

Economic Impacts of Northern Southeast Regional Aquaculture Association

Prepared for:
**Northern Southeast
Regional Aquaculture Association**



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Executive Summary

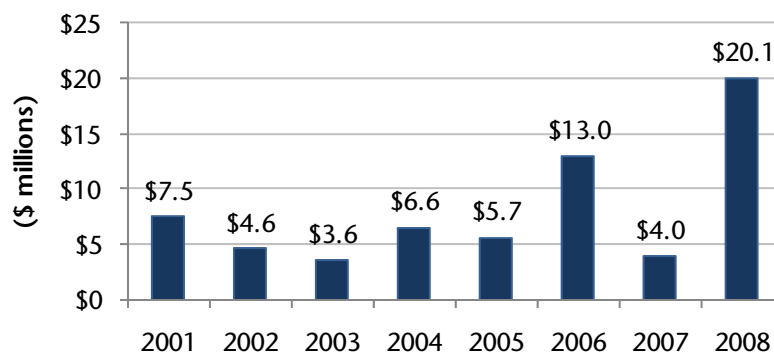
The purpose of this study is to present the economic impacts of the Northern Southeast Regional Aquaculture Association (NSRAA) salmon enhancement program. Based in Sitka, NSRAA is a private nonprofit cooperative working to increase salmon returns for the commercial fleet, sportfish charter operators and other user groups. The organization produces four species of Pacific salmon—chum, sockeye, chinook, and coho. Two hatchery facilities and several remote release sites are utilized.

Economic impacts generated by NSRAA's salmon production and business operations are widely spread throughout Southeast Alaska. The key findings from the analysis of NSRAA's economic impacts are presented in this section.

Commercial Harvest

- Between 2001 and 2008, NSRAA contributed salmon worth an ex-vessel value of \$65 million to the commercial salmon industry, averaging \$8 million annually. NSRAA contributions reached 22.8 million pounds of salmon in 2008, worth \$20.1 million in ex-vessel value in 2008.
- Chum salmon is NSRAA's primary species of production. On average, chums accounted for approximately four-fifths of all NSRAA returns between 2001 and 2008, averaging an annual value of \$6.4 million. Chinook and coho each accounted for about 10 percent and sockeye for less than 1 percent.
- The purse seine fleet harvested the majority (nearly 60 percent) of NSRAA returns between 2001 and 2008, averaging \$4.8 million annually, followed by trollers (\$1.8 million) and gillnetters (\$1.5 million).

**Total Ex-Vessel Value of NSRAA Salmon
Harvested in Common Property Commercial Fisheries, 2001-2008**

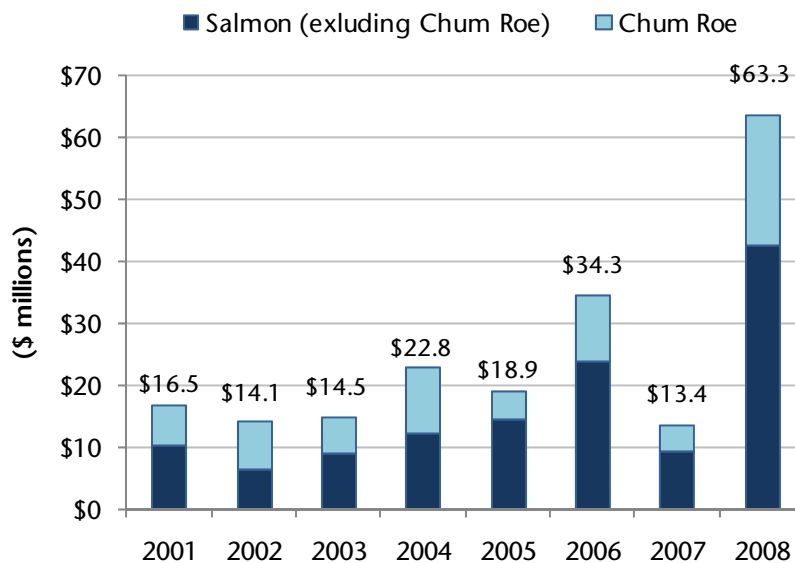


Source: NSRAA, 2009.

Seafood Processing

- The cumulative first wholesale value of NSRAA salmon harvested in common property and cost recovery commercial fisheries was nearly \$200 million between 2001 and 2008. In 2008 alone, that value reached \$63.3 million.
- Chum roe products accounted for one-quarter to one-half of the annual first wholesale value of all NSRAA salmon between 2001 and 2008. The value of chum roe products was approximately \$21 million in 2008, one-third of the total value that year.

**First Wholesale Value of NSRAA Salmon,
with Chum Roe Shown Separately, 2001-2008**



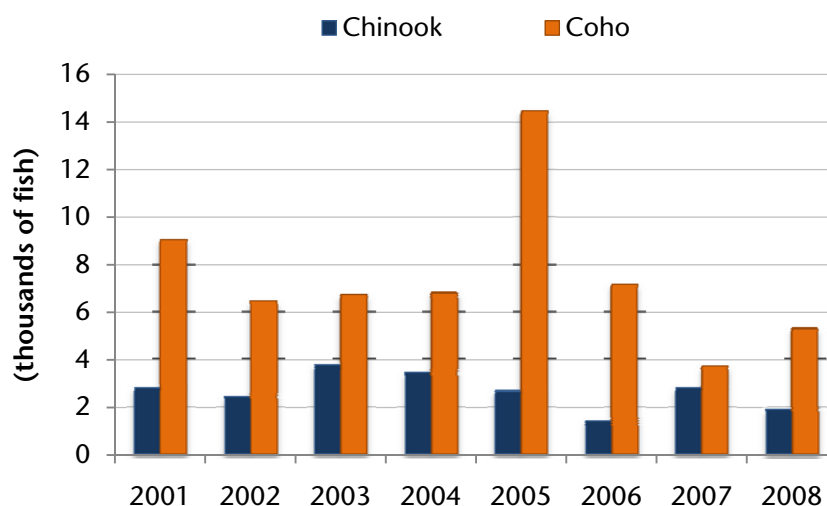
Source: McDowell Group estimates, based on data provided by NSRAA, ADF&G and ADOR, 2009.

Note: Includes common property and cost recovery harvests.

Sport Harvest

- NSRAA's contribution to Southeast Alaska's sport fishery has fluctuated over the past eight years, generally ranging from 6,000 to 12,000 fish annually and has averaged 10,000 fish. In 2006, the contribution peaked at more than 17,000 Chinook and coho combined.
- Between 2001 and 2007, NSRAA-produced salmon averaged 7 percent of the chinook and coho sport harvest in the Juneau and Sitka areas.
- While very difficult to quantify precisely, the economic impact of sport harvest of NSRAA salmon is significant, and estimated at approximately \$1 million in 2008. This total includes direct and indirect effects of non-resident sport harvest of NSRAA salmon.

Recreational Harvest of NSRAA Salmon, 2001-2008



Source: NSRAA, 2009.

