

***ECONOMIC IMPACTS OF THE
NORTHERN SOUTHEAST
REGIONAL AQUACULTURE
ASSOCIATION***

***Prepared for:
Northern Southeast Regional Aquaculture Association
1308 SAWMILL CREEK ROAD
SITKA, ALASKA 99835***

March 2001

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Prepared by:



Juneau • Anchorage

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The purpose of this study is to quantify the economic impacts of Northern Southeast Regional Aquaculture Association (NSRAA) salmon production from 1990 through 2000. Included are NSRAA impacts on seafood harvesting, processing, recreational fishing, the community of Sitka, and the Southeast region of Alaska. Key findings are presented below.

Economic Impacts of Commercial Harvest of NSRAA Salmon

NSRAA's Medvejie and Hidden Falls hatcheries are the most economically important programs in southeast Alaska. Since 1978, fishermen have paid in \$20 million, while harvesting over \$100 million of salmon - a 1 to 5 cost: benefit ratio.

Commercial fishermen in Southeast Alaska harvested 59 million pounds of NSRAA salmon and earned \$21 million in ex-vessel value during the 2000 season. In the Deep Inlet and Hidden Falls fisheries, an estimated 3,080 skippers and crew members earned income from NSRAA salmon.

In terms of personal income (take home pay) to fishermen, NSRAA salmon generated an estimated \$11 million in 2000.

Fishermen spent another \$6 million on goods and services in support of their fishing operations.

Between 1990 and 2000, commercial fishermen harvested over 348 million pounds of NSRAA salmon with a total ex-vessel value of \$104 million. On average, approximately 32 million pounds worth \$9 million in ex-vessel value were harvested annually during the last eleven years.

NSRAA salmon accounted for 32 percent of the ex-vessel value of the entire Southeast Alaska commercial salmon harvest in 2000. NSRAA's percentage of the ex-vessel value of the Southeast regional salmon harvest has increased from 2 percent in 1990, to 16 percent in 1995, and to 32 percent in 2000 - doubling in importance in the past six years.

The induced economic impacts in 2000 from NSRAA-related commercial harvest personal income was 290 annual equivalent jobs, \$8 million in payroll, and \$28 million in total economic output. Induced impacts are those changes to the economy from household spending. Total output is the value of all direct and indirect economic activity in all sectors of the regional economy.

Commercial Harvest of NSRAA Salmon by Gear Type, Species and Area

Ex-vessel income from NSRAA salmon is broadly distributed throughout the region. In 1999, earnings from the NSRAA chum fisheries benefited the following communities: Wrangell/Petersburg, \$1.4 million; Sitka, \$1.3 million; Juneau

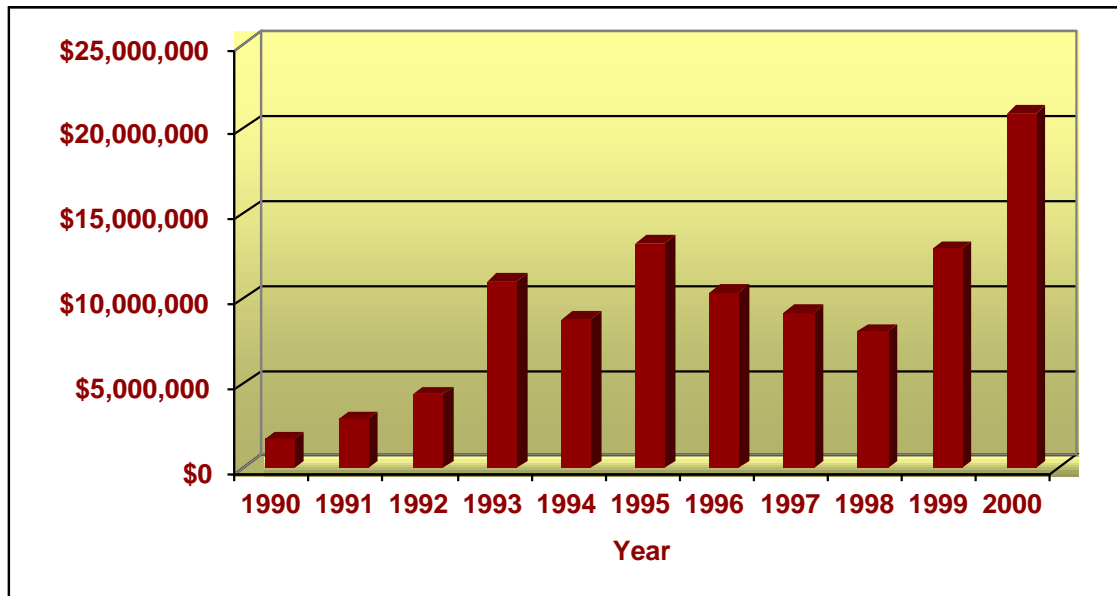
\$550,000; Ketchikan, \$440,000; Haines, \$250,000; Prince of Wales-Outer Ketchikan, \$180,000; and other Alaska communities, \$600,000.

For the period 1990 through 2000, the seine fleet harvested 71 percent of the total ex-vessel value of the NSRAA catch, the troll fleet 19 percent, and the gillnet fleet 10 percent.

During this period, chum salmon accounted for 84 percent of the ex-vessel harvest value of NSRAA salmon, followed by coho at 12 percent, and chinook (king) at 4 percent.

From 1990 to 2000, harvest of NSRAA salmon accounted for 13 percent of the total Southeast Alaska commercial salmon harvest and 12 percent of the total ex-vessel value.

**Total Ex-Vessel Value of NSRAA Salmon
All Species and Gear Types, 1990-2000**



Economic Impacts of Seafood Processing of NSRAA Salmon

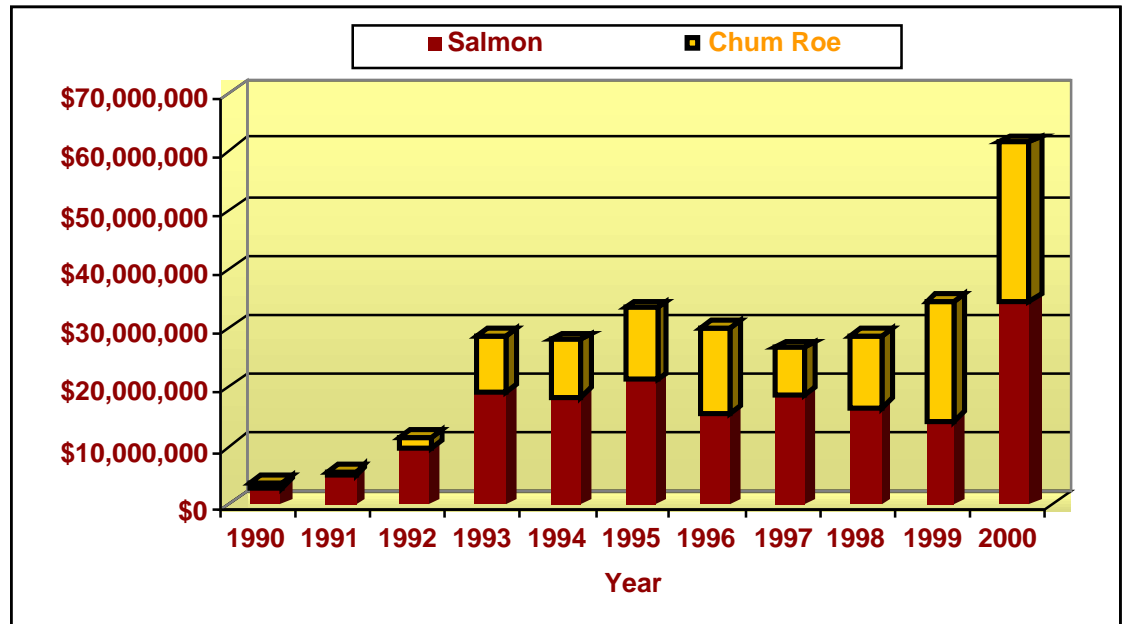
In 2000, the first wholesale value of NSRAA salmon production was \$35 million plus another \$27 million in chum roe production. Total first wholesale value of NSRAA-related product was \$62 million.

Between 1990 and 2000, the total estimated first wholesale value of NSRAA salmon was \$293 million with an annual average value of \$27 million (including chum roe). Chum salmon (including roe) accounted for 90 percent of the first wholesale value of total processed NSRAA salmon.

Economic impacts (indirect and induced) from the processing of the NSRAA commercial harvest (including roe) in 2000 totaled an estimated 462 jobs, \$13 million

in payroll, and \$56 million in total output. These are the net impacts of processing and are in addition to the impacts from \$21 million paid by processors to harvesters for raw product.

