

***ECONOMIC IMPACTS OF
DOUGLAS ISLAND PINK AND CHUM, INC.***

***PREPARED FOR:
DOUGLAS ISLAND PINK AND CHUM, INC.
2697 CHANNEL DRIVE
JUNEAU, ALASKA 99801***

MAY 2001

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JUNEAU • ANCHORAGE

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The purpose of this study is to present the economic impact of the Douglas Island Pink and Chum, Incorporated (DIPAC) salmon enhancement program, including commercial and sport harvests. The McDowell Group used the Impact Analysis for Planning Model (IMPLAN) to estimate economic impacts of DIPAC salmon production. Key findings are reported below.

Summary of Economic Impacts

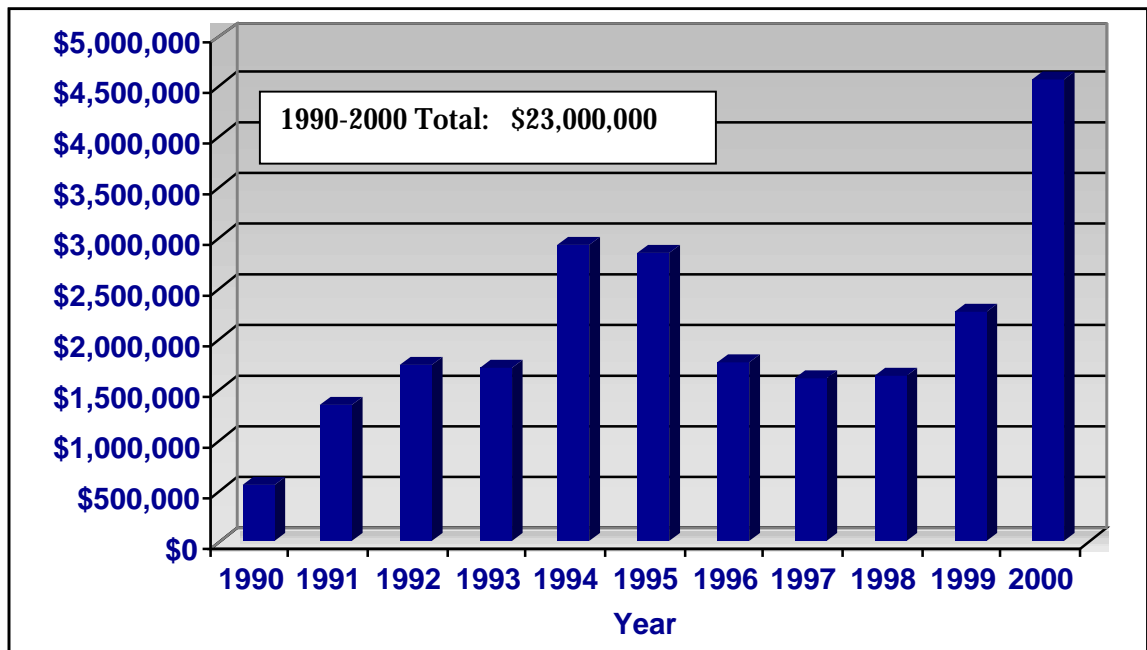
- In 2000, economic impacts resulting from the production and harvest of DIPAC salmon were \$40 million in total output, including \$10 million in labor income and 360 jobs. Impacts for each sector (commercial fishing, seafood processing, sport harvest, and DIPAC operations) are summarized below.

Commercial Harvest

- Between 1990 and 2000, commercial fishermen harvested over 63 million pounds of DIPAC salmon with a total ex-vessel value¹ of \$23 million. Annual harvests averaged 6 million pounds worth \$2 million.
- Fishermen harvested a record 12.4 million pounds with an ex-vessel value of \$4.6 million in 2000.
- Economic impacts in 2000 from the ex-vessel earnings resulted in \$5.3 million in total output, including \$1.5 million in labor income and 51 jobs.

¹ Ex-vessel value is the gross value paid to commercial fishermen for their salmon harvest.

Commercial Harvest of DIPAC Salmon, Total Ex-vessel Value, 1990-2000



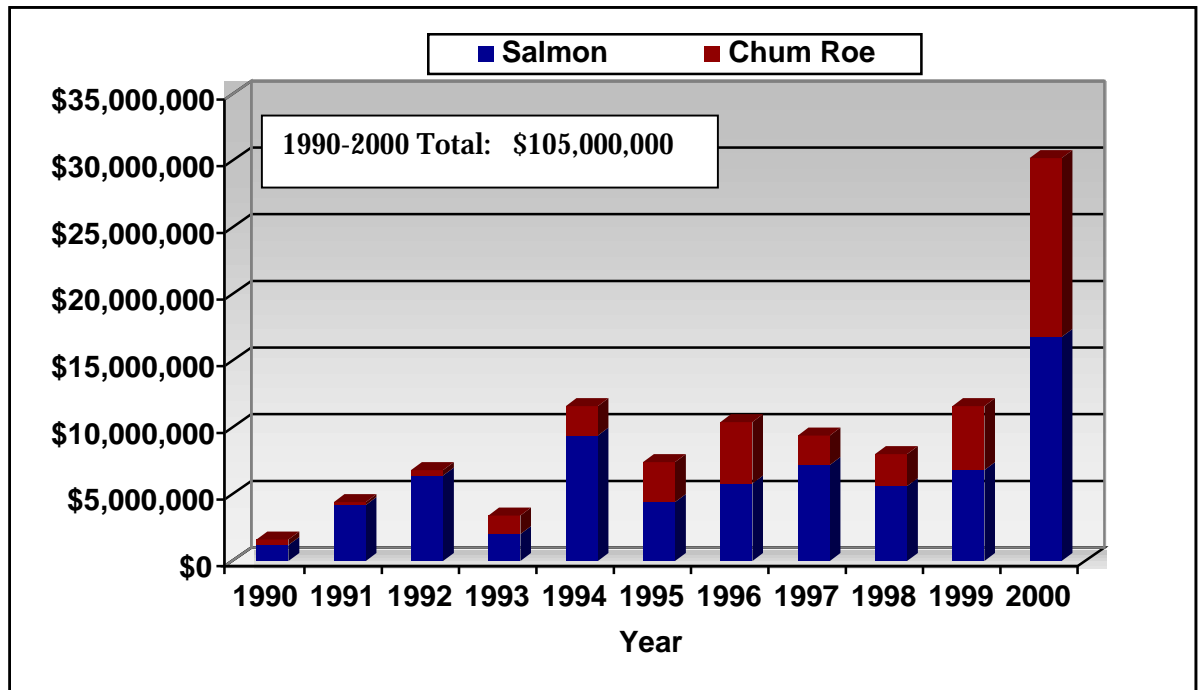
- DIPAC is a major player in the northern Southeast Alaska gillnet fisheries conducted in Stephens Passage and Lynn Canal. Since 1995, DIPAC salmon accounted for 49 percent of ex-vessel value and 69 percent of volume in these fisheries.
- In 2000, DIPAC fish contributed a record 65 percent of ex-vessel value and 77 percent of volume to the northern area gillnet fisheries.
- All three commercial salmon gear types – drift gillnet, troll, and purse seine - garner significant benefits from DIPAC salmon production. Since 1990, annual ex-vessel value to the drift gillnet fleet averaged \$1.8 million, followed by \$242,000 to the troll fleet and \$79,000 to the seine fleet.
- Chum salmon accounted for most of the total ex-vessel value (70 percent), followed by coho (17 percent), sockeye (8 percent), pink (3 percent), and chinook (1 percent).
- Alaska resident permit holders see most of the economic benefits of DIPAC production. In 1999 (the most recent year for which data is available), Alaska resident permit holders harvested 93 percent or \$1.1 million of the ex-vessel value, with 7 percent or \$89,000 harvested by non-residents.
- Of the 1999 Alaska resident harvest, Haines and Juneau residents accounted for 85 percent of the northern area gillnet harvest of DIPAC salmon. Haines residents harvested 45 percent or \$530,000 in ex-vessel value, and Juneau residents 40 percent or \$477,000. The remainder of the Alaska resident harvest

was by Wrangell and Petersburg residents (4 percent, \$49,000), Sitka residents (2 percent, \$23,000), and other Alaska residents (1 percent, \$17,000).

Seafood Processing

- Between 1990 and 2000, the total first wholesale value² of commercial and cost recovery harvest of DIPAC salmon was \$105 million with an annual average value of \$9.5 million (including chum salmon roe).
- From 1990-2000, chum salmon (flesh and roe) earned the largest share of wholesale value (72 percent), followed by coho (12 percent), pink (9 percent), sockeye (6 percent), and chinook (less than 1 percent).
- In 2000, the first wholesale value totaled a record \$30 million. This generated a total regional output of \$25.7 million, including \$5.4 million in payroll and 208 jobs.

First Wholesale Value of DIPAC Salmon to Southeast Alaska Processors, 1990-2000

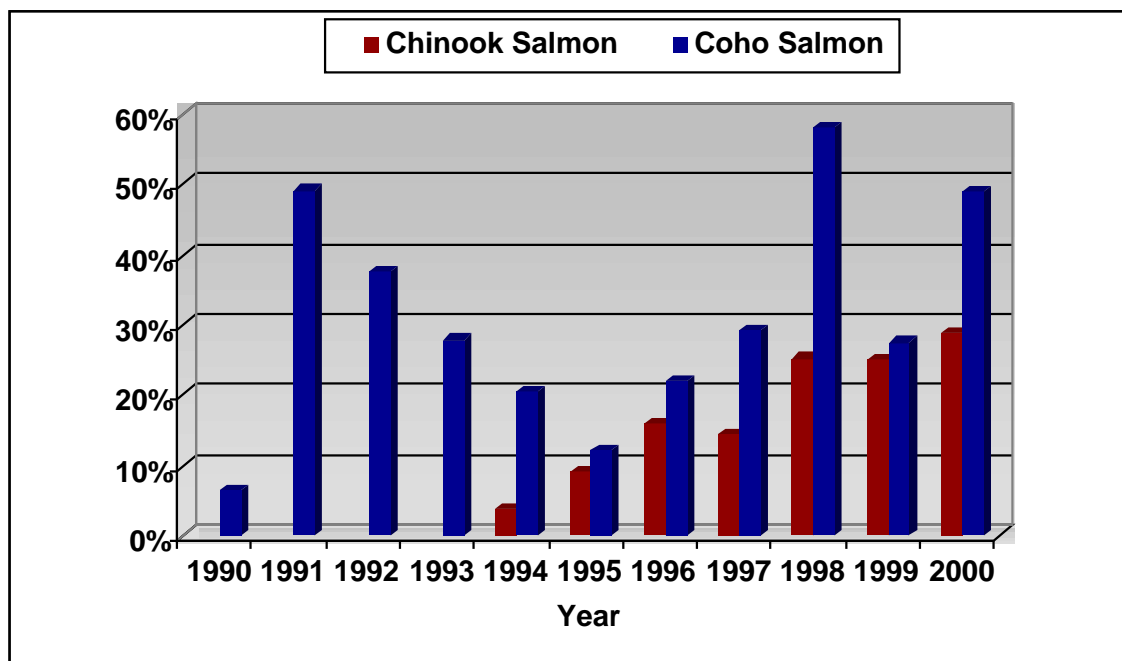


² First wholesale value is the first sale of fish from a processor to a buyer outside of the processor's affiliate network.

