

# Economic Impacts of the Southern Southeast Regional Aquaculture Association



PREPARED FOR

**SSRAA**

August 2018



PREPARED BY

**McDowell  
GROUP**

# ***Economic Impacts of the Southern Southeast Regional Aquaculture Association (SSRAA)***

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**SSRAA**

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# Executive Summary

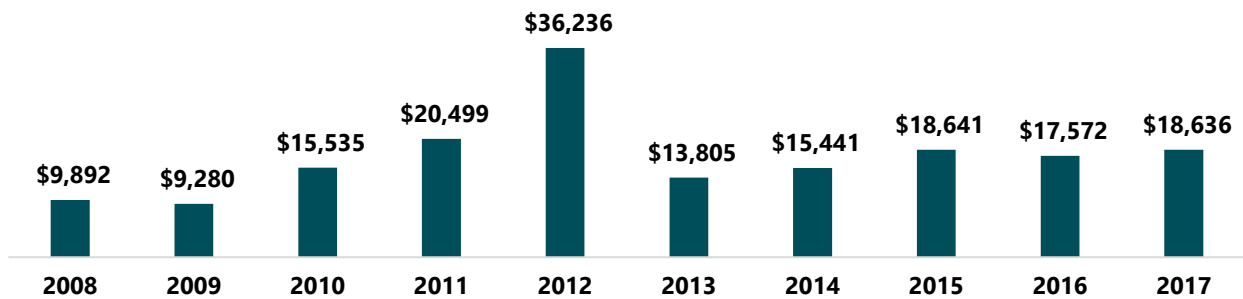
The Southern Southeast Regional Aquaculture Association (SSRAA) is a non-profit corporation headquartered in Ketchikan, Alaska working to enhance the salmon stocks in Southern Southeast Alaska (SSE). This study estimates and describes SSRAA's economic impacts on SSE's commercial fishing, seafood processing, and sportfishing industries. Unless stated otherwise, numbers presented reflect 2013 to 2017 averages.

SSRAA operates seven hatcheries and seven additional release sites throughout SSE, producing and releasing around 170 million salmon smolts annually. SSRAA's operations are primarily funded through cost recovery harvests and a three percent ex-vessel tax on landed salmon in SSE. Between sport harvests, commercial fisheries, and cost recovery activities, about 3.2 million SSRAA salmon are harvested annually.

## Commercial Harvest

During the study period, annual harvests of SSRAA salmon in common property fisheries averaged 22 million pounds with an average ex-vessel value of \$16.8 million. Chum salmon accounted for 89 percent of the volume and 75 percent of the value of SSRAA's contribution to commercial fisheries during this period. Coho and Chinook production are also important to the region's troll, seine, and gillnet fleets.

**SSRAA Salmon Harvest Value, Common Property Fisheries (\$000s), 2008-2017**



	2013	2014	2015	2016	2017	2013-2017 Average	2013-2017 Percent of Total
Chum	\$8,971	8,917	15,940	13,010	15,887	\$12,545	75
Coho	3,025	4,714	1,135	3,360	1,547	2,756	16
Chinook	1,792	1,808	1,567	1,202	1,202	1,514	9
<b>Total</b>	<b>\$13,805</b>	<b>15,441</b>	<b>18,641</b>	<b>17,572</b>	<b>18,636</b>	<b>\$16,819</b>	

As a portion of the overall catch in SSE commercial salmon fisheries, SSRAA is responsible for over half of chum harvests (57 percent from 2008 through 2017), 39 percent of Chinook harvests, and 31 percent of coho harvests.

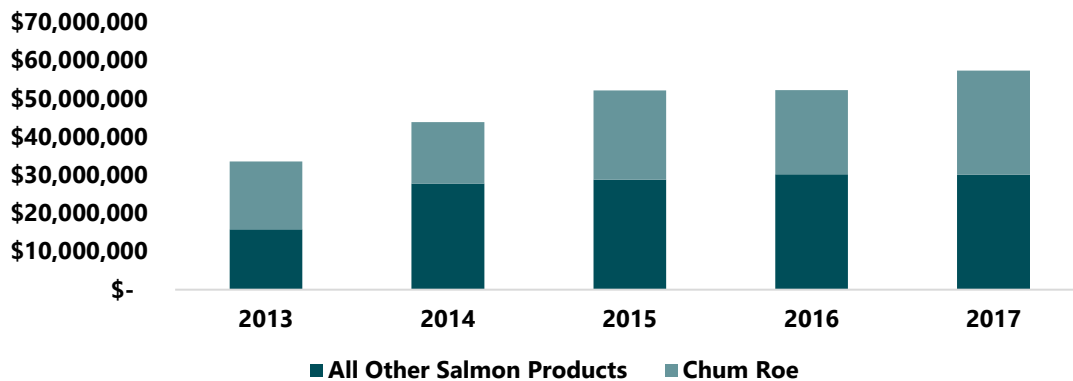
## Seafood Processing

From 2013 to 2017, the cumulative wholesale value of SSRAA salmon was \$239 million, including \$49 million derived from sales of cost recovery salmon and \$190 million from common property salmon. Annually, first wholesale value averaged \$48 million during the study period.

By species, chum accounted for more than three-fourths (79 percent) of the wholesale value of SSRAA fish, followed by Chinook (14 percent) and coho (7 percent).

Chum roe is a major driver of the value of SSRAA production, typically representing just under half of SSRAA-generated wholesale value (see chart below).

**First Wholesale Value of SSRAA Salmon, Chum Roe versus all other Products, 2013-2017**



## Sportfishing

Based on data provided by SSRAA, sport fishermen in SSE harvested 3,150 Chinook and 28,150 coho salmon, on average, in recent years. While chum are harvested by area sport fishermen, SSRAA's contributions to sport chum harvests are not tracked or estimated.

**Southern Southeast Sport Harvest of SSRAA Salmon (number of fish), 2013-2017**

	2013	2014	2015	2016	2017	2013-2017 Average
Chinook	2,080	1,750	4,612	2,732	4,691	3,150
Coho	19,970	50,567	38,798	9,742	21,607	28,150

SSRAA's contribution to the overall SSE sport harvest averaged 11 percent of Chinook and 20 percent of coho harvests from 2013-2016. In 2014 (the most recent year for which data is available), more than half (58 percent) of the region's Chinook and coho sport harvest was caught by guided anglers.

SSRAA's role in the sport sector is especially prominent in the Ketchikan area. ADF&G creel survey data indicates that roughly a third of the Chinook salmon caught in the Ketchikan area are typically SSRAA-produced fish, along with about 13 percent of the sport coho harvest. In May and June, Ketchikan's full-day and half-day charter fleet (primarily serving cruise visitors) is largely dependent on SSRAA Chinook returning to nearby release sites including Whitman Lake and Neets Bay.

## SSRAA Operations

In 2017, SSRAA employed an average of 60 workers who earned a total of \$3.3 million in wages. Additionally, the organization purchased supplies and services for its operations in Ketchikan (and at its various hatcheries and release sites) which contributed to the local economy. In state expenditures totaled \$3.6 million for 2017.