Estimated Total First Wholesale Value of NSRAA Salmon and Chum Roe, 1990-2000



Economic Impacts of Sport Harvest of NSRAA Salmon

Total sport fishing harvest of NSRAA chinook and coho salmon from 1990 to 2000 was 70,000 fish, for an annual average of 6,400 fish.

Total economic impacts of NSRAA salmon on the Sitka and Juneau area sport fishing industries in 1999 were \$1 million in total output, \$385,000 in payroll, and 21 annual equivalent jobs.

Economic Impacts of NSRAA on Sitka

NSRAA operations, harvesting of NSRAA salmon by Sitka resident fishermen, and processing of NSRAA salmon in Sitka are addressed in this study and are summarized below. However, the total economic impacts on Sitka of NSRAA activity and production are not quantifiable within the limits of this study. This is due primarily to the substantial, but unmeasured, impacts of salmon harvesters not based in Sitka who still impact the community's economy.

NSRAA Operations Impacts

In 2000, NSRAA operations employed an annual equivalent of 35 (with a peak of 48) people generating an annual payroll of \$1 million. In addition, NSRAA purchased an estimated \$864,000 in supplies and services in Sitka.

Between 1990 and 2000, NSRAA's employment and payroll have averaged about 35 jobs (with peaks up to 60) and about \$1 million in payroll. Total NSRAA payroll for this period exceeds \$12 million.

The total economic impacts, including indirect and induced impacts, of NSRAA's operations budget in 2000 were an estimated 42 jobs, \$1.4 million in payroll, and \$3 million in total economic output.

Impacts of Sitka Resident Commercial Harvests of NSRAA Salmon

From 1990 to 2000, Sitka resident commercial fishermen harvested \$12 million in NSRAA chum salmon for an annual average of nearly \$1 million in ex-vessel value. Historically, Sitka residents harvest about 14 percent of the total value of NSRAA chum production.

During 2000, Sitka residents harvested NSRAA salmon worth \$3 million in ex-vessel value. The resulting impacts of this harvest on the Sitka economy are estimated at 26 annual equivalent jobs, \$665,000 in payroll, and \$3.4 million in total economic output.

Impacts of Processing NSRAA Salmon in Sitka

From 1990 to 2000, the estimated total first wholesale value of NSRAA salmon processed in Sitka was \$66 million with an annual average value of \$6 million (including salmon roe). This amounts to about 23 percent of the total first wholesale value of NSRAA-related processing production region-wide.

During the 2000 fishing season the economic impacts from processing \$12.8 million of NSRAA salmon product in Sitka were an estimated 128 annual equivalent jobs, \$4 million in payroll, and \$17 million in total economic output.

Impacts of Sitka Area Sport catch of NSRAA Salmon

NSRAA sport fish harvest of chinook and coho salmon contributes to the economy of Sitka. NSRAA has contributed to the development of Sitka's large charter fleet by producing coho and particularly chinook, which are a primary focus of a significant portion of charter fleet customers.

NSRAA salmon accounted for approximately 13 percent of the total Sitka area sport fishery harvest or an estimated \$700,000 in direct spending by non-resident anglers during 1999. This spending generated an estimated 15 jobs, \$330,000 in payroll, and \$880,000 in total output.

Total Economic Impacts of NSRAA Salmon Harvests

In addition to \$21 million in fishermen's income in 2000, the economic impacts of NSRAA commercial and sport fish harvest and related processing were 772 annual equivalent jobs, \$22 million in payroll, and \$86 million in total economic output. These numbers are generated by McDowell Group's use of the IMPLAN economic model that calculates impacts of economic activity in all sectors of the economy.

Summary of NSRAA Economic Impacts in 2000

<u>Regional Impacts</u>	
Harvest volume (pounds)	59,000,000
Harvest ex-vessel value	\$21,000,000
Percent of Southeast Alaska total ex-vessel value	32%
Wholesale value of NSRAA salmon and roe	\$62,000,000
Sport harvest of coho and chinook salmon (number of fish)	6,500
Fishermen (including crew) earning income from NSRAA chum fisheries	3,080
<u>Direct and Indirect Economic Impacts</u>	
(includes, processing, sport charter, direct NSRAA operations, and all indirect multiplier impacts in all sectors of the regional economy affected by NSRAA salmon and operations)	
Total annual equivalent jobs created by NSRAA salmon	772
Total payroll (all direct and indirect payroll ultimately related to NSRAA salmon and operations)	\$22,000,000
Total economic output (i.e., the value of all economic activity, both direct and indirect in all sectors of the regional economy resulting from NSRAA salmon and operations)	\$86,000,000
<u>Impacts on Sitka</u>	
First wholesale value of NSRAA salmon to Sitka processors	\$13,000,000
Percent of NSRAA wholesale value processed in Sitka	21%
Ex-vessel income to Sitka commercial fishermen	\$3,000,000
Percent of NSRAA commercial catch harvested by Sitka residents	16%

Purpose and Scope

The purpose of this study is to provide an estimate of the economic impacts of Northern Southeast Aquaculture Association's (NSRAA) operations in Southeast Alaska and Sitka. The report concentrates on four primary subjects:

1. **Commercial Harvest of NSRAA Salmon** – In this section, the overall economic benefits of NSRAA salmon are addressed using ex-vessel and net income to Southeast fishermen by species. In addition, regional distributions from NSRAA salmon fisheries are reported.
2. **Economic Impacts of NSRAA Processed Salmon** - Southeast Alaska's seafood processing industry also benefits from NSRAA salmon. This section addresses the overall economic impacts to Southeast Alaska from processing NSRAA harvested salmon by considering first wholesale value as well as indirect economic impacts on the regional economy.
3. **Economic Impacts of NSRAA Salmon on the Regional Sport Fishing Industry** - The report identifies the relative importance of NSRAA salmon to the total Juneau and Sitka sport fishing industry.
4. **Economic Impacts of NSRAA in Sitka** – This analysis estimates the economic benefits to Sitka based commercial fishing, seafood processing, and sport fishing industries. Information on economic benefits to fleet support, salmon enhancement, business tax, and NSRAA operations are included.

Methodology

The data used in this report comes from a variety of sources including NSRAA, Alaska Commercial Fisheries Entry Commission (CFEC), Alaska Department of Labor (AKDOL), Alaska Department of Revenue, and Alaska Department of Fish and Game (ADF&G). In addition, contacts were made with Sitka area processors, Sitka charter operators, NSRAA staff, and ADF&G staff who assist in the management of terminal fishery harvests. The study also utilizes recent McDowell Group research on the Sitka economy, NSRAA economic impacts, and studies of chinook sport fishing impacts to Southeast Alaska. It should be noted that research on the economics of the region's seafood industry is limited, and in some cases non-existent. This is particularly true in areas related to personal income of commercial fishermen and sport fishing values.

To assist in estimating the economic impacts of NSRAA salmon production from seafood processing and sport fishing in the region, McDowell Group used IMPLAN. The U.S. Forest Service, in cooperation with the Federal Emergency Management

Agency and the Bureau of Land Management, developed IMPLAN (Implan Analysis for Planning) to help with land resource planning issues. It was later refined by the Minnesota IMPLAN Group. IMPLAN is one of the most widely used economic models today.

NSRAA – An Overview

Introduction

Northern Southeast Regional Aquaculture Association (NSRAA) is a private non-profit cooperative established to increase salmon returns to benefit commercial and other users. Since it began operation in 1978, NSRAA quickly became an integral part of the commercial and sport fishing industry in Northern Southeast Alaska (stretching from Petersburg to Haines). Currently, NSRAA has a wide variety of operations. These projects include the Medvejie Hatchery, Hidden Falls Hatchery, the Coho Lake Rearing program, the Chilkat Lake sockeye project, two spawning channels near Haines, and remote incubation boxes near Haines.

NSRAA's Medvejie and Hidden Falls hatcheries are the most economically important programs in southeast Alaska. Since 1978, fishermen have paid in \$20 million, while harvesting over \$100 million of salmon - a 1 to 5 cost: benefit ratio.

NSRAA'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.

Much of the success of these projects is evidenced by the continued high releases and returns of hatchery-reared salmon. In 1999, NSRAA participated in the release of over 147 million fry and smolts. During that same year, an estimated ex-vessel value of \$13 million was paid to fishermen for NSRAA harvested salmon.