NSRAA Subsistence Contributions

NSRAA continues to be a consistent provider of surplus salmon for subsistence, cultural, and educational purposes. While not quantifiable in economic terms, NSRAA fully understands the importance of contributing in its home region. The organization's policy is to provide salmon to anyone in need.

Over the past decade NSRAA regularly provided chinook, coho and chum salmon to villages and communities in Northern Southeast Alaska. For example, the villages of Kake and Angoon regularly request and receive surplus coho from the Hidden Falls Hatchery. In Sitka, NSRAA chinook salmon are provided to the Dog Point Fish Camp for both subsistence and educational purposes. The Sitka Tribe of Alaska Traditional Food Program receives both salmon and fresh salmon roe for subsistence. The Alaska Native Brotherhood, tribal elders and general public also receive salmon from NSRAA.

NSRAA Operations

- In 2008, NSRAA generated an annual average of 36 jobs, with a total payroll of approximately \$1.5 million annually.
- Spending on goods and services in support of hatchery operations totaled approximately \$4.8 million, of which nearly \$2.7 million went to 180 Alaska businesses and fishermen.
- Including all of the indirect and induced effects associated with NSRAA spending on payroll and other goods and services, the organization itself has a total Alaska economic impact of about \$5 million, including \$2 million in labor income.

Total Economic Impacts

- The total economic impact of commercial harvest of NSRAA salmon, including all direct, indirect and induced effects, amounted to approximately \$30 million in spending and income in 2008.
- Including all direct, indirect and induced impacts associated with harvesting and processing, NSRAA salmon in 2008 had a total economic impact of approximately \$100 million. This includes spending by NSRAA in support of its operations, the gross (ex-vessel) income earned by commercial fishermen, income earned by processors (net of what they pay fishermen), and all the expenditures fishermen and processors make in support of their operations and households.
- Of the \$100 million total impact, approximately 30 percent (\$30 million) is labor (personal) income for fishermen, processing workers, and owners/employees of businesses that provide goods and services to fishermen and processors.
- It is not possible to measure the number of people in Southeast Alaska that directly or indirectly earn income from the harvest and production of NSRAA salmon. However, the total includes several hundred fishermen, plus processing plant employees, NSRAA employees, and workers employed by the numerous businesses that provide goods and services to fishermen, processors and their households. Based on the average annual wage in the Southeast Alaska economy, \$30 million in labor income is the amount that would be generated by approximately 780 typical Southeast region jobs.

Summary of NSRAA Production, Operations and Economic Impacts, 2008

Harvest Volume	
Total NSRAA Production (# of fish; includes common property, cost recovery & sport)	3.8 million
Commercial harvest of NSRAA salmon (# of fish, includes common property)	2.8 million
NSRAA commercial harvests % of the Southeast commercial harvest	18%
Sport harvest of NSRAA salmon (# of fish)	7,200
Commercial Harvest Value	
Total ex-vessel value of NSRAA salmon (all fisheries)	\$20.1 million
harvested by Sitka residents (Hidden Falls & Deep Inlet chum fisheries)	\$2.1 million
NSRAA salmon ex-vessel value as % of the Southeast commercial harvest	23%
First wholesale value of NSRAA salmon	\$63.3 million
NSRAA Employment, Payroll and Spending	
NSRAA annual average employment	36
NSRAA total annual payroll	\$1.5 million
NSRAA total annual spending on goods and services	\$4.8 million
spending in Sitka	\$2.0 million
Direct and Indirect Economic Impacts*	
Total labor income related to commercial harvest and processing of NSRAA salmon	\$30 million
Total annual average employment equivalent	780 jobs
Total income and spending (output) related to harvest and processing of NSRAA salmon	\$100 million

*Impacts include commercial harvesting and processing of NSRAA salmon, NSRAA operations, and all indirect multiplier effects throughout the regional economy. The estimated \$1 million total economic impact of sport harvest of NSRAA salmon is not included in this total.

Purpose and Methodology

Purpose and Scope

The Northern Southeast Regional Aquaculture Association (NSRAA) contracted with McDowell Group, an Alaska research and consulting firm, to analyze the economic impacts of its salmon enhancement program. Updating information published in a 2001 McDowell Group impact analysis, this report presents volume and value data associated with NSRAA-produced salmon harvested between 2001 and 2008, as well as the 2008 economic impacts resulting from the hatchery's production and operations. The analysis is delivered in the following five sections:

1. **Commercial Harvest**—The economic value of commercially caught NSRAA salmon is measured using the ex-vessel income earned by Southeast Alaska fishermen. Ex-vessel income represents the gross value paid to fishermen for their catch.
2. **Processing**—The economic benefits from processing NSRAA salmon are presented in terms of the first wholesale value of those fish commercially harvested in Southeast Alaska. First wholesale value represents the value paid to the primary processor by the initial buyer outside its affiliate network.
3. **Sport Harvest**—Estimates of the economic contributions of NSRAA salmon to the Southeast Alaska sport fishery are discussed, including economic activity resulting from non-resident harvests facilitated by the charter industry.
4. **NSRAA Operations**—Economic and employment information related to NSRAA production and operations are presented.
5. **Regional Economic Impacts**—The overall economic benefits to Southeast Alaska resulting from the commercial harvest, processing, and sport harvest of NSRAA salmon, and NSRAA operations are estimated in this section. This includes local and regional tax benefits generated via the Salmon Enhancement Tax and the Fisheries Business Tax.

For purposes of this report, Southeast Alaska is defined as commercial fishing Districts 1 through 16 and non-coastal Districts 152, 154, 156, and 157.

Methodology

The data presented in this report comes from a variety of sources, including NSRAA, Alaska Department of Fish and Game (ADF&G), Alaska Commercial Fisheries Entry Commission (CFEC), Alaska Department of Labor and Workforce Development (ADOLWD) and Alaska Department of Revenue (ADOR). Additionally, McDowell Group conducted interviews with Southeast sportfish charter operators and incorporated recent research relevant to communities in Southeast.

Estimates provided in this report are based on the most recent and relevant data. Volume and ex-vessel value estimates of NSRAA salmon harvested in commercial [and cost recovery] fisheries are based on data provided by NSRAA, ADF&G and CFEC. First wholesale values prior to 2008 are calculated using average annual prices per product from Southeast Alaska processors, as published by ADOR. Wholesale values for 2008 are estimated by applying the ratio of ex-vessel values to first wholesale values from prior years to 2008 ex-vessel values.

Some first wholesale data was unavailable due to DOR confidentiality regulations. In these instances, McDowell Group used conservative estimates from a range of values. Therefore, wholesale values reported in this study should be considered minimum estimates.

Sportfish estimates are based on data provided by NSRAA, ADF&G, Southeast municipal governments and interviews conducted with charter operators in Southeast communities.

McDowell Group developed an economic model to estimate the economic impacts related to NSRAA production and operations. Inputs to this model were drawn from the sources described above. The model linked ADOLWD employment and payroll data, ex-vessel volume and value data, first wholesale value data and other information to generate estimates of average annual employment, income and total economic activity related to NSRAA-produced salmon.

