

***Economic Impacts of the
Prince William Sound
Aquaculture Corporation:
2006 Update***

***Prepared for:
Prince William Sound
Aquaculture Corporation***



Research-Based Consulting

Juneau
Anchorage
Kodiak

May 2007

Economic Impact of the Prince William Sound Aquaculture Corporation: 2006 Update

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This study analyzes the impacts of the Prince William Sound Aquaculture Corporation (PWSAC) on regional and statewide economies. This is the third update to a report issued originally in 2001. The current report reflects data through 2006; earlier reports addressed data through 2000, 2002 and 2004. The report examines the impact of PWSAC activities on commercial, sport, personal use and subsistence harvests. It also examines the market conditions for those salmon species that currently are most important to PWSAC's production. Key findings from the analysis are noted below.

Summary of Economic Impacts

- In 2006, processors, commercial fishermen, and sport fishing service businesses earned an estimated \$82 million from PWSAC salmon. The estimated economic impacts from these earnings, plus the activities of the PWSAC organization itself, were \$135 million in total economic output, including \$42 million in labor income and 750 jobs.¹ Impacts for each sector (commercial fishing, seafood processing, sport, personal use and subsistence harvests, and PWSAC operations) are summarized below.

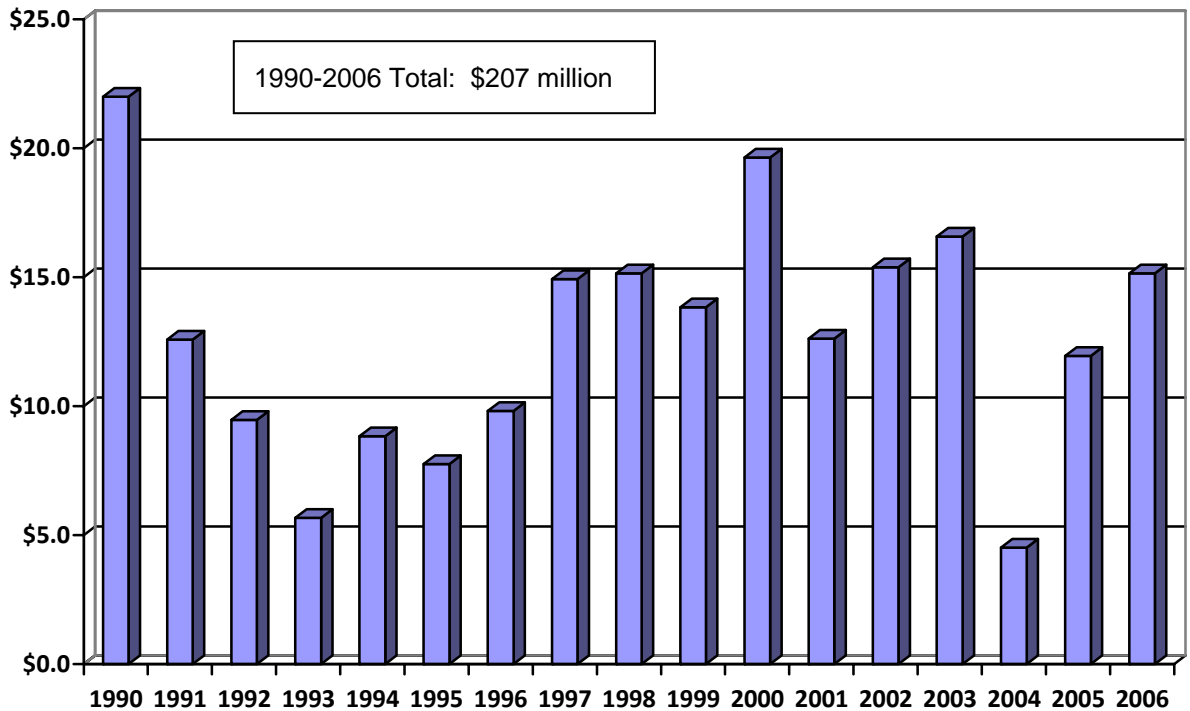
Commercial Harvest

- In 2006, 34 million pounds of PWSAC salmon were commercially harvested in Prince William Sound, with an ex-vessel value of \$15 million to commercial fishermen. Though the harvest volume was about 40 percent lower than the five-year average, the value of the harvest was 20 percent higher, due to a favorable species mix and strong prices for key species.
- From 1990 to 2006, commercial fishermen harvested 848 million pounds of PWSAC salmon in common property fisheries with a total ex-vessel value of \$207 million.²
- From 1990 to 2006, commercial fishermen contributed \$12 million in enhancement taxes in support of PWSAC. The \$207 million ex-vessel value of PWSAC salmon harvested during the same time period returned fishermen more than \$17 for every \$1 of tax paid.
- From 1990 to 2006, PWSAC salmon accounted for an average of 35 percent of ex-vessel value and 49 percent of total volume of the Prince William Sound commercial fishery.

¹ Total output refers to all spending activity generated throughout the regional economy. An economic model, IMPLAN, was used to estimate total output. One dollar of input often results in more than one dollar of output because the dollar may circulate through many sectors in the economy.

² Ex-vessel value is the gross value paid to commercial fishermen for their salmon harvest.

**Ex-Vessel Value of Common Property Commercial Harvest
of PWSAC Salmon, 1990-2006
(millions of dollars)**



Source: Alaska Department of Fish and Game and McDowell Group estimates.

- Resident ex-vessel earnings from PWSAC salmon harvested in 2006 were \$11.7 million. This resulted in an estimated \$22.8 million in total economic output, including \$18.7 million in labor income and 345 jobs.
- Alaska resident permit holders see most of the economic benefits of PWSAC production. In 2006, Alaska resident permit holders earned an estimated 77 percent of the total PWSAC ex-vessel value.
- From 2004 to 2006, Cordova resident permit holders earned a total of \$10.2 million from PWSAC fish. Homer residents were the next highest earners, followed by Valdez and Anchorage.

**Ex-Vessel Value of PWSAC Commercial Harvest by Permit Holders'
Area of Residence, Top Seven Communities
2004 to 2006**

	2004	2005	2006
Cordova	\$2,391,000	\$5,121,000	\$5,694,000
Homer	641,000	1,990,000	2,213,000
Valdez	178,000	945,000	1,051,000
Anchorage	283,000	666,000	741,000
Girdwood	88,000	506,000	563,000
Wasilla	88,000	231,000	257,000
Kasilof	\$48,000	\$207,000	\$230,000

Source: Commercial Fisheries Entry Commission and McDowell Group estimates.

- Regional economic impacts include an estimated 120 jobs and \$8 million in payroll in the Valdez-Cordova area, 90 jobs and \$3 million in payroll in the Kenai Peninsula area, and 60 jobs and \$2 million in payroll in the Anchorage area.

Estimated Economic Output from Commercial Ex-Vessel Value of PWSAC Salmon, 2006

Census Area	2006 Ex-Vessel Income	Economic Output	Jobs	Payroll
Valdez-Cordova	\$6,789,000	\$9,946,000	120	\$8,195,000
Kenai Peninsula	\$2,913,000	\$4,897,000	90	\$3,472,000
Anchorage	\$1,475,000	\$2,621,000	60	\$2,105,000
Statewide	\$11,716,000	\$22,846,000	345	\$18,734,000

Source: CFEC and McDowell Group estimates.

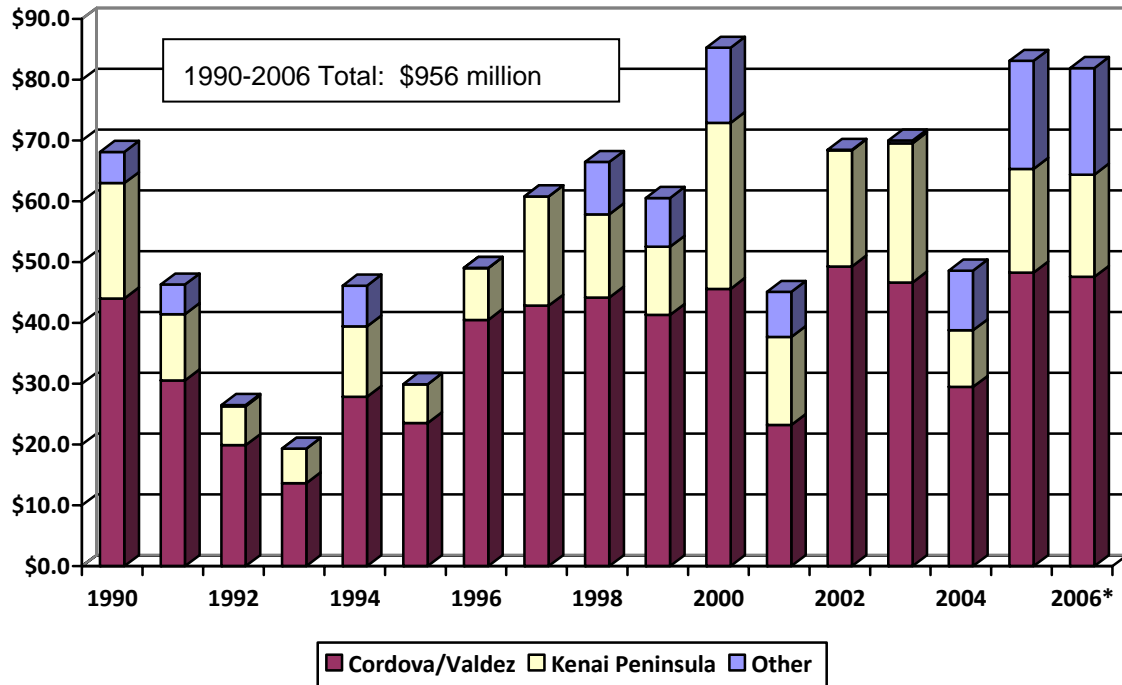
- Pink salmon accounted for 39 percent of the ex-vessel value of PWSAC salmon harvested from 1990 to 2006, followed by sockeye (38 percent), chum (20 percent), coho (2 percent), and chinook (less than 1 percent).

Seafood Processing

- The first wholesale value of processed PWSAC salmon in 2006 was an estimated \$81 million. This is comparable to the 2005 total of \$83 million. Lower harvests in 2006 were offset by higher prices and a species mix that favored high-value species.
- Between 1990 and 2006, the total first wholesale value of commercial and cost recovery harvest of PWSAC salmon was \$956 million, with an annual average value of \$56 million.³
- PWSAC salmon are processed by as many as 17 different Alaska processors. In terms of wholesale value, most PWSAC salmon are processed in the Cordova/Valdez area and on the Kenai Peninsula.
- From 1990 to 2006, first wholesale value for Cordova/Valdez area processors was about \$618 million, followed by \$237 million to Kenai Peninsula processors, and \$83 million to processors elsewhere in the state.
- Processing of PWSAC fish generated an estimated \$97 million in total output in 2006, including \$17 million in labor income and 305 jobs.

