Fishery Management Report No. 22-14

2021 Bristol Bay Area Annual Management Report

by

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Alaska Department of Fish and Game **Divisions of Sport Fish and Commercial Fisheries**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the following reports by the Divisions of Sport Fish and of Commercial Fisheries: Fishery Manuscripts, Fishery Data Series Reports, Fishery Management Reports, and Special Publications. All others, including deviations from definitions listed below, are noted in the text at first mention, as well as in the titles or footnotes of tables, and in figure or figure captions.

Weights and measures (metric)

centimeter	cm
deciliter	dL
gram	g
hectare	ha
kilogram	kg
kilometer	km
liter	L
meter	m
milliliter	mL
millimeter	mm

Weights and measures (English)

cubic feet per second	ft^3/s
foot	ft
gallon	gal
inch	in
mile	mi
nautical mile	nmi
ounce	oz
pound	lb
quart	qt
yard	yd

Time and temperature

day	d
degrees Celsius	°C
degrees Fahrenheit	°F
degrees kelvin	K
hour	h
minute	min
second	s

Physics and chemistry

all atomic symbols	
alternating current	AC
ampere	A
calorie	cal
direct current	DC
hertz	Hz
horsepower	hp
hydrogen ion activity (negative log of)	pH
parts per million	ppm
parts per thousand	ppt, ‰
volts	V
watts	W

General

Alaska Administrative Code	AAC
all commonly accepted abbreviations	e.g., Mr., Mrs., AM, PM, etc.
all commonly accepted professional titles	e.g., Dr., Ph.D., R.N., etc.
at	@
compass directions:	
east	E
north	N
south	S
west	W
copyright	©
corporate suffixes:	
Company	Co.
Corporation	Corp.
Incorporated	Inc.
Limited	Ltd.
District of Columbia	D.C.
et alii (and others)	et al.
et cetera (and so forth)	etc.
exempli gratia (for example)	e.g.
Federal Information Code	FIC
id est (that is)	i.e.
latitude or longitude	lat or long
monetary symbols (U.S.)	$, ¢
months (tables and figures): first three letters	Jan,...,Dec
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	use two-letter abbreviations (e.g., AK, WA)

Mathematics, statistics

all standard mathematical signs, symbols and abbreviations	
alternate hypothesis	H_A
base of natural logarithm	e
catch per unit effort	CPUE
coefficient of variation	CV
common test statistics	(F, t, χ^2, etc.)
confidence interval	CI
correlation coefficient (multiple)	R
correlation coefficient (simple)	r
covariance	cov
degree (angular)	°
degrees of freedom	df
expected value	E
greater than	>
greater than or equal to	≥
harvest per unit effort	HPUE
less than	<
less than or equal to	≤
logarithm (natural)	ln
logarithm (base 10)	log
logarithm (specify base)	$\log_2$, etc.
minute (angular)	′
not significant	NS
null hypothesis	H_O
percent	%
probability	P
probability of a type I error (rejection of the null hypothesis when true)	α
probability of a type II error (acceptance of the null hypothesis when false)	β
second (angular)	″
standard deviation	SD
standard error	SE
variance	
population	Var
sample	var

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2021 BRISTOL BAY AREA ANNUAL MANAGEMENT REPORT

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ABSTRACT

The *2021 Bristol Bay Area Annual Management Report* is the 60th consecutive annual report of management activities of the Alaska Department of Fish and Game, Division of Commercial Fisheries staff in Bristol Bay. This report describes the information, decisions, and rationale used to manage the commercial salmon (sockeye *Oncorhynchus nerka*, Chinook *O. tshawytscha*, chum *O. keta*, pink *O. gorbuscha*, and coho *O. kisutch*) and Pacific herring (*Clupea pallasii*) fisheries in Bristol Bay each year. The 2021 inshore sockeye salmon run of 67.7 million fish was 35% above the preseason forecast of 50.0 million fish. Sockeye salmon dominated the inshore commercial harvest, totaling 42.0 million of the 42.2 million salmon commercially harvested. Total Bristol Bay sockeye salmon escapement was 25.7 million fish, and escapement goals were either met or exceeded in all systems with established goals. In total, 6,944 Chinook, 212,250 chum, 3,596 pink, and 48,206 coho salmon were also harvested in the commercial fishery. Chinook salmon sonar estimate into Nushagak River was 55,222, just above the 55,000-lower end of the escapement goal range. However, because there is harvest above the sonar, the escapement goal was likely not achieved. The 2021 Togiak District herring preseason biomass forecast was 236,742 short tons. Total harvest from the commercial herring fishery is confidential because fewer than 3 processors registered for the fishery in 2021. All 2021 commercial salmon harvest data are based on fish tickets; these data can change if more information becomes available.

Keywords: Pacific salmon *Oncorhynchus* spp., sockeye salmon *Oncorhynchus nerka*, Chinook salmon *O. tshawytscha*, chum salmon *O. keta*, coho salmon *O. kisutch*, pink salmon *O. gorbuscha*, Pacific herring *Clupea pallasii*, commercial fisheries, subsistence fisheries, exvessel value, harvest, Port Moller Test Fishery, genetics, Bristol Bay, Naknek, Kvichak, Egegik, Ugashik, Wood, Nushagak, Igushik, Togiak, Annual Management Report (AMR)

INTRODUCTION

MANAGEMENT AREA DESCRIPTION

The Bristol Bay management area includes all coastal and inland waters east of a line from Cape Newenham to Cape Menshikof (Figure 1). The area includes 9 major river systems: Naknek, Kvichak, Alagnak, Egegik, Ugashik, Wood, Nushagak, Igushik, and Togiak. Collectively, these rivers are home to the largest commercial sockeye salmon *Oncorhynchus nerka* fishery in the world. Sockeye salmon are by far the most abundant salmon species that return to Bristol Bay each year, but Chinook *O. tshawytscha*, chum *O. keta*, coho *O. kisutch*, and, in even years, pink salmon *O. gorbuscha* returns are important to the fishery as well. The Bristol Bay area is divided into 5 management districts (Naknek-Kvichak, Egegik, Ugashik, Nushagak, and Togiak) that correspond to major river systems. The management objective for each river is to achieve salmon escapements within established escapement goal ranges (Table 1; Erickson et al. 2018) while harvesting fish in excess of those ranges, consistent with regulatory management plans (5 AAC 06.355–5 AAC 06.369).

OVERVIEW OF BRISTOL BAY SALMON FISHERIES

The 5 species of Pacific salmon found in Bristol Bay are the focus of major commercial, subsistence, and sport fisheries. Management of Bristol Bay salmon is primarily focused on the inshore run of these species. The inshore run is those fish harvested within the designated commercial fishing districts of Bristol Bay and those counted at area escapement projects. Annual commercial harvest for the most recent 20 years (2001–2020) averaged 28.1 million sockeye, 39,571 Chinook, 1.1 million chum, 510,000 pink (even-years only), and 95,583 coho salmon (Appendices A3–A7). Since 2001, the annual exvessel value of the commercial salmon harvest within Bristol Bay has averaged $157.1 million. Sockeye salmon were the most valuable and averaged $155.5 million annually (Appendix A22). The average subsistence harvest from 2000–2019 was 121,888 salmon and includes the average sockeye salmon harvest of 93,860

(Tiernan et al. 2021). Subsistence salmon harvest estimates for 2021 were not available at the time of publication. Sport fisheries harvested all species of salmon, but most effort was directed toward Chinook and coho salmon.

Management of the commercial fishery in Bristol Bay is focused on discrete stocks. Harvests are directed at terminal areas around the mouths of major river systems, and each stock is managed to achieve a spawning escapement goal based on sustained yield. Escapement goals are achieved by regulating fishing time and area by emergency order (EO), adjusting weekly fishing schedules, or both. Legal gear for the commercial salmon fishery includes both drift (150 fathoms) and set (50 fathoms) gillnets. The Alaska Board of Fisheries (BOF) passed a regulation in 2003 that allows 2 drift permit holders to concurrently fish from the same vessel and jointly operate up to 200 fathoms of drift gillnet gear. Drift gillnet permits are the most numerous in Bristol Bay (Area T) with a total of 1,862 permits, of which 1,753 were registered to fish in 2021 (Appendix A2). There are 964 set gillnet permits in Bristol Bay, and 870 made at least one delivery in 2021 (Appendix A2).

2021 COMMERCIAL SALMON FISHERY

RUN STRENGTH INDICATORS

Fishery managers in Bristol Bay have several early indicators of sockeye salmon run size. These include the preseason forecast, the South Alaska Peninsula commercial salmon fishery, an offshore test fishery operating from Port Moller, genetic stock identification, age composition information, early performance of the commercial fishery, inriver test fishery programs, and timely escapement information from counting towers and a sonar project. These indicators are assessed based on the relative strengths of year classes, discrepancies from the forecast (relative to expected year class contributions), or differences in run timing, which are important to successful management of the commercial fishery. These pieces of information may not give a correct assessment of run size individually, but collectively allow broad-scale examination of inseason data.

PRESEASON FORECASTS

Total inshore (excluding harvest in other areas) sockeye salmon production for Bristol Bay in 2021 was forecast to be 50.0 million (Buck et al. 2020). The Bristol Bay sockeye salmon inshore harvest was predicted to be 36.4 million fish (Table 2). Runs were expected to be large enough to meet spawning escapement goals for all river systems in Bristol Bay.

The forecast for the sockeye salmon run to Bristol Bay in 2021 was the sum of individual predictions for 9 river systems (Kvichak, Alagnak, Naknek, Egegik, Ugashik, Wood, Igushik, Nushagak, and Togiak) and 4 major age classes (age 1.2, 1.3, 2.2, and 2.3, plus age 0.3 and 1.4 for Nushagak; Table 3). Adult escapement and return data from brood years 1972–2017 were used in the analyses.

Forecasts for each age class returning to a river system were derived from models based on the relationship between adult returns of that age class and either total returns or sibling returns from the same brood years (Buck et al. 2020). In general, models with statistically significant parameters, the best past performance (accuracy and precision), or both were chosen. Performance was evaluated using mean absolute deviation, mean absolute percent error, mean arctangent absolute percent error, and mean percent error between forecasted and observed returns. These performance metrics were calculated and considered for each model across the most recent 3-year and 5-year time frames. In

certain cases, competing models were averaged in a hybrid model approach. The forecast range is the upper and lower values of the 80% confidence interval for the total run forecast. The confidence bounds were calculated from the deviation of actual runs and run forecasts from 2001 through 2020.

PORT MOLLER TEST FISHERY

From 1967 to 1985, ADF&G operated a test fishery near the community of Port Moller, approximately 150–200 miles southwest of the Bristol Bay fishing districts. A large vessel (70–100 ft) fished gillnets at specific stations on a transect line, perpendicular to the migration path of sockeye salmon returning to Bristol Bay. Collected data were used to estimate strength, timing, age, and size composition of the run about 6–9 days prior to arrival at the commercial fishing districts. The project was popular with salmon processors because it gave an early indication of run size, which influenced production capacity and the price paid to commercial fishery participants. The project did not operate in 1986. The project was operated from 1987 through 2002 by the Fisheries Research Institute (FRI; University of Washington, Seattle WA), with financial assistance from industry. The project was then operated from 2003 through the present by Bristol Bay Science and Research Institute (BBSRI), with financial and technical support from ADF&G and industry (Raborn and Link 2020).

In 2021, the Port Moller Test Fishery (PMTF) operated from June 10 to July 15 (Figure 1). During this period, there were 7 days without fishing because of poor weather. Since 2018, the project has been using a second vessel to extend the sampling transect and further investigate migratory pathways traveled by the returning sockeye salmon. In addition, some sites between traditional stations were sampled to assess possible patchiness of the run along the test fishing transect. Finally, a deeper net was deployed to assess fish traveling deeper in the water column. Between the 2 vessels, coverage was almost complete along a line between Port Moller and Cape Newenham for most of the project duration. Fish were present throughout the transect, but the middle stations, 8, 10, and 12, had the highest mean station indices.

GENETICS

Over the last 19 years, ADF&G has built and tested a genetic baseline capable of identifying salmon stock compositions of mixed-fishery samples from within Bristol Bay. The genetics program has 2 primary objectives: (1) to provide managers with a preliminary estimate of stock compositions of sockeye salmon returning to Bristol Bay through the Port Moller test fishery (Dann et al. 2013); and (2) to provide researchers with sockeye salmon stock composition estimates, by year, within fishing districts to estimate total runs and develop brood tables (Cunningham et al. 2018, Dann et al. 2011).

Genetic sampling was added to the Port Moller test fishery project in 2004. The intent was to use inseason genetic analysis to identify components of the annual sockeye salmon run in time to inform management decisions for individual stocks. ADF&G genetics staff can complete analysis and deliver results in 3 to 5 days depending on several factors (e.g., timing of airline flights or weather on the fishing grounds). The travel time for fish from Port Moller to Bristol Bay is approximately 6 to 9 days depending on several factors (e.g., district, water temperature, or wind). Therefore, results from genetic sampling are typically available before the fish they represent reach the fishing districts of Bristol Bay (Figure 2).

ECONOMICS AND MARKET PRODUCTION

In 2021, the exvessel value of inshore commercial salmon harvest was an estimated $260.7 million (Table 4), which was 65% above the $157.1 million 20-year average (2001–2020) (Appendix A22). The average sockeye salmon price in 2021 was $1.31/pound before incentives and postseason adjustments. Prices paid for the other salmon species ranged from $0.07/pound for pink salmon to $1.03/pound for Chinook salmon (Table 4).

During the 2021 season, 44 processors/buyers registered to process fish from Bristol Bay. Of those processors, 3 companies canned, 40 froze, 20 exported fresh, 2 cured salmon, and 14 extracted roe. Product was exported by air by 35 companies and exported by sea by 25 companies (Table 5).

RUN AND HARVEST PERFORMANCE BY SPECIES

Sockeye Salmon

The 2021 inshore sockeye salmon run of approximately 67.7 million fish was the largest run on record and 35% above the preseason forecast of 50.0 million (Table 2). The sockeye salmon runs to the Naknek and Egegik Rivers came in under forecast, with the remaining river systems coming in above forecast in 2021. Sockeye salmon dominated the inshore commercial harvest, totaling 42.0 million fish, which was the second largest since 2001 and the third largest sockeye salmon harvest recorded in Bristol Bay since 1893 (Table 6 and Appendix A3). Sockeye salmon sustainable escapement goals (SEG) were met or exceeded in all systems with established goals (Tables 1 and 2; Erickson et al. 2018).

The average weight of the sockeye salmon harvest was the lowest on record at 4.7 pounds—this was a pound less than the 20-year average (2001–2020) weight of 5.7 pounds (Appendix A20). Average weights of all age classes have decreased from a 6.0-pound average in 2013 as the run sizes have increased (Figure 3 and Appendix A11). Many permit holders have shifted to using smaller gillnet mesh sizes in response to smaller fish sizes.

Chinook Salmon

The 2021 baywide commercial harvest of 6,944 Chinook salmon was the lowest since 1955 and the second year in a row with the lowest harvest on record (Appendix A4). The harvests in all 5 districts were below the 20-year average (2001–2020). Harvest in the Nushagak District (the largest producer of Chinook salmon in Bristol Bay) was 4,306 fish, which was below the 20-year average (2001–2020) of 34,632 fish (Appendix A4). The Nushagak River Chinook salmon inriver run estimate at Portage Creek Sonar was 55,222 fish, which likely does not allow the escapement goal of 55,000–120,000 to be met when upstream harvest is eventually subtracted (Table 7 and Appendix A17). However, it is likely that many Chinook salmon went undetected at the sonar because they were masked by the record high sockeye salmon passage. High sockeye salmon passage saturates the test fishing nets at the sonar project, a situation shown to bias the Chinook salmon count low in previous years. This is supported by reported inseason sport fish catch rates along with postseason aerial surveys indicating that the run was larger than the final sonar count.

Chum Salmon

In 2021, the baywide commercial harvest of 212,250 chum salmon was the lowest on record for the second year in a row. Chum salmon harvests were below the 20-year averages (2001–2020) in all districts (Appendix A5). The Nushagak River sonar project is the only chum salmon

escapement assessment project in Bristol Bay. The escapement of 125,352 was below the lower bound SEG of 200,000 (Tables 1 and 7, and Appendix A19).

Pink Salmon

Bristol Bay has a dominant even-year pink salmon cycle. In 2021, the baywide pink salmon harvest was 3,596 fish (Appendix A6). There is a lower bound SEG of 165,000 for even years only that is based on the Nushagak River sonar. However, the sonar project has not operated during the pink salmon run in recent years because of budget priorities.

Coho Salmon

The commercial harvest of coho salmon was 48,206 fish, which was below the 20-year average (2001–2020) of 95,583 fish. The harvest was below average in all districts except for the Egegik District. The largest commercial harvest was in the Nushagak District, where the 27,467 fish harvest was below the 20-year average (2001–2020) of 63,444 fish (Appendix A7). The Nushagak River sonar project was only operational until July 25, because of budget priorities, and did not count any coho salmon (Table 7). There is an established SEG of 60,000–120,000 based on the Nushagak River sonar project (Table 1).

SEASON SUMMARY BY DISTRICT

Naknek-Kvichak District

The 2021 inshore run forecast for the rivers in the Naknek-Kvichak District was 17.0 million sockeye salmon, composed of a projected 8.0 million for escapement and 9.0 million for harvest (Table 2). The forecast by river system was 6.2 million for the Kvichak River, 3.7 million for the Alagnak River, and 7.1 million for the Naknek River (Table 2). The SEG for Naknek River is a range of 800,000–2.0 million sockeye salmon. The SEG for the Kvichak River is a range of 2.0–10.0 million sockeye salmon. The Alagnak River has a lower bound SEG of 210,000 sockeye salmon. The total run to the Naknek-Kvichak District in 2021 was 20.0 million sockeye salmon, consisting of a commercial harvest of 9.3 million and a total escapement of 10.7 million (Appendix A12).

