

ECONOMIC IMPACTS OF THE SOUTHERN SOUTHEAST REGIONAL AQUACULTURE ASSOCIATION

*Prepared for:
Southern Southeast Regional
Aquaculture Association*



Research-Based Consulting

Juneau
Anchorage



October 2008

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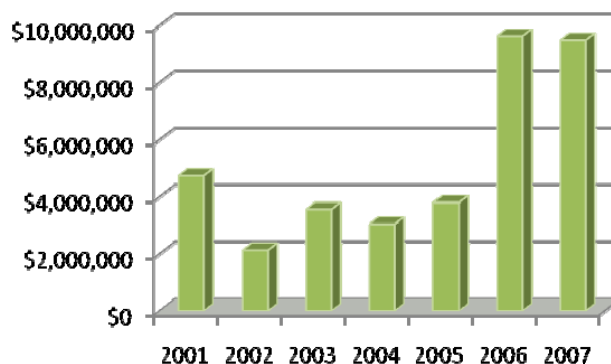
Executive Summary

The Southern Southeast Regional Aquaculture Association (SSRAA) has a significant economic impact on Southern Southeast Alaska's commercial fishing, seafood processing and sportfishing industries through its salmon production efforts and general operations. The purpose of this study is to estimate the level of impact in each of these industries, as well as the impacts to local and regional economies in Southeast Alaska. Key findings are presented below.

Commercial Harvest

- Between 2001 and 2007, commercial fishermen harvested 81.3 million pounds of SSRAA-produced salmon with an ex-vessel value of \$36.3 million. The ex-vessel value is the gross value paid by seafood processors to commercial fishermen for their catch.
- In 2007, 18.0 million pounds of SSRAA salmon were harvested by commercial fishermen, with an ex-vessel value of \$9.5 million. This includes \$5.5 million earned by commercial fishermen residing in Southern Southeast (SSE) Alaska.
- The total economic output resulting from commercial harvest of SSRAA salmon by SSE resident fishermen was \$8 million in 2007. This output generated an annual equivalent of 110 jobs and \$3.6 million in labor income.

**Total Ex-Vessel Value of SSRAA Salmon
Commercial Harvest, 2001-2007**



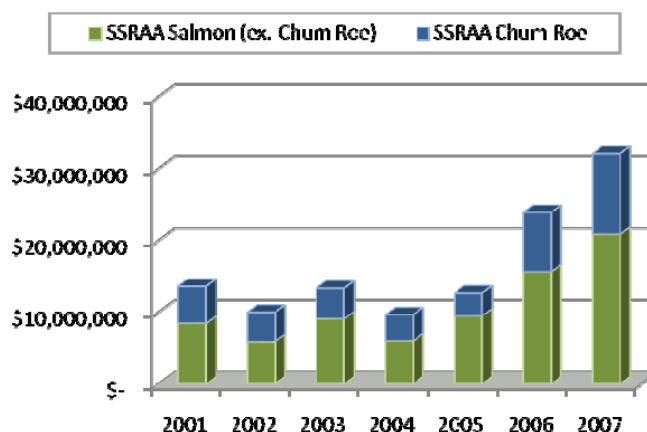
- Between 2001 and 2007, SSRAA salmon comprised 12 percent of the salmon harvest volume in SSE Alaska (districts 1 through 9) and accounted for one-quarter (23 percent) of the total ex-vessel value of salmon in the area.
- In 2006, SSRAA salmon made up 37 percent of the total ex-vessel value and 44 percent of the harvest volume of SSE salmon fisheries. Returns of SSRAA salmon were particularly strong in 2006, but the SSE contribution percentages were further inflated due to poor returns of wild pink stocks that season.

- Adult returns of SSRAA salmon were strong again in 2007. Despite a rebound in SSE pink stocks, the ex-vessel value of SSRAA salmon in 2007 still accounted for one-third (31 percent) of total SSE value, even while the SSRAA percentage of harvest volume dropped to 12 percent. This is attributed to high chum salmon prices in 2007.
- Benefits from SSRAA-produced salmon are well distributed among the three major commercial harvest gear types—purse seine, drift gillnet, and troll. Between 2001 and 2007, the purse seine fleet averaged an annual ex-vessel income of \$2.1 million from SSRAA fish, followed by the drift gillnet fleet at \$1.9 million, and trollers at \$1.8 million.
- In terms of overall ex-vessel value, chum is the most valuable SSRAA-produced salmon. From 2001 and 2007, commercial fishermen earned an annual average of \$3.2 million from SSRAA chum. SSRAA coho yielded an annual average of \$1.2 million, followed by chinook (\$700,000), and sockeye (\$14,000).

Seafood Processing

- In addition to the benefits garnered by fishermen, the commercial harvest of SSRAA salmon generates substantial benefits for Southeast Alaska’s seafood processors, as indicated by first wholesale value. The first wholesale value is defined as payment received upon sale of product by a processor to a buyer outside their affiliate network. Between 2001 and 2007, the total first wholesale value of SSRAA salmon was \$115 million, with an annual average of \$16.4 million.
- In 2007, the first wholesale value of SSRAA salmon totaled \$32.1 million, including \$11.2 million in chum roe products. Excluding the ex-vessel value, the net wholesale value of SSRAA salmon was \$22.6 million in 2007. This includes fish that were harvested in both common property and cost recovery efforts.
- Based on the net wholesale value (\$22.6 million), McDowell Group estimates that the processing of SSRAA salmon resulted in economic output totaling \$30 million in 2007. Over half of this output (\$17 million) went into the Ketchikan economy, including \$2.5 million in labor income and an annual equivalent of 112 jobs.

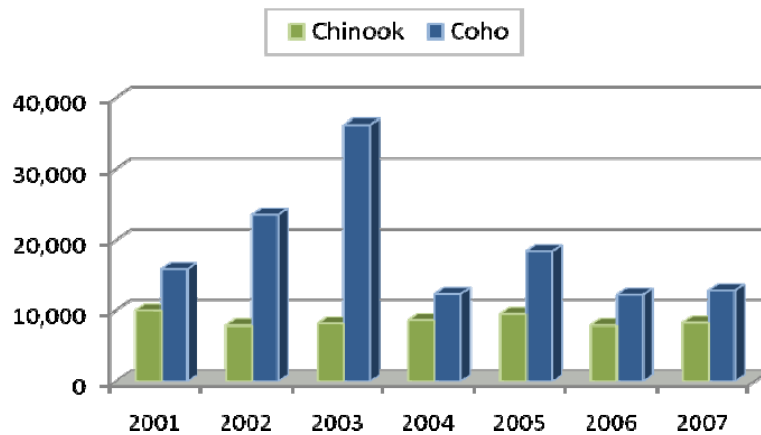
First Wholesale Value of SSRAA Salmon with Chum Roe Shown Separately, 2001-2007



Sport Harvest

- SSRAA-produced chinook and coho salmon have a substantial impact on the sportfish industry in SSE Alaska. Without SSRAA fish, there would likely be fewer sportfish charter businesses operating in and around Ketchikan, Wrangell, Petersburg, and on Prince of Wales Island.
- Between 2001 and 2007, SSRAA production added 200,000 chinooks and cohos to the SSE sport harvest, averaging 27,000 salmon annually.
- The economic impacts of the sport fish industry are difficult to quantify and measuring the impact of SSRAA fish as part of the industry is even more of a challenge. McDowell Group estimates that \$2.3 million entered the Ketchikan economy in 2007 as a direct result of SSRAA chinooks and cohos caught by sport fishermen visiting Ketchikan. This translates to approximately \$3 million in total economic output, including \$1 million in labor income and an annual equivalent of 45 jobs.

Total Number of SSRAA Salmon Harvested in Sport Fisheries, 2001-2007



Combined Economic Impacts of SSRAA Production and Operations

Generally speaking, residents of most Southern Southeast Alaska communities, including Ketchikan, Petersburg, Wrangell, Prince of Wales Island, and the surrounding area, feel the impacts of SSRAA production and operations. Combined economic impacts include direct spending associated with commercial fishing, seafood processing, the sport fish charter industry, and SSRAA operations, as well as all related indirect and induced spending. Tax revenue generated from the harvest of SSRAA salmon is presented separately.

Southern Southeast Alaska

- In 2007, combined economic output in SSE from SSRAA production and operations totaled \$46 million, including 420 jobs and \$11.5 million in labor income.
- The bulk of this economic activity is in the Ketchikan area, but significant impacts also occur in the Petersburg-Wrangell area and on Prince of Wales Island.