Northern Southeast Regional Aquaculture Association (NSRAA) is a private nonprofit cooperative working to increase salmon returns for the benefit of commercial, sport, and personal use fishermen. Established in 1978, NSRAA has become an integral part of Southeast Alaska's commercial and sportfishing industries.

The organization's overall strategy is to develop hatchery returns that are isolated from wild stocks. This process allows extensive terminal harvest that produces high quality and valued fish with minimal impact on wild stocks. Chum and sockeye are produced for commercial fleets operating in northern Southeast Alaska, while chinook and coho are produced primarily for the Sitka sport fishing fleets.

NSRAA's current projects include the Medvejie Hatchery, Hidden Falls Hatchery, the Deer Lake rearing program, three spawning channels near Haines, as well as incubation boxes and three spawning channels near Haines. Descriptions of their primary facilities are presented below.

Facilities and Operations

Medvejie Project

The Medvejie Hatchery is located on the western coast of Baranof Island, south of the community of Sitka. The hatchery has been in operation for nearly 30 years and produces chum, chinook, and coho salmon. Chum salmon make up the largest number of returns from Medvejie and are typically harvested in the Deep Inlet area. A large expansion of NSRAA's chinook program has enabled the hatchery to double its production of that species, increasing returns significantly since 2002. Additionally, the association began an experimental zero-check chinook program in 1999 (first release in 2000), which has shown some promise with 16,000 adult returns to date. (A zero-check program releases smolts after only one year of rearing instead of the traditional two.)

The Medvejie coho program is undergoing a shift of its brood stock. Rearing associated with the new stock, under development at Salmon Lake, will occur at NSRAA's new Sawmill Cove Hatchery, but production goals from this effort will likely take several years to reach.

Hidden Falls Project

The Hidden Falls Hatchery is on Baranof Island adjacent to Chatham Strait. It was built by the State of Alaska in 1978-79 and operated by the state until 1988, when operation of the facility was transferred to NSRAA. Since taking over the operation of Hidden Falls, NSRAA has more than doubled chum production, tripled chinook production, and initiated a successful coho program. In 2004, a major hatchery expansion was conducted at this site and its success has allowed fishermen continued increases in fishing opportunities in the early part of the season.

Deer Lake Rearing Project

NSRAA operates its successful coho rearing program at Deer Lake, located on the southeastern shore of Baranof Island. Since 2005, the program has used a net-pen system, averaging approximately one million fry annually. In 2009, NSRAA plans to double this number in attempts to generate additional adult returns of 180,000 to 200,000 coho per year.

Commercial Harvest of NSRAA Salmon

This section opens with an overview of recent salmon market conditions in Southeast Alaska and a discussion of commercial salmon harvest volume and value, including value generated through seafood processing.

Southeast Alaska Salmon Market Overview: Production & Price Trends

The major commercial fisheries in Southeast Alaska produced \$206 million in ex-vessel value in 2008, according to preliminary figures, up from \$192 million in 2006 and \$204 million in 2007.

Salmon remains the value leader in the region's major fisheries by a wide margin. In 2008, salmon value was nearly \$117 million (57 percent of the total), based on preliminary estimates, and is expected to increase as the 2008 season value data is finalized. The 2008 season represents a sixth consecutive year of salmon value growth in the region, having more than doubled from the decade's low point of \$50 million in 2002.

The value growth in salmon is driven by a combination of strong harvest volumes for pink and chum salmon and steady growth in the price per pound of all five salmon species caught in the region. Salmon harvest volume in the strong years of the pink salmon abundance cycle has declined recently, but this has been offset by substantial price increases for all five salmon species, particularly for pink and chum salmon in 2008.

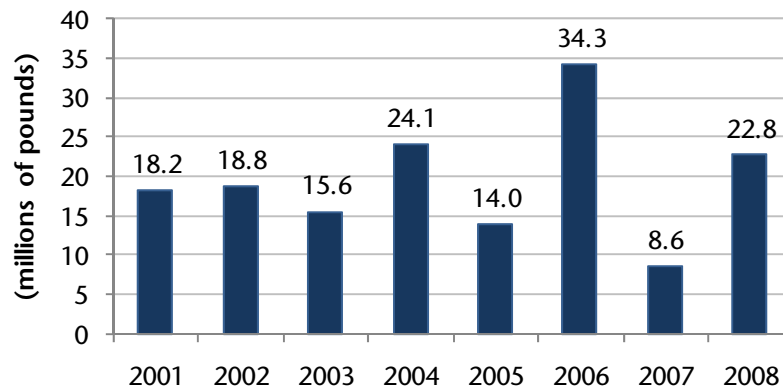
Recent price growth in pink and chum salmon is driven by a combination of steady growth in the average wholesale price of meat products (frozen, canned, etc.) and by a major price increase for roe products in 2008.

The outlook for salmon value in 2009 is uncertain. Prices for the traditional high-value salmon species of the region (particularly chinook and coho) will likely see substantial downward pressure with recessionary spending patterns. Chum salmon prices are also likely to be lower, as the unusually strong roe market (primary driver for chum price) has cooled since 2008.

Commercial Harvest Volume and Ex-Vessel Value

NSRAA salmon production provides a significant contribution to Southeast Alaska's commercial salmon harvest. Between 2001 and 2008, the organization has added 156.3 million pounds of salmon to the Southeast harvest, an average of 19.5 million pounds annually. With a contribution of 34.3 million pounds, 2006 was a record year for commercially harvested NSRAA salmon. The following chart shows NSRAA's annual contribution, in terms of volume, to common property fisheries between 2001 and 2008. It does not include cost recovery harvests.

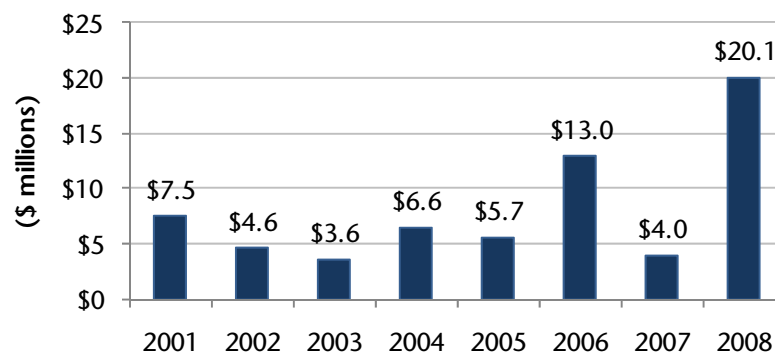
Figure 1: Total Pounds of NSRAA Salmon Harvested in Common Property Commercial Fisheries, 2001-2008



Source: NSRAA, 2009.

NSRAA-produced salmon also have a substantial impact on the value of Southeast Alaska's commercial salmon industry. The total ex-vessel value of NSRAA's contribution between 2001 and 2008 was \$65.1 million, averaging \$8.1 million annually. In 2008, NSRAA-produced salmon was valued at a record \$20.1 million. Southeast salmon prices hit record levels that year, and chum, NSRAA's primary species, averaged an ex-vessel price that was double the five-year average from 2003 to 2007 (\$0.62 per pound compared to \$0.30). The following chart shows NSRAA's annual contribution, in terms of ex-vessel value, to common property fisheries between 2001 and 2008. It does not include cost recovery harvests.

