



McKINLEY RESEARCH
GROUP, LLC

FOREGONE HARVEST 2020-2024: **UNREALIZED ECONOMIC OPPORTUNITY IN THE BRISTOL BAY SALMON FISHERY**

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PREPARED FOR:

Bristol Bay Regional Seafood Development Association

Introduction

This study updates a 2009 McKinley Research Group report demonstrating the lost economic opportunity associated with foregone harvest in the Bristol Bay sockeye salmon fishery with data for the 2020 to 2024 harvest seasons.

Foregone harvest occurs for a variety of reasons, including but not limited to processing capacity, fleet effectiveness and participation, Alaska Department of Fish and Game (ADF&G) management policies and decision, and natural conditions, such as compressed run entry, unforeseen weather patterns, and variance from predicted run strength.

Methodology for Calculating Foregone Harvest

For the purposes of this study, foregone harvest is defined as the actual escapement of sockeye salmon to Bristol Bay River systems above the preseason established escapement goals of each river system.

There are five management districts in Bristol Bay, including a total of nine rivers. The Naknek/Kvichak district includes the Naknek, Kvichak, and Alagnak rivers, and the Nushagak district includes the Nushagak, Wood, and Igushik rivers. The Egegik, Ugashik, and Togiak districts each contain only their namesake river.

Actual escapement by river system is published annually by ADF&G in their Bristol Bay Salmon Season Summary. ADF&G's Bristol Bay Sockeye Salmon Forecast was used to calculate escapement goals. ADF&G has established lower and upper-end escapement goals for each river system within the Bristol Bay watershed and manages goals for each district based on predicted run strength. The department sets an escapement target for the year at the 25th, 50th, or 75th percentile within their larger overall range for each river system, dependent on predicted run size. On a year with a weak return forecast, the 25th percentile is used as the escapement goal, allowing for a larger commercial harvest while still providing enough escapement to maintain the population. The 75th percentile is used for a strong forecast and the 50th percentile is used for an average forecast. For example, in 2024 the Ugashik river system had an average-size run forecast, so the escapement goal of 950,000 fish was the midpoint of the river system's escapement goal range of 500,000 – 1,400,000 fish.

During the 2020 to 2024 study period, the following percentiles were used as the escapement goals for each river system.¹

Table 1. Percentile in Escapement Goal Range Used for Calculating Foregone Harvest by River System, Bristol Bay, 2020-2024

	Egegik	Ugashik	Nushagak	Naknek	Kvichak	Togiak	Wood	Igushik
2020	75	50	25	25	25	50	75	50
2021	75	75	75	75	25	50	75	50
2022	75	75	75	75	25	75	75	75
2023	75	25	75	75	25	50	75	75
2024	25	50	75	25	25	25	75	25

Source: ADF&G Bristol Bay Sockeye Salmon Forecast

Escapement goals were identified for each river system using the method described above and aggregated to the district level to determine the district escapement goals below.

Table 2. Escapement Goals (thousands of fish) by district, Bristol Bay, 2020-2024

	Egegik	Ugashik	Nushagak	Naknek/ Kvichak	Togiak
2020	1,700	950	3,316	5,310	195
2021	1,700	1,175	3,843	6,020	195
2022	1,700	1,175	3,906	6,020	233
2023	1,700	725	3,906	6,020	195
2024	1,100	950	3,781	5,420	158

Source: ADF&G Bristol Bay Sockeye Salmon Forecast

The preseason escapement goal was subtracted from the actual escapement for each district to determine total foregone harvest. Foregone sockeye harvest is calculated on a river-by-river basis, then condensed to the district level on which ADF&G manages the fishery.

Due to the complexity of managing a wild run fishery such as Bristol Bay sockeye salmon, any under-escapement values (i.e. actual escapement below the preseason goal) are considered to be a value of zero foregone harvest to account for variance of run strength from preseason forecasts. This methodology considers any negative values as under-escapement, not over-harvest. This analysis therefore does not include any future harvest value implications of escapement below target levels.