Ketchikan

- In 2007, the combined economic output in Ketchikan resulting from SSRAA production and operations totaled \$26 million, including 220 jobs and \$6 million in labor income.
- Two-thirds of this output comes from the seafood processing industry. Another 15 percent is generated by SSRAA operations.

Salmon Enhancement and Business Taxes

- Harvest and processing of SSRAA-produced salmon generated \$2.5 million in revenue from the Salmon Enhancement Tax and Fisheries Business Tax between 2001 and 2007.
- In 2007, taxes paid on SSRAA salmon totaled \$600,000.

Impact Summary

The table below summarizes harvest volume and value of SSRAA-produced fish, as well as economic impacts of SSRAA operations and production.

Summary SSRAA Production, Operations, and Economic Impacts, 2007

Harvest Volume			
Total SSRAA Production (# of fish; includes common property, cost recovery and sport)	3.2 million		
Commercial harvest of SSRAA salmon (# of fish, includes common property)	2.2 million		
SSRAA commercial harvest as % of Southern Southeast Alaska total harvest	12%		
Sport harvest of SSRAA salmon (# of fish)	21,000		
Harvest Value (Direct)			
Total harvest ex-vessel value of SSRAA salmon	\$9.5 million		
... harvested by SSE Alaska residents	\$5.5 million		
SSRAA salmon ex-vessel value as % of Southern Southeast Alaska total ex-vessel value	31%		
First wholesale value of SSRAA salmon (processed in Southern Southeast Alaska)	\$32.1 million		
... processed in Ketchikan	\$18.1 million		
... processed in Ketchikan as % of total first wholesale value	56%		
SSRAA Employment, Payroll and Spending (Direct)			
SSRAA annual average employment	38		
SSRAA total annual payroll	\$1.7 million		
SSRAA total annual spending on goods and services	\$8.1 million		
... spending in Southern Southeast Alaska	\$2.2 million		
Economic Impacts*			
	Total Output	Employment	Labor Income
Commercial harvest of SSRAA salmon	\$8 million	110	\$3.6 million
Seafood processing of SSRAA salmon	30 million	215	4.9 million
Sport harvest of SSRAA salmon	3 million	45	1.0 million
SSRAA operations	5 million	50	1.9 million
Total economic output from SSRAA activity	\$46 million	420	\$11.5 million

*Impacts include commercial harvesting and processing of SSRAA salmon, sport charter harvest, direct SSRAA operations, and all indirect multiplier effects throughout the regional economy. Total labor income does not equal the sum of categorical labor income values due to rounding.

Purpose and Methodology

Purpose and Scope

The purpose of this study is to provide an estimate of the economic impacts of the Southern Southeast Regional Aquaculture Association (SSRAA) between 2001 and 2007. This is an update of an earlier economic impact report produced by McDowell Group in 2001. Similar to the 2001 study, this report concentrates on five primary subjects:

1. **Commercial Harvest**—The overall economic benefits of commercially caught SSRAA salmon are presented using ex-vessel income to Southeast Alaska fishermen. Ex-vessel income to Southeast fishermen represents the gross value paid to fishermen for their catch. The geographic distribution of earnings from SSRAA salmon commercial harvest is also reported.
2. **Seafood Processing**—The overall economic impact from processing SSRAA salmon harvested in commercial fisheries is addressed. First wholesale value represents the first sale of fish by a processor to a buyer outside their affiliate network.
3. **Sport Harvest**—Contributions of SSRAA fish to the regional sport harvest are addressed, including economic output from non-resident harvest facilitated by the charter industry.
4. **Regional and Local Economic Impacts**—This includes estimates of the economic benefits of SSRAA salmon to the Southern Southeast region, as well as to the local Ketchikan economy.
5. **Local Tax Benefits**—Tax revenue is generated from all commercially harvested fish in Alaska via a 3 percent Salmon Enhancement Tax and a 3 percent Fisheries Business Tax.

For purposes of this report, Southern Southeast Alaska is defined as the Ketchikan Gateway Borough, Prince of Wales (POW) Island-Outer Ketchikan Census Area, and Wrangell-Petersburg Census Area. In terms of commercial fishing districts, SSE is defined as districts 1 through 9.

Methodology

The data used in this report comes from a variety of sources, including SSRAA, Alaska Commercial Fisheries Entry Commission (CFEC), Alaska Department of Fish and Game (ADFG), Alaska Department of Labor and Workforce Development (ADOLWD), and Alaska Department of Revenue. In addition, interviews with SSRAA staff and sport charter operators were conducted. Recent McDowell Group research on the Ketchikan, Wrangell, Petersburg, and POW economies was also used in this study.

Estimates provided in this report are based on the best available data. Volume and value estimates of SSRAA salmon that was commercially harvested are based on data provided by SSRAA, CFEC and ADFG. Wholesale values are based on average annual prices per product form for Southeast Alaska, published by Alaska Department of Revenue. Wholesale values for 2007 were estimated by multiplying the 2007 ex-vessel value by the average 2001-2006 ratio between wholesale and ex-vessel values.

The value of SSRAA salmon processed in Ketchikan was estimated by multiplying the total first wholesale value of SSRAA salmon by the ratio of salmon harvested from districts 1 through 9 and landed in Ketchikan to the total volume harvested from districts 1 through 9. Harvest and landing data are based on information reported on fish tickets. This methodology assumes the SSRAA-produced salmon harvested from districts 1 through 9 and landed in Ketchikan were also processed in Ketchikan. The data does not account for salmon that was reported to be processed in Ketchikan but transferred by a processor to another location, or salmon that was intended to be processed in another location but transferred to Ketchikan.

Some wholesale value data was unavailable from the Alaska Department of Revenue due to confidentiality regulations. The study team made an effort to be conservative at analysis points when it was possible to choose from a range of values. Therefore, wholesale values reported in this study should be considered *minimum* estimates.

Sport fish estimates are based on data provided by SSRAA, ADFG, the Ketchikan Gateway Borough, and interviews conducted with sport fish charter operators in Ketchikan, Wrangell, Petersburg, and on POW Island.

McDowell Group developed an economic model to estimate the economic impacts related to SSRAA production and operations. Inputs to this model were drawn from the sources described above. The model linked ex-vessel volume and value data, ADOWLD employment and payroll data, first wholesale value data, and other information to generate estimates of annual employment, income, and total output related to SSRAA salmon. Multipliers were drawn from IMPLAN, a widely used input-output model useful in measuring the direct, indirect and induced economic impact of industry and infrastructure development. Along with experience from previous analysis, the study team used the model to estimate the economic impacts related to the sport fish harvest of SSRAA fish and to SSRAA operations in SSE.

The Southern Southeast Regional Aquaculture Association (SSRAA) is a non-profit corporation headquartered in Ketchikan, Alaska. The organization was incorporated in 1976 and began operation in 1978 to enhance the salmon stocks in Southern Southeast Alaska from Dixon Entrance to Frederick Sound. SSRAA is guided by a 21-member Board of Directors representing a diverse group from the commercial, subsistence, sport, and fish processing sectors, as well as representatives from Native corporations, municipalities, the business community, and the general public. SSRAA employs an annual average of 38 staff and a peak of 45 workers during the summer months.

SSRAA is funded primarily through a combination of revenues from a 3 percent ex-vessel tax on landed salmon within its operating area, and through cost recovery of adult salmon returns. SSRAA is unique among aquaculture associations in that it markets its own cost recovery fish. Chum salmon are the backbone of SSRAA cost-recovery income. The chum roe is processed into Ikura, a highly desired salmon product in Japan and Eastern Europe. The chum flesh is used for a variety of products, such as smoked salmon.

Facilities and Operations

SSRAA operates four hatcheries, five remote release sites, and two restoration sites throughout Southern Southeast Alaska. Hatcheries are located at Whitman Lake in Ketchikan; in Neets Bay, roughly 40 miles north of Ketchikan; Burnett Inlet, 25 miles south of Wrangell; and Crystal Lake, 20 miles south of Petersburg. These facilities raise chinook, coho, chum, and sockeye salmon for on-site releases, as well as releases from remote sites in Kendrick Bay, Nakat Inlet, Anita Bay, Bakewell Lake, and Neck Lake. Additionally, SSRAA has wild salmon stock restoration projects at Hugh Smith Lake and McDonald Lake.

Chum salmon constitute SSRAA's largest production effort and expected return. They are produced at the Whitman Lake and Neets Bay facilities, and released on-site at the hatcheries and at remote sites in Kendrick Bay, Nakat Inlet, and Anita Bay. Chum are primarily targeted by drift gillnet and purse seine fisheries in Clarence and Sumner Straits. Since 2001, SSRAA contributions to common property commercial fisheries have ranged from 463,000 fish in 2002 to 2.3 million fish in 2006, with a 2001-2007 average return of 1.2 million fish. The 2007 chum harvest totaled approximately 2 million SSRAA-produced fish.