Medvejie Project

The Medvejie Hatchery is located on the western coast of Baranof Island, south of the community of Sitka. The hatchery began operation in 1981. Currently the hatchery produces chum, chinook, and coho salmon. Chum salmon make up the largest number of returns from Medvejie. Returns in recent years have exceeded 1 million fish. Most of the chums are harvested in the Deep Inlet area. Medvejie project also has great success with rearing chinook salmon. In recent years, the Medvejie chinook program has been one of the most successful in Southeast in terms of commercial and sport fishing contribution. In 1999, over 9,500 chinook were harvested by commercial and sport fishermen. Currently, NSRAA is in the process of a major expansion of its chinook program. Returns to Medvejie are expected to double by 2003 to average annual returns of 60,000 chinook. The coho projects

include smolt release programs at Shamrock Bay and Hidden Falls and a fry stocking program at Deer Lake.

Hidden Falls Project

The Hidden Falls Hatchery is located on Baranof Island on 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 coho program that releases 1.7 million coho smolt annually. The chum program at Hidden Falls is the one of most successful in North America, contributing over 80% of the return to the common property fishery. In 2000, over 2.7 million chums returned for a total ex-vessel value of \$7 million.

Its success has allowed fishermen greater fishing opportunity in the early part of the season. In recent years the number of seiners in this fishery has grown to 240 vessels. According to NSRAA, due to this concentrated fishing effort at Hidden Falls drawing most of the seine fleet, the Alaska Department of Fish and Game has been able to conduct wild stock harvests on smaller chum stocks in Tenakee Inlet.

Coho and chinook salmon returns also have increased substantially. The coho salmon harvest peaked in 1999 at 124,000 fish worth over \$600,000 in ex-vessel value. The chinook harvest peaked in 1996 at 33,000 fish worth over \$700,000 in ex-vessel value.

Coho Lake Rearing Project

In cooperation with the US Forest Service, ADF&G, and the National Marine Fisheries Service, the Coho Lake Rearing Project at Deer Lake has become one of the top producers of coho salmon in Alaska. In 1999, more than 293,000 coho adults were produced from Deer Lake release, contributing over 180,000 harvested fish in the commercial and sport fisheries.

Commercial Harvest of NSRAA Salmon

Salmon Market Overview

Alaska has traditionally supplied over half of the world's wild salmon production. During the 1990s, Alaska increased its dominance as a producer of wild salmon. Wild salmon however, is not the only source of salmon. Farmed salmon production during the same period has increased dramatically, even surpassing wild salmon production in the latter part of the last decade. In 2000, farmed salmon accounted for nearly 60 percent of worldwide salmon production.

The result to the Alaska salmon industry has been market and price erosion for traditional high-value species, particularly sockeye. Some of the price erosion is due in part to declines in prices and harvest. Fortunately, the Alaska harvest of salmon is diverse. Pink and chum salmon have fared better in the world market. These two species make up over two-thirds of Alaska harvest and their markets are largely unaffected by competition from farmed salmon. Statewide, over 75 percent of pink salmon are canned and farmed product has virtually no presence in canned salmon markets. About 70 percent of Alaska's chum product is in frozen form, typically used in value-added products.

Harvest and price trends during the last ten years reveal that the relative importance of pinks and chums has increased while traditional high-value species have declined. Chums and pinks make up most of the salmon harvest volume, accounting for 90 percent of the Southeast Alaska salmon harvest in recent years. Southeast Alaska was the top-earning region in Alaska for two of the last five seasons and was the second in earnings for the remaining three seasons.

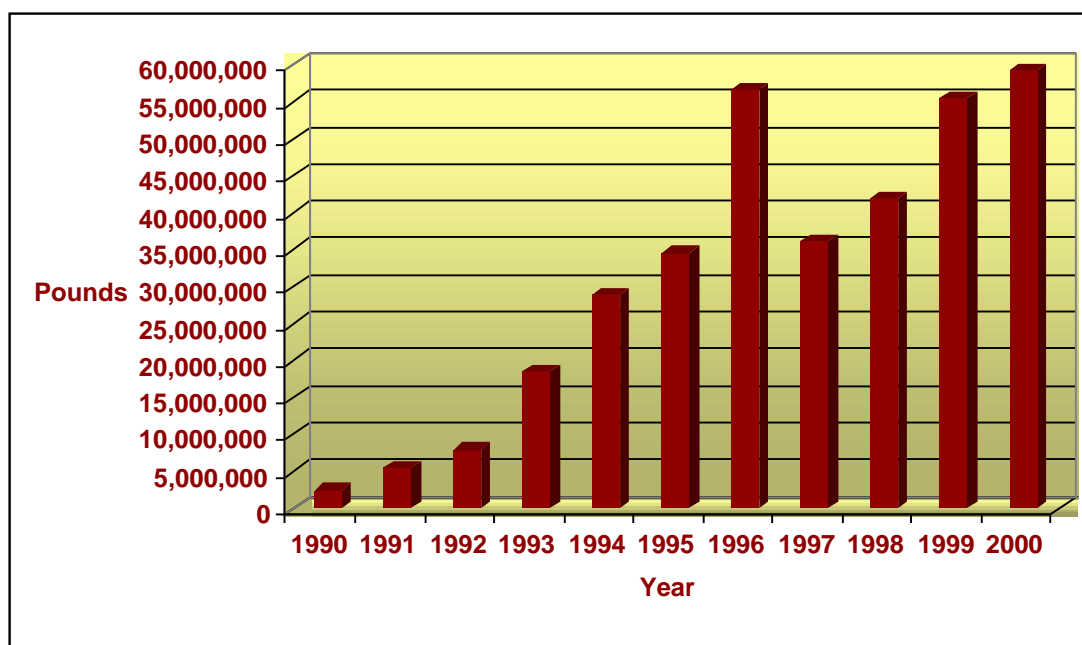
Japan is the world leader in chum salmon production. Japan's harvest peaked in 1996 at 70 million fish. Over the past four years, Japan's harvest of chums has declined significantly. In 2000, Japan's harvest was about 32 million chums, the smallest since the early 1980s.

Since chums have little market competition from farmed salmon, Japan's production losses translate to increased demand rather than substitution. This is good news for Southeast Alaska. In 1999 and 2000, Southeast Alaska saw record and near record chum returns and increasing prices for the species. The 2000 harvest of nearly 24 million chums statewide was concurrent with a five-year high in ex-vessel price. Overall, chum salmon accounted for 22 percent of the statewide salmon ex-vessel value in 2000.

Harvest Volume and Ex-Vessel Value of NSRAA Salmon

Commercial harvest of NSRAA salmon has been successful over the past eleven years. Figure 1 demonstrates the remarkable growth of NSRAA salmon production since 1990. Since then, commercial harvest of NSRAA salmon has grown an average of 45 percent annually. During this period, the commercial fleet harvested 348 million pounds of NSRAA salmon, for an average annual catch of 32 million pounds. Catches exceeded 55 million pounds in 1996, 1999 and 2000.

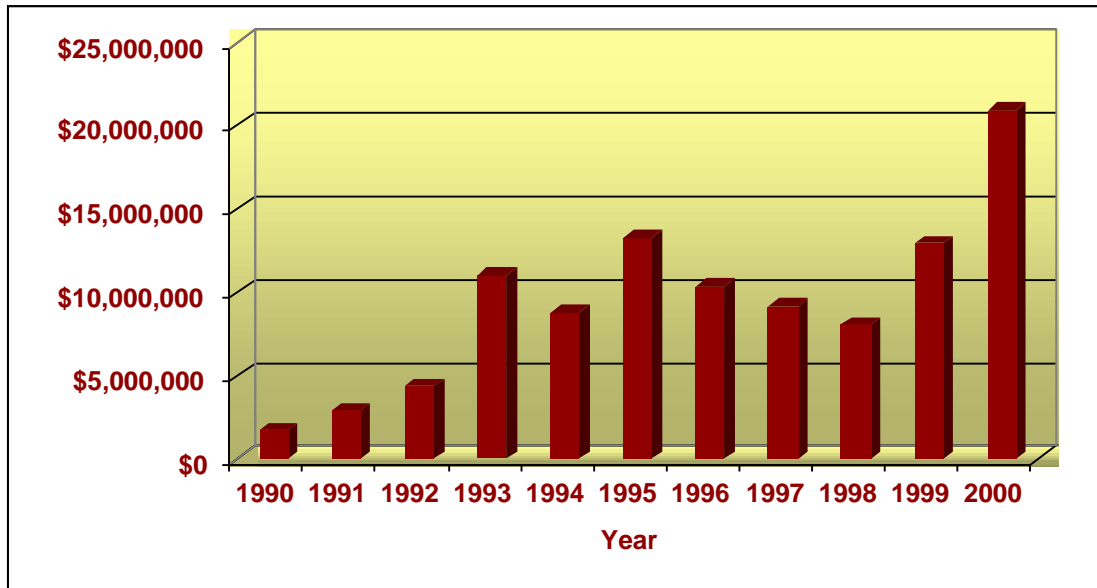
Figure 1.
Commercial Common Property Harvest of NSRAA Salmon
In Total Pounds
All Species and Gear Types - 1990-2000



The seine fleet harvested 81 percent of the total catch, the gillnet fleet 11 percent, and the troll fleet 8 percent. Chum salmon accounted for 97 percent of the harvest, followed by coho at 3 percent, and chinook and sockeye at less than one percent. The fluctuation in the annual harvest over the period was primarily due to higher than normal marine survival, and to a lesser degree, modest increases in the number of fry released for chum salmon.