³ First wholesale value is the first sale of fish from a processor to a buyer outside of the processor's affiliate network.

**First Wholesale Value of PWSAC Salmon and Roe
by Processor Region, 1990 to 2006
(millions of dollars)**



Source: ADF&G and McDowell Group estimates. 2004 data is preliminary.

- By species (including roe), pink salmon contributed the largest share of wholesale value (61 percent), followed by chum (21 percent) and sockeye (16 percent). Coho accounted for 1 percent of value and chinook was less than 1 percent.

Sport Harvest

- PWSAC-origin salmon are harvested in sport fisheries over a wide area, including the Copper River Basin and Prince William Sound.
- In 2006, sport harvests of PWSAC salmon totaled 49,000 fish, the vast majority of which were pink salmon. The previous year saw harvests of approximately 27,000 fish. These oscillations are consistent with two-year cycles in pink salmon abundance.
- From 1990 to 2006, sport fishermen in the Prince William Sound area harvested 246,000 PWSAC salmon.
- Economic impacts from the 2006 harvest were an estimated \$524,000 in total output, including \$262,000 in payroll and 13 jobs.
- The record harvest of PWSAC fish occurred in 2006, when anglers harvested 49,000 fish. The 2000 harvest was second largest at 46,000 fish.

**Sport Harvest of PWSAC Salmon
in Numbers of Fish, 2002 to 2006**

Species	2002	2003	2004	2005	2006
Chinook	80	-	-	-	-
Sockeye	7,756	4,000	1,869	3,400	1,863
Coho	22,698	13,067	4,543	22,673	46,425
Pink	3,013	3,009	2,999	100	-
Chum	1,823	1,811	1,820	500	1,000
Total	35,370	21,887	11,231	28,519	49,288

Source: ADF&G, PWSAC and McDowell Group estimates.

Personal Use and Subsistence Fisheries

- In 2005, personal use and subsistence harvesters took 70,900 PWSAC-origin sockeye salmon.
- Between 1999 and 2005, Alaskans from across the state harvested 316,000 PWSAC sockeye in the Copper River personal use and subsistence fisheries.
- The largest harvests of PWSAC sockeye were by residents of Fairbanks, Anchorage, Wasilla, North Pole and Copper Center.

**Copper River Personal Use and Subsistence Fishery Harvest of PWSAC Sockeye,
1999-2005 Total by Place of Residence
Top Nine Communities**

City	1999	2000*	2001	2002	2003	2004	2005	Grand Total
Fairbanks	7,333	4,614	3,829	18,268	9,605	5,367	17,031	66,047
Anchorage	9,388	4,896	5,071	18,190	9,634	4,525	12,593	64,297
Wasilla	3,246	2,045	1,853	8,067	4,105	2,106	7,647	29,069
North Pole	2,312	1,287	1,243	5,223	3,026	1,636	5,459	20,186
Copper Center	2,209	1,253	1,255	6,466	4,174	1,308	4,686	21,351
Eagle River	2,352	868	1,149	4,278	2,063	970	3,294	14,974
Delta	1,288	762	674	2,597	1,672	777	2,973	10,743
Glennallen	2,254	1,100	944	5,175	2,652	688	2,964	15,777
Valdez	1,182	769	744	3,010	1,271	814	2,224	10,014

Source: ADF&G and McDowell Group estimates.

* Reporting requirements were changed in 2000 and may result in some inconsistencies in the time series data.

PWSAC Organization

- The PWSAC organization creates an annual average of 72 jobs in the regional economy. The organization generates annual payroll and expenditures of \$3.5 million within the state, plus an additional \$2.5 million in out-of-state expenditures.
- Economic impacts of PWSAC spending include approximately \$17 million in total output, 190 jobs and \$5.7 million in labor income.

Purpose and Scope

The purpose of this study is to provide an estimate of the economic impacts of PWSAC's hatcheries in Southcentral Alaska. Analyses include:

Commercial Harvest of PWSAC Salmon. In this section, the overall and regional economic benefits of PWSAC salmon are estimated based on ex-vessel income to permit holders in the Prince William Sound commercial fishery. In addition, regional economic effects from PWSAC salmon harvest are reported.

Economic Impacts of the Seafood Processing Industry. This section addresses the overall and regional economic impacts of processing PWSAC salmon based on first wholesale value and indirect economic impacts on the regional economy.

Sport Harvest of PWSAC Salmon. The sport harvest of PWSAC salmon is addressed, including economic impacts from angler spending.

Personal Use and Subsistence Harvest of PWSAC Salmon. The Copper River dipnet and fishwheel personal use and subsistence PWSAC harvests are described, including estimated number of fish harvested by fishermen's town of residence and economic impacts of participant spending.

Tax Payments from PWSAC Harvest. The fisheries business and enhancement tax revenue paid from the harvest of PWSAC fish are presented, including the ratio of income earned to enhancement tax paid by commercial fishermen.

Methodology

The data used in this report comes from a variety of sources, including PWSAC, Alaska Commercial Fisheries Entry Commission (CFEC), Alaska Department of Labor and Workforce Development, Alaska Department of Revenue, and Alaska Department of Fish and Game (ADF&G). It should be noted that available data on the economics of the region's seafood industry, sport, personal use and subsistence fisheries are limited, and in some cases non-existent. This is particularly true in areas related to personal income of commercial fishermen and the value of sport fishing activity. In these cases, estimates are based on the best available data.

Some preliminary commercial and sport harvest data was available through 2004. Some wholesale value data was unavailable from the State of Alaska due to confidentiality regulations. Therefore, wholesale values should be considered minimum estimates. Ex-vessel income for some communities was restricted due to state confidentiality laws. For these communities, the fishery average income per permit by gear type was used as a proxy.

Processor wholesale data and commercial harvest data by community of residence were available through 2005 from ADF&G and CFEC. For 2006, processor wholesale data was estimated by multiplying the ratio of ex-vessel to wholesale value in 2005 by the estimated ex-vessel value for 2006, based on ADF&G annual reports. The study team also assumed that the wholesale value of PWSAC salmon in 2006 was apportioned by area as it was in 2005. Ex-vessel value by community for 2006 was assumed to be in the same proportion as for 2005, and is estimated based on ADF&G annual reports. The 2006 estimates will be updated with actual ADF&G and CFEC data in future reports.

Wholesale value data for roe in Prince William Sound is not available. When fewer than four companies in a region process a seafood product, the State of Alaska considers the data confidential to protect the financial interests of the involved parties. The value of roe in the region was estimated from the statewide wholesale roe values, and assumed to be in proportion to the total contribution of Prince William Sound region salmon to the statewide total, by species. The wholesale value contribution of PWSAC salmon roe to the regional total was assumed to be in the same proportion as the contribution of PWSAC salmon to the regional total, by species.

Sport fishery harvest figures for PWSAC chinook, coho and sockeye are based on PWSAC hatchery manager estimates reported in annual reports to ADF&G. PWSAC pink salmon and chum are not reported in PWSAC reports, but are assumed to be harvested in substantial numbers by Prince William Sound anglers. For chum salmon, the percentage of PWSAC chum in the sport fishery is assumed to be the same as the PWSAC contribution to the commercial fishery. For pink salmon, the sport harvest in the Valdez area is assumed to be entirely from the Valdez Fishery Development Association (VFDA), and not from PWSAC. Therefore, the PWSAC contribution to the pink salmon sport fishery was assumed to be the same proportion as the PWSAC contribution to the commercial fishery in the Prince William Sound area, excluding the Valdez area.

The Copper River dipnet and fishwheel fisheries are important to thousands of Alaskans. The remoteness of the fishing area means that many users travel long distances to participate. These fishers buy fuel, ice, fishing equipment and clothing to harvest their catch. Estimating where these dollars are spent would require extensive research beyond the scope of this study. Furthermore, people would travel to the fishery to dipnet salmon even in the absence of PWSAC fish. Data is provided on estimated harvest per Alaska community, based on ADF&G Subsistence Division data.

Economic Modeling

The McDowell Group used the Impact Analysis for Planning Model (IMPLAN) to estimate the distribution of economic impacts of PWSAC salmon harvest and production throughout the economy. The IMPLAN model estimates total economic output, which reflects the entire supply chain of transactions resulting from harvest or processing of fish. For example, harvesting of fish will require purchase of a vessel, fuel, food, gear, and many other goods. This spending cycles through the regional economy. The IMPLAN model estimates the total set of such transactions. As a result, one dollar of input often results in more than one dollar of output because the dollar may circulate several times through the economy. The model also estimates employment and labor income, including total wage and salary employment as well as self-employed jobs in a region. It includes both full-time and part-time workers and is measured in annual average jobs. The IMPLAN model estimates economic impacts by census area or region. Data was grouped accordingly when assessing impacts with the IMPLAN model. To determine an accurate estimate of expenditures in Alaska would require research beyond the scope of this study.

Introduction

The Prince William Sound Aquaculture Corporation (PWSAC) is a non-profit organization formed in 1974 by a local area fishermen's group to optimize salmon production in Prince William Sound for the long term well-being of all user groups. PWSAC headquarters are located in Cordova.

The organization operates four remote hatcheries in Prince William Sound and one inland on the Gulkana River. Four species of salmon are currently produced: pink, chum, coho and sockeye. The returning salmon benefit the commercial, sport, personal use and subsistence fishers in the Prince William Sound area and throughout the state.

PWSAC is a private non-profit corporation. It relies on cost recovery revenues and a 2 percent tax on the regional commercial salmon harvest to fund its salmon enhancement activities.

Facilities and Operations

Armin F. Koernig Hatchery

The Armin F. Koernig Hatchery is located about 60 air miles west of Cordova in Sawmill Bay, on Evans Island. The site was originally a salmon cannery, but was converted to become the first PWSAC hatchery in 1975. The facility was built with monies borrowed from the State of Alaska's Fisheries Enhancement Revolving Loan Fund. Six on-site year-round staff and up to 14 seasonal staff operate the facility.

Armin F. Koernig was the only hatchery directly affected by the Exxon Valdez Oil Spill in 1989. Although oil booms surrounded the operation to protect the out-migrating fry, the effects of the spill to Armin F. Koernig and the Sound are still being investigated.

In 2006, Armin F. Koernig Hatchery saw estimated returns of 5.2 million pink salmon and 10.1 million pink salmon in 2005. The five-year average (2002-2006) for the hatchery was 7.0 million pink salmon.

Wally Noerenberg Hatchery

The Wally Noerenberg Hatchery was built in 1985 with monies borrowed from the State of Alaska's Fisheries Enhancement Revolving Loan Fund. It is located approximately 20 miles east of Whittier in Lake Bay on the southern tip of Esther Island, in the South Esther Island State Marine Park. WNH is the largest salmon production facility in North America. Eight on-site year-round staff and 30 seasonal staff operate the facility.