ADF&G does not forecast Chinook, chum, coho, or pink salmon for systems in Naknek-Kvichak District. Commercial harvest of Chinook salmon has remained relatively small because of a mesh size restriction that prohibits gillnets with a mesh size larger than 5.5 inches from June 1 until July 22 in the Naknek-Kvichak, Egegik, and Ugashik Districts. Additionally, the *Naknek-Kvichak District Commercial Set and Drift Gillnet Sockeye Salmon Fisheries Management and Allocation Plan* (5 AAC 06.364(f)) directs the department to open commercial fishing periods for drift gillnets only between the 7-foot flood and 7-foot ebb tide stage for the conservation of Chinook salmon.

Salmon counting towers were operated on the Naknek, Kvichak, and Alagnak Rivers during the 2021 season. Fish counts were started at the Naknek River tower on June 19, the Kvichak River tower on June 23, and the Alagnak River tower on June 29 (Table 8). The Naknek River escapement was 2.8 million, the Kvichak River escapement was 4.7 million, and the Alagnak River escapement was 3.2 million sockeye salmon. Naknek River escapement was above the escapement goal range, Kvichak River escapement was within the escapement goal range, and Alagnak River escapement was above the lower bound escapement goal (Table 2, Appendix A1).

Additional funding was allocated to tower projects in 2020 to extend the operational dates and establish hard end dates for the projects. This greatly improved overall project operations. Prior to

this change, towers generally ceased operation after 3 consecutive days with daily passage that was less than one percent of the total season passage. The established dates for the last day of counting were July 21 for Naknek River tower, July 27 for Kvichak River tower, and July 28 for Alagnak River tower.

Fishing with drift gillnets was restricted to the Naknek Section during the early season schedule, while both sections were opened to set gillnets. Fishing periods were from 9:00 AM Monday until 9:00 AM Friday, beginning 9:00 AM Tuesday, June 1, and ending 9:00 AM Friday, June 25. The first deliveries occurred on June 14 and the early season fishing schedule ended with a small harvest (Table 9). Following the closure on June 24, subsequent fishing periods were based on inseason indicators of abundance in the Naknek, Kvichak, and Alagnak Rivers.

Drift gillnet effort was expected to be low in the Naknek-Kvichak District early in the season because of recent high harvests and earlier run timing in other districts. In 2017 and 2018, the Nushagak District experienced record-breaking sockeye salmon runs. Both Nushagak River and Wood River had large forecasts again for 2021 (Table 3). The Nushagak and Egegik Districts typically experience earlier run timing than the Naknek-Kvichak District and this pattern has been amplified in the previous 6 seasons when substantial harvests in the Naknek-Kvichak District did not occur until July. These trends in run sizes and run timing have led to a popular strategy for drift fishers to start the season in the Nushagak or Egegik District and transfer to Naknek-Kvichak or Ugashik District later in the season. Through June 24, only 68 vessels had registered to fish in the Naknek-Kvichak District (Table 10).

Escapement on the Naknek River started slow with one sockeye salmon observed on June 24. However, subsistence catches on the Naknek beach were beginning to pick up. On the morning of June 25, fish began to reach the tower, and by 6:00 AM, 1,914 had passed. At 9:00 AM an advisory announcement stated that the district would open at 1:00 PM June 26 for a 7-hour fishing period for drift gillnets in the Naknek Section and set gillnets in the Naknek-Kvichak District. Harvest from this period was 49,106 sockeye salmon (Table 9).

Escapement from midnight to 6:00 AM on June 26 was approximately 15,000, for a cumulative total of approximately 27,000 sockeye salmon. There were 92 vessels registered to fish in the district. With limited effort, the drift fleet fished each high tide in the Naknek Section from June 27 to June 28 for a total of 4 fishing periods. With a series of extensions, set gillnets fished continuously in the Naknek-Kvichak District from 1:00 PM June 26 to 10:30 PM June 28. Sockeye salmon harvest was 102,835 on June 27 and 24,975 on June 28. Escapement was 18,486 on June 27 and 26,700 on June 28 for a cumulative of 76,788 sockeye salmon (Table 8).

Fishing was closed on the morning tide of June 29 and resumed on the evening tide with 191 vessels registered to fish. Drift gillnets were restricted to the Naknek Section for 7 hours while the set gillnet fleet fished continuously in the Naknek-Kvichak District. Fishing was reported to be good on the Johnson Hill line with the drift fleet catching approximately 88% of the 53,326 sockeye salmon caught on June 29. Fishing continued each high tide for drift gillnets in the Naknek Section and with daily extensions for the set gillnet fleet in the Naknek-Kvichak District through July 3. Harvest ranged from 209,868 sockeye salmon on June 30 to 290,637 on July 2 (Table 9). Kvichak setnets caught approximately 30% of the daily harvest during this time period.

The Naknek River escapement was 626,886 sockeye salmon from July 2 to July 4, putting it on track for the upper half of the escapement goal range. On July 5, the lower bound of the escapement goal was met with a cumulative escapement of 815,424 sockeye salmon. On the same day, the

Kvichak River daily escapement increased to 459,324 for a cumulative of 876,306 sockeye salmon (Table 8). This put the Kvichak River on track for meeting the escapement goal.

On July 4, drift gillnets fished the Naknek Section for a 19 hour period and fished the Naknek Section on July 5 for a 18.5 hour period. Harvest was 273,219 on July 4 and increased to 464,863 sockeye salmon on July 5 (Table 9).

On the morning of July 6, the Kvichak inriver estimate was 700,000 fish in addition to the approximately 1,040,000 that had already passed the tower (Table 11). An announcement was made to open the Naknek-Kvichak District to drift gillnets for a 7-hour period starting at 10:30 AM on July 7. Harvest on July 7 was 476,324 sockeye salmon with drift gillnets catching about 64% of the daily harvest. Drift gillnets were restricted to the Naknek Section for an additional period on the morning of July 8. From July 9 to July 16, drift gillnets fished 18.5 to 19.5-hour periods in the Naknek-Kvichak District (Table 9).

Drift gillnets caught less than 84% of the daily harvest until July 11, when 516 vessels were registered to fish (Table 10). Registration peaked at the end of the registration period with 671 drift gillnet permits registered to fish. The harvest allocation from June 1 to July 17 was 75% drift gillnet, 13% Naknek set gillnet, and 12% Kvichak set gillnet. Regulation specifies the allocation be divided as follows: 84% drift gillnet, 8% Naknek set gillnet, and 8% Kvichak set gillnet (Appendix A9).

The district was opened to continuous fishing from July 17 to August 15. The fall schedule was initiated on August 15 and allows for fishing from 9:00 AM Monday to 9:00 AM Sunday. The season ended September 30, but the last deliveries occurred on August 23 (Table 9).

Sockeye salmon harvest was approximately 8,280,000 during the allocation period and there were an additional 970,000 caught after the allocation period ended. The midpoint of the run was July 9, which is 3 days later than the most recent 20-year average (2001–2020). It was the earliest run timing since 2014 (T. Elison, Naknek-Kvichak Area Management Biologist, ADF&G, Anchorage, unpublished data, 2021). Harvest peaked on July 13 at 808,019 (Table 9). Twenty-five processors registered to purchase fish in the Naknek-Kvichak District in 2021 (Table 5).

The Naknek River tower operated through July 21 and had a final escapement estimate of 2,796,534 sockeye salmon. The Kvichak River tower operated through July 27 and had a final escapement estimate of 4,703,520 sockeye salmon. The Alagnak River tower operated through July 28 and had a final escapement estimate of 3,236,904 sockeye salmon (Table 8).

The total harvest of sockeye salmon was 9.3 million, 5% above the 20-year average (2001–2020) harvest of 8.9 million fish (Appendix A3). The total harvest of Chinook Salmon was 990 fish, below the 20-year average (2001–2020) harvest of 1,714 (Appendix A4). The chum salmon harvest of 34,338 fish was the lowest since 2004 (Appendix A5). There was a commercial harvest of 224 pink salmon and 1,053 coho salmon (Appendices A6 and A7).

Egegik District

The 2021 Egegik River total inshore run of sockeye salmon was forecast to be approximately 11.0 million fish, with a projected harvest of 9.3 million fish for harvest (Table 2). The Egegik River SEG range is 800,000–2.0 million fish. The actual run to the Egegik District in 2021 totaled 10.4 million sockeye salmon, with a harvest of 8.5 million and an escapement of 1.8 million fish (Table 2, Appendix A13).

The district opened to commercial salmon fishing for a set schedule of 3 days per week at 9:00 AM Tuesday, June 1. Fishing was permitted from 9:00 AM Monday to 9:00 AM Wednesday, and 9:00 AM Thursday to 9:00 AM Friday through June 18. The first deliveries were recorded on June 10 (Table 12). Daily harvests were small but began to increase toward the end of the early-season schedule. By June 18, the total harvest was approximately 83,000 sockeye salmon. After June 18, the district went to active management, and additional fishing time was based on inseason indicators of abundance.

The Egegik River tower began operations on June 17, and escapement counts through June 18 had totaled fewer than 12,000 sockeye salmon, which was low for this period of time (Table 13). Because harvest and escapement numbers did not indicate a substantial number of fish being present, the next commercial fishing period did not occur until June 20. Daily inriver test fishing, which provides an index of sockeye salmon passage into the lower Egegik River, began operations on June 19 at established sites upstream of Wolverine Creek (Table 13). Initial catches from the test fishery indicated small numbers of fish moving into the Egegik River. Harvest from June 20 was similar to the last full day of the early season schedule, suggesting abundances had not increased (Table 12).

The daily escapement increased on June 20, bringing the cumulative count to 49,392 sockeye salmon (Table 13). With escapement tracking the most recent 5-year average (2016–2020), a fishing period for both gear groups was announced for June 22 to gauge if fish were starting to build in the district. Harvest from this period was 108,762 fish, nearly double from the previous one (Table 12). Escapements continued to increase daily during this time, with a season cumulative count of 152,634 through June 22, which was above average for this period in time. Between June 22 and July 1, a series of storms moved through the Bristol Bay region that brought strong easterly winds and heavy inshore seas. This likely affected harvest power as some vessels elected not to fish at times, and for those that did, gillnet gear can become less effective in rough sea conditions. This also affected project operations for the inriver test fishery project because they were unable to operate for extended periods of time (Table 13).

The district remained closed on June 23 to spread fish throughout the district and allow for additional escapement. With strong easterly winds occurring, passage rates at the tower decreased on June 23, but the cumulative count of 183,732 fish was still above average and tracking to exceed the escapement goal range (Table 13). A 6.5-hour drift and 8-hour set gillnet fishing period was announced for the morning tide of June 24. Sockeye salmon harvest from this period totaled 209,415 fish, an improvement from the previous period (Table 12). Cumulative harvest was tracking along the most recent 5-year average (2016–2020), with 457,117 sockeye salmon being harvested to date. Escapement also increased on June 24 with a daily count of 87,984 fish. With this count, the cumulative escapement of 271,716 fish was tracking well ahead of needed levels for this point in the season (Table 13).

Commercial fishing periods for both gear groups were announced for both tides on June 25. Harvest from these periods totaled just 133,675 sockeye salmon, with harvest likely being affected by strong easterly winds (Table 12). However, the winds did not have the same effect on escapement as the daily count for June 25 was 108,810 fish, which was the highest daily count to date (Table 13).

Because cumulative escapement was still tracking above needed levels, similar fishing periods for both gear groups were announced for each tide from June 26 through July 1. Daily harvests ranged

from 292,877 (June 28) to 357,270 (June 30) sockeye salmon, a notable increase from previous periods. Collectively these added up to a harvest of approximately 1.74 million sockeye salmon over those 6 days, increasing the season total to 2.2 million fish (Table 12). Meanwhile, daily escapements ranged from 33,954 on July 1 to 101,952 fish on June 27 (Table 13). Through July 1, overall escapement was still projected to exceed the escapement goal range.

Commercial fishing opportunities continued to be provided for each tide between July 2 and July 5; however, the period durations for the drift fleet were reduced (Table 12). Consistently fishing every tide for the past 6 days had led to few fish making it past the outer boundaries of the fishing district. Reducing the duration of the drift periods and shifting their start time to later in the flood allowed fish to spread out within the district, letting some fish move through uninterrupted for escapement. The combined harvest from July 2 to July 5 was 1.3 million fish, bringing the season total to 3.8 million. Although cumulative harvest through July 5 was in line with the most recent 5-year average (2006–2020), it was beginning to appear that this run might not materialize as forecasted. To date, there had not been a significant push of fish that led to daily harvests eclipsing 500,000 fish, as there had been in recent years when runs exceeded 11 million fish. Some drift fishers were seeing the same trends, as the number of registered vessels had been decreasing since July 2 (Table 10). Escapement counts increased daily between July 2 and July 5, bringing the season total count to 933,096 fish and exceeding the lower bound of the escapement goal on July 4 (Table 13).

With the escapement goal being achieved and a good portion of the run left to come, consistent tidal fishing opportunities were provided until the end of the season. Between July 6 and July 9, the duration of drift gillnet periods increased to 6.5 hours. Daily harvests ranged from the season peak of 627,577 sockeye salmon on July 7 to 294,015 fish on July 9 (Table 12), bringing the cumulative total to 1.8 million sockeye salmon over those 4 days. Escapement counts at the tower totaled 476,562 over the same 4-day period, bringing the cumulative count to 1.4 million sockeye salmon (Table 13). On July 9, the midpoint of the escapement goal range (1.4 million fish) was exceeded, and on July 10, the 48-hour transfer waiting period into the Egegik District was waived.

Additional fishing opportunities were provided for both gear groups, from July 10 through July 16. Drift gillnets averaged approximately 14.0 hours per day and set gillnets averaged 17.5 hours per day of fishing time. The cumulative harvest from those 7 days was 2.3 million fish (Table 12). Daily escapement counts exceeded 30,000 fish through July 16, bringing the cumulative count to 1.7 million fish (Table 13). With escapement within the upper half of the escapement goal range and harvest levels beginning to decrease, commercial fishing in Egegik District was liberalized to 24 hours per day from July 17 through August 7, with the fall schedule taking effect on August 8.

The 2021 Egegik sockeye salmon run was below forecast and exhibited an average run timing; the midpoint was July 5, the same as the 20-year average (2001–2020; A. Tiernan, Egegik/Ugashik Area Management Biologist, ADF&G, Anchorage, unpublished data, 2021). By the end of the allocation period (July 17) the cumulative catch was 7.9 million sockeye salmon, with an additional 678,000 fish caught before the last buyer ended operations for the year. Harvest of all species in 2021 was 8.6 million fish (Table 12). The escapement goal was met with a final escapement of 1.8 million sockeye salmon (Table 13).

The 2021 Egegik sockeye salmon run was composed of mostly ocean age-2 and age-3 fish (Table 14), which originated from 2016 and 2017 escapements of 1.8 million and 2.6 million

sockeye salmon, respectively (Appendix A10). All age classes were under forecast for the season. Age-1.2 fish were the most abundant age class, making up 49% of the 2021 run.

During the period from June 16 to July 17 in 2021, a total of 305 hours were fished by the drift gillnet group and 407 hours were fished by the set gillnet group, which equated to 45% and 60%, respectively, of the 672 available hours (Table 12). By the end of the allocation period on July 17, harvest percentages were at 84% drift gillnet and 16% set gillnet, relatively close to what is specified in regulation (Appendix A9).

The 2021 harvest of 8.6 million sockeye salmon in the Egegik District ranked 8th highest in the last 20 years and 15th highest on record since 1952. It was above the 20-year average (2001–2020) of approximately 7.5 million fish (Appendix A13). The fishery still harvested 82% of the run into the district, similar to the 20-year average (2001–2020) of 83% (Appendix A13). Harvest peaked at 628,000 fish on July 7 (Table 12). Escapement peaked on July 8, when 166,542 sockeye salmon passed the tower (Table 13). Effort peaked on July 1, when 441 drift gillnet permits were registered in the district, including 106 dual permits (Table 10). Twelve processors registered to purchase fish in the Egegik District in 2021 (Table 5).

The commercial harvest of other salmon species in the Egegik District was 37,025 fish, or about 0.4% of the total salmon harvest (Table 12). The Chinook salmon harvest was 475 fish, below the 20-year average (2001–2020) of 784 fish (Appendix A4). The district chum salmon harvest of 20,317 fish was below the 20-year average (2001–2020) of 76,448 fish (Appendix A5). Pink salmon harvest was 281 fish (Appendix A6). The coho salmon harvest of 15,952 fish was above the 20-year average (2001–2020) of 13,743 fish (Appendix A7).

Ugashik District

The 2021 Ugashik River total inshore run of sockeye salmon was forecast to be approximately 6.5 million fish, consisting of 5.3 million fish for harvest and 1.2 million fish for escapement (Table 2). The commercial catch of approximately 5.2 million sockeye salmon was above the 20-year average (2001–2020) of 2.9 million fish (Table 15, Appendix A3). The sockeye salmon escapement to the Ugashik River of 2,859,930 fish was the highest on record since 1983 and exceeded the SEG range of 500,000–1.4 million fish (Tables 1 and 16). The 2021 total run of sockeye salmon to the Ugashik District of 8.0 million fish ranked second highest out of the last 20 years (Appendix A14).

Pacific walrus returned to the same beach used during recent seasons, located about 0.5 miles north of the district boundary. Once again, EO authority was used to move the district boundary 1 mile south from the location defined in regulation to provide an additional buffer space for the walrus. Although this did not eliminate interactions between the drift gillnet fleet and walrus, the buffer zone seemed to work as intended by reducing the number of vessels in the immediate areas.