The value of NSRAA salmon has also seen remarkable growth during the last eleven years (Figure 2). On average, the common property commercial harvest of NSRAA salmon generated approximately \$9 million from purse seine, drift gillnet, and troll fisheries in Southeast Alaska. During this period, total ex-vessel value of NSRAA salmon was approximately \$104 million. 2000 was a record ex-vessel year showing a value of \$21 million.

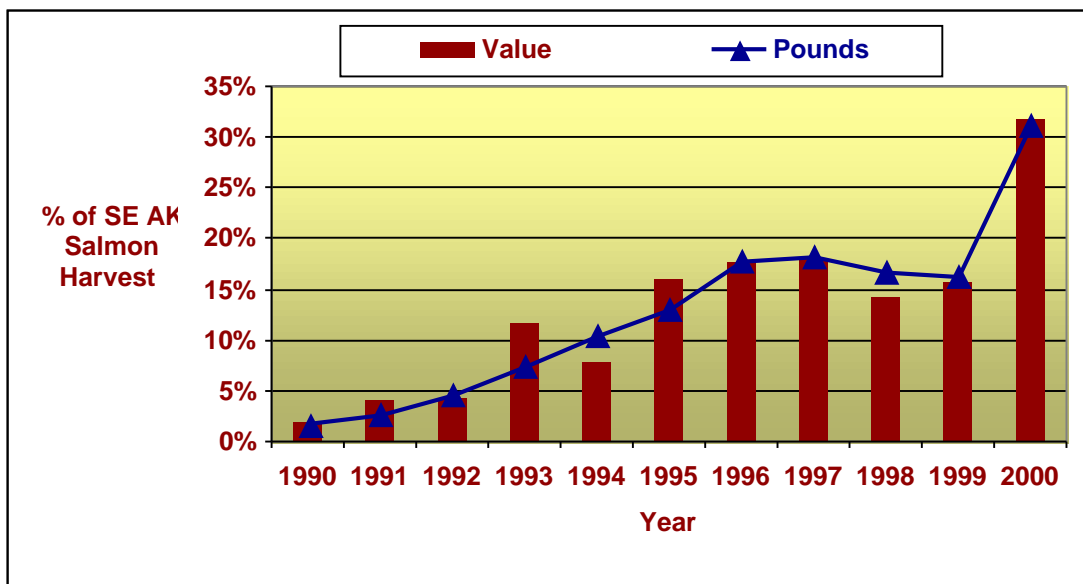
**Figure 2. Total Ex-Vessel Value of NSRAA Salmon
All Species and Gear Types, 1990-2000**



In Southeast Alaska, the NSRAA salmon are playing an increasing role (Figure 3). During the last eleven years, NSRAA salmon accounted for 13 percent of all commercially harvested salmon by weight and 12 percent of ex-vessel value.

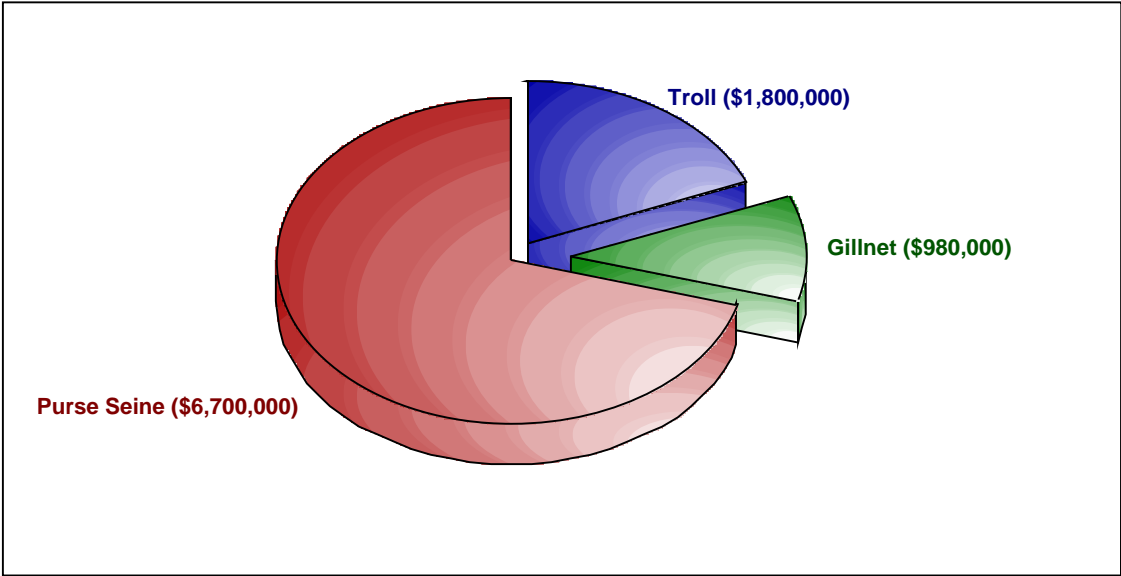
The 2000 season saw record NSRAA chum salmon returns and record ex-vessel value. NSRAA fish accounted for over 31 percent of the harvest and 32 percent of the ex-vessel value in Southeast Alaska.

**Figure 3. Total Ex-Vessel Value and Harvest of NSRAA Salmon
as a Percent of Southeast Alaska Total Salmon Harvest,
All Species and Gear Types, 1990-2000**

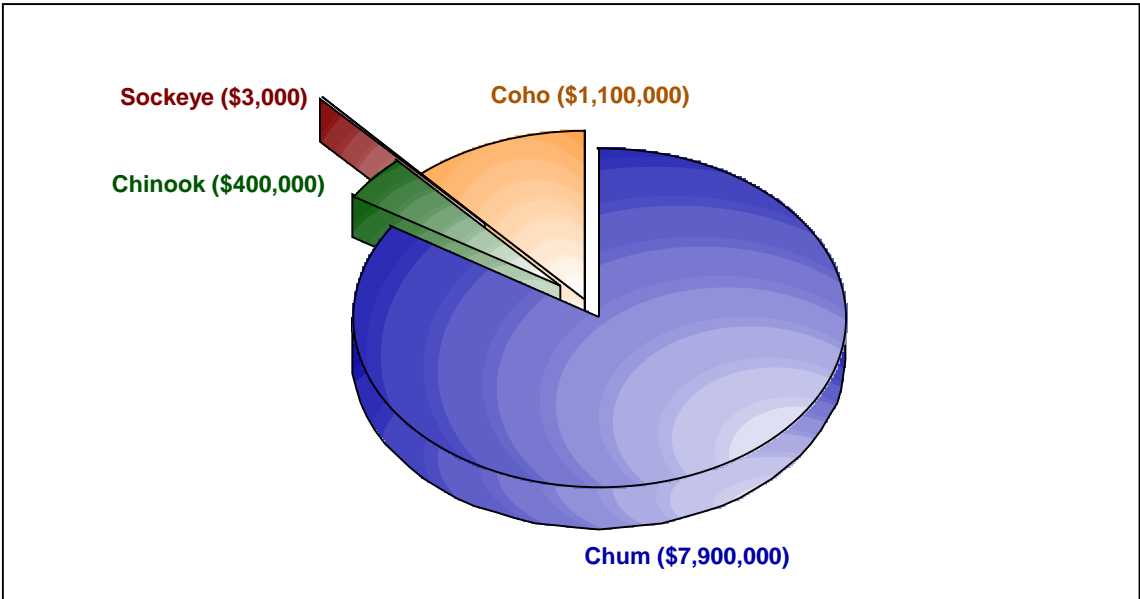


From 1990-2000, the seine fishery harvested an average of 71 percent of commercial ex-vessel value of NSRAA salmon. The troll fleet averaged 19 percent and gillnetters 10 percent (Figure 4). By species, chum salmon on average made up for 84 percent of total ex-vessel value, or \$8 million. Coho salmon accounted on average for approximately 12 percent of the total ex-vessel value at \$1 million; chinook salmon comprised an average of 4 percent (\$400,000); and sockeye salmon made up on average less than one percent (\$3,000). Allocation of fishery value among gears is regulated by the Alaska Board of Fisheries.