Coho salmon are produced primarily at the Neets Bay hatchery, as well as at the Whitman Lake and Crystal Lake facilities. In addition to hatchery releases, coho are also released from a large enhancement project at Neck Lake. Coho are primarily targeted by trollers region-wide, and by drift gillnetters and sport fishermen in Sumner and Clarence Straits and the Ketchikan area. Recent commercial and sport harvest of SSRAA coho has ranged from 125,000 fish in 2006 to 379,000 fish in 2003, with a 2001-2007 average of 240,000 fish. The 2007 harvest was roughly 196,000 SSRAA-produced coho.

Chinook salmon are mainly produced at SSRAA's Crystal Lake hatchery, under contract with the ADFG Sport Fish Division, as well as at the Whitman Lake and Neets Bay facilities. The fish are released on-site at the three facilities, and remotely from Anita Bay. SSRAA chinook are primarily targeted by troll and sport fleets near Ketchikan. Since 2001, SSRAA contributions to chinook commercial and sport harvests ranged from 21,000 fish in 2002 to 39,000 fish in 2007, with a 2001-2007 average return of 29,000.

SSRAA's **sockeye** salmon enhancement projects have recently shifted. In addition to its traditional operations at the Burnett Inlet hatchery, SSRAA has recently focused on restoration of natural sockeye populations, with projects at Hugh Smith Lake and McDonald Lake. Releases occur at the Burnett Inlet facility and at Hugh Smith Lake, although due to inconsistent counting efforts, hatchery-raised sockeye returns in 2006 and 2007 were not recorded. The sockeye releases from Neck Creek have been discontinued. Evaluating SSRAA's sockeye production is made more challenging by the fact that the most successful project, Hugh Smith Lake, has both wild stock and hatchery-produced fish returning to the system. According to ADFG estimates, commercial harvests of wild and hatchery sockeye returning to Hugh Smith Lake ranged from 15,000 to 35,000 fish during the 2004-2007 time period. It is unknown what portion of returning fish are SSRAA-produced.

For the purposes of this economic impact report, recorded harvest counts of SSRAA sockeye are used. However, it is recognized that the impact of SSRAA's sockeye production effort is underestimated. Recorded counts decreased from 9,000 hatchery fish in 2005 to zero in 2006 and 2007. The 2001-2007 average recorded return was 2,600 fish.

Commercial Harvest of SSRAA Salmon

This section includes an overview of recent salmon market conditions and a discussion of commercial salmon harvest volume and value, including value generated through seafood processing.

Salmon Market Overview: Production & Price Trends

Salmon markets trends are extremely important to the value of SSRAA operations. For example, recent significant upward trends in market demand and prices for chum, coho, and chinook dramatically affect economic values reflected in this report.

Chum Salmon: recent history

Southeast Alaska region-average chum salmon prices have improved substantially in recent years, from 22 cents per pound in 2003 to 39 cents per pound in 2007.

Roe value has traditionally been a significant driver for the ex-vessel price of chums, but the price increases through 2007 resulted from increased wholesale value of chum salmon meat products. The previous 10-year peak for statewide chum price was 2001, when the average ex-vessel price was 34 cents per pound. This was driven largely by strong wholesale values for chum roe, at or near \$11 per pound at the time.

More recently, chum roe has been selling at first wholesale prices in the \$6-7 range and remained fairly steady at that level from 2003 through summer of 2007. In contrast, 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 the low-90-cent range in 2007. Frozen chum fillets show similar wholesale value growth, from the \$1.30-1.40 range in 2003 and 2004 to the mid-\$1.90 per pound range in 2007.

The improved price for chum salmon meat products is 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. Wholesale chum prices of 2006 may also have been buoyed by substitution activity associated with the pink salmon harvest shortfall that year.

Chum Salmon: recent developments

Preliminary information from the 2008 season indicates the SE region average ex-vessel price for the 2008 season may be above 60 cents per pound, a 20-year high. This is driven by a substantial increase in the wholesale price of chum roe, augmented by continued, modest increases in wholesale price for chum salmon meat products.

The substantial wholesale price increase for chum roe is widely considered to be a product of market diversification and increased competition between the traditional market in Japan and emerging markets in Europe and Russia.

Japan has traditionally received most U.S. salmon roe export volume (averaging 75 percent from 2003 to 2005) but that share has recently dropped, to 66 percent in 2006 and 58 percent in 2007. Meanwhile, salmon roe exports to the European Union and Russia have increased, from 10 percent of volume in 2005 to 24 percent in 2007.

Coho Salmon

The product-form mix of coho has changed to some extent in recent years. Most recently (2007), approximately 56 percent goes to frozen H&G, 22 percent to fresh H&G, and 15 percent to fillet products, with a small percentage canned.

Statewide average first wholesale value of most coho products increased steadily from 2003 to 2007. Frozen H&G coho increased from \$1.40 per pound in 2003 to \$2.38 in 2007. Similarly, wholesale value of frozen coho fillets grew from \$2.70 to \$4.43 per pound between 2003 and 2007 and fresh H&G coho increased from \$1.40 to \$2.70 per pound.

While these increases reflect the general trend of increasing wild salmon values, coho products show stronger value growth than other traditional high-value species. This may be due in part to the high percentage of coho caught in low volume fisheries such as trolling, which generate high-quality products that can capitalize on the strong market demand for top-end wild salmon. As a result, wholesale value of coho products produced in Southeast Alaska is generally higher than the statewide average. In 2007, 50 percent of the statewide coho harvest was caught in Southeast Alaska.

Chinook Salmon

Ex-vessel prices for chinook salmon were at historic highs during the 2007 Winter fishery and the 2008 spring and summer seasons, driven by a major supply shortfall. Ex-vessel prices from the winter troll fishery were well into the \$9 per pound range during much of the winter fishery (ADFG) and anecdotal reports from the summer troll chinook fishery indicate unprecedented high prices in the \$6 - \$7 range.

The North American chinook salmon harvest peaked in 2004 with a commercial harvest of over 2.2 million fish but has since declined to the 600,000 to 800,000 range as a result of conservation-driven fishery closures in the West Coast fisheries off California, Washington and Oregon.

The Southeast Alaska chinook harvest has declined substantially due to cuts in Pacific Salmon Treaty (PST) harvest quotas, but this is offset by the dramatic increase in ex-vessel price for chinooks. It should be noted that harvest of hatchery-produced chinooks is not counted against the chinook harvest quotas dictated by the Pacific Salmon Treaty and that the economic contribution of commercially harvested SSRAA chinooks increases in significance as PST chinook quotas are reduced.

Commercial Harvest and Ex-Vessel Value

SSRAA-produced salmon contribute significantly to the commercial harvest of salmon in Southern Southeast Alaska. Harvests of SSRAA salmon were particularly strong in 2006 and 2007, more than doubling previous years' volumes. Between 2001 and 2007, commercial harvest of SSRAA salmon ranged from 6.2 million pounds (2004) to 21.9 million pounds (2006). During this 7-year period, the commercial fleet harvested a total of 81.3 million pounds of SSRAA salmon, for an average annual catch of 11.6 million pounds. The 2007 harvest was 18.0 million pounds.

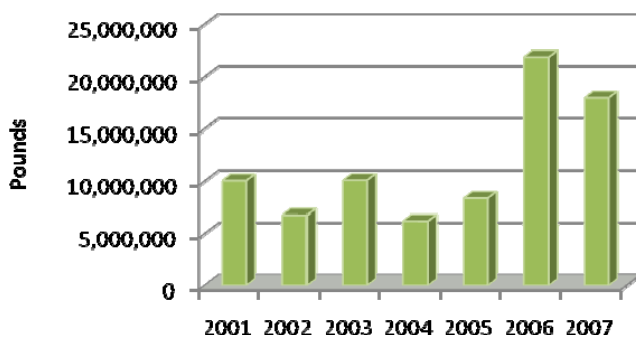
Recent Harvest Composition of SSRAA Salmon, by Volume

Species	2001-2007 Average		2006		2007	
	Lbs.	Percent	Lbs.	Percent	Lbs.	Percent
Chum	9,760,000	84%	20,798,000	95%	16,377,000	91%
Coho	1,524,000	13	771,000	4	1,139,000	6
Chinook	311,000	3	313,000	1	449,000	2
Sockeye	15,000	0	0	0	0	0
Total	11,609,000	100%	21,882,000	100%	17,965,000	100%

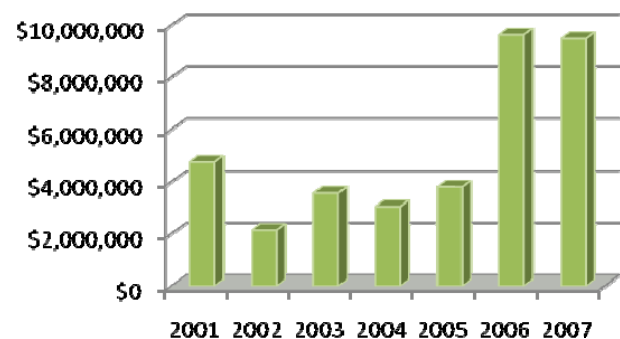
Source: SSRAA

SSRAA's economic contribution to the value of Southern Southeast's salmon harvest is substantial. This is because SSRAA's production efforts focus on relatively low-volume, high-value species of salmon. Between 2001 and 2007, the ex-vessel value of SSRAA salmon ranged from a low of \$2.1 million in 2002 to a high \$9.6 million in 2006. During this period, earnings of commercial fishermen totaled \$36.3 million, an average of \$5.2 million annually. In 2007, fishermen earned \$9.5 million in ex-vessel value from SSRAA salmon.

