

# Economic Impact Assessment of Guided Angling

Sea-to-Sky Region

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Prepared for:

Sea-to-Sky Angling Guides

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# Table of Contents

<b>Executive Summary</b>	<b>2</b>
<b>1.0 Introduction</b>	<b>2</b>
1.1 Reference Area	3
1.2 Seasons in the Sea-to-Sky Corridor	5
<b>2.0 Aggregate Impacts</b>	<b>6</b>
2.1 Effort & Timing	6
2.2 Impacts Overview	6
<b>3.0 Coho and Chum Salmon Season</b>	<b>9</b>
3.1 Effort & Timing	9
3.2 Impacts Overview	10
3.3 Value Per Landed and Killed Fish	12
<b>4.0 Pink Salmon Season</b>	<b>14</b>
4.1 Effort & Timing	14
4.2 Impacts Overview	15
4.3 Value Per Landed and Killed Fish	16
<b>5.0 Spring Steelhead Season</b>	<b>19</b>
5.1 Effort & Timing	19
5.2 Impacts Overview	20
5.3 Value Per Landed and Killed Fish	21
<b>6.0 Lake Season</b>	<b>24</b>
6.1 Effort & Timing	24
6.2 Impacts Overview	25
6.3 Value Per Landed and Killed Fish	26
<b>7.0 Conclusion</b>	<b>29</b>
<b>References</b>	<b>30</b>
<b>Appendix A - Methods</b>	<b>30</b>

# Executive Summary

This study estimates the economic contribution of guided angling over the calendar years of 2016, 2017, 2018 and 2019 for the four guiding seasons in the Sea-to-Sky region. We find that the four major fisheries that constitute the main Sea-to-Sky guided angling seasons — coho and chum salmon, spring steelhead, pink salmon and lake fishing — are of increasing economic importance.

Targeting non-anadromous fish occurs almost year round, but there are several distinct guiding seasons that mirror the freshwater migration of targeted anadromous salmonids:

- January and February provide some opportunities for fishing for non-anadromous fish, but lakes are typically frozen and streams are limited by low water conditions and cold weather.
- In March, targeting steelhead in streams and non-anadromous fish in lakes begins. The spring steelhead season lasts until freshet, typically at the end of April, or until rains dirty the water such that they are unfishable. During the freshet, there is a lull in fishing for anadromous fish until salmon start to return to their home streams.
- In odd-numbered years, targeting pink salmon typically starts in July and continues until mid-September, when coho salmon and chum salmon start to enter the rivers.
- The coho and chum salmon season typically begins mid-September and continues until the start of December. In October, the lake fishing season comes to a close as temperatures drop and many lakes in the region start to freeze over.

Our analysis shows that the number of angling days is up 21.1% from 2016 to 2019, from 2,206 to 2,694 guided angling days. On average, the economic impacts of guided angling in the Sea-to-Sky region amounted to over \$1.5 million per year in terms of domestic output, just under \$850,000 in annual GDP, and over \$450,000 in labour income in British Columbia (BC). But the economic impacts of guided angling in the Sea-to-Sky region extends beyond BC. Domestic output totalled over \$1.7 million across Canada and \$1.0 million in GDP in 2019, which increased 44.7% and 49.3% respectively from 2016 to 2019. In 2019, guided angling in the Sea-to-Sky region supported over 14 jobs. Relative to the impact on fish, the economic benefits are high. For example, assuming a 10% mortality rate, one coho or chum killed through incidental mortality results in an average of \$11,659 of domestic output, \$6,596 of GDP, \$305.72 of net taxes, \$3,752 of labour income, \$2,588 of gross operating surplus, and \$502 of international imports across Canada.

Based on the estimates developed in this study, we conclude that the economic benefits of guided angling in the Sea-to-Sky region are relatively high compared to its impacts on populations of coho and chum, spring steelhead, pink salmon and other fish. This is largely due to the sustainable, catch-and-release model of guided angling, and its growing popularity as a tourism sport in the Sea-to-Sky region.

# 1.0 Introduction

In the fall of 2020, Fisheries and Oceans Canada (DFO) closed the non-retention fishery for chum salmon, while still allowing recreational angling for coho salmon on the Squamish River and its tributaries. This action was not only unprecedented, but came as a surprise to recreational Sea-to-Sky anglers. There was little substantive rationale provided for the decision, and no consultation with the angling community nor public consideration of the economic impacts.

These and potential future closures are expected to cause a significant impact on guiding businesses and the associated benefits that accrue to the economy in the Sea-to-Sky region. Importantly, in an era of lower salmon abundance, it is essential to consider how resource utilization compares with the value generated by different stakeholders. For example, guided angling in the Sea-to-Sky tends to generate very large impacts per fish killed since the fisheries in the Sea-to-Sky are generally catch-and-release.

It is within this context that this study provides the first estimates of the economic impacts of recreational or guided angling in the Sea-to-Sky region. This project provides economic impact estimates in the calendar years of 2016, 2017, 2018, and 2019 for guided angling on water bodies in the Sea-to-Sky region. The remainder of the report is organized as follows:

We first define the reference area ("Sea-to-Sky region") and the waterbodies that are included in this reference area. We then provide an overview of the timing and effort of guided angling and define the seasons over the course of the calendar year. The guiding seasons in the Sea-to-Sky Region identified and presented in this report are: coho and chum season (mid September to mid December), pink salmon season (July to mid September), spring steelhead (March and April), and lake season (March to October).

We then examine the economic impacts of the industry as a whole over our reference years (2016–2019) in terms of domestic output, gross domestic product (GDP), net taxes, labour income, gross operating surplus, international imports and jobs. For each guiding season we provide these economic impacts and provide an analysis of the economic impacts per caught, as well as landed and killed fish.

## 1.1 Reference Area

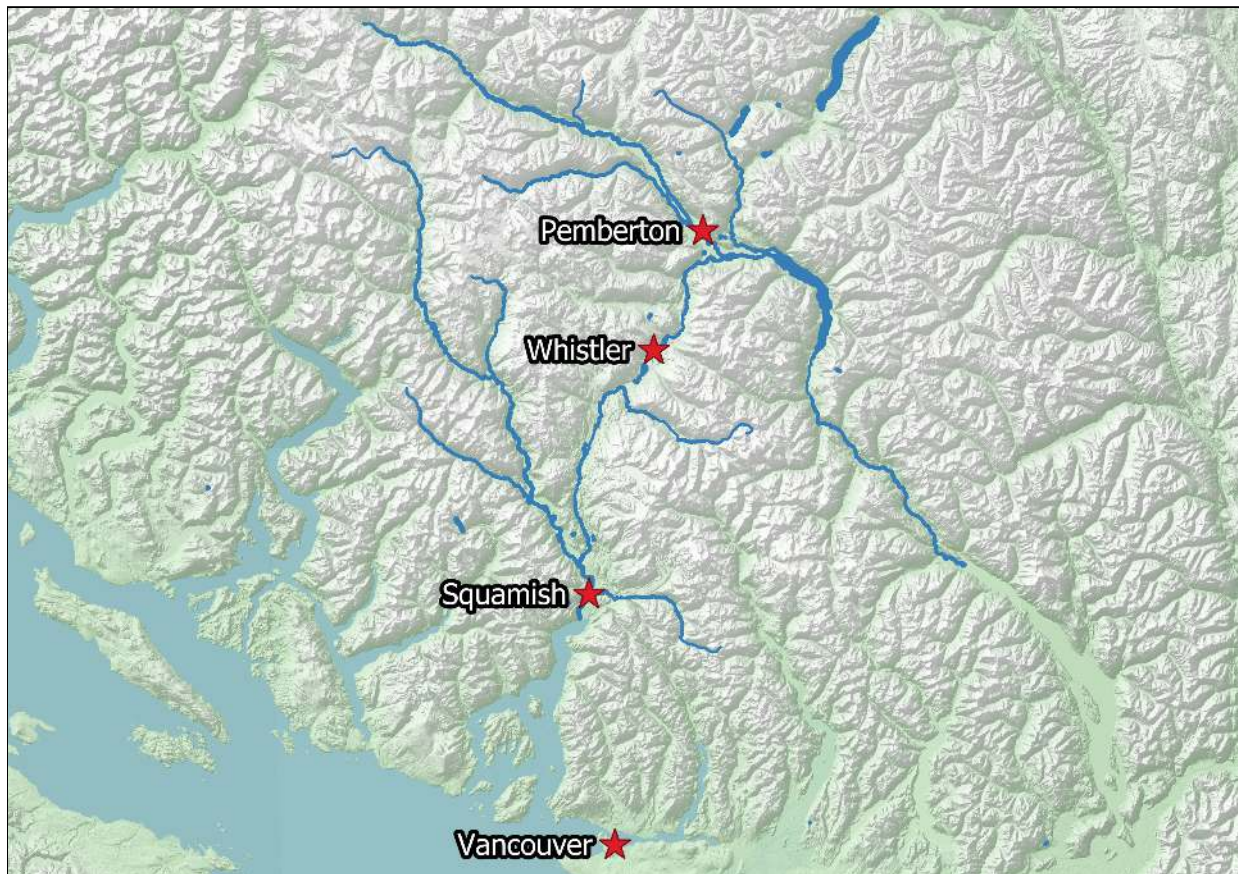
Our reference area captures guided angling that is based in the Sea-to-Sky region, or approximately the area from the District of Squamish to north of the Village of Pemberton (Figure 1.1). Most guiding businesses in our study are located in the Sea-to-Sky region, with some based out of Vancouver. Our study includes guiding activity from businesses that have "rod days" on waterbodies in the Sea-to-Sky region. Our reference area includes the waterbodies listed in Table 1.1. Throughout this report, economic impacts are presented at two geographical levels: the Province of British Columbia (BC) and Canada as a whole.