**Figure 4. Ex-Vessel Value of NSRAA Salmon by Gear Type
Annual Average, 1990 – 2000**



**Figure 5. Commercial Harvest of NSRAA Salmon
Total Ex-Vessel Value by Species
Annual Average, 1990-2000**



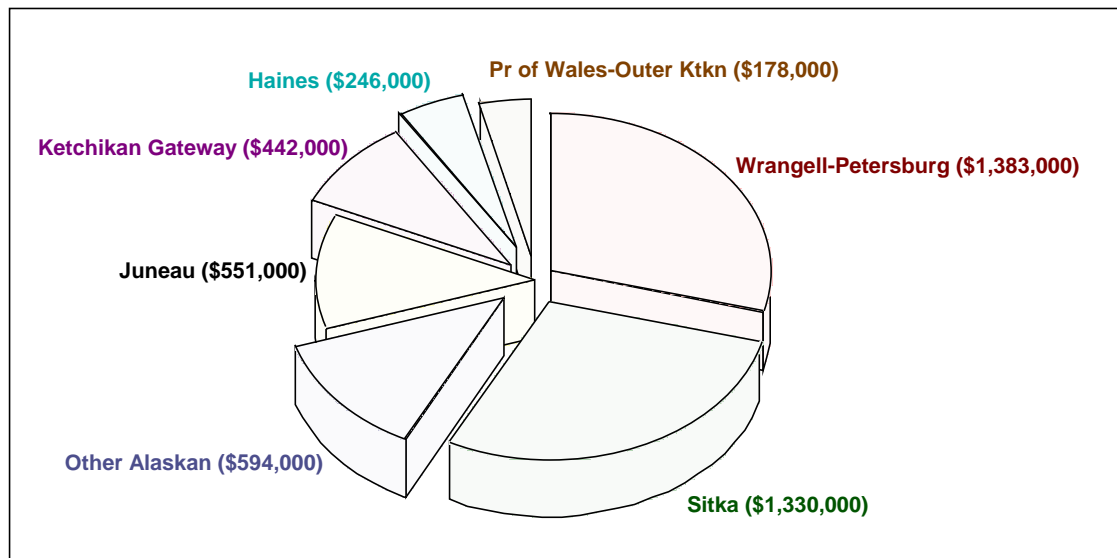
Geographic Distribution of NSRAA Commercial Harvest

The commercial harvest of NSRAA salmon is widely distributed throughout Southeast Alaska. Data from the Commercial Fisheries Entry Commission (CFEC) for the Hidden Falls and Deep Inlet chum fisheries provide a measure of this distribution.

In 1999, commercial fishermen participating in the Hidden Falls terminal fishery earned \$3.5 million ex-vessel value. Alaska resident commercial fishermen harvested approximately 47 percent or \$1.6 million of the ex-vessel value, while non-Alaska commercial fishermen harvested the remaining \$1.9 million (53%). By community, fishermen from Wrangell and Petersburg historically have harvested the largest share of the NSRAA salmon, averaging 25 percent since 1990.

Participants in the Deep Inlet terminal fishery during 1999 harvested \$4.8 million ex-vessel value. Alaska resident commercial fishermen harvested \$3.1 million of the Deep Inlet commercial ex-vessel value (64%), while non-Alaska harvested the remaining \$1.7 million (35%). By community, Sitka commercial fishermen have traditionally harvested the largest share of the Deep Inlet terminal fishery, averaging 33 percent over the last eight years. The following graph shows the communities receiving the major economic impacts of NSRAA chum harvests.

Figure 6.
Geographic Distribution By Community
Ex-vessel Value of NSRAA Chum Fisheries, 1999



Income to Fishermen from Harvest of NSRAA Salmon

To determine the economic impacts from the commercial harvest of NSRAA salmon, ex-vessel value was adjusted. Ex-vessel value represents the gross value of the salmon harvest to commercial fishermen. Taking into account personal tax, non-tax payments, interest paid by persons, personal transfer payments, and personal savings, the remaining portion is personal income. Using Bureau of Economic Analysis data, overall personal income totals approximately 81 percent of total ex-vessel value or \$17 million for 2000.

McDowell Group further adjusts for fishermen's income by estimating ex-vessel income paid out for business expenses. The study estimates that \$11 million in fishermen's income could then be considered "take-home pay" equivalent to salaries and wages in other shore-side industries.

When fishermen spend their personal income in the economy, this creates additional economic activity. For example, a portion of the earnings could be spent on food, household supplies, a new boat motor, etc. These impacts continue to cycle through the regional economy though gradually dwindling due to leakages of purchases outside the region. Leakage and thus economic impacts vary greatly depending on the size and economic diversity of the community. Larger communities tend to have less leakage because of their business diversity, while smaller regions have higher leakage due to the limited business diversity.

It is important to recognize that some portion of earnings from NSRAA-related ex-vessel value is paid to non-Alaskan commercial fishermen. For 2000, approximately 43 percent of all ex-vessel earnings were paid to non-Alaskans. Some portion of their earnings will, in all likelihood, be spent outside Alaska. To account for this, approximately \$7.3 million of total personal income from NSRAA ex-vessel value will be analyzed using a U.S. IMPLAN model rather than an Alaska model. McDowell Group will, for ease of analysis, assume non-Alaskan personal income was spent outside Alaska. The McDowell Group recognizes this assumption is not always true, but to determine an accurate estimate of expenditures in Alaska would require research beyond the scope of this study.

Combined resident and non-resident ex-vessel earnings resulted in 290 jobs, \$8 million in labor income, and \$28 million in total output. Due to the nature of expenditure behavior for personal income, the impacts are spread across a wide diversity of businesses.

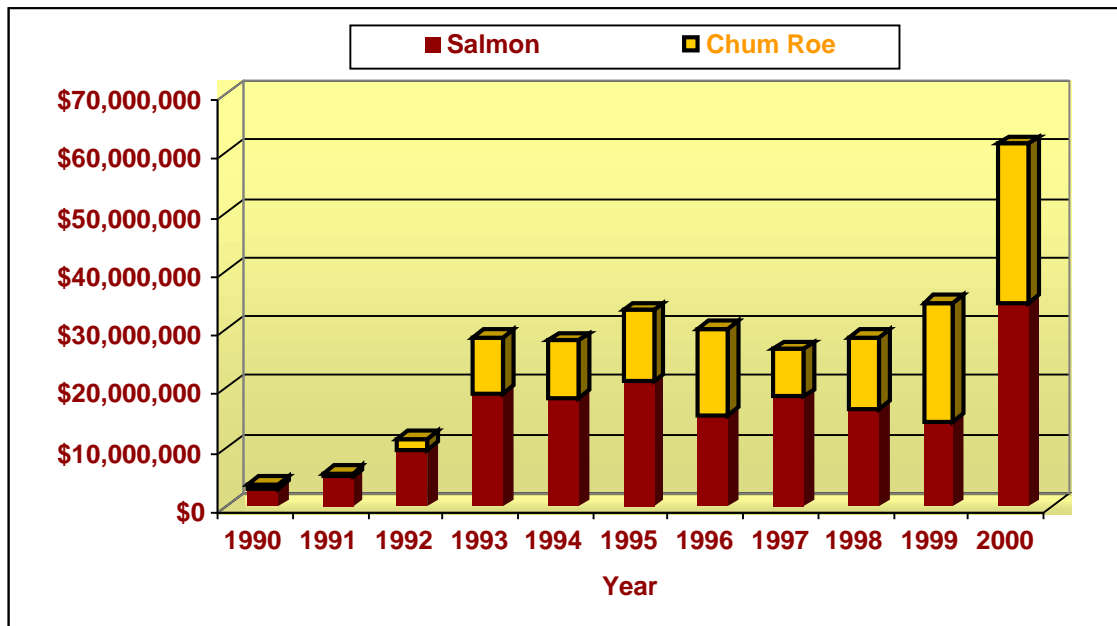
Economic Impacts on Seafood Processors

Processing of NSRAA Salmon Harvest

The commercial harvest of NSRAA salmon generates significant benefits for Southeast Alaska's seafood processors. After processors purchase NSRAA salmon from fishermen, the product is then processed into an assortment of different products like fresh salmon, frozen fillets, steaks, and frozen fish with head and guts removed.