Wally Noerenberg Hatchery returns included an estimated 4.1 million pink, 2.2 million chum salmon and 100,000 coho salmon in 2006. In 2005 returns included 9.1 million pink, 1.9 million chum salmon and 80,000 coho salmon. Over the five-year period, the hatchery averaged returns of 7.8 million pink salmon, 3.2 million chum salmon, and 66,000 coho.

Cannery Creek Hatchery

The Cannery Creek Hatchery was built in 1978 by the Alaska Department of Fish and Game (ADF&G) Fisheries Rehabilitation, Enhancement and Development (FRED) division. PWSAC took

over operational control of the hatchery on July 1, 1988. The site is located on land managed by the U.S. Forest Service, approximately 40 miles east of Whittier, on the eastern shore of Unakwik Inlet in the northern area of Prince William Sound. PWSAC funds and operates the pink salmon facility under a 20-year contract with the ADF&G. Six on-site year-round staff and 14 seasonal staff operate the facility.

Cannery Creek Hatchery pink returns totaled an estimated 2.9 million fish in 2006. In 2005, the hatchery saw record returns of 13.5 million pinks. Over the five-year period from 2002 to 2006, average returns to the hatchery were 5.8 million pink salmon.

Main Bay Hatchery

Main Bay Hatchery is owned by the State of Alaska and situated on land managed by the U.S. Forest Service in Main Bay on the western shore of the sound, approximately 40 miles southwest of Whittier. Main Bay was built in 1981 by ADF&G as a chum salmon hatchery, but switched to a sockeye salmon enhancement program in 1986, becoming the first sockeye salmon smolt-producing hatchery in the world. PWSAC took over operation and management on July 1, 1991. Six on-site year-round staff and 12 seasonal staff operate the facility.

Main Bay Hatchery sockeye returns totaled about 1 million fish in 2006 and 467,000 fish in 2005. The five-year average for the facility was 907,000 returning sockeye.

Gulkana Hatchery

The Gulkana Hatchery is located on the Gulkana River near Paxson, 250 miles northeast of Anchorage and 177 miles south of Fairbanks on the Richardson Highway. PWSAC operates the facility under a contract, which began in 1993 and runs through 2013. The facility is owned by ADF&G and located on Bureau of Land Management land. Four on-site year-round staff and 12 seasonal staff operate the facility.

In 1973, the first streamside incubator box was introduced in an attempt to enhance Copper River sockeye salmon. With a survival rate of 79 percent the first year, significant enhancement opportunities were recognized along with the possibility of future expansion. By 1984, Gulkana became the largest sockeye salmon fry production facility in North America.

Gulkana Hatchery sockeye returns totaled about 272,000 fish 2006 and 261,000 fish in 2005. These numbers were consistent with the five-year average of 265,000 sockeye.

Cordova and Anchorage

PWSAC administration offices are located in Cordova. PWSAC owns a distribution center in Anchorage to consolidate and expedite supplies to and from the remote hatchery sites via Whittier.

Market Discussion

This section is intended as a broad overview of salmon market conditions relative to the species mix of PWSAC-origin salmon. Assessment of market performance and outlook is based on first wholesale value and product-form data published by Alaska Department of Revenue in the Alaska Salmon Price Report (ASPR) series.

PWSAC primarily produces pink and chum salmon and those species are the focus of this discussion. By volume, the five-year average of PWSAC production (2002-2006) is 70 percent pink, 24 percent chum and 6 percent sockeye.

The 2005 and 2006 seasons are unusual relative to the 5-year average of PWSAC salmon production. In 2005, the harvest of PWSAC pink salmon was the second-largest since 1990, totaling 104 million pounds and 85 percent of the total PWSAC harvest. 2006 was another anomaly, with the return of PWSAC pinks at just 40 million pounds, second-lowest in 10 years.

Table 1
Recent Harvest Composition of PWSAC Salmon by Volume

Species	2002-2006 Avg		2005		2006	
	Million lbs.	Percent	Million lbs.	Percent	Million lbs.	Percent
Pink	68.5	70%	104.0	85%	40.6	62%
Chum	23.6	24%	15.3	13%	17.7	27%
Sockeye	5.9	6%	3.1	3%	7.6	11%

Source: ADF&G Salmon Enhancement Annual Reports. Data from 2006 is preliminary.

Chum Salmon

Statewide average chum salmon prices have improved substantially in recent years, from 19 cents per pound in 2003 to 31 cents per pound in 2006. The rebound in chum price is a result of improved market conditions for chum salmon meat products rather than roe.

The previous 10-year peak for Prince William Sound chum price was 2001, when ex-vessel average for the region was 40 cents per pound. This was driven largely by strong first wholesale values for chum roe, at or near \$11 per pound.

More recently, chum roe has been selling at statewide average first wholesale prices in the \$6 to \$7 per pound range and has remained fairly steady at that level from 2003 through 2006. In comparison, first wholesale value of frozen headed and gutted (H&G) chum has risen steadily since 2003, from the mid-40-cent range in 2003 to 97 cents per pound in late 2006. Frozen chum fillets show similar first wholesale value growth, from the \$1.30-1.40 range in 2003 and 2004 to \$2.00 per pound in 2006.

The improved price for chum salmon meat products are widely considered to be a function of the continued growth in broad consumer demand for salmon, and the ongoing success of efforts to differentiate wild salmon from farmed product.

Pink Salmon

While ex-vessel pink prices from the 2006 season show only a modest improvement (with the statewide average up from \$0.10 in 2004 to \$0.13 in 2006), recent changes in inventory and growth in first wholesale prices provide more promising signs of recovery for Alaska pink salmon value.

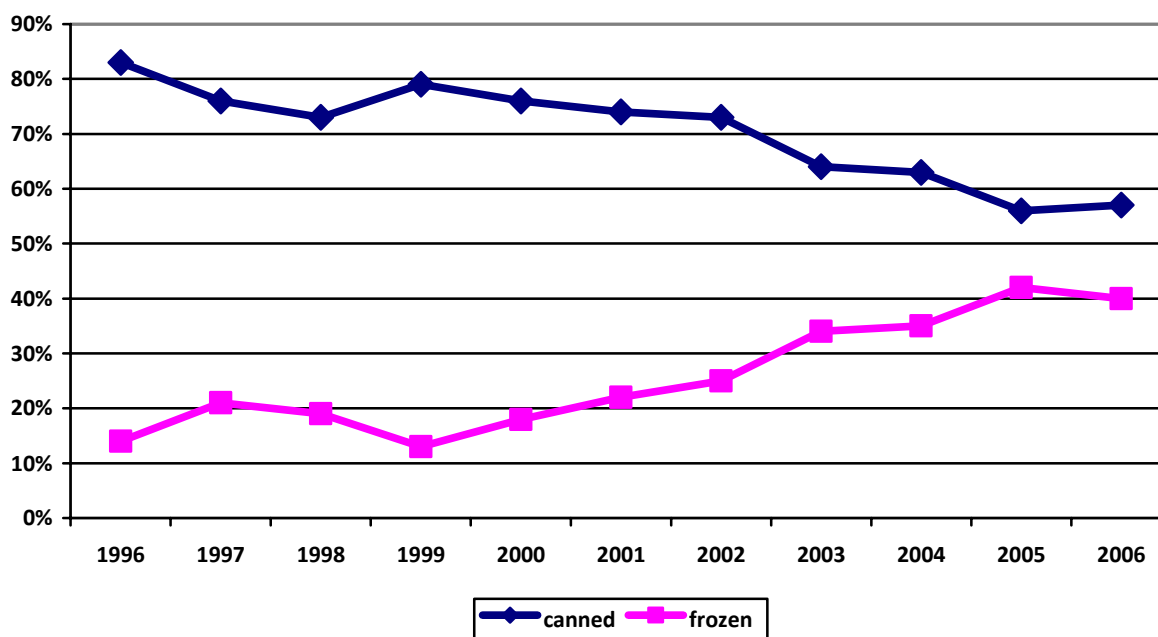
The market outlook for pinks is positive, based on three factors. First, market demand for salmon and for wild salmon in particular continues to grow. Pink salmon makes up nearly half of Alaska salmon harvest tonnage and pink products benefit from the upward trend in demand and salmon commodity value. Second, the recent product-form shift from canned to frozen pink has reduced the supply of raw material for the canned pack, helping balance supply and demand in the canned segment. Third, the below-average pink harvest of 2006 (the smallest in 10 years) heightened demand for frozen pinks and helped “dry up” surplus inventory of canned pinks.

The September 2006 canned pink salmon inventory is estimated at 2.8 million 48-tall case equivalent, a major reduction from the 5-year average of 4 million 48-tall equivalent. Five-year average sales volume of canned pink salmon is 3.2 million cases.

With canned pink inventory significantly below average sales (by 12 percent), the longstanding surplus of canned pink appears to be at an end. This is reflected in the most recent first wholesale case price figures for 48-tall canned pinks, up from the \$35 - \$42 per case range of the last five years to over \$53 per case in the September - December 2006 reporting period.

Frozen H&G pink salmon value has increased substantially, from 41 cents per pound in 2003 to 82 cents per pound in 2006. Per-pound value of frozen pink doubled in four years and sales volume during the same period grew from 36 million pounds to 62 million pounds. The combination of increased price and increased sales volume are clear indicators of genuine growth in demand rather than scarcity-driven pricing.

Figure 1
Pink Salmon Product Form Composition, 1996-2006



Source: ADF&G Commercial Operators Annual Report, Alaska Department of Revenue ASPR.

Sockeye Salmon

Prince William Sound sockeye typically bring the highest ex-vessel value in the state. Average ex-vessel sockeye price for Prince William Sound has increased steadily over the last four years, from \$1.10 per pound in 2003 to \$1.65 in 2006. In contrast the statewide average price of sockeye changed little during the same period, from 62 cents in 2003 to 67 cents in 2006.

While a significant amount of Prince William Sound (Copper River) sockeye is sold at high specialty-market prices early in the season, a good deal of PWS sockeye is caught and sold in June and early July while other Alaska sockeye fisheries are producing substantial volumes of fish. Buyers of early-season PWS sockeye generally purchase the fish for reasons other than price, but for mid-season and late-season production, PWS sockeye value is more directly linked to the broader Alaska sockeye market.

That market is showing two significant developments that are likely to keep statewide average prices stable or slightly lower in the short term. First, canned salmon makes up about a third of sockeye production and the canned sockeye market appears to be oversupplied. The September 2006 canned sockeye inventory is estimated at 1.4 million 48-tall case equivalent. Five-year average sales volume for the September - August reporting period is 1.1 million 48-tall equivalent. The oversupply will probably weaken ex-vessel price, particularly in Bristol Bay which contributed nearly 70 percent of Alaska sockeye production in 2006.

