Bay, Florence, Garibaldi, Gold Beach, Hammond, Harbor, Logsdon, Monument, Newport, North Bend, Pacific City, Port Orford, Reedsport, Rockaway Beach, Roseburg, Seaside, Siletz, Sisters, South Beach, Tillamook, Toledo, Warrenton, and Winchester Bay; and in California: Albion, Arroyo Grande, Atascadero, Avila Beach, Bodega Bay, Corte Madera, Costa Mesa, Crescent City, Culver City, Dana Point, Dillon Beach, El Granada, El Sobrante, Eureka, Fields Landing, Fort Bragg, Half Moon Bay, Kneeland, Lafayette, Long Beach, Los Angeles, Los Osos, Marina, McKinleyville, Monterey, Morro Bay, Moss Landing, Novato, Oxnard, Pebble Beach, Point Arena, Port Hueneme, Princeton, San Diego, San Francisco, San Jose, San Pedro, Santa Ana, Santa Barbara, Santa Cruz, Santa Rosa, Sausalito, Seaside, Sebastopol, Sunset Beach, Tarzana, Terminal Island, Torrance, Trinidad, Ukiah, Valley Ford, and Ventura. Two selected communities were located in other states: Pleasantville, New Jersey, and Seaford, Virginia.

Polasky, S., E. Nelson, J. Camm, B. Csuti, P. Fackler, E. Lonsdorf, C. Montgomery, D. White, J. Arthur, **B. Garber-Yonts,** R. Haight, J. Kagan; A. Starfield, C. Tobalske. 2007. "Where to Put Things? Spatial Land Management to Sustain Biodiversity and Economic Returns." Submitted to *Biological Conservation*.

Expanding human population and economic growth have lead to large-scale conversion of natural habitat to human-dominated landscapes with consequent large-scale declines in biodiversity. Conserving biodiversity, while at the same time meeting expanding human needs, is an issue of utmost importance. In this paper we develop a spatially explicit landscape-level model for analyzing the biological and economic consequences of alternative land-use patterns. The spatially-explicit biological model incorporates habitat preferences, area requirements and dispersal ability between habitat patches for terrestrial vertebrate species to predict the likely number of species that will be sustained on the landscape. The spatially explicit economic model incorporates site characteristics and location to predict economic returns in a variety of potential land uses. We use the model to search for efficient land-use patterns that maximize biodiversity conservation objectives for a given level of economic returns, and vice-versa. We apply the model to the Willamette Basin, Oregon, USA. By thinking carefully about the arrangement of activities, we find land-use patterns that sustain high biodiversity and economic returns. Compared to the current land-use pattern, we show that both biodiversity conservation and the value of economic activity could be increased substantially.

Seung, Chang. 2006. "Estimating Dynamic Impacts of Seafood Industry in Alaska." Submitted to *Marine Resource Economics.*

To date, regional economic impact analyses for fisheries have neglected use of time-series models. This study, for the first time in the literature of regional economic impacts of fisheries, address this weakness by employing a vector autoregressive error correction model (VECM). Based on economic base concept, this study develops a VECM to investigate multivariate relationships between basic sectors (including seafood sector) and nonbasic sectors for each of two fishery-dependent regions in Alaska. While structural models such as input-output model and computable general equilibrium model facilitate more detailed intersectoral long-run relationships in a regional economy, the present study shows that the VECMs have the advantage of properly attributing the impact of shocks, estimating directly the long-run relationships, and of identifying the process of adjustment by nonbasic sectors to the long-run equilibrium. Results show, first, that a nonbasic sector may increase or decrease in response to a shock to a basic sector – a result that would be obscured in a linear economic impact model such as an input-output model, which always predicts positive impacts. Second, the impacts of seafood processing employment are relatively small in the two study regions, where a significant number of seafood processing workers are nonresidents and a large portion of intermediate inputs used in seafood processing are imported from the rest of the United States.

Schnier, K.E., R.L. Hicks, and **A.C. Haynie.** 2007. “Common Property, Information, and Cooperation: Commercial Fishing in the Bering Sea.” To be submitted to *Land Economics*.

A substantial theoretical and experimental literature has focused on the conditions under which cooperative behavior among actors providing public goods or extracting common-property natural resources is likely to occur. The literature identifies the importance of coercion, small groups of actors, or the existence of social norms as being conducive to cooperation. In this paper we investigate a natural experiment in which information on extractive activities with respect to a common property resource is relayed to all players. These players operate under an overall harvest total allowable catch (TAC), and consequently, one player’s actions can have a deleterious effect on all players. The case we investigate is incidental catch (termed bycatch) of halibut by the Alaskan flatfish fishery, where participants voluntarily report bycatch information to an agent who then distributes data to the fleet. Consequently, fishermen know the extent to which other fishermen are avoiding bycatch, and are thereby able to observe efforts by other fishermen to avoid bycatch and to extend the fishing season for marketable fish species. Using a mixed logit model of spatial fishing behavior our results show that cooperative behavior is prevalent early in the season, but significant heterogeneity with respect to bycatch avoidance arises as bycatch TACs tighten.

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