One indicator of the benefits to the Southeast seafood processors is the first wholesale value (Figure 7). From 1990 to 2000, the total estimated first wholesale value of NSRAA salmon was \$293 million. The annual average value was \$27 million (including salmon roe). The largest contributor of first wholesale value was chum salmon (including roe; 90 percent) followed by coho (8 percent) and chinook (2 percent).

Figure 7.
Estimated Total First Wholesale Value of
NSRAA Salmon and Chum Roe, 1990-2000



The 2000 harvest of NSRAA chum salmon was approximately 56 percent of the Southeast Alaska regional harvest. Assuming the same percentage of Southeast chum roe production, NSRAA chum roe accounted for an estimated 2.6 million pounds, with an estimated value of \$27 million. Chum roe, combined with chum salmon flesh first wholesale value of \$32 million, totaled \$59 million in 2000, or 96 percent of the total NSRAA first wholesale value. NSRAA coho salmon had a total first wholesale value of \$1.3 million and chinook reached a record \$1.1 million.

In measuring the total economic effects of NSRAA seafood processing in Southeast Alaska, indirect impacts from payroll expenditures and purchases of goods and services by the seafood processors and fishermen should be included. When employees of Southeast Alaska based seafood processors and commercial fishermen purchase goods and services from their payroll, additional economic activity throughout the Southeast Alaska economy is created. In addition, the processors will also purchase goods and service from the local businesses. Some examples of purchase include electricity, transportation, advertising, and computer services.

In order to prevent double counting of ex-vessel value and seafood processing impacts, ex-vessel value was subtracted from total first wholesale value for NSRAA processed salmon. Total wholesale value for NSRAA salmon, including roe, in 2000 was \$62 million. After removing value paid to fishermen of \$21 million, the adjusted first wholesale value is \$41 million.

Total economic impacts from processing NSRAA commercial catch during 2000 were an estimated 462 jobs (including 274 jobs in the seafood processing sector and 34 jobs in the wholesale sector), \$13 million in payroll, and \$56 million in total output.

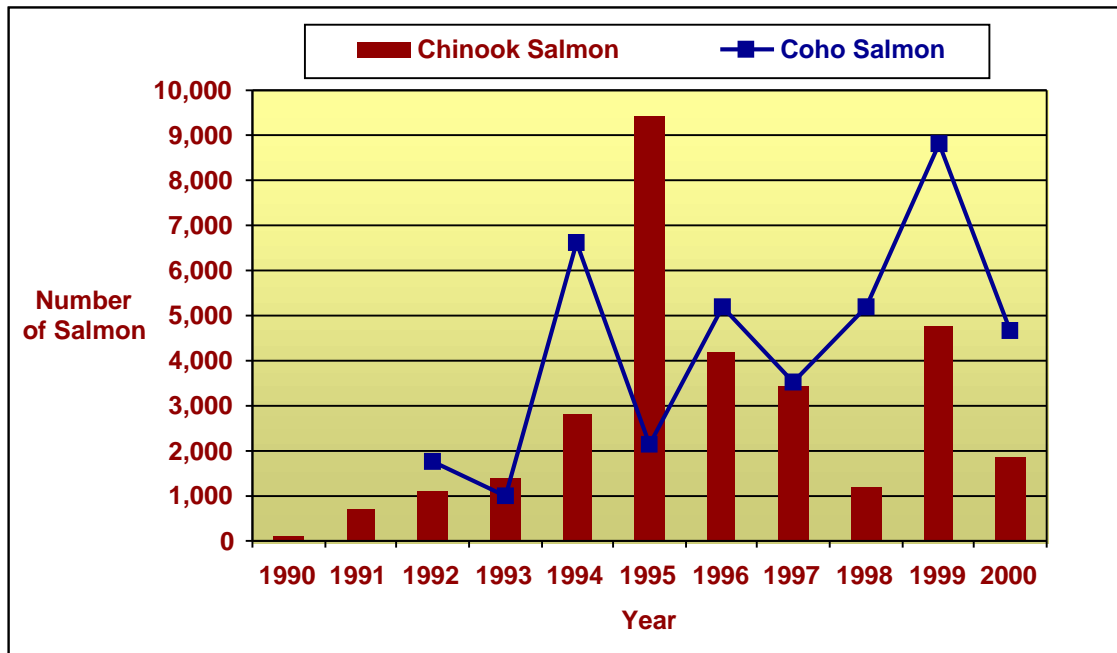
Regional Recreational Fishing Industry

Sport harvest of NSRAA Salmon

In addition to providing benefits to the regional commercial seafood industry, NSRAA hatchery produced salmon also play an important roll in sport fisheries in Northern Southeast Alaska. Chinook and coho are the primary NSRAA species harvested in the sport fishery. Depicted in Figure 8 is the sport fish harvest of NSRAA chinook and coho salmon over the past eleven years. From 1990 to 2000, 70,000 NSRAA chinook and coho salmon were harvested by sport fishermen in the Juneau and Sitka areas. The recent 5-year average (1996-2000) of 8,600 fish represents a 90 percent increase of the previous six-year period.

The 1999 season was the most successful year on record for NSRAA contributions to the sport fishing industry. The sport fish harvest was over 13,600 NSRAA chinook and coho salmon. The previous record was in 1995 with 11,600 coho and chinook salmon harvested.

Figure 8.
Sport Fish Harvest of NSRAA Salmon
Chinook and Coho, 1990-2000



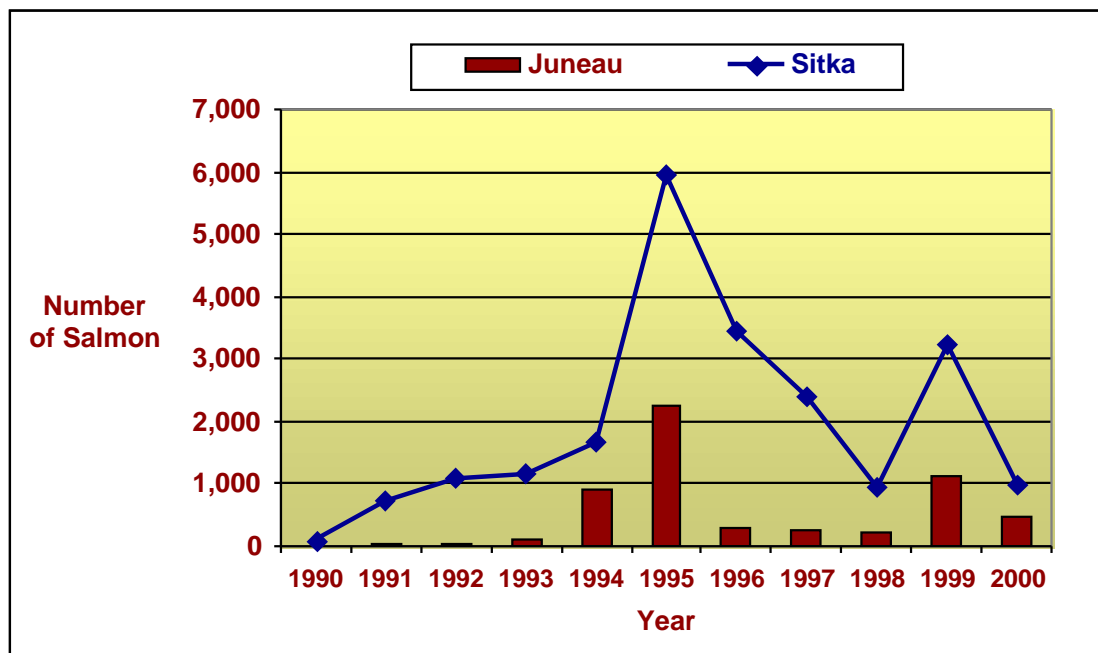
Regional Sport Harvest of NSRAA Chinook Salmon

From 1990 to 2000, approximately 31,000 NSRAA chinook salmon were harvested by sport fishermen for an annual average catch of 2,800 fish. During the period, 79 percent of the sport fish harvest of NSRAA chinook salmon were caught in the Sitka district. The Juneau area on average captured 21 percent (Figure 9).

Of the total Sitka and Juneau area chinook sport fish harvest from 1990 to 2000, an average of 8 percent were NSRAA chinook salmon. NSRAA's portion of total chinook harvest in the Sitka area sport fishery was approximately 11 percent, while NSRAA's contribution in the Juneau area was 4 percent.

The single biggest year for Sitka and Juneau area NSRAA sport fish harvest was 1995. During that year, the Sitka area accounted for 5,900 NSRAA chinook salmon, 34 percent of the Sitka chinook sport fishery harvest. Juneau anglers harvested over 2,200 NSRAA chinook salmon, 22 percent of the area's total.