The Ugashik District was opened to a fishing schedule of 4 days per week (9:00 AM Monday to 9:00 AM Friday) beginning 9:00 AM Tuesday, June 1. The first landings occurred on June 14 (Table 15). Because the preseason forecast for the Kvichak River allowed all fishing districts to start the season in their full areas, the schedule of 4 days per week was continued until 9:00 AM Wednesday, June 23. Then the department switched to an active management strategy where additional fishing time was dependent on inseason indicators of abundance. The Ugashik District inriver test fishery operates about 3 miles upstream of Ugashik Village and provides a daily index of sockeye salmon passage into the lower part of the Ugashik River. Inriver test fishing began

June 23 and immediately caught low numbers of fish passing upriver. The district was closed until June 25, when a 10-hour period was opened for both gear groups to provide insight on run entry and strength into the district. The harvest of 46,109 sockeye salmon was above average for the date. A small percentage of these fish were harvested by the setnet fleet, signifying that fish were still on the outside portion of the district and had yet to move inside the river mouth.

Genetic stock composition estimates at PMTF from June 21–22 became available on June 25 and indicated a notable abundance of Ugashik bound fish entering the bay (Figure 2). Through the morning of June 26, lower river test fish data continued to suggest low numbers of fish present in the river. An 8-hour commercial fishing opportunity for both gear groups was announced for June 27. Harvest from this period was 41,139 fish, which is above average for the date and on par with the previous period considering the reduction in time (Table 15). The district was left closed the following day, with the next period being announced for June 29 to gain insight into whether run entry and strength into the district had changed.

The next genetic stock composition estimates at PMTF from June 25 became available on June 28, with a continued abundance of Ugashik bound fish (Figure 2). The harvest of 85,230 sockeye salmon from June 29 was an increase from previous periods (Table 15). However, low overall catch numbers for the setnet fleet continued to signify that fish were building on the outside portion of the district and had yet to move inside the river mouth. The escapement tower project, operating about 24 miles upstream of Ugashik Village, began June 29 and counted 14,178 sockeye salmon that day (Table 16). Tower count data corroborated inriver test fishery data that entry of fish into the river was low and that there were few fish below the escapement project.

The following 2 opportunities were announced for July 1 and 3. Harvest from these periods were 161,899 and 156,306 sockeye salmon, respectively (Table 15). Numerous reports from the drift fleet, of a sizeable mass of fish building in the northwest corner of the district, began to come in after each of those periods. Cumulative harvest through July 3 was 551,415 sockeye salmon and above the most recent 5-year average. Daily escapements were decreasing by July 3 when 3,036 fish passed the counting tower. The cumulative season count, to date, was 28,998 fish (Table 16) and was projected to achieve the lower portion of the escapement goal range. The district would remain closed on July 4 in an effort to increase passage numbers.

The department flew an aerial survey of the district on July 4 and observed the milling fish that had been reported in previous days. The abundance of fish was thought to be large by the amount of fish activity that could been observed. However, because of the prolonged period of strong easterly winds that just moved through the region, it was believed at the time that some of the milling fish could be bound for districts and rivers other than Ugashik. Daily inriver test fish data and tower counts continued along a decreasing trend on July 4 (Table 16). The next opportunity occurred on July 5 and total harvest was consistent with the previous periods (Table 15). Passage rates at both assessment projects did not indicate a significant change in escapement (Table 16). Although cumulative harvest was tracking above average for the date, escapement was tracking behind needed levels and the district was left closed on July 6.

To get an indication if fish were starting to move throughout the district, another opportunity was announced for July 7; however, the drift fleet was reduced to just 3.5 hours, while the setnet fleet was provided 10 hours. By leaving the setnet fleet in for most of the tide, this allowed the department to see if fish were moving through the district in strong numbers. Harvest from this period was 219,193 sockeye salmon, a sizeable increase from the previous period (Table 15). Like

the last period, the drift fleet caught the vast majority of the harvest on the outside portion of the district, even with the reduction in time, suggesting that fish were still milling and building in numbers. Daily escapement for July 7 was 2,700 fish, bringing the cumulative escapement to 39,156 and still tracking below needed levels (Table 16).

The weather for July 9 was forecasted to be a strong west to southwest wind, which has been known to provide a push to milling fish. Therefore, an opportunity was announced for July 9 with an increase to 6 hours for the drift fleet and another 10 hours for the setnets, just in case a large push of fish occurred. The increase for the drift fleet was to make up for a reduction in catch efficiency due to the tough fishing condition caused by the wind. Total harvest from this period yielded 193,050 sockeye salmon, a decrease from the previous period likely due to rough fishing conditions. However, with that decrease, the setnet fleet did have their highest daily harvest to date, indicating that fish were beginning to spread out into the district. Inriver test fish indices began increasing on July 8 and continued through the mid-day of July 9, suggesting that escapements would soon be improving at the counting tower (Table 16).

Because assessment data was suggesting fish were moving upriver in higher numbers, an opportunity for both gear groups was announced for July 10. This was another short period for the drift fleet because of a need for increased escapement. Total harvest from this period was 136,747 sockeye salmon (Table 15). The setnet fleet harvest increased for the second consecutive period, indicating that more fish were moving through the district. Inriver test fish indices continued to improve as well on July 10. Additionally, escapement counts at the Ugashik tower began to increase during the morning of July 10, indicating a travel time of 1½–2 days between assessment projects (Table 16).

With the increased passage rates observed at the escapement projects, a 6-hour drift and 8-hour setnet opportunity was announced for July 11. Shortly after the period began, reports of excellent fishing started to come in and it appeared that the mass of fish that had been building on the outside portion of the district had finally started to move. Therefore, an extension of 2 hours for the drifters and 2 hours for the setnets was announced midway through the current period. Harvest from this period was 654,059 sockeye salmon, a substantial increase from previous days (Table 15). Daily escapement for July 11 was 93,864, bringing the season cumulative escapement to 191,964 fish and back in line with needed levels (Table 16). Also, based on the recent indices observed at the inriver test fish project, passage rates at the counting tower would continue to increase over the near term.

A fishing period of 6 hours for the drifters and 10 hours for setnets was initially announced for July 12. However, similar reports to the previous day of excellent fishing began to come in almost instantly after the period started. Which led to the announcement of another extension of 4 hours for the drifters and 2 hours for the setnets (Table 15). Harvest from this period totaled 676,486 sockeye salmon, which was the season's peak daily harvest and the highest since 1995. Cumulative harvest for the season stood at approximately 2.6 million fish, with approximately half of those being caught in the last 2 days. Inriver test fish indices continued to trend upwards over the course of July 12. The daily escapement count took a slight dip on July 12, but the season total of 267,822 fish was still projecting to achieve the escapement goal.

Assured that escapement numbers were continuing to head in the right direction, commercial fishing was liberalized over the next few days. Nearly identical fishing periods were announced for July 13 and 14 and yielded a combined harvest of approximately 1.2 million fish, bringing the

cumulative harvest to 3.7 million fish. Daily escapements rose sharply with combined passage of 514,014 fish for the same 2-day period and brought the season total to 781,836 fish through July 14, surpassing the lower bound of the escapement goal (500,000 fish; Table 16). An additional fishing period of 12 hours for both gear groups was provided on July 15. Daily harvest decreased for the second day in a row, likely indicating that the peak of the run had passed through the district (Table 15). The midpoint of the escapement goal (950,000 fish) was exceeded on July 15, when 537,348 fish were counted past the tower. Passage rates at the tower continued to be high through July 19, with the peak count of 557,334 fish occurring on July 16. The tower operated until July 28 and passed a total of 2,859,930 sockeye salmon for the season.

Commercial fishing continued through the rest of July and an additional 1.1 million sockeye salmon were harvested. The last deliveries occurred on August 14 and the cumulative catch was 5.2 million sockeye salmon (Table 15). By the end of the allocation period, July 17, set gillnets caught approximately 13% of the sockeye salmon harvest and drift gillnets caught 87%. The allocation specified in regulation is 10% set gillnet and 90% drift gillnet (Appendix A9). Between June 25 and July 17, set gillnet permit holders were provided a total of 151.5 hours of fishing time and drift gillnet permit holders were permitted to fish a total of 112.5 hours (Table 15).

The reported harvest of 444 Chinook salmon was below the 20-year average (2001–2020) of 996 fish (Appendix A4). Chinook and chum salmon escapements are assessed via aerial surveys in the Dog Salmon and King Salmon Rivers, major tributaries of the Ugashik River and the biggest producers of these species in the district. In 2021, escapement surveys for these species were not flown due to budget constraints. The chum salmon harvest of 20,793 fish was below the 20-year average (2001–2020) of 67,585 fish (Appendix A5). The reported pink salmon harvest was 28 fish (Appendix A6). There was limited commercial effort for coho salmon in 2021, with a reported harvest of 151 fish (Appendix A7).

In summary, the 2021 Ugashik District sockeye salmon fishery harvested approximately 65% of the sockeye salmon run to the district, compared to the 20-year average (2001–2020) harvest rate of 72% (Appendix A14). The midpoint of the escapement was July 16 compared to the 20-year average (2001–2020) of July 11 (A. Tiernan, Egegik/Ugashik Area Management Biologist, ADF&G, Anchorage, unpublished data, 2021). Eleven processors registered to purchase fish in the Ugashik District this season (Table 5).

Nushagak District

The 2021 Nushagak District total inshore sockeye salmon run was 28.3 million fish, 94% above the preseason forecast of 14.8 million fish (Table 2). Commercial sockeye salmon harvest in Nushagak District reached 18.3 million fish, 50% above the preseason projected harvest of 12.2 million fish and 129% above the 20-year average (2001–2020) harvest of 8.0 million sockeye salmon (Table 2, Appendix A3 and A15). Escapement in the district's 3 major river systems was: 4,410,156 for Wood River, 878,952 for Igushik River, and 4,697,299 sockeye salmon for Nushagak River (Tables 7 and 17). All 3 rivers' sockeye salmon escapements exceeded the upper end of the escapement goal ranges (Appendix A1).

In 2021, there was no forecast for Nushagak District Chinook salmon. The preseason plan for Chinook salmon management was to not expect directed openings for Chinook salmon; this decision was based on the lower-than-average Chinook salmon runs in recent years and the lack of a reliable forecast for the 2021 season (Appendix A17). As the Chinook salmon run developed, it was clear that it was a poor run, and it would not support directed Chinook salmon openings.

Additionally, with an above-average sockeye salmon forecast and a larger than usual fleet it was expected that incidental harvest of Chinook salmon would control any potential surplus. The Chinook salmon run produced an incidental harvest of 4,306 Chinook salmon (Tables 6 and 18) in the Nushagak District in 2021. This harvest is 12% of the 20-year average (2001–2020) harvest of 34,632 fish for the Nushagak District (Appendices A4 and A19). Chinook salmon sonar estimate into Nushagak River was 55,222, just above the 55,000-lower end of the escapement goal range. However, because there was harvest above the sonar it is likely the escapement goal was not achieved. However, it is likely that many Chinook salmon went undetected at the sonar because they were masked by the record high sockeye salmon passage. High sockeye salmon passage saturates the test fishing nets at the sonar project, a situation shown to bias the Chinook salmon count low in previous years. This is supported by reported inseason sport fish catch rates along with postseason aerial surveys indicating that the run was larger than the final sonar count.

The sonar escapement enumeration project at Portage Creek was fully operational on June 6 (Table 7). Nushagak Chinook salmon escapement was very poor all season and didn't project to meet the 55,000 lower end of the escapement goal range until July 10. The cumulative sonar count through June 18 was 4,330, which projected out to a total count of approximately 27,109 Chinook salmon (Table 7). The preseason plan, outlined in the outlook, indicated commercial fishing for sockeye salmon would begin in the Nushagak District when Wood River sockeye salmon escapement reached 100,000 if Nushagak River Chinook salmon count was projecting below 95,000. Management emphasis would also switch from Chinook salmon to sockeye salmon at this juncture; however, efforts would be made to keep drift fishing time to 12 hours or less daily for as many days as possible to protect Nushagak Chinook salmon.

Because Nushagak Chinook salmon sonar count was projecting below the minimum escapement, staff wanted to wait as long as possible before opening commercial fishing in the district while still protecting against a big influx of sockeye salmon. Staff closely watched Wood River sockeye salmon escapement, where enumeration began on June 17, for signs of such an influx. Wood River sockeye salmon escapement remained low, relative to the previous 8 years, and only 20,394 total sockeye salmon had passed the tower through June 22. However, there were reports of jumpers in the district and Port Moller genetics indicated that Nushagak District sockeye salmon made up a large component of fish heading to Bristol Bay. The weather forecast also indicated high winds in the immediate forecast. Based on this information, at 3:00 PM June 22 the department announced the fleet should be ready on short notice with the earliest possible opening June 23 at 3:00 PM.

The morning of June 23 was stormy, and staff could not fly due to weather. The early morning count from Wood River was 4,860 sockeye salmon between midnight and 6:00 AM, but the 7:00 AM count was an additional 25,000 fish (Table 17). There were also reports that subsistence fishing had improved the afternoon of June 22. Because the cumulative Wood River sockeye salmon escapement was still far short of 100,000, and Nushagak Chinook salmon sonar count was projecting below the 55,000 minimum escapement, staff announced at noon on June 23 that the earliest possible opening would be 1:30 PM June 24.

The June 23, daily escapement increased precipitously, from 5,382 on June 22 to 89,982 on June 23 (Table 17). This number greeted department staff on the morning of June 24. The midnight to 6:00 AM count was an additional 16,000 fish. Staff announced at 9:00 AM that commercial fishing with set gillnets would open at noon and drift gillnets would begin at 1:30 PM June 24 (Table 18).

With the first commercial opening, the department began the switch from Chinook salmon conservation to sockeye salmon management. Staff wanted to provide opportunity to harvest increasing numbers of sockeye salmon, but with intermittent breaks in fishing to allow additional Chinook salmon escapement. This translated to the previously mentioned 4-hour drift opening on June 24 and a 5.5-hour drift opening on June 25. From June 26 to June 28, there were 2 openings per day for the drift fleet averaging 12 hours each day. The June 26 opening was very strong with a harvest of 719,860 sockeye salmon. Harvest decreased by half each of the next 3 days including the June 29 harvest of 120,700 sockeye salmon in one 6-hour opening (Table 18).

On June 29, the Wood River sockeye salmon escapement exceeded 1.1 million; therefore, the Wood River Special Harvest Area (WRSHA) was opened to commercial fishing with set gillnets. The weather forecast indicated that more strong winds would be in the area for the next few days. The PMTF numbers and genetics indicated fish volume in the Nushagak District should be increasing. Taking all these factors into consideration, department staff increased fishing pressure to better control sockeye salmon escapement. Fishing with set gillnets was opened in the Nushagak Section and the WRSHA until further notice at 5:00 PM June 29. On June 30, the drift fleet fished 2 openings for a total of 15 hours and continued to fish both tides each day after that, averaging 18.25 hours of fishing daily when fishing was extended until further notice July 11.

The surge of sockeye salmon into the Nushagak District, which began June 30, was unprecedented. Inseason, the daily processor reports indicated a daily harvest of 1.78 million on June 30 and another 1.81 million on July 1. These were both record single day harvests for the Nushagak District. Postseason fish ticket numbers show the June 30 daily harvest at 2.4 million (Table 18). The reported daily harvest exceeded 1 million 7 of the 8 days between June 30 and July 7. Another 5 million sockeye salmon were harvested after July 7. The 18.3 million sockeye salmon harvest ranks second all-time behind the 24 million harvested in 2018 (Appendix A3).

Igushik set gillnet fishing opened on June 14 for 8 hours a day (Table 18). This schedule was maintained through June 24, when the fishing was extended until further notice. Escapement into the Igushik River was stronger than usual from the second day of counting on (Table 17). Escapement continued at an above average pace and the 150,000 lower end of the escapement goal was exceeded on July 3 and the 400,000 upper end was exceeded 5 days later, on July 8. The 878,952 total escapement ranks as the third largest escapement ever (Appendix A1; T. Sands, Nushagak/Togiak Area Management Biologist, ADF&G, Dillingham, unpublished data, 2021).

As the sockeye salmon run ended, fishing effort dropped steadily, and processing effort also diminished. With decreased fishing effort and reduced processing capacity, the department transitioned from sockeye salmon management to coho salmon management. In 2021, the sonar counting station was operational on the Nushagak River until July 25. This meant that sonar counts were not available for management of the coho salmon fishery. With no escapement information for pink or coho salmon, staff used harvest information to determine if fishing was warranted.

Fishing remained open continuously in the Nushagak District for both drift and set gillnets, but effort gradually diminished over the remainder of the season (Table 18). Without sonar counts it was impossible to quantify the pink or coho salmon runs in 2021. Pink salmon do not occur in large numbers on odd years in Bristol Bay. With no significant pink salmon run, most major processors ceased buying operations the third week of July and fishing quickly tapered off as did sockeye salmon abundance. There was some directed fishing for coho salmon, but effort was minimal as commercial fishing operators were still focused on sockeye salmon opportunities on

the Eastside of Bristol Bay or weren't interested in fishing for coho salmon. The coho salmon harvest of 27,467 was below the recent 10-year average (2011-2020) of 91,585 (Appendix A7). The total Nushagak District pink salmon harvest was 1,122, insignificant relative to the 20-year average (2001–2020) of 424,411, but not unexpected for an odd year (Tables 6 and 18, Appendix A6). The final chum salmon harvest was 115,456 (Tables 6 and 18, Appendix A5). The chum salmon escapement of 125,352 on the Nushagak River was below the lower bound SEG of 200,000 (Tables 1 and 7). The final sockeye salmon harvest was 18,283,479 (Tables 6 and 18, Appendix A3). The final sockeye salmon escapement to the district was 10.0 million fish and escapements exceeded the escapement goal ranges on all 3 river systems (Table 2).

Togiak District

The 2021 inshore run forecast for the Togiak River was 800,000 sockeye salmon composed of a projected 200,000 fish escapement and 600,000 fish harvest (Table 2). Smaller sockeye salmon runs to other drainages in the district (primarily the Kulukak River) occur, but these are not included in the preseason forecast; however, they contribute approximately 50,000 sockeye salmon to the district harvest each year. The SEG for the Togiak River is 120,000–270,000 sockeye salmon. The total inshore run to the district in 2021 was 956,999 sockeye salmon, making it above average relative to the last 20 years (Table 2, Appendix A16). The commercial harvest of 676,163 fish is also above average (Table 19, Appendices A3 and A16).