Figure 2: Total Ex-Vessel Value of NSRAA Salmon Harvested in Common Property Commercial Fisheries, 2001-2008



Source: NSRAA, 2009.

Chum salmon constitute the overwhelming majority of NSRAA adult returns. Ninety-four percent of NSRAA's 2001-2008 average returns were chum salmon, followed by coho (4 percent), chinook (2 percent), and sockeye (fewer than 1 percent). Similar distributions were seen specifically in 2007 and 2008.

Table 1: Recent Commercial Harvest Composition (Volume) of NSRAA Salmon, by Species, 2007 & 2008

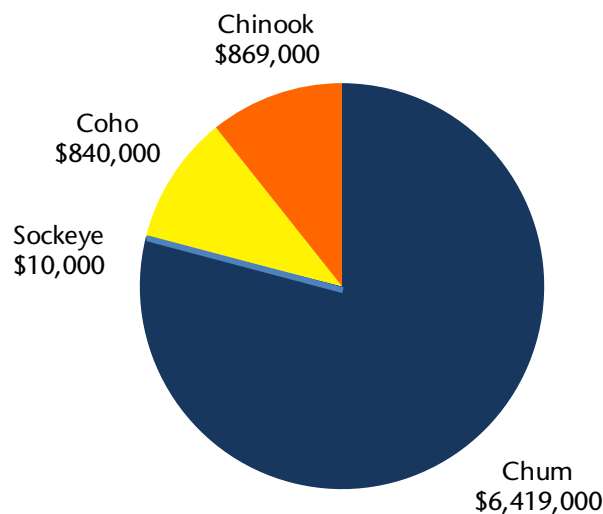
Species	2001-2008 Average		2007		2008	
	Lbs. (in thousands)	Percent	Lbs. (in thousands)	Percent	Lbs. (in thousands)	Percent
Chum	18,399	94%	8,096	94%	21,442	94%
Coho	743	4	223	3	836	4
Chinook	387	2	271	3	495	2
Sockeye	10	<1	0	0	0	0
Total	19,540	100%	8,590	100%	22,773	100%

Source: NSRAA, 2009.

Note: Totals may not equal column sums due to rounding.

Among the four species produced by NSRAA, chum salmon is by far the most prevalent. Between 2001 and 2008, commercially harvested NSRAA chum averaged an ex-vessel value of \$6.4 million, followed by chinook (\$869,000) and coho (\$840,000). NSRAA-produced sockeye averaged \$10,000, but was only harvested during four of the eight years.

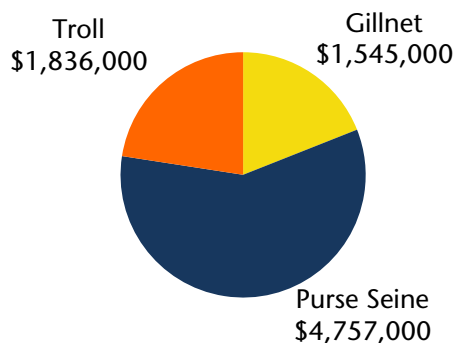
Figure 3: Average Ex-Vessel Value of NSRAA Salmon Harvested in Common Property Fisheries, by Species, 2001-2008



Source: NSRAA, 2009.

The majority of earnings from commercially harvested NSRAA salmon are associated with Southeast’s purse seine fleet. Earnings associated with regional troll and gillnet fleets are roughly evenly distributed. Between 2001 and 2008, seiners harvested an annual average of \$4.7 million worth of NSRAA salmon. The troll fleet harvested an annual average of \$1.8 million during that time period, and gillnetters harvested an annual average of \$1.5 million.

Figure 4: Average Ex-Vessel Value of NSRAA Salmon Harvested in Common Property Fisheries, by Gear Type, 2001-2008



Source: NSRAA, 2009.

The following table presents annual ex-vessel values from 2001 to 2008 associated with the four salmon species produced by NSRAA and with the three harvest gear types. Chum and coho values tended to fluctuate between 2001 and 2005 before substantial increases in 2006 and 2008. Chinook values did not see an increase in 2006, but jumped significantly in 2008 with record ex-vessel prices. Similarly, the seine and gillnet fleets, harvesting primarily NSRAA chum and coho, saw increased earnings in 2006 and 2008, while trollers, harvesting primarily NSRAA chinook, saw a substantial increase in 2008 only.

Table 2: Commercial Harvest Composition (Value) of NSRAA Salmon, by Gear Type and Species, 2001-2008
(\$ in thousands)

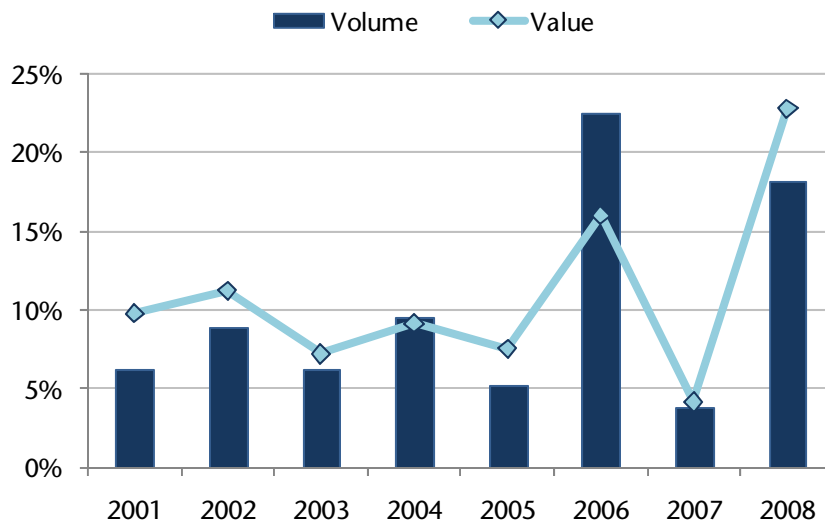
	2001	2002	2003	2004	2005	2006	2007	2008
Species								
Chum	\$6,185	\$3,556	\$2,871	\$4,853	\$3,910	\$11,187	\$2,923	\$15,867
Sockeye	31	25	0	0	14	7	0	0
Coho	633	557	379	828	982	1,389	298	1,656
Chinook	668	484	366	896	753	430	788	2,572
Gear Type								
Purse Seine	4,453	2,683	2,270	3,403	2,117	8,226	1,636	13,269
Gillnet	1,133	888	535	1,473	1,542	2,633	976	3,182
Troll	1,931	1,050	810	1,699	2,001	2,153	1,398	3,644
Total	\$7,517	\$4,622	\$3,616	\$6,576	\$5,660	\$13,012	\$4,009	\$20,094

Source: NSRAA, 2009.

Note: Totals may not equal column sums due to rounding.