Figure 9.
Sport Fish Harvest of NSRAA Chinook Salmon
Juneau & Sitka Sport Fisheries, 1990 - 2000



Regional Sport Harvest of NSRAA Coho Salmon

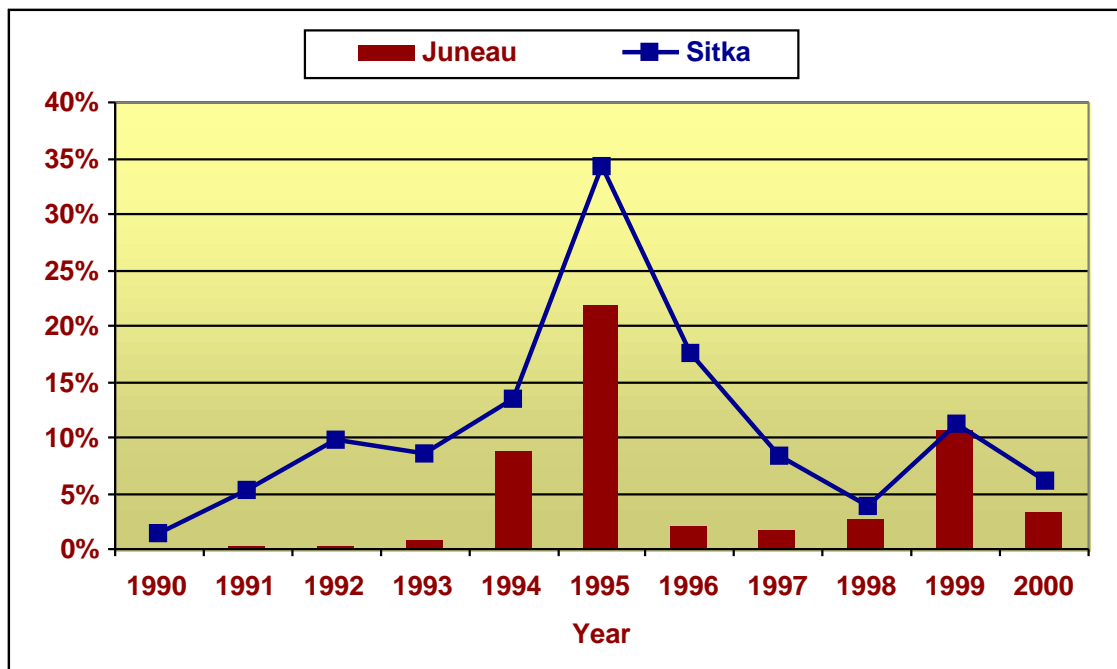
With the exception of 2000, the NSRAA sport fish harvest of coho salmon has shown dramatic growth over the last nine years, averaging approximately 3,900 salmon. In 2000, according to ADFG and NSRAA, lower coho sport catches were a result of lower overall coho production, lower marine survival, and poor weather. The most successful year to date for anglers targeting NSRAA coho salmon was 1999. During that year, 8,700 NSRAA coho were harvested (Figure 10).

Similar to the chinook sport fishery, the primary areas of recreational harvest of NSRAA coho salmon were Sitka and Juneau districts. Sitka area accounted for over 90 percent of all NSRAA sport fish harvested coho, and the Juneau area accounted for 10 percent.

Of the total sport harvested coho in the Sitka and Juneau areas from 1992 to 2000, on average approximately 7 percent were NSRAA coho. In Sitka, an average 15 percent of the total area coho sport harvest were NSRAA fish. In Juneau, an average 2 percent of the total area coho harvest were NSRAA fish.

For both the Sitka and Juneau areas, 1999 was the most successful year for NSRAA coho sport fish harvest. Sports anglers harvested 7,400 NSRAA coho salmon from the Sitka area. This was approximately 14 percent of the total recreational harvest of coho. Anglers harvested 1,200 coho salmon or 5 percent in the Juneau area during this same period.

Figure 10.
Sport Fish Harvest of NSRAA Coho Salmon
as a percent of Juneau and Sitka Sport Fisheries, 1990 – 2000



Economic Impacts of the Sport Fishing Industry

Overall, sport fish harvest of NSRAA chinook and coho salmon contributes to the economy of the region, primarily in the Sitka area with some impacts in Juneau and elsewhere. Economic impacts of the NSRAA contribution to the sports fisheries include non-resident spending in the Sitka area for fuel, fishing gear, repair services, bait, food, charter boats, hotels, transportation to and from the region, and other expenditures.

Using ADF&G estimates of angler days and some approximate expenditure estimates from older studies in Canada and Alaska for input to the IMPLAN model, the McDowell Group generated the following estimated economic impacts of NSRAA salmon on the Sitka and Juneau area sport fishing industries. The total economic impacts of the NSRAA contribution to the sport fishing industry in the Sitka and Juneau economies are estimated at \$1 million in total output, \$385,000 in payroll, and 21 annual equivalent jobs. This estimate is considered an approximation, at best, due to the nature of the input data.

Resident sport fishing value resulting from NSRAA salmon is also a factor of economic impact to the regional economy. Millions of dollars are spent each year on boats, fishing gear, fuel, etc. This spending creates jobs and income in the local economy. However, measuring resident economic impact requires research beyond the scope of this study. In economic analysis, resident activity is treated differently than non-resident activity. Resident money already exists in the economy and moves from one pocket to another. Non-resident dollars count as “new money” added to the economy, increasing total economic value.

Economic Impacts of NSRAA in Sitka

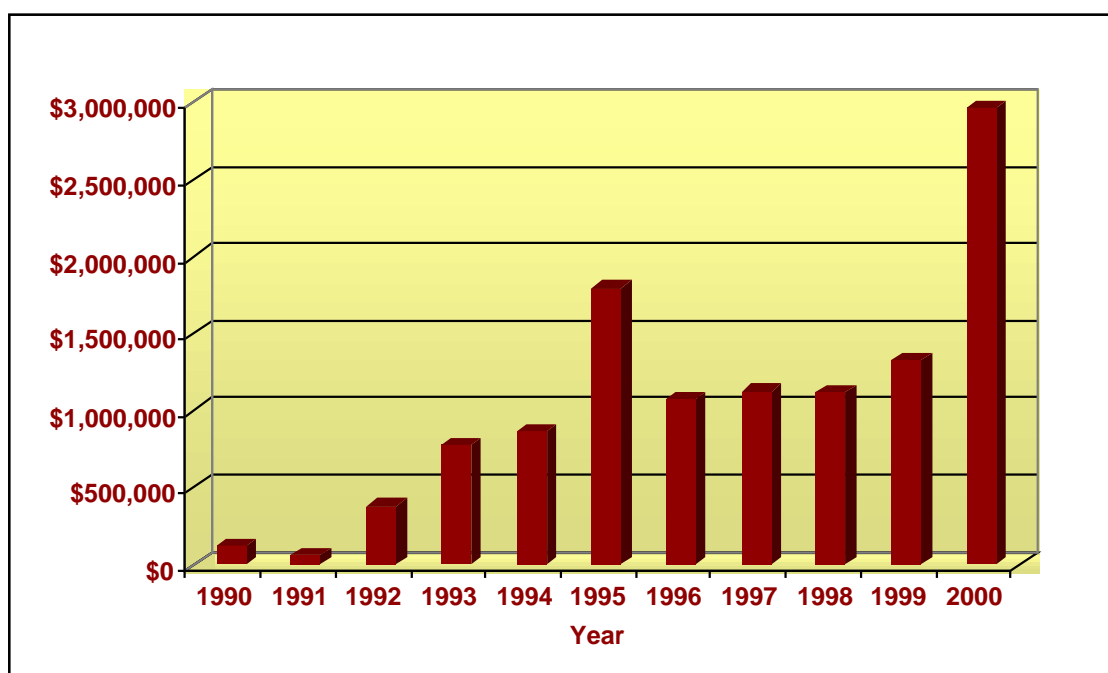
The economic impacts for NSRAA produced salmon are spread throughout communities in Southeast Alaska. However, the location of NSRAA's two major hatcheries gives Sitka the largest economic benefits.

Commercial Harvesting Impacts on Sitka Resident Fishermen

From 1990 to 2000, Sitka commercial fishermen harvested \$12 million in NSRAA chum salmon for an annual average of over \$1 million (Figure 11). Sitka commercial fishermen on average captured 14 percent of the total ex-vessel value of NSRAA chum salmon over the last decade.