Multiplier effects result from subsequent spending by SSRAA's employees and operational spending with vendors in the region. Including these multiplier effects, economic impacts resulting from SSRAA's operations totaled 80 jobs and \$4.1 million in labor income in 2017.

## Combined Economic Impact of SSRAA Production and Operations

SSRAA's total economic impact in 2017 is estimated at 680 jobs and \$32 million in labor income, including impacts related to commercial fishing, seafood processing, nonresident sportfishing, and from SSRAA's own spending and employment.

Output is a measure of total economic activity, including all labor income, spending on supplies and services, and all related multiplier effects. Economic output associated with SSRAA and the salmon it produces totaled approximately \$70 million in 2017.

**Economic Impact of SSRAA Production and Operations, 2017**

	Direct Impacts	Indirect & Induced Impacts	Total Economic Impacts
<b>Commercial Fishing</b>			
Employment	140	90	230
Labor Income	\$10.1 million	\$3.6 million	\$13.7 million
<b>Seafood Processing</b>			
Employment	200	110	310
Labor Income	\$7.4 million	\$4.2 million	\$11.6 million
<b>Non-resident Sportfishing</b>			
Employment	45	15	60
Labor Income	\$1.6 million	\$0.6 million	\$2.2 million
<b>SSRAA Operations</b>			
Employment	60	20	80
Labor Income	\$3.3 million	\$0.8 million	\$4.1 million
<b>Total Economic Impact</b>			
<b>Employment</b>	<b>445</b>	<b>235</b>	<b>680</b>
<b>Labor Income (\$millions)</b>	<b>\$22.4 million</b>	<b>\$9.2 million</b>	<b>\$32 million</b>
<b>Economic Output (labor income, spending, and multiplier effects)</b>			<b>\$70 million</b>

Note: Totals may not sum due to rounding.

Source: McDowell Group estimates using IMPLAN, ADF&G, DOLWD, and SSRAA data.

# Purpose and Methodology

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## Purpose and Scope

This study estimates and describes the economic impacts of the Southern Southeast Regional Aquaculture Association (SSRAA), with a focus on the five-year period from 2013 to 2017. This is an update of earlier economic impact reports produced by McDowell Group in 2001 and 2008. The report concentrates on five primary subjects:

1. **Commercial Harvest** – The overall economic benefits of commercially caught (common property) SSRAA salmon are presented using ex-vessel income – the gross value paid to fishermen for their catch. The geographic distribution of earnings from SSRAA salmon commercial harvest is also reported.
2. **Seafood Processing** – The overall economic impact resulting from processing SSRAA salmon (including common property and cost recovery harvests) is estimated using first wholesale value data from ADF&G. First wholesale value represents the first sale of fish by a processor to a buyer outside their affiliate network.
3. **Sport Harvest** – Contributions of SSRAA fish to the regional sport harvest are addressed, including impacts resulting from guided and unguided non-resident harvests.
4. **Economic Impacts** – This section summarizes the total economic impacts of SSRAA fish on the various sectors described above, along with the economic impacts resulting from SSRAA operations.
5. **Tax Revenue** – SSRAA fish support a variety of economic activities that are taxed, providing revenue to local governments throughout the SSE region.

For purposes of this report, Southern Southeast Alaska (SSE) is defined as the Ketchikan Gateway Borough, Prince of Wales (POW) Island-Hyder Census Area, City and Borough of Wrangell, and the Petersburg Borough. In terms of commercial fishing districts, SSE is defined as districts 1 through 8.

## Methodology

The data used in this report comes from a variety of sources, including SSRAA, Alaska Commercial Fisheries Entry Commission (CFEC), Alaska Department of Fish and Game (ADF&G), Alaska Department of Labor and Workforce Development (DOLWD), and Alaska Department of Revenue (DOR). In addition, interviews were conducted with SSRAA staff, ADF&G employees, and other experts.

Estimates provided in this report are based on the best available data. SSRAA provided estimates of their contributions to common property, sport, and cost recovery fisheries in terms of number of fish. Average weights per fish and prices per pound were applied (based on ADF&G data for Southeast Alaska) to estimate the volume and value of SSRAA returns.

Several reports and other sources provided important sources of sportfishing data and related information, including the following:

- McDowell Group, 2010. *Impacts of Nonresident Sportfishing on the Ketchikan Economy*. Prepared for the Ketchikan Visitors Bureau.
- McDowell Group, 2008. *Economic Impacts of the Southern Southeast Regional Aquaculture Association*. Prepared for SSRAA.
- ADF&G, 2016. *Participation, Effort, and Harvest in the Sport Fish Business/Guide Licensing and Logbook Programs, 2014*. Fishery Data Series No. 16-02.
- Alaska Sport Fishing Survey database. 1996–2017. ADF&G, Division of Sport Fish (accessed May 2018): <http://www.adfg.alaska.gov/sf/sportfishingsurvey/>
- ADF&G, 2009. *An Evaluation of Estimates of Sport Fish Harvest from the Alaska Statewide Harvest Survey, 1996-2006*. Special Publication No. 09-12.

### ***Economic Impact Modeling***

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

In most cases, economic impact numbers presented in this report reflect 2013-2017 averages to smooth out year-to-year variations in salmon returns. The exception is impacts related to SSRAA's operations, which are based on 2017 data alone. For simplicity, total economic impacts are reported as representing 2017.



# Introduction

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The Southern Southeast Regional Aquaculture Association (SSRAA) is a non-profit corporation headquartered in Ketchikan, Alaska. Incorporated in 1976, the organization works to enhance the salmon stocks in Southern Southeast Alaska (SSE) from Dixon Entrance to Frederick Sound. SSRAA is guided by a 21-member Board of Directors representing a diverse group from the commercial, subsistence, sport, and fish processing sectors, as well as representatives from Native corporations, municipalities, the business community, and the general public. SSRAA employed an annual average of 61 staff in 2017 and a peak of 68 workers during the summer months.