**Table 1.1: Major Waterbodies Defined in our Reference Area**

Lakes			Streams
Alpha Lake	Green Lake	Mowson Pond	Ashlu Creek
Alta Lake	Gwenyth Lake	Nita Lake	Birkenhead River
Anderson Lake	Ivey Lake	Ogre Lake	Cheakamus River
Birkenhead Lake	Levette Lake	One Mile Lake	Elaho River
Blackwater Lake	Lillooet Lake	Phantom Lake	Green River
Brohm Lake	Loggers Lake	Salamander Lake	Lillooet River
Cougar Lake	Lost Lake	Shadow Lake	Mamquam River
Echo Lake	Lucille Lake	Showh Lakes	Ryan River
Fowl Lake	Madeley Lake		Sampson Creek
Gates Lake	Mosquito Lake		Sloquet River
			Squamish River

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

**Figure 1.1: Map of the Sea-to-Sky Guided Angling Region**



Source: Big River custom map, waterbodies from Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

## 1.2 Seasons in the Sea-to-Sky Corridor

There are several guiding seasons in the Sea-to-Sky region. Targeting non-anadromous fish occurs almost year round, but there are several distinct guiding seasons that mirror the freshwater migration of targeted anadromous salmonids:

- January and February provide some opportunities for fishing for non-anadromous fish, but lakes are typically frozen and streams are limited by low water conditions and cold weather.
- In March, targeting steelhead in streams and non-anadromous fish in lakes begins. The spring steelhead season lasts until freshet, typically at the end of April, or until rains dirty the water such that they are unfishable. During the freshet, there is a lull in fishing for anadromous fish until salmon start to return to their home streams.
- In odd-numbered years, targeting pink salmon typically starts in July and continues until mid-September, when coho salmon and chum salmon start to enter the rivers.
- The coho and chum salmon season typically begins mid-September and continues until the start of December. In October, the lake fishing season comes to a close as temperatures drop and many lakes in the region start to freeze over.

Guided angling days in the pink salmon season increased by 17.1% from 2017 to 2019. The coho and chum salmon season typically begins mid-September and continues until the start of December. The number of guided angling days for coho and chum salmon increased by 21.7% from 2016 to 2018, but dropped by -25.4% from 2018 to 2019 due to poor fishing conditions. In October, the lake fishing season comes to a close as temperatures drop and many lakes in the region start to freeze over.

Table 1.2 presents our definitions of the respective guiding seasons, by major waterbody and month, that make up the guided angling year in the Sea-to-Sky Region.

**Table 1.2: Seasons by Timing and Waterbody, Sea-to-Sky Region.<sup>1</sup>**

Season	Timing	Waterbodies
Spring Steelhead	March–April	Cheakamus River Lillooet River Mamquam River Squamish River
Pink Salmon	July–Mid-September (Odd Years)	Ashlu Creek Birkenhead River Cheakamus Mamquam River Squamish River
Coho and Chum Salmon	Mid-September–Mid-December	Ashlu Creek Birkenhead River

<sup>1</sup> These seasons specify the primary target species by time period, multiple species can be targeted on almost all waterbodies throughout the year.

		Cheakamus River Lillooet River Mamquam River Squamish River
Lake Fishing	March to October	All Lakes

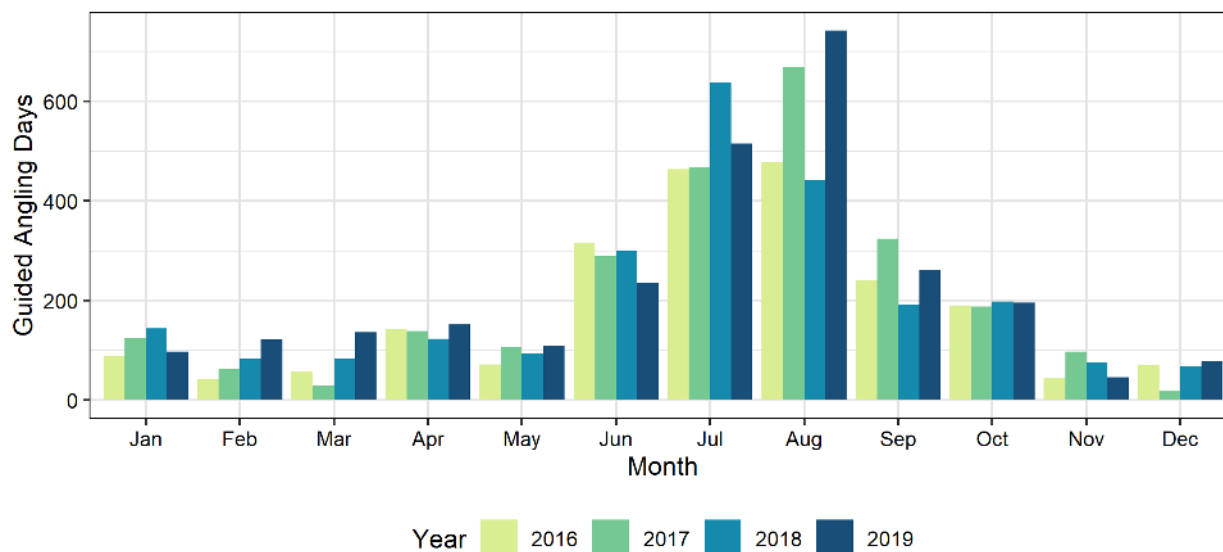
## 2.0 Aggregate Impacts

This section of the report presents aggregate results for guided angling that took place in the Sea-to-Sky region over the calendar years of 2016, 2017, 2018, and 2019.

### 2.1 Effort & Timing

Figure 2.1 shows the number of guided angler days in each month of our reference years. Growth in guided angling days is evident (see Table 2.1), with the most notable increase in August of 2019 during peak pink salmon season.

**Figure 2.1: Guided Angling Activity by Month, Sea-to-Sky region, 2016-2019**



Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

**Table 2.1: Guided Angler Days and Year-Over-Year Growth, Sea-to-Sky Region, 2016-2019**

	2016	2017	2018	2019
<b>Guided Angler Days</b>	2,206	2,516	2,441	2,694
<b>Growth (%)</b>	---	12.32%	-3.07%	9.39%

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2



## 2.2 Impacts Overview

The economic impacts in this report are measured in terms of domestic output, GDP, net taxes, labour income, gross operating surplus, international imports, and employment (jobs). Domestic output is estimated as the total spending attributable to guided angling that takes place in our reference area minus imports and indirect taxes on consumption. GDP in this context measures the final value of the goods and services produced in the guided angling economy; from guides, retail shops, restaurants and hotels, and other participants in the value-chain. Taxation is presented in terms of net taxes, meaning the total federal and provincial taxes after any subsidies. Labour income is all income that is generated from goods and services in the guided angling economy. Gross operating surplus is income generated by incorporated businesses less wages paid and applicable taxes. International imports are the value of imported goods that result from guided angling economy. Finally, employment is measured in terms of total jobs, not full-time equivalent (FTE) jobs. Total jobs includes full-time, part-time and seasonal employment, which is appropriate for this study as guided angling is a seasonal business.

The total economic impact is comprised of three components: the direct component, which is largely payments to guiding businesses net of their expenditures; the indirect component, which captures the demand created by guided angling for inputs (e.g. rods and fishing gear, food for lunches); and the induced component, which measures the spillover impact when industry participants (guides and assistant guides) spend the money they have earned in the local economy. In the body of this report, unless otherwise noted, total impacts (direct, indirect, and induced impacts) are presented. A detailed breakdown of the components of total impacts is included in the appendix.

The roughly 2,500 guided angling days per year in the Sea-to-Sky area generate significant economic impacts in BC and Canada as a whole (see Table 2.2.1 and 2.2.2). On average, the economic impacts of the guided angling in the Sea-to-Sky region amounted to over \$1.5 million per year in terms of domestic output, just under \$850,000 in annual GDP, and over \$450,000 in labour income in BC.

**Table 2.2.1: Economic Impacts - Guided Angling in the Sea-to-Sky Region, 2016–2019, BC**

	2016	2017	2018	2019	Average
<b>Domestic Output</b>	\$1,104,875.00	\$1,598,248.00	\$1,713,881.00	\$1,605,029.00	\$1,505,508.00
<b>GDP</b>	\$624,349.40	\$865,490.50	\$969,295.70	\$937,798.90	\$849,233.60
<b>Net taxes</b>	\$27,433.39	\$43,081.20	\$43,910.58	\$39,035.72	\$38,365.22
<b>Labour income</b>	\$318,397.50	\$518,955.60	\$548,397.00	\$559,011.10	\$486,190.30
<b>Gross operating surplus</b>	\$283,368.70	\$313,008.90	\$385,688.60	\$345,868.40	\$331,983.60
<b>International imports</b>	\$41,885.50	\$67,243.23	\$66,926.14	\$56,649.28	\$58,176.04
<b>Jobs</b>	9.06	15.06	15.68	15.98	13.94

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers



The economic impacts of guided angling in the Sea-to-Sky region extend beyond just BC. Flights, car rentals, hotels, restaurants and other service providers across Canada benefit from angling trips to the Sea-to-Sky region and from Sea-to-Sky guides procuring inputs for their businesses (see Table 2.2.2). On average, the economic impacts in Canada amount to just over \$1.6 million in terms of annual domestic output (direct + indirect + induced impacts), over \$900,000 in terms of annual GDP, and over \$500,000 in labour income per year. Over average, over 14 jobs are attributable to the guided angling industry in the Sea-to-Sky region.