Total Pounds of SSRAA Salmon Harvested in Common Property Commercial Fisheries, 2001-2007



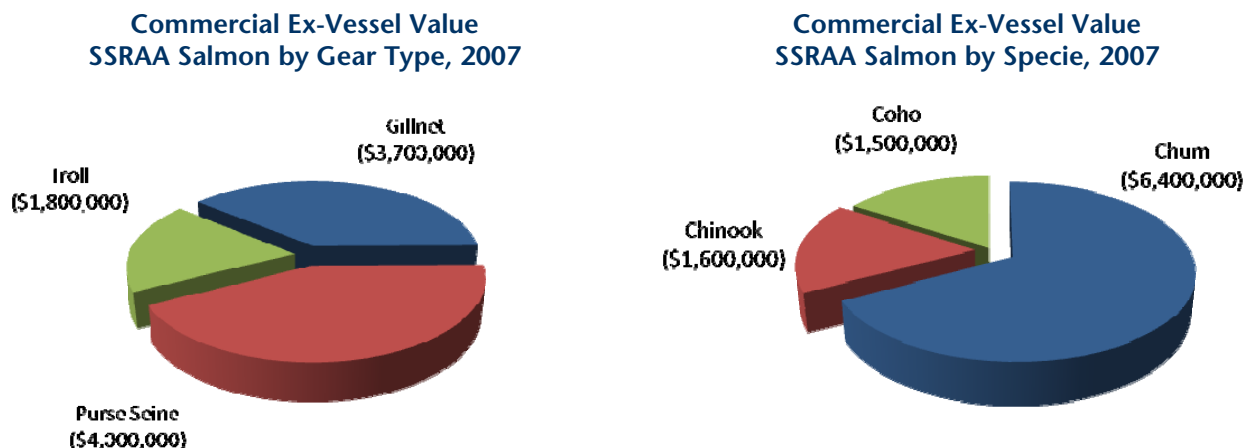
Total Ex-Vessel Value of SSRAA Salmon Commercial Harvest, 2001-2007



Source: McDowell Group estimates

The ex-vessel value of SSRAA salmon is well-distributed among the major gear types: purse seine, gillnet, and troll. In 2007, the ex-vessel value of SSRAA salmon to the purse seine fleet was \$4.0 million, followed by \$3.7 to the gillnet fleet, and \$1.8 million to the troll fleet.

In terms of volume and value, chum is the leading SSRAA-produced salmon. In 2007, chum salmon accounted for \$6.4 million in ex-vessel value, followed by chinook (\$1.6 million), and coho (\$1.5 million). SSRAA-produced sockeye returns were not recorded in 2007. As noted in the introduction, some portion of the 2007 commercial harvest can be attributed to SSRAA fish, but the exact amount is unknown. The ex-vessel value of recorded SSRAA sockeye from previous years ranged from \$1,000 (2002) to \$55,000 (2005).



Source: McDowell Group estimates

Between 2001 and 2005, the ex-vessel value of SSRAA-produced salmon fluctuated between \$2 million and \$5 million, before jumping to \$9.5 million in 2006 and 2007. Among commercial fishing gear types, the most substantial increase was seen in the purse seine fleet, though gillnetters also enjoyed strong value growth. Income to trollers remained relatively stable during this time period.

In terms of trends among SSRAA-produced species, earnings from chum and chinook salmon increased most dramatically between 2001 and 2007, while earnings from coho remained fairly consistent and sockeye earnings remained very minor.

Commercial Ex-Vessel Value Trends of SSRAA Salmon by Gear Type and Species, 2001-2007
(in thousands of dollars)

	2001	2002	2003	2004	2005	2006	2007
By Gear Type							
Purse Seine	\$1,788	\$746	\$892	\$730	\$1,479	\$5,165	\$4,050
Gillnet	1,593	811	1,557	1,014	1,298	3,289	3,668
Troll	1,351	569	1,106	1,292	1,019	1,162	1,752
By Species							
Chum	3,144	948	1,618	996	2,125	7,279	6,387
Coho	1,042	933	1,567	1,410	888	1,195	1,503
Chinook	544	244	363	593	728	1,142	1,579
Sockeye	2	0.5	6	37	54	0	0
Total	\$4,733	\$2,126	\$3,555	\$3,036	\$3,796	\$9,616	\$9,470

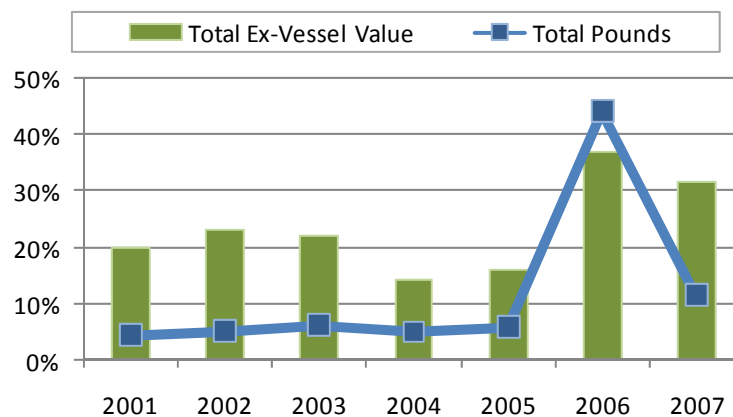
Source: McDowell Group estimates

Between 2001 and 2005, SSRAA salmon represented 14 to 23 percent of the Southern Southeast harvest's ex-vessel value but only 4 to 6 percent of its volume. SSRAA's relatively strong value role is attributed to the production focus on relatively low-volume, mid-value chum salmon, and on high-value chinook and coho.

In 2006, the importance of SSRAA's production, in terms of volume and value, spiked to record levels, 44 percent and 37 percent respectively. This dramatic increase is explained primarily by an extremely low pink salmon harvest in the region that year, widely attributed to spawning-bed mortality of parent-year fish associated with warm and dry weather during the summer of 2004. The low pink harvest decreased the overall 2006 salmon harvest volume considerably. However, since SSRAA does not produce pink salmon, these adverse climate conditions did not affect SSRAA production and as a result, SSRAA-produced fish accounted for a substantially higher percentage of the Southern Southeast commercial harvest that year.

In 2007, SSRAA salmon, as a percentage of regional harvest volume, was closer to the long-term trend (12 percent), but as a percentage of regional harvest value, SSRAA remained strong, representing one-third of the regional value. This is attributed to strong chum prices in 2007.

