

*Economic Impacts of
Douglas Island Pink and Chum, Inc.*

Prepared for:
Douglas Island Pink and Chum, Inc.



Research-Based Consulting

Juneau
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Executive Summary

The purpose of this study is to present the economic impacts of the Douglas Island Pink and Chum, Inc. (DIPAC) salmon enhancement program. Based in Juneau, DIPAC is a private nonprofit salmon hatchery operator working “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.”

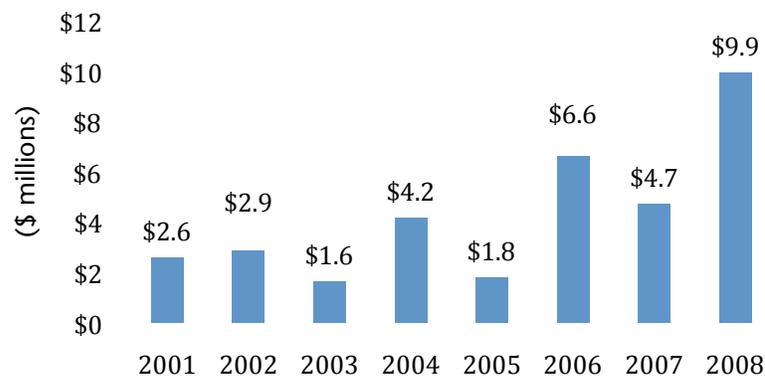
DIPAC currently produces four species of Pacific salmon—chum, sockeye, chinook, and coho—from two hatchery facilities and several remote release sites. Chum and sockeye are produced for commercial fleets operating in northern Southeast Alaska, while chinook and coho are produced primarily for the Juneau, Haines and Skagway sport fishing fleets.

Economic impacts generated by DIPAC’s salmon production and business operations are widely spread throughout Southeast Alaska; however, much of the hatchery’s impact occurs in Juneau and Haines. The key findings from the analysis of DIPAC’s economic impacts are presented in this section.

Commercial Harvest

- Between 2001 and 2008, DIPAC contributed salmon worth an ex-vessel value of \$39 million to the commercial salmon industry, averaging \$4.3 million annually. DIPAC contributions reached 15.8 million pounds of salmon worth a record \$9.9 million in ex-vessel value in 2008.

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



Source: DIPAC, 2009.

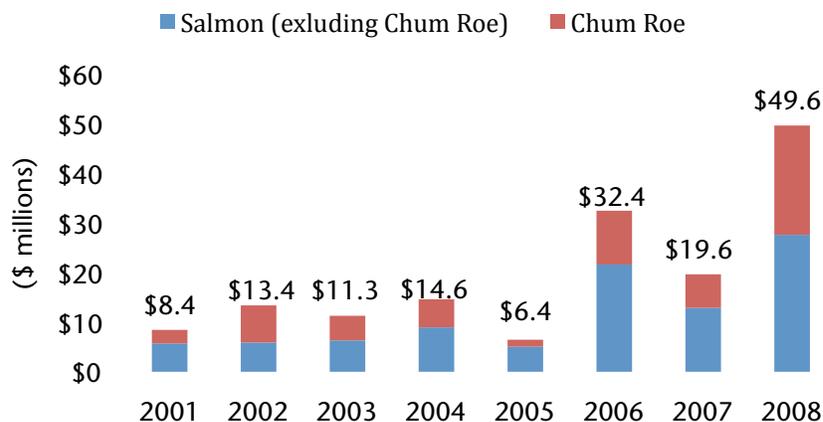
- Chum salmon accounts for the majority of commercially-harvested DIPAC salmon. Between 2001 and 2008, chum constituted an average of 91 percent of the total volume of DIPAC salmon and 79 percent of the total value.

- On average, commercial gillnetters earned three-fourths of the annual ex-vessel income associated with the commercial harvest of DIPAC salmon between 2001 and 2008.
- In terms of geography, gillnet fishermen from Juneau earned the largest proportion (44 percent) of this income in 2008, followed by Haines resident fishermen (33 percent).

Seafood Processing

- In addition to earnings for fishermen, the commercial harvest of DIPAC salmon generates significant economic benefits for Southeast Alaska’s seafood processors. Between 2001 and 2008, the cumulative first wholesale value of DIPAC salmon was \$155 million and the annual average was \$19.4 million.
- In 2008, the combination of a large chum harvest and high prices made for a banner year, reaching nearly \$50 million in first wholesale value. Most of this value was reflective of the first wholesale value of DIPAC chum.
- Chum roe is a particularly valuable fish product. The first wholesale value of DIPAC chum roe reached \$22 million in 2008, a record value.

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



Source: McDowell Group estimates, based on data provided by DIPAC, ADFG and ADOR, 2009.

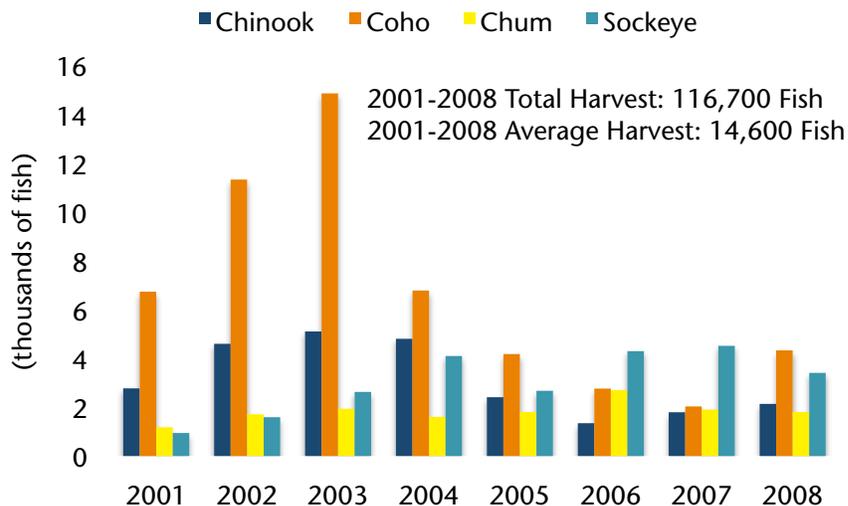
Note: Includes common property and cost recovery harvests.

- DIPAC accounted for an estimated 8.9 million pounds of salmon processed in Juneau in 2008. For the five-year period 2004 through 2008, Juneau landings of DIPAC salmon totaled 32 million pounds. Assuming per-pound first wholesale values were about the same for processors located in Juneau as for those located outside of Juneau, the first wholesale value of DIPAC salmon landed and processed in Juneau totaled \$28 million in 2008 and \$79 million for the 2004 to 2008 period.