**Table 2.2.2: Economic Impacts in Canada (including BC) Associated with Guided Angling in the Sea-to-Sky Region, 2016–2019**

	2016	2017	2018	2019	Average
<b>Domestic Output</b>	\$1,195,049.00	\$1,739,783.00	\$1,855,461.00	\$1,729,543.00	\$1,629,959.00
<b>GDP</b>	\$672,100.60	\$939,824.90	\$1,043,768.00	\$1,003,483.00	\$914,794.10
<b>Net taxes</b>	\$30,936.43	\$48,504.41	\$49,360.52	\$43,844.31	\$43,161.41
<b>Labour income</b>	\$343,152.80	\$557,354.40	\$586,854.90	\$593,097.40	\$520,114.90
<b>Gross operating surplus</b>	\$302,806.50	\$343,453.90	\$416,209.50	\$372,692.90	\$358,790.70
<b>International imports</b>	\$51,363.92	\$82,296.00	\$81,870.79	\$69,522.39	\$71,263.27
<b>Jobs</b>	9.48	15.71	16.33	16.55	14.52

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

## 3.0 Coho and Chum Salmon Season

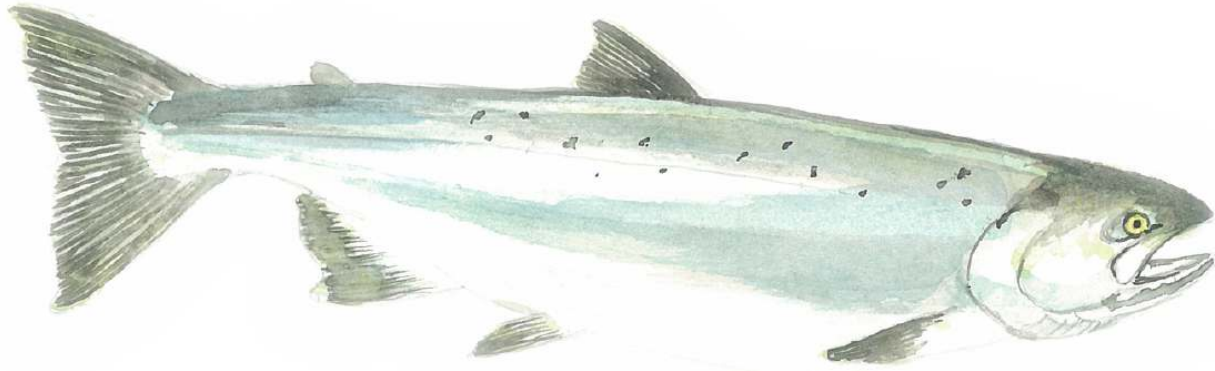


Image Credit: Rod Brown - Cohowood Studio

This section of the report presents results for the fall coho and chum salmon season (mid-September to mid-December).

Coho can migrate into the freshwater systems of the Sea-to-Sky region as early as late August, but generally coho and chum are not targeted until mid-September. Coho and chum salmon will continue to enter Sea-to-Sky rivers to spawn all the way until late November and can sometimes be found in the system well into December.

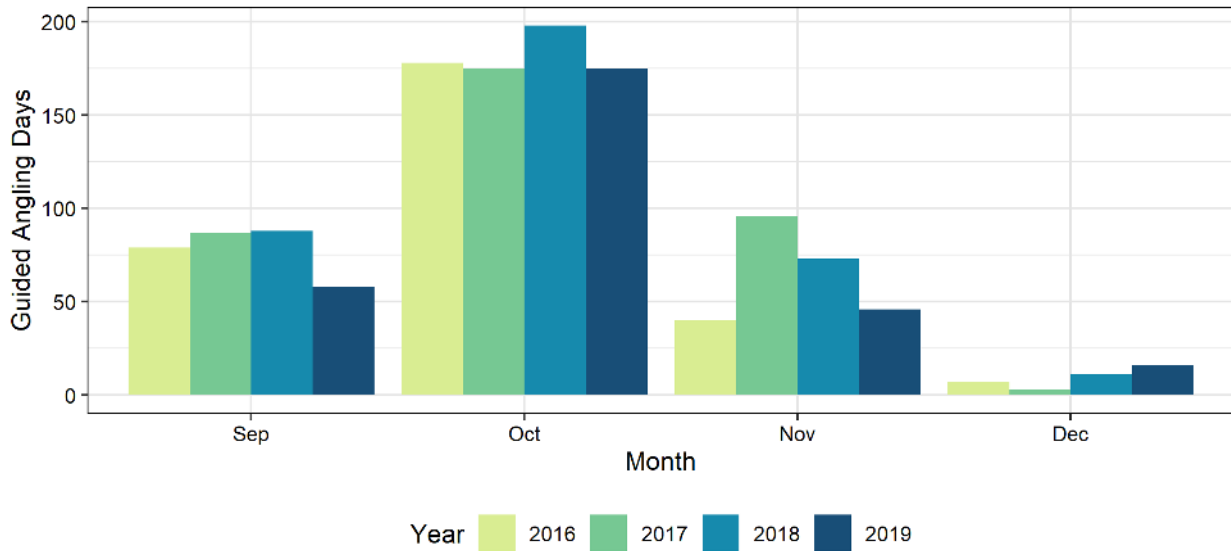
The coho and chum fishery in the Sea-to-Sky region is smaller than other nearby salmon fisheries on the tributaries of the Fraser River. It is generally a catch-and-release fishery with only limited harvesting opportunities available originating from the Tenderfoot Creek Hatchery on the Cheakamus River. Over our reference period during the coho and chum season, only one salmon was reported as being retained. This low abundance of hatchery salmon can be part of the appeal for those anglers who wish to come in contact with a wild fish. Although in other fisheries, chum salmon are sometimes overlooked due to their lower quality meat, in the Sea-to-Sky region they are sought after, as they are second only to chinook salmon in their strength and size.

### 3.1 Effort & Timing

Because there is no data source that measures coho and chum salmon abundance or run timing, our best data source for timing is guiding data. Guiding data suggests that, after accounting for outliers, the coho and chum season starts in mid-September, peaks in October and continues until mid-December when there is lack of fresh fish and colder weather starts to set in.

Figure 3.1 presents guided angling activity for each month over our reference years, highlighting the coho and chum salmon fishery. Guided angling grew by over 20 percent from 2016 to 2018, but substantially dropped to below 2016 levels in 2019. This is likely due, as some guides noted, to the particularly poor fishing conditions during the coho and chum season of 2019 when more trips than usual needed to be cancelled due to high and muddy water conditions.

**Figure 3.1: Guided Angling Activity Targeting Coho and Chum Salmon by Month, Sea-to-Sky Region, 2016–2019**



Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

Table 3.1 presents the number of guided angling days during the coho and chum season by year, and the year-over-year percentage changes.

**Table 3.1: Guided Angler Days and Year-Over-Year Growth, Coho and Chum Salmon, Sea-to-Sky Region, 2016–2019**

	2016	2017	2018	2019
<b>Guided Angler Days</b>	304	361	370	295
<b>Growth (%)</b>	---	15.79%	2.43%	-25.42%

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

## 3.2 Impacts Overview

The roughly 330 guided angling days per year directed at coho and chum salmon in the Sea-to-Sky region generate significant economic impacts in BC and Canada as a whole. Table 3.2.1 presents those impacts of spending, domestic output, GDP, employment, and taxation within BC.

On average, the economic impacts of guided angling directed at coho and chum salmon in the Sea-to-Sky region for BC amount to just over \$200,000 in annual domestic output, almost \$115,000 in annual GDP, and over \$65,000 in labour income per year. On average, under two jobs are attributable to guided angling directed at coho and chum salmon.

**Table 3.2.1: Economic Impacts in BC associated with Guided Angling in the Sea-to-Sky Region Directed at Coho and/or Chum Salmon, 2016–2019**

	2016	2017	2018	2019	Average
<b>Output</b>	\$152,258.40	\$229,319.40	\$259,785.40	\$175,754.80	\$204,279.50
<b>GDP</b>	\$86,039.08	\$124,182.10	\$146,923.20	\$102,691.40	\$114,958.90
<b>Net taxes</b>	\$3,780.49	\$6,181.37	\$6,655.84	\$4,274.51	\$5,223.05
<b>Labour income</b>	\$43,877.08	\$74,460.64	\$83,124.49	\$61,213.17	\$65,668.85
<b>Gross operating surplus</b>	\$39,049.91	\$44,911.05	\$58,461.60	\$37,873.49	\$45,074.01
<b>International imports</b>	\$5,772.07	\$9,648.18	\$10,144.48	\$6,203.24	\$7,941.99
<b>Jobs</b>	1.25	2.16	2.38	1.75	1.88

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

The economic impacts of guided angling directed at coho and chum salmon in the Sea-to-Sky region extend beyond BC to all of Canada (see Table 3.2.2). On average, the economic impacts of guided angling directed at coho and chum salmon in the Sea-to-Sky region amount to just over \$220,000 in Canada’s annual domestic output, almost \$124,000 in annual GDP, and over \$70,000 in labour income per year. On average, just under two jobs are attributable to guided angling directed at coho and chum salmon.