Harvest and Ex-Vessel Value of SSRAA Salmon as a Percentage of Southern Southeast Alaska Commercial Salmon Harvest, 2001-2007



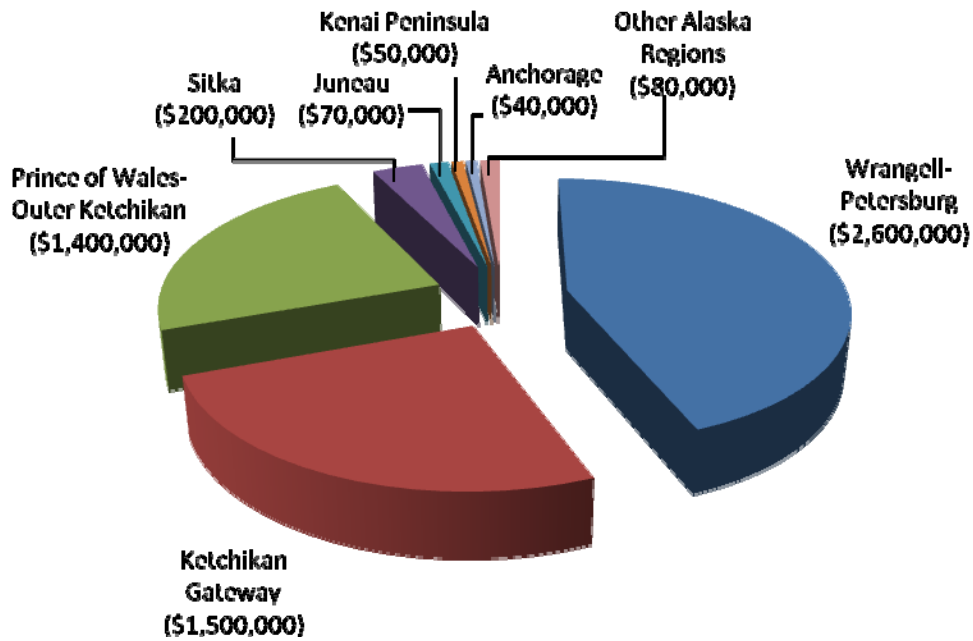
Source: McDowell Group estimates

Geographic Distribution of Commercial Harvest

Among commercial fishermen, Alaska residents are the primary beneficiaries of SSRAA-produced salmon harvested in Southern Southeast Alaska, earning nearly two-thirds (\$6 million) of the total ex-vessel value (\$9.5 million) in 2007. Ex-vessel benefits of SSRAA salmon are spread throughout SSE Alaska. Of the 2007 Alaska resident harvest, permit holders residing in the Petersburg-Wrangell area accounted for the largest percentage (44 percent), earning \$2.6 million. They were followed by Ketchikan Gateway Borough residents, with 25 percent (\$1.5 million); Prince of Wales-Outer Ketchikan residents at 23 percent (\$1.4 million); and other Alaska residents, with approximately 8 percent of the total resident harvest.

The chart below details this breakdown and includes salmon harvested by all gear types.

Geographic Distribution of SSRAA Ex-Vessel Value to Alaska Residents Fishing in Southern Southeast Alaska, 2007



Source: CFEC

Seafood Processing

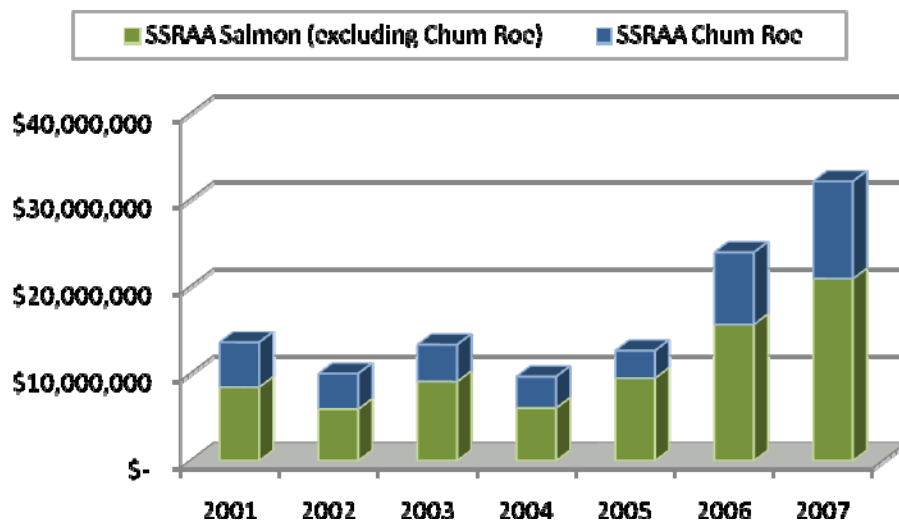
The commercial harvest of SSRAA salmon generates significant benefits for Southeast Alaska’s seafood processing industry, as indicated by its first wholesale value. First wholesale value is the most complete measure of economic activity associated with the salmon industry in Southeast Alaska. It is defined as the price received at sale of product by a processor to a buyer outside their affiliate network.

First wholesale value includes payments to commercial fishermen (defined as ex-vessel value) and reflects the full spectrum of processor expenditures on goods and services associated with converting whole fish to a salable food product. This includes processing labor, local utilities, packaging and warehousing, and an array of support-sector activity associated with processing, such as tender vessel operations, expediting, maintenance and mechanical services, and processors' profit.

From 2001 to 2007, the total wholesale value of SSRAA salmon was \$115 million, with an annual average value of \$16.4 million. On average, chum salmon (flesh and roe) accounted for three-fourths of the total wholesale value, followed by coho (20 percent), chinook (5 percent), and sockeye salmon (less than 1 percent). Chum roe products, specifically, represented one-third of the SSRAA-generated wholesale value between 2001 and 2007.

The 2007 total first wholesale value of SSRAA salmon was \$32.1 million, 35 percent of which was generated by chum roe products. The 2007 first wholesale value of all SSRAA-produced species combined is a McDowell Group estimate, as is the 2007 value of SSRAA chum roe.

**First Wholesale Value of SSRAA Salmon
with Chum Roe Shown Separately, 2001-2007**



Source: McDowell Group estimates

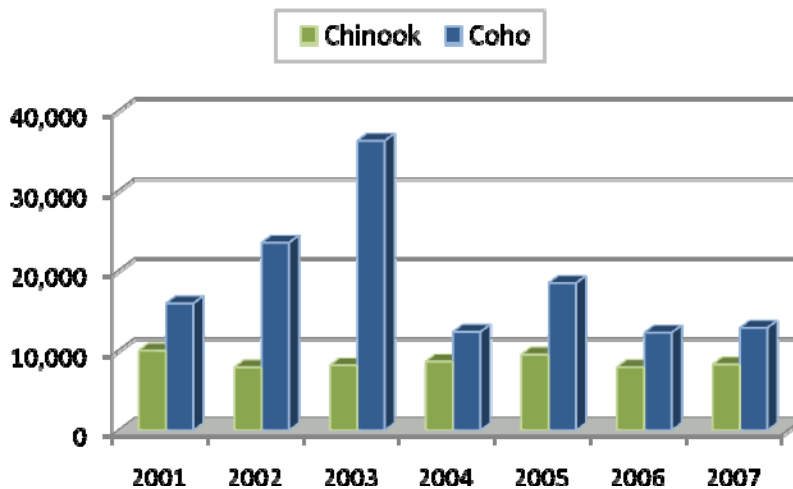
Sport Harvest of SSRAA Salmon

Sport Harvest

SSRAA's salmon production efforts also have a significant impact on the sport fish industry in Southern Southeast Alaska. Based on data provided by SSRAA, sport fishermen have harvested an estimated 60,000 chinook and 131,000 coho salmon produced by the aquaculture association between 2001 and 2007. The average annual chinook harvest was approximately 8,600 fish during this time period, with a peak harvest of nearly 10,000 in 2001. The annual average coho harvest was about 18,800 fish, with a peak harvest of 36,000 in 2003.

In 2007, a total of 8,200 SSRAA chinook and 12,800 coho were harvested by sport fishermen in SSE Alaska, according to SSRAA estimates. Southern Southeast includes Statewide Harvest Survey areas (SWHS) A, B and C. Area A encompasses the greater Ketchikan area, B covers the Prince of Wales Island area, and C includes Petersburg, Wrangell and Kake.

**Total Number of SSRAA Salmon
Harvested in Sport Fisheries, 2001-2007**



Source: SSRAA estimates

User Groups

SSRAA-produced fish are caught in SWHS areas A, B and C by three distinct user groups: local (Alaska) residents, non-residents participating in guided (charter) fishing tours, and non-residents fishing on their own (unguided). Within the scope of this project, it is not possible to determine exactly how many SSRAA fish are caught by each user group in each area. The information presented below quantifies the importance of SSRAA fish where possible, with a primary focus on the Ketchikan area.

According to ADFG annual surveys, sport fishermen harvested approximately 35,600 chinook and 85,300 coho salmon in SWHS areas A, B and C in 2006 (the most recent survey data available). Approximately 10,950 chinook and 31,800 coho were caught in the Ketchikan area during that year. ADFG's onsite creel survey indicates that 36 percent of chinook salmon (3,900 fish) caught in the Ketchikan area in 2006 were SSRAA-produced fish, along with 26 percent of the harvested coho (8,100 fish). Combined, SSRAA fish accounted for approximately 27 percent of the 2006 total chinook and coho harvest in area A.