The proportion of Southeast Alaska’s total salmon harvest that is attributable to NSRAA’s production has fluctuated over recent years, averaging approximately 10 percent of the region’s harvest volume and value. Between 2001 and 2005, NSRAA salmon accounted for 5 to 10 percent of the regional salmon harvest, in terms of both volume and value. In 2006, the percentage increased to more than 20 percent due to an extremely low regional pink salmon harvest, which decreased the overall salmon harvest volume that year. The following year, the portion of the Southeast harvest attributable to NSRAA production dropped significantly before rebounding in 2008. Record market prices account for 2008’s impressive harvest value. That year, NSRAA-produced salmon accounted for nearly one-fifth of the regional harvest volume and, with record prices, nearly one-quarter of the value.

Figure 5: Volume and Ex-Vessel Value of NSRAA Salmon as a Percentage of the Southeast Commercial Salmon Harvest, 2001-2008



Source: NSRAA, 2009.

Geographic Distribution of Commercial Harvest

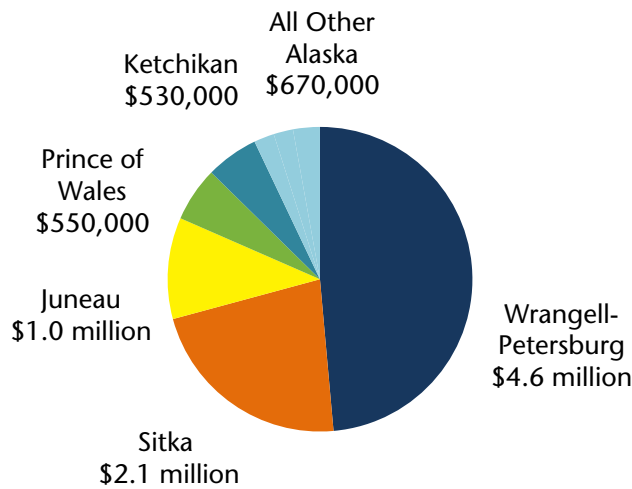
The commercial harvest of NSRAA salmon is widely distributed throughout Southeast Alaska. Information on the residency of Alaskan fishermen in the Hidden Falls and Deep Inlet chum fisheries provides a good measure of this distribution because the overwhelming majority of NSRAA salmon are harvested in these two fisheries.

In 2008, a little more than half of the Hidden Falls chum harvest went to Alaska fishermen, a value of \$4.8 million. Among Alaskans, fishermen from Wrangell and Petersburg harvested salmon worth approximately 60 percent of the total fishery value. Sitka residents harvested another 13 percent.

Alaskan fishermen made up 70 percent of the Deep Inlet chum fishery in 2008, earning \$2.9 million. Sitka resident fishermen harvested the largest portion (45 percent), followed by residents of Wrangell or Petersburg (20 percent), and Juneau (16 percent).

Based on these proportions, an estimated three-fifths of commercially harvested NSRAA chum were harvested by Alaska fishermen in 2008. Among Alaska fishermen, Wrangell and Petersburg residents harvested approximately half, earning \$4.6 million in ex-vessel value. Sitka residents harvested nearly one-quarter, earning \$2.1 million, followed by residents of Juneau (\$1 million), Prince of Wales Island (\$550,000) and Ketchikan (\$530,000). The remaining harvest, valued at \$670,000, went to fishermen from other communities throughout Alaska.

Figure 6: Ex-Vessel Value of NSRAA Chum Salmon Harvested in Common Property Fisheries in Southeast, by Residency of Fishermen, 2008



Source: NSRAA, 2009.

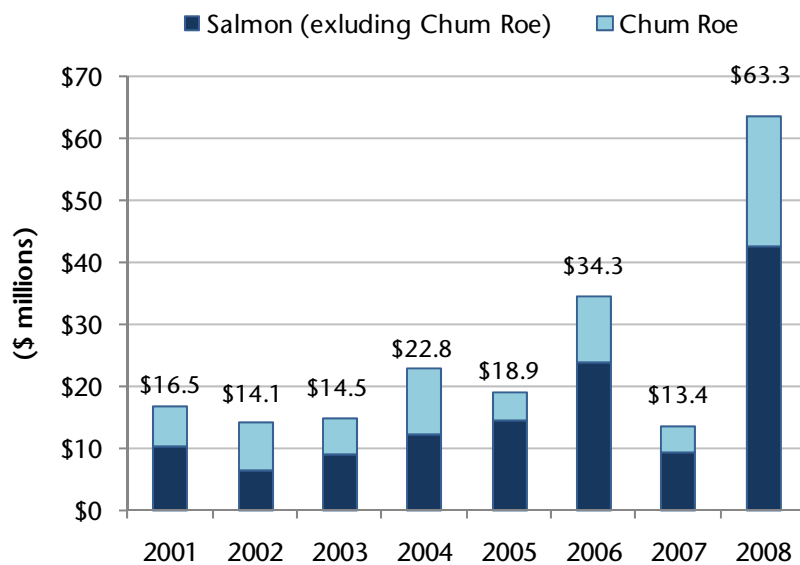
Processing of NSRAA Salmon

In addition to earnings for regional fishermen, NSRAA salmon generates significant economic benefits for Southeast Alaska’s seafood processors. These benefits are measured in terms of first wholesale value: the amount received by processors for the initial sale of product outside their affiliate network. First wholesale values include the processing value of salmon harvested in commercial (common property) and cost recovery fisheries.

Between 2001 and 2008, the cumulative first wholesale value of NSRAA salmon totaled \$198 million. In 2008 record ex-vessel prices generated high earnings for processors as well. The first wholesale value of NSRAA salmon reached \$63 million in 2008, compared to an average value of \$19 million between 2001 and 2007. Chum accounted for \$54 million, or 86 percent, of the total first wholesale value of NSRAA salmon in 2008. Coho accounted for \$5 million that year, and chinook for \$3 million. No NSRAA sockeye were harvested in 2008.

Salmon roe is a particularly valuable salmon product and chum roe are the most lucrative for hatchery-produced fish. On average, between 2001 and 2008, chum roe accounted for approximately one-third of the first wholesale value of NSRAA salmon, ranging from one-quarter to over half the total value. In 2008, Southeast Alaska processors earned a record \$25 million from NSRAA chum roe.

Figure 7: First Wholesale Value of NSRAA Salmon, with Chum Roe Shown Separately, 2001-2008



Source: McDowell Group estimates, based on data provided by NSRAA, ADF&G and ADOR, 2009.

Note: Includes common property and cost recovery harvests.

The first wholesale value of NSRAA-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.