Sport Harvest

- Traditionally, DIPAC-produced chinook, coho and sockeye contribute substantially to the Juneau-area sport fish and personal use harvest. Between 2001 and 2008, a total of 116,700 DIPAC salmon was harvested by anglers and personal use fishers, including 78,000 chinook and coho, and 24,000 sockeye.
- In recent years, DIPAC's contribution of chinook and coho to the fishery declined. Several factors are attributable to this change. One was the reduction in coho releases to accommodate increased chinook production for Skagway sport fishery enhancement. Coinciding with this was a shift in dates of Juneau's Golden North Salmon Derby between 2005 and 2008, which pre-empted the return of DIPAC coho in mid- to late-August. A third factor is the general decline of DIPAC chinook survival compared to the earlier part of the decade, when DIPAC saw record returns.

Recreational Harvest of DIPAC Salmon, 2001-2008



Source: DIPAC, 2009.

- Between 2001 and 2008, DIPAC-produced chinook and coho accounted for an average of 24 percent and 15 percent of the total Juneau sport harvest of those species.
- While very difficult to quantify precisely, the economic impact of sport harvest of DIPAC salmon is significant, and estimated at approximately \$1.2 million in 2008. This total includes direct and indirect effects of non-resident sport harvest of DIPAC salmon.

DIPAC Operations

- In 2008, DIPAC generated an average of 42 jobs, including staff at both the Macaulay and Snettisham hatcheries, with total payroll of approximately \$1.4 million annually.

- Spending on goods and services in support of hatchery operations totaled approximately \$4.5 million, of which nearly \$3 million went to 145 Alaska businesses.
- Including all of the indirect and induced effects associated with DIPAC spending on payroll and other goods and services, the organization itself has a total Alaska economic impact of about \$5.5 million, including \$2.2 million in labor income.

Total Economic Impacts

- The total economic impact of commercial harvest of DIPAC salmon, including all direct, indirect and induced effects, amounted to approximately \$16 million in spending and income in 2008.
- Including all direct, indirect and induced impacts associated with harvested and processing, DIPAC salmon in 2008 had a total economic impact of approximately \$80 million. This includes spending by DIPAC 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 \$80 million total impact, approximately 30 percent (\$25 million) is labor (personal) income for fishermen, processing workers, and owners/employees of businesses that provide goods and services to fishermen and processors.
- Between 2001 and 2008, the harvest and processing of DIPAC-produced salmon generated a combined total of \$2.4 million in Fishery Business Tax and Salmon Enhancement Tax revenues. Approximately \$1.2 million in fishery business tax revenues went to state and local governments for fishery management and infrastructure development (including \$300,000 in 2008 alone). Similar amounts went to the regional aquaculture association for continued salmon enhancement efforts.
- 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 DIPAC salmon. However, the total includes several hundred fishermen, plus processing plant employees, DIPAC 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, \$25 million in labor income is the amount that would be generated by approximately 650 typical Southeast region jobs.

A summary table detailing the total economic impact of DIPAC production and operations is presented on the following page.

Summary of DIPAC Production and Commercial Harvest, 2001-2008

Harvest Volume	2001-2008	Annual Average	2008
Total DIPAC production (# of fish; includes common property, cost recovery and sport)	22.3 million	2.8 million	3.6 million
Commercial harvest of DIPAC salmon (# of fish, includes common property)	8.9 million	1.1 million	1.8 million
DIPAC commercial harvest as % of districts 11 & 15 total gillnet harvest volume	69%	65%	82%
Sport harvest of DIPAC salmon (# of fish)	116,800	14,600	11,700
Commercial Harvest Value			
Total harvest ex-vessel value of DIPAC salmon	\$34.3 million	\$4.3 million	\$9.9 million
... harvested by Juneau residents	\$12.0 million	\$1.5 million	\$3.8 million
DIPAC salmon ex-vessel value as % of districts 11 & 15 total gillnet harvest value	58%	53%	76%
First wholesale value of DIPAC salmon	\$155 million	\$19.4 million	\$49.6 million

Summary of DIPAC Production, Operations and Economic Impacts, 2008

DIPAC Employment, Payroll and Spending	
DIPAC annual average employment	42
DIPAC total annual payroll	\$1.4 million
DIPAC total annual spending on goods and services	\$4.5 million
... spending in Juneau	\$2.7 million
Direct and Indirect Economic Impacts*	
Total labor income related to commercial harvest and processing of DIPAC salmon	\$25 million
Total annual average employment equivalent	650 jobs
Total income and spending (output) related to harvest and processing of DIPAC salmon	\$80 million

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

Purpose and Methodology

Purpose and Scope

Douglas Island Pink and Chum, Inc. (DIPAC) 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 DIPAC-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 DIPAC 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 DIPAC 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 their affiliate network.
3. **Sport Harvest**—Estimates of the economic contributions of DIPAC salmon to the Southeast Alaska sport fishery are discussed, including economic activity resulting from non-resident harvests facilitated by the charter industry.
4. **DIPAC Operations**—Economic and employment information related to DIPAC 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 DIPAC salmon, and DIPAC 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, northern Southeast Alaska is defined as commercial fishing districts 11 (Juneau) and 15 (Haines).

Methodology

The data presented in this report comes from a variety of sources, including DIPAC, Alaska Department of Fish and Game (ADFG), 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 sport fish 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 DIPAC salmon harvested in commercial fisheries are based on data provided by DIPAC, ADFG 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 is unavailable due to ADOR 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.

Sport fish estimates are based on data provided by DIPAC, ADFG and Southeast municipal governments.

McDowell Group developed an economic model to estimate the direct and indirect economic impacts related to DIPAC 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 DIPAC-produced salmon.

Douglas Island Pink and Chum, Inc. (DIPAC), a private nonprofit salmon hatchery operator, was formed in 1976 by a group of Juneau residents concerned about depleting fisheries resources. The organization's mission 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 four species of Pacific salmon—chum, sockeye, chinook, and coho. Chum and sockeye are produced for commercial fleets operating in northern Southeast Alaska, while chinook and coho are produced primarily for the Juneau, Haines and Skagway sport fishing fleets.

With regard to its operational funding, DIPAC receives no enhancement tax revenue from commercial harvests; instead, it relies primarily on cost-recovery harvests of chum, sockeye and coho salmon to fund its enhancement activities. State contracts also fund its chinook and trans-boundary sockeye programs.

Facilities and Operations

DIPAC currently operates two hatcheries and several remote release sites throughout the northern inside waters of Southeast Alaska. Its administrative offices are located at the Macaulay Salmon Hatchery site in Juneau. The organization also operates the state owned Snettisham Hatchery 40 miles south of the capital city. A description of each facility is provided below.

Macaulay Salmon Hatchery

The Macaulay Salmon Hatchery is a large, multi-species facility located just north of downtown Juneau. Constructed in 1989, the Macaulay facility, which also houses a visitor center, has been in operation for 20 years and produces three species of salmon: chum, chinook and coho.

The Ladd Macaulay Visitor Center houses an assortment of aquariums that display a variety of local marine life. The center attracts an average of over 100,000 visitors per year during the summer and hosts over 3,000 local children, parents and teachers, as part of its year-round educational programming. The DIPAC Tourism Division oversees the center's operations, and supports its own budget through admissions, concessions and rental revenue.