The Togiak District is managed differently than other districts in Bristol Bay. This district uses a fixed fishing schedule of 60 hours per week in the Kulukak Section, 4 days per week in the Togiak River Section (except for a peak fishing schedule of 5.5 days per week from July 1 to July 15), and 5 days per week in Osviak, Matogak, and Cape Peirce sections. In addition, transferring into Togiak District prior to July 27 was prohibited by regulation if the permit and or vessel had been registered in any of the 4 other Bristol Bay districts. Conversely, permit holders that have fished in Togiak District are prohibited from fishing in any other Bristol Bay district until July 27.

ADF&G does not forecast Chinook salmon for systems in the Togiak District. However, based on recent harvests, the Chinook salmon run was again anticipated to be below average. As a result, the department managed the early portion of the season conservatively and monitored effort and Chinook salmon harvest closely through June. Effort remained low throughout much of June and the department took no management actions to restrict fishing time. This was partly due to low effort and partly due to poor weather, including high winds that reduced fishing effort. The total Chinook salmon harvest for the Togiak District was 729 fish, below the 20-year average (2001–2020; Table 19 and Appendix A18).

The escapement counting tower on the Togiak River began counting on July 5. Escapement counts started strong and remained solid for the duration of counts. With strong escapement, the fishing schedule was extended 7 times over the course of the season for the maximum allowable extension each time. On August 4, escapement peaked with 22,842 fish, followed by 15,072 on August 5 (Table 17). Tower operations ended on August 7 with a daily count of 2,016. Escapement into Togiak Lake was 280,836 sockeye salmon, just above the escapement goal range of 120,000–270,000 fish (Table 17, Appendix A1).

The commercial harvest of non-sockeye salmon species in the Togiak District during 2021 was 27,599 fish, or about 4% of the total (Table 19). The commercial Chinook salmon harvest of 729 fish represented only 14% of the 20-year average (2001–2020), and the chum salmon harvest of 21,346 fish was 13% of the 20-year average (2001–2020; Appendices A4 and A5). Pink salmon

harvest was negligible because pink salmon are an even year species in Bristol Bay. Harvest for coho salmon totaled 3,583, 25% of the 20-year average (2001–2020; Appendix A7).

In 2021, the Togiak District fishery harvested approximately 71% of the sockeye salmon run to the district, compared to the 20-year average (2001–2020) harvest rate of 64% (Appendix A16). Peak escapement occurred on August 4, when 22,842 sockeye salmon passed the counting tower (Table 17). Peak effort occurred on July 27 when 107 permits delivered fish. Three processors registered to purchase fish in the Togiak District in 2021 (Table 5).

2021 BRISTOL BAY HERRING FISHERY

The Bristol Bay area includes all waters south of a line extending west from Cape Newenham, east of the International Date Line in the Bering Sea, and north of a line extending west from Cape Menshikof. The Bristol Bay area is divided into 3 herring fishing districts: The Bay District, including all waters east of the longitude of Cape Constantine; the Togiak District, including all waters between the longitude of Cape Newenham and the longitude of Cape Constantine; and the General District, including all waters west of the longitude of Cape Newenham. Togiak District spans approximately 192 kilometers (Figure 4). Togiak village lies at the center of the district, 108 kilometers west of Dillingham.

Pacific herring (*Clupea pallasii*) have been documented throughout Bristol Bay, but a large concentration returns to the Togiak area each spring to spawn and is the focus of herring sac roe and spawn-on-kelp fisheries. In the Togiak District, herring are commercially harvested for sac roe using gillnets and purse seines, while herring spawn on rockweed kelp (*Fucus* spp.) is harvested by hand.

The herring sac roe fishery began in the Togiak District in 1967, followed by the first fishery for spawn on kelp in 1968. Effort and harvest levels remained low for the first 10 years of the fishery. However, increased interest, favorable market conditions, and additional incentives provided by the Fishery Conservation and Management Act of 1976 (later becoming the Magnusson-Stevens Act) resulted in a rapid expansion of the Togiak herring fishery in 1977.

The Togiak herring fishery is the largest in Alaska. Between 2001 and 2020, the Togiak sac roe harvest has averaged 22,052 tons, worth an average of $2.5 million annually (Appendices B2 and B5). Given the volatile nature of the herring sac roe market, historical harvest and value are of limited utility when contemplating future harvest or value. In 2021, the sac roe harvest value was confidential (Appendix B5). No spawn-on-kelp fishery has occurred since 2003.

STOCK ASSESSMENT

Since 1978, ADF&G has conducted aerial surveys throughout the herring spawning migration to estimate abundance, timing, and distribution of Pacific herring in the Togiak District. Surveys are conducted after there is a reasonable expectation that herring might be present in the Togiak area. Surveys occur several times a week after threshold biomass has been documented. Surveys are performed as weather, pilot availability, and funding allow.

Fundamental aerial survey techniques used in Togiak have remained largely unchanged since 1978 and are described in Lebida and Whitmore (1985). Herring school surface area is estimated through a handheld tube with a measured grid and a known focal length from a known altitude. Standard conversion factors of 1.52 tons (water depths of 16 ft or less), 2.58 tons (water depths between 16 and 26 ft), and 2.83 tons (water depths greater than 26 ft) per 538 ft^2 of surface area is applied

to herring school surface areas to estimate the total biomass observed during each flight. Over the last 10 years, ADF&G has transitioned to aerial survey data collection methods that use Geographic Information Systems (GIS), allowing real-time data entry and analysis. The new GIS-based program, among other improvements, allows observers to use the survey aircraft to estimate length and width dimensions of very large herring schools, providing a more objective and reliable estimate.

Herring ages 2 through 20 have been observed in the Togiak District, but herring are generally considered to begin recruiting into the fishery at age 4 and to be fully recruited at age 9. Herring abundance is related to year class survival and is strongly driven by large recruitment events that occur approximately every 8 to 10 years.

SAC ROE HERRING FISHERY OVERVIEW

Fishing and Industry Participation

Unlike most herring fisheries in Alaska, the Togiak sac roe fishery is not a limited entry fishery. Gillnets, purse seines, and hand purse seines are legal gear. Because fishing effort is not limited, effort levels can vary substantially from year to year. Herring market conditions are one of the leading factors influencing effort each year, but other factors also influence fleet size. Because most herring permit holders in Togiak participate in other fisheries, like Bristol Bay salmon, the health of the salmon market and markets for other fish can indirectly affect effort in the herring fishery. Herring prices paid to permit holders the prior year and run timing also affect effort. Processors have utilized cooperative fleets for the purse seine fishery for over a decade. Under limited markets, processors choose the makeup of their fishing fleets to maximize their efficiency, thereby influencing the number of participants.

Fishing effort in the sac roe fishery increased through the late 1980s, decreased early in the 1990s, increased again to a peak in 1996, and has generally declined since that time (Appendix B1; T. Sands, Nushagak/Togiak Area Management Biologist, ADF&G, Dillingham, unpublished data, 2021). Since 1994, gillnet effort increased from 146 vessels to a peak of 461 in 1996, followed by a general decline to an all-time low of 1 in 2018 and again in 2020 (Appendix B1). Purse seine participation fluctuated between 100 and 300 vessels from 1994 to 1998, before declining to an all-time low of 2 vessels in 2020 (Appendix B1). The 2020 participation of 2 purse seine vessels and 1 gillnet vessels was partly due to complications from COVID-19. Participation increased in 2021 to 10 for purse seine and 3 for gillnet.

Industry participation in the fishery peaked between 1979 and 1982, when 33 processors participated in the herring fishery. From 1994 through 1997, between 16 and 22 companies have purchased herring from Togiak. Since 1998, industry participation has steadily declined to a low of 4 companies in 2012 and 2015 to present (Appendix B1). In 2021, processor participation involved 2 companies (Table 20). Processing capacity on the grounds has also declined from a high of 4,850 tons per day in 1996, to a low in 2007 of 1,420 tons per day. Capacity in 2021 is confidential (Appendix B1). Two companies participated in the 2021 Togiak herring fishery.

2021 SEASON SUMMARY

The following is a summary of the 2021 Togiak herring fishery in the Togiak District, Bristol Bay. Herring are commercially harvested for sac roe using gillnet and purse seine gear when they migrate into the district to spawn, typically during the months of April and May. In July, a food

and bait fishery also occurs near Dutch Harbor; this fishery is primarily composed of the Togiak herring stock, and the allocation is based on the forecasted biomass of Togiak herring. The Dutch Harbor fishery is summarized separately. All data included in this summary are preliminary (Table 21 and Appendix B4).

COMMERCIAL FISHERY

Togiak District herring fisheries are managed in accordance with the *Bristol Bay Herring Management Plan* (5 AAC 27.865), which specifies a maximum allowable exploitation rate of 20% and allocates the harvestable surplus among all the fisheries harvesting Togiak herring stocks. The 2021 preseason biomass forecast was 236,742 tons, with an exploitation rate of 20% (47,348 tons). The projected harvest guideline for each fishery was as follows: 1,500 tons of herring equivalent (350,000 lb of product) for the spawn-on-kelp fishery, 3,209 tons for the Dutch Harbor food and bait fishery, and the remaining 42,639 tons allocated to the sac roe fishery. The management plan further specifies that the department will manage the sac roe fishery so that 80% of the harvest is taken by purse seine (34,111 tons in 2021) and 20% of the harvest is taken by gillnet (8,528 tons in 2021).

The *Bristol Bay Herring Management Plan* and other regulations direct the department to conduct an orderly, manageable fishery and strive for the highest level of product value while minimizing waste. For at least the past decade, the seine fleet has been made up of processor-organized cooperatives. During the 2021 season, management staff allowed long-duration purse seine openings across a large area of the district and let processors limit harvest for their individual fleets based on processing capacity.

Department staff took a poll of processing companies prior to the 2021 season to assess processing capacity and to inquire about additional concerns or issues. The poll indicated 2 companies intended to participate in the 2021 Togiak herring fishery. One company indicated they planned to buy both gillnet and purse seine fish. A second company intended to only buy purse seine fish.

Purse Seine

The Togiak purse seine fishery opened until further notice at 6:00 PM on May 3, with harvest beginning that evening. Ten purse seine vessels participated in the Togiak herring fishery in 2021. All harvest for the fishery is confidential due to less than 3 processors participating. The weather was good for most of the season and did not appear to prevent fishing for any significant amount of time. The fishery continued until participation ended on May 14.

Gillnet

The Togiak herring gillnet fishery opened until further notice at 12:00 PM May 7, but the first harvest did not occur until May 10. Three vessels participated in the Togiak herring fishery in 2021, so harvest is confidential. The fishery remained open until May 31, though participation ended on May 15.

EXVESSEL VALUE / EXPLOITATION

All information related to harvest, value, and exploitation is confidential in 2021 due to low participation in the fishery.

AGE COMPOSITION

A total of 3,570 herring were sampled over the course of the fishery from commercial harvest to: (1) determine age composition of the harvest, (2) estimate the age composition of the biomass, (3) determine the size at age of herring in this year's spawning biomass, and (4) provide data for next year's forecast. The 2021 spawning biomass was both very young and composed of fish that were small for their age. Age-4 and younger herring made up 43% of the spawning biomass while age-5 and -6 made up 48% of the spawning biomass and the remaining 9% of the spawning biomass were age-7 and older (Appendix B3). The mean weight of herring caught in the purse seine harvest was 265 grams, and the mean weight of herring caught in the gillnet harvest was 339 grams (T. Sands, Nushagak/Togiak Area Management Biologist, ADF&G, Dillingham, unpublished data, 2021). This biomass represents a large recruitment event to the Togiak herring population in 2021.

EXPLOITATION

All information related to harvest, value, and exploitation is confidential in 2021 due to low participation in the fishery. However, the combined Togiak and Dutch Harbor harvest was 12,068 tons and an exploitation rate of 5.1% in 2021 (Appendix B2).

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TABLES AND FIGURES

Table 1.–Summary of current escapement goals for salmon stocks in Bristol Bay Management Area; recommendations from Erickson et al. (2018).

System	Escapement goal	Enumeration method	Goal type	Initial year	Recommendation
CHINOOK SALMON					
Nushagak River	55,000–120,000	sonar	SEG	2013	No change
Alagnak River	2,700	single aerial survey	lower-bound SEG	2007	discontinue
CHUM SALMON					
Nushagak River	200,000	sonar	lower-bound SEG	2013	No change
COHO SALMON					
Nushagak River	60,000–120,000	sonar	SEG	2013	No change
PINK SALMON					
Nushagak River (even years only)	165,000	sonar	lower-bound SEG	2013	No change
SOCKEYE SALMON					
Kvichak River	2,000,000–10,000,000	tower count	SEG	2010	No change
Alagnak River	320,000	tower count	lower-bound SEG	2007	correct and update to 210,00
Alagnak River	125,000	single aerial survey	lower-bound SEG	2015	discontinue
Naknek River	800,000–2,000,000	tower count	SEG	2015	No change
Egegik River	800,000–2,000,000	tower count	SEG	2015	No change
Ugashik River	500,000–1,400,000	tower count	SEG	2015	No change
Wood River	700,000–1,800,000	tower count	SEG	2015	No change
Igushik River	150,000–400,000	tower count	SEG	2015	No change
Nushagak River	370,000–900,000	sonar	SEG	2015	No change
	260,000–760,000	sonar	OEG	2012	NA
Togiak River	120,000–270,000	tower count	SEG	2007	No change

Table 2.–Comparison of inshore sockeye salmon forecast versus actual run, escapement goals versus actual escapements, and projected versus actual commercial catch, by river system and district, in thousands of fish, Bristol Bay, 2021.

	Inshore run			Escapement		Inshore catch		
River system[a]	Forecast[b]	Actual[c]	Percent deviation[d]	Range	Actual	Projected harvest[b]	Actual[c]	Percent deviation[d]
Kvichak River	6,244	8,462	36	2,000–10,000	4,704	2,244	3,758	68
Alagnak River	3,671	5,776	57	210 minimum	3,237	1,319	2,539	92
Naknek River	7,089	6,785	-4	800–2,000	2,797	5,389	3,988	-26
Egegik River	10,955	7,323	-33	800–2,000	1,832	9,255	5,491	-41
Ugashik River	6,523	10,100	55	500–1,400	2,860	5,348	7,240	35
Wood River	7,787	12,040	55	700–1,800	4,410	6,257	7,630	22
Igushik River	1,321	1,943	47	150–400	879	1,050	1,064	1
Nushagak River	5,649	14,289	153	370–900	4,697	4,879	9,592	97
Togiak River	800	957	20	120–270	281	605	676	12
TOTAL BRISTOL BAY[e]	50,039	67,675	35	5,650–19,090	25,696	36,346	41,979	15

[a] The Bristol Bay inshore forecast does not include several minor river systems, including the Snake River drainage in Nushagak District, and the Kulukak, Osviak, Matogak and Slug River systems in Togiak District. Catches, escapements, and total runs for these smaller systems are not included in this table so that forecast efficacy may be gauged. Totals may not equal column sums due to rounding.

[b] Does not include South Peninsula projected harvest.

[c] Catch and inshore run is based on postseason genetic mixed stock analysis and does not account for the district harvested. Includes personal use and test fishery catches.

[d] Percent deviation = ([Actual – Forecast] / Forecast)*100.

[e] Total may not equal sum of all districts due to rounding.

Table 3.–Forecast of total sockeye salmon returns by age class, river system and district, in thousands of fish, Bristol Bay, 2021 (Buck et al. 2020).

	2-Ocean			3-Ocean			
District / River system	1.2 (2017)	2.2 (2016)	Total	1.3 (2016)	2.3 (2015)	Total	Total
NAKNEK-KVICHAK DISTRICT							
Kvichak River	3,209	554	3,763	2,536	72	2,608	6,371
Alagnak River	1,699	121	1,820	1,839	86	1,926	3,745
Naknek River	3,195	267	3,462	3,449	323	3,772	7,233
Total	8,103	941	9,044	7,824	481	8,305	17,350
EGEGIK DISTRICT	4,327	3,507	7,833	2,053	1,292	3,345	11,178
UGASHIK DISTRICT	3,888	636	4,524	1,971	161	2,131	6,655
NUSHAGAK DISTRICT							
Wood River	5,314	120	5,434	2,472	39	2,511	7,945
Igushik River	393	6	399	939	10	949	1,348
Nushagak River[a]	1,485	29	1,514	4,175	24	4,198	5,764
Total	7,192	155	7,347	7,586	72	7,658	15,057
TOGIAK DISTRICT[b]	309	8	316	496	4	500	816
TOTAL BRISTOL BAY[c,d]							
Number	23,818	5,247	29,065	19,930	2,010	21,939	51,056
Percent	47%	10%	57%	39%	4%	43%	100%

[a] Nushagak River forecast total includes minor contributions from age-0.3 and age-1.4 fish.

[b] Several smaller river systems not forecast. These systems contribute approximately 50,000 sockeye salmon to Togiak District harvest each year.

[c] Sockeye salmon of several minor age classes are expected to contribute an additional 1–2% to the total return.

[d] Total may not equal sum of all districts due to rounding.

Table 4.–Mean round weight, price per pound, and total exvessel value of the commercial salmon catch by species, Bristol Bay, 2021.

Species	Total catch (lb)	Mean weight (lb)	Mean price ($/lb)	Exvessel value ($)
Sockeye	198,630,534	4.7	1.31	260,009,632
Chinook	65,170	9.4	1.03	67,125
Chum	1,115,715	5.3	0.35	390,500
Pink	11,784	3.3	0.07	825
Coho	297,317	6.2	0.60	178,390
Total	200,120,521			260,646,472

Table 5.–Commercial salmon processors and buyers operating in Bristol Bay, 2021.