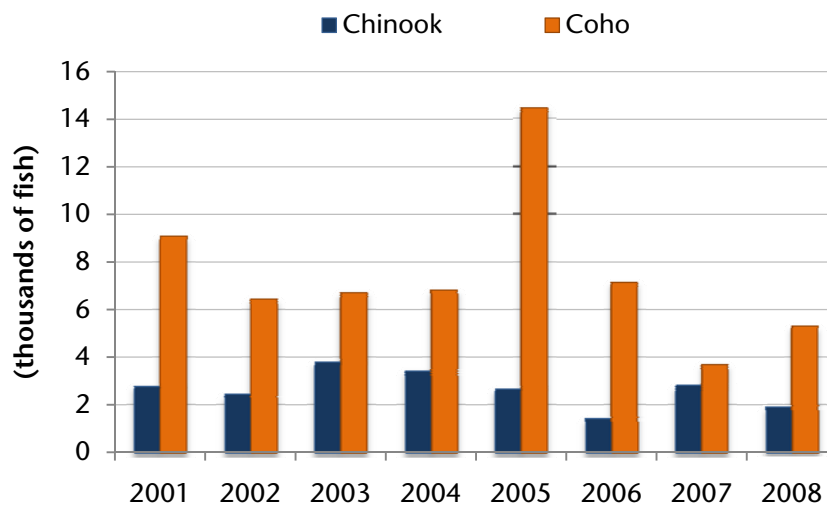
One significant advantage of Southeast hatchery-produced salmon is the large chum roe component. While chum roe is the most desirable of salmon roe products, farmed salmon is not a suitable or preferred source for most salmon roe products. Considering the long-term growth in salmon production, consumption, 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 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 NSRAA-produced salmon, this translates to good prospects for continued strength in chum salmon values, which are driven primarily by the roe market. Over the past two decades, the first wholesale value of NSRAA salmon steadily increased, with particularly high value years in 2000, 2006, and 2008.

Sport Harvest of NSRAA Salmon

NSRAA salmon play a significant role in the Sitka sport and personal use fisheries, and also contributes to the Juneau district sport fish harvest. Traditionally, chinook and coho are the primary species targeted in these fisheries, with an average of 2,700 NSRAA chinook caught annually and 7,500 NSRAA coho. As reflected in the chart below, between 2001 and 2008, annual chinook harvests fluctuated between approximately 1,500 and 4,000 fish, while coho ranged generally from 4,000 to 9,000 with the exception of 2005, when more than 14,000 were harvested by sport fishermen. Total harvest from 2001-2008 was 80,900 fish with an average of 10,100 fish per year.

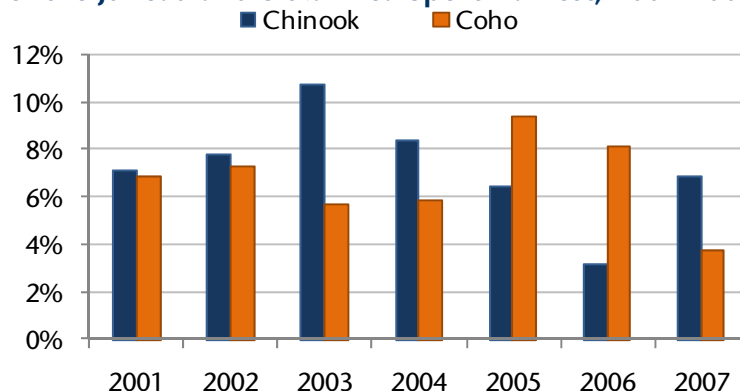
Figure 8: Recreational Harvest of NSRAA Salmon, 2001-2008



Source: NSRAA, 2009.

Nearly all of the NSRAA salmon sport and personal use harvest occurs in the areas around Sitka and to a lesser extent Juneau. On average, NSRAA salmon accounted for 7 percent of the area chinook sport harvest and 7 percent of the coho harvest between 2001 and 2007.

Figure 9: Recreational Harvest of NSRAA Salmon as a Percentage of the Juneau and Sitka Area Sport Harvest, 2001-2007



Source: McDowell Group estimates based on data provided by NSRAA and ADF&G, 2009.

User Groups

While nearly all sport-harvested NSRAA salmon are caught in Sitka and Juneau-area waters, anglers come from a variety of communities, including: Sitka, Juneau, other Alaskan towns and communities outside of Alaska.

Resident Fishermen

Sport-harvested NSRAA salmon offer many local residents a unique food source and recreational experience, including contributions to the Sitka Salmon Derby. According to data provided by NSRAA, chinook returns from their Medvejie hatchery have accounted for roughly one-third of Sitka Salmon Derby Chinook in recent years.

Non-Resident Fishermen

The largest economic impact associated with sport-harvested NSRAA salmon is seen among non-resident anglers. Whether purchasing a charter package or fishing on their own, non-resident fishermen spend significant amounts of money with Sitka and Juneau businesses, purchasing items and services such as: fuel, fishing gear, repair services, bait, food, lodging, transportation, and charter fees.

Economic Impacts of NSRAA Production and Operations

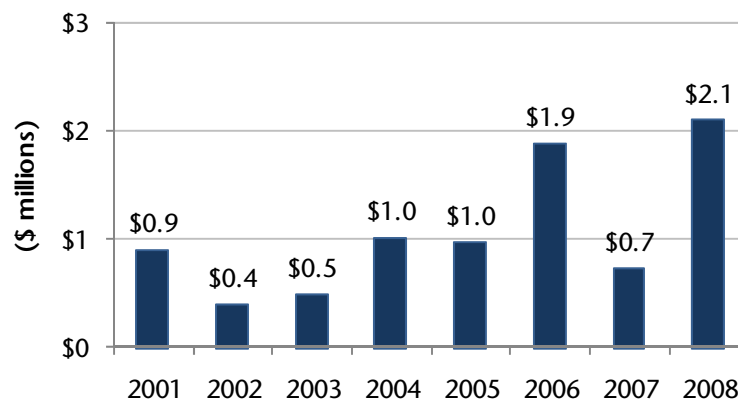
NSRAA's salmon production and business operations generate direct, indirect, and induced economic impacts to communities throughout Southeast Alaska. Commercial and sport fishermen purchase fuel, food, gear, and many other supplies in support of their effort to catch NSRAA salmon, and seafood processors spend money on an array of goods and services, including employee labor. This spending cycles through the regional and local economies, creating additional economic activity. Direct impacts describe ex-vessel earnings from commercially harvested NSRAA salmon, income to seafood processors, local spending by non-resident anglers and NSRAA expenditures on local goods and services. Indirect and induced impacts describe the added economic activity generated as direct spending circulates through the local economy.

This section discusses the impacts from commercially harvested and sport-caught NSRAA salmon on the community of Sitka, as well as the total economic impact of NSRAA salmon harvests, processing, operations, and tax revenue to Southeast Alaska's regional economy. Limited data prohibit community-level analysis of seafood processing.

Commercial Harvest

While the economic impact of the commercial harvest of NSRAA salmon is seen throughout Southeast Alaska, the majority of the impact occurs in Sitka. Between 2001 and 2008, fishermen living in Sitka harvested approximately \$8.5 million worth of NSRAA chum from the Hidden Falls and Deep Inlet chum fisheries, averaging \$1.1 million annually. Sitka residents harvested \$2.1 million worth of NSRAA chum from these two key terminal fisheries in 2008.

Figure 10: Ex-Vessel Income to Sitka Commercial Permit Holders from NSRAA Salmon Harvested in the Hidden Falls and Deep Inlet Chum Fisheries, 2001-2008



Source: McDowell Group estimates based on data provided by NSRAA and CFEC, 2009.