Sport Harvest

- DIPAC salmon play an important role in sport and personal use fisheries in the Juneau area. From 1990-2000, sport anglers harvested over 190,000 DIPAC salmon, with an annual average of 17,000 fish. Personal use catches of sockeye totaled 18,000 fish from 1995-2000.
- Coho salmon comprised 58 percent of the DIPAC salmon recreational harvest by number, followed by pink (19 percent), sockeye (8 percent), chum (8 percent), and chinook (7 percent).
- The 2000 all-species sport harvest was over 22,000 fish.
- Since 1998, DIPAC have accounted for 29% of the coho harvest and 37% of the chinook harvest in the Juneau Golden North Salmon Derby.
- Since 1990, DIPAC coho salmon have contributed up to 40% of the Juneau area annual coho sport harvest. DIPAC chinook have contributed over 25% of the Juneau annual sport harvest in recent years.

DIPAC Contribution to the Juneau Area Sport Fishery, 1990-2000

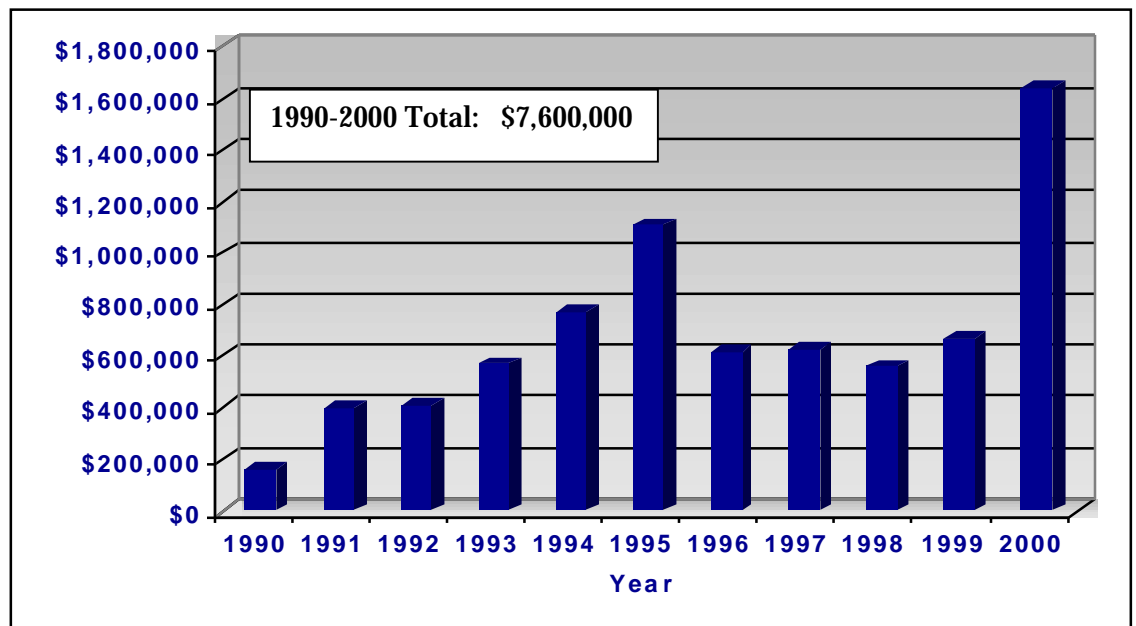


Economic Impacts of DIPAC in Juneau and Northern Southeast Alaska Communities

Commercial Harvest

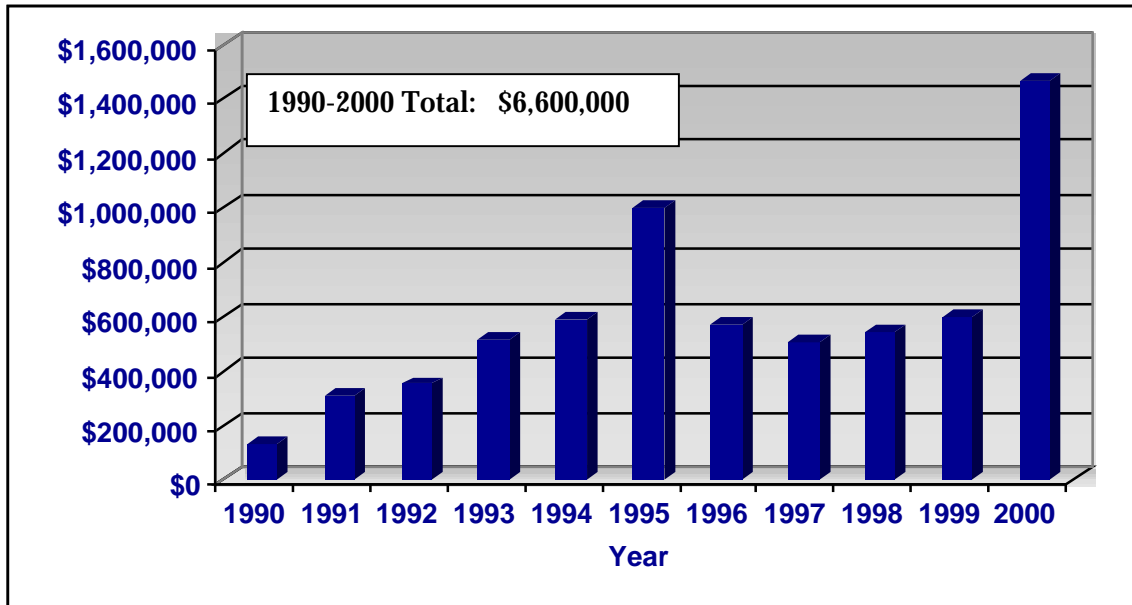
- From 1990 to 2000, Haines gillnet vessels fishing in Stephens Passage and Lynn Canal harvested a total of \$7.6 million dollars worth of DIPAC salmon, for an average of \$688,000 per year.
- In 2000, Haines fishermen earned a record \$1.6 million in ex-vessel income from DIPAC salmon.
- Economic impacts to Haines from this income in 2000 resulted in an estimated \$1.4 million in total output, including \$196,000 in labor income and nine jobs.

Ex-vessel Income to Haines Commercial Drift Gillnet Permit Holders from DIPAC Salmon in the District 11 and 15 fisheries, 1990 - 2000



- From 1990 to 2000, Juneau gillnet vessels fishing in the Stephens Passage and Lynn Canal fisheries harvested 36 percent of the DIPAC ex-vessel value, earning a total of \$6.6 million dollars, with an average of \$600,000 per year.
- In 2000, Juneau commercial gillnet fishermen earned a record \$1.5 million in ex-vessel income from DIPAC salmon.
- Economic impacts to Juneau from this income in 2000 resulted in an estimated \$1.4 million in total output, including \$267,000 in labor income and 10 jobs.

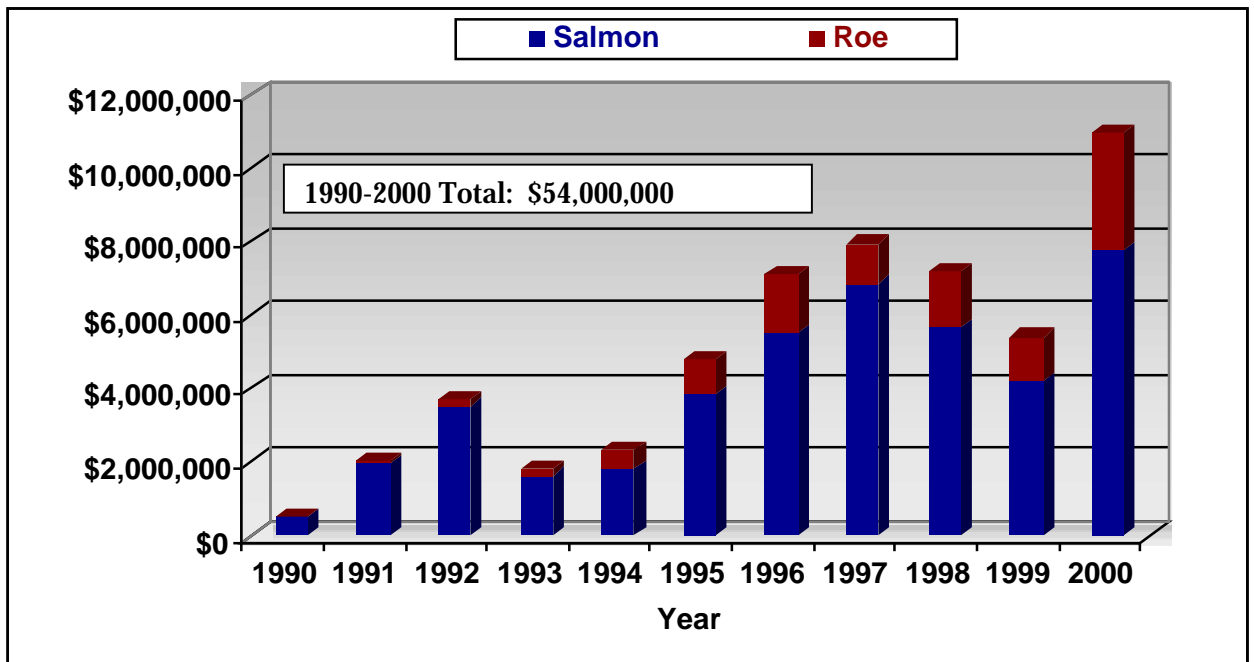
Ex-vessel Income to Juneau Commercial Drift Gillnet Permit Holders from DIPAC Salmon in the District 11 and 15 fisheries, 1990 - 2000



Seafood Processing

- § From 1990 to 2000, the total first wholesale value of DIPAC salmon processed in Haines, Excursion Inlet, Hoonah and Gustavus was \$54 million, with an annual average value of \$5 million.
- § In 2000, the total first wholesale value of DIPAC salmon processed in these communities was a record \$11 million
- § Economic impacts to these communities from processing DIPAC salmon in 2000 resulted in \$7.9 million in total output, including \$1.9 million in payroll and 59 jobs.