**Total Chinook and Coho Salmon Sportfish Harvest
by Statewide Harvest Survey Area, 2006**

Area	Chinook	Coho
Ketchikan (A)	10,950	31,800
Prince of Wales Island (B)	12,700	48,900
Petersburg, Wrangell & Kake (C)	12,000	4,600
Southern Southeast (A,B&C)	35,650	85,300

Source: Based on the 2006 Statewide Harvest Survey (includes fish caught by residents and non-residents in fresh and salt water)

The ADFG creel survey is based on a stratified random sampling at fishery landing locations. Not all times of day and landing locations are sampled each day. According to SSRAA, this methodology likely undercounts SSRAA produced fish. For purposes of this report, ADFG data is assumed to be reasonable, but conservative.

Most (two-thirds) of SSRAA-produced chinook are harvested by sport fishermen in the Ketchikan area and one-third of the estimated 12,000 SSRAA coho that were sport-caught were harvested in the Ketchikan area.

About 3 percent of chinook and 3 percent of coho salmon sampled in Craig and Klawock in 2006 were SSRAA fish. These were the only communities sampled on Prince of Wales Island. Considering that the 70 charter vessels based in Craig and Klawock catch thousands of salmon, even these relatively low percentages indicate a significant SSRAA contribution to this fishery. There were likely many more SSRAA salmon caught, especially on the east coast of Prince of Wales Island, but not recorded by ADFG.

The 2006 Petersburg creel survey indicates that one-quarter of the area's 2006 chinook sport harvest was SSRAA fish. The Petersburg area harvest of SSRAA coho salmon was about one-tenth.

The 2006 ADFG creel survey for the Wrangell area showed that one-fifth of the area's chinook were SSRAA fish. No SSRAA coho salmon were recorded in the Wrangell area in 2006.

NON-RESIDENT GUIDED SPORT FISHERMEN

In order to better understand SSRAA's contribution to this segment of the sport fish industry, the study team conducted interviews with a sample of charter vessel operators based in SSE Alaska and other knowledgeable industry sources.

ADFG charter vessel logbook data indicate that there are approximately 156 individual charter vessels homeported in Ketchikan, 30 on the eastern side of POW Island, 136 on other parts of POW Island, 30 in Petersburg, and ten in Wrangell. The vessels listed in this table may not all be active and vessels may fish in areas outside of their homeport areas.

Southern Southeast Charter Vessel Home Ports, 2007

SWHS Area	Homeport	# of Vessels
A	Ketchikan	156
B	East POW Island (includes: Coffman Cove, Hollis, Saltery Cove, Sportsman Cove, Thorne Bay, Whale Pass)	30
B	Remainder of POW Island	136
C	Petersburg	30
C	Wrangell	10

Source: ADFG Saltwater Log Books, 2007

The primary impact of SSRAA-reared salmon for the Ketchikan charter industry occurs in the early chinook season (May and June) and during the late coho run (late August through September). While there is likely some minor use of charter fishing services by Alaskan residents, for the purpose of this report we assume that nearly all charter fishing clients are non-residents.

According to charter operators, in May and June the full-day and half-day charter fleet (primarily serving cruise visitors) is largely dependent on SSRAA chinook returning to Whitman Lake and Neets Bay. Charter operators that provide multi-day trips also depend on SSRAA chinook, but not as exclusively as the day charters. Charter operators interviewed for this project all expressed the importance of SSRAA fish to their industry. The following are selected comments from those interviews:

- "Even though SSRAA fish are not available all season long, without them, we would not have a charter fleet providing service to cruise passengers."
- "I would not be in business without SSRAA's hatchery fish."
- "SSRAA, and specifically Neets Bay fish, are a BIG part of my business."

While less information is available on SSRAA fish caught by guided charter tours in areas around POW Island, Petersburg and Wrangell, interviewees stated that SSRAA-produced fish are an important part of local sport fish industries. Several Petersburg guides stated that more than 70 percent of the area sport-harvested chinook and more than 50 percent of the sport-harvested coho salmon are hatchery fish. These percentages are substantially higher than ADFG creel survey estimates and may reflect different fishing locations and methods, or may highlight potential limits in the ADFG data.

Comments offered by charter operators in Petersburg, Wrangell, and on POW Island include:

- “The wild stock salmon and halibut we catch would not be enough of a draw to sustain a charter business in Petersburg.”
- “The Crystal Lake hatchery is crucial to our business; we would not have the business without those fish.”
- “Hatchery fish are very important to the Wrangell commercial fleet and the sport fishermen. They help pick-up where the Stikine River kings leave off and just before the Stikine River cohos come in. I would hate to see them go away. In fact, it would be nice to increase their production, with funding help from the sport side.”
- “From mid-August to mid-September our salmon catch is generally all Neets Bay SSRAA fish, predominantly cohos, and some kings. We catch between 50 and 150 salmon per day during this period. We appreciate SSRAA’s work very much and have made donations to the organization in the past. SSRAA provides a major improvement to our late-season business.”
- “Hatchery fish are a small portion of our salmon (2 to 4 percent) and we get hatchery fish from SSRAA, British Columbia, Washington and Oregon. We feel that hatcheries have a positive impact on the sport fishing industry in Craig and look forward to additional effort being made to produce more kings.”

NON-RESIDENT UNGUIDED SPORT FISHERMEN

There are a substantial number of bare-boat rentals in the Ketchikan area. Bare-boat rentals allow fishermen a less expensive alternative to guided charter fishing. As with charter vessels, there are likely some bare-boat rentals by Alaska residents, but for purposes of this report we assume rentals are made by non-resident sport fishermen. Bare-boat rentals are available in most communities throughout SSE Alaska, but the largest fleet of rentals (60-70 skiffs) is located in Ketchikan, in the Clover Pass/West Behm Canal area. The majority of bare-boat rentals are skiffs (14'-16' open aluminum boats with outboard motors), but more substantial vessels are also available.

In the Ketchikan area, late summer (August and September) is a very active time period for sport fishermen, targeting SSRAA cohos returning to Neets Bay. Accommodations and rental boats in the area are generally booked to capacity during this period. One Clover Pass area lodge operator described the late summer coho run as “the most important time of the year” for his business. The number of SSRAA chinook and coho salmon caught by unguided sport fishermen is not recorded.

RESIDENT SPORT FISHERMEN

Sport-harvested SSRAA salmon provide many Southern Southeast Alaska residents with a high quality food source and recreational experience. However, the number of SSRAA chinook and coho salmon caught by resident sport fishermen is unknown.

Economic Impacts of SSRAA Production and Operations

SSRAA production efforts impact the regional and local economies in Southeast Alaska through the fish harvesting and processing industries. Commercial and sport fishermen purchase vessels, fuel, food, gear, and many other supplies in Southeast Alaska and seafood processors purchase an array of goods and services, including employee labor. SSRAA operations generate additional economic impacts through spending on goods and services in Ketchikan and other Southern Southeast communities. This spending cycles through the regional and local economies, creating direct and indirect economic activity.

In 2007, SSRAA production and operations spurred economic output totaling \$46.4 million, including 420 jobs and \$11.5 million in labor income. The location of SSRAA's major operations offers the Ketchikan, Wrangell-Petersburg, and Prince of Wales Island areas a large portion of these economic benefits.

Ketchikan

Residents, businesses, and local government in the Ketchikan Gateway Borough benefit greatly from SSRAA salmon production and operations. SSRAA production impacts are realized through the commercial fishing, seafood processing, and sport fishing industries. SSRAA operations in Ketchikan include the organization's headquarters, located in downtown Ketchikan, as well as the Neets Bay hatchery. In 2007, SSRAA production and operations generated a total of \$25.9 million in economic output, generating 220 jobs and \$6.0 million in labor income.

Commercial Fishing

Commercial fishermen residing in the Ketchikan Gateway Borough and fishing in SSE Alaska (districts 1-9) harvested a total of \$5.9 million worth of SSRAA salmon between 2001 and 2007, averaging \$800,000 annually. In 2007, total ex-vessel income to Ketchikan Gateway Borough fishermen was \$1.5 million. The economic impact of Ketchikan's 2007 commercial harvest of SSRAA salmon included \$2.1 million in output, 30 jobs and \$1.0 million in labor income.