The local economic impact of commercial harvest of NSRAA chum by Sitka residents totaled approximately \$3.2 million in 2008. This includes the \$2.1 million in direct impact, plus another \$1.1 million in indirect and induced economic effects. Over half (about \$1.8 million) of this economic impact is labor income for fishermen, processing workers, and workers in the support sector. These are conservative estimates of NSRAA's local economic impact because they relate only to the chum harvest by Sitka residents. Sitka residents also commercially harvest NSRAA Chinook salmon.

The total regional economic impact of the commercial harvest of NSRAA salmon includes the \$20.1 million in ex-vessel value, plus all the additional spending that occurs as fishermen purchase goods and services in support of their fishing activity and households. Including the total ex-vessel value, plus all the indirect and induced spending effects, the total economic impact of the commercial harvest of NSRAA salmon was approximately \$30 million in 2008. Since a portion of the commercial harvest is taken by non-residents, some of this economic impact occurs outside the region. However, even non-resident fishermen have an impact on the Southeast economy, through their purchases of goods and services while in the region.

Seafood Processing (Southeast)

Nearly all NSRAA salmon harvested in commercial fisheries are processed in Southeast Alaska. According to two processors interviewed for this study, the commercial harvest of NSRAA fish (including cost recovery) represents 6 to 25 percent of their total processing activity, depending on the year.

In 2008, first wholesale value of NSRAA salmon was a record \$63.3 million. This is nearly double the 2006 value and almost five times the 2007 volume. Chum roe values also spiked in 2008, reaching \$20.8 million.

The economic impact associated with the processing of NSRAA salmon includes those impacts generated from the commercial harvest as well. Seafood processors in Southeast Alaska pay commercial fishermen for their catch, and these expenditures are reflected in the first wholesale price, which is the basis for the first wholesale value estimate.

Including all direct, indirect and induced impacts, commercial harvest and processing of NSRAA salmon in 2008 had a total economic impact of approximately \$100 million. This includes the gross (ex-vessel) income earned by commercial fishermen, and all the expenditures those fishermen made in support of their fishing operations and households. The total economic impact also includes all the expenditures processors made (in addition to payments to fishermen for their fish) in support of their activity to process NSRAA fish such as payroll for employees, purchases of supplies, utilities expenses, taxes, etc. Indirect and induced effects are felt throughout nearly all sectors of the economy. Approximately 30 percent (\$30 million) of the total economic impact is labor income

Sport Harvest (Sitka and Juneau)

In addition to the commercial harvest, the sport harvest of NSRAA salmon contributes to the local economies of Juneau and Sitka. Resident and non-resident anglers spend money on items such as gear, fuel, and food in support of sport and personal use fishing. Additionally, non-residents add to local tourism industries, paying for accommodations, restaurants, and charter fees, among other expenditures.

Traditionally, NSRAA has been a major contributor to the chinook and coho harvests associated with Sitka Salmon Derby, with chinook returns from their Medveje hatchery accounting for roughly one-third of all chinook entered into the derby. A smaller portion of NSRAA fish contributes to Juneau's annual Golden North Salmon Derby.

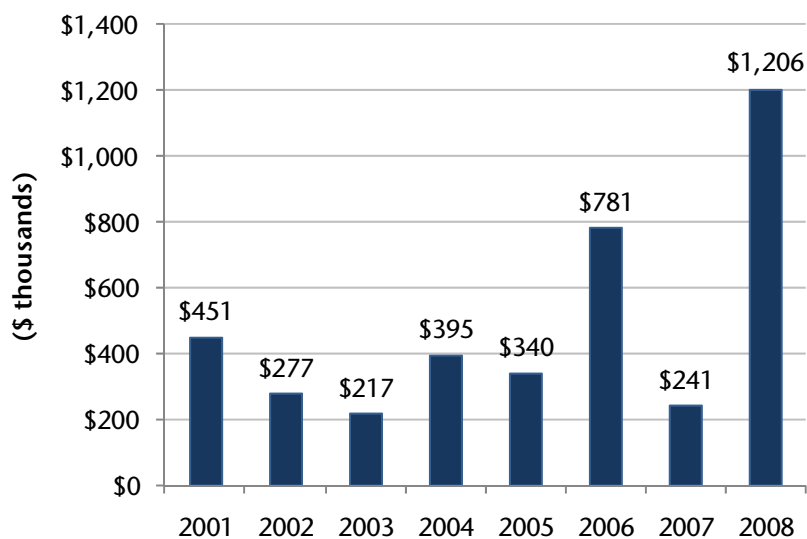
In 2008, an estimated 7,200 NSRAA salmon were harvested in Juneau and Sitka's sport and personal use fisheries. While total 2008 sport and personal use harvest figures for the area were not yet available at the time this report was written, NSRAA salmon has accounted for, on average, 7 percent of both the chinook and coho harvests between 2001 and 2007 (the most recent data available).

It is not possible to precisely measure the economic impact of sport-caught salmon, whether wild or hatchery raised. The value of sport fishing is a blend of the actual money spent in pursuit of salmon (or halibut and/or other sport-caught fish) and the experiential value of sport fishing. Further, actual spending on sport fishing varies widely for resident and non-resident fishermen, and insufficient data exists regarding spending by either group. Still, the economic impact of the opportunity to fish for, and catch, NSRAA salmon is important. A recent detailed study of the impacts of non-resident sport-harvested hatchery-produced fish in Ketchikan found a total direct and indirect economic effect of approximately \$3 million. The sport harvest of NSRAA salmon is approximately one-third the number of hatchery fish harvested in Ketchikan, suggesting a total economic impact of about \$1 million annually, including \$300,000 in labor income. This estimate does not include spending by local residents in support of their effort to catch hatchery-produced salmon.

Salmon Enhancement and Fisheries Business Taxes (Southeast)

All salmon commercially harvested and processed in Southeast Alaska, including NSRAA-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 continued operations of regional aquaculture efforts, such as NSRAA, and revenue from the Fisheries Business Tax is shared between the State of Alaska and the city or borough in which the fish were landed. Both of these taxes are based on the ex-vessel value of the harvest.

Figure 11: Estimated Salmon Enhancement and Fisheries Business Tax Revenue Generated from NSRAA Salmon, 2001-2008



Source: McDowell Group estimates based on data provided by NSRAA, 2009.

NSRAA Operations

As a locally-based organization, NSRAA has economic impacts on the Sitka economy as well. In 2008, NSRAA accounted for an average of 36 jobs, with total payroll of approximately \$1.5 million. Spending on goods and services in support of hatchery operations also generates activity in the local economy. Goods and services include a wide range of expenditures, including hatchery infrastructure and office supplies, maintenance, travel, and payments to commercial seiners during cost recovery efforts. NSRAA spent approximately \$4.8 million on goods and services in support of operations in 2008, of which \$2.7 million went to approximately 180 Alaska businesses and fishermen.