	Name of operator/buyer	Base of operations	District[a]	Processing[b]	Export
1	Alaska General Seafoods	Kenmore, WA	E, K, N	C, EF, F, RE	AIR, SEA
2	Alaska's Best Seafoods, LLC.	Dillingham, AK	N	EF, F, RE	AIR, SEA
3	Anthony Wood	King Salmon, AK	K	EF, F	AIR, SEA
4	Copper River Seafoods	Anchorage, AK	E, K, N, T, U	EF, F, RE	AIR, SEA
5	Diamond O Fish House	Wasilla, AK	K	F	AIR
6	E&E (Coffee Point Seafoods)	Renton, WA	E	EF, F, RE	AIR
7	E&E (P/V Cape Greig)	Renton, WA	E, K, N, U	F	SEA
8	Ekuk Fisheries LLC.	Seattle, WA	N	F, RE	SEA
9	Ekuk Wild Salmon and Halibut	Dillingham, AK	N	EF, F, S	AIR, SEA
10	Favco Inc.	Anchorage, AK	N	F	AIR
11	Freedom Fisheries LLC.	Naknek, AK	K	F	AIR
12	Friedman Family Fisheries	Baltimore, MD	N	F	SEA
13	High Tide Fisheries	Duluth, MN	K	F	AIR, SEA
14	Jojo's Wild Salmon LLC.	Chugiak, AK	N	EF, F, RE	AIR
15	Just Wild Salmon	College Place, WA	N	F	SEA
16	Kevin Cossairt	Bonners Ferry, ID	K	F	AIR
17	Kristene Stanford	Wasilla, AK	N	EF	AIR
18	Leader Creek Fisheries Inc.	Seattle, WA	E, K, N, U	F, RE	SEA
19	Little Alaska Fish Co.	Dillingham, AK	N	EF, F, RE	AIR
20	Madison's Salmon Co.	Anchorage, AK	K	F	AIR
21	Nakeen Homepack LLC.	King Salmon, AK	K	EF, F, RE	AIR, SEA
22	Naknek Kvichak Wild Salmon	Igiugig, AK	K	F	AIR
23	Net to Table Seafood	Rockford, MI	N	EF, F	AIR
24	North Pacific Seafoods (Togiak Fisheries)	Seattle, WA	T	F	SEA
25	North Pacific Seafoods	Seattle, WA	E, K, N, U	EF, R	AIR, SEA
26	OBI Seafoods	Seattle, WA	E, K, N, U	C, EF, F, RE	AIR, SEA
27	Pearl Bay Seafoods LLC.	Homer, AK	N, T, U	F, RE	AIR, SEA
28	Peter Pan Seafoods	Bellevue, WA	E, K, N, U	EF, F, RE, S	AIR, SEA
29	Salmon Shop LLC.	Wichita, KS	K	F	SEA
30	Salmon Slayer LLC.	Lakewood, CO	N	EF	AIR
31	Silver Bay Seafoods	Seattle, WA	E, K, N, U	F, RE	SEA
32	Small Boat Salmon	Homer, AK	N	EF	AIR
33	Sunrise Salmon	Naknek, AK	K	F	AIR, SEA
34	Terpening Fishing LLC	Homer, AK	U	F	AIR
35	Trident Seafoods Corp.	Seattle, WA	E, K, N, U	C, EF, F, RE	AIR, SEA
36	Tulchina Fisheries	Naknek, AK	K	EF, F	AIR
37	Two If By Seafoods	Saint John, WA	K	F	AIR, SEA
38	Ugashik Wild Salmon Company	Anchorage, AK	U	F	AIR
39	Victor Popa	Fallbrook, CA	E	F	AIR, SEA
40	Wild Alaska Salmon and Seafood	King Salmon, AK	K	EF, F	AIR, SEA
41	Wild Bay Seafood Co.	Gig Harbor, WA	K	F	SEA
42	Wild Premium	Raymond, WA	E	EF, F	AIR
43	Willbros Salmon Co.	Ruidoso, NM	K	F	AIR
44	Wilsons' Wild Salmon	Hailey, ID	K	F	AIR

[a] E = Egegik; K = Naknek-Kvichak; N = Nushagak; T = Togiak; U = Ugashik.

[b] Type of processing: C = canned; EF = export fresh; F = frozen; RE = roe extraction; S = cured.

Table 6.–Commercial salmon catch by district, river, and species, in numbers of fish, Bristol Bay, 2021.

River system	Sockeye	Chinook	Chum	Pink	Coho	Total
Naknek-Kvichak District	9,253,721	990	34,338	224	1,053	9,290,326
Egegik District	8,552,456	475	20,317	281	15,952	8,589,481
Ugashik District	5,205,169	444	20,793	28	151	5,226,585
Nushagak District	18,283,479	4,306	115,456	1,122	27,467	18,431,830
Togiak District	676,163	729	21,346	1,941	3,583	703,762
Bristol Bay Total	41,970,988	6,944	212,250	3,596	48,206	42,241,984

Note: Based on fish tickets as of October 25, 2021. Does not include personal use or test fish harvest.

Table 7.–Daily and cumulative passage estimates by salmon species, Nushagak River sonar project, Bristol Bay, 2021.

	Sockeye		Chinook[a]		Chum		Coho[b]	
Date	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
6/6	136	136	297	297	179	179	–	–
6/7	296	432	589	886	321	500	–	–
6/8	357	789	688	1,574	335	835	–	–
6/9	513	1,302	286	1,860	233	1,068	–	–
6/10	354	1,656	147	2,007	112	1,180	–	–
6/11	450	2,106	181	2,188	156	1,336	–	–
6/12	773	2,879	312	2,500	266	1,602	–	–
6/13	2,079	4,958	82	2,582	41	1,643	–	–
6/14	2,686	7,644	58	2,640	46	1,689	–	–
6/15	1,702	9,346	81	2,721	46	1,735	–	–
6/16	21,938	31,284	878	3,599	895	2,630	–	–
6/17	27,207	58,491	527	4,126	880	3,510	–	–
6/18	14,769	73,260	204	4,330	256	3,766	–	–
6/19	5,018	78,278	160	4,490	0	3,766	–	–
6/20	5,440	83,718	444	4,934	206	3,972	–	–
6/21	2,307	86,025	209	5,143	1,180	5,152	–	–
6/22	4,740	90,765	79	5,222	23	5,175	–	–
6/23	186,187	276,952	2,305	7,527	2,861	8,036	–	–
6/24	331,728	608,680	5,997	13,524	10,623	18,659	–	–
6/25	221,925	830,605	1,159	14,683	7,069	25,728	–	–
6/26	301,185	1,131,790	2,368	17,051	9,767	35,495	–	–
6/27	286,244	1,418,034	950	18,001	4,802	40,297	–	–
6/28	220,810	1,638,844	2,648	20,649	84	40,381	–	–
6/29	120,488	1,759,332	3,746	24,395	2,792	43,173	–	–
6/30	54,834	1,814,166	1,856	26,251	1,276	44,449	–	–
7/1	190,627	2,004,793	5,829	32,080	10,760	55,209	–	–
7/2	508,463	2,513,256	1,316	33,396	1,847	57,056	–	–
7/3	485,450	2,998,706	3,281	36,677	6,413	63,469	–	–
7/4	170,783	3,169,489	107	36,784	290	63,759	–	–
7/5	104,882	3,274,371	1,863	38,647	1,057	64,816	–	–
7/6	328,724	3,603,095	3,003	41,650	5,977	70,793	–	–
7/7	207,913	3,811,008	2,915	44,565	10,764	81,557	–	–
7/8	209,815	4,020,823	752	45,317	7,395	88,952	–	–
7/9	152,041	4,172,864	1,889	47,206	12,936	101,888	–	–
7/10	149,546	4,322,410	2,094	49,300	6,208	108,096	–	–
7/11	97,527	4,419,937	80	49,380	4,134	112,230	–	–
7/12	24,919	4,444,856	1,245	50,625	2,504	114,734	–	–

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Table 7.–Page 2 of 2.

	Sockeye		Chinook[a]		Chum		Coho[b]	
Date	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative	Daily	Cumulative
7/13	30,944	4,475,800	29	50,654	3,437	118,171	–	–
7/14	48,228	4,524,028	1,596	52,250	2,191	120,362	–	–
7/15	64,522	4,588,550	748	52,998	1,072	121,434	–	–
7/16	30,633	4,619,183	111	53,109	456	121,890	–	–
7/17	18,011	4,637,194	97	53,206	1,128	123,018	–	–
7/18	14,904	4,652,098	335	53,541	157	123,175	–	–
7/19	7,048	4,659,146	363	53,904	281	123,456	–	–
7/20	6,008	4,665,154	7	53,911	963	124,419	–	–
7/21	10,273	4,675,427	44	53,955	554	124,973	–	–
7/22	7,776	4,683,203	329	54,284	160	125,133	–	–
7/23	5,227	4,688,430	55	54,339	85	125,218	–	–
7/24	4,490	4,692,920	309	54,648	118	125,336	–	–
7/25	4,379	4,697,299	574	55,222	16	125,352	–	–

Note: All counts rounded to nearest whole fish. Cells with an en dash (–) indicate no data.

[a] Counts are considered inriver abundance estimates, not a final escapement.

[b] Coho were not counted in 2021.

Table 8.–Daily sockeye salmon escapement tower counts by river system, eastside Bristol Bay, 2021.

	Kvichak River		Naknek River		Alagnak River		Egegik River		Ugashik River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/17	–	–	–	–	–	–	3,648	3,648	–	–
6/18	–	–	–	–	–	–	7,644	11,292	–	–
6/19	–	–	234	234	–	–	8,694	19,986	–	–
6/20	–	–	240	474	–	–	29,406	49,392	–	–
6/21	–	–	180	654	–	–	35,268	84,660	–	–
6/22	–	–	330	984	–	–	67,974	152,634	–	–
6/23	0	0	66	1,050	–	–	31,098	183,732	–	–
6/24	0	0	6	1,056	–	–	87,984	271,716	–	–
6/25	0	0	10,248	11,304	–	–	108,810	380,526	–	–
6/26	54	54	20,298	31,602	–	–	55,158	435,684	–	–
6/27	258	312	18,486	50,088	–	–	101,952	537,636	–	–
6/28	4,554	4,866	26,700	76,788	–	–	55,542	593,178	–	–
6/29	37,800	42,666	6,498	83,286	4,836	4,836	38,868	632,046	14,178	14,178
6/30	59,550	102,216	3,390	86,676	34,050	38,886	49,092	681,138	4,110	18,288
7/1	45,551	147,767	66,570	153,246	10,782	49,668	33,954	715,092	4,104	22,392
7/2	27,865	175,632	185,382	338,628	3,012	52,680	25,548	740,640	3,570	25,962
7/3	47,826	223,458	277,410	616,038	25,926	78,606	37,662	778,302	3,036	28,998
7/4	193,524	416,982	164,094	780,132	178,686	257,292	86,064	864,366	954	29,952
7/5	459,324	876,306	35,292	815,424	347,634	604,926	68,730	933,096	3,570	33,522
7/6	502,458	1,378,764	454,644	1,270,068	148,632	753,558	127,902	1,060,998	2,934	36,456
7/7	352,230	1,730,994	475,560	1,745,628	206,292	959,850	67,752	1,128,750	2,700	39,156
7/8	522,030	2,253,024	131,406	1,877,034	352,320	1,312,170	166,542	1,295,292	6,798	45,954
7/9	571,104	2,824,128	99,570	1,976,604	398,220	1,710,390	114,366	1,409,658	10,080	56,034
7/10	397,332	3,221,460	208,998	2,185,602	305,682	2,016,072	81,630	1,491,288	42,066	98,100
7/11	327,198	3,548,658	132,888	2,318,490	247,440	2,263,512	36,186	1,527,474	93,864	191,964
7/12	406,866	3,955,524	54,522	2,373,012	238,014	2,501,526	54,438	1,581,912	75,858	267,822
7/13	163,428	4,118,952	80,328	2,453,340	57,540	2,559,066	33,114	1,615,026	158,286	426,108
7/14	82,278	4,201,230	74,736	2,528,076	62,508	2,621,574	36,924	1,651,950	355,728	781,836
7/15	106,410	4,307,640	60,750	2,588,826	90,234	2,711,808	48,756	1,700,706	537,348	1,319,184
7/16	84,276	4,391,916	52,344	2,641,170	51,924	2,763,732	40,008	1,740,714	557,334	1,876,518
7/17	47,748	4,439,664	39,858	2,681,028	69,990	2,833,722	25,698	1,766,412	404,118	2,280,636
7/18	73,470	4,513,134	16,362	2,697,390	66,144	2,899,866	19,182	1,785,594	242,058	2,522,694
7/19	14,964	4,528,098	14,574	2,711,964	12,918	2,912,784	13,482	1,799,076	128,706	2,651,400
7/20	8,442	4,536,540	11,862	2,723,826	3,672	2,916,456	5,556	1,804,632	39,054	2,690,454
7/21	3,168	4,539,708	72,708	2,796,534	9,402	2,925,858	4,956	1,809,588	26,694	2,717,148
7/22	21,372	4,561,080	–	–	115,410	3,041,268	7,944	1,817,532	16,980	2,734,128
7/23	102,732	4,663,812	–	–	113,778	3,155,046	9,042	1,826,574	15,570	2,749,698
7/24	15,096	4,678,908	–	–	29,622	3,184,668	5,622	1,832,196	20,646	2,770,344
7/25	5,466	4,684,374	–	–	8,190	3,192,858	–	–	22,842	2,793,186
7/26	6,798	4,691,172	–	–	19,866	3,212,724	–	–	24,840	2,818,026
7/27	12,348	4,703,520	–	–	16,962	3,229,686	–	–	22,752	2,840,778
7/28	–	–	–	–	7,218	3,236,904	–	–	19,152	2,859,930

Note: Cum. = cumulative. Cells with an en dash (–) indicate no data.

Table 9.–Commercial salmon catch by date and species, in numbers of fish, Naknek-Kvichak District, Bristol Bay, 2021.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/14[a,b]	15	15	–	1	–	–	–	–	–	–
6/15[a]	24	24	–	–	–	–	–	–	–	–
6/16[a,b]	24	24	–	3	–	–	–	–	–	–
6/17[a,b]	24	24	1	3	–	–	–	–	–	–
6/18[a,b]	9	9	–	1	–	–	–	–	–	–
6/19	0	0	–	–	–	–	–	–	–	–
6/20	0	0	–	–	–	–	–	–	–	–
6/21[a]	15	15	3	14	199	0	1	0	0	200
6/22[a]	24	24	3	16	452	6	2	0	0	460
6/23[a]	24	24	–	5	82	0	1	0	0	83
6/24[a]	24	24	4	48	4,446	33	14	0	0	4,493
6/25[a]	9	9	–	16	2,111	0	8	0	0	2,119
6/26[a]	7	7	76	126	49,106	27	153	0	0	49,286
6/27[a]	16.5	24	197	327	102,835	38	256	0	0	103,129
6/28[a]	16	22.5	125	212	24,975	7	58	0	0	25,040
6/29[a]	7	7.5	107	88	53,326	7	223	0	0	53,556
6/30[a]	15.5	24	268	204	209,868	19	329	0	0	210,216
7/1[a]	15	24	401	383	236,875	44	285	0	0	237,204
7/2[a]	14.5	24	372	350	290,637	19	388	0	0	291,044
7/3[a]	15	24	370	472	246,517	37	278	0	0	246,832
7/4[a]	15	24	534	443	273,219	30	489	0	0	273,738
7/5[a]	18	24	435	363	464,863	20	471	0	0	465,354
7/6[a]	18	24	415	539	736,543	41	677	0	0	737,261
7/7[c]	15	24	457	475	476,324	22	484	0	0	476,830
7/8[c]	15.5	24	546	451	474,268	38	482	0	0	474,788
7/9	18.5	24	489	378	784,683	25	831	0	0	785,539
7/10	18.5	24	476	531	700,133	53	859	0	0	701,045
7/11	18.5	24	602	262	523,090	24	916	7	0	524,037
7/12	18.5	24	567	401	651,569	34	1,260	14	0	652,877
7/13	19	24	702	433	808,019	71	2,415	37	0	810,542
7/14	19	24	600	363	383,776	36	1,243	0	0	385,055
7/15	19.5	24	595	388	561,003	55	1,934	0	0	562,992
7/16	19.5	24	523	353	218,800	28	1,210	6	0	220,044
7/17	19.5	24	508	151	112,018	17	928	0	0	112,963
7/18	24	24	345	176	62,257	35	1,232	0	0	63,524
7/19	24	24	327	101	72,916	20	1,074	0	0	74,010
7/20	24	24	310	103	262,001	13	3,793	0	0	265,807

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Table 9.–Page 2 of 2.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/21	24	24	326	182	150,316	19	2,747	0	35	153,117
7/22	24	24	240	137	69,581	21	1,970	0	67	71,639
7/23	24	24	170	78	49,164	21	1,173	0	0	50,358
7/24	24	24	103	72	68,842	33	1,463	3	106	70,447
7/25	24	24	79	109	52,722	40	1,319	21	84	54,186
7/26	24	24	69	85	31,921	26	1,366	30	146	33,489
7/27	24	24	34	82	16,193	14	532	14	61	16,814
7/28	24	24	33	72	12,020	13	766	19	173	12,991
7/29	24	24	17	48	3,775	3	376	4	43	4,201
7/30	24	24	13	33	2,988	1	90	8	17	3,104
7/31[b]	24	24	6	24	–	–	–	–	–	–
8/1[b]	24	24	6	14	–	–	–	–	–	–
8/2[b]	24	24	4	7	–	–	–	–	–	–
8/3[b]	24	24	2	8	–	–	–	–	–	–
8/4[b]	24	24	3	6	–	–	–	–	–	–
8/5[b]	24	24	1	4	–	–	–	–	–	–
8/6[b]	24	24	1	4	–	–	–	–	–	–
8/7[b]	24	24	–	5	–	–	–	–	–	–
8/8[b]	24	24	–	6	–	–	–	–	–	–
8/9[b]	24	24	–	9	–	–	–	–	–	–
8/10[b]	24	24	–	4	–	–	–	–	–	–
8/11[b]	24	24	–	4	–	–	–	–	–	–
8/12[b]	24	24	1	2	–	–	–	–	–	–
8/13[b]	24	24	–	3	–	–	–	–	–	–
8/14[b]	24	24	–	2	–	–	–	–	–	–
8/15[b]	9	9	–	1	–	–	–	–	–	–
8/16	15	15	–	–	–	–	–	–	–	–
8/17	24	24	–	–	–	–	–	–	–	–
8/18	24	24	–	–	–	–	–	–	–	–
8/19	24	24	–	–	–	–	–	–	–	–
8/20	24	24	–	–	–	–	–	–	–	–
8/21	24	24	–	–	–	–	–	–	–	–
8/22	9	9	–	–	–	–	–	–	–	–
8/23[b]	15	15	1	–	–	–	–	–	–	–
Total	1,343	1,477	11,466	9,181	9,253,721	990	34,338	224	1,053	9,290,326

Note: Cells with an en dash (–) indicate no data.