**Table 3.2.2: Economic Impacts in Canada (Including BC) Associated with Guided Angling in the Sea-to-Sky Region Directed at Coho and/or Chum Salmon, 2016–2019**

	2016	2017	2018	2019	Average
<b>Domestic Output</b>	\$164,685.00	\$249,627.10	\$281,245.60	\$189,389.40	\$221,236.80
<b>GDP</b>	\$92,619.48	\$134,847.70	\$158,211.50	\$109,884.00	\$123,890.70
<b>Net taxes</b>	\$4,263.23	\$6,959.50	\$7,481.93	\$4,801.07	\$5,876.43
<b>Labour income</b>	\$47,288.51	\$79,970.17	\$88,953.84	\$64,945.71	\$70,289.56
<b>Gross operating surplus</b>	\$41,728.55	\$49,279.35	\$63,087.89	\$40,810.85	\$48,726.66
<b>International imports</b>	\$7,078.26	\$11,807.97	\$12,409.75	\$7,612.88	\$9,727.21
<b>Jobs</b>	1.31	2.25	2.48	1.81	1.96

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

### 3.3 Value Per Landed and Killed Fish

In this section we examine the economic value per landed fish and killed fish. The coho and chum fishery in the Sea-to-Sky region is primarily a catch-and-release fishery with only one recorded case of a kept coho salmon (see Table 3.3.1). However, there is additional incidental mortality attributable to catch-and-release angling. The factors that influence mortality estimates create a range of possible rates that might apply to the Sea-to-Sky coho and chum salmon fishery, hence why estimates of the economic impact per killed coho or chum salmon for mortality rates of 5%, 10%, and 15% are provided (see Table 3.3.3 to Table 3.3.5).

**Table 3.3.1: Guided Angler Success, Coho or Chum Salmon Caught, 2016–2019**

Year	Released/Day	Kept/Day	Released	Kept	Caught
2016	1.77	0.00	233	0	233
2017	2.23	0.00	399	0	399
2018	0.89	0.00	167	0	167
2019	0.70	0.01	105	1	106

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

The economic impacts per coho or chum salmon caught in the Sea-to-Sky region between 2016 and 2019 are presented in Table 3.3.2. The average domestic output per coho or chum salmon caught in 2017 and 2019 was \$1,200.81. The economic impacts per fish in 2018 and 2019 were approximately double of those in 2016 and 2017 because significantly fewer fish were caught in 2018 and 2019 (167 in 2018 and 106 in 2019 compared to 233 in 2016 and 399 in 2017).

**Table 3.3.2: Economic Impact per Coho or Chum Salmon Caught from Guided Angling in the Sea-to-Sky Region, 2016–2019**

	2016	2017	2018	2019
Domestic Output	\$706.80	\$625.63	\$1,684.11	\$1,786.69
GDP	\$397.51	\$337.96	\$947.37	\$1,036.64
Net taxes	\$18.30	\$17.44	\$44.80	\$45.29
Labour income	\$202.95	\$200.43	\$532.66	\$612.70
Gross operating surplus	\$179.09	\$123.51	\$377.77	\$385.01
International imports	\$30.38	\$29.59	\$74.31	\$71.82

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

Tables 3.3.3 through 3.3.5 present the economic impact per coho or chum salmon killed for 5%, 10%, and 15% incident mortality. Assuming a 10% mortality rate, one coho or chum killed through incidental mortality results in an average of \$11,659 of domestic output, \$6,596 of GDP, \$305.72 of net taxes, \$3,752 of labour income, \$2,588 of gross operating surplus, and \$502 of international imports across Canada.

**Table 3.3.3: Economic Impact per Coho or Chum Salmon Killed from Guided Angling in the Sea-to-Sky Region, 5% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
Output	\$14,136.05	\$12,512.63	\$33,682.11	\$30,302.31
GDP	\$7,950.17	\$6,759.28	\$18,947.48	\$17,581.43
Net taxes	\$365.94	\$348.85	\$896.04	\$768.17
Labour income	\$4,059.10	\$4,008.53	\$10,653.15	\$10,391.31
Gross operating surplus	\$3,581.85	\$2,470.14	\$7,555.44	\$6,529.74
International imports	\$607.58	\$591.88	\$1,486.20	\$1,218.06

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

**Table 3.3.4: Economic Impact per Coho or Chum Salmon Killed from Guided Angling in the Sea-to-Sky Region, 10% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
Output	\$7,068.02	\$6,256.32	\$16,841.05	\$16,468.64
GDP	\$3,975.08	\$3,379.64	\$9,473.74	\$9,555.13
Net taxes	\$182.97	\$174.42	\$448.02	\$417.48
Labour income	\$2,029.55	\$2,004.26	\$5,326.58	\$5,647.45
Gross operating surplus	\$1,790.92	\$1,235.07	\$3,777.72	\$3,548.77
International imports	\$303.79	\$295.94	\$743.10	\$661.99

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

**Table 3.3.5: Economic Impact per Coho or Chum Salmon Killed from Guided Angling in the Sea-to-Sky Region, 15% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
Output	\$4,712.02	\$4,170.88	\$11,227.37	\$11,306.83
GDP	\$2,650.06	\$2,253.09	\$6,315.83	\$6,560.24
Net taxes	\$121.98	\$116.28	\$298.68	\$286.63
Labour income	\$1,353.03	\$1,336.18	\$3,551.05	\$3,877.36
Gross operating surplus	\$1,193.95	\$823.38	\$2,518.48	\$2,436.47
International imports	\$202.53	\$197.29	\$495.40	\$454.50

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multiplier

## 4.0 Pink Salmon Season

This section of the report presents results for the summer pink salmon season (July to mid-September, odd years).

Pink salmon start to migrate into the freshwater systems of the Sea-to-Sky region during odd years in July. The season peaks in August but fish can be found in the system as late as October. Around mid-September, the target salmon species for anglers generally shifts from pink salmon to coho and chum salmon, but fishing methods and techniques are similar among the three species.

Although pink salmon only enter the rivers of the Sea-to-Sky region every two years, they come in much greater abundance than other species, making it very likely for anglers to come into contact with a fish. The high chances of catching a salmon and the warm summer weather make it an attractive and accessible fishery for anglers of all skill levels. It is not uncommon for anglers to catch more than 20 fish on a good day during peak season. Anglers in the Sea-to-Sky region do occasionally keep a pink salmon when allowed, but the majority are released. .

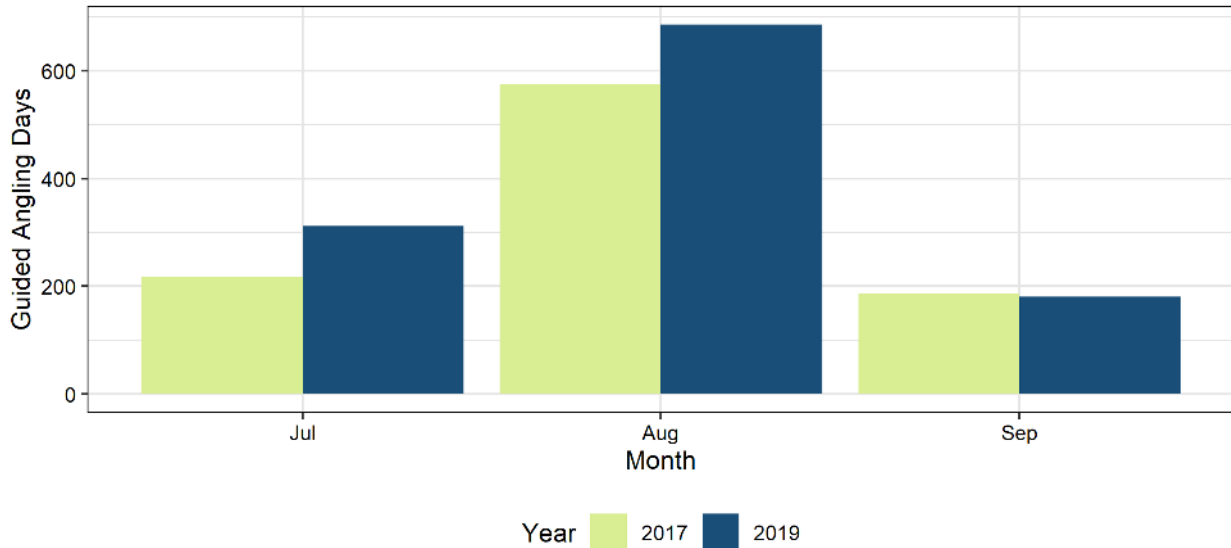
### 4.1 Effort & Timing

The guiding data suggests that the pink salmon season starts at the beginning of July and continues to about mid-September, when the focus turns to targeting coho and chum salmon. There is some overlap between the two seasons, but in order to separate guiding activity by target species, the pink salmon season and the coho and chum season have been defined such that the pink salmon season ends when the coho and chum salmon season begins.