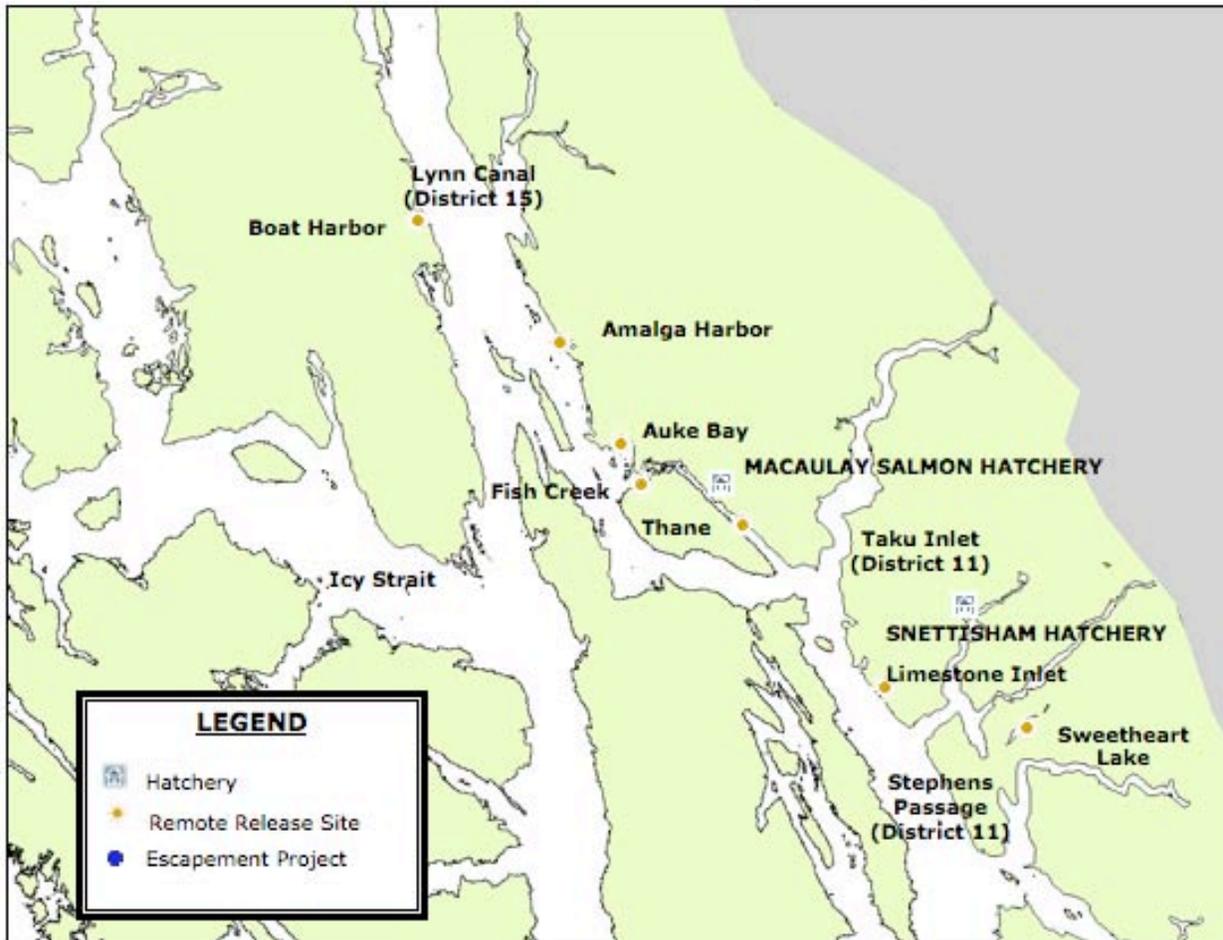
The Macaulay Salmon Hatchery also donates wet lab space to the University of Alaska Fairbanks for research use by the Juneau Center for Fisheries and Ocean Sciences.

Adjacent to the Macaulay site is a public dock used for sport fishing. Local residents are the primary users, and it is a popular fishing site for people who do not own a boat and children learning how to fish. In 2001, the Alaska Department of Transportation and Public Facilities expanded the dock and adjacent uplands to provide off-street parking and handicap access.

Snettisham Hatchery

Originally built and operated by the Alaska Department of Fish and Game, the Snettisham Hatchery was brought under DIPAC management in 1996. This state-of-the-art, single-species sockeye hatchery located in Port Snettisham, between Juneau and Petersburg, is one of the largest smolt facilities in the state. The hatchery produces sockeye salmon for local commercial and personal use fisheries and also operates a unique trans-boundary enhancement program under the auspices of the U.S./Canada Salmon Treaty.

DIPAC Hatchery and Release Site Locations
(need a new one, but this is a place holder)



Commercial Harvest of DIPAC Salmon

DIPAC salmon contribute substantially to the commercial fisheries and local economies of northern Southeast Alaska. The harvest of DIPAC salmon directly benefits commercial fishermen through increased earnings and employment, and stimulates the economies of regional coastal communities through increased spending on goods and services in support of the fishing industry as well as increased tax revenue.

Southeast Alaska Salmon Market Overview: Production & Price Trends

The major commercial fisheries in Southeast Alaska produced \$206 million in ex-vessel value in 2008 (preliminary) 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. Salmon value in 2008 was nearly \$117 million (57 percent of the total), based on preliminary estimates, and is expected to increase as 2008-season value data are 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 had declined in recent past, but this has changed with 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.

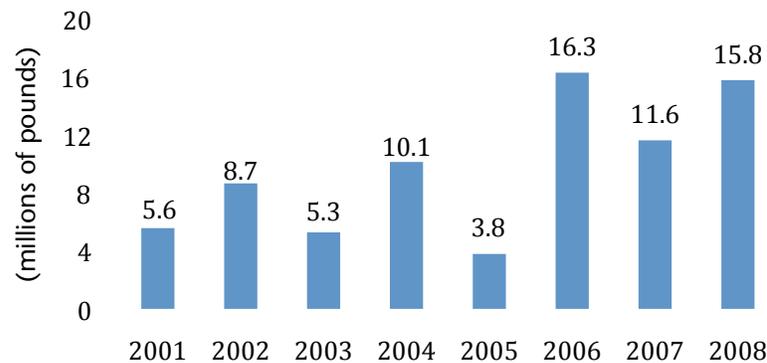
The outlook for salmon value in 2009 is uncertain. Prices for the traditional high-value salmon species of the region (particularly chinook and coho) will likely see substantial downward pressure with recessionary spending patterns. Chum salmon prices are also likely to be lower, as the unusually strong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

However, recessionary impacts on Alaska salmon prices may be offset by recent production problems in the farmed salmon sector that will likely result in a significant decrease in world salmon supply, on the order of 5-10 percent. This decrease, combined with the continued strong world demand for salmon, may offset recessionary price pressures on Alaska salmon in the 2009 season.

Commercial Harvest Volume and Ex-Vessel Value

Salmon produced by DIPAC contribute significantly to the northern Southeast commercial harvest. Between 2001 and 2008, DIPAC contributions to this regional industry have more than doubled in volume, from 5.6 million pounds of salmon in 2001 to 15.8 million pounds in 2008, averaging 9.6 million pounds during this 8-year timeframe.