Second, there was a dramatic reduction in the export of frozen Alaska sockeye to Japan in 2006. In the last three years (2004-2006) Alaska produced between 80 million pounds and 96 million pounds of frozen H&G sockeye. In 2004 and 2005, about three-quarters of that production (74 percent and 80 percent, respectively) was exported to Japan. In 2006 frozen H&G sockeye production was slightly over 80 million pounds but only 30 million pounds (37 percent) was exported to Japan.

The decline in sockeye exports to Japan nearly doubled the supply of frozen Alaska sockeye available to other markets, from 28-30 million pounds in 2004 and 2005 to 53 million pounds in 2006.

In the long term, this will likely create a favorable situation for Alaska producers as more sockeye is sold into markets with significant salmon consumption growth, namely the domestic market and European Union countries. But in the short term, there is potential for softening of the sockeye market, as domestic and EU buyers absorb an additional 20-25 million pounds of Alaska frozen sockeye. This is reflected in the statewide average first wholesale price for frozen H&G sockeye, which declined 17 cents per pound from 2005 to 2006.

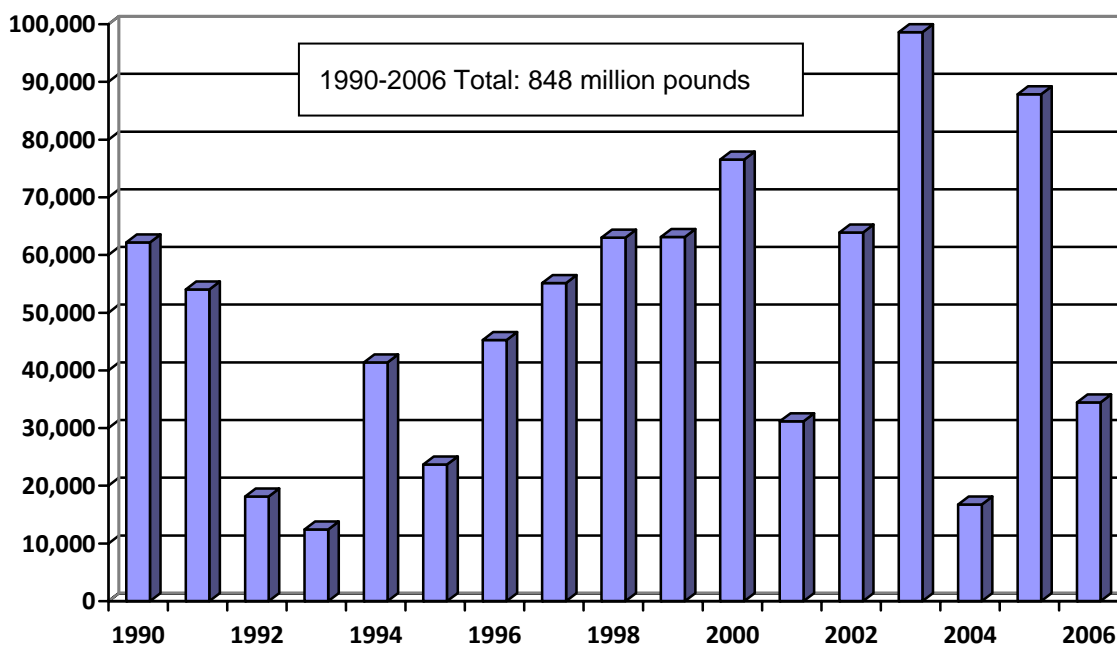
The 2007 Alaska sockeye harvest projection is for 41 million fish, consistent with the strong sockeye harvests of 2004-2006.

COMMERCIAL HARVEST OF PWSAC SALMON

Commercial Harvest and Ex-Vessel Value

Commercial fishermen harvested 34 million pounds of PWSAC salmon in 2006, and 88 million in 2005. While the 2006 harvest was the third lowest in a decade, the 2005 harvest was the second highest on record. Year-to-year oscillations in harvest are common as pink salmon returns, which make up the majority of PWSAC's fish, tend to cycle over a two-year period. Cumulatively from 1990 to 2006, commercial fishermen harvested 848 million pounds of PWSAC salmon in common property fisheries (see Figure 2). This was an average of 50 million pounds annually. The 2003 harvest was a record at nearly 100 million pounds of fish, with a second record season following in 2005 with 88 million fish.

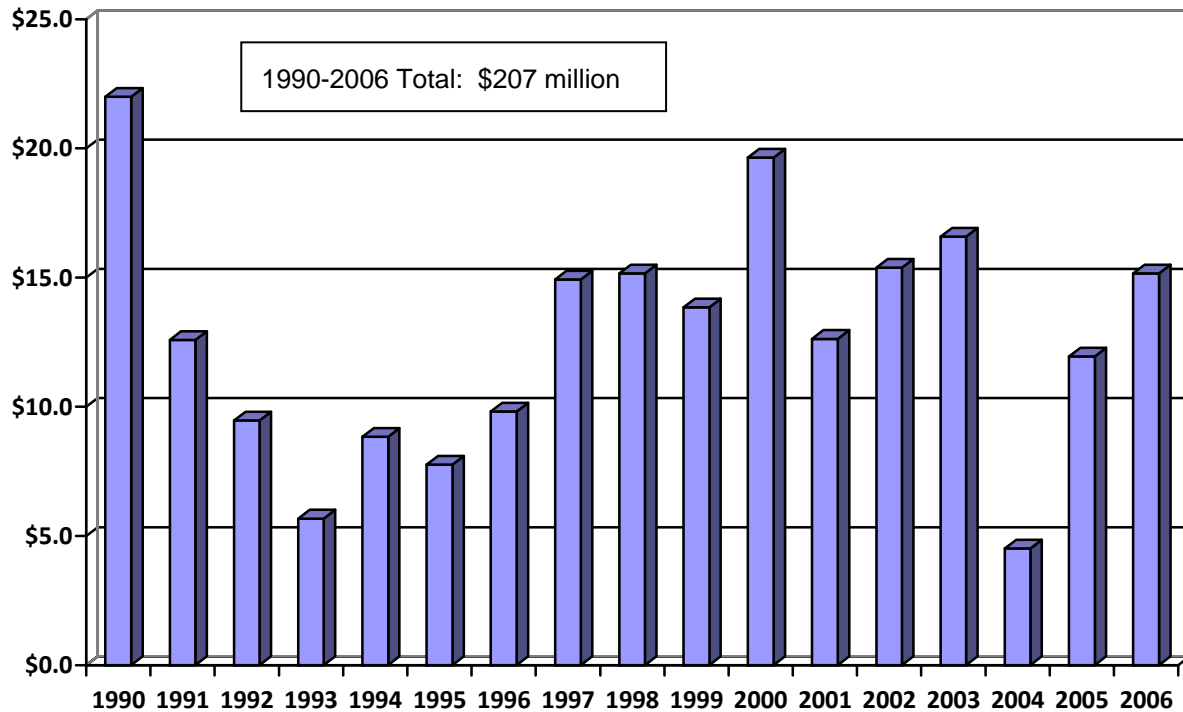
Figure 2
Total Pounds of PWSAC Salmon Harvested in
Common Property Commercial Fisheries, 1990-2006
(thousands of pounds)



Source: ADF&G and McDowell Group estimates. 2006 data is preliminary. Number of PWSAC fish provided by Alaska Department of Fish and Game annual enhancement reports; total poundage based on average weight by species by gear type.

The harvest value of the 2006 commercial fishery was relatively high, at \$15 million, despite the modest return. This was due largely to a species mix that favored higher valued species, supported by improving ex-vessel prices. Commercial fishermen earned an estimated \$207 million in ex-vessel value from PWSAC salmon in common property fisheries from 1990 to 2006, an average of \$12 million annually. Averages are pulled down by extremely low earnings in 2004 caused by poor pink salmon returns.

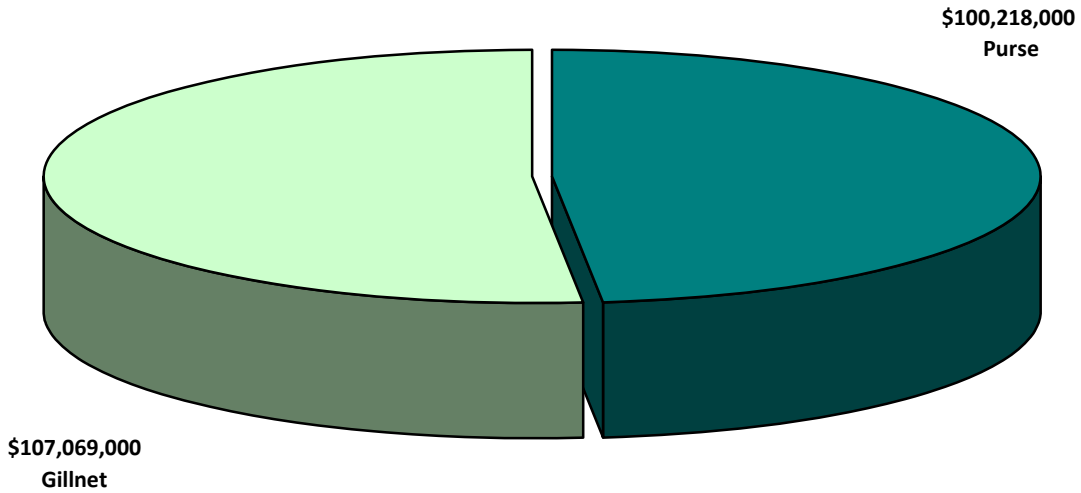
Figure 3
Ex-Vessel Value of Common Property Commercial Harvest of
PWSAC Salmon, 1990-2006
 (millions of dollars)



Source: ADF&G and McDowell Group estimates. Data for 2006 is preliminary.