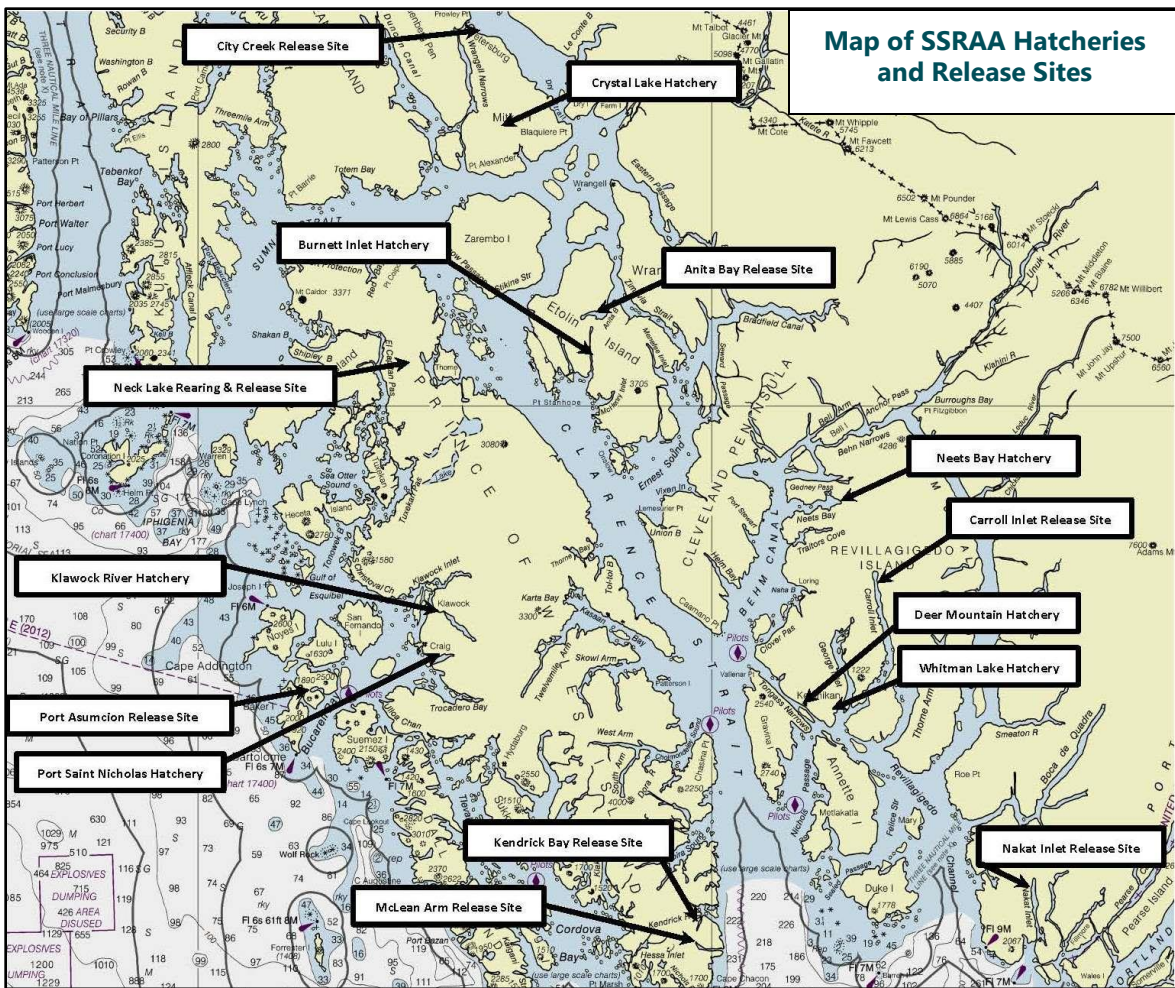
SSRAA is primarily funded through a combination of revenues from a 3 percent ex-vessel tax on landed salmon within its operating area, and cost recovery of adult salmon returns. After nearly two decades running its own cost recovery program, SSRAA transitioned to a more typical royalty model starting in 2014. Among other smaller revenue sources, SSRAA also receives funding from ADF&G's Division of Sport Fish to provide releases of Chinook salmon for Ketchikan, Wrangell, and Petersburg area fisheries.

## Facilities and Production

SSRAA operates seven hatcheries and seven additional remote release sites throughout SSE (see map on following page). SSRAA's longest-running hatcheries are located at Whitman Lake in Ketchikan; in Neets Bay, roughly 40 miles north of Ketchikan; Burnett Inlet, 25 miles south of Wrangell; and Crystal Lake, 20 miles south of Petersburg. These facilities raise Chinook, coho, and chum salmon for on-site releases, as well as for transfer to remote release sites in Kendrick Bay/McLean Arm, Nakat Inlet, Anita Bay, City Creek, and Neck Lake.

SSRAA has absorbed additional hatcheries and release sites run by other organizations in recent years. In 2014, SSRAA took over the Deer Mountain Hatchery in Ketchikan formerly run by the Ketchikan Tribal Hatchery Corporation. Chinook salmon reared at Deer Mountain are released at a remote Carroll Inlet release site and in Ketchikan Creek near downtown Ketchikan. In 2016, SSRAA took over operations of the Klawock River and Port Saint Nicholas hatcheries previously run by the Prince of Wales Hatchery Association (POWHA). POWHA's system included a release site at Port Asumcion that SSRAA now operates and is targeting for additional releases.

As shown in Table 1 below, Neets Bay accounts for 50 percent of all SSRAA releases, and the largest releases of chum, Chinook, and coho. After Neets Bay, the most important release sites are Kendrick Bay/McLean Arm, Anita Bay, Nakat Inlet, and Burnett Inlet. Other release sites account for less than 5 percent of total releases.



**Table 1. Number of Smolts Released, by Release Site and Species, 2013-2017 Averages**

Release Site	Chinook	Chum	Coho	Total	% of Total
Neets Bay	728,760	79,251,800	3,995,340	83,975,900	50%
Kendrick Bay/McLean Arm		29,300,800		29,300,800	17%
Anita Bay	454,460	22,263,600	504,300	23,222,360	14%
Nakat Inlet		14,336,600	525,000	14,861,600	9%
Burnett Inlet		9,690,000	185,420	9,875,420	6%
Klawock			4,480,000	4,480,000	3%
Neck Lake			1,763,600	1,763,600	1%
Whitman Lake	638,200		352,500	990,700	1%
Crystal Lake	635,830		131,820	767,650	0%
Carroll Inlet	365,000			365,000	0%
City Creek	98,000			98,000	0%
Deer Mountain	70,000			70,000	0%
Port St. Nicholas	89,000			89,000	0%
<b>Total</b>	<b>3,079,250</b>	<b>154,842,800</b>	<b>11,937,980</b>	<b>169,860,030</b>	

Source: SSRAA. Note: Releases from the Klawock and Port St. Nicholas hatcheries (new to SSRAA) reflect 2017 production. In addition, releases for newer programs from Deer Mountain/Carroll Inlet and City Creek reflect 2017 production.

## Species Produced

**Chum** salmon constitute SSRAA's largest production effort and expected return. Chum fry are produced at the Whitman Lake, Burnett Inlet, and Neets Bay facilities. Chum are released on-site at the Neets Bay and Burnett Inlet hatcheries and at remote sites in Kendrick Bay/McLean Arm, Nakat Inlet, Anita Bay, and Port Asumcion (first release in 2018). Chum are primarily targeted by drift gillnet and purse seine fisheries in Clarence and Sumner Straits. A total of 169 million chum smolts were released by SSRAA in 2017.

Since 2013, SSRAA contributions to common property commercial chum harvests have ranged from 1.4 million fish in 2014 to 3.3 million fish in 2015, with a 2013-2017 average harvest of 2.1 million fish.

**Coho** salmon are produced primarily at the Whitman Lake hatchery, as well as at the Neets Bay and Klawock River hatcheries. In addition to hatchery releases, coho are released remotely from Anita Bay, Nakat Inlet, a large enhancement project at Neck Lake, and other sites. Coho are primarily targeted by trollers region-wide, and by drift gillnetters and sport fishermen in Sumner and Clarence Straits and the Ketchikan area. A total of 12.4 million coho smolts were released by SSRAA in 2017.