Figure 4.1 presents guiding activity for each month of the two pink salmon years in our reference period, highlighting the pink salmon fishery. Between 2017 and 2019, guided angling for pink salmon grew by 17%. Pink salmon also have the highest number of annual guided angling days out of any of the species in our target area.



**Figure 4.1: Guided Angling Activity Targeting Pink Salmon by Month, Sea-to-Sky Region, 2016–2019**



Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

Table 4.1 presents the number of guided angling days during the pink salmon season by year, and the year-over-year percentage changes.

**Table 4.1: Guided Angler Days and Year-Over-Year Growth, Pink Salmon, Sea-to-Sky Region, 2016–2019**

	2017	2019
<b>Guided Angler Days</b>	978	1,179
<b>Growth (%)</b>		17.05%

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

## 4.2 Impacts Overview

The roughly 1,000 guided angling days per odd year directed at pink salmon in the Sea-to-Sky region generate significant economic impacts in BC and in Canada as a whole. Table 4.2.1 presents those impacts of spending, domestic output, GDP, employment, and taxation within BC.

On average, the economic impacts of guided angling directed at pink salmon in the Sea-to-Sky region amount to just over \$660,000 of BC’s annual domestic output, almost \$375,000 of annual GDP, and over \$223,000 in labour income per year. On average, over six jobs are attributable to guided angling directed at pink salmon.

**Table 4.2.1: Economic Impacts in BC associated with Guided Angling in the Sea-to-Sky Region Directed at Pink Salmon, 2016–2019**

	2017	2019	Average
Domestic Output	\$621,258.67	\$702,423.47	\$661,841.07
GDP	\$336,426.75	\$410,417.57	\$373,422.16
Net taxes	\$16,746.19	\$17,083.56	\$16,914.87
Labour income	\$201,724.40	\$244,645.17	\$223,184.79
Gross operating surplus	\$121,670.39	\$151,365.56	\$136,517.98
International imports	\$26,138.27	\$24,791.95	\$25,465.11
Jobs	5.85	6.99	6.42

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

The economic impacts of guided angling directed at pink salmon in the Sea-to-Sky region extend beyond BC to all of Canada (see Table 4.2.2). On average, the economic impacts of guided angling directed at pink salmon in the Sea-to-Sky region for Canada amount to just over \$716,000 of annual national domestic output, over \$402,000 of annual GDP, and over \$238,000 in labour income per year. On average, over six jobs are attributable to guided angling directed at pink salmon, the same as at the provincial level.

**Table 4.2.2: Economic Impacts in Canada Associated with Guided Angling in the Sea-to-Sky region Directed at Pink Salmon, 2016–2019**

	2017	2019	Average
Domestic Output	\$676,274.95	\$756,915.67	\$716,595.31
GDP	\$365,321.42	\$439,163.31	\$402,242.37
Net taxes	\$18,854.26	\$19,187.99	\$19,021.12
Labour income	\$216,650.49	\$259,562.69	\$238,106.59
Gross operating surplus	\$133,504.73	\$163,105.04	\$148,304.89
International imports	\$31,989.46	\$30,425.72	\$31,207.59
Jobs	6.10	7.24	6.67

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

### 4.3 Value Per Landed and Killed Fish

In this section we examine the economic value per landed fish and killed fish. The pink salmon fishery in the Sea-to-Sky region is mostly a catch-and-release fishery with only seven recorded cases in 2017 and five recorded cases in 2019 (see Table 4.3.1). In addition to kept fish, incidental mortality is accounted for in Table 4.3.3 to Table 4.3.5.

**Table 4.3.1: Guided Angler Success, Pink Salmon Caught, 2016–2019**

Year	Released/Day	Kept/Day	Released	Kept	Caught
2017	4.13	0.02	1,840	7	1,847
2019	3.57	0.01	1,566	5	1,571

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

Table 4.3.2 presents the economic impacts per pink salmon caught in the Sea-to-Sky region in 2017 and 2019. The average domestic output per pink salmon caught in 2017 and 2019 was \$423.98. The impacts per fish in 2019 were between 112% and 144% of those in 2017 as there were 276 fewer fish caught.

**Table 4.3.2: Economic Impact per Pink Salmon Caught from Guided Angling in the Sea-to-Sky Region, 2016–2019**

	2017	2019
Domestic Output	\$366.15	\$481.81
GDP	\$197.79	\$279.54
Net taxes	\$10.21	\$12.21
Labour income	\$117.30	\$165.22
Gross operating surplus	\$72.28	\$103.82
International imports	\$17.32	\$19.37

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

Tables 4.3.3 through 4.3.5 present the economic impact per pink salmon killed for 5%, 10%, and 15% incidental mortality. We remark that as the incidental mortality rate increases, the value per pink salmon killed decreases, as the total economic impacts become distributed over a larger number of fish.

**Table 4.3.3: Economic Impact per Pink Salmon Killed from Guided Angling in the Sea-to-Sky region, 5% Incidental Mortality, 2016–2019**

	2017	2019
Domestic Output	\$6,831.06	\$9,086.62
GDP	\$3,690.12	\$5,272.07
Net taxes	\$190.45	\$230.35
Labour income	\$2,188.39	\$3,116.00
Gross operating surplus	\$1,348.53	\$1,958.04
International imports	\$323.13	\$365.25

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

**Table 4.3.4: Economic Impact per Pink Salmon Killed from Guided Angling in the Sea-to-Sky region, 10% Incidental Mortality, 2016–2019**

	2017	2019
<b>Domestic Output</b>	\$3,540.71	\$4,683.88
<b>GDP</b>	\$1,912.68	\$2,717.59
<b>Net taxes</b>	\$98.71	\$118.74
<b>Labour income</b>	\$1,134.30	\$1,606.20
<b>Gross operating surplus</b>	\$698.98	\$1,009.31
<b>International imports</b>	\$167.48	\$188.28

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

**Table 4.3.5: Economic Impact per Pink Salmon Killed from Guided Angling in the Sea-to-Sky Region, 15% Incidental Mortality, 2016–2019**

	2017	2019
<b>Domestic Output</b>	\$2,389.66	\$3,155.13
<b>GDP</b>	\$1,290.89	\$1,830.61
<b>Net taxes</b>	\$66.62	\$79.98
<b>Labour income</b>	\$765.55	\$1,081.96
<b>Gross operating surplus</b>	\$471.75	\$679.89
<b>International imports</b>	\$113.04	\$126.83

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

## 5.0 Spring Steelhead Season

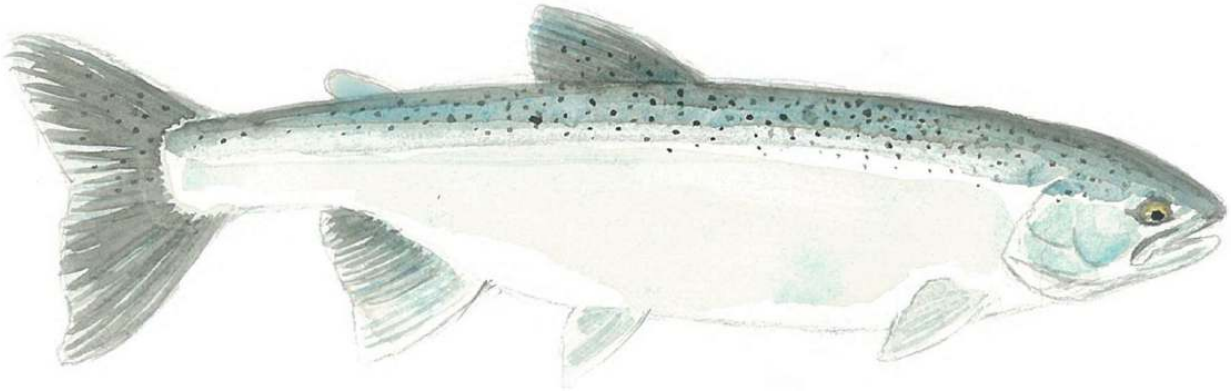


Image Credit: Rod Brown - Cohowood Studio

This section of the report presents the results for the spring steelhead season (March–April).

Although many tributaries of the Fraser River in the Lower Mainland have a winter steelhead season with fish caught as early as December, steelhead generally only start to migrate into rivers in the Sea-to-Sky region in late February, with steelhead typically only being caught in the Sea-to-Sky region during the months of March and April. The freshet in Sea-to-Sky streams usually occurs at the end of April or early May which makes the spring steelhead season in the Sea-to-Sky a relatively short one. Spring steelhead generally spend only a few weeks to a couple of months in freshwater. They can sometimes be found in rivers up until early June, but usually the streams in the Sea-to-Sky are unfishable by that time.