[a] Drift gillnet gear was open in the Naknek Section only.

[b] Less than 3 permit holders or companies operated, harvest confidential.

[c] Drift gillnet gear was open in the Naknek Section only during one of 2 periods.

Table 10.–Daily district registration of drift gillnet permit holders and dual vessel registration, by district, Bristol Bay, 2021.

	Naknek-Kvichak		Egegik		Ugashik		Nushagak		Togiak[a]	
Date	Total	Dual	Total	Dual	Total	Dual	Total	Dual	Total	Total[b]
6/1	0	0	6	0	0	0	1	0	0	7
6/2	3	0	12	0	1	0	1	0	1	18
6/3	3	0	12	0	1	0	1	0	1	18
6/4	3	0	13	0	1	0	1	0	1	20
6/5	3	0	17	1	1	0	2	0	2	25
6/6	3	0	17	1	1	0	2	0	2	25
6/7	3	0	17	1	1	0	2	0	2	26
6/8	3	0	17	1	1	0	2	0	3	26
6/9	3	0	20	2	1	0	4	0	3	31
6/10	3	0	39	2	1	0	4	0	3	50
6/11	5	0	41	2	1	0	5	0	3	57
6/12	5	0	44	2	3	1	7	0	5	64
6/13	8	1	47	2	5	2	7	0	5	73
6/14	8	1	54	4	7	3	7	0	6	82
6/15	12	1	76	9	12	5	13	2	6	119
6/16	19	1	99	15	14	6	15	2	6	156
6/17	21	1	129	23	14	6	25	4	9	200
6/18	32	2	171	33	15	6	43	7	11	276
6/19	35	2	193	39	11	4	60	10	15	315
6/20	43	3	304	76	13	5	71	12	16	447
6/21	53	6	316	79	17	7	79	12	16	482
6/22	65	7	343	85	37	14	110	17	17	574
6/23	67	5	347	87	34	13	208	38	19	676
6/24	68	5	366	92	34	12	308	60	20	802
6/25	74	6	383	92	42	15	745	200	26	1,270
6/26	94	7	396	93	50	19	815	222	26	1,381
6/27	163	17	415	96	59	20	860	232	26	1,523
6/28	201	26	411	96	76	23	839	225	26	1,554
6/29	214	26	410	96	80	24	800	215	27	1,531
6/30	263	36	422	101	93	27	757	197	27	1,562
7/01	303	45	441	106	105	32	742	188	27	1,618
7/02	335	53	429	102	131	43	746	186	27	1,670
7/03	358	62	421	102	128	42	741	184	29	1,678
7/04	375	67	398	95	131	43	734	181	30	1,668
7/05	383	70	388	92	136	44	739	180	30	1,677
7/06	395	74	384	91	150	49	736	180	31	1,696
7/07	411	80	370	88	150	49	723	176	31	1,685
7/08	420	81	345	83	150	48	736	179	31	1,683
7/09	452	90	335	81	154	48	673	160	32	1,647
7/10	464	92	312	73	156	48	644	150	33	1,609
7/11	516	108	285	66	178	54	451	100	33	1,463
7/12	542	114	293	69	205	64	395	92	33	1,470
7/13	657	139	293	70	273	81	381	87	35	1,639
7/14	692	144	295	73	305	90	364	82	35	1,691
7/15	670	141	312	77	334	98	344	75	35	1,695
7/16	671	140	317	78	351	102	337	73	35	1,702
Average[c]	292	53	333	79	117	37	491	66	26	1,259

Note: Total permit sum includes dual boat registrations.

[a] Dual boat registration in not permitted by regulation in Togiak District.

[b] Total does not include permits in transfer status.

[c] Seasonal averages calculated for June 16–July 16.

Table 11.–Comparison of daily sockeye escapement estimates by tower count and river test fish enumeration methods, Kvichak River, Bristol Bay 2021.

			River test fishing				
	Tower count		Fish per	Index points		Estimated cumulative	Estimated
Date	Daily	Cum.	index point[a]	Daily	Cum.	escapement	river fish[b]
6/23	0	0	–	0	–	–	–
6/24	0	0	0	16	16	–	–
6/25	0	0	0	11	27	–	–
6/26	54	54	80	349	375	20,000	20,000
6/27	258	312	80	249	624	40,000	20,000
6/28	4,554	4,866	57	524	1,148	70,000	30,000
6/29	37,800	42,666	123	488	1,637	130,000	60,000
6/30	59,550	102,216	646	46	1,683	160,000	30,000
7/1	45,551	147,768	316	127	1,810	200,000	40,000
7/2	27,865	175,632	274	1,459	3,268	600,000	400,000
7/3	47,826	223,458	120	4,184	7,452	1,100,000	500,000
7/4	193,524	416,982	193	2,071	9,523	1,500,000	400,000
7/5	459,324	876,306	531	1,318	10,842	2,200,000	700,000
7/6	502,458	1,378,764	300	2,663	13,505	3,000,000	800,000
7/7	352,230	1,730,994	198	4,048	17,553	3,800,000	800,000
7/8	522,030	2,253,024	462	1,299	18,852	4,400,000	600,000
7/9	571,104	2,824,128	562	1,068	19,920	5,000,000	600,000
7/10	397,332	3,221,460	331	2,117	22,038	5,700,000	700,000
7/11	327,198	3,548,658	779	835	22,873	6,350,000	650,000
7/12	406,866	3,955,524	2,968	118	22,990	6,700,000	350,000
7/13	163,428	4,118,952	733	273	23,263	6,900,000	200,000
7/14	82,278	4,201,230	1,755	114	23,377	7,100,000	200,000
7/15	106,410	4,307,640	1,285	156	23,533	7,300,000	200,000
7/16	84,276	4,391,916	1,058	94	23,627	7,400,000	100,000
7/17	47,748	4,439,664	–	–	–	–	–
7/18	73,470	4,513,134	–	–	–	–	–
7/19	14,964	4,528,098	–	–	–	–	–
7/20	8,442	4,536,540	–	–	–	–	–
7/21	3,168	4,539,708	–	–	–	–	–
7/22	21,372	4,561,080	–	–	–	–	–
7/23	102,732	4,663,812	–	–	–	–	–
7/24	15,096	4,678,908	–	–	–	–	–
7/25	5,466	4,684,374	–	–	–	–	–
7/26	6,798	4,691,172	–	–	–	–	–
7/27	12,348	4,703,520	–	–	–	–	–

Note: Cum. = cumulative. Cells with an en dash (–) indicate no data.

[a] The fish per index (FPI) used to estimate the daily Estimated river fish (ERF) prior to using lag time relationships was calculated using a 4-year mean of median FPIs with a stronger 2-ocean component and similar inshore total run as that projected for 2015. This method was used until June 26 when FPIs were based on lag time relationships.

[b] Estimated river fish (ERF) was based on the inriver test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on catchability and other factors.

Table 12.–Commercial salmon catch by species, in numbers of fish, Egegik District, Bristol Bay 2021.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/1	15	15	–	–	–	–	–	–	–	0
6/2	9	9	–	–	–	–	–	–	–	0
6/3	15	15	–	–	–	–	–	–	–	0
6/4	9	9	–	–	–	–	–	–	–	0
6/5	–	–	–	–	–	–	–	–	–	–
6/6	–	–	–	–	–	–	–	–	–	–
6/7	15	15	–	–	–	–	–	–	–	0
6/8[a]	24	24	–	–	–	–	–	–	–	–
6/9	9	9	–	–	–	–	–	–	–	0
6/10	15	15	1	6	176	1	0	0	0	177
6/11[a]	9	9	–	–	–	–	–	–	–	–
6/12	–	–	–	–	–	–	–	–	–	–
6/13	–	–	–	–	–	–	–	–	–	–
6/14	15	15	21	41	8,687	18	61	0	0	8,766
6/15	24	24	20	36	4,675	3	36	0	0	4,714
6/16	9	9	6	6	537	3	8	0	0	548
6/17	15	15	121	102	63,853	16	275	0	0	64,144
6/18	9	9	14	16	4,723	1	24	0	0	4,748
6/19	–	–	–	–	–	–	–	–	–	–
6/20	6	8	207	160	56,289	18	338	0	0	56,645
6/21	–	–	–	–	–	–	–	–	–	–
6/22	6	8	248	223	108,762	30	424	0	0	109,216
6/23	–	–	–	–	–	–	–	–	–	–
6/24	6.5	8.5	330	229	209,415	29	519	0	0	209,963
6/25	11	15.5	269	230	133,675	11	393	0	0	134,079
6/26	11.5	16	360	313	339,157	17	828	0	0	340,002
6/27	11.5	16	481	324	326,036	14	673	0	0	326,723
6/28	12.5	16	469	292	292,877	18	1,142	0	0	294,037
6/29	11	16	485	283	293,018	18	489	0	0	293,525
6/30	12	15.25	518	213	357,270	16	331	0	0	357,617
7/1	12.25	15.25	299	185	289,871	5	385	0	0	290,261
7/2	9.25	15	582	327	313,830	22	405	0	0	314,257
7/3	7	10.5	554	153	272,674	13	256	0	0	272,943
7/4	7.5	12	556	452	441,810	43	418	0	0	442,271
7/5	8	15.25	477	392	317,645	16	290	0	0	317,951
7/6	7.75	15.25	525	341	490,896	15	281	0	0	491,192

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	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/7	10.75	15.25	459	519	627,577	17	448	0	0	628,042
7/8	11.25	15.25	405	307	353,753	12	330	0	0	354,095
7/9	12.5	17.5	302	275	294,015	15	423	0	0	294,453
7/10	12.75	17.5	279	238	258,525	6	384	0	0	258,915
7/11	13	18	324	402	412,863	16	926	0	0	413,805
7/12	13.5	18	384	275	425,528	10	1,197	1	0	426,736
7/13	14	18	400	335	409,185	14	807	26	0	410,032
7/14	14.5	17.75	370	367	351,987	9	813	0	0	352,809
7/15	15	17.5	375	286	274,078	10	796	0	0	274,884
7/16	14.75	17	299	250	133,256	8	534	0	0	133,798
7/17	24	24	200	189	117,414	3	583	0	0	118,000
7/18	24	24	181	165	75,850	2	575	0	0	76,427
7/19	24	24	168	137	55,580	0	409	0	0	55,989
7/20	24	24	127	106	47,688	2	362	0	0	48,052
7/21	24	24	92	104	49,601	4	287	0	0	49,892
7/22	24	24	75	99	41,321	1	361	0	0	41,683
7/23	24	24	63	78	27,347	3	208	0	1	27,559
7/24	24	24	50	59	30,006	3	319	5	4	30,337
7/25	24	24	47	63	33,653	3	290	0	1	33,947
7/26	24	24	43	54	33,477	1	319	5	20	33,822
7/27	24	24	44	25	29,240	3	245	58	18	29,564
7/28	24	24	34	28	23,925	2	238	7	47	24,219
7/29	24	24	34	28	19,679	1	161	5	72	19,918
7/30	24	24	29	21	12,183	2	106	4	504	12,799
7/31	24	24	21	13	12,449	1	86	5	56	12,597
8/1	24	24	7	11	4,791	0	22	11	3	4,827
8/2	24	24	17	13	11,282	0	57	23	53	11,415
8/3	24	24	10	4	9,238	0	45	4	301	9,588
8/4	24	24	8	4	5,332	0	153	11	289	5,785
8/5	24	24	17	6	7,792	0	286	90	749	8,917
8/6	24	24	4	3	2,138	0	79	0	222	2,439
8/7	24	24	4	5	3,328	0	44	18	120	3,510
8/8	9	9	–	–	–	–	–	–	–	–
8/9	15	15	5	2	4,510	0	90	0	350	4,950
8/10	24	24	8	7	3,931	0	82	2	801	4,816
8/11	24	24	9	7	7,754	0	111	5	880	8,750
8/12	24	24	9	6	3,980	0	61	1	1,170	5,212

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Table 12.–Page 3 of 3.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
8/13	24	24	4	5	3,352	0	81	0	1,114	4,547
8/14	24	24	3	5	1,741	0	11	0	596	2,348
8/15 [a]	9	9	–	–	–	–	–	–	–	–
8/16	15	15	0	0	–	–	–	–	–	–
8/17 [a]	24	24	–	–	–	–	–	–	–	–
8/18 [a]	24	24	–	–	–	–	–	–	–	–
8/19 [a]	24	24	–	–	–	–	–	–	–	–
8/20 [a]	24	24	–	–	–	–	–	–	–	–
8/21	24	24	0	0	–	–	–	–	–	–
8/22 [a]	9	9	–	–	–	–	–	–	–	–
8/23	15	15	0	0	–	–	–	–	–	–
8/24 [a]	24	24	–	–	–	–	–	–	–	–
8/25 [a]	24	24	–	–	–	–	–	–	–	–
8/26	24	24	0	0	–	–	–	–	–	–
8/27	24	24	0	0	–	–	–	–	–	–
8/28	24	24	0	0	–	–	–	–	–	–
8/29	24	24	0	0	–	–	–	–	–	–
8/30	9	9	0	0	–	–	–	–	–	–
8/31	15	15	0	0	–	–	–	–	–	–
Totals	1,472	1,574	11,466	8,840	8,552,456	475	20,317	281	15,952	8,589,481

Note: Cells with an en dash (–) indicate no data. Due to rounding, totals may not equal column sums.

[a] Less than 3 permit holders or companies operated, harvest confidential.

Table 13.–Comparison of daily sockeye escapement estimates by tower count and river test fish enumeration methods, Egegik River, Bristol Bay 2021.

			River test fishing				
	Tower count		Fish per	Index points		Estimated cumulative	Estimated
Date	Daily	Cum.	index point[a]	Daily	Cumulative	escapement	river fish[b]
6/17	3,648	3,648	0	–	–	–	–
6/18	7,644	11,292	0	–	–	–	–
6/19	8,694	19,986	82	273	273	–	–
6/20	29,406	49,392	82	223	496	–	–
6/21	35,268	84,660	82	327	823	45,000	45,000
6/22	67,974	152,634	189	317	1,140	105,000	60,000
6/23	31,098	183,732	–	155	1,296	105,000	No ERF
6/24	87,984	271,716	–	–	1,296	105,000	No ERF
6/25	108,810	380,526	–	–	1,296	105,000	No ERF
6/26	55,158	435,684	–	–	1,296	105,000	No ERF
6/27	101,952	537,636	–	542	1,838	105,000	No ERF
6/28	55,542	593,178	222	180	2,018	145,000	40,000
6/29	38,868	632,046	330	61	2,079	165,000	20,000
6/30	49,092	681,138	–	118	2,197	165,000	No ERF
7/1	33,954	715,092	–	152	2,349	165,000	No ERF
7/2	25,548	740,640	274	182	2,532	215,000	50,000
7/3	37,662	778,302	186	431	2,962	295,000	80,000
7/4	86,064	864,366	100	953	3,915	390,000	95,000
7/5	68,730	933,096	207	483	4,399	490,000	100,000
7/6	127,902	1,060,998	215	349	4,747	565,000	75,000
7/7	67,752	1,128,750	233	300	5,047	635,000	70,000
7/8	166,542	1,295,292	309	259	5,306	715,000	80,000
7/9	114,366	1,409,658	381	210	5,516	795,000	80,000
7/10	81,630	1,491,288	315	254	5,769	875,000	80,000
7/11	36,186	1,527,474	241	331	6,101	955,000	80,000
7/12	54,438	1,581,912	637	102	6,203	1,020,000	65,000
7/13	33,114	1,615,026	220	227	6,429	1,070,000	50,000
7/14	36,924	1,651,950	–	–	–	–	–
7/15	48,756	1,700,706	–	–	–	–	–
7/16	40,008	1,740,714	–	–	–	–	–
7/17	25,698	1,766,412	–	–	–	–	–
7/18	19,182	1,785,594	–	–	–	–	–
7/19	13,482	1,799,076	–	–	–	–	–
7/20	5,556	1,804,632	–	–	–	–	–
7/21	4,956	1,809,588	–	–	–	–	–
7/22	7,944	1,817,532	–	–	–	–	–
7/23	9,042	1,826,574	–	–	–	–	–
7/24	5,622	1,832,196	–	–	–	–	–

Note: Cum. = cumulative. Cells with an en dash (–) indicate no data.

[a] The fish per index (FPI) used to estimate the daily ERFs prior to using lag time relationships was calculated using a 4-year mean of median FPIs. This method was used until June 21 when FPIs were based on lag time relationships.

[b] Estimated river fish (ERF) between test fish and tower projects was based on the inriver test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on catchability and other factors.

Table 14.–Inshore run of sockeye salmon by age class, river system, and district, in thousands of fish, Bristol Bay, 2021.