Including all of the indirect and induced effects associated with NSRAA spending on payroll and other goods and services, the organization has a total Alaska economic impact of about \$5 million, including \$2 million in labor income.

Qualitative Benefits

As part of McDowell Group economic impact analysis of NSRAA, the study team interviewed a number of Sitka retailers and regional seafood processors about the impact of NSRAA on their particular business. Those interviewed said NSRAA has a positive impact on their specific businesses and the community's overall economy by providing long-term, stable, family-wage jobs. As a result, NSRAA employees tend to stay in Sitka for a long time and their families are active members of the community. Hatchery production also allows fishermen to work a longer season, some businesses said.

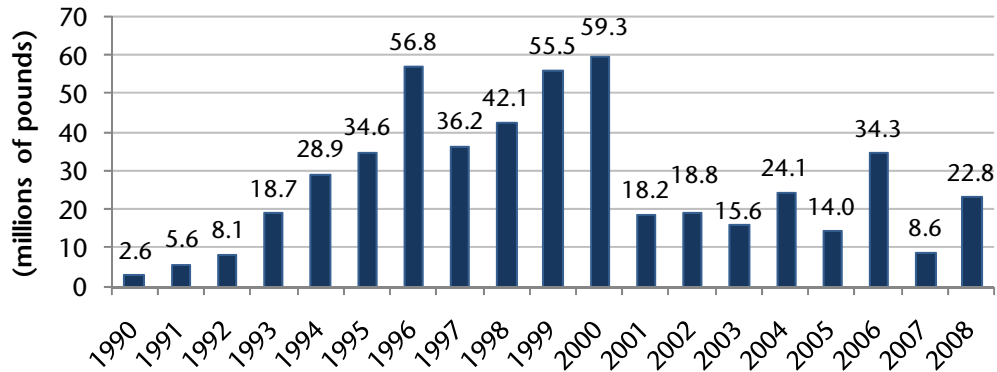
One fishing-related retailer noted that business increased each year, in part due to NSRAA production. Commercial and recreational fishermen start their seasons earlier and usually end later because of enhanced salmon stocks stemming from increased hatchery production.

Businesses unrelated to fisheries also said that NSRAA production helped their bottom line. One retailer, for instance, estimated that fishermen and charter boat clients account for roughly one-third of its annual business. In past summers, a surge of customers from mid-May through August caused this business to hire two to four additional employees during the fishing season. This summer has been the exception, with no need yet to hire additional workers because of changes in the charter industry unrelated to hatcheries.

Historical Overview of NSRAA Contributions, 1990-2008

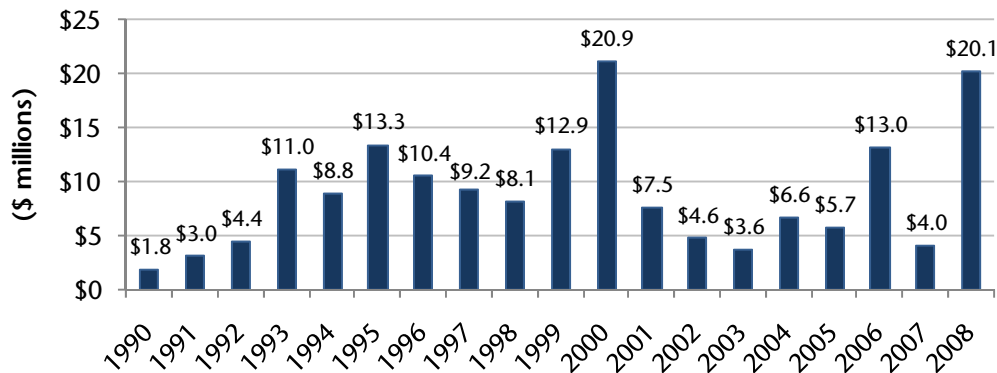
Commercial Harvest Volume and Value

Figure 12: Total Pounds of NSRAA Salmon Harvested in Common Property Commercial Fisheries, 1990-2008



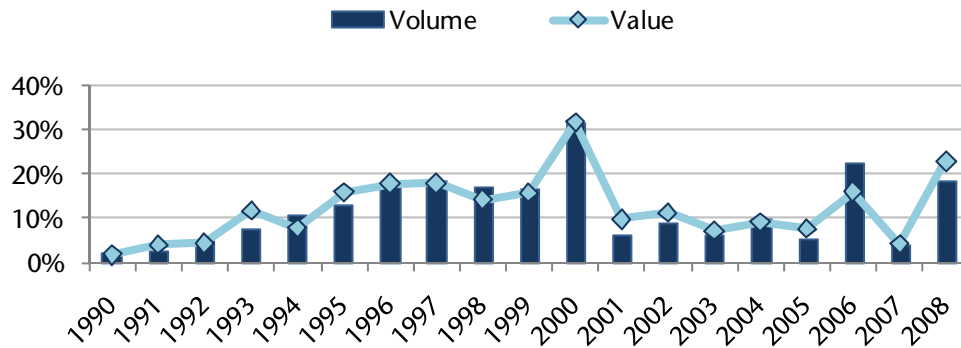
Source: NSRAA, 2009.

Figure 13: Total Ex-Vessel Value of NSRAA Salmon Harvested in Common Property Commercial Fisheries, 1990-2008



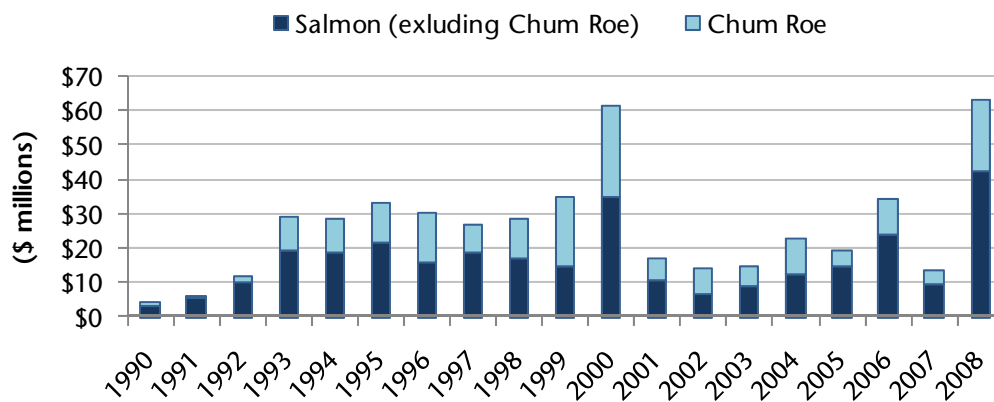
Source: NSRAA, 2009.

Figure 14: Volume and Ex-Vessel Value of NSRAA Salmon as a Percentage of the Southeast Commercial Salmon Harvest, 1990-2008



Source: McDowell Group estimates based on data provided by NSRAA and CFEC, 2001 and 2009.

Figure 15: First Wholesale Value of NSRAA Salmon with Chum Roe Shown Separately, 1990-2008



Source: McDowell Group estimates based on data provided by NSRAA, ADF&G and ADOR, 2001 and 2009.