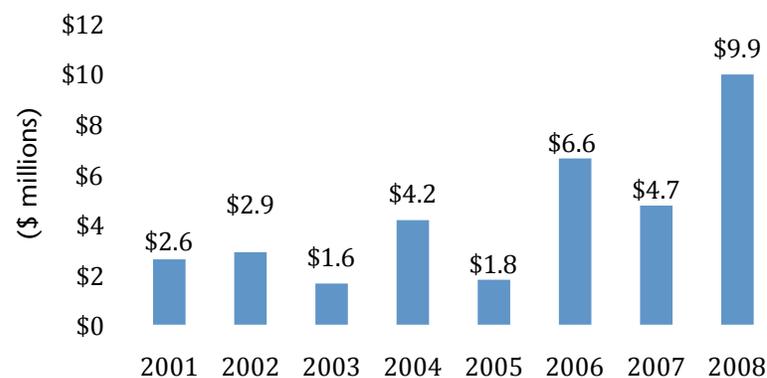
Figure 1: Total Pounds of DIPAC Salmon Harvested in Common Property Commercial Fisheries, 2001-2008



Source: DIPAC, 2009.

Market prices vary significantly from year to year, rendering the annual value of DIPAC salmon to be somewhat independent of its volume. However, as with volume, the value of DIPAC's contributions to the regional commercial harvest has generally increased between 2001 and 2008. The 2008 season was a record year for salmon prices, making the ex-vessel value of DIPAC's 2008 contribution nearly four times that of its 2001 contribution (\$9.9 million compared to \$2.6 million). Between 2001 and 2008, the average annual ex-vessel value was \$4.3 million.

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



Source: DIPAC, 2009.

Like other salmon hatcheries in Southeast Alaska, DIPAC tends to focus its production efforts on a relatively high-volume, low-value species: chum salmon. Between 2001 and 2008, on average, chum constituted 91 percent of harvested DIPAC salmon. In 2008, nearly all (98 percent) of harvested DIPAC salmon were chum. Chum roe commands particularly high prices, boosting the value of the species.

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

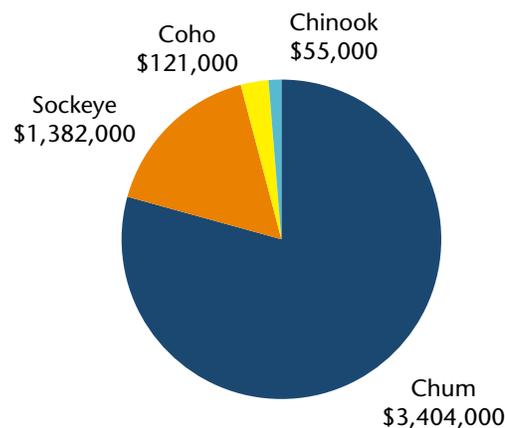
Species	2001-2008 Average		2007		2008	
	000s lbs.	Percent	000s lbs.	Percent	000s lbs.	Percent
Chum	8,775	91%	11,216	96%	15,436	98%
Sockeye	724	8	347	3	204	1
Coho	117	1	51	<1	109	<1
Chinook	23	<1	10	<1	26	<1
Total	9,639	100%	11,624	100%	15,775	100%

Source: DIPAC, 2009.

Note: Percentage totals may not equal column sums due to rounding.

In terms of ex-vessel value, chum accounts for the majority of all DIPAC-produced salmon. Between 2001 and 2008, chum averaged over three-fourths (\$3.4 million) of total ex-vessel value. Sockeye averaged \$1.4 million during that time, followed by coho (\$121,000) and chinook (\$55,000).

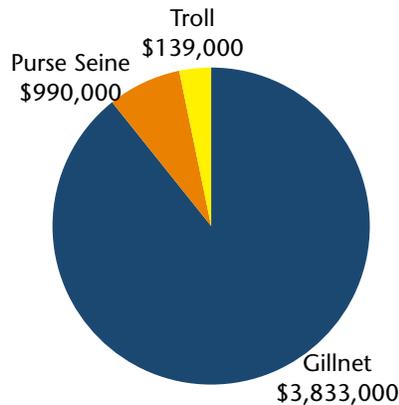
Figure 3: Average Ex-Vessel Value of DIPAC Salmon Harvested in Common Property Fisheries, by Species, 2001-2008



Source: DIPAC, 2009.

As the primary harvester of DIPAC's most abundant species, the commercial gillnet fleet earns much of the value associated with DIPAC-produced salmon. Between 2001 and 2008, gillnetters averaged 89 percent (\$3.8 million) of the total ex-vessel value of DIPAC fish. Approximately \$1 million went to the purse seine fleet and \$140,000 to trollers.

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



Source: DIPAC, 2009.

The following table presents annual ex-vessel values from 2001 to 2008 associated with the four salmon species produced by DIPAC and with the three harvest gear types. Earnings from chum and chinook increased dramatically in 2008. Following this trend, gillnet and troll fleets also saw substantial increases from DIPAC salmon in 2008.

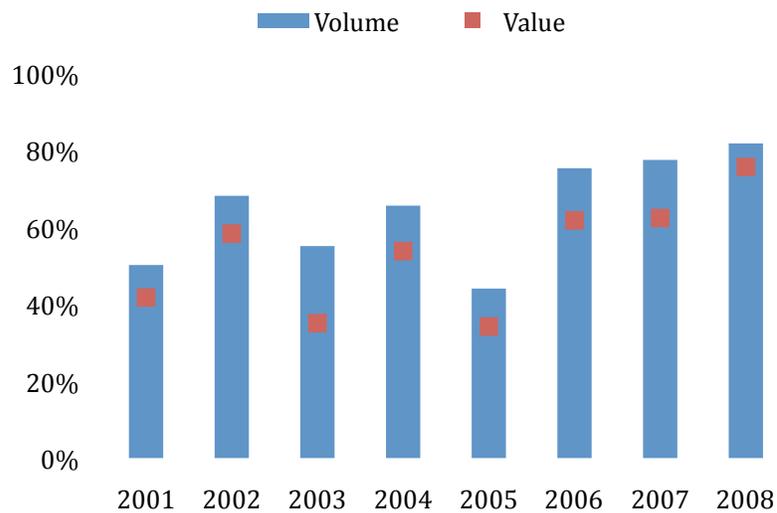
Table 2: Commercial Harvest Composition (Value) of DIPAC Salmon, by Gear Type and Species, 2001-2008 (\$ thousands)

	2001	2002	2003	2004	2005	2006	2007	2008
Species								
Chum	\$1,605	\$2,314	\$1,122	\$2,293	\$1,123	\$5,227	\$4,219	\$9,330
Sockeye	792	461	412	1,639	507	1,203	401	291
Coho	143	82	86	171	83	125	80	195
Chinook	56	23	16	54	72	55	35	131
Total	\$2,597	\$2,880	\$1,636	\$4,157	\$1,785	\$6,610	\$4,735	\$9,947
Gear Type								
Purse Seine	223	19	167	824	311	654	301	76
Gillnet	2,199	2,773	1,386	3,147	1,363	5,829	4,340	9,622
Troll	174	89	82	186	112	127	93	249
Total	\$2,596	\$2,881	\$1,635	\$4,157	\$1,786	\$6,610	\$4,734	\$9,947

Source: DIPAC, 2009.