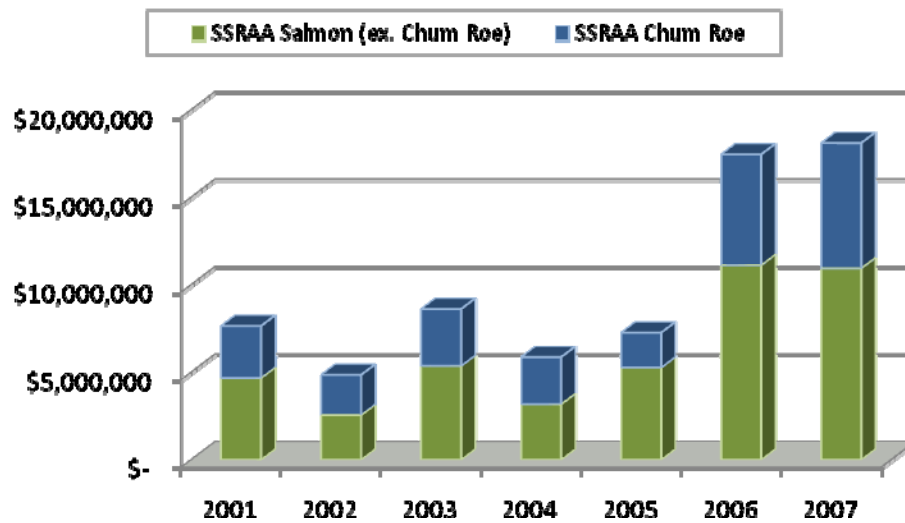
Seafood Processing

Over half of the salmon produced by SSRAA and harvested in Southern Southeast Alaska are processed in Ketchikan. Between 2001 and 2007, the total first wholesale value of all SSRAA salmon processed in Ketchikan was \$69.8 million, with an annual average of \$10.0 million. In 2007, \$18.1 million worth of finished SSRAA salmon product was processed in Ketchikan, representing 56 percent of the \$32.1 million regional total. Additionally, the first wholesale value of roe taken from SSRAA chum and processed in Ketchikan accounted for 40 percent of all SSRAA salmon products produced in Ketchikan in 2007.

These values are based on “landing port” and “intended processor location” as reported on CFEC fish tickets. The data does not account for salmon that was intended to be processed in Ketchikan but was transferred by a processor to another location, or salmon that was intended to be processed in another location but was transferred to Ketchikan.

Based on the net wholesale value (\$22.6 million), which excludes ex-vessel value, the processing of SSRAA salmon resulted in economic output totaling \$30.4 million in 2007. Over half of this output (\$16.5 million) went into the Ketchikan economy, generating the annual equivalent of 112 jobs and \$2.5 million in labor income.

First Wholesale Value of SSRAA Salmon Landed in the Ketchikan Area, with Chum Roe Shown Separately, 2001-2007



Source: McDowell Group estimates

Sport Fishing

Sport fish harvests of SSRAA chinook and coho salmon also contribute significantly to the Ketchikan economy. Direct economic impacts from the SSRAA sport fishery include non-resident spending in the region on guided fishing tours, boat rentals, fishing gear, bait, food, lodging, and transportation.

According to the Ketchikan Gateway Borough Finance Department, the Ketchikan-based sport fish charter industry’s gross revenue was \$6.2 million, generating \$228,000 in tax revenue in 2007. Gross revenue accounts for sales reported by sport fish charter operators for the fishing-related portion of their business, including bare-boat rentals and likely incidental expenditures for items such as fuel, bait and food. Reporting is voluntary and the reports are unaudited.

Gross Sales and Related Tax Revenue from Ketchikan Sport Fishing Lodges and Marine Charters, 2004-2007

	2004	2005	2006	2007
Gross sales	\$5,140,000	\$5,723,000	\$5,765,000	\$6,199,000
Tax collected	\$162,000	\$196,000	\$183,000	\$228,000

Source: Ketchikan Gateway Borough

Through interviews with local fishing lodges, charter business operators and charter fishermen, the study team was able to estimate the share of sport fishing effort related to SSRAA salmon. This was multiplied by gross sales to estimate total sport fish-related spending attributable to SSRAA-produced salmon at \$1.6 million in 2007. This does not include spending on accommodations or other unidentified spending by non-resident fishermen such as tours and souvenirs.

The value of accommodation sales related to non-resident sport fishermen is unknown because businesses do not report sales by customer type. However, based on previous research, McDowell Group estimates indicate that Ketchikan accommodation sales related to sport fishing were approximately \$2.3 million for 2007. The study team multiplied the share of sport fishing effort related to SSRAA salmon by gross accommodations sales from sport fishing. This suggests accommodations gross sales of approximately \$725,000 attributable to SSRAA-produced salmon in 2007. There is a 7 percent bed tax collected on accommodations sales.

Resident sport fishing has a significant impact on the Ketchikan economy. Millions of dollars are spent each year on boats, motors, fishing gear, fuel, bait, tackle, repairs and maintenance services, and harbor and ramp fees. Unfortunately, measuring local spending by industry is complex and requires research well beyond the scope of this study.

In 2007, the total economic impact of non-resident sport harvest of SSRAA fish on the Ketchikan economy included approximately \$3.2 million in total output, 45 annual equivalent jobs, and \$1.0 million in labor income.

SSRAA Operations

SSRAA, as a locally-based organization, has economic impacts on the Ketchikan economy as well. In 2007, SSRAA contributed an average of 38 jobs to the Ketchikan economy, with payroll of approximately \$1.7 million. SSRAA employment increases during the summer months and peaked at 45 jobs in August 2007. Additionally, the organization purchases goods and services for its operations in Ketchikan (and at its various hatcheries and release sites) which contribute to the local economy. This includes contracting with fishing vessels and crews during cost recovery efforts. Total SSRAA expenditures in Ketchikan totaled \$1.7 million for 2007 (not including payroll). The total economic impact from SSRAA employment, payroll, and expenditures on the Ketchikan economy included \$4.0 million in output in 2007, 32 annual equivalent jobs and \$1.4 million in payroll.

Other Southern Southeast Alaska Communities

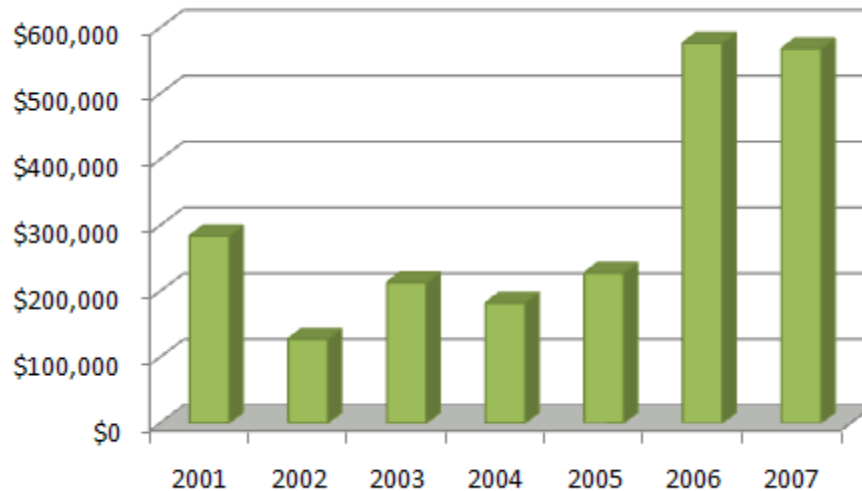
The economic activity generated by SSRAA production and operations affect other Southern Southeast communities as well, namely Petersburg, Wrangell, Craig, and Klawock. Much of the impact in Petersburg comes from the commercial fishing and seafood processing industries, as well as some impact from the sport fish charter industry. Similarly, economies in Wrangell, Craig, and Klawock see the bulk of SSRAA impact from their commercial fishing industries and some from sport fish charter industries. Seafood processing of SSRAA salmon also has some impact on Wrangell's economy.

Salmon Enhancement and Fisheries Business Taxes

All salmon commercially harvested and processed in Southeast Alaska, including SSRAA-produced fish, are subject to a 3 percent Salmon Enhancement Tax paid by commercial fishermen and a 3 percent Fisheries Business Tax paid by commercial seafood processors. Revenue from the Salmon Enhancement Tax helps fund the operations of regional aquaculture efforts, such as SSRAA, and revenue from the Fisheries Business Tax is shared between the State of Alaska and the city or borough where the fish were landed. Both of these taxes are based on the ex-vessel value of the harvest.

Since 2001, the total value of Salmon Enhancement and Fisheries Business taxes paid on SSRAA salmon was \$2.5 million, with an annual average of \$311,000. The 2007 taxes paid on SSRAA salmon totaled approximately \$568,000.