During 2000, Sitka commercial fishermen harvested an estimated \$3 million in NSRAA salmon. Taking into account personal tax, non-tax payments, interest paid by persons, personal transfer payments, and personal savings, Sitka commercial fishermen brought home approximately \$2.4 million in personal income, including income for business expenses. Economic impacts from this personal income spent in the Sitka economy results in an estimated 26 jobs, \$665,000 in labor income, and \$3.4 million in total output.

Figure 11.
Ex-Vessel Value of NSRAA Harvest by Sitka Residents
Hidden Falls and Deep Inlet Chum Fisheries, 1990 - 2000

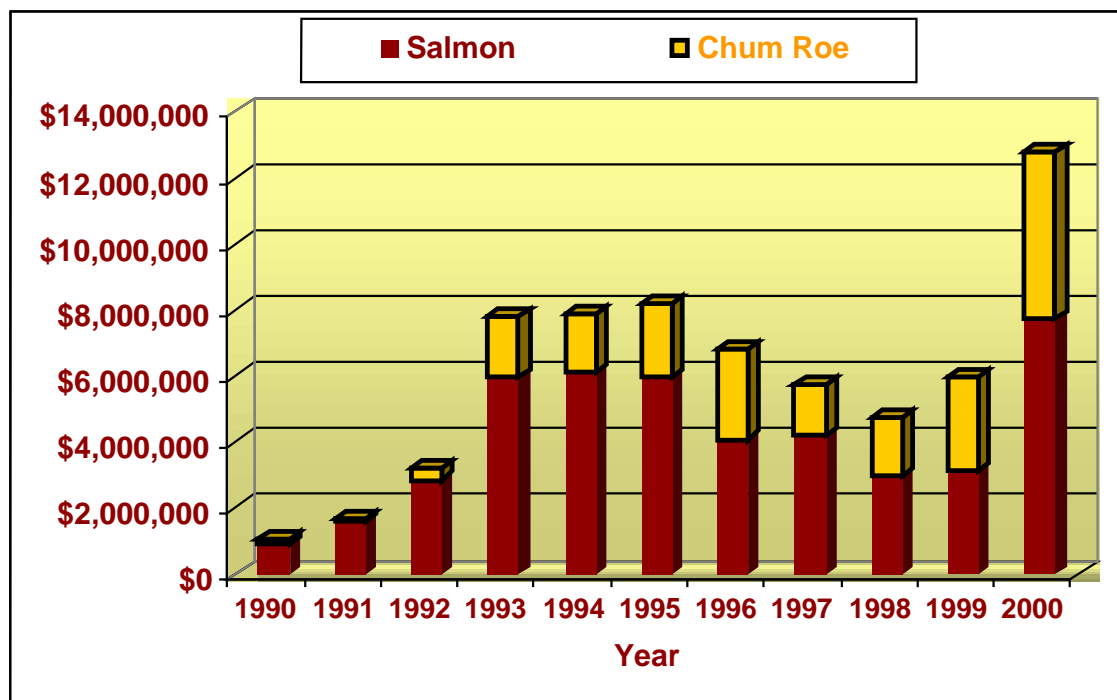


Economic Impacts on Sitka Seafood Processors

The economic impacts to Sitka area seafood processors from NSRAA are substantial. Interviews with area processors, indicate that most of the troll and seine caught chinook remain in Sitka for processing. As much as half of the NSRAA coho harvested is processed in Sitka. A large portion of the troll caught NSRAA chum and an estimated 15 percent of the chum seine harvest is processed in Sitka. Very little of the gillnet harvest for any species is processed in Sitka.

From 1990 to 2000, the estimated total first wholesale value of NSRAA salmon processed in Sitka was \$66 million with an annual average value of \$6 million (including chum salmon roe) (Figure 12). In 2000, the estimated total first wholesale value of NSRAA salmon processed in Sitka was a record \$7.7 million, and first wholesale value of chum roe processed in Sitka was an estimated \$5 million for a total of \$13 million first wholesale value. After deducting payments to fishermen of \$3 million from total first wholesale value to avoid double counting, McDowell Group utilized a modified IMPLAN model to determine the economic impacts to the Sitka community from processing NSRAA salmon and roe. Estimates of the economic impacts were 128 jobs, \$4 million in payroll, and \$17 million in total output during 2000.

Figure 12.
Estimated Total First Whole Sale Value NSRAA Salmon and Chum Roe
Processed in Sitka, 1990 – 2000



Economic Impacts of the Recreational Fishing Industry

NSRAA sport fish harvest of chinook and coho salmon contributes to the economy of Sitka. NSRAA has contributed to the development of Sitka's large charter fleet by producing coho and particularly chinook, which are a primary focus of a significant portion of charter fleet customers. Economic impacts from the NSRAA sports fishery include non-resident spending in the Sitka area for fuel, fishing gear, repair services, bait, food, charter boats, hotels, transportation to and from the region, and other expenditures.

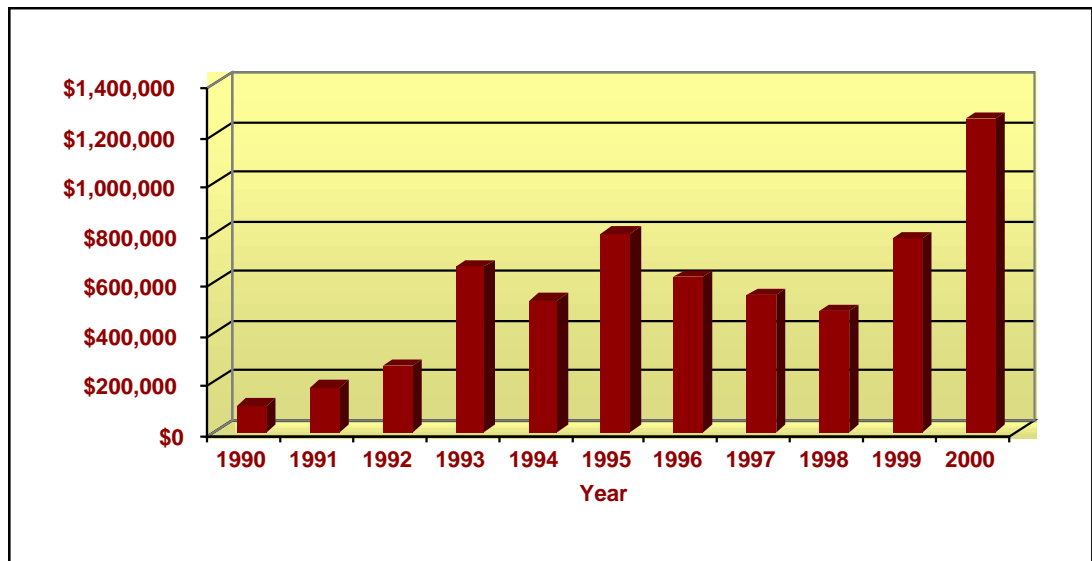
Using ADF&G estimates of Sitka angler days and some approximate expenditure estimates from older studies in Canada and Alaska for input to the IMPLAN model, the McDowell Group generated the following estimate of NSRAA salmon on the Sitka area's sport fishing industry. The total economic impacts of the NSRAA contribution to the sport fishing industry in the Sitka economy are estimated at \$880,000 in total output, \$330,000 in payroll, and 15 annual equivalent jobs. This estimate is considered an approximation, at best, due to the nature of the input data.

Salmon Enhancement and Business Tax

As with all salmon commercially harvested and processed in Alaska, NSRAA fish are subject to the 3% Salmon Enhancement Tax and 3% Fisheries Business Tax. Both of these taxes are based on the ex-vessel value of the salmon.

As shown in Figure 13, the total value of Fisheries and Business Tax paid on NSRAA Salmon has ranged between \$53,000 (in 1990) and \$1.3 million (in 2000). In 2000, NSRAA salmon represented about 10 percent of revenues received by Sitka as its share of total Fisheries Business Tax collected.

Figure 13.
NSRAA Salmon Enhancement and Fisheries Business Taxes,
1990-2000



Impacts of NSRAA Business Operations

NSRAA as an organization also impacts the Sitka economy. While some NSRAA employment and expenditures are located outside the community, the major impacts of NSRAA operations are felt in the Sitka economy.

In 2000, NSRAA contributed annual equivalent employment of 35 jobs (with a peak of 48 in summer) and a payroll of \$1.2 million. In addition, NSRAA purchased \$864,000 million in supplies and services in the Sitka area. These include, for example, rent, utilities, air travel, purchases of services and supplies for hatchery sites, and the chartering of seine boats and crew during cost recovery efforts.

The total direct and indirect economic impacts from these expenditures are an estimated 42 jobs, \$1.4 million in payroll, and \$3.0 million in total economic output.