Recent commercial harvest of SSRAA coho has ranged from 190,000 fish in 2017 to 477,000 fish in 2014, with a 2013-2017 annual average of 304,600 fish.

**Chinook** salmon are mainly produced at SSRAA's Crystal Lake hatchery under contract with the ADF&G Sport Fish Division, as well as at the Whitman Lake, Neets Bay, and Port Saint Nicholas facilities. The fish are released on-site at the three facilities, from Neets Bay, and remotely from various sites. SSRAA Chinook are primarily targeted by troll and sport fleets near Ketchikan. A total of 2.9 million Chinook smolts were released in 2017.

Since 2013, SSRAA contributions to Chinook commercial harvests ranged from 22,700 fish in 2017 to 48,000 fish in 2015, with a 2013-2017 average harvest of 35,400.

SSRAA's **sockeye** salmon programs (primarily in support of restoration projects) have been phased out and the last SSRAA sockeye returns were seen in 2013 and 2014.

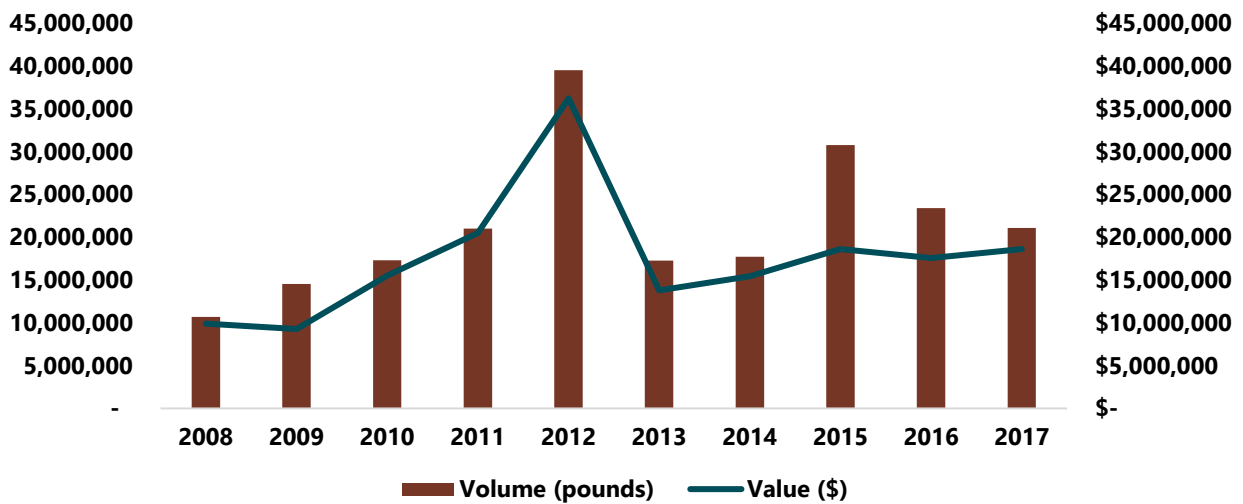
# SSRAA Salmon in Commercial Fisheries

This section includes an overview of SSRAA’s contributions to commercial salmon harvests in SSE, including harvest volume and harvest value. SSRAA-produced salmon that are caught outside of districts 1 through 8 are not included in these estimates. SSRAA fish are harvested outside of the SSRAA region, including other parts of Alaska and in British Columbia waters to the south, but not in sufficient numbers to warrant the additional sampling efforts that would be required to estimate SSRAA’s contributions to harvests in these areas. The estimates presented below should be considered conservative.

## Commercial Harvest of SSRAA Salmon

SSRAA-produced salmon contribute significantly to the commercial harvest of salmon in SSE. Since 2008, SSRAA contributed over 210 million pounds of salmon worth an ex-vessel value of \$175 million to common property fisheries. During the record year of 2012, SSRAA contributed nearly 40 million pounds in ex-vessel volume.

**Figure 1. SSRAA Salmon Harvest Volume and Value, Common Property Fisheries, 2008-2017**



Source: McDowell Group estimates. Data from ADF&G and SSRAA.

Between 2013 and 2017, SSRAA contributed an average of 22 million pounds annually and a total of 110 million pounds of salmon to common property fisheries. On average, chum made up 89 percent of the volume during this five-year period, averaging 19.5 million pounds per year.

**Table 2. SSRAA Salmon Common Property Harvest Volume (000s of pounds), 2013-2017**

Species	2013	2014	2015	2016	2017	2013-2017 Average	2013-2017 Percent of Total
Chum	14,695	13,627	28,833	20,728	19,826	19,542	89%
Coho	2,044	3,530	1,379	2,343	993	2,058	9%
Chinook	527	550	567	330	280	451	2%
<b>Total</b>	<b>17,266</b>	<b>17,708</b>	<b>30,779</b>	<b>23,400</b>	<b>21,098</b>	<b>22,050</b>	

Source: McDowell Group estimates based on data from SSRAA and ADF&G.

The value of SSRAA salmon to the region’s commercial fisheries has trended up over the last decade, due to higher prices – particularly for chum roe – and increased production and returns. Between 2013 and 2017, earnings of commercial fishermen attributable to SSRAA fish totaled \$84 million for an annual average of \$16.8 million. The high during this period was \$18.6 million in 2015 and 2017 and the low was \$13.8 million in 2013.

As mentioned previously, chum is the leading SSRAA-produced salmon. In 2017, chum salmon accounted for \$15.9 million in ex-vessel value, followed by coho (\$1.5 million), and Chinook (\$1.2 million).

By gear type, SSRAA salmon harvest value is typically dominated by the seine fleet. During the 2013-2017 period, an estimated 46 percent of the value of commercially-harvested SSRAA fish went to seiners, 32 percent to gillnetters, and 21 percent to trollers.

**Table 3. Commercial Ex-Vessel Value of SSRAA Salmon (\$000s), 2013-2017**

	2013	2014	2015	2016	2017	2013-2017 Average	2013-2017 Percent of Total
<b>By Species</b>							
Chum	8,971	8,917	15,940	13,010	15,887	12,545	75
Coho	3,025	4,714	1,135	3,360	1,547	2,756	16
Chinook	1,792	1,808	1,567	1,202	1,202	1,514	9
<b>By Gear Type</b>							
Purse Seine	5,498	5,859	10,206	8,567	8,886	7,803	46
Gillnet	4,703	5,367	6,176	5,089	5,882	5,443	32
Troll	3,604	4,215	2,260	3,917	3,868	3,573	21
<b>Total</b>	<b>13,805</b>	<b>15,441</b>	<b>18,641</b>	<b>17,572</b>	<b>18,636</b>	<b>16,819</b>	

Source: McDowell Group estimates based on data from SSRAA and ADF&G.