Estimated Salmon Enhancement and Fisheries Business Tax Paid on SSRAA Salmon, 2001-2007



Source: McDowell Group estimates

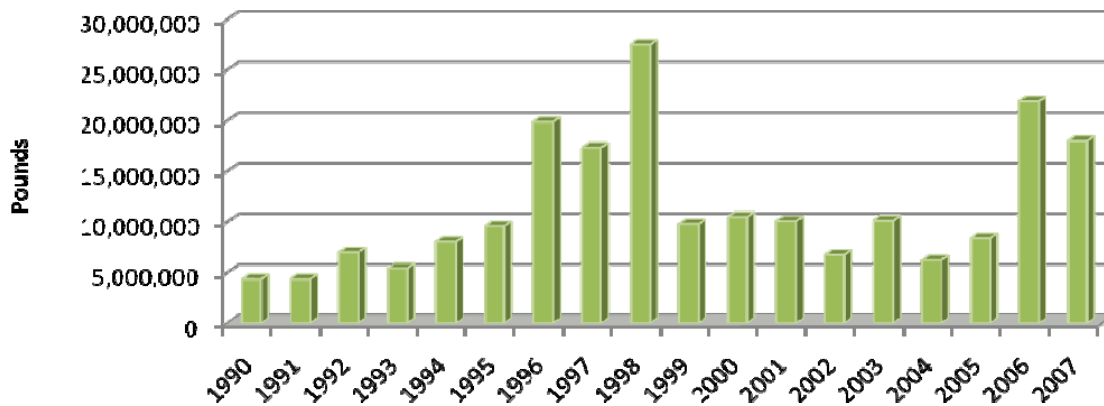
Historical Overview of SSRAA, 1990-2007

Selected findings from McDowell Group's 2001 study and the current study are combined and analyzed in this section.

Commercial Harvest and Ex-Vessel Value

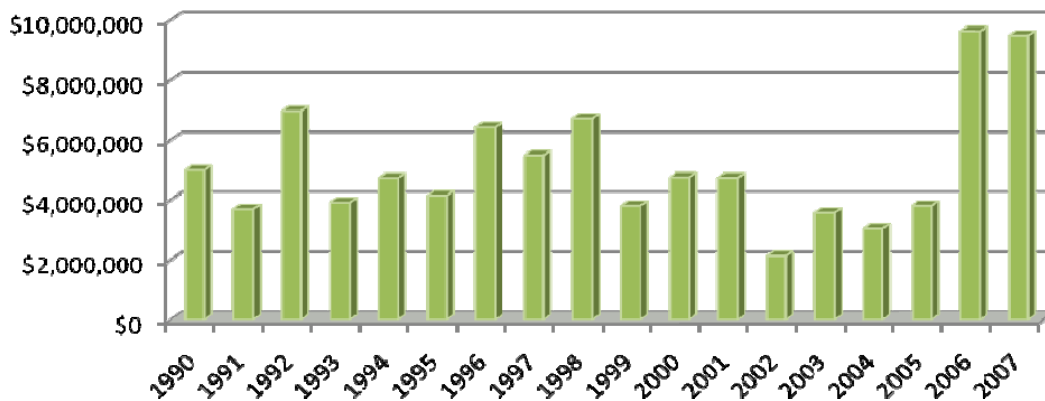
The harvest volume of SSRAA-produced salmon fluctuated between 1990 and 2007, with peaks between 1996 and 1998 and in 2006 and 2007. These peaks are generally consistent with strong chum harvests in the broader Southeast region and likely reflect favorable ocean survival conditions for chum salmon.

Total Pounds of SSRAA Salmon Harvested in Commercial Fisheries, 1990-2007



Source: McDowell Group estimates

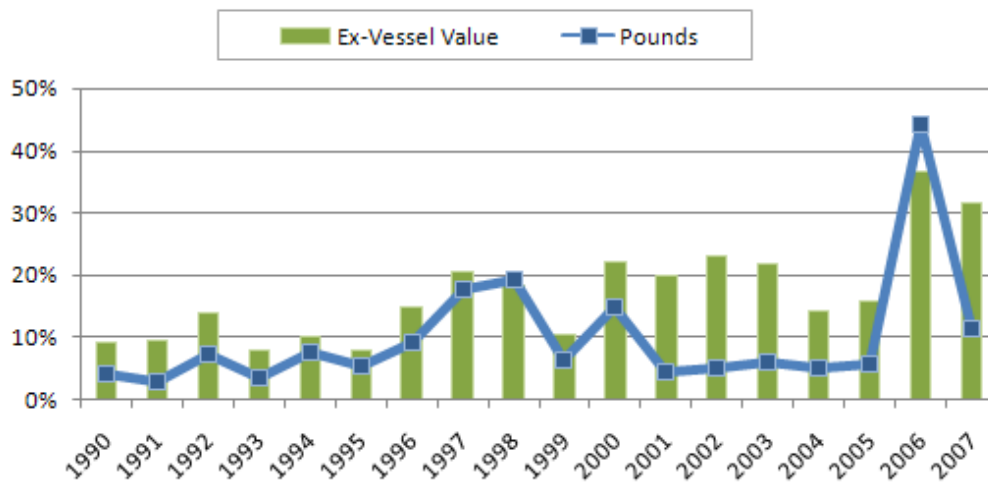
Total Ex-Vessel Value of SSRAA Salmon Commercial Harvest, 1990-2007



Source: McDowell Group estimates

Over the past two decades, SSRAA production has accounted for an increasing share of Southern Southeast’s total salmon ex-vessel value. Between 2001 and 2007, SSRAA salmon averaged 23 percent of the region’s total value, one and a half times the 1990-2000 average share of 13 percent. In 2006, SSRAA salmon made up 44 percent of the total regional harvest due to an abnormally low wild pink salmon return, as discussed earlier in the report. In terms of harvest volume, the percentage of the SSE total salmon harvest attributed to SSRAA fish averaged 12 percent between 2001 and 2007, compared to 9 percent between 1990 and 2000.

Harvest and Ex-Vessel Value of SSRAA Salmon as a Percentage of SSE Alaska Commercial Salmon Harvest, 1990-2007



Source: McDowell Group estimates

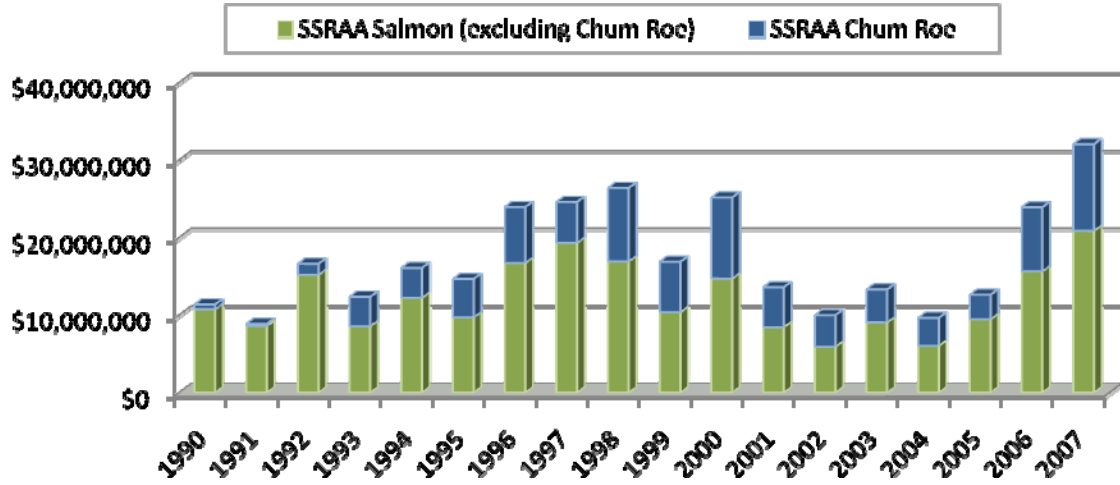
Seafood Processing

The first wholesale value of SSRAA-produced salmon is driven by a wide variety of factors, including worldwide commodity values of salmon and the success of differentiation strategies in the marketplace.

One significant advantage of SSRAA-produced salmon is the large chum roe component. While chum roe is the most desirable of salmon roe products, farmed salmon is not a suitable or preferred source for most salmon roe products. Considering the long-term growth in salmon production, consumption and market demand (all driven higher by steadily increasing farmed salmon production), this puts chum producers in an advantageous position. The recent market diversification for chum roe (Russia, Eastern Europe) has heightened market competition for a limited product stream, with limited prospects of product substitution activity from farmed salmon production.

For seafood processors and for common-property fishermen that harvest SSRAA-produced salmon, this translates to good prospects for continued strength in chum salmon values, which are driven primarily by the roe market.

**First Wholesale Value of SSRAA Salmon
with Chum Roe Shown Separately, 1990-2007**



Source: McDowell Group estimates