District and river system[a]		1.2	2.2	2-Ocean	1.3	2.3	3-Ocean	1.4	Total[b]
NAKNEK-KVICHAK									
Kvichak River									
	Number	5,867	550	6,417	1,801	219	2,020	5	8,462
	Percent	69.3	6.5	75.8	21.3	2.6	23.9	0.1	99.8
Alagnak River									
	Number	2,196	339	2,535	2,551	664	3,215	22	5,776
	Percent	38.0	5.9	43.9	44.2	11.5	55.7	0.4	99.9
Naknek River									
	Number	3,963	400	4,363	1,909	391	2,300	73	6,785
	Percent	58.4	5.9	64.3	28.1	5.8	33.9	1.1	99.3
Total	Number	12,026	1,289	13,315	6,261	1,274	7,535	100	21,023
	Percent	57.2	6.1	63.3	29.8	6.1	35.8	0.5	99.7
EGEGIK RIVER									
	Number	3,560	2,060	5,620	443	628	1,071	0	7,323
	Percent	48.6	28.1	76.7	6.0	8.6	14.6	0.0	91.4
UGASHIK RIVER									
	Number	6,304	802	7,106	2,754	218	2,972	0	10,100
	Percent	62.4	7.9	70.4	27.3	2.2	29.4	0.0	99.8
NUSHAGAK									
Wood River									
	Number	10,585	408	10,993	963	72	1,035	0	12,040
	Percent	87.9	3.4	91.3	8.0	0.6	8.6	0.0	99.9
Igushik River									
	Number	974	11	985	895	57	952	6	1,943
	Percent	50.1	0.6	50.7	46.1	2.9	49.0	0.3	100.0
Nushagak River									
	Number	8,138	170	8,308	5,899	32	5,931	37	14,289
	Percent	57.0	1.2	58.1	41.3	0.2	41.5	0.3	99.9
Total	Number	19,697	589	20,286	7,757	161	7,918	43	28,272
	Percent	69.7	2.1	71.8	27.4	0.6	28.0	0.2	99.9
TOGIAK RIVER[c]									
	Number	483	2	485	470	0	470	2	957
	Percent	50.5	0.2	50.7	49.1	0.0	49.1	0.2	100.0
TOTAL BRISTOL BAY[d]									
	Number	42,070	4,742	46,812	17,685	2,281	19,966	145	67,675
	Percent	62.2	7.0	69.2	26.1	3.4	29.5	0.2	98.9

[a] The inshore run data does not include the South Peninsula catch of Bristol Bay sockeye or immature high seas bycatch.

[b] Totals do not include minor age classes; therefore, totals are greater than the sum of age classes listed.

[c] Does not include rivers other than Togiak River.

[d] Totals may not equal column sums due to rounding.

Table 15.–Commercial catch by date and species, in numbers of fish, Ugashik District, Bristol Bay, 2021.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/1	15	15	0	0	–	–	–	–	–	–
6/2	24	24	0	0	–	–	–	–	–	–
6/3	24	24	0	0	–	–	–	–	–	–
6/4	9	9	0	0	–	–	–	–	–	–
6/5	–	–	–	–	–	–	–	–	–	–
6/6	–	–	–	–	–	–	–	–	–	–
6/7	15	15	0	0	–	–	–	–	–	–
6/8	24	24	0	0	–	–	–	–	–	–
6/9	24	24	0	0	–	–	–	–	–	–
6/10	24	24	0	0	–	–	–	–	–	–
6/11	9	9	0	0	–	–	–	–	–	–
6/12	–	–	–	–	–	–	–	–	–	–
6/13	–	–	–	–	–	–	–	–	–	–
6/14	15	15	3	0	172	8	3	0	0	183
6/15	24	24	4	0	807	19	7	0	0	833
6/16	24	24	4	0	1,266	33	25	0	0	1,324
6/17	24	24	5	0	1,543	16	29	0	0	1,588
6/18[a]	9	9	1	0	–	–	–	–	–	–
6/19	–	–	–	–	–	–	–	–	–	–
6/20	–	–	–	–	–	–	–	–	–	–
6/21	15	15	21	7	19,662	17	150	0	0	19,829
6/22	24	24	21	8	25,004	28	71	0	0	25,103
6/23	9	9	15	0	12,278	6	53	0	0	12,337
6/24	–	–	–	–	–	–	–	–	–	–
6/25	10	10	29	28	46,109	18	97	0	0	46,224
6/26	–	–	–	–	–	–	–	–	–	–
6/27	8	8	52	38	41,139	17	106	0	0	41,262
6/28	–	–	–	–	–	–	–	–	–	–
6/29	6	8	68	65	85,230	26	118	0	0	85,374
6/30	–	–	–	–	–	–	–	–	–	–
7/1	7	10	90	38	161,899	3	1,479	0	0	163,381
7/2	–	–	–	–	–	–	–	–	–	–
7/3	6	10	88	42	156,306	30	368	0	0	156,704
7/4	–	–	–	–	–	–	–	–	–	–
7/5	4.5	10	95	41	133,147	22	286	0	0	133,455
7/6	–	–	–	–	–	–	–	–	–	–
7/7	3.5	10	99	72	219,193	17	505	0	0	219,715
7/8	–	–	–	–	–	–	–	–	–	–
7/9	6	10	110	102	193,050	10	427	0	0	193,487
7/10	3.5	8	111	101	136,747	10	156	0	0	136,913
7/11	8	10	198	131	654,059	13	762	0	0	654,834
7/12	10	12	231	156	676,486	7	919	0	0	677,412

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Table 15.–Page 2 of 2.

	Hours fished		Deliveries							
Date	Drift	Set	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/13	9	12	272	125	665,124	19	2,991	0	0	668,134
7/14	9.5	12	251	138	503,531	11	1,669	0	0	505,211
7/15	12	12	243	118	334,518	20	1,685	0	0	336,223
7/16	9.5	9.5	280	80	217,932	18	1,022	0	0	218,972
7/17	24	24	249	57	235,266	8	955	0	0	236,229
7/18	24	24	247	54	137,838	17	816	0	0	138,671
7/19	24	24	203	40	67,130	14	656	0	0	67,800
7/20	24	24	193	28	66,483	2	499	0	0	66,984
7/21	24	24	133	13	76,904	21	677	0	0	77,602
7/22	24	24	132	12	68,187	1	899	0	0	69,087
7/23	24	24	84	31	50,019	3	471	0	0	50,493
7/24	24	24	91	18	42,916	2	592	0	0	43,510
7/25	24	24	57	23	39,010	0	578	0	0	39,588
7/26	24	24	61	24	34,567	3	533	0	0	35,103
7/27	24	24	46	17	26,833	0	409	0	96	27,338
7/28	24	24	15	8	8,863	0	127	0	0	8,990
7/29	24	24	18	8	10,206	1	117	0	0	10,324
7/30	24	24	11	2	6,778	0	87	0	0	6,865
7/31	24	24	12	2	11,994	1	71	0	0	12,066
8/1	24	24	7	0	7,949	0	50	0	0	7,999
8/2	24	24	8	2	6,597	0	40	0	0	6,637
8/3	24	24	5	2	5,155	0	125	9	11	5,300
8/4	24	24	4	0	4,071	2	83	1	3	4,160
8/5	24	24	7	0	5,187	0	30	0	0	5,217
8/6	24	24	3	0	2,010	1	7	18	0	2,036
8/7	24	24	5	0	3,760	0	42	0	0	3,802
8/8	24	24	3	1	2,184	0	0	0	5	2,189
8/9	9	9	0	0	–	–	–	–	–	0
8/10	–	–	–	–	–	–	–	–	–	–
8/11	–	–	–	–	–	–	–	–	–	–
8/12[a]	15	15	0	1	–	–	–	–	–	–
8/13[a]	24	24	0	1	–	–	–	–	–	–
8/14[a]	24	24	0	1	–	–	–	–	–	–
8/15	24	24	0	0	–	–	–	–	–	0
8/16	9	9	0	0	–	–	–	–	–	0
8/17	–	–	–	–	–	–	–	–	–	–
8/18	–	–	–	–	–	–	–	–	–	–
8/19	15	15	0	0	–	–	–	–	–	0
8/20	24	24	0	0	–	–	–	–	–	0
8/21	24	24	0	0	–	–	–	–	–	0
8/22	24	24	0	0	–	–	–	–	–	0
8/23	9	9	0	0	–	–	–	–	–	0
Totals	1,169	1,208	3,885	1,635	5,205,169	444	20,793	28	151	5,226,585

Note: Cells with an en dash (–) indicate no data. Due to rounding, totals may not equal column sums.

[a] Less than 3 permit holders or companies operated, harvest confidential.

Table 16.–Comparison of daily sockeye escapement estimates by tower count and river test fish enumeration methods, Ugashik River, Bristol Bay 2021.

			River test fishing				
	Tower count		Fish per	Index points		Estimated cumulative	Estimated
Date	Daily	Cum.	index point[a]	Daily	Cum.	escapement	river fish[b]
6/23	–	–	0	25	25	–	–
6/24	–	–	0	71	96	–	–
6/25	–	–	0	103	199	–	–
6/26	–	–	0	123	322	–	–
6/27	–	–	0	108	430	–	–
6/28	–	–	0	185	615	–	–
6/29	14,178	14,178	78	172	788	–	–
6/30	4,110	18,288	78	211	999	–	–
7/1	4,104	22,392	78	111	1,110	–	–
7/2	3,570	25,962	78	128	1,238	10,000	10,000
7/3	3,036	28,998	134	60	1,298	18,000	8,000
7/4	954	29,952	158	63	1,362	28,000	10,000
7/5	3,570	33,522	181	55	1,417	38,000	10,000
7/6	2,934	36,456	237	42	1,459	48,000	10,000
7/7	2,700	39,156	113	88	1,547	58,000	10,000
7/8	6,798	45,954	90	279	1,826	83,000	25,000
7/9	10,080	56,034	71	708	2,535	133,000	50,000
7/10	42,066	98,100	199	754	3,288	283,000	150,000
7/11	93,864	191,964	144	1,566	4,854	508,000	225,000
7/12	75,858	267,822	86	2,044	6,898	683,000	175,000
7/13	158,286	426,108	58	6,838	13,737	1,083,000	400,000
7/14	355,728	781,836	86	6,976	20,713	1,683,000	600,000
7/15	537,348	1,319,184	198	2,523	23,236	2,183,000	500,000
7/16	557,334	1,876,518	146	3,428	26,663	2,683,000	500,000
7/17	404,118	2,280,636	–	–	–	–	–
7/18	242,058	2,522,694	–	–	–	–	–
7/19	128,706	2,651,400	–	–	–	–	–
7/20	39,054	2,690,454	–	–	–	–	–
7/21	26,694	2,717,148	–	–	–	–	–
7/22	16,980	2,734,128	–	–	–	–	–
7/23	15,570	2,749,698	–	–	–	–	–
7/24	20,646	2,770,344	–	–	–	–	–
7/25	22,842	2,793,186	–	–	–	–	–
7/26	24,840	2,818,026	–	–	–	–	–
7/27	22,752	2,840,778	–	–	–	–	–
7/28	19,152	2,859,930	–	–	–	–	–

Note: Cum. = cumulative. Cells with an en dash (–) indicate no data.

[a] The FPI used to estimate the daily ERFs prior to using lag time relationships was calculated using a 5-year mean of median FPIs with similar age composition and inshore total run as that projected for 2021. This method was used until lag time relationships could be established (7/2).

[b] Estimated river fish (ERF) between test fish and tower projects was based on the inriver test fish cumulative escapement estimate less the cumulative tower count. On occasion, staff adjusted the ERF based on catchability and other factors.

Table 17.–Daily sockeye salmon escapement tower counts by river system, Bristol Bay westside, 2021.

	Wood River		Igushik River		Togiak River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.
6/17	3,372	3,372	–	–	–	–
6/18	4,872	8,244	–	–	–	–
6/19	3,198	11,442	–	–	–	–
6/20	1,704	13,146	–	–	–	–
6/21	1,866	15,012	–	–	–	–
6/22	5,382	20,394	–	–	–	–
6/23	89,982	110,376	–	–	–	–
6/24	203,514	313,890	–	–	–	–
6/25	155,154	469,044	–	–	–	–
6/26	242,832	711,876	390	390	–	–
6/27	230,232	942,108	23,700	24,090	–	–
6/28	127,680	1,069,788	28,908	52,998	–	–
6/29	106,014	1,175,802	27,918	80,916	–	–
6/30	76,650	1,252,452	18,774	99,690	–	–
7/1	149,802	1,402,254	19,332	119,022	–	–
7/2	416,568	1,818,822	28,734	147,756	–	–
7/3	258,936	2,077,758	23,592	171,348	–	–
7/4	226,392	2,304,150	47,034	218,382	–	–
7/5	154,794	2,458,944	66,360	284,742	4,830	4,830
7/6	225,300	2,684,244	53,766	338,508	6,012	10,842
7/7	242,418	2,926,662	52,980	391,488	3,450	14,292
7/8	245,298	3,171,960	58,218	449,706	6,288	20,580
7/9	190,566	3,362,526	46,026	495,732	5,436	26,016
7/10	162,972	3,525,498	55,374	551,106	4,350	30,366
7/11	159,702	3,685,200	50,874	601,980	5,682	36,048
7/12	82,320	3,767,520	49,410	651,390	6,810	42,858
7/13	70,680	3,838,200	32,076	683,466	6,942	49,800
7/14	94,662	3,932,862	21,762	705,228	8,802	58,602
7/15	87,846	4,020,708	20,484	725,712	11,454	70,056
7/16	69,636	4,090,344	28,488	754,200	9,798	79,854
7/17	71,160	4,161,504	24,468	778,668	12,228	92,082
7/18	53,250	4,214,754	20,442	799,110	10,890	102,972
7/19	47,784	4,262,538	13,188	812,298	9,204	112,176
7/20	21,690	4,284,228	8,196	820,494	8,094	120,270
7/21	25,656	4,309,884	11,118	831,612	4,938	125,208

-continued-

Table 17.–Page 2 of 2.

	Wood River		Igushik River		Togiak River	
Date	Daily	Cum.	Daily	Cum.	Daily	Cum.
7/22	25,500	4,335,384	9,858	841,470	8,502	133,710
7/23	34,062	4,369,446	10,452	851,922	9,930	143,640
7/24	40,710	4,410,156	5,412	857,334	10,494	154,134
7/25	–	–	3,636	860,970	9,396	163,530
7/26	–	–	5,310	866,280	8,964	172,494
7/27	–	–	4,134	870,414	6,876	179,370
7/28	–	–	3,330	873,744	6,630	186,000
7/29	–	–	5,208	878,952	13,536	199,536
7/30	–	–	–	–	8,472	208,008
7/31	–	–	–	–	10,890	218,898
8/1	–	–	–	–	6,564	225,462
8/2	–	–	–	–	3,930	229,392
8/3	–	–	–	–	8,388	237,780
8/4	–	–	–	–	22,842	260,622
8/5	–	–	–	–	15,072	275,694
8/6	–	–	–	–	3,126	278,820
8/7	–	–	–	–	2,016	280,836

Note: Cum. = cumulative. Cells with an en dash (–) represent days when projects were not operational.

Table 18.–Commercial salmon catch by date and species, in numbers of fish, Nushagak District, Bristol Bay, 2021.

	Hours fished (drift/set)		Deliveries							
Date	Nushagak	Igushik	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
6/14[a]	0/0	0/8	–	5	–	–	–	–	–	–
6/15[a]	0/0	0/8	–	4	–	–	–	–	–	–
6/16[a]	0/0	0/8	–	8	–	–	–	–	–	–
6/17[a]	0/0	0/8	–	15	–	–	–	–	–	–
6/18[a]	0/0	0/8	–	13	–	–	–	–	–	–
6/19[a]	0/0	0/8	–	19	–	–	–	–	–	–
6/20[a]	0/0	0/8	–	20	–	–	–	–	–	–
6/21[a]	0/0	0/8	–	31	–	–	–	–	–	–
6/22[a]	0/0	0/8	–	18	–	–	–	–	–	–
6/23[a]	0/0	0/8	–	8	–	–	–	–	–	–
6/24	4/5.5	4/8	429	180	422,424	432	4,915	0	0	427,771
6/25	5.5/6.5	5.5/11	490	121	316,795	235	3,211	0	0	320,241
6/26	11.5/16	11.5/24	797	273	719,860	283	5,569	2	0	725,714
6/27	12.5/16.5	12.5/24	721	400	350,225	334	2,374	0	1	352,934
6/28	12/16	12/24	598	364	143,263	200	1,093	1	0	144,557
6/29[b]	6/17	6/24	268	399	120,700	133	496	0	0	121,329
6/30[b]	15/24	15/24	928	330	2,421,069	244	19,441	2	0	2,440,756
7/1[b]	20/24	20/24	821	503	1,551,336	270	6,783	0	0	1,558,389
7/2[b]	15/24	15/24	818	513	885,664	227	3,802	2	0	889,695
7/3[b]	16/24	16/24	850	494	743,602	189	3,599	3	0	747,393
7/4[b]	16.5/24	16.5/24	783	500	1,358,181	186	6,331	4	0	1,364,702
7/5[b]	21.5/24	21.5/24	889	506	1,602,310	137	6,651	2	0	1,609,100
7/6[b]	24/24	24/24	752	485	1,590,346	113	6,225	2	0	1,596,686
7/7[b]	17/24	17/24	598	603	968,507	142	4,877	6	0	973,532
7/8[b]	18/24	18/24	821	533	835,668	96	4,117	9	0	839,890
7/9[b]	20.5/24	20.5/24	593	311	963,499	68	5,406	3	0	968,976
7/10[b]	17/24	17/24	587	399	445,664	76	3,534	10	0	449,284
7/11[b]	18.5/24	18.5/24	461	480	556,654	63	3,043	29	2	559,791
7/12[b,c]	24/24	24/24	474	453	643,873	114	4,262	39	2	648,290
7/13[b]	24/24	24/24	372	494	520,747	89	4,054	67	14	524,971
7/14[b]	24/24	24/24	310	493	327,132	90	2,753	45	12	330,032
7/15[b]	24/24	24/24	305	350	223,957	81	4,195	62	20	228,315
7/16[b]	24/24	24/24	273	352	177,606	74	2,501	52	26	180,259
7/17[b]	24/24	24/24	190	288	106,322	56	1,536	60	103	108,077
7/18[b]	24/24	24/24	142	295	69,606	45	1,412	61	63	71,187
7/19[b]	24/24	24/24	109	233	49,907	55	954	68	224	51,208
7/20	24/24	24/24	39	195	33,284	42	462	38	157	33,983
7/21	24/24	24/24	14	158	18,930	18	253	24	290	19,515
7/22	24/24	24/24	13	157	19,989	12	292	47	359	20,699