**Total First Wholesale Value of DIPAC Salmon and Chum Roe Processed
in Haines, Excursion Inlet, Hoonah and Gustavus, 1990 – 2000**



- § From 1990 to 2000, the total first wholesale value of DIPAC salmon processed in Juneau was \$5.5 million with an annual average value of \$500,000.
- § In 2000, the total first wholesale value of DIPAC salmon processed in Juneau was a record \$2.4 million.
- § Economic impacts to Juneau from DIPAC fish processing in 2000 resulted in \$2.4 million in total output, including \$526,000 in payroll and 20 jobs.

Sport Harvest

- § Since 1998, more than one-quarter of all coho and chinook harvested in the Juneau area were DIPAC fish.
- § In 2000, over 40% of the coho and chinook salmon caught in the Juneau area were DIPAC fish.
- § In 2000, Juneau economic impacts from non-resident-angler harvest of DIPAC fish were \$1.2 million in total output, including \$500,000 in payroll and 31 jobs.

University of Alaska

- § DIPAC's public service extends to its long-term commitment to the University of Alaska. Providing in-kind DIPAC space and utilities for salmon research has enabled the University to pursue numerous research grants.
- § Since 1991, the University has received over \$3 million in grants to conduct research at DIPAC facilities.
- § These awards have funded an average of 4 graduate students per year, and resulted in over 30 publications of salmon research.

DIPAC Organization

- § The DIPAC organization contributes up to 45 full-time equivalent jobs to the Juneau economy, with an annual payroll of approximately \$1.5 million.
- § Total DIPAC expenditures in the Juneau area during 2000 were \$1.2 million.
- § The economic impacts from DIPAC employment and expenditures to the Juneau economy in 2000 were \$6.6 million in total output, including \$2.5 million in payroll and 73 jobs.

Summary of DIPAC Economic Impacts, 2000

Regional Impacts

Harvest volume (pounds)	12,400,000
Harvest ex-vessel value to commercial fishermen	\$4,600,000
Percent of Northern Southeast Alaska total ex-vessel value	20%
Wholesale value of DIPAC salmon (including hatchery cost recovery)	\$30,000,000
Sport harvest of DIPAC salmon (number of fish)	19,000
Percent of Juneau area chinook and coho sport harvest	44%

Economic Output

Total annual equivalent jobs created by DIPAC salmon (excluding commercial fishing employment)	360
Total payroll	\$10,000,000
Total economic output	\$40,000,000

Impacts on the Northern Southeast Alaska Economy

First wholesale value of DIPAC salmon to Haines, Excursion Inlet, Hoonah and Gustavus processors	\$11,000,000
First wholesale value of DIPAC salmon to Juneau processors	\$2,400,000
Percent of DIPAC wholesale value processed in Northern Southeast Alaska	45%
Ex-vessel income to Haines commercial gillnet fishermen	\$1,600,000
Ex-vessel income to Juneau commercial gillnet fishermen	\$1,500,000
Percent of DIPAC gillnet ex-vessel value harvested by Juneau and Haines residents	68%

Purpose and Scope

The purpose of this study is to provide an estimate of the economic impacts of DIPAC's hatcheries in Southeast Alaska. The report concentrates on four primary subjects:

1. Commercial Harvest of DIPAC Salmon. In this section, the overall economic benefits of DIPAC salmon are addressed using ex-vessel income to Southeast fishermen. In addition, regional economic distributions from DIPAC salmon harvest are reported.
2. Sport Harvest of DIPAC Salmon. The sport harvest of DIPAC salmon is addressed, including economic impacts from non-resident-angler harvest.
3. Economic Impacts of the Seafood Processing Industry. This section addresses the overall economic impacts of processing DIPAC salmon by considering first wholesale value and indirect economic impacts on the regional economy.
4. Economic Impacts of DIPAC in Juneau and Northern Southeast Alaska Communities. This section estimates the economic benefits to Juneau and northern Southeast Alaska-based fishing industries. Economic benefits to fleet support, salmon enhancement, and DIPAC business expenses are included.

Methodology

The data used in this report comes from a variety of sources, including DIPAC, Alaska Commercial Fisheries Entry Commission, Alaska Department of Labor and Workforce Development, Alaska Department of Revenue, Alaska Department of Fish and Game, and Juneau area processors. The study utilizes recent McDowell Group research on the Juneau economy and DIPAC economic impacts in the region. However, it should be noted that research on the economics of the region's seafood industry and sport fishery are limited, and in some cases non-existent. This is particularly true in areas related to personal income of commercial fishermen and sport fishing values.

Some data had to be estimated. Wholesale values for 2000 were estimated by multiplying the 2000 ex-vessel value by the average 1996-1999 ratio between wholesale and ex-vessel values. The 2000 first wholesale value of DIPAC salmon processed in Juneau was estimated as the average (1996-1999) percent of the total salmon wholesale value processed in Juneau multiplied by the percent of DIPAC ex-vessel value to the northern Southeast Alaska region in 2000. DIPAC salmon wholesale value for other northern Southeast Alaska communities was estimated as the average percent of Juneau wholesale value that these communities produced

from 1996-1999 multiplied by the percent of DIPAC ex-vessel value to the northern Southeast Alaska region in 2000.

Some wholesale value data was unavailable from the State of Alaska due to confidentiality regulations. Therefore, wholesale values should be considered minimum estimates.

According to DIPAC, reliable contribution estimates of DIPAC pink salmon to the commercial fisheries were possible for all gear types combined, but not by individual gear. Therefore, in the northern fishing districts where most DIPAC fish are harvested, DIPAC pink salmon were attributed to each gear type in the same proportion as the catch of all pink salmon by each gear type.

The 2000 contribution of DIPAC chum salmon roe to the regional total was assumed to be the same percentage as the contribution of DIPAC chum salmon to the regional total.

The 1996-1999 average percent of the gillnet harvest in districts 11 and 15 taken by Juneau and Haines fishermen was used to estimate the 2000 Juneau and Haines fishermen harvest.

Sport fishery harvest estimates of DIPAC fish were not available for pink and chum salmon, except for those caught at the DIPAC dock. Therefore, sport harvests of these two species should be considered minimum estimates.

The McDowell Group used the Impact Analysis for Planning Model (IMPLAN) to estimate economic impacts of NSRAA salmon production. IMPLAN, one of the most widely used economic models today, was used to estimate the total economic output, including payroll and jobs that are created as a result of the production, harvest and processing of NSRAA salmon. The IMPLAN model estimates total economic output, which reflects the entire supply chain of transactions to harvest or process fish. For example, harvesting of fish will require purchase of a vessel, fuel, food, gear, and many other goods. The IMPLAN model estimates the total set of such transactions, and therefore, one dollar of input often results in more than one dollar of output because the dollar may circulate through many sectors in the economy. The model also estimates the number of full-time equivalent jobs (e.g., four three-month jobs count as one full-time equivalent job), and payroll resulting from the total economic output, and does not include skipper and crew aboard commercial fishing vessels.

Introduction

Douglas Island Pink and Chum, Incorporated (DIPAC), was formed in 1976 in Juneau by a group of residents concerned with depleted fisheries resources. The goal of DIPAC is to sustain and enhance valuable salmon resources of the State of Alaska for the economic, social, and cultural benefit of all citizens, and to promote public understanding of Alaska's salmon resources and salmon fisheries through research, education, and tourism.

DIPAC currently produces five species of Pacific salmon - chinook, sockeye, coho, pink, and chum. The sockeye, pink, and chum species are produced for the commercial fleets. The chinook and coho species are produced for the Juneau and Haines sport fishing fleets.

DIPAC is a private nonprofit corporation. It receives no enhancement taxes from commercial harvest, and relies primarily on cost-recovery of chum and sockeye salmon to fund its salmon enhancement activities. In addition to the Juneau operations, DIPAC works in locations throughout the northern inside waters of Southeast Alaska, including Haines, Skagway, Port Snettisham, and in Canadian tributaries of the Taku and Stikine Rivers.

Facilities and Operations

Macaulay Salmon Hatchery

The Macaulay Salmon Hatchery is located two miles north of downtown Juneau. This facility is one of the larger salmon hatcheries in the State of Alaska, providing a diversity of enhancement programs that benefit commercial, sport and subsistence users. In 2000, the facility produced returns of 2.2 million chum, 140,000 pink, 90,000 coho, and 4,500 chinook salmon.

The Macaulay facility is also the home of DIPAC's Ladd Macaulay Visitor Center, with a local-species marine aquarium and a popular reception area used for meetings and events. The facility accommodates over 100,000 visitors per year, and is a popular stop where tourists can view salmon returning to the hatchery. DIPAC's Tourism Division supports its own budget through admission, concession, and rental revenue.

A public sport fishing dock located adjacent to the Macaulay site offers salmon fishing primarily to local residents, providing easy access for seniors and children, as well as fishing opportunity to those who do not own a boat. A spring 2001 expansion will provide increased dock area, increased parking, and handicap access.

Sheep Creek

The Sheep Creek Hatchery, built in 1980, is located two miles south of downtown Juneau. In 2000, the facility produced returns of 451,000 chum and 2,300 coho salmon. Several institutions conduct research at the facility, including the University of Alaska, the University of Notre Dame, and the US Forest Service.