¹ The table does not include the Alagnak river system because it is unique in the Bristol Bay watershed as the only river managed passively, with an established Biological Escapement Goal (BEG) of 210,000 fish, and a Sustainable Escapement Goal (SEG) of 320,000 fish. Preseason escapement goals for this river system were based on the ADF&G preseason recommendation of either the BEG or SEG, dependent on expected run strength.

Types of Foregone Revenue

For purposes of this analysis, the impacts of foregone harvest are expressed as lost revenue to harvesters, processors, and local and state governments. These values are not additive and are presented as various ways of describing the level of foregone value to different groups impacted by foregone harvest. For example, wholesale value earned by processors is used by those processors to pay for operating expenses, pay fishermen for salmon harvested (ex-vessel value), and various taxes and fees assessed to processors.

Ex-Vessel Value Loss

Ex-vessel value is defined as the value of raw fish upon sale by a harvester to a processor. Total ex-vessel value of the foregone harvest is calculated from the foregone harvest estimate, ADF&G average fish size, and final ex-vessel price-per-pound paid to harvesters.

Ex-vessel prices of foregone harvest are assumed to be consistent with the ex-vessel price of actual harvest. Predictions of changes to market conditions based on additional harvest are outside the scope of this work.

First Wholesale Value Loss

First wholesale value is defined as the value upon sale by a seafood processor to a buyer outside their affiliate network. First wholesale value of salmon is compiled by the Alaska Department of Revenue and published by ADF&G in its *Commercial Operators Annual Reports*.

While ex-vessel value is the most commonly used measure of fishery performance, first wholesale value is a much more complete statement of the economic activity associated with Alaska salmon fisheries. First wholesale value reflects the cost of raw fish (ex-vessel paid to harvesters) and reflects processors' expenditures on labor, material, tenders, shoreside goods and services, local utilities, property taxes, and other costs associated with the processing and distribution of seafood products.

Foregone first wholesale value accounts for an average recovery rate calculated annually from the total pounds harvested and the total pounds sold. This recovery rate from 2020 to 2023 ranged from a low of 59% in 2022, to a high of 70% in 2021 with an average recovery rate for the time period of 65%.

Lost Tax Revenues to Municipalities, Boroughs, and the State of Alaska

Local governments in the Bristol Bay region levy a variety of taxes, including assessments on ex-vessel value by local municipalities, local boroughs, the State of Alaska, and by the Regional Seafood Development Association. The basis for all of these taxes is ex-vessel value.

Potential lost tax revenue is calculated from total ex-vessel value of the foregone harvest and tax rates for the various assessments in each fishing district. State Fisheries Business Tax (FBT) revenue collected by the state is shared back to the region in which the fish is harvested. Potential FBT revenue associated with foregone harvest represents a loss to state revenues and an equal loss to communities and boroughs of the Bristol Bay region.

The foregone tax rate calculations are based on the tax rates below. Municipal and borough rates differ among different parts of the Bristol Bay region. For example, fish landed in the Ugashik district are subject to a 2% borough tax imposed by the Lake and Peninsula Borough and a 3% tax from the City of Pilot Point, located in this district.

Table 3. Summary of Region and State Tax Rates, Bristol Bay, Average 2020-2024

	Egegik	Ugashik	Nushagak	Naknek/Kvichak	Togiak
Municipal Assessments	3.0%	3.0%	-	-	2.0%
Borough Assessments	2.0%	2.0%	-	3.0%	-
State Fisheries Business Tax*	3.3%	3.3%	3.3%	3.3%	3.3%
Regional Seafood Development	1.0%	1.0%	1.0%	1.0%	1.0%
Seafood Marketing	0.5%	0.5%	0.5%	0.5%	0.5%
Total	9.8%	9.8%	4.8%	7.8%	6.8%

Source: Alaska Department of Commerce, Community, and Economic Development, Alaska Department of Revenue, McKinley Research Group calculations.

*Blended tax rate of 3.3% provided by the Alaska Department of Revenue. This is composite of FBT tax rates of 3% shoreside, 4.5% canned, and 5% floating processor. In recent years, the proportion of Bristol Bay sockeye processed into canned salmon or aboard floating processors has decreased.