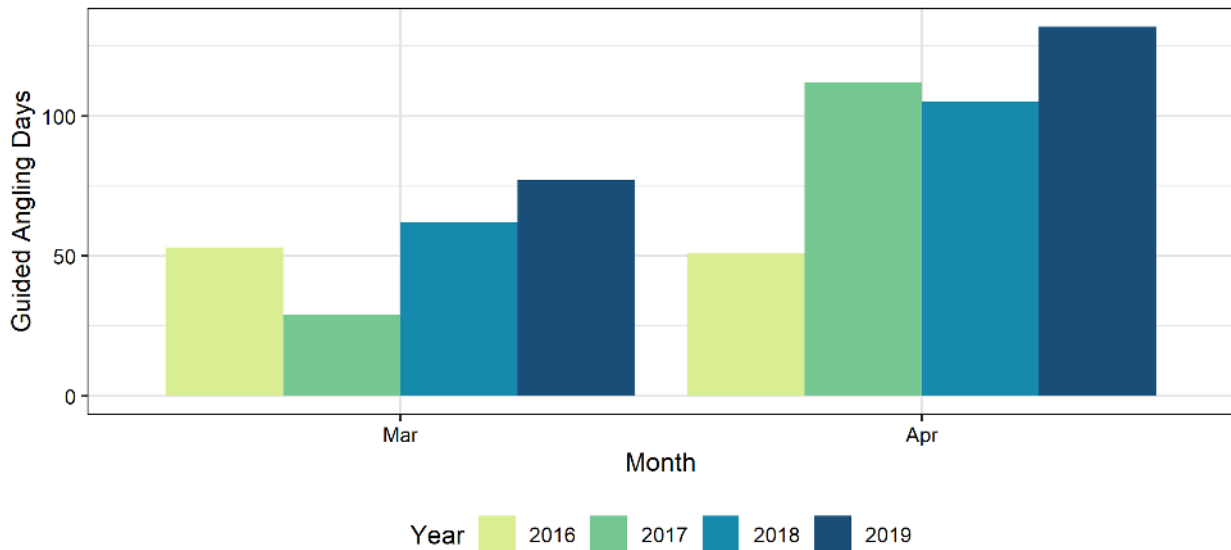
The Sea-to-Sky region hosts a catch-and-release wild steelhead fishery which operates across the province of BC. It is one of the few areas in the southern mainland of BC that do not contain a steelhead hatchery. It is a draw for anglers who want to experience catching a wild steelhead without travelling long distances to other, better known wild steelhead fisheries such as those in Northern BC.

### 5.1 Effort & Timing

The guiding data suggests that almost all steelhead caught in the Sea-to-Sky region are caught in the months of March and April.

Figure 5.1 presents guiding activity for each month in our reference period, highlighting the steelhead fishery in spring. The number of guided angling days in the Sea-to-Sky region more than doubled over our four-year reference period and has consistently grown by over 15% every year. This pattern suggests that this fishery will continue to grow (see Table 5.1).

**Figure 5.1: Guided Angling Activity Targeting Steelhead by Month, Sea-to-Sky region, 2016–2019**



Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

Table 5.1 presents the number of guided angling days during the spring steelhead season by year, and the year-over-year percentage changes.

**Table 5.1: Guided Angler Days and Year-Over-Year-Growth, Steelhead, Sea-to-Sky Region, 2016–2019**

	2016	2017	2018	2019
<b>Guided Angler Days</b>	104	141	167	209
<b>Growth (%)</b>		26.24%	15.57%	20.10%

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

## 5.2 Impacts Overview

The roughly 105 guided angling days per year directed at spring steelhead in the Sea-to-Sky region generate significant economic impacts in BC and in Canada as a whole. Table 5.2.1 presents the impacts of spending, domestic output, GDP, employment, and taxation within BC.

On average, the economic impacts of guided angling directed at steelhead in the Sea-to-Sky region for BC amount to nearly \$96,000 in annual domestic output, just over \$54,000 in annual GDP, and over \$31,000 in labour income per year. On average, less than one job is attributable to guided angling directed at steelhead.

**Table 5.2.1: Economic Impacts in BC Associated with Guided Angling in the Sea-to-Sky Region Directed at Steelhead, 2016–2019**

	2016	2017	2018	2019	Average
<b>Domestic Output</b>	\$52,088.41	\$89,567.97	\$117,254.50	\$124,517.80	\$95,857.17
<b>GDP</b>	\$29,434.42	\$48,503.24	\$66,313.96	\$72,754.26	\$54,251.47
<b>Net taxes</b>	\$1,293.32	\$2,414.33	\$3,004.12	\$3,028.38	\$2,435.04
<b>Labour income</b>	\$15,010.58	\$29,082.97	\$37,518.35	\$43,367.97	\$31,244.97
<b>Gross operating surplus</b>	\$13,359.18	\$17,541.44	\$26,386.72	\$26,832.40	\$21,029.94
<b>International imports</b>	\$1,974.66	\$3,768.40	\$4,578.72	\$4,394.84	\$3,679.16
<b>Jobs</b>	0.43	0.84	1.07	1.24	0.90

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

The economic impacts of guided angling directed at steelhead in the Sea-to-Sky region extend beyond BC to all of Canada (see Table 5.2.2). On average, the economic impacts of guided angling directed at steelhead in the Sea-to-Sky region for Canada amount to nearly \$104,000 in annual domestic output, over \$58,000 in annual GDP, and over \$33,000 in labour income per year. On average, less than one job is attributable to guided angling directed at steelhead.

**Table 5.2.2: Economic Impacts in Canada Associated with Guided Angling in the Sea-to-Sky Region Directed at Steelhead, 2016–2019**

	2016	2017	2018	2019	Average
<b>Domestic Output</b>	\$56,339.59	\$97,499.76	\$126,940.60	\$134,177.60	\$103,739.40
<b>GDP</b>	\$31,685.61	\$52,669.04	\$71,408.97	\$77,849.99	\$58,403.40
<b>Net taxes</b>	\$1,458.47	\$2,718.25	\$3,376.98	\$3,401.43	\$2,738.78
<b>Labour income</b>	\$16,177.65	\$31,234.89	\$40,149.44	\$46,012.38	\$33,393.59
<b>Gross operating surplus</b>	\$14,275.56	\$19,247.62	\$28,474.80	\$28,913.45	\$22,727.86
<b>International imports</b>	\$2,421.51	\$4,611.98	\$5,601.16	\$5,393.53	\$4,507.04
<b>Jobs</b>	0.45	0.88	1.12	1.28	0.93

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

## 5.3 Value Per Landed and Killed Fish

In this section we examine the economic value per landed and killed fish. The spring steelhead fishery is a wild steelhead fishery, and thus is catch-and-release as per province wide regulations and no steelhead are kept in the Sea-to-Sky (see Table 5.3.1). Any steelhead killed in the Sea-to-Sky region would be due to incidental mortality, which are presented at mortality rates of 5%, 10% and 15% (see Table 5.3.3 to Table 5.3.5).



**Table 5.3.1: Guided Angler Success, Steelhead Caught, 2016–2019**

Year	Released/Day	Kept/Day	Released	Kept	Caught
2016	0.07	0	4	0	4
2017	0.19	0	14	0	14
2018	0.12	0	11	0	11
2019	0.10	0	11	0	11

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

We provide the economic impact per steelhead caught in the Sea-to-Sky region in Table 5.3.2. Between 2016 and 2019, the average domestic output per steelhead caught was \$11,197. In 2017, the domestic output, GDP, net taxes, labour income, gross operating surplus, and international imports per steelhead caught were roughly half the values as in 2016 and 2018 because there were significantly more fish caught (14 in 2017 compared to four in 2016, and 11 in 2018).

**Table 5.3.2: Economic Impact per Steelhead Caught from Guided Angling in the Sea-to-Sky Region, 2016–2019**

	2016	2017	2018	2019
Domestic Output	\$14,084.90	\$6,964.27	\$11,540.057	\$12,197.965
GDP	\$7,921.40	\$3,762.07	\$6,491.72	\$7,077.27
Net taxes	\$364.62	\$194.16	\$307.00	\$309.22
Labour income	\$4,044.41	\$2,231.06	\$3,649.95	\$4,182.94
Gross operating surplus	\$3,568.89	\$1,374.83	\$2,588.62	\$2,628.50
International imports	\$605.38	\$329.43	\$509.20	\$490.32

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

Since the steelhead fishery is catch-and-release, fish are only killed through incidental mortality. We present the economic impact per steelhead killed for 5%, 10%, and 15% incident mortality in Tables 5.3.3 through 5.3.5. We remark that the economic impacts per fish killed, for a certain incidental mortality, can surpass the per-fish economic impacts. This is because there are so few steelhead caught. For example, assuming a 5% incidental mortality, the economic impact that results from a fish being killed accidentally in a given year will outweigh economic gain per fish caught as long as there are fewer than 20 steelhead caught.

**Table 5.3.3: Economic Impact per Steelhead Killed from Guided Angling in the Sea-to-Sky Region, 5% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
<b>Domestic Output</b>	\$281,697.96	\$139,285.38	\$230,801.05	\$243,959.25
<b>GDP</b>	\$158,428.06	\$75,241.49	\$129,834.49	\$141,545.43
<b>Net taxes</b>	\$7,292.36	\$3,883.22	\$6,139.96	\$6,184.42
<b>Labour income</b>	\$80,888.25	\$44,621.27	\$72,998.97	\$83,658.88
<b>Gross operating surplus</b>	\$71,377.78	\$27,496.59	\$51,772.37	\$52,569.90
<b>International imports</b>	\$12,107.54	\$6,588.54	\$10,183.92	\$9,806.42

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

**Table 5.3.4: Economic Impact per Steelhead Killed from Guided Angling in the Sea-to-Sky Region, 10% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
<b>Domestic Output</b>	\$140,848.98	\$69,642.69	\$115,400.53	\$121,979.62
<b>GDP</b>	\$79,214.03	\$37,620.74	\$64,917.25	\$70,772.71
<b>Net taxes</b>	\$3,646.18	\$1,941.61	\$3,069.98	\$3,092.21
<b>Labour income</b>	\$40,444.12	\$22,310.63	\$36,499.49	\$41,829.44
<b>Gross operating surplus</b>	\$35,688.89	\$13,748.30	\$25,886.18	\$26,284.95
<b>International imports</b>	\$6,053.77	\$3,294.27	\$5,091.96	\$4,903.21

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

**Table 5.3.5: Economic Impact per Steelhead Killed from Guided Angling in the Sea-to-Sky Region, 15% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
<b>Domestic Output</b>	\$93,899.32	\$46,428.46	\$76,933.68	\$81,319.75
<b>GDP</b>	\$52,809.35	\$25,080.50	\$43,278.16	\$47,181.81
<b>Net taxes</b>	\$2,430.79	\$1,294.41	\$2,046.65	\$2,061.47
<b>Labour income</b>	\$26,962.75	\$14,873.76	\$24,332.99	\$27,886.29
<b>Gross operating surplus</b>	\$23,792.59	\$9,165.53	\$17,257.46	\$17,523.30
<b>International imports</b>	\$4,035.85	\$2,196.18	\$3,394.64	\$3,268.81

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

## 6.0 Lake Season

This section of the report presents the results for the Lake Fishing season (March to October).