Snettisham Hatchery

The Snettisham Hatchery was constructed by the State of Alaska in 1980 and operated by the Department of Fish and Game until DIPAC took over operation in July of 1996. The remote hatchery is located in Port Snettisham, between Juneau and Petersburg. In 2000, the facility produced sockeye salmon returns of over 200,000 fish to a variety of release sites, including the Stikine and Taku River cooperative projects with Canada, the Sweetheart Creek personal use fishery near the hatchery, and the Chilkat Lake cooperative project in Haines.

Commercial Harvest of DIPAC Salmon

Salmon Market Overview

Alaska has traditionally supplied over half of the world's wild salmon production. However, wild salmon is not the only source of world production. Farmed salmon production from Chile and Norway increased dramatically since 1990, 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. 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, such as smoked salmon.

During the last ten years, the relative importance of pinks and chums has increased, while traditional high-value species have declined. Chums and pinks make up most of the local salmon harvest volume, accounting for 90 percent of 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 second in earnings for the remaining three seasons.

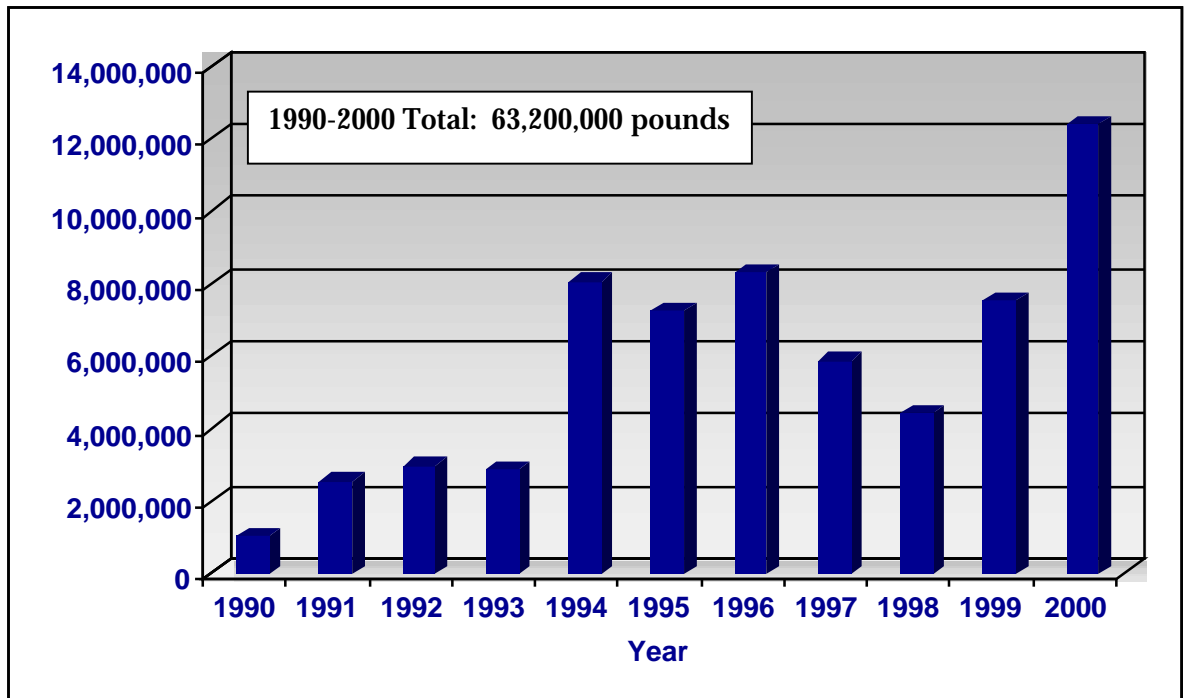
Japan is the world leader in chum salmon production, with a peak harvest of over 70 million fish in 1996. However, over the past four years, Japan's harvest of chums has declined significantly. In 2000, Japan's harvest was about 32 million chums, the smallest since the early 1980s.

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 statewide salmon ex-vessel value in 2000.

DIPAC Salmon Commercial Harvest and Ex-Vessel Value

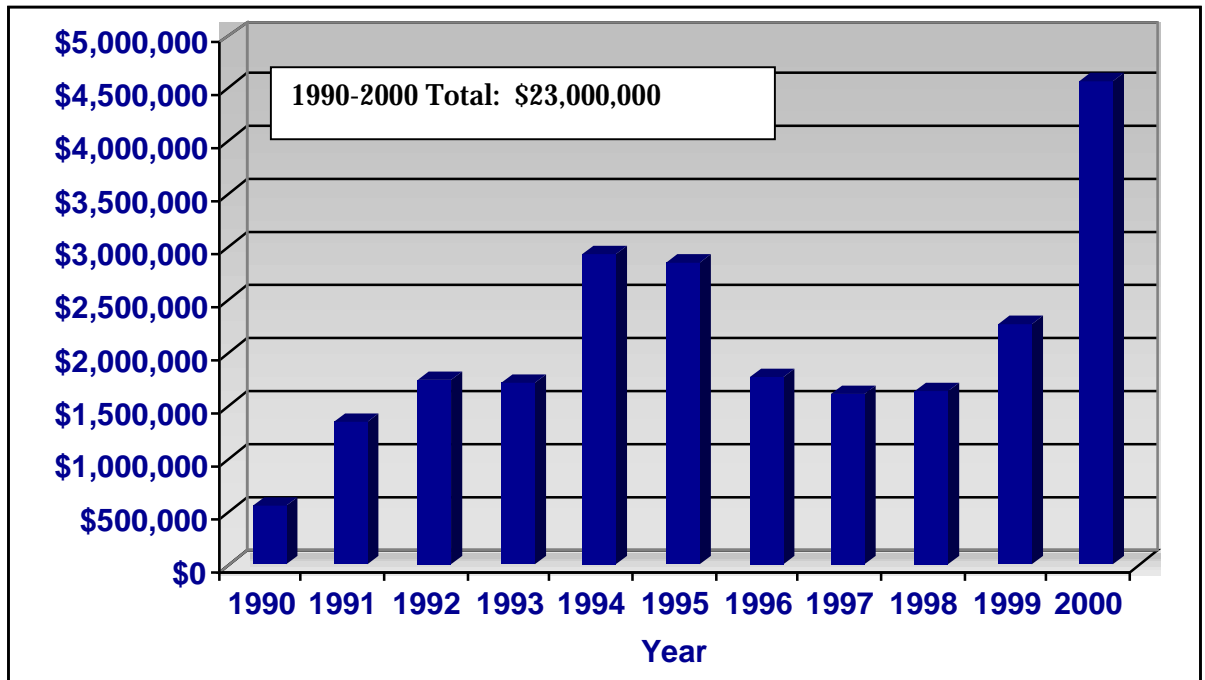
Since 1990, commercial harvest of DIPAC salmon has grown an average of 31 percent annually (Figure 1). During this period, the commercial fleet harvested 63.2 million pounds of DIPAC salmon for an average annual catch of 5.7 million pounds. The 2000 harvest was a record 12 million pounds.

Figure 1.
Total Pounds of DIPAC Salmon Harvested in
Common Property Commercial Fisheries, 1990-2000



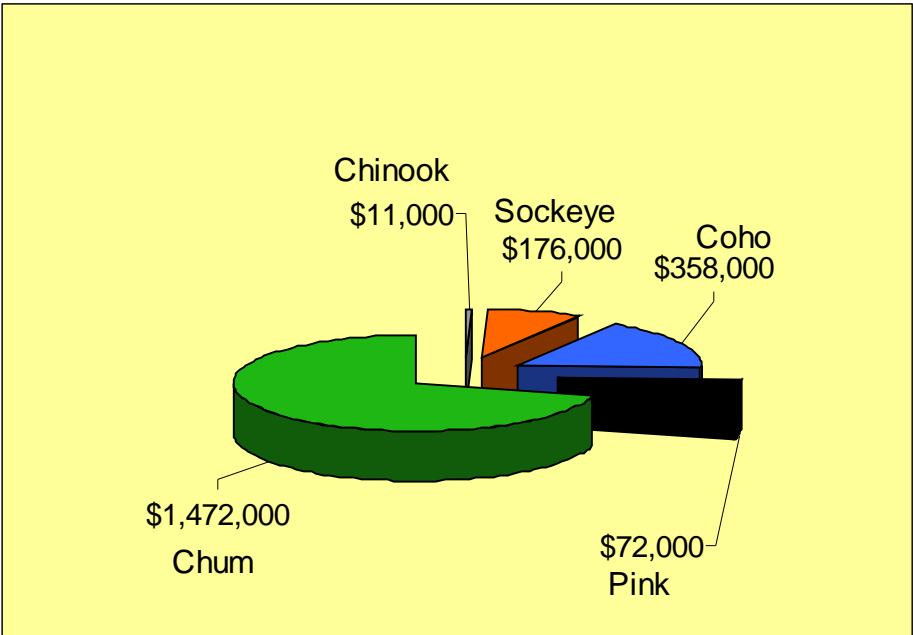
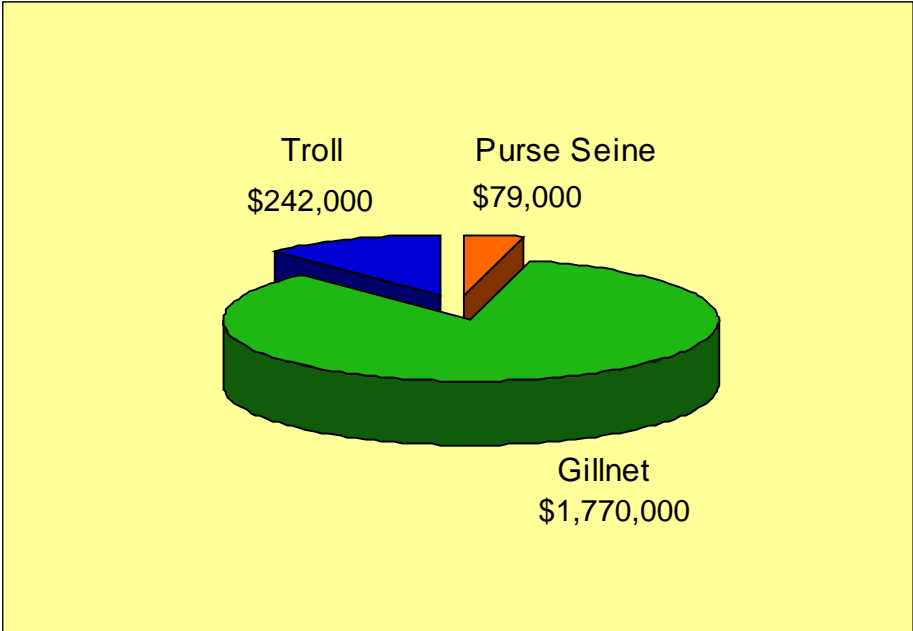
The ex-vessel value of DIPAC salmon increased tremendously from 1990 to 2000 (Figure 2). Commercial fishermen earned \$23 million dollars from DIPAC salmon from 1990-2000, with an average of \$2 million annually. The 2000 season was a record year of \$4.6 million in ex-vessel earnings.