Foregone Harvest

From 2020 to 2024, the total foregone harvest for the Bristol Bay sockeye salmon fishery was more than 35 million fish. Average annual foregone harvest was about 7 million fish, ranging from a low of 1.5 million in 2023 to a high of nearly 13 million in 2021.

Table 4. Foregone Sockeye Salmon Harvest (thousands of fish), Bristol Bay, 2020-2024

	Preseason Escapement Goal	Actual Escapement	Foregone Harvest
2020	11,471	18,721	7,250
2021	12,933	25,696	12,763
2022	13,033	18,861	5,828
2023	12,546	13,931	1,535
2024	11,408	19,968	8,560
2020-2024 Total	61,391	97,178	35,937
2020-2024 Average	12,278	19,436	7,187

Source: ADF&G, McKinley Research Group calculations.

Note: Region totals are the sum of individual river systems preseason escapement goal, actual escapement, and total foregone harvest by district.

The totals above are derived from combining total foregone harvest by fishing district. The two largest contributors to regionwide foregone harvest over the past five years have been the Nushagak district and the Naknek/Kvichak district, the districts with the largest annual salmon returns historically.

Table 5. Foregone Sockeye Salmon Harvest (thousands of fish) by District, Bristol Bay, 2020-2024

	Egegik	Ugashik	Nushagak	Naknek/Kvichak	Togiak	Total
2020	689	795	480	5,220	66	7,250
2021	132	1,685	6,143	4,717	86	12,763
2022	86	262	3,676	1,794	10	5,828
2023	-	404	1,058	-	73	1,535
2024	14	810	3,025	4,507	204	8,560
2020-2024 Total	921	3,955	14,383	16,239	439	35,937
2020-2024 Average	184	791	2,877	3,248	88	7,187

Source: ADF&G, McKinley Research Group calculations.

Note: Region totals are the sum of individual river systems preseason escapement goal, actual escapement, and total foregone harvest by district. Foregone harvest is calculated on a district level basis; districts that do not meet their escapement goals are considered to have no foregone harvest.

Foregone harvest at the river-system level can be seen below. The Naknek/Kvichak and Nushagak districts contain multiple river systems, while the Egegik, Ugashik, and Togiak districts contain only their namesake rivers.

Table 6. Foregone Sockeye Salmon Harvest (thousands of fish) by River System, Bristol Bay, 2020-2024

	Egegik	Ugashik	Nushagak	Naknek	Kvichak	Togiak	Wood	Igushik	Alagnak
2020	689	795	594	3,012	31	66	-	49	2,177
2021	132	1,685	3,536	1,097	704	86	2,003	604	2,917
2022	86	262	2,294	221	225	10	1,341	41	1,348
2023	-	404	611	-	-	73	242	205	779
2024	14	810	547	-	2,644	204	1,998	480	2,037
2020-2024 Total	921	3,955	7,583	4,330	3,604	439	5,583	1,379	9,258
2020-2024 Average	230	791	1,517	1,443	901	88	1,396	276	1,852

Source: ADF&G, McKinley Research Group calculations.

Note: Cells with no value reflect harvest above the escapement goal.

Foregone Ex-Vessel and First Wholesale Value

Based on average fish sizes by harvest year, the average annual forgone harvest of 7 million fish represents about 35 million pounds of salmon each year. The ex-vessel value of foregone harvest in the Bristol Bay region totaled about \$233 million between 2020 and 2024. The annual average foregone ex-vessel value was about \$47 million, ranging from a low of \$7 million in 2023 to a high of \$109 million in 2021.

The estimated first wholesale value of forgone harvest for 2020-2023 was about \$260 million. This ranges from a low of \$14 million in 2023 to a high of \$140 million in 2021. At the time of publication, first wholesale value of the Bristol Bay sockeye salmon fishery for 2024 was unavailable.