Note: 2013 and 2014 totals include a small amount of sockeye returns that are not specifically broken out. In addition, totals may not sum due to rounding.

## SSRAA Harvest Value in Relation to Overall Southern Southeast Harvests

Over the last 10 years, SSRAA has contributed 19 percent of the volume and 28 percent of the value of SSE common property salmon harvests. SSRAA’s relatively strong value role is attributed to the production focus on relatively low-volume, mid-value chum salmon, and on high-value Chinook and coho.

SSRAA’s relative contribution is influenced by year to year variations in wild pink salmon abundance. Peak contributions – over 40 percent of the harvest value in 2017, for instance – occur in years with low pink salmon abundance. In years with near record pink salmon abundance, such as 2013, SSRAA contributed 13 percent of regional salmon harvest value.

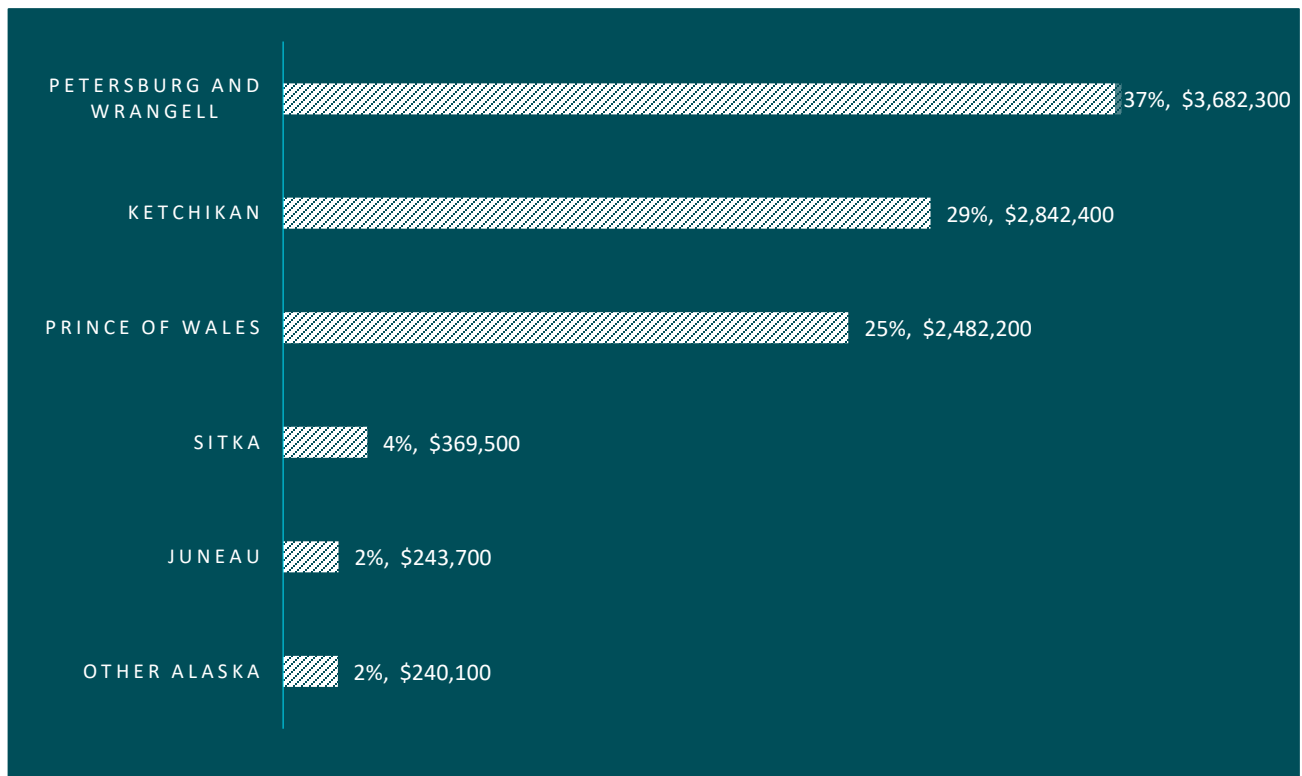
By gear group, SSRAA’s relative contribution is greatest for the SSE gillnet and troll fleets (43 percent of harvest value from 2008 through 2017), followed by the seine fleet (20 percent). By species, SSRAA is responsible for over half of chum harvests (57 percent from 2008 through 2017), 39 percent of Chinook harvests, and 31 percent of coho harvests.

## Geographic Distribution of Commercial Harvest Value

Among commercial fishermen, Alaska residents are the primary beneficiaries of SSRAA-produced salmon, earning three-fifths (\$9.9 million) of the average annual ex-vessel value from 2013 through 2017.

Among Alaskans, ex-vessel benefits of SSRAA salmon are concentrated in SSE. Permit holders residing in the Petersburg-Wrangell area earned \$3.7 million in ex-vessel value from SSRAA fish, accounting for 37 percentage of ex-vessel value to Alaska residents. They were followed by Ketchikan Gateway Borough residents, with 29 percent (\$2.9 million); Prince of Wales residents at 25 percent (\$2.5 million); Sitka area residents at 4 percent; and other Alaska residents, with approximately 4 percent of the total resident harvest value.

**Figure 2. Geographic Distribution of SSRAA Ex-Vessel Value to Alaska Residents, 2013-2017 Average**



Source: McDowell Group calculations based on data from CFEC and SSRAA. Note: Chart only shows income to Alaska residents.

# SSRAA Salmon and the Processing Sector

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

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

Estimates of the first wholesale value derived from SSRAA salmon in 2017 are based on preliminary data.

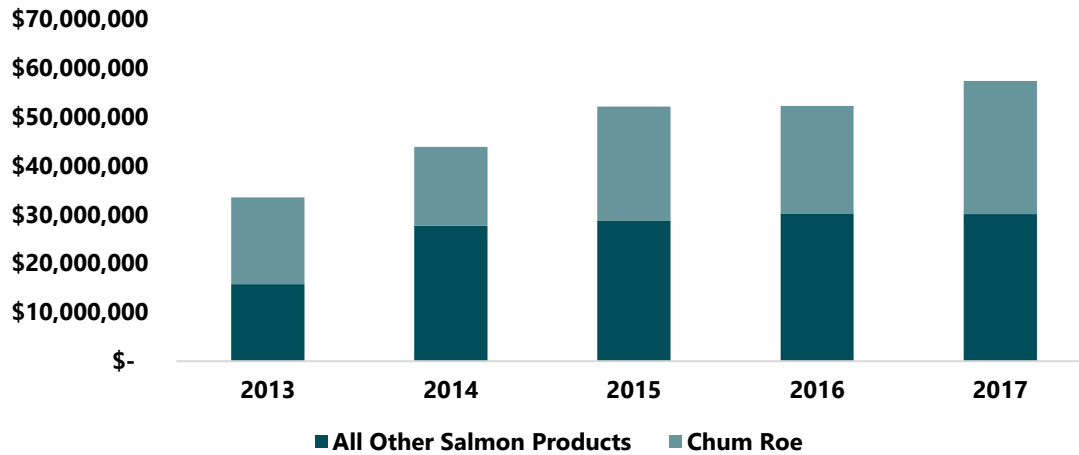
## **Role of SSRAA Fish in Seafood Processing Sector**

A key benefit of SSRAA fish is providing stable chum returns to processors to balance out volatility in other species, especially pink salmon. Together, chum and pink salmon account for over half of the first wholesale value of all seafood species caught and processed in Southeast Alaska (which species is most important varies from year to year). While wild-stock pink salmon returns fluctuate significantly from year to year, hatchery-bred chum salmon provide a stable source of income for processors and harvesters.