Figure 2.
Total Ex-Vessel Commercial Harvest Value of DIPAC Salmon, 1990-2000



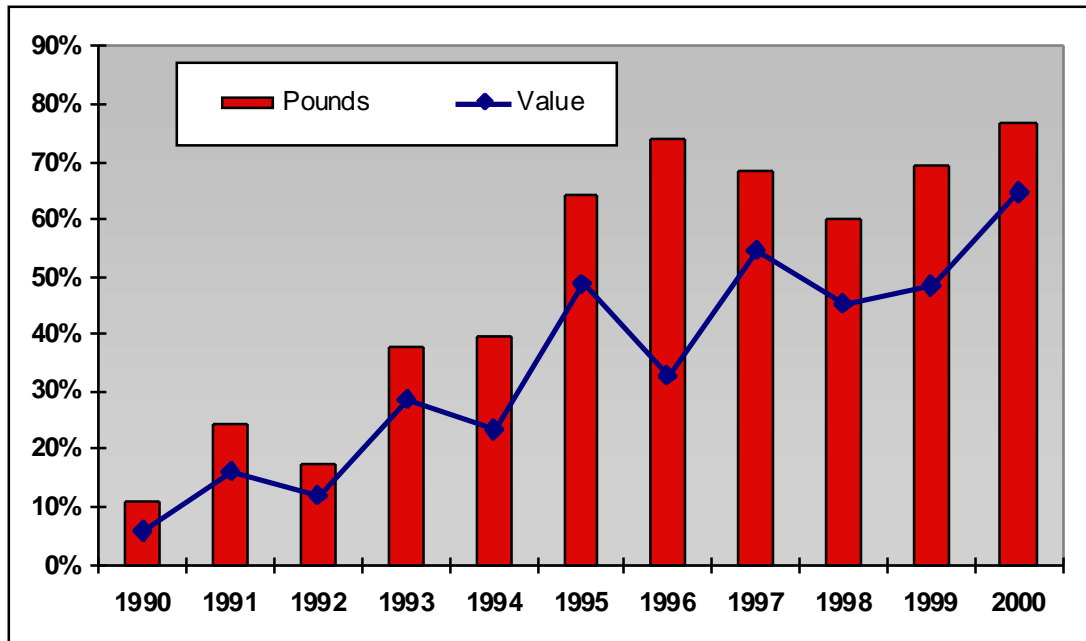
By gear, ex-vessel value to the drift gillnet fleet from 1990-2000 averaged nearly \$1.8 million, followed by \$242,000 to the troll fleet, and \$79,000 to the seine fleet (Figure 3). Chum salmon accounted for most of the ex-vessel value (\$1.472 million), followed by coho (\$358,000), sockeye (\$176,000), pink (\$72,000), and chinook (\$11,000).

Figure 3.
Commercial Ex-Vessel Value by Species and Gear of DIPAC Salmon, 1990-2000 Averages



DIPAC salmon production has increased in importance to the northern inside Southeast Alaska commercial gillnet fisheries conducted in Stephens Passage and Lynn Canal (fishing districts 11 and 15). Since 1995, DIPAC salmon have accounted for an average of 49 percent ex-vessel value and 69 percent of volume by weight (Figure 4). The 2000 season showed record contributions, with DIPAC fish accounting for 65 percent of ex-vessel value and 77 percent of volume.

Figure 4.
Ex-Vessel Value and Harvest of DIPAC Salmon as a Percent of Northern Southeast Alaska Commercial Salmon Harvest, 1990-2000

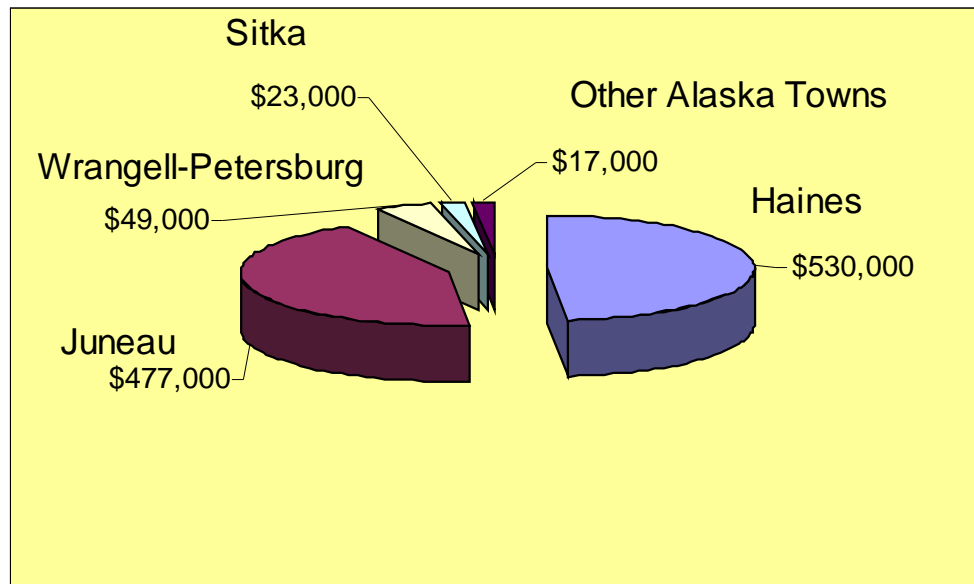


Geographic Distribution of DIPAC Commercial Harvest

The geographic distribution of the commercial harvest of DIPAC salmon was estimated for the drift gillnet fleet, which harvests the majority of DIPAC fish. In 1999 (the last year for which geographic income information was available), commercial gillnetters earned \$1.2 million dollars from DIPAC salmon. Alaska resident permit holders harvested 93 percent or \$1.1 million of the ex-vessel value, with 7 percent or \$89,000 harvested by non-residents.

Of the Alaska resident harvest, Haines and Juneau residents accounted for 85 percent of the harvest, with Haines commercial fishermen harvesting 45 percent or \$530,000 in ex-vessel value, and Juneau residents 40 percent or \$477,000 (Figure 5). The remainder of the Alaska resident harvest was by Wrangell and Petersburg residents (4 percent, \$49,000), Sitka residents (2 percent, \$23,000), and other Alaska residents (1 percent, \$17,000).

**Figure 5.
Geographic Distribution by Community, Ex-Vessel Value of DIPAC
Commercial Harvest, District 11 and 15 Drift Gillnet Fisheries, 1999**



Economic Impacts from DIPAC Salmon Harvest

To determine the economic impacts from the commercial harvest of DIPAC salmon, personal and business income to fishermen were estimated from ex-vessel earnings. According to the 1989 Alaska Seafood Industry Study by the McDowell Group, approximately 53 percent of gross vessel income stays with a fisherman as direct personal income. The remaining 47 percent is spent on business expenses. Of the business expenses, approximately 40 percent is spent on taxes and interest, and 60 percent on business purchases of goods and services (purchase of fuel, gear, etc.). Personal income and business expenses related to the purchases of goods and services are used to estimate the economic impacts of DIPAC salmon in the IMPLAN model.

Fishermen who purchase goods and services related to fishing create additional economic activity. Purchases could include fishing supplies, fuel, boat repairs, food, household supplies, a new boat motor, etc. These impacts cycle through the regional economy and gradually dwindle due to leakages of purchases outside the region. Leakage refers to the money generated in a community that is not, in turn, spent in the community, but is taken or spent elsewhere. 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 communities have higher leakage.

In 2000, approximately 27 percent of all ex-vessel earnings were paid to non-Alaskans. Some portion of their earnings will likely be spent outside Alaska. To account for this, 27 percent (\$1 million) of personal income and business revenue from DIPAC ex-vessel earnings (\$3.7 million) will be analyzed using a U.S. IMPLAN model rather than an Alaska model. McDowell Group assumed 100 percent of all non-Alaskan personal income and business revenue 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.

The 2000 economic impacts of non-Alaskan DIPAC-related personal income and business revenue were an estimated \$2.1 million in total output, including \$700,000 in labor income and 23 jobs. The impacts from Alaska resident DIPAC-related income of \$2.7 million were an estimated \$3.2 million in total output, including \$800,000 in labor income and 28 jobs. All combined, 2000 ex-vessel earnings resulted in \$5.3 million in total output, including \$1.5 million in labor income and 51 jobs (Table 1). The 2000 economic impacts were more than double that of any year since 1996.