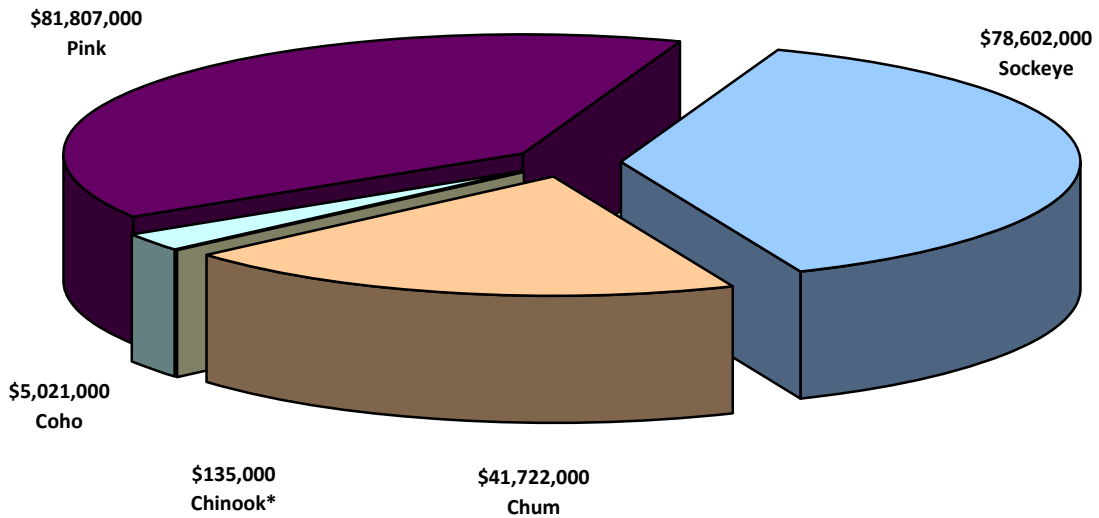
PWSAC salmon ex-vessel value totaled \$107 million to the gillnet fleet and \$100 million to the purse seine fleet between 1990 and 2006 (Figure 4), or close to a 50/50 split. In 2006, however, harvests favored the gillnet fleet, which harvested fish worth about 62 percent of the total PWSAC value. In 2005 the harvest favored seiners, which took about 57 percent of the total value. Pink salmon accounted for most of the cumulative 1990-2006 ex-vessel value (\$81 million), followed by sockeye salmon (\$79 million), chum (\$42 million), coho (\$5 million) and chinook (\$135,000) (Figure 5). (PWSAC no longer produces chinook salmon.)

Figure 4
Ex-Vessel Value of PWSAC Salmon
by Gear, 1990-2006 Total



Source: ADF&G and McDowell Group estimates. This data excludes fish used for cost recovery.

Figure 5
Ex-Vessel Value of PWSAC Salmon
by Species, 1990-2006 Total

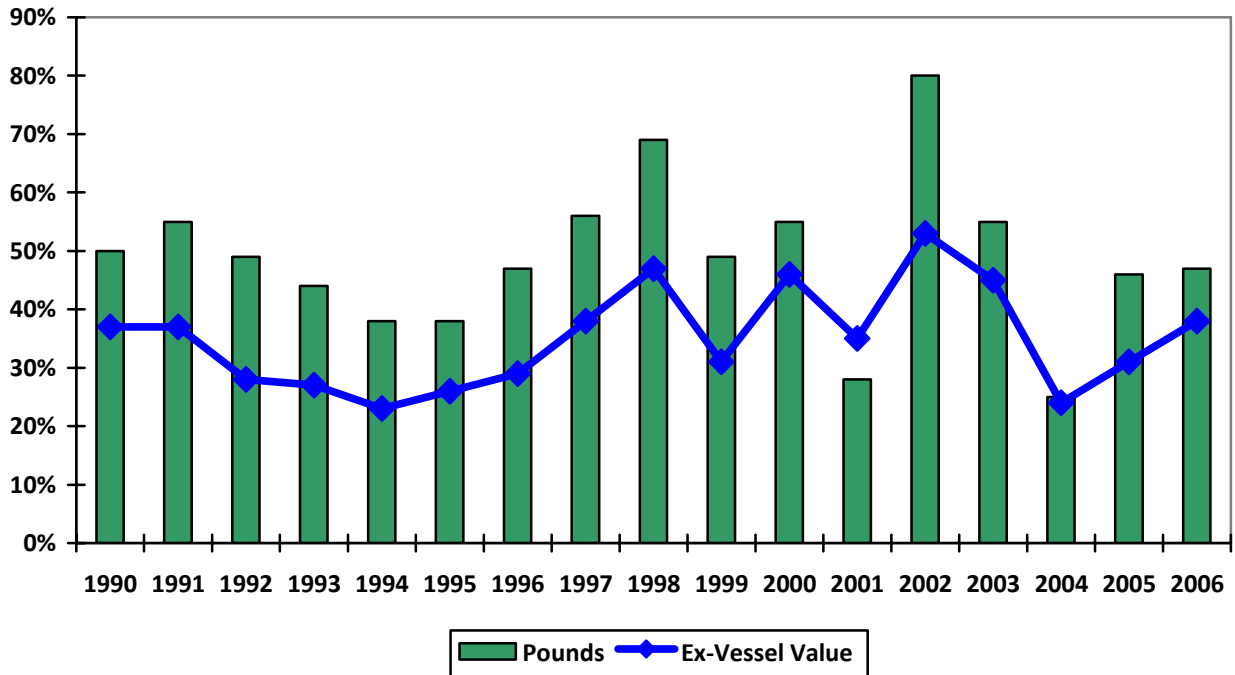


Source: ADF&G and McDowell Group estimates. This data excludes fish used for cost recovery.

* PWSAC no longer produces chinook salmon. Final returns occurred in 2001 and 2002.

PWSAC salmon production is of major importance to Prince William Sound fisheries. Since 1990, PWSAC salmon have accounted for an average of 35 percent of ex-vessel value and 49 percent of volume (Figure 6).

Figure 6
Ex-Vessel Value and Harvest of PWSAC Salmon as a Percent of the Prince William Sound Commercial Salmon Harvest, 1990-2006



Source: ADF&G and McDowell Group estimates.

Geographic Distribution of PWSAC Commercial Harvest Value

Alaska residents earned an estimated 77 percent of the ex-vessel value of PWSAC salmon in 2006. The Alaska resident harvest is widely distributed, with participation by residents from Fairbanks to Dutch Harbor to Hydaburg. Residents from an estimated 38 towns harvested PWSAC salmon worth an estimated \$11.7 million in ex-vessel value in 2006.

Table 2
Geographic Distribution of Estimated Ex-vessel Earnings
by Fishermen's Place of Residence*
PWSAC Commercial Harvest, 2004-2006

	2004	2005**	2006***
Anchor Point	\$44,000	\$124,000	\$138,000
Anchorage	283,000	666,000	741,000
Bethel	10,000	-	-
Big Lake	10,000	10,000	11,000
Bird Creek	10,000	-	-
Chenega Bay	10,000	10,000	11,000
Chitina	10,000	20,000	22,000
Chugiak	39,000	117,000	130,000
Circle City	21,000	20,000	22,000
Copper Center	21,000	20,000	22,000
Cordova	2,391,000	5,121,000	5,694,000
Delta Junction	46,000	51,000	57,000
Dutch Harbor	10,000	10,000	11,000
Eagle River	24,000	31,000	34,000
Fairbanks	10,000	10,000	11,000
Fort Richardson	10,000	10,000	11,000
Girdwood	88,000	506,000	563,000
Homer	641,000	1,990,000	2,213,000
Hydaburg	-	10,000	11,000
Indian	10,000	10,000	11,000
Juneau	25,000	24,000	27,000
Kasilof	48,000	207,000	230,000
Kenai	23,000	113,000	126,000
Kodiak	21,000	20,000	22,000
Nikiski	21,000	-	-
Ninilchik	21,000	10,000	11,000
Palmer	75,000	61,000	68,000
Sand Point	10,000	10,000	11,000
Seldovia	-	10,000	11,000
Seward	72,000	91,000	101,000
Soldotna	31,000	20,000	22,000
Tatitlek	31,000	29,000	32,000
Tok	-	10,000	11,000
Valdez	178,000	945,000	1,051,000
Wasilla	88,000	231,000	257,000
Willow	21,000	20,000	22,000
Grand Total	\$ 4,353,000	\$10,537,000	\$11,716,000

Source: CFEC and McDowell Group estimates. Totals may not be exact due to rounding.

* Data for 2005 is preliminary.

**Data for some communities is unavailable due to confidentiality. Estimates for these communities are based on average Alaska resident earnings, by permit type, for the preceding three years.

*** Ex-vessel earnings data are not yet available on a community level for 2006.

Earnings per community based on total ex-vessel estimates for 2006 and are assumed to be proportionate to those in 2005.

Cordova residents harvested fish worth an estimated 55 percent of the total value of the PWSAC harvest by Alaska residents (\$6.5 million), followed by residents of Homer (14 percent, \$1.7 million), Anchorage and Valdez (7 and 6 percent, respectively; \$827,000 and \$688,000).

The estimated economic impacts from Alaska resident PWSAC-related ex-vessel income of \$11.7 million were \$22.8 million in total output, including \$18.7 million in labor income and 345 jobs. Total resident and non-resident ex-vessel earnings of \$15.2 million resulted in \$29.5 million in total output, including \$24.2 million in labor income and 445 jobs (Table 3).

Table 3
Regional Economic Output, Including Jobs and Payroll
from Commercial Ex-Vessel Value of PWSAC Salmon, 2006

Sector	Ex-Vessel Income	Economic Output	Jobs	Payroll
Alaska Resident	\$11,700,000	\$22,800,000	345	18,700,000
Resident and Non-Resident	\$15,200,000	\$29,500,000	445	NA*

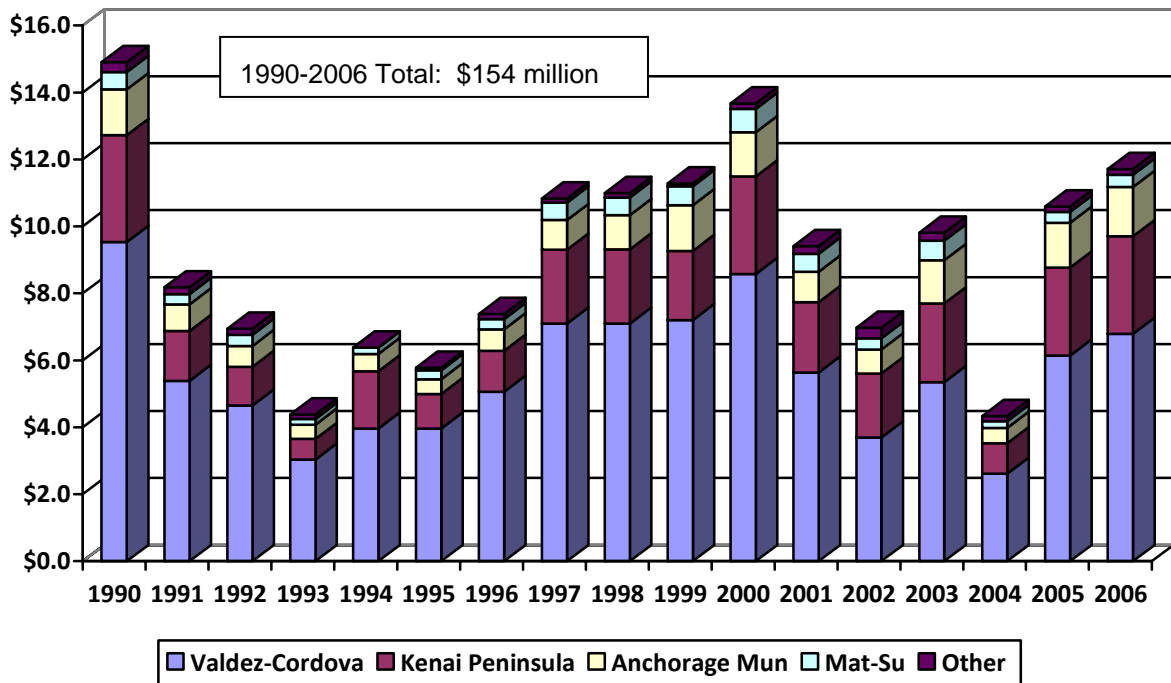
Source: CFEC and McDowell Group estimates.