From 2013 to 2017, the cumulative wholesale value of SSRAA salmon was \$239 million, including \$49 million derived from sales of cost recovery salmon and \$190 million from common property salmon. Annually, first wholesale value averaged \$48 million during the study period. By species, chum accounted for more than three-fourths (79 percent) of the wholesale value of SSRAA fish, followed by Chinook (14 percent), and coho (7 percent).

Less the cost of fish, processors earned an estimated gross margin of \$134 million on SSRAA fish during the five-year study period. This amount reflects the total value added to SSRAA salmon by regional seafood processors.

**Figure 3. First Wholesale Value of SSRAA Salmon, Chum Roe versus all other Products, 2013-2017**



Source: McDowell Group estimates based on data from SSRAA, ADF&G, and DOR.

As evidenced by the data in Figure 3, chum roe is a major driver of the value of SSRAA production. Chum roe products represented close to half (45 percent) of the SSRAA-generated wholesale value between 2013 and 2017. More information on market trends for chum roe and other key products is provided in the last section of this report.



# SSRAA Salmon in Sport Fisheries

In addition to SSRAA’s importance to SSE commercial fisheries, sport harvest of SSRAA salmon has a significant impact on the region’s economy. Resident anglers who target SSRAA fish spend money on boats, fishing gear, fuel, and supplies, while non-resident anglers often hire local charter fishing companies that source many supplies locally and provide jobs to local residents.

Based on data provided by SSRAA, sport fishermen harvested an estimated 15,865 Chinook and 140,684 coho salmon produced by the aquaculture association between 2013 and 2017. The average annual Chinook and coho harvest was approximately 3,150 and 28,150 fish, respectively, during this time period.

**Table 4. Southern Southeast Sport Harvest of SSRAA Salmon (number of fish), by Species, 2013-2017**

	2013	2014	2015	2016	2017	2013-2017 Average
Chinook	2,080	1,750	4,612	2,732	4,691	3,150
Coho	19,970	50,567	38,798	9,742	21,607	28,150

Source: SSRAA estimates. Note: Averages rounded to the nearest 50.

Data from ADF&G’s annual Statewide Harvest Survey for areas A (Ketchikan), B (POW), and C (Petersburg/Wrangell/Kake) indicate overall catches in the region averaged 28,300 Chinook and 144,200 coho annually from 2013-2016. Data for 2017 was not available at the time of this report.

**Table 5. Total Chinook and Coho Salmon Sportfish Harvest by Statewide Harvest Survey Area, 2013-2016 Averages**

Area	Chinook	Coho
Ketchikan (A)	10,200	50,850
Prince of Wales Island (B)	12,900	80,100
Petersburg, Wrangell & Kake (C)	5,200	13,250
<b>Southern Southeast (A, B &amp; C)</b>	<b>28,300</b>	<b>144,200</b>

Source: ADF&G 2014 Statewide Harvest Survey.

SSRAA’s contribution to the overall SSE sport harvest averaged 11 percent of Chinook and 20 percent of coho harvests, based on 2013-2016 data. As shown in Table 6, there is substantial variation year to year.

**Table 6. SSRAA Salmon, as a Percent of Total Southern Southeast Sport Harvest, 2013-2016**

	2013	2014	2015	2016	2013-2016 Average
Chinook	9	5	15	10	11
Coho	12	33	25	10	20

Source: ADF&G and SSRAA.

SSRAA’s role in the sportfishing sector is especially prominent in the Ketchikan area. ADF&G’s creel survey data indicates that roughly a third of the Chinook salmon caught in the Ketchikan area are typically SSRAA-produced fish, along with about 13 percent of the sport coho harvest.<sup>1</sup>

Similar data for the Petersburg/Wrangell/Kake area indicate roughly a quarter and a tenth of the sport harvest of Chinook and coho, respectively, near those communities was SSRAA fish. For the west coast of Prince of Wales Island (POW), creel data indicates roughly 2 to 5 percent of Chinook and coho harvests were SSRAA fish. These numbers were provided by ADF&G staff but are not regularly published and are presented as reference points to understand the relative importance of SSRAA fish in sport harvests throughout the region.<sup>2</sup>

## Charter Fleet Harvest of SSRAA Salmon

ADF&G charter vessel logbook data indicates that approximately 324 charter vessels offloaded in SSE ports in 2014 (the most recent data available). Of these, 146 offloaded in the Ketchikan area, 145 in POW ports, 26 in Petersburg, and 7 in Wrangell.<sup>3</sup> Vessels may operate out of multiple ports, and totals reflect an unknown, but likely minor, amount of double counting.

**Table 7. Southern Southeast Charter Vessels, by Port of Offloading, 2014**

SWHS Area	Port of Offloading	# of Vessels
A	Ketchikan	146
B	Prince of Wales Island	145
C	Petersburg	26
C	Wrangell	7
<b>Total SSE</b>		<b>324</b>

Source: ADF&G Saltwater Log Books, 2014 Note: Total may include some double counting.

Combined, charter vessels in SSE completed a total of 14,994 trips and supported 59,680 angler-days in 2014. Over 96 percent of angler days reflect non-residents. These fishermen harvested over 18,000 Chinook and 88,000 coho in 2014, representing 57 and 58 percent respectively, of the overall SSE sport harvest of these species that year.

The primary impact of SSRAA salmon for the Ketchikan charter industry occurs in the early Chinook season (May and June) and during the late coho run (late August through September). In May and June, the full-day and half-day charter fleet (primarily serving cruise visitors) is largely dependent on SSRAA Chinook returning to nearby release sites including Whitman Lake and Neets Bay. This is especially true in Summer 2018 due to low wild Chinook returns.

<sup>1</sup> The ADFG creel survey is based on a stratified random sampling at fishery landing locations. Not all times of day and landing locations are sampled each day. Surveys end in mid-September.

<sup>2</sup> Personal communication with Mike Jaenicke, ADF&G.

<sup>3</sup> ADF&G, 2016. *Participation, Effort, and Harvest in the Sport Fish Business/Guide Licensing and Logbook Programs, 2014*. Fishery Data Series No. 16-02.

# Economic Impacts of SSRAA Production and Operations

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SSRAA has a wide array of economic impacts in Southeast Alaska through its contributions to commercial fishing, seafood processing, sportfishing, and its own operations. Commercial fishermen earn income from the harvest of SSRAA-produced fish and purchase fuel, food, gear, and many other supplies in support of their fishing efforts. Seafood processing companies employ hundreds of workers and purchase goods and services as they add value to SSRAA salmon. SSRAA operations directly generate additional economic impacts through wages for its own employees and through purchases of goods and services in Ketchikan and other SSE communities. This spending cycles through the regional and local economies, creating indirect and induced economic “multiplier” effects.