Table 7. Foregone Sockeye Salmon Harvest by Volume and Value, Bristol Bay, 2020-2024

	Foregone Harvest (lbs)	Foregone Ex-Vessel Value	Foregone First Wholesale Value
2020	36,976,000	\$40,352,000	\$60,410,000
2021	62,411,000	\$109,270,000	\$140,546,000
2022	29,724,000	\$41,644,000	\$43,780,000
2023	8,505,000	\$7,006,000	\$14,460,000
2024	38,778,000	\$34,512,000	Not Available
2020-2024 Total	176,394,000	\$232,784,000	\$259,196,000
2020-2024 Average*	35,278,800	\$46,556,800	\$64,799,000

Source: ADFG, McKinley Research Group calculations.

Note: First wholesale value for 2024 is unavailable as of the time of publication.* The average foregone first wholesale value is 2020-2023.

Foregone Tax Revenue

The foregone Bristol Bay harvest between 2020-2024 represents an estimated \$3 million in foregone tax revenues each year, across state and local fisheries taxes and fisheries marketing assessments.

- Fisheries Business Tax (FBT) is divided evenly between the State of Alaska and Bristol Bay region communities and boroughs. Between 2020 and 2024, foregone harvest would have resulted in an estimated \$1.5 million in FBT tax each year, or \$768,000 in foregone revenue to both the state and local governments in the Bristol Bay region.
- The harvest of foregone salmon would have also resulted in additional municipal fisheries tax and borough fish tax revenues. Foregone municipal and borough tax revenue averaged more than \$900,000 in this period.
- Foregone annual revenue for the Alaska Seafood Marketing Institute (ASMI) and the Bristol Bay Regional Seafood Development Association (BBRSDA) averaged about \$700,000.

Table 8. Foregone Fisheries Tax Revenue by Tax Category, Bristol Bay, 2020-2024

	Region Share FBT Revenue	State Share FBT Revenue	Municipal & Borough	BBRSDA & ASMI	Total
2020	\$666,000	\$666,000	\$1,292,000	\$605,000	\$3,229,000
2021	\$1,803,000	\$1,803,000	\$2,004,000	\$1,639,000	\$7,249,000
2022	\$687,000	\$687,000	\$510,000	\$625,000	\$2,509,000
2023	\$116,000	\$116,000	\$99,000	\$105,000	\$435,000
2024	\$569,000	\$569,000	\$728,000	\$518,000	\$2,384,000
2020-2024 Total	\$3,841,000	\$3,841,000	\$4,633,000	\$3,492,000	\$15,807,000
2020-2024 Average	\$768,000	\$768,000	\$927,000	\$698,000	\$3,161,000

Source: ADFG, Alaska Department of Revenue, McKinley Research Group calculations.

Note: Fisheries business tax revenue is calculated based on an average 3.3% state fisheries business tax rate, shared evenly between the region and the state.

The estimated annual average of \$3 million in foregone harvest would have been generated by (had the harvest taken place) the following districts and would have benefited residents in these regions as well as the state government and both local and statewide marketing programs.

Table 3. Foregone Fisheries Tax Revenue (all categories) by Fishing District, Bristol Bay, 2020-2024

	Egegik	Ugashik	Nushagak	Naknek/Kvichak	Togiak	Total
2020	\$376,000	\$434,000	\$128,000	\$2,266,000	\$25,000	\$3,229,000
2021	\$111,000	\$1,414,000	\$2,525,000	\$3,150,000	\$50,000	\$7,249,000
2022	\$60,000	\$183,000	\$1,261,000	\$1,000,000	\$5,000	\$2,509,000
2023	\$0	\$181,000	\$232,000	\$0	\$23,000	\$435,000
2024	\$6,000	\$320,000	\$585,000	\$1,417,000	\$56,000	\$2,384,000
2020-2024 Total	\$553,000	\$2,532,000	\$4,731,000	\$7,833,000	\$159,000	\$15,806,000
2020-2024 Average	\$110,600	\$506,400	\$946,200	\$1,566,600	\$31,800	\$3,161,200

Source: Alaska Department of Commerce, Community, and Economic Development, Alaska Department of Revenue, McKinley Research Group calculations.

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