Table 1.
Economic Output, Including Jobs and Payroll, from Commercial Ex-Vessel Value of DIPAC salmon, 1996-2000

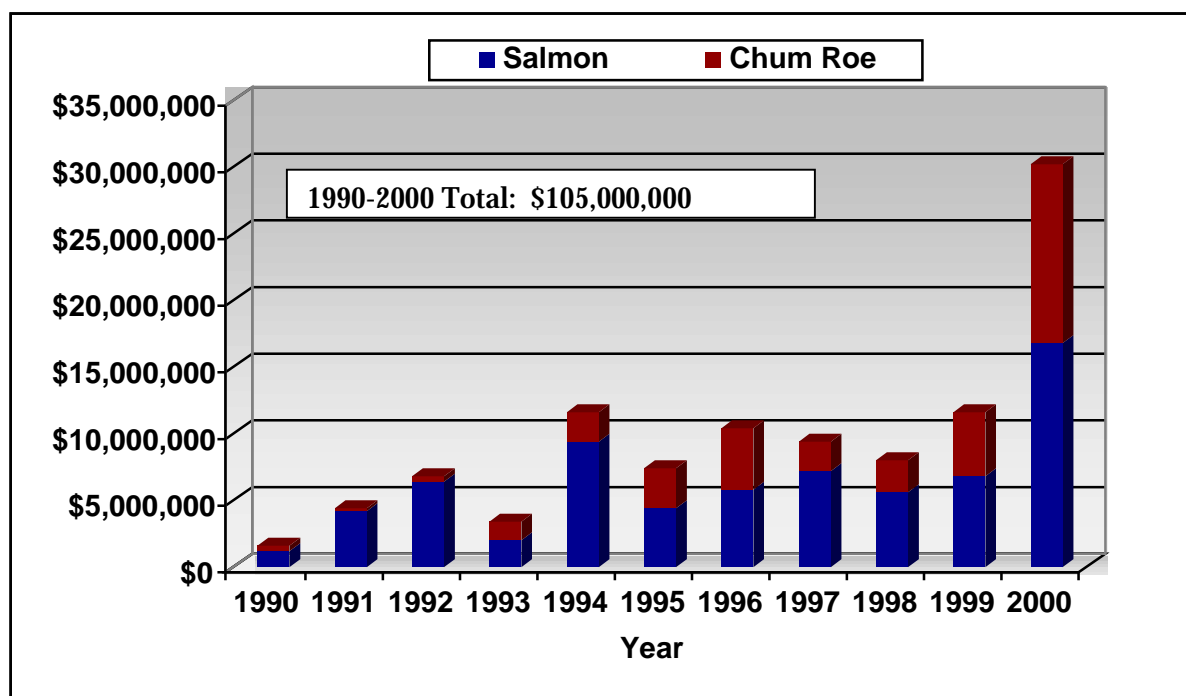
Year	Economic Output	Jobs	Payroll
1996	\$2,000,000	18	\$510,000
1997	\$1,900,000	17	\$480,000
1998	\$1,900,000	17	\$490,000
1999	\$2,600,000	23	\$660,000
2000	\$5,300,000	51	\$1,500,000

Economic Impacts on Seafood Processors

The commercial harvest of DIPAC salmon generates significant benefits for Southeast Alaska's seafood processors, as indicated by the first wholesale value (i.e., the first income a processor receives for selling their product). From 1990 to 2000, the total wholesale value of DIPAC salmon taken in commercial and cost-recovery fisheries was \$105 million, with an annual average value of \$9.5 million, including salmon roe (Figure 6). Chum salmon (flesh and roe) earned the largest share of wholesale value (72 percent), followed by coho (12 percent), sockeye (6 percent), pink (9 percent), and chinook (less than 1 percent).

The 2000 total first wholesale value of DIPAC salmon was a record \$30 million (Figure 6). Chum salmon wholesale value (roe and flesh) accounted for \$ 26.8 million in 2000, or 89 percent of the total DIPAC first wholesale value, followed by sockeye at \$2.3 million (8 percent), coho at \$732,000 (2 percent), pink at \$321,000 (1 percent), and chinook at \$60,000 (less than 1 percent).

Figure 6.
First Wholesale Value of DIPAC Salmon and Chum Roe, 1990-2000



After determining the first wholesale value of DIPAC salmon, the next step is to estimate the economic impacts in the region from processing DIPAC salmon. The first wholesale value provides a good starting point to estimate direct impacts. Direct impacts from processing include payroll and jobs related to processing activity. Indirect impacts include payroll expenditures and purchases of goods and services by seafood processors. Seafood processor employees who purchase goods and services create economic activity throughout the economy. In addition, processors purchase goods and services from local businesses, such as utilities, warehousing, transportation, advertising, and computer services.

Total wholesale value for DIPAC salmon, including roe, was \$30 million in 2000. Subtracting ex-vessel payments to commercial fishermen and to DIPAC for cost-recovery, adjusted first wholesale value was \$19.4 million. This generated an estimated \$25.7 million in total output, including \$5.4 million in payroll and 208 jobs. The 2000 economic impacts were more than double that of any year since 1996 (Table 2).

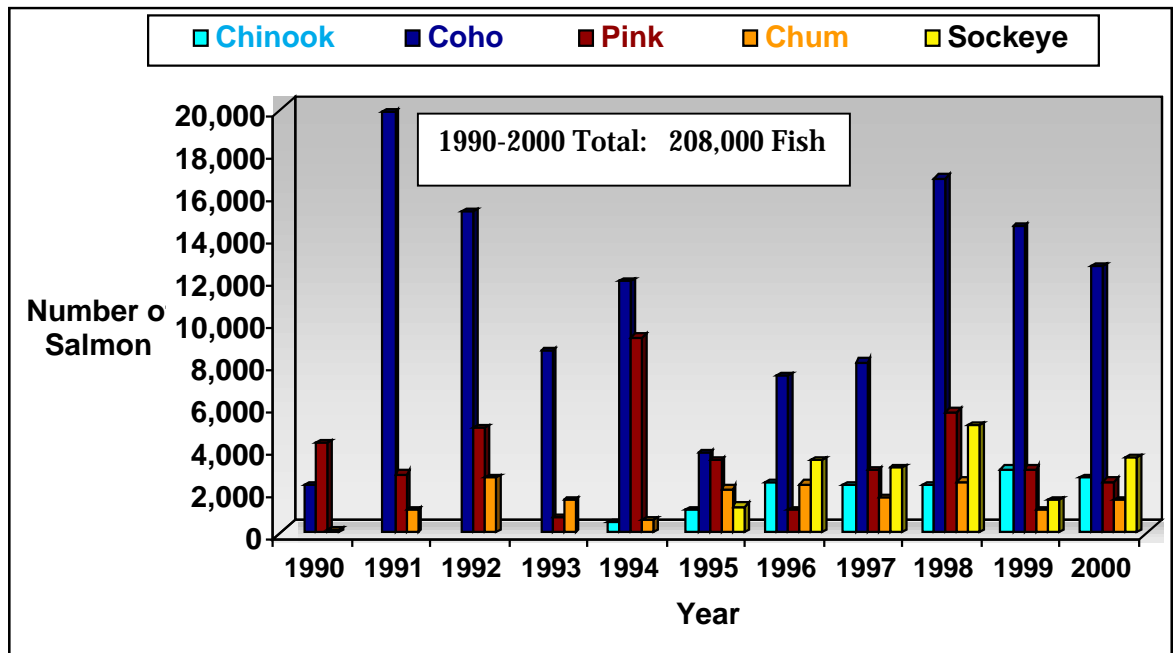
Table 2. Economic Output, Including Jobs and Payroll, from Processing of the Commercial Harvest of DIPAC salmon, 1996-2000

Year	Economic Output	Jobs	Payroll
1996	\$8,400,000	70	\$1,800,000
1997	\$8,100,000	67	\$1,700,000
1998	\$6,000,000	49	\$1,300,000
1999	\$9,900,000	82	\$2,100,000
2000	\$25,700,000	208	\$5,400,000

Recreational Harvest of DIPAC Salmon

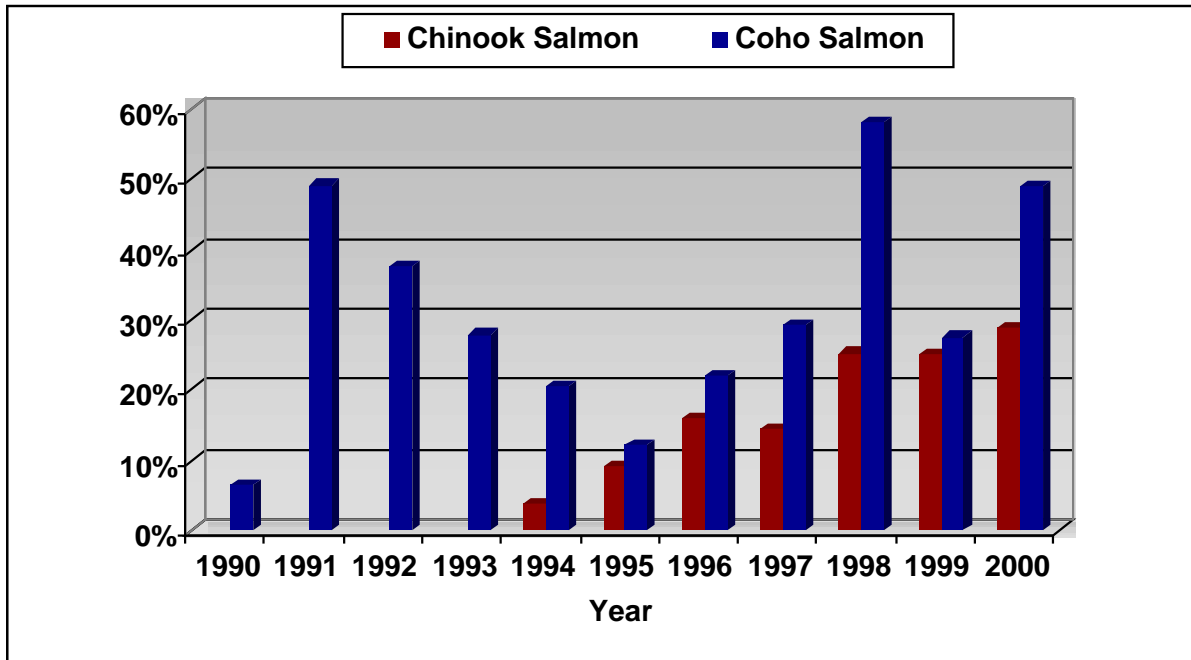
DIPAC salmon play an important role in Juneau-area sport and personal use fisheries, with a sport harvest of over 190,000 fish and personal use harvest of 18,000 fish from 1990-2000 (Figure 7). Coho salmon comprised 58 percent of the DIPAC salmon harvest by number, followed by pink (19 percent), chum (8 percent), sockeye (8 percent), and chinook (7 percent). DIPAC chinook salmon were first harvested in the Juneau fishery in 1994, and since 1996 have accounted for over 2,000 fish annually. The 2000 all-species harvest was nearly 23,000 fish.