As described in more detail below, SSRAA’s 2017 production and operations spurred economic output in Southeast Alaska totaling \$65 million, an economic footprint that included 640 jobs and \$30 million in labor income, including all multiplier effects. Specific contributions from commercial fishing, seafood processing, sportfishing, and SSRAA operations are outlined in this chapter.

## Commercial Fishing Economic Impacts

Over the 2013 to 2017 period, commercial fishermen harvested SSRAA salmon with an annual average ex-vessel value of \$16.8 million. A portion of this total ex-vessel value becomes pay for permit holders and crew, with the rest spent on the goods and services necessary to conduct commercial fishing operations. Both of these components of ex-vessel value fuel economic activity in the region’s support sector.

**Commercial fishing-related labor income:** Based on McDowell Group estimates, about 50 to 60 percent (depending on gear type) of commercial salmon fishing ex-vessel value becomes labor income or net pay for permit holders and crew. Based on these and other estimates, SSRAA-related labor income earned by skippers and crew averaged \$10.1 million over the 2013 to 2017 period.

As commercial fishermen spend their income in support of their households, “induced” employment and wages are generated.

Additional employment and labor income is created in the region as fishermen make purchases in support of their fishing business. An estimated \$3.8 million in in-region purchases are made annually in support of commercial fishing targeting SSRAA salmon, assuming roughly 60 percent of spending is in-region. Jobs and wages created by this spending are termed “indirect” economic impacts. This estimate factors in non-resident participation in the commercial harvest of SSRAA salmon.

McDowell Group modeling of indirect and induced effects indicates that commercial fishing for SSRAA salmon produced \$13.7 million in labor income, including direct, indirect, and induced impacts. This includes commercial fishing income earned in Southeast Alaska, and related multiplier effects in the regional economy.

**Commercial fishing related employment:** Measuring commercial salmon fishing employment in terms of full-time equivalents or monthly averages is difficult due to the highly seasonal nature of the fishery. However, it is useful to do so to provide a measure of relative importance. While several hundred skippers and crew harvest SSRAA-produced salmon, a measure of annual average equivalency places employment at 140 jobs. As described above, spending by fishermen in support of their fishing activity and households has multiplier effects, creating additional jobs and income. Including those multiplier effects, commercial harvest of SSRAA salmon accounted for an average of 230 jobs (including 140 direct jobs and 90 support sector jobs).

**Table 8. Economic Impact of Commercial Harvest of SSRAA-Produced Salmon**

	Direct	Indirect/Induced	Total
Employment	140	90	230
Labor Income	\$10.1 million	\$3.6 million	\$13.7 million

Source: McDowell Group estimates

## Seafood Processing Economic Impacts

Over the 2013 to 2017 period, the total first wholesale value of all SSRAA salmon averaged \$47.9 million, including the value of cost recovery production. Components of that total value include \$24.6 million in payments to fishermen for their catch and payments to SSRAA for cost recovery fish, an estimated \$7.4 million in wages paid to processing employees, and \$5.6 million in local purchases of goods and services in support of processing operations.

Direct employment related to processing of SSRAA salmon is estimated at 200 jobs in the SSE region. This is an annualized figure. The number of individual workers who earn some income from processing SSRAA salmon is much higher. Processing employment data for Ketchikan illustrates the relationship between annualized employment and peak employment. In 2016, for example, seafood processing accounted for 341 jobs in Ketchikan, averaged over all 12 months of the year. Peak employment (in August) totaled 968 jobs.

Similar to commercial fishing, there are indirect and induced (multiplier) effects associated with processor spending and employee spending in the local economy. The analysis of multiplier effects requires adjustments for non-resident participation in the seafood processing workforce. Non-resident workers spend less in the local economy than their resident co-workers and therefore have a lower multiplier impact. In the SSE region, non-residents account for about 70 percent of the jobs and 65 percent of the wages in seafood processing.

Based on McDowell Group modeling, a total of 310 jobs and \$11.6 million in annual labor income are linked to processing of SSRAA salmon, including all direct, indirect, and induced effects.

**Table 9. Economic Impact of Processing of SSRAA-Produced Salmon**

	Direct	Indirect/Induced	Total
Employment	200	110	310
Labor Income	\$7.4 million	\$4.2 million	\$11.6 million

Source: McDowell Group estimates

## Sportfishing Economic Impacts

Sport fish harvests of SSRAA Chinook and coho salmon also contribute significantly to the SSE economy. Direct economic impacts from the SSRAA sport fishery include non-resident spending in the region on guided fishing tours, boat rentals, fishing gear, bait, food, lodging, and transportation. Economic impacts resulting from resident sportfishing is not quantified for this report, as discussed in more detail below.

Based on the findings of previous McDowell Group studies and data from ADF&G and SSRAA, the study team estimated annual non-resident spending on sportfishing in the SSE region. SSRAA's percentage of the sport harvest, along with other data, was used to translate overall spending to spending attributable to SSRAA-produced salmon – estimated at \$3.3 million in 2014. That figure, adjusted for inflation, is assumed to be a reasonable estimate for 2017.

In 2017, the regional economic impact of non-resident sport harvest of SSRAA salmon included 60 annual equivalent jobs and \$2.2 million in labor income, including all direct and multiplier effects.

Resident sportfishing has a significant impact on the region's economy. Millions of dollars are spent each year on boats, fishing gear, fuel, bait, tackle, repairs and maintenance services, and harbor and ramp fees. Unfortunately, no reliable data is available on resident spending on sportfishing and an analysis of impacts resulting from resident sportfishing is outside the scope of this project.

## Economic Impacts of SSRAA Operations

In 2017, SSRAA employed an average of 60 workers who earned a total of \$3.3 million in wages. Additionally, the organization purchased supplies and services for its operations in Ketchikan (and its various hatcheries and release sites) which contributed to the regional economy. In state expenditures totaled \$3.6 million for 2017. The indirect and induced economic impact of employee spending and SSRAA spending on supplies and services is estimated at 20 jobs and \$800,000 in labor income. Based on those estimates, SSRAA operations impact totaled 81 jobs and \$4.1 million in labor income, including direct, indirect, and induced impacts.

**Table 10. Economic Impact of SSRAA Operations**

	Direct	Indirect/Induced	Total
Employment	60	20	80
Labor Income	\$3.3 million	\$0.8 million	\$4.1 million

Source: McDowell Group estimates

## Summary of Economic Impacts

The total economic impact of SSRAA, including jobs and income related to commercial fishing, seafood processing, non-resident sportfishing, and from SSRAA's own spending and employment, is estimated at 680 jobs and \$32 million in labor income.