While the previous sections of this report focus on guided angling for anadromous fish that enter streams, the Sea-to-Sky region has a plethora of lakes that are available to anglers from spring to fall, or as long as the lakes are not frozen over. There are a wide variety of species that can be targeted across the different lakes in the area, but the majority of the target species in lakes are species of trout.

The lake fishery is one of the most popular guided angling fisheries in the Sea-to-Sky region, and is second only to the pink salmon fishery in the annual number of angler days. Like the pink salmon fishery, much of the draw for the lake fishery is the availability during the warm summer months, with the majority of guided angling days accruing over the months of June to August.

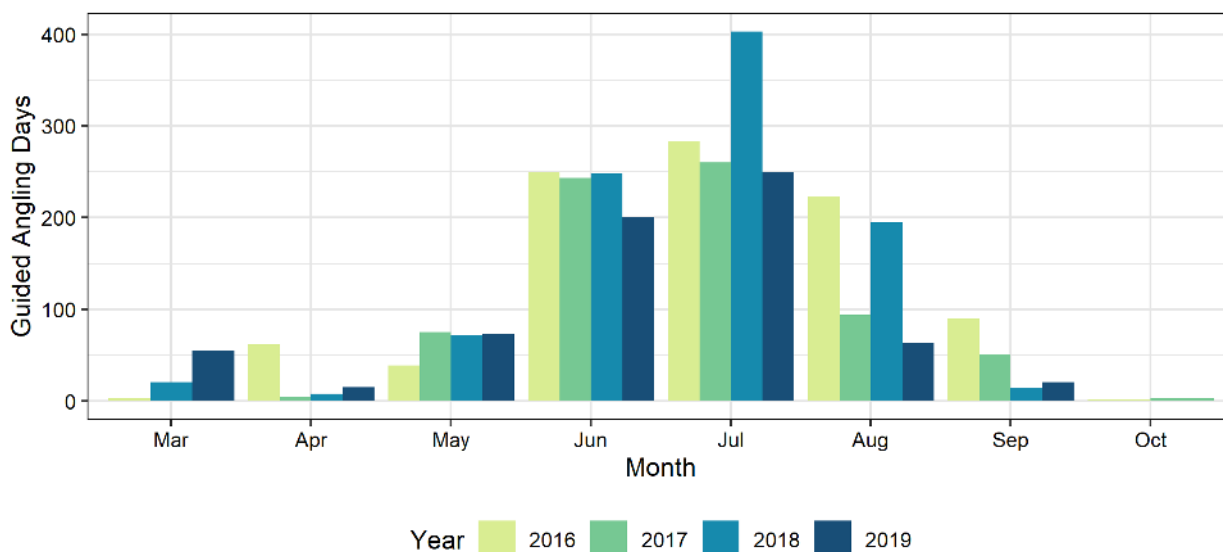
Over our reference period there were a lower number of guided angler days during the years of 2017 and 2019, compared to the years of 2016 and 2018. This is likely due to guides choosing to target pink salmon instead of fishing lakes during the summer months in 2017 and 2019.

### 6.1 Effort & Timing

The guiding data suggests that the lake guiding season generally starts in March and continues all the way until October. Fishing the lakes of the Sea-to-Sky region is possible as long as ice is not present on the lakes.

Figure 6.1 presents guiding activity for each month in our reference period, highlighting the lake fishery. Because of the cyclical nature of this fishery from the pink salmon fishery during odd years, it is difficult to determine any general growth pattern of the lake fishery (see Table 6.1).

**Figure 6.1: Guided Angling Activity in Lakes by Month, Sea-to-Sky region, 2016–2019**



Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

Table 6.1 presents the number of guided angling days attributable to lake fishing by year, and year-over-year percentage changes.

**Table 6.1: Guided Angler Days and Year-Over-Year Growth, Lakes, Sea-to-Sky Region, 2016–2019**

	2016	2017	2018	2019
<b>Guided Angler Days</b>	952	731	961	679
<b>Growth (%)</b>		-30.23%	23.93%	-41.53%

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

## 6.2 Impacts Overview

The roughly 830 guided angling days per year directed at fishing at lakes in the Sea-to-Sky region generate significant economic impacts in BC and in Canada as a whole. Table 6.2.1 presents those impacts of spending, domestic output, GDP, employment, and taxation within BC.

On average, the economic impacts of guided angling on lakes in the Sea-to-Sky region for BC amount to just over \$505,000 in annual domestic output, almost \$285,000 in annual GDP, and over \$161,000 in labour income per year. On average, more than four jobs are attributable to guided angling on lakes.

**Table 6.2.1: Economic Impacts in BC Associated with Guided Angling in the Sea-to-Sky Region in Lakes, 2016–2019**

	2016	2017	2018	2019	Average
<b>Domestic Output</b>	\$476,809.30	\$464,355.90	\$674,739.90	\$404,534.00	\$505,109.80
<b>GDP</b>	\$269,438.20	\$251,460.10	\$381,603.10	\$236,364.30	\$284,716.40
<b>Net taxes</b>	\$11,838.89	\$12,516.84	\$17,287.21	\$9,838.62	\$12,870.39
<b>Labour income</b>	\$137,404.50	\$150,777.60	\$215,899.00	\$140,894.00	\$161,243.80
<b>Gross operating surplus</b>	\$122,287.90	\$90,941.78	\$151,842.20	\$87,173.21	\$113,061.30
<b>International imports</b>	\$18,075.70	\$19,536.89	\$26,348.23	\$14,277.97	\$19,559.70
<b>Jobs</b>	4.09	4.56	6.43	4.17	4.81

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

The economic impacts of guided angling on lakes in the Sea-to-Sky region extend beyond BC to all of Canada (see Table 6.2.2). On average, the economic impacts of guided angling in lakes in the Sea-to-Sky region for Canada amount to almost \$547,000 in annual domestic output, almost \$307,000 in annual GDP, and over \$172,000 in labour income per year. On average, more than four jobs are attributable to guided angling on lakes.

**Table 6.2.2: Economic Impacts in Canada Associated with Guided Angling in the Sea-to-Sky Region in Lakes, 2016–2019**

	2016	2017	2018	2019	Average
<b>Domestic Output</b>	\$515,724.00	\$505,477.50	\$730,478.40	\$435,916.70	\$546,899.10
<b>GDP</b>	\$290,045.20	\$273,057.20	\$410,922.30	\$252,919.30	\$306,736.00
<b>Net taxes</b>	\$13,350.62	\$14,092.50	\$19,432.80	\$11,050.59	\$14,481.63
<b>Labour income</b>	\$148,087.70	\$161,934.10	\$231,039.60	\$149,485.20	\$172,636.60
<b>Gross operating surplus</b>	\$130,676.20	\$99,787.28	\$163,858.00	\$93,934.12	\$122,063.90
<b>International imports</b>	\$22,166.12	\$23,910.32	\$32,231.80	\$17,522.53	\$23,957.69
<b>Jobs</b>	3.91	4.37	6.17	4.03	4.62

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

## 6.3 Value Per Landed and Killed Fish

In this section we examine the economic value per landed and killed fish. The lake fishery does not follow the strict catch-and-release model of the other fisheries in the Sea-to-Sky region. Nonetheless, with an average of 20 fish kept per year, the proportion of fish kept to fish released is still very low (see Table 6.3.1). Once again, there is always the possibility of incidental

mortality, which are presented at mortality rates of 5%, 10% and 15% (see Table 6.3.2 to Table 6.3.4).

**Table 6.3.1: Guided Angler Success, Lake Species Caught, 2016–2019**

Year	Released/Day	Kept/Day	Released	Kept	Caught
2016	6.18	0.10	1,867	30	1,897
2017	3.83	0.05	1,146	14	1,160
2018	5.34	0.07	1,885	24	1,909
2019	5.23	0.05	1,423	14	1,437

Source: Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2

Table 6.3.2 provides the economic impact per lake species caught in the Sea-to-Sky region. Despite (i) the total economic impact of lake fish being smaller in 2017 than in either 2016 or 2018, and (ii) 2017 being a pink salmon year, the economic impact per caught lake fish was higher in 2017 than in any of the other reference years. This is primarily due to fewer fish being caught in 2017.