Figure 7.
Recreational Harvest of DIPAC Salmon, 1990-2000



Nearly all of the DIPAC salmon sport harvest occurs in the Juneau area. In some years, over 40 percent of the Juneau coho sport harvest is DIPAC fish (Figure 8). DIPAC chinook salmon are playing an increasing role, accounting for over 25 percent of the Juneau harvest since 1998.

Figure 8.
DIPAC Contribution to the Juneau Area Sport Fishery, 1990-2000



Economic Impacts of DIPAC to Northern Southeast Alaska Communities

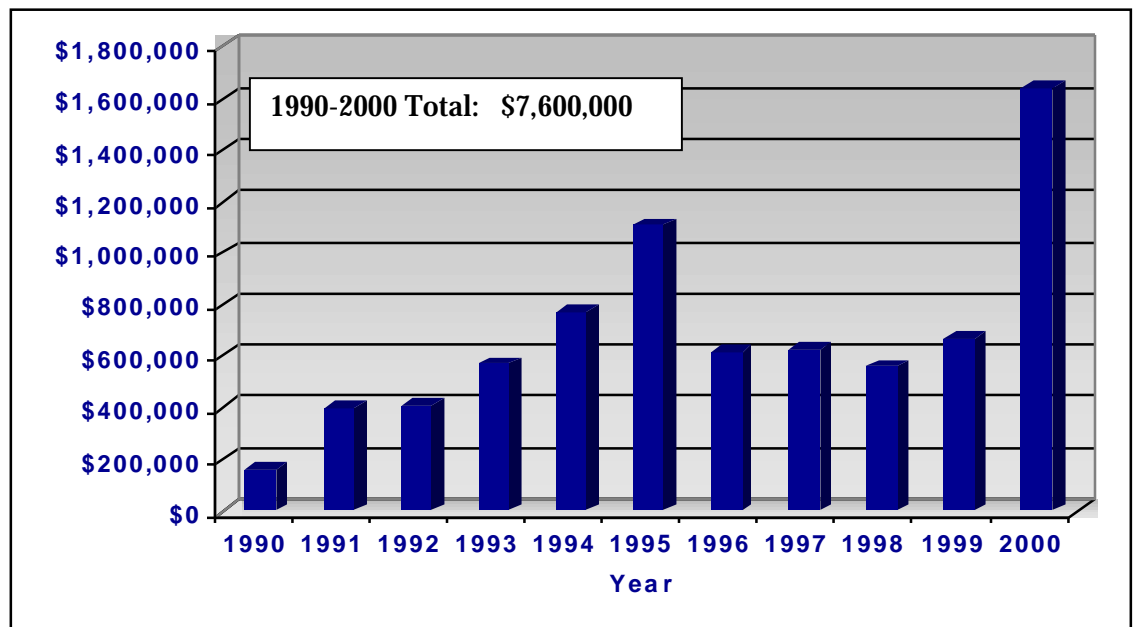
The economic impacts for DIPAC-produced salmon are spread throughout communities in Southeast Alaska. However, the location of DIPAC's major operations offer northern Southeast Alaska communities particular economic benefits.

Commercial Harvest - Haines

From 1990 to 2000, Haines permit holders fishing in Stephens Passage and Lynn Canal harvested a total of \$7.6 million dollars worth of DIPAC salmon, for an average of \$688,000 per year (Figure 9). Since 1990, an average of 72 Haines vessels harvested 42% of the total ex-vessel value of DIPAC salmon.

During 2000, Haines fishermen harvested a record estimated total \$1.6 million in DIPAC salmon, of which \$1.3 million was personal and business income. Economic impacts to Haines from this income spent was an estimated \$1.4 million in total output, including \$196,000 in labor income and nine jobs.

Figure 9.
Ex-vessel Income to Haines Commercial Drift Gillnet Permit Holders from DIPAC Salmon in the District 11 and 15 fisheries, 1990 - 2000

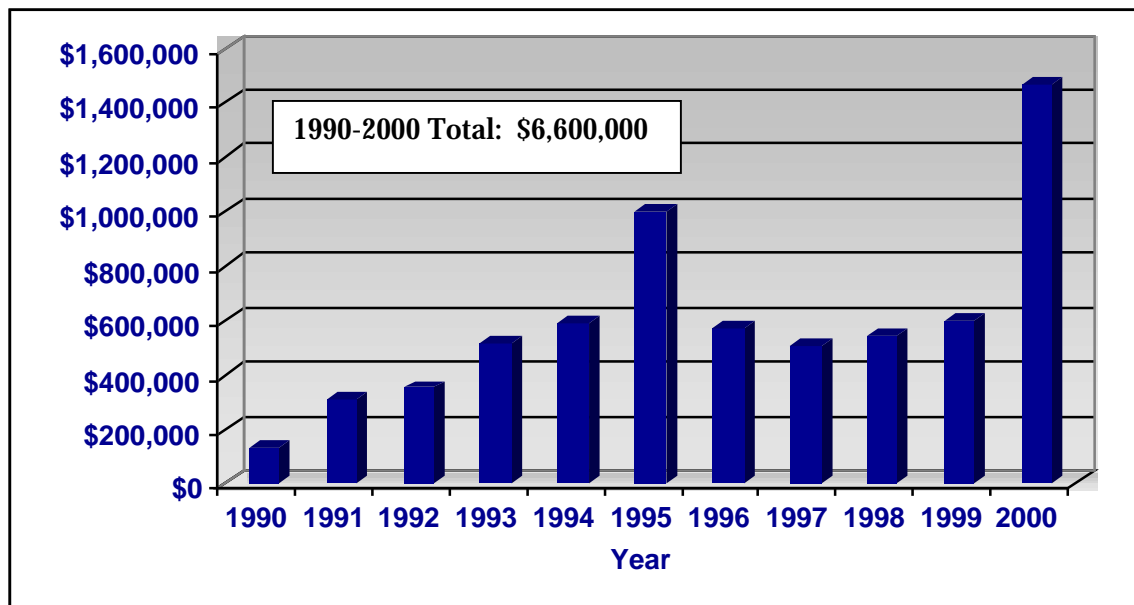


Commercial Harvest - Juneau

From 1990 to 2000, Juneau permit holders fishing in Stephens Passage and Lynn Canal harvested a total of \$6.6 million dollars worth of DIPAC salmon, for an average of \$600,000 per year (Figure 10). Since 1990, an average of 77 Juneau vessels harvested 36% of the total ex-vessel value of DIPAC salmon.

During 2000, Juneau fishermen harvested a record total \$1.5 million in DIPAC salmon, of which \$1.2 million was personal and business income. Economic impacts to Juneau from this income spent was an estimated \$1.4 million in total output, including \$267,000 in labor income and 10 jobs.

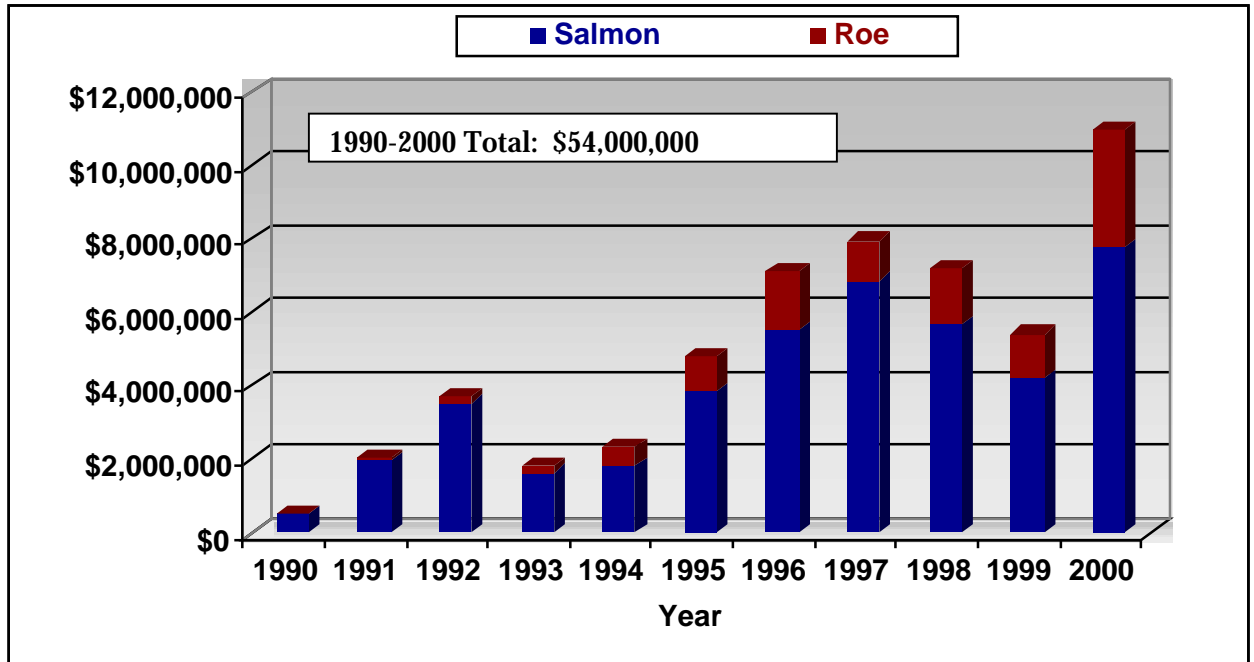
Figure 10.
Ex-vessel Income to Juneau Commercial Drift Gillnet Permit Holders from DIPAC Salmon in the District 11 and 15 fisheries, 1990 - 2000



Seafood Processing – Haines, Excursion Inlet, Hoonah and Gustavus

From 1990 to 2000, the total first wholesale value of DIPAC salmon processed in Haines, Excursion Inlet, Hoonah and Gustavus was \$54 million, with an annual average value of \$5 million (Figure 11). Chum and sockeye account for about half of salmon processing value in these communities. In 2000, the total first wholesale value of DIPAC salmon processed was a record \$11 million. Using IMPLAN, the 2000 estimated economic impact to these communities from processing DIPAC salmon was \$7.9 million in total output, including \$1.9 million in payroll and 59 jobs.