**Table 11. Economic Impact of SSRAA, Including Direct, Indirect, and Induced Impacts, 2017**

	Commercial Fishing	Seafood Processing	Nonresident Sportfishing	SSRAA Operations	Total Impacts
Employment	230	310	60	80	680
Labor Income	\$13.7 million	\$11.6 million	\$2.2 million	\$4.1 million	\$32 million

Source: McDowell Group estimates

Output is a measure of total economic activity, including all labor income, spending on supplies and services, and all related multiplier effects. Economic output associated with SSRAA and the salmon it produces totaled approximately \$70 million in 2017.

## Realized and Expected Production Increases

The economic impact analysis presented in this report is based on average SSRAA salmon returns (and resulting harvest volumes and values) over the 2013 to 2017 period. These returns are the result of releases three to six years earlier, depending on the species.

SSRAA has seen increased releases in the last few years due to increased chum production and the incorporation of the Klawock River Hatchery previously operated by the Prince of Wales Hatchery Association. These recent additional releases have not yet translated into increased harvests and are not reflected in the ex-vessel value and first wholesale value numbers presented in this report. (On the other hand, the operating expenses associated with running these additional programs *are* included in the economic impact calculations in this report, as the SSRAA operations analysis is based on 2017 financial statements and vendor data.)

In addition to recent increases, additional production has been planned and permitted and can be expected to be realized by 2020. Compared to the production years that resulted in the 2017 harvests, the following increases are expected by 2020:<sup>4</sup>

- 30 percent increase in summer chum production
- 16 percent increase in fall chum production
- 45 percent increase in fall coho production
- 12 percent increase in Chinook production.

<sup>4</sup> Based on data provided by SSRAA.

To put these increases in perspective, summer chum is anticipated to constitute 79 percent of total releases in 2020, followed by fall chum (14 percent), fall coho (4 percent), summer coho (1 percent), and Chinook (1 percent).

Translating increased production into increased economic impacts is challenging due a variety of factors. A point of reference can be calculated based on assuming a conservative 25 percent increase in overall releases and a similar increase in average ex-vessel volumes and values by 2025. A roughly 25 percent increase over 2013-2017 averages would result in ex-vessel values to commercial fishermen of \$21 million by 2025 (an additional \$4.2 million). The economic output resulting from these additional increases would likely not increase at the same rate, but an increase of 20 percent would bring the total economic output associated with SSRAA to \$84 million.

# Tax Revenue Associated with SSRAA Salmon

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## **Fisheries Business Tax**

All salmon commercially harvested and processed in Southeast Alaska, including SSRAA-produced common property and cost recovery fish, are subject to a 3 percent Fisheries Business Tax paid by commercial seafood processors. Revenue from the Fisheries Business Tax is shared equally between the State of Alaska and the city or borough where the fish were landed.

From 2013 through 2017, the estimated Fisheries Business tax receipts derived from SSRAA salmon totaled \$3 million, with an annual average of \$507,000. Half of these receipts are shared with local governments where the fish was landed. In SSE, most of the local government revenue impacts of the Fisheries Business Tax will be felt in Ketchikan, Wrangell, and Petersburg due to the location of major salmon processing plants.

## **Local Taxes**

Regional spending resulting from SSRAA production and operations also leads to substantial tax revenue to local governments, including sales, property, and bed tax revenue. These revenues occur as a result of spending in all sectors directly and indirectly impacted by SSRAA. Estimating these local tax impacts is beyond the scope of this study.



## Chum Market Trends

Market trends have significant implications for SSRAA and the commercial fleet harvesting SSRAA-sourced fish. Changes to the value of chum are particularly relevant as the species is the primary focus of the hatchery association and the species usually accounts for about 80 percent of the average first wholesale value of products made with SSRAA salmon.

Southeast Alaska chum salmon prices to fishermen averaged \$0.74 per pound from 2008 through 2017 – more than double the average over the preceding decade. Prices peaked at close to a dollar per pound in 2011, after which they dropped to \$0.59 a pound in 2015 and then rebounded to \$0.86 by 2017. Preliminary 2018 prices appear to be comparable or higher than 2017.

Roe value is a key driver of chum prices, generally contributing close to 50 percent or more of the total wholesale value of the species to processors. Prices reported to DOR and published in the department's Alaska Salmon Price Reports include all types of chum roe combined. Based on this dataset, chum roe prices in Southeast Alaska peaked at over \$20 a pound in Fall 2012. More recently, chum roe has been selling at wholesale prices in the \$15 to \$17 range.

Prices paid to Southeast Alaska processors for frozen headed and gutted (H&G) chum have also risen steadily – from around \$0.59 in 2004 to \$1.69 in 2017. Similar to chum roe, frozen H&G prices peaked in 2012 at \$2.01 a pound.

After frozen H&G and roe products – which each provide comparable total revenues to Southeast processors – the next most import product form is frozen fillets. In 2015 (the year with the most complete data), frozen fillets made up 7 percent of total chum product sales reported by Southeast processors. Prices reported for frozen fillets followed similar trends to other chum products, with a 2017 price of \$3.55.

Prices in 2018 are expected to be favorable due to lower than average production in Japan (a leading chum producer), relatively high farmed salmon prices, and lower run forecasts for 2018.

## Coho Market Trends

Average Southeast Alaska coho salmon prices to fishermen rose above \$1 a pound starting in 2006, only dropping below that milestone in one subsequent year (2015 saw an average price of \$0.91 a pound). Over the last ten years, the ex-vessel price averaged \$1.34 a pound and has been as high as \$1.64 (2008). In 2017, Southeast Alaska fishermen received an average price of \$1.55 a pound, the second highest on record.

First wholesale prices also hit near record highs in 2017, continuing a steady trend of increasing prices. Frozen H&G coho prices hit \$3.45 a pound in 2017, the second highest on record (2013 saw prices of \$3.60 a pound).

Frozen Southeast Alaska coho fillets went for as much as \$6.39 a pound last year, also the second highest on record and up from \$3.58 in 2004.

Based on production data reported to the Alaska Department of Revenue (Alaska Salmon Price Reports), frozen H&G products made up 44 percent of revenue from coho salmon, followed by frozen fillets (27 percent), and fresh H&G (24 percent). Roe made up only 4 percent.

## **Chinook Market Trends**

Chinook salmon ex-vessel prices to Southeast Alaska fishermen have climbed steadily over the last decade. Previously averaging around \$2 a pound (from 1984 through 2007), the last decade saw average ex-vessel prices of \$4.82. In 2017 – a year with low harvest volumes – fishermen received an all-time high of \$7.44 a pound. Due to strong demand and limited supply, preliminary 2018 ex-vessel prices are even higher than 2017.

Wholesale prices also hit peaks in 2017. Frozen filet prices averaged \$14.94 a pound in 2017, up from \$11.73 the previous year and \$8.45 in 2015. Fresh H&G Chinook prices averaged \$9.70 a pound in 2017, up 50 percent over 2016 prices and 25 percent over 2008. Roughly half of Chinook wholesale value derives from sales of frozen fillets (49 percent in 2017), followed by fresh H&G (28 percent), and frozen H&G (22 percent).