* This analysis focuses on direct and indirect payroll generated in Alaska. It is assumed that a significant portion of non-resident income is spent outside of Alaska. Therefore the payroll effects of that spending are not considered in this analysis.

Regional Economic Impacts of PWSAC Commercial Salmon Harvest, 1990 to 2006 Total

- Fishermen from the Valdez-Cordova area harvested \$7 million of PWSAC salmon in 2006, and \$6 million in 2005. Total harvests from 1990 to 2006 were worth \$96 million, an average of \$5.6 million per year.
- Kenai Peninsula fishermen earned close to \$3 million in both 2005 and 2006. The total value from 1990 to 2006 was \$33 million, for an annual average of \$1.9 million.
- Anchorage fishermen earned \$1.5 million in 2006 and \$1.3 million in 2005. The 1990 to 2006 total was \$16 million, for an annual average of \$916,000.
- Matanuska-Susitna fishermen earned \$320,000 in 2005 and \$360,000 in 2006, with 1995-2006 total of \$7 million and an annual average of nearly \$398,000 (Figure 7).

Figure 7
Ex-Vessel Income from PWSAC Salmon by Alaska-Resident Permit Holder, 1990 to 2006
(millions of dollars)



Source: CFEC, ADF&G and McDowell Group estimates.

- PWSAC salmon contributed \$6.8 million to Valdez-Cordova commercial permit holder ex-vessel income in 2006, resulting in an estimated economic output of \$9.9 million, including 120 jobs and \$8.2 million in labor income.
- Kenai Peninsula permit holders earned \$2.9 million in ex-vessel value from PWSAC salmon in 2006, resulting in \$4.9 million in economic output, including 90 jobs and \$3.5 million in labor income.
- Anchorage permit holders earned \$1.5 million in ex-vessel value from PWSAC salmon in 2006, resulting in \$2.6 million in economic output, including 60 jobs and \$2.1 million in labor income.
- Statewide, resident permit holders earned \$11.7 million in ex-vessel value from PWSAC salmon in 2006, resulting in \$22.8 million in economic output, including 345 jobs and \$18.7 million in labor income.

Table 4
Regional Economic Output, Including Jobs and Payroll, from
Commercial Ex-Vessel Value of PWSAC Salmon, 2006

Census Area	2006 Ex-Vessel Income	Economic Output	Jobs	Payroll
Valdez-Cordova	\$6,789,000	\$9,946,000	120	\$8,195,000
Kenai Peninsula	\$2,913,000	\$4,897,000	90	\$3,472,000
Anchorage	\$1,475,000	\$2,621,000	60	\$2,105,000
Statewide	\$11,716,000	\$22,846,000	345	\$18,734,000

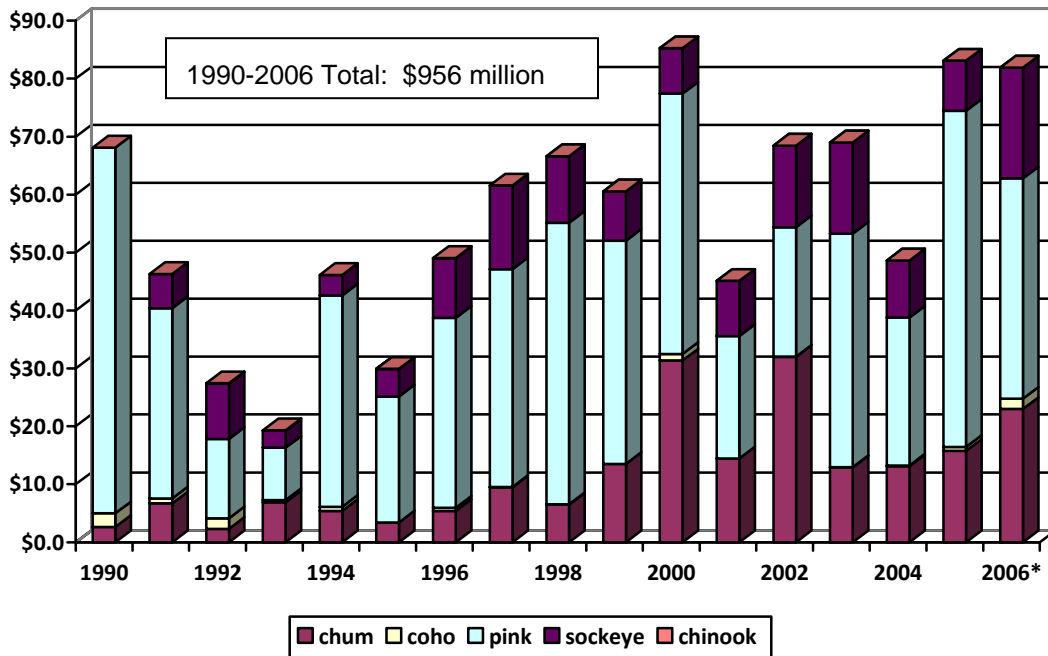
Source: CFEC and McDowell Group estimates.

ECONOMIC IMPACTS OF SEAFOOD PROCESSORS

The commercial harvest of PWSAC salmon generates significant benefits for Southcentral Alaska’s seafood processors, as indicated by the first wholesale value (i.e., the income a processor receives when product is sold outside its affiliate network for the first time). From 1990 to 2006, the total first wholesale value of PWSAC salmon and roe harvested in commercial and cost-recovery fisheries was \$956 million, with an annual average value of about \$56 million. By species (including roe), pink salmon led with the largest share of wholesale value (61 percent), followed by chum (21 percent) and sockeye (16 percent). Coho accounted for 1 percent of value and chinook was less than 1 percent.

The estimated first wholesale value of PWSAC salmon in 2006 was \$81 million. This generated an estimated \$95 million in total output, including \$17 million in payroll and 305 jobs. (Wholesale value in 2006 was comparable to the 2005 total of \$83 million. Though volumes of fish in 2005 were significantly higher, the species mix in 2006 favored higher value salmon, resulting in comparable estimated total value.)

Figure 8
First Wholesale Value of PWSAC Salmon, Including Roe,
by Species, 1990-2006
 (millions of dollars)



Source: ADF&G and McDowell Group estimates. Excludes confidential values

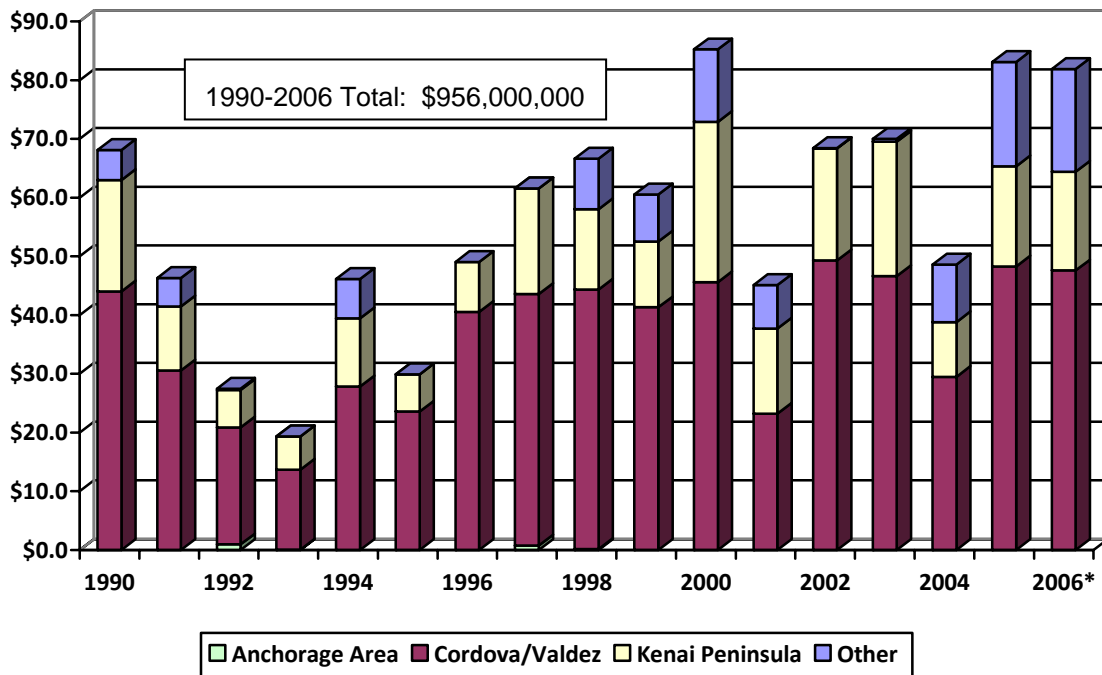
Note: Wholesale value for 2006 is based on the proportion of first wholesale value to ex-vessel value in 2005.

Regional Impacts of PWSAC Salmon Processing

PWSAC salmon was processed by as many as 17 different Alaska processors in 2005 (the most recent year for which data is available). Processors were grouped by geographic area to estimate regional impacts. As would be expected, most PWSAC wholesale value is realized in the Cordova/Valdez area. This is followed by the Kenai Peninsula. It should be noted that, while salmon from Prince William Sound are known to be processed in Anchorage, confidentiality restrictions limit the availability of data in some years, resulting in Anchorage's exclusion from some years' estimates.⁴

From 1990 to 2006, first wholesale value for Cordova/Valdez area processors totaled about \$618 million, followed by \$237 million to Kenai processors, and \$83 million to processors elsewhere in the state (Figure 9).

Figure 9
First Wholesale Value of PWSAC Salmon and Roe by
Processor Region, 1990-2006
 (millions of dollars)



Source: ADF&G and McDowell Group estimates. Excludes confidential values.

Notes: Wholesale value for 2006 is based on the proportion of first wholesale value to ex-vessel value in 2005.

Data on Anchorage-area processing activity is frequently subject to confidentiality restrictions due to the limited number of processors handling Prince William Sound fish in the area.