**Table 6.3.2: Economic Impact per Lake Species Caught from Guided Angling in the Sea-to-Sky Region, 2016–2019**

	2016	2017	2018	2019
Domestic Output	\$271.86	\$435.76	\$382.65	\$303.35
GDP	\$152.90	\$235.39	\$215.26	\$176.01
Net taxes	\$7.04	\$12.15	\$10.18	\$7.69
Labour income	\$78.06	\$139.60	\$121.03	\$104.03
Gross operating surplus	\$68.89	\$86.02	\$85.83	\$65.37
International imports	\$11.68	\$20.61	\$16.88	\$12.19

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

Tables 6.3.3 through 6.3.5 provide the economic impact per lake species killed for 5%, 10%, and 15% incident mortality. We remark that as the incident mortality rate increases, the value per lake species killed decreases, as the total economic impacts become distributed over a larger number of fish. Similar to the trend found for economic impact per lake species caught (Table 6.3.2), we remark that the economic impact per lake species killed was highest, across all incidental mortality rates in 2017, as this was the year when the fewest fish were caught.

**Table 6.3.3: Economic Impact per Lake Species Killed from Guided Angling in the Sea-to-Sky Region, 5% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
Domestic Output	\$4,180.98	\$7,089.45	\$6,177.41	\$5,119.40
GDP	\$2,351.40	\$3,829.69	\$3,475.03	\$2,970.28
Net taxes	\$108.23	\$197.65	\$164.34	\$129.78
Labour income	\$1,200.55	\$2,271.16	\$1,953.82	\$1,755.55
Gross operating surplus	\$1,059.39	\$1,399.54	\$1,385.69	\$1,103.16
International imports	\$179.70	\$335.35	\$272.57	\$205.78

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

**Table 6.3.4: Economic Impact per Lake Species Killed from Guided Angling in the Sea-to-Sky Region, 10% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
Domestic Output	\$2,379.90	\$3,930.62	\$3,437.55	\$2,788.97
GDP	\$1,338.46	\$2,123.31	\$1,933.75	\$1,618.17
Net taxes	\$61.61	\$109.58	\$91.45	\$70.70
Labour income	\$683.38	\$1,259.21	\$1,087.25	\$956.40
Gross operating surplus	\$603.03	\$775.95	\$771.10	\$600.99
International imports	\$102.29	\$185.93	\$151.68	\$112.11

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers

**Table 6.3.5: Economic Impact per Lake Species Killed from Guided Angling in the Sea-to-Sky Region, 15% Incidental Mortality, 2016–2019**

	2016	2017	2018	2019
Domestic Output	\$1,663.36	\$2,719.08	\$2,381.35	\$1,916.54
GDP	\$935.48	\$1,468.84	\$1,339.60	\$1,111.98
Net taxes	\$43.06	\$75.81	\$63.35	\$48.58
Labour income	\$477.63	\$871.08	\$753.19	\$657.22
Gross operating surplus	\$421.47	\$536.78	\$534.17	\$412.99
International imports	\$71.49	\$128.62	\$105.08	\$77.04

Source: Big River calculations based on guide financial statements, Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Region 2, and Statistics Canada multipliers



## 7.0 Conclusion

This study examines the economic impacts of guided angling in the Sea-to-Sky region for the years 2016–2019. We find that guided angling has increased over our reference period (21.1%) and economic impacts have also substantially increased over our reference period (45.2% increase in domestic outputs).

In aggregate, the four major fisheries (coho and chum salmon, pink salmon, spring steelhead, and lakes) that constitute the main guided angling seasons in the Sea-to-Sky region are of increasing importance. The number of angling days is up 21.1% from 2016 to 2019, from 2,206 to 2,694 guided angling days. Domestic output totalled over \$1.7 million across Canada and \$1.0 million in GDP, which increased 45.2% and 49.3% respectively. In 2019, guided angling in the Sea-to-Sky region supported over 14 jobs.

The DFO's recent closures of the non-retention fishery for chum salmon in 2020 and potential future closures are likely to cause a significant impact on guiding businesses and the associated benefits that accrue to the economy of the Sea-to-Sky region. The Sea-to-Sky region will be the hardest hit by any guided angling closures. In an era of lower salmon abundance, it is essential to consider how resource utilization compares with the value generated by different stakeholders. Guided angling in the Sea-to-Sky tends to generate very large impacts per fish killed since the fisheries in the Sea-to-Sky are generally catch-and-release. Assuming a 10% mortality rate<sup>2</sup>, one coho or chum killed through incidental mortality results in an average of \$11,659 of domestic output, \$6,596 of GDP, \$305.72 of net taxes, \$3,752 of labour income, \$2,588 of gross operating surplus, and \$502 of international imports across Canada. Conservation is a shared responsibility, and it is of utmost importance for the long-term sustainability of industries like guided angling. If imposed conservation measures are to be effective, it is essential that they take into consideration the local, economic costs and produce comparable outcomes in resource protection.

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<sup>2</sup> A 10% mortality rate is commonly used for salmon released from recreational angling. (Raby, Graham D., et al., 2015)

## References

Big River Analytics. (2018). *Economic Impacts Associated with Guided Angling—Lower Skeena Region*.

Statistics Canada. *Table 36-10-0478-01 Supply and use tables, detail level, provincial and territorial (x 1,000)*

Raby, G. D., Donaldson, M. R., Hinch, S. G., Clark, T. D., Eliason, E. J., Jeffries, K. M., ... & Cooke, S. J. (2015). *Fishing for effective conservation: context and biotic variation are keys to understanding the survival of Pacific salmon after catch-and-release*. *Integrative and Comparative Biology*, 55(4), 554-576.

# Appendix A - Methods

This section describes how we produced our estimates of economic impacts attributable to guided angling in the Sea-to-Sky region, including the various types and sources of data used in the computation of our estimates.

## A1. Financial Data

### Financial Data From Guiding Business

In order to ensure our estimates were flexible and could be used for different years and waterbodies, we computed a “representative guided angler day”. This estimate consists of the revenues and expenditures of a representative guiding operation associated with the provision of a guided angler day and served as the primary input in the Statistics Canada input/output (I/O) model to calculate impacts for BC and Canada as a whole.

In total, six guiding businesses from the Sea-to-Sky region provided financial statements for all or a subset of our reference years (2016, 2017, 2018, 2019), resulting in 24 financial reports that were included in our calculations. In order to estimate our representative angler day, we aggregated the 24 submissions across businesses and years whenever feasible, while preserving as many revenue and expenditure categories as possible. These reports detail their guiding activities in our reference years. The sum of guided angler days from these reports provided the number used as the denominator for our estimate of a representative guided angler day, expressed in terms of revenue and expenses, for our sample of guiding businesses across reference years (see Table 7.1).

**Table A.1: Guiding Business Revenue and Expenditures Expressed per Guided Angler Day**

	Per Day
<b>Total Revenue</b>	<b>\$341.48</b>
<b>Guide Expenses</b>	
Accommodations	\$3.59
Advertising and Promotion	\$10.10
Air Charter	\$14.53
Amortization	\$5.56
Assistant Guides	\$96.49
Boat	\$0.90
Boat Insurance (trailer)	\$0.06
Credit Card Charges	\$3.59
Employee Benefits	\$2.33
Fish Shuttles	\$0.36
Food Supplies	\$5.79
Fuel and Oil	\$11.21
General Repairs and Maintenance	\$0.48
Guide Supplies	\$18.73
Guide Wages	\$8.42
Heating	\$1.55
Insurance	\$3.50
Interest and Bank Charges	\$3.89
Internet	\$1.17
Licenses, Dues, and Rod Day Fees	\$2.78
Management and Admin	\$5.36
Other	\$3.17
Other wages	\$0.86
Meals and Entertainment	\$2.36
Permits	\$1.31
Professional Fees	\$1.68
Rental	\$8.12
Repair and Maintenance	\$4.67
Repairs and Maintenance	\$1.32
Sales Commissions	\$3.98
Subcontractors	\$4.90
Supplies	\$8.79
Telephone	\$6.04
Travel	\$0.62
Vehicle	\$17.74
Total Costs	\$265.96
Income Taxes	\$2.92
<b>NET PROFIT</b>	<b>\$72.59</b>

Because the input to the I/O model was in terms of a representative angler day, the output from the I/O model was also in terms of a representative angler day. In order to estimate the economic impact in each of our respective reference years, the vector of economic impacts (output from the I/O model) was multiplied by our estimated number of guided angler days in each reference year. This produced an estimate of the economic impacts attributable to guided angling in the Sea-to-Sky region and in BC as a whole in each year. No adjustments for inflation have been made, and estimates are in current-year dollars.

## A.2 Catch Data

Catch data, which refers to the number and species of fish caught, is included in the annual guide reports. From these data, we estimated the average number per angler day of each species of fish kept and released in the sample, by month.

## A.3 Guiding Activity Data

The above approach relies on two assumptions: a good estimate of the number of guided angler days, and the representativeness of the revenues, expenses, and additional client expenditures of the six guided businesses for all guided angling in the Sea-to-Sky region..

## A.4 Guided Angling Days

All waterbodies in the Sea-to-Sky are unclassified waters, so the estimate of guided angler days is drawn from the guide reports for the six guides in our study that are submitted to and managed by the Ministry of Environment and Climate Change Strategy on behalf of the Ministry of Forests, Lands, Natural Resource Operations and Rural Development.