In recent years, the importance of DIPAC salmon to the northern Southeast commercial fisheries has increased slightly in terms of volume and value. The following chart measures the total volume and ex-vessel value of DIPAC salmon harvested by the gillnet fleet as percentages of the fleet’s total harvest from northern Southeast inside waters (fishing districts 11 and 15). This comparison makes the assumption that the overwhelming majority of DIPAC-produced fish are harvested from these fisheries. Knowing that some portion of DIPAC salmon are harvested elsewhere and/or by other gear groups, the percentages presented in the chart below should be viewed as general indicators of DIPAC’s production importance, not as concrete proportions.

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



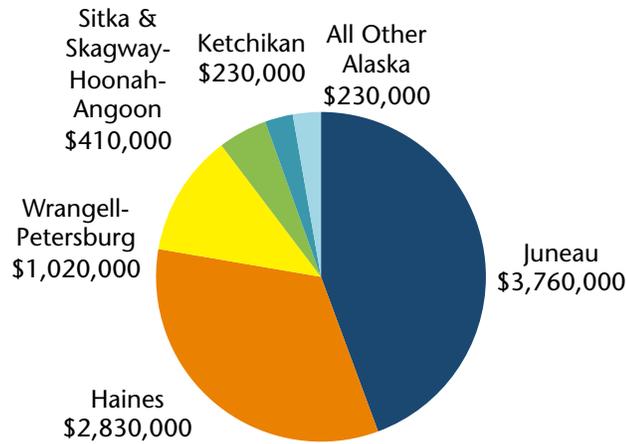
Source: McDowell Group estimates based on data provided by DIPAC and ADFG, 2009.

Note: Northern Southeast is defined as fishing districts 11 and 15.

Geographic Distribution of Commercial Harvest

In 2008, commercial gillnetters harvested \$9.6 million worth of DIPAC salmon, of which Alaska resident fishermen harvested 90 percent (approximately \$8.5 million). Among Alaska resident fishermen, the majority of earnings went to residents of Juneau (\$3.8 million or 44 percent) and Haines (\$2.8 million or 33 percent). The remainder of Alaska resident harvest earnings went to residents of Wrangell and Petersburg (\$1 million); Sitka, Skagway, Hoonah or Angoon (\$410,000); Ketchikan (\$230,000); and other Alaska communities (\$230,000).

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



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

Note: Northern Southeast is defined as fishing districts 11 and 15.

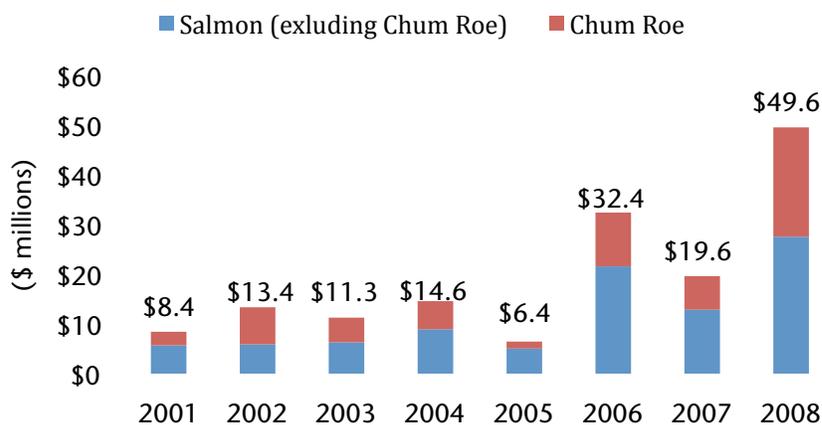
Processing of DIPAC Salmon

In addition to earnings for fishermen, the commercial harvest of DIPAC 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 DIPAC salmon was \$155 million and the annual average was \$19.4 million. In 2008, the combination of a large chum harvest and high prices made for a banner year, reaching nearly \$50 million. Chum accounted for \$48 million of the total first wholesale value of DIPAC salmon that year. The other three species: coho, sockeye and chinook, made up the remainder, each accounting for less than \$1 million.

Salmon roe is a particularly valuable salmon product and chum roe, specifically, is the most lucrative for hatchery-produced fish. Between 2001 and 2008, chum roe generally accounted for one-quarter to one-half of the first wholesale value of DIPAC salmon. The first wholesale value of DIPAC chum roe reached \$22 million in 2008, a record value.

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



Source: McDowell Group estimates, based on data provided by DIPAC, ADFG and ADOR, 2009.

Note: Includes common property and cost recovery harvests.

In Juneau, in 2008, DIPAC accounted for an estimated 8.9 million pounds of locally processed salmon. Over the five-year period 2004 through 2008, Juneau landings of DIPAC salmon totaled approximately 32 million pounds.

Assuming per-pound first wholesale values were about the same for processors located in Juneau as for those located outside of Juneau, the first wholesale value of DIPAC salmon landed and processed in Juneau totaled

\$28 million in 2008 (including roe). For the period 2004 through 2008, the total first wholesale value of DIPAC salmon processed in Juneau is estimated at \$79 million.

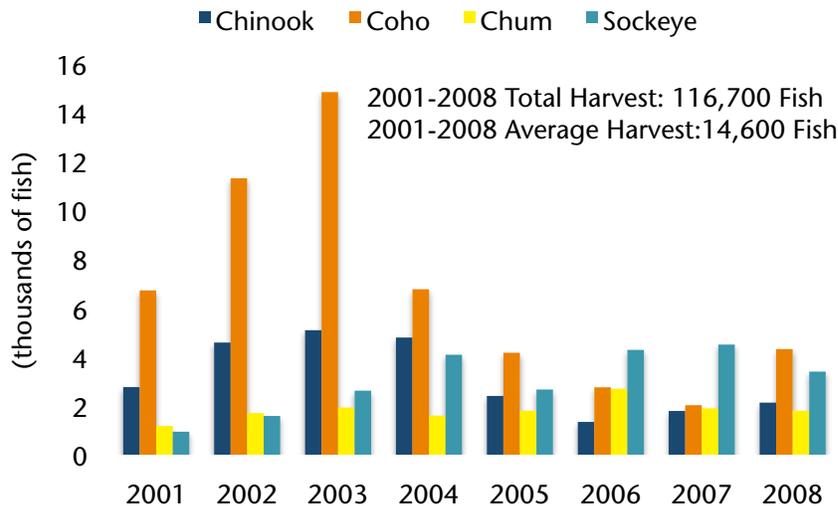
The first wholesale value of DIPAC-produced salmon is driven by a wide variety of factors, including worldwide commodity values of salmon. One significant advantage of Southeast hatchery-produced salmon is the large chum roe component. Farmed salmon is not a good source for most salmon roe products. For seafood processors and for common-property fishermen that harvest DIPAC-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 DIPAC salmon steadily increased, with particularly high value years in 2000, 2006 and 2008.