⁴ The Alaska Department of Fish and Game suppresses data when fewer than three companies report value information (in previous year this threshold has been fewer than four reporting). This protects the confidential data of individual firms. However, in some cases it can result in limiting the availability of data.

Of the estimated \$82 million in first wholesale value of PWSAC salmon to Alaska processors in 2006, \$48 million went to Cordova/Valdez processors, \$17 million to Kenai processors, and \$18 million to processors elsewhere in the state. Processing of PWSAC fish generated an estimated 115 jobs in Cordova/Valdez, 55 jobs on the Kenai Peninsula, and 135 jobs elsewhere in the state (Table 5).

Table 5
Economic Output, Including Jobs and Payroll, from Processing
of the Commercial Harvest of PWSAC salmon, 2006

Region	First Wholesale Value	Economic Output	Jobs	Payroll
Cordova/Valdez	\$47,586,000	\$48,395,000	115	\$3,298,000
Kenai Peninsula	\$16,813,000	\$19,213,000	55	\$2,797,000
Other Alaska Towns	\$17,506,000	\$26,998,000	135	\$11,347,000
Statewide	\$81,905,000	\$94,606,000	305	\$17,441,000

Source: ADF&G and McDowell Group estimates. Excludes confidential values.

Economic output totals do not include output associated with ex-vessel value.

PERSONAL USE AND SUBSISTENCE FISHERIES

Alaskans travel from around the state to participate in the Copper River dipnet personal use and fishwheel subsistence fisheries. PWSAC salmon play an important role in these fisheries. Alaskans harvested 316,000 PWSAC-origin sockeye from 1999 to 2005. In 2005 alone an estimated 70,900 PWSAC sockeye were taken in these fisheries. Data for 2006 is not yet available. Residents of Fairbanks harvested more of these fish than residents of any other community, followed by Anchorage, Wasilla, Copper Center, and North Pole. Residents of Palmer, Glennallen, and Eagle River also harvested large numbers of PWSAC sockeye in these fisheries.

Table 6
Number of PWSAC Sockeye Harvest, by Fishermen's Place of Residence,
Copper River Personal Use and Subsistence Fishery, 1999-2005

City	1999	2000	2001	2002	2003	2004	2005	Grand Total
Anchor Point	-	-	-	-	-	19	104	123
Anchorage	9,388	4,896	5,071	18,190	9,634	4,525	12,593	64,297
Anderson	19	72	35	89	33	-	144	392
Barrow	76	25	35	95	90	39	134	494
Big Lake	219	84	133	387	252	91	167	1,333
Cantwell	46	19	25	20	16	4	15	145
Central	9	30	6	39	40	9	45	178
Chickaloon	171	38	37	96	90	34	271	737
Chistochina	-	-	-	-	-	271	186	457
Chitina	340	179	188	982	932	334	758	3,713
Chugiak	681	406	392	1,178	770	316	832	4,575
Clear	28	13	27	51	9	60	138	326
Cooper Landing	25	28	18	162	52	26	99	410
Copper Center	2,209	1,253	1,255	6,466	4,174	1,308	4,686	21,351
Cordova	3	9	49	272	28	20	44	425
Delta	1,288	762	674	2,597	1,672	777	2,973	10,743
Denali	27	18	14	9	15	6	24	113
Dot Lake	10	8	12	24	51	-	30	135
Eagle River	2,352	868	1,149	4,278	2,063	970	3,294	14,974
Eielson	606	402	264	848	395	173	531	3,219
Elmendorf AFB	103	70	73	139	61	29	52	527
Ester	176	92	104	451	333	192	521	1,869
Fairbanks	7,333	4,614	3,829	18,268	9,605	5,367	17,031	66,047
Fort Richardson	72	50	53	206	80	21	90	572
Fort Wainwright	390	190	151	694	217	156	548	2,346
Gakona	834	888	768	1,829	1,234	496	2,193	8,242
Girdwood	101	54	44	358	173	78	141	949
Glennallen	2,254	1,100	944	5,175	2,652	688	2,964	15,777
Gulkana	-	-	-	-	-	127	-	127
Healy	117	75	90	184	81	72	264	883
Homer	69	32	22	54	55	10	87	329
Houston	43	19	36	58		9	8	173

Table 6 (continued)
Number of PWSAC Sockeye Harvest, by Fishermen's Place of Residence, Copper River
Personal Use and Subsistence Fishery, 1999-2005

City	1999	2000	2001	2002	2003	2004	2005	Grand Total
Indian	5	10	11	15	10	10	33	94
Juneau	45	11	17	44	49	14	55	235
Kenai	30	21	7	33	16	7	7	121
Kenny Lake	-	-	-	-	-	334	-	334
Kodiak	6	10	15	37	48	7	10	133
Kotzebue	4	-	1	30	11	-	5	51
McCarthy	38	1	1	67	-	89	5	201
Nenana	66	25	64	383	207	-	-	745
Ninilchik	17	19	15	37	18	1	20	127
Nome	10	7	7	13	30	-	10	77
North Pole	2,312	1,287	1,243	5,223	3,026	1,636	5,459	20,186
Northway	150	40	29	-	100	70	429	818
Palmer	2,221	1,209	1,211	5,232	2,466	-	-	12,339
Paxson	14	7	7	15	93	-	-	136
Salcha	223	101	89	412	303	220	565	1,913
Seward	35	17	12	49	44	8	59	224
Slana	190	107	138	259	309	340	454	1,797
Soldotna	53	30	33	80	44	16	20	276
Sutton	163	49	50	342	131	95	242	1,072
Talkeetna	83	42	66	140	85	30	173	619
Tanacross	-	-	-	-	-	-	186	186
Tazlina	-	-	-	-	-	282	-	282
Tok	736	448	367	1,075	822	657	1,865	5,970
Trapper Creek	30	-	2	-	-	6	7	45
Two Rivers	61	32	55	198	114	42	144	646
Valdez	1,182	769	744	3,010	1,271	814	2,224	10,014
Wasilla	3,246	2,045	1,853	8,067	4,105	2,106	7,647	29,069
Willow	164	121	75	378	187	69	102	925
Willow	-	-	-	-	-	-	-	171
Other Alaska ²	185	83	59	273	188	107	243	1,138
Grand Total	40,300	22,800	21,700	88,600	48,500	23,200	70,900	316,000

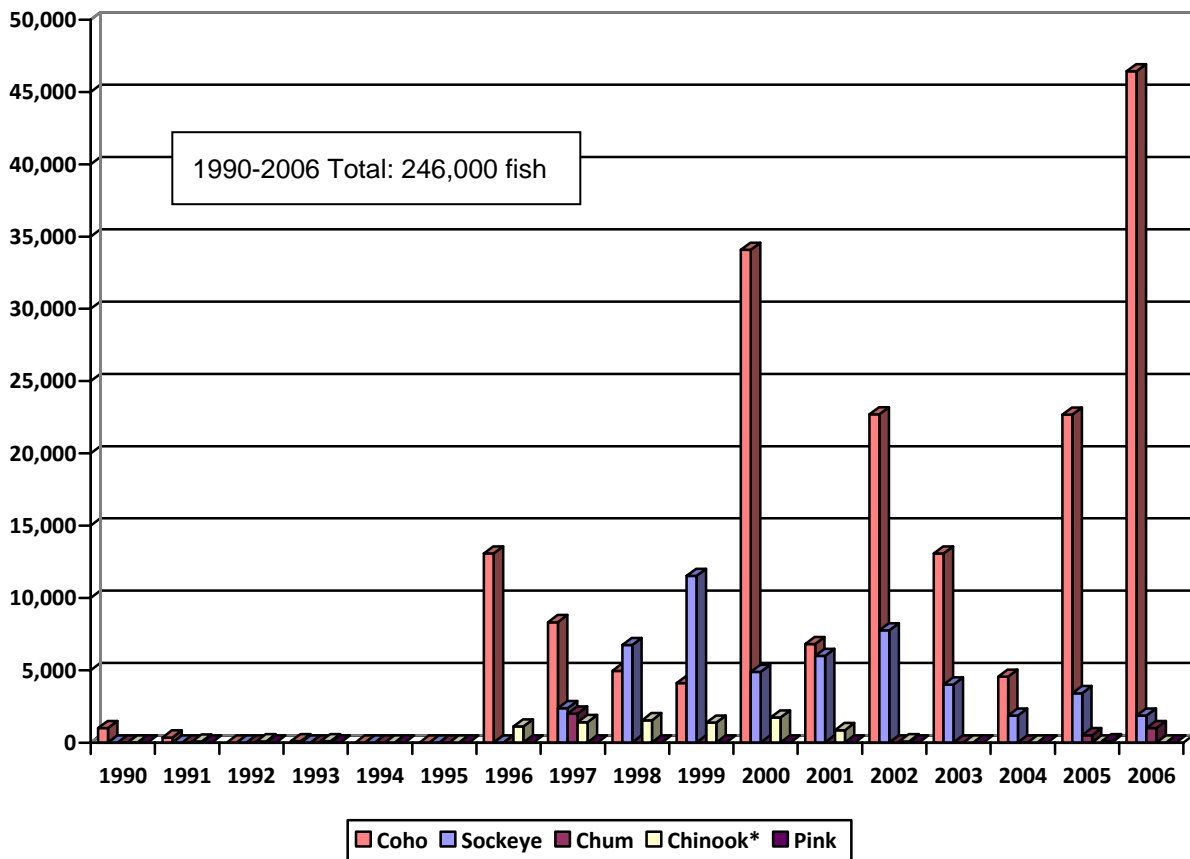
Source: ADF&G, McDowell Group estimates.

1. Reporting requirements were changed in 2000. Prior to 2000, a punch card to record each salmon harvested was required to be turned into ADF&G following each trip. In 2000, harvesters recorded the date and number of fish on a form, and did not have to submit the form until the end of the season.
2. "Other Alaska" includes communities whose residents harvested 50 fish or fewer from 1999 to 2005.

Recreational Harvest of PWSAC Salmon

PWSAC salmon play an important role in the Prince William Sound sport fisheries, with 49,000 fish harvested in sport fisheries in 2006 and 27,000 in 2005. Overall, PWSAC contributed 246,000 fish to the sport fishery from 1990-2006 (Figure 10). Three quarters of the fish harvested were coho, followed by sockeye (20 percent). Others contributed a total of about 5 percent of the fish. The 2006 all-species harvest of 49,000 fish generated estimated direct expenditures of \$419,000. The estimated economic impacts of this activity are \$524,000 in total economic output, including \$262,000 in payroll and 13 jobs.

Figure 10
Recreational Harvest of PWSAC Salmon, 1990-2006
 (in numbers of fish)



Source: ADF&G and McDowell Group estimates.

* PWSAC no longer produces chinook salmon. Final returns for the species occurred in 2002.