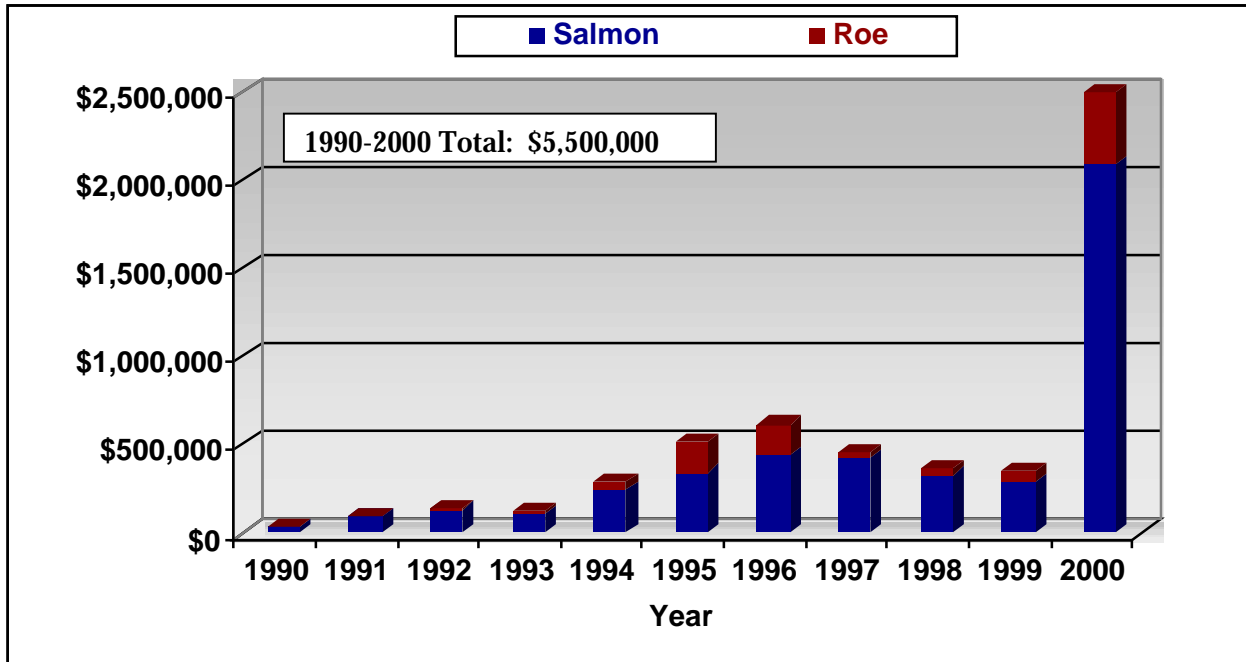
Figure 11.
Total First Wholesale Value of DIPAC Salmon and Chum Roe Processed
in Haines, Excursion Inlet, Hoonah and Gustavus, 1990 – 2000.



Seafood Processing – Juneau

From 1990 to 2000, the total first wholesale value of DIPAC salmon processed in Juneau was \$5.5 million, with an annual average value of \$500,000 (Figure 12). Sockeye and chum account for over 70 percent of salmon processing value in Juneau. In 2000, the total first wholesale value was a record \$2.5 million. Using IMPLAN, the 2000 estimated economic impact from processing DIPAC salmon in Juneau was \$2.4 million in total output, including \$526,000 in payroll and 20 jobs.

Figure 12.
Total First Wholesale Value of DIPAC Salmon and
Chum Roe Processed in Juneau, 1990 – 2000



Sport Harvest

DIPAC chinook and coho salmon contribute significantly to the Juneau area sport fishing industry, with few DIPAC fish caught in sport fisheries elsewhere. DIPAC is a major contributor to the harvest of anglers fishing during the annual Juneau Golden North Salmon Derby. DIPAC salmon accounted for a total of 27,000 coho and 5,400 chinook during the derby from 1990-2000, with DIPAC salmon accounting for 30 percent of the derby harvest since 1998.

DIPAC salmon also provide an important shore fishery to local residents, particularly those with small children or those unable to fish from a boat, through a public fishing dock adjacent to the Macaulay Hatchery. In 1999, children accounted for 25 percent of fishing effort from the dock, with seniors accounting for 5 percent and adults 70 percent.

Economic impacts to Juneau include non-resident dollars spent in the region for expenses such as fuel, fishing gear, repair services, bait, food, lodging, transportation, and charter fees. Using ADF&G estimates of Juneau angler days and some approximate expenditure estimates from discussions with Juneau charter vessel operators for input to the IMPLAN model, the McDowell Group estimated the impact of DIPAC salmon on the Juneau area's sport fishing industry. Economic impacts from the sport harvest of DIPAC fish have exceeded \$1 million dollars annually since 1997 (Table 3).

Table 3. Economic Output, Including Jobs and Payroll, from Non-Resident Sport Harvest of DIPAC salmon, 1996-2000

Year	Economic Output	Jobs	Payroll
1996	\$700,000	20	\$310,000
1997	\$1,000,000	24	\$380,000
1998	\$1,400,000	35	\$550,000
1999	\$1,300,000	32	\$500,000
2000	\$1,300,000	31	\$500,000

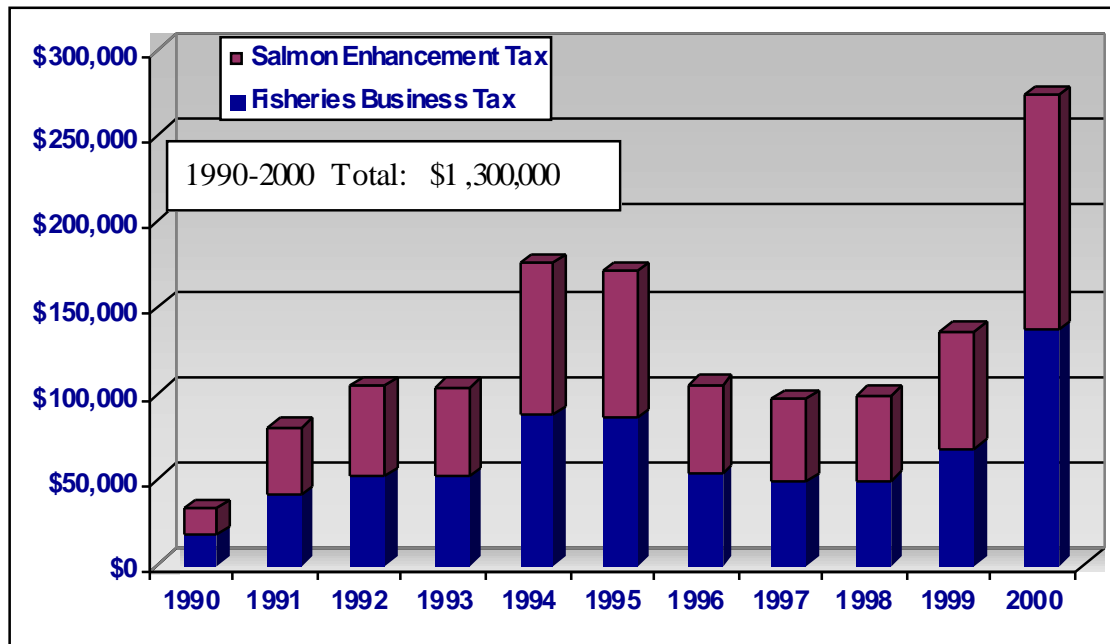
Resident sport fishing value is also a factor in the Juneau economy. Millions of dollars are spent each year on boats, fishing gear, fuel, etc. This spending creates jobs and income in the local economy. However, measuring this economic impact requires research beyond the scope of this study.

Salmon Enhancement and Business Tax

As with all salmon commercially harvested and processed in Southeast Alaska, DIPAC fish are subject to State of Alaska taxes. These include a three percent Salmon Enhancement Tax and a three percent Fisheries Business Tax. Both of these taxes are based on the ex-vessel value of the salmon.

From 1990-2000, commercial fishermen paid in an estimated \$13 million in salmon enhancement tax on their total commercial salmon harvest in northern Southeast Alaska. Of this total value, DIPAC salmon contributed about \$690,000 (Figure 13). Fisheries Business taxes were assessed in a similar fashion. Tax revenues from DIPAC salmon increased from \$33,000 in 1990 to \$172,000 in 1995 to \$274,000 in 2000.

Figure 13. Salmon Enhancement and Business Taxes Paid on DIPAC Fish, 1990-2000



Impacts to the University of Alaska

DIPAC's public service extends to its long-term commitment to the University of Alaska. Availability of in-kind DIPAC space and utilities for salmon research has enabled the University to pursue numerous research grants. Since 1991, the University has received over \$3 million in research grants. These awards have funded an average of 4 graduate students per year, and resulted in over 30 publications of salmon research.

Impacts to Juneau Tourism and Events

DIPAC's Macaulay facility is also the home of DIPAC's Ladd Macaulay Visitor Center, with a local-species marine aquarium and a popular reception area used for meetings and events. The facility accommodates over 100,000 visitors per year, and is a popular stop where tourists can view salmon returning to the hatchery. DIPAC's Tourism Division supports its own budget through admission, concession, and rental revenue.

Impacts of DIPAC Business Expenses

DIPAC as an organization also impacts the Juneau economy. DIPAC employment contributes up to 45 full-time equivalent jobs to the Juneau economy, with payroll of approximately \$1.5 million annually. In addition, supplies and operational expenditures of the organization contribute to the local economy. These expenses might include air travel, purchase of goods and supplies for hatchery sites, and the chartering of seine boats and crew during cost recovery efforts. From 1996 to 2000, total direct and indirect economic impacts to Juneau from DIPAC employment and expenses have generated an average annual total output of over \$4 million, including annual employment of over 70 jobs and an annual payroll of over \$2 million (Table 4).

Table 4.
Economic Output, Including Jobs and Payroll, from DIPAC Operations

Year	Economic Output	Jobs	Payroll
1996	\$3,700,000	63	\$2,000,000
1997	\$4,500,000	78	\$2,400,000
1998	\$4,200,000	72	\$2,200,000
1999	\$4,300,000	70	\$2,300,000
2000	\$4,100,000	73	\$2,200,000