Sport Harvest of DIPAC Salmon

DIPAC salmon play a significant role in the Juneau-area sport and personal use fisheries. Traditionally, chinook and coho are the primary species sought after in these fisheries, with an average of 3,100 chinook and 6,600 coho caught annually. As reflected in the chart below, annual harvests of these have declined in recent years, from 20,000 fish (combined) in 2003 to around 4,000 fish in 2006 and 2007. This decline is largely explained by three factors. First, recent chinook returns have been lower than the record returns DIPAC saw in the earlier part of the decade. Second, there was a reduction in coho releases in order to accommodate increased chinook production in support of a sport fishery enhancement program in Skagway. Third, Juneau's annual Golden North Salmon Derby, which attracts hundreds of local anglers, was moved from mid-August to early August between 2005 and 2008, thus pre-empting DIPAC's traditional coho return.

DIPAC salmon production also supports a popular personal use fishery at Sweetheart Creek. This dedicated program has contributed over 24,000 sockeye from 2001 to 2008, averaging 3,000 fish annually. Chum salmon accounts for a much smaller proportion of DIPAC-produced sport and personal use harvests, averaging 1,800 fish caught annually in the same time period.

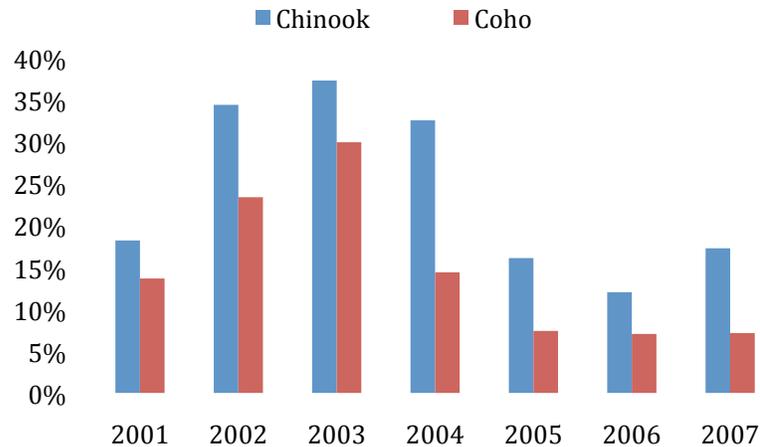
Figure 8: Recreational Harvest of DIPAC Salmon, 2001-2008



Source: DIPAC, 2009.

Nearly all of the DIPAC salmon sport and personal use harvest occurs in the Juneau area, including waters surrounding Admiralty Island, Douglas Island, and in southern Lynn Canal to Point Sherman. On average, DIPAC salmon accounted for one-quarter of the chinook harvest between 2001 and 2007 (the most recent data available), ranging from 12 to 37 percent, and one-seventh of the coho harvest, ranging from 7 to 30 percent.

Figure 9: Recreational Harvest of DIPAC Salmon as Percentage of the Total Juneau-Area Sport Harvest, 2001-2007



Source: McDowell Group estimates based on data provided by DIPAC and ADFG, 2009.

User Groups

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

Resident Fishermen

Sport-harvested DIPAC salmon offer many Juneau residents a unique food source and recreational experience. The public-use dock located adjacent to DIPAC Macaulay Salmon Hatchery provides access to a key shore fishery for local residents, particularly those unable to fish from a boat.

Non-Resident Fishermen

The largest economic impact associated with sport-harvested DIPAC 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 Juneau businesses, purchasing items and services such as fuel, fishing gear, repair services, bait, food, lodging, transportation and charter fees.

Economic Impacts of DIPAC Production and Operations

DIPAC'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 DIPAC 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 DIPAC salmon, income to seafood processors, local spending by non-resident anglers, and DIPAC 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-harvested DIPAC salmon in the communities of Juneau and Haines, as well as the total economic impact of DIPAC salmon harvests, processing, operations and tax revenue to Southeast Alaska's regional economy. Limited data prohibit community-level analysis of seafood processing.

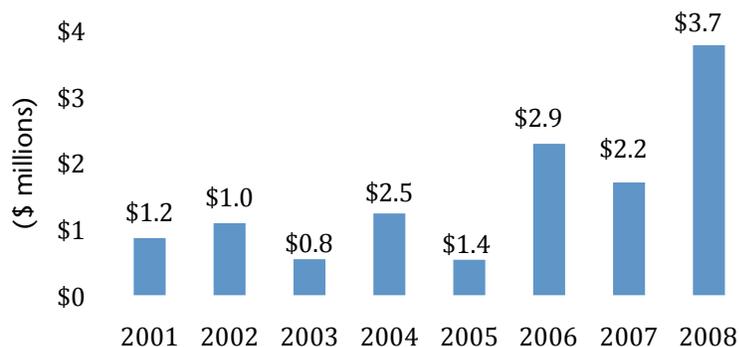
Commercial Harvest

While the economic impact of the commercial harvest of DIPAC salmon is seen throughout Southeast Alaska, the majority of the impact occurs in Juneau and Haines.

Juneau

Juneau resident permit holders fishing in the Stephens Passage and Lynn Canal commercial gillnet fisheries harvested a total of \$17.2 million worth of DIPAC salmon between 2001 and 2008, averaging \$1.9 million annually. DIPAC's contribution to Juneau gillnetters' total salmon harvest averaged 73 percent during the 8-year timeframe. In 2008, Juneau's harvest of DIPAC salmon reached a record value of \$3.7 million.

Figure 10: Ex-Vessel Income to Juneau Commercial Gillnet Permit Holders from DIPAC Salmon Harvested in Districts 11 & 15, 2001-2008



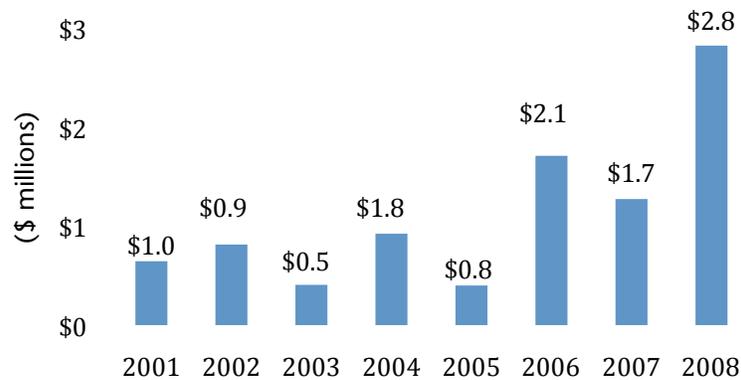
Source: McDowell Group estimates based on data provided by DIPAC and ADFG, 2009.