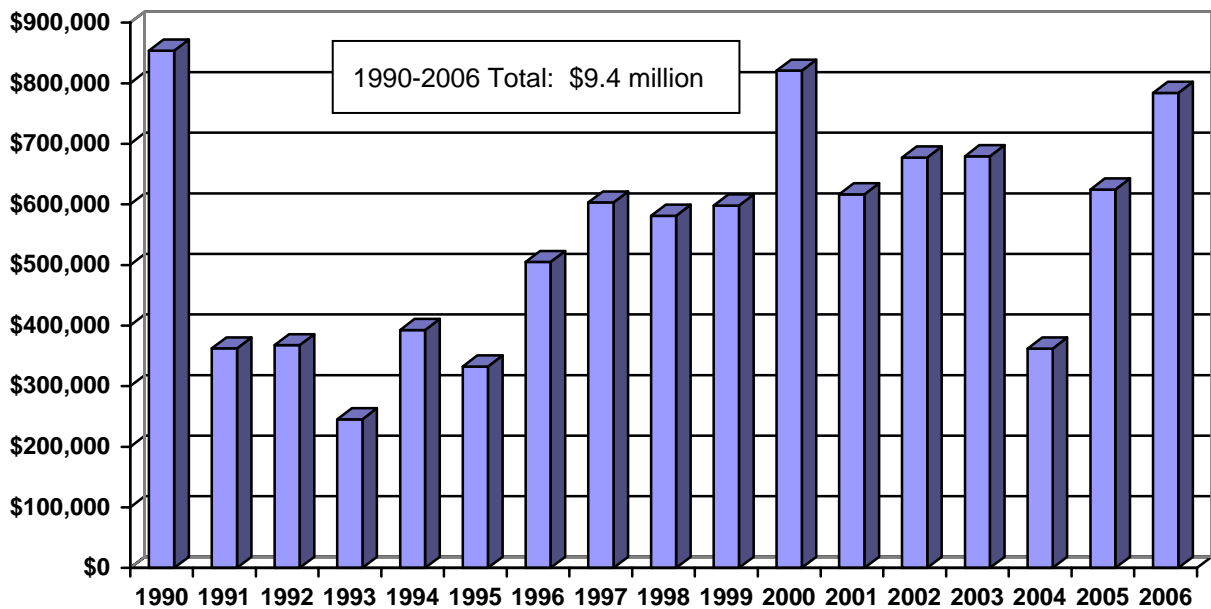
The PWSAC salmon sport harvest is spread over a wide area, including the entire Prince William Sound area and the Gulkana River in the Copper River drainage.

SALMON ENHANCEMENT AND FISHERIES BUSINESS TAX

As with all salmon commercially harvested and processed in Prince William Sound, PWSAC salmon are subject to a 3 percent State of Alaska Fisheries Business Tax, which is deposited into the state's General Fund.

From 1990 to 2006, Prince William Sound commercial salmon fishermen paid an estimated \$22 million in total fisheries business tax. The tax on PWSAC salmon accounted for about \$9 million of this total value, including fisheries business taxes paid on PWSAC cost recovery fish (Figure 11). Estimated receipts in 2006 were \$780,000; in 2005 they were \$620,000.

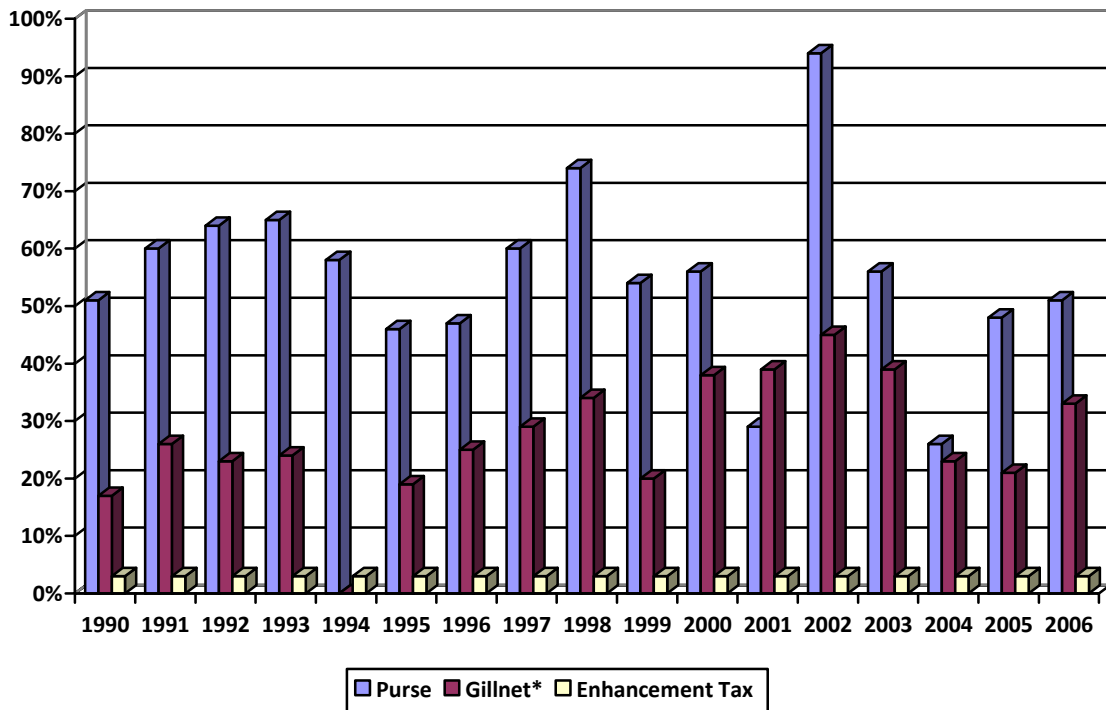
Figure 11
State Fisheries Business Taxes Paid on PWSAC Fish, 1990 to 2006



Source: ADF&G and McDowell Group estimates.

Commercial fishermen fishing in Prince William Sound also pay a 2 percent Salmon Enhancement Tax to fund PWSAC operations. The return on this investment is substantial. From 1990 to 2006, purse seiners derived 53 percent of their incomes from PWSAC fish. Gillnetters derived 27 percent of their incomes from PWSAC fish (Figure 12).

Figure 12
Percent of Ex-vessel Value for Seine and Gillnet Harvesters from PWSAC Salmon Versus the Salmon Enhancement Tax Rate 1990 to 2006

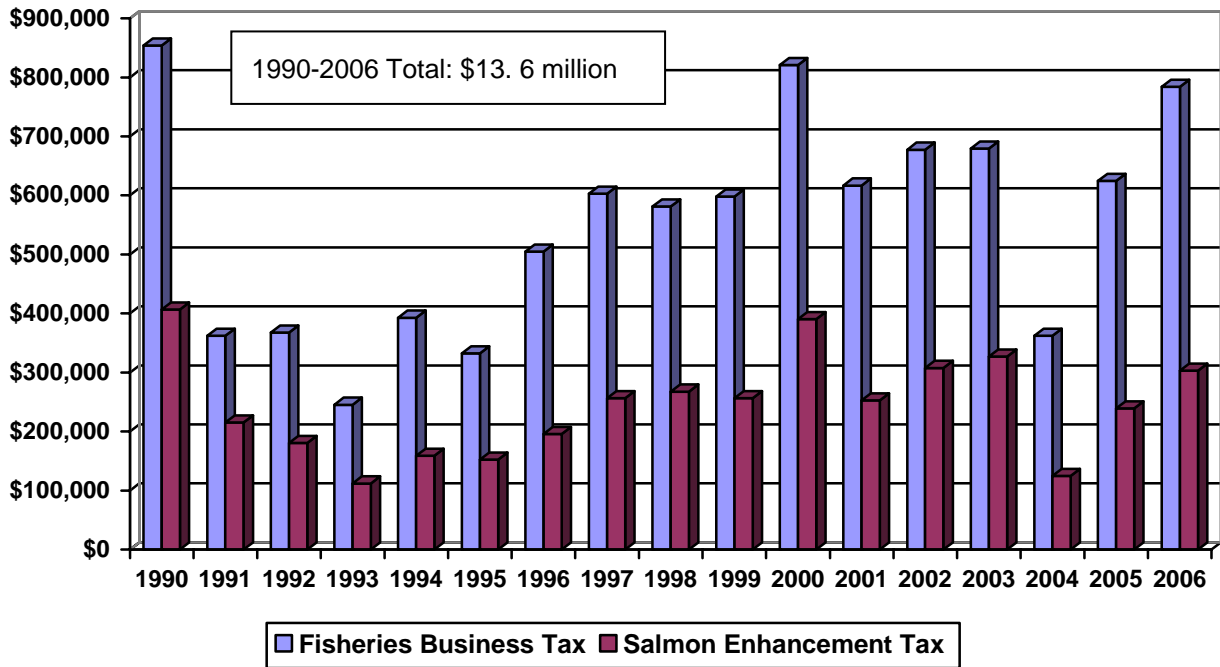


Source: ADF&G and McDowell Group estimates.

* Gillnet includes setnet and drift gillnet gear.

In 2006, commercial fishermen contributed \$300,000 in enhancement taxes in Prince William Sound, and \$239,000 in 2005. From 1990 to 2006, contributions totaled \$12 million in enhancement taxes. Over the same period, PWSAC fish contributed \$207 million in ex-vessel value to the commercial fishery, a return to fishermen of \$17 for every \$1 of tax paid (Figure 13).

Figure 13
Salmon Enhancement and Fisheries Business Taxes
Paid on PWSAC Fish, 1990 to 2006



Source: ADF&G and McDowell Group estimates.

IMPACTS OF PWSAC BUSINESS EXPENSES

The PWSAC organization has substantial impacts on the regional economy. PWSAC directly creates 72 full-time equivalent jobs. Payroll and in-state operating expenses totaled just under \$3.5 million in calendar year 2006, plus out-of-state spending for fish feed, employee health insurance and miscellaneous equipment of about \$2.5 million.

In calendar year 2006, PWSAC spending was spread out among 19 Alaska communities, with purchasing the highest in Juneau, Anchorage, Valdez, Cordova and Whittier (Table 7).

Table 7
PWSAC Spending by Community, 2006

Community	Expenditures
Juneau	\$1,774,900
Anchorage	747,200
Valdez	442,700
Cordova	247,900
Whittier	136,900
Seward	28,700
Fairbanks	25,500
Glennallen	24,000
Gakona	15,400
Palmer	15,100
Wasilla	7,700
Eagle River	5,100
Anchor Point	4,600
Homer	2,800
Delta Junction	2,600
Girdwood	1,700
Chenega Bay	1,600
Sitka	600
Bethel	< \$100

Source: PWSAC and McDowell Group estimates.

Total economic impact of the spending includes approximately \$17 million in total output, 190 jobs and \$5.7 million in labor income.