The local economic impact of commercial harvest of DIPAC salmon by Juneau residents totaled approximately \$5.9 million in 2008. This includes the \$3.7 million in direct impact, plus another \$2.2 million in indirect and induced economic effects. Over half (about \$3.6 million) of this economic impact is labor income for fishermen and workers in the support sector.

Haines

Between 2001 and 2008, Haines resident permit holders fishing in the Stephens Passage and Lynn Canal commercial gillnet fisheries harvested a total of \$12.9 million worth of DIPAC salmon, or approximately \$1.4 million annually. DIPAC’s contribution to Haines’ total salmon harvest averaged 74 percent during the 8-year timeframe. In 2008, Haines’ harvest of DIPAC salmon reached a record value of \$2.8 million.

Figure 11: Ex-Vessel Income to Haines Commercial Gillnet Permit Holders from DIPAC Salmon Harvested in Districts 11 & 15, 2001-2008



Source: McDowell Group estimates based on data provided by DIPAC and ADFG, 2009.

The economic impact in Haines from commercial harvest of DIPAC salmon by Haines residents totaled approximately \$3.5 million in 2008. This includes the \$2.8 million in direct impact, plus another \$1.3 million in indirect and induced economic effects. Approximately \$2.2 million of this economic impact is labor income for fishermen and workers in the support sector.

Region-Wide

The total regional economic impact of the commercial harvest of DIPAC salmon includes the \$10 million total ex-vessel, plus all the additional spending that occurs as fishermen purchase goods and services in support of their fishing activity and their households. Including the total ex-vessel value, plus all the indirect and induced spending effects, the total economic impact of the commercial harvest of DIPAC salmon was approximately \$16 million in 2008. Since a portion of the commercial harvest is taken by non-Alaska residents, some of this economic impact occurs outside the region. However, non-resident fishermen also have an impact on the Southeast economy, through their purchases of goods and services while in the region.

Seafood Processing

Nearly all commercially-harvested DIPAC salmon are processed in Southeast Alaska. In 2008, the first wholesale value associated with DIPAC salmon was \$49.5 million. The combination of a large chum harvest and high prices made for a record year for Southeast processors. The first wholesale value of DIPAC chum roe reached \$22 million in 2008, a record value and 44 percent of DIPAC's total first wholesale value.

The economic impact associated with the processing of DIPAC 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 DIPAC salmon in 2008 had a total economic impact of approximately \$80 million. This includes the gross (ex-vessel) income earned by commercial fishermen, and all the expenditures those fishermen make in support of their fishing operations and households. The total economic impact also includes all the expenditures processors make (in addition to payments to fishermen for their fish) in support of their activity to process DIPAC 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 (\$25 million) of the total economic impact is labor income.

Sport Harvest

In addition to the commercial harvest, the sport harvest of DIPAC salmon contributes significantly to Juneau's economy. 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 Juneau's tourism industry, paying for accommodations, restaurants and charter fees, among other expenditures.

Traditionally, DIPAC has been a major contributor to the chinook and coho harvests associated with Juneau's annual Golden North Salmon Derby. Between 2001 and 2007, DIPAC's contribution averaged 11 percent to anglers' chinook harvest and 12 percent to the coho harvest. In prior years, DIPAC's contribution was even greater, accounting for 30 percent of the combined derby harvest between 1998 and 2000. Between 2005 and 2007, the dates of the derby were shifted forward, from mid-August to early August, marginalizing the impact of DIPAC coho, which typically run during the late summer and early fall.

In 2008, an estimated 8,570 DIPAC salmon were harvested in Juneau's sport and personal use fisheries, including waters surrounding Admiralty Island, Douglas Island, and in southern Lynn Canal to Point Sherman. While total 2008 sport and personal use harvest figures were not yet available at the time this report was written, DIPAC salmon has accounted for, on average, one-quarter of the chinook harvest between 2001 and 2007 (the most recent data available) and one-seventh of the coho harvest.

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, DIPAC 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 DIPAC salmon is slightly less than half (40 percent) the number of hatchery fish harvested in Ketchikan, suggesting a total economic impact of about \$1.2 million annually, including \$400,000 in labor income. This estimate does not include spending by local residents in support of their effort to catch hatchery-produced salmon.

DIPAC Operations

As a locally-based organization, DIPAC has economic impacts on the Juneau economy as well. In 2008, DIPAC contributed an average of 42 jobs, including staff at both the Macaulay and Snettisham hatcheries, with total payroll of approximately \$1.4 million annually. Spending on goods and services in support of hatchery operations also contributes to the local economy. Goods and services include a wide range of expenditures, including hatchery infrastructure and office supplies, maintenance, travel and payments to commercial seiner during cost recovery efforts. DIPAC spent approximately \$4.5 million on goods and services in support of operations in 2008, of which nearly \$3 million went to 145 Alaska businesses and fishermen.

Including all of the indirect and induced effects associated with DIPAC spending on payroll and other goods and services, the organization has a total Alaska economic impact of about \$5.5 million, including \$2.3 million in labor income.

Salmon Enhancement and Fisheries Business Taxes

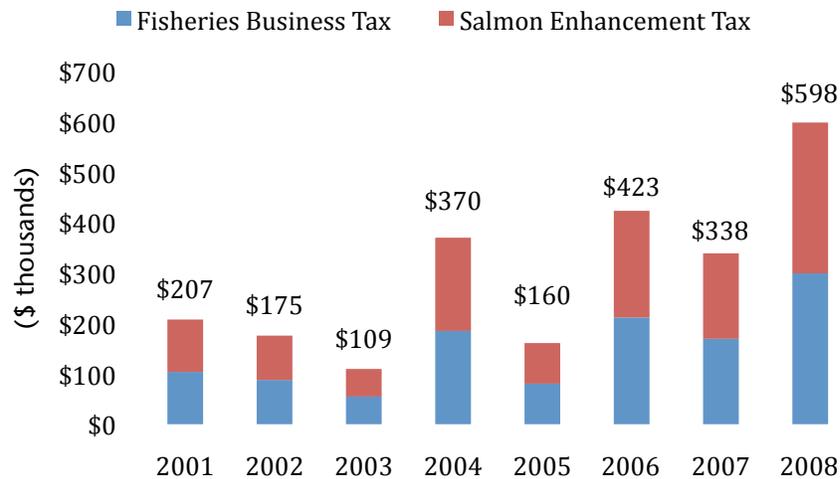
All salmon commercially harvested and processed in Southeast Alaska, including DIPAC-produced fish, are subject to a 3 percent Salmon Enhancement Tax paid by commercial fishermen and a 3 percent Fisheries Business tax paid by seafood processors. Revenue from the Salmon Enhancement Tax helps fund operations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

While DIPAC receives no salmon enhancement tax revenue due to its non-association status, harvest of the salmon it produces generates significant tax revenue for the Northern Southeast Regional Aquaculture Association to help fund continued salmon enhancement efforts in the region. Likewise, revenue from the fisheries business tax is used to support fisheries management and infrastructure development at the state and local levels.

Between 2001 and 2008, harvest of DIPAC-produced fish generated a combined total of approximately \$2.4 million in salmon enhancement and fishery business tax revenue. Of this amount, \$1.2 million in fisheries business taxes was generated over that time period, or roughly \$150,000 annually. In 2008, the commercial harvest of DIPAC salmon generated approximately \$300,000 in tax revenue to Southeast municipalities and

the State of Alaska. This is nearly three times the revenue generated from DIPAC salmon in 2001 and more than double the 2001-2007 annual average revenue.

Figure 12: Estimated Salmon Enhancement and Fisheries Business Tax Revenue Generated from DIPAC Salmon, 2001-2008



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

Qualitative Impacts: University of Alaska Southeast and Juneau Tourism and Education

As part of its public service to Alaskan residents and students, the Macaulay Salmon Hatchery donates wet lab space to the University of Alaska Fairbanks for research use by the Juneau Center for Fisheries and Ocean Sciences. In 2008, the Center secured approximately \$98,000 in federal grant revenue for research projects associated with the Macaulay lab.

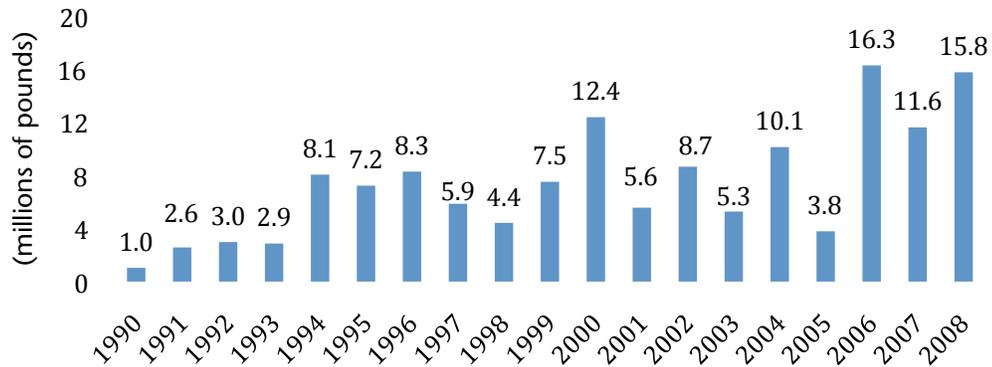
Additionally, DIPAC's Ladd Macaulay Visitor Center hosts thousands of non-resident visitors, school children and volunteers each year. The visitor center's assortment of aquariums display a variety of local marine life and its educational tours provide an overview of salmon characteristics and hatchery operations. Each year the center attracts an average of over 100,000 visitors and hosts over 3,000 local children, parents and teachers, as part of its year-round educational programming. The DIPAC Tourism Division oversees the center's operations, and supports its own budget through admissions, concessions and rental revenue.

Historical Overview of DIPAC Contributions, 1990-2008

Commercial Harvest Volume and Value

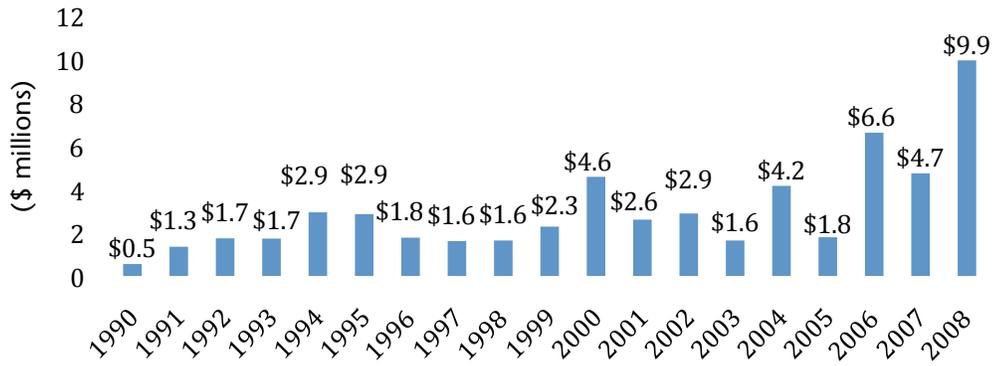
- The volume of DIPAC salmon harvested in commercial fisheries has doubled this decade compared to the 1990s as the corporation's enhancement programs have reached full production capacity and improvements in culture techniques have resulted in more consistent marine survivals.
- The common property commercial harvest of DIPAC salmon has averaged about 10 million pounds in the 2000s, compared to an average of about 5 million pounds in 1990s.

Figure 13: Total Pounds of DIPAC Salmon Harvested in Common Property Commercial Fisheries, 1990-2008



- The value of DIPAC salmon harvested has increased even more over the same time period as improved prices have coincided with record returns in recent years.
- So far this decade, the value of commercially harvested DIPAC salmon has totaled nearly \$39 million, with an annual average of \$4.3 annually. During the 1990s, \$18 million worth of DIPAC salmon was harvested, averaging \$1.8 million annually.

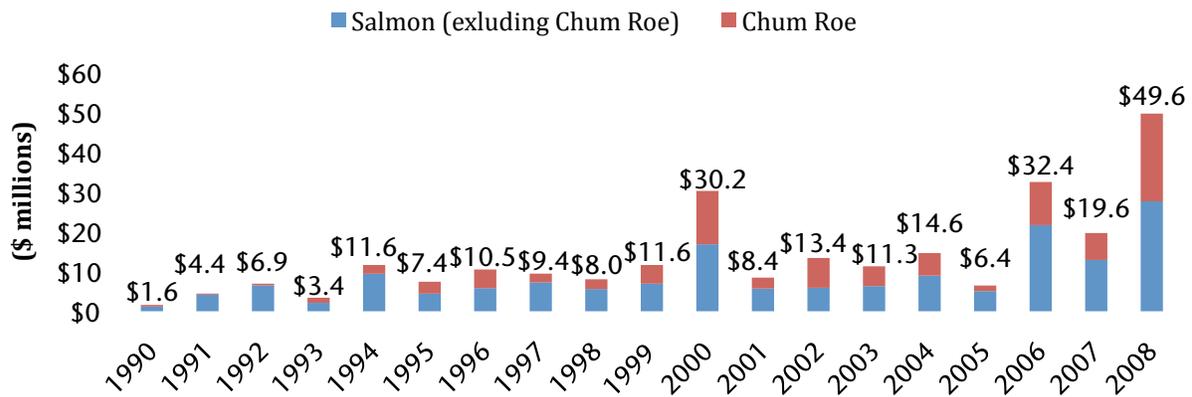
Figure 14: Total Ex-Vessel Value of DIPAC Salmon Harvested in Common Property Commercial Fisheries, 1990-2008



Seafood Processing

- The first wholesale value of DIPAC salmon harvested and processed this decade is almost three times greater than in the 1990s. For the 1990 through 1999 period, first wholesale values totaled \$75 million, and averaged \$7.5 million annually. Between 2000 and 2008, first wholesales values totaled \$186 million, averaging \$20.7 million for the nine-year period.

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



Source: McDowell Group estimates, based on data provided by DIPAC, ADFG and ADOR, 2009. Note: Includes common property and cost recovery harvests.