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	Hours fished (drift/set)		Deliveries							
Date	Nushagak	Igushik	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/23	24/24	24/24	7	134	18,247	14	212	46	504	19,023
7/24	24/24	24/24	5	104	16,602	14	170	59	549	17,394
7/25	24/24	24/24	8	93	10,375	8	184	40	577	11,184
7/26	24/24	24/24	3	76	6,817	13	84	68	1,686	8,668
7/27	24/24	24/24	5	68	5,780	8	46	64	1,538	7,436
7/28	24/24	24/24	11	56	3,241	5	130	61	2,389	5,826
7/29	24/24	24/24	6	47	4,020	5	277	50	1,397	5,749
7/30	24/24	24/24	4	31	2,193	2	11	39	964	3,209
7/31[a]	24/24	24/24	1	17	–	–	–	–	–	–
8/1[a]	24/24	24/24	5	23	–	–	–	–	–	–
8/2[a]	24/24	24/24	5	23	–	–	–	–	–	–
8/3[a]	24/24	24/24	5	21	–	–	–	–	–	–
8/4[a]	24/24	24/24	2	26	–	–	–	–	–	–
8/5[a]	24/24	24/24	2	17	–	–	–	–	–	–
8/6[a]	24/24	24/24	3	5	–	–	–	–	–	–
8/7[a]	24/24	24/24	6	1	–	–	–	–	–	–
8/8[a]	24/24	24/24	7		–	–	–	–	–	–
8/9[a]	24/24	24/24	10	3	–	–	–	–	–	–
8/10[a]	24/24	24/24	2		–	–	–	–	–	–
8/11[a]	24/24	24/24	5	2	–	–	–	–	–	–
8/12[a]	24/24	24/24	5	3	–	–	–	–	–	–
8/13[a]	24/24	24/24	1	1	–	–	–	–	–	–
8/14[a]	24/24	24/24	–	1	–	–	–	–	–	–
8/15[a]	24/24	24/24	–	2	–	–	–	–	–	–
8/16[a]	24/24	24/24	–	3	–	–	–	–	–	–
8/17[a]	24/24	24/24	–	2	–	–	–	–	–	–
8/18[a]	24/24	24/24	–	1	–	–	–	–	–	–
8/19[a]	24/24	24/24	–	1	–	–	–	–	–	–
8/20[a]	24/24	24/24	–	1	–	–	–	–	–	–
8/21[a]	24/24	24/24	–	1	–	–	–	–	–	–
Total	1255/1350	1255/1467	14,553	11,766	18,283,479	4,306	115,456	1,122	27,467	18,431,830

Note: Cells with an en dash (–) indicate no data.

[a] Less than 3 permit holders or companies operated, harvest confidential.

[b] Setnet fishing in WRSHA was open between 6/29–7/19. Catch is included in totals.

[c] Fishing extended until further notice.

Table 19.–Commercial salmon catch by date and species, in numbers of fish, Togiak District, Bristol Bay, 2021.

Date	Deliveries		Sockeye	Chinook	Chum	Pink	Coho	Total
	Drift	Set						
6/15[a]	–	–	–	–	–	–	–	–
6/16[a]	–	–	–	–	–	–	–	–
6/17[a]	–	–	–	–	–	–	–	–
6/18[a]	–	–	–	–	–	–	–	–
6/21	2	14	551	4	40	0	0	595
6/22	1	18	594	9	26	0	0	629
6/23	1	6	400	1	7	0	0	408
6/24	2	0	575	0	16	0	0	591
6/25	1	3	68	1	6	0	0	75
6/28	14	54	3,479	18	163	2	0	3,662
6/29	19	66	4,564	36	242	8	0	4,850
6/30	9	31	4,253	15	123	0	0	4,391
7/1	3	11	1,621	2	20	0	0	1,643
7/2	15	47	8,484	14	121	6	0	8,625
7/3	5	45	4,200	10	81	5	0	4,296
7/5	21	50	5,800	20	208	11	0	6,039
7/6	34	79	13,544	48	572	13	0	14,177
7/7	47	106	18,447	46	722	30	0	19,245
7/8	42	95	17,480	22	707	40	0	18,249
7/9	20	77	15,031	18	323	22	0	15,394
7/10	12	81	13,805	27	412	64	0	14,308
7/11	18	86	18,471	26	712	66	0	19,275
7/12	43	139	21,549	42	1,057	146	0	22,794
7/13	48	128	22,957	66	1,197	136	0	24,356
7/14	39	158	26,689	53	1,320	178	0	28,240
7/15	46	128	19,878	37	1,506	112	0	21,533
7/16	55	142	24,282	52	1,253	142	0	25,729
7/17	41	126	24,327	16	882	51	0	25,276
7/18	7	29	5,921	3	97	22	0	6,043
7/19	48	128	26,658	23	891	96	1	27,669
7/20	45	127	20,771	15	1,061	98	0	21,945
7/21	50	107	18,530	15	1,071	47	0	19,663
7/22	40	136	23,284	13	1,085	39	0	24,421
7/23	50	128	30,490	5	846	50	0	31,391
7/24	50	140	35,833	12	982	56	0	36,883

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Table 19.–Page 2 of 2.

	Deliveries							
Date	Drift	Set	Sockeye	Chinook	Chum	Pink	Coho	Total
7/25	15	41	12,447	8	172	13	0	12,640
7/26	32	134	27,836	9	568	82	0	28,495
7/27	65	142	33,909	12	717	68	8	34,714
7/28	20	107	13,193	3	243	33	5	13,477
7/29	43	73	24,493	4	261	19	2	24,779
7/30	53	83	24,377	1	322	15	1	24,716
7/31	12	61	6,808	2	89	10	0	6,909
8/1	4	21	3,072	0	16	3	0	3,091
8/2	38	60	13,886	2	153	17	5	14,063
8/3	35	123	18,911	2	222	50	7	19,192
8/4	26	106	11,601	1	179	29	20	11,830
8/5	17	79	6,904	2	99	16	17	7,038
8/6	12	57	6,317	1	82	17	8	6,425
8/7	16	58	8,433	2	112	11	15	8,573
8/8	4	19	3,279	1	26	4	11	3,321
8/9	11	34	3,714	0	43	18	43	3,818
8/10	15	70	6,321	2	82	13	73	6,491
8/11	12	66	4,415	2	50	12	57	4,536
8/12	10	54	3,658	3	40	11	94	3,806
8/13	2	45	2,295	0	29	10	83	2,417
8/14	4	32	964	1	15	6	68	1,054
8/15	2	2	408	0	5	4	16	433
8/16	6	10	1,082	0	12	10	156	1,260
8/17	7	20	1,546	0	22	5	309	1,882
8/18	5	15	1,252	0	11	4	354	1,621
8/19	4	13	818	0	2	2	298	1,120
8/20	3	14	459	0	3	2	241	705
8/21	2	20	448	0	9	13	286	756
8/22	1	3	57	0	1	0	7	65
8/23	1	7	180	0	7	2	334	523
8/24	4	8	224	0	2	0	463	689
8/25	5	2	267	0	1	2	601	871
Total	1,314	4,070	676,163	729	21,346	1,941	3,583	703,762

Note: Cells with an en dash (–) indicate no data.

[a] Less than 3 permit holders or companies operated, harvest confidential.

Table 20.–Commercial herring sac roe and spawn-on-kelp buyers in Togiak District, 2021.

			Product purchased		
			Sac roe		
	Operator/Buyer[a]	Base of operation	Gillnet	Purse seine	Spawn-on-kelp
1	Icicle Seafoods	P/V *Gordon Jensen*	X	X	
2	Silver Bay Seafoods	S/P Naknek		X	

[a] Operators that registered in the Togiak District.

Table 21.–Daily observed estimates in short tons of herring, by index area, Togiak District, 2021.

				Estimated biomass by index area[a]													
Date	Start time	Survey rating[b]	Spawn	NUS	KUK	MET	NVK	UGL	TOG	TNG	MTG	OSK	PYR	CPN	HAG	WAL	Daily total
28-Apr	14:00	2.5	0.0	0	0	0	0	0	0	0	0	0	NS	NS	0	NS	0
30-Apr	14:00	2.5	0.0	0	0	0	0	0	0	0	0	0	NS	NS	0	NS	0
3-May	14:30	2.9	5.8	766	11,132	6,851	3,476	822	126	4,155	8,941	1,781	NS	NS	11,800	NS	49,850
4-May	15:00	2.3	13.1	1,231	17,752	3,652	8,488	2,816	14,583	7,984	6,430	1,308	NS	NS	3,325	NS	67,569
5-May	11:30	3.6	6.0	13	6,039	12,251	11,972	11,070	4,771	NS	NS	NS	NS	NS	NS	NS	46,117
6-May	10:00	2.5	28.8	1,662	13,844	6,395	12,345	13,153	40,118	28,660	34,516	10,200	2,596	2,508	72	NS	166,021
12-May	13:00	2.7	5.2	3,952	24,215	9,837	4,147	414	297	2,742	10,180	3,692	1,797	NS	1,730	NS	63,002
18-May	13:00	3.0	0.2	1,178	3,803	609	1,259	773	2,129	NS	128	214	NS	NS	2	NS	10,095
Total linear miles of spawn			59.1										Peak biomass estimate				166,021

Note: NS = no survey.

[a] Index areas: NUS = Nushagak Peninsula; KUK = Kulukak; MET = Metervik; NUK = Nunavachak; UGL = Ungalikthluk/Togiak; TOG = Togiak; TNG = Tongue Pt.; MTG = Matogak; HAG = Hagemeister; OSK = Osviak; PYT = Pyrite Point; CPN = Cape Newenham.

[b] Average survey rating for all sections surveyed: 1 = Excellent, 2 = Good, 3 = Fair, 4 = Poor, 5 = Unsatisfactory.

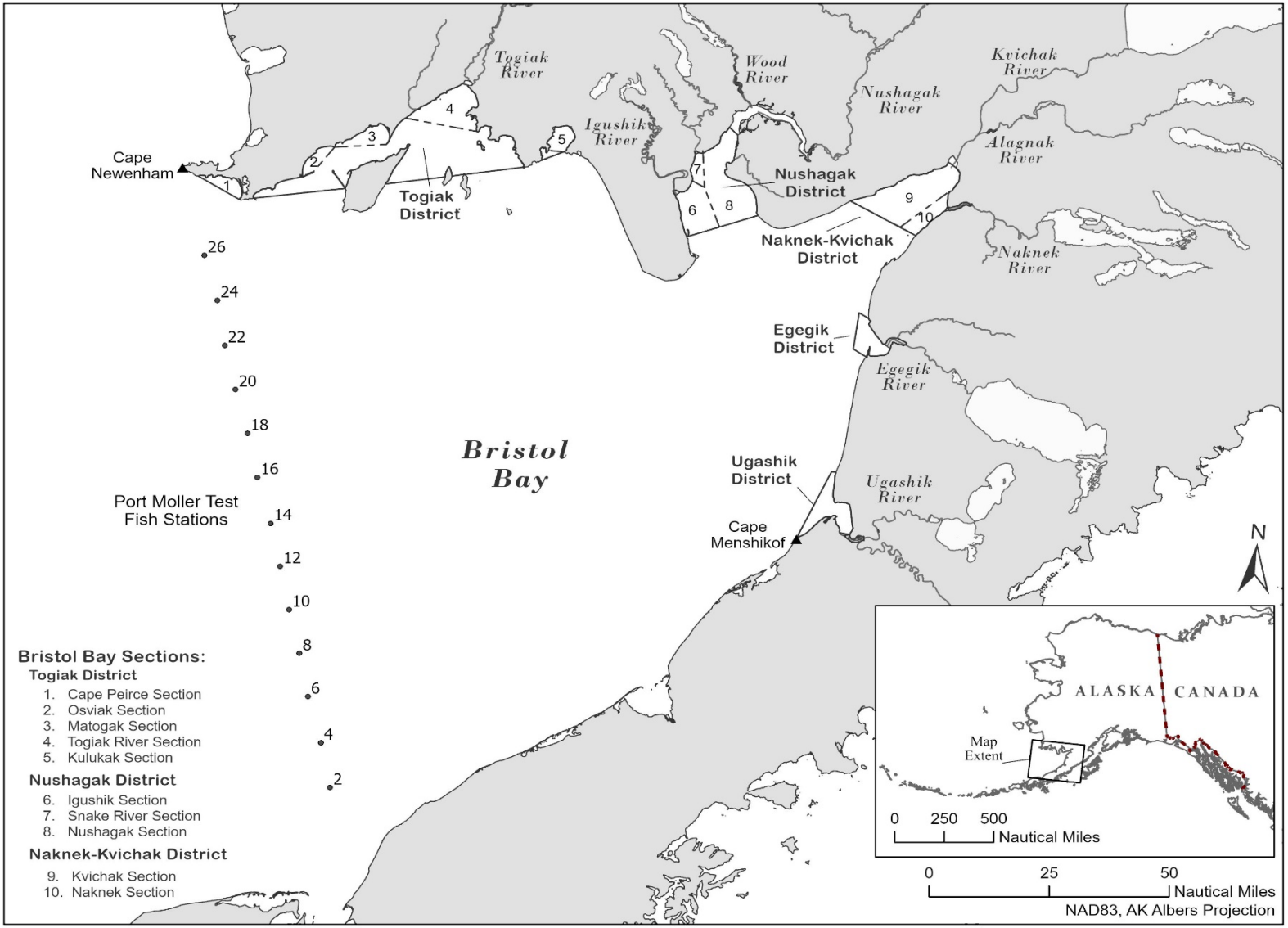

Figure 1.–Bristol Bay area commercial fisheries salmon management districts, sections, rivers, and the Port Moller Test Fish Stations.

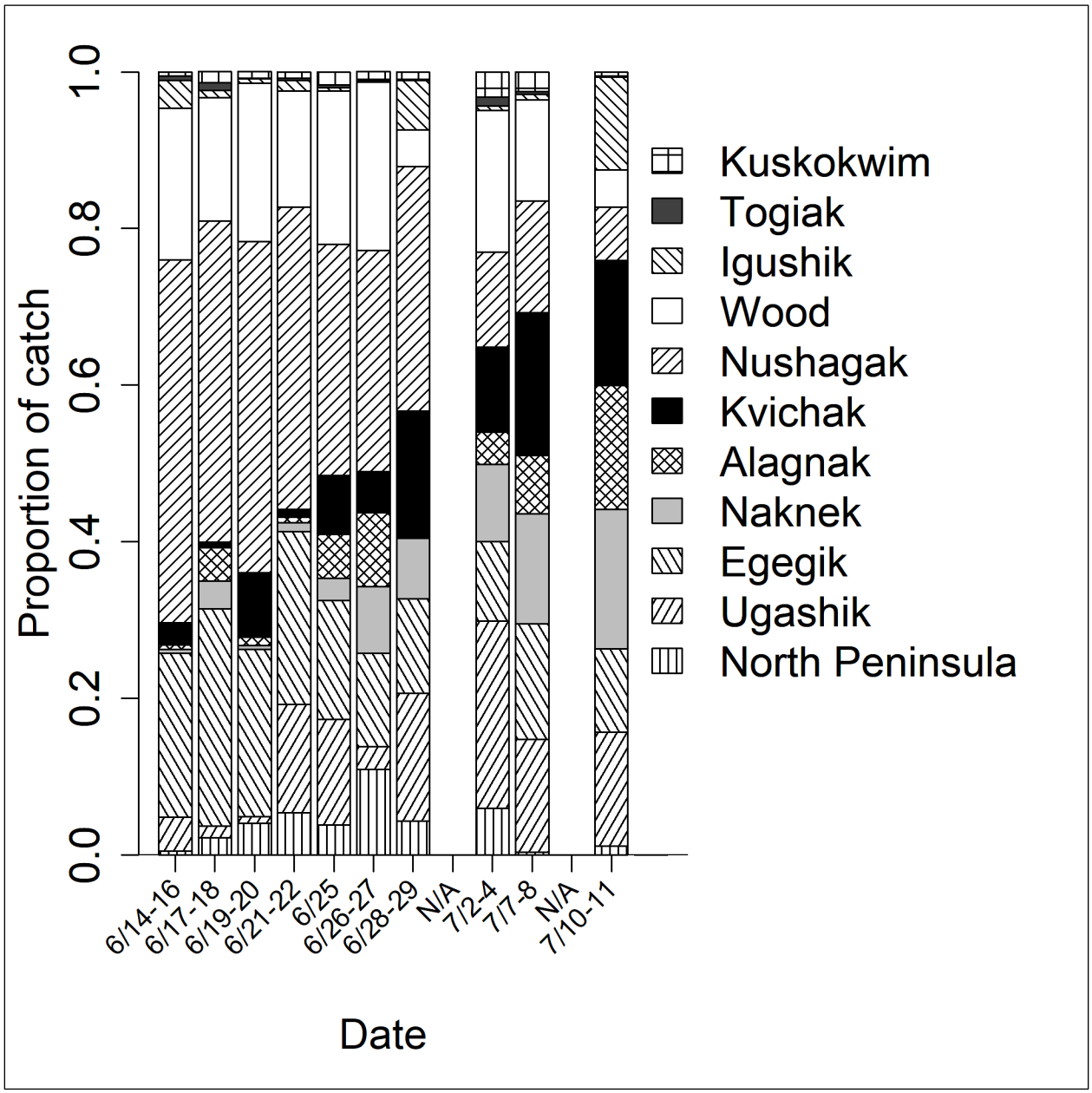

Figure 2.–Stock composition estimates for sockeye salmon sampled from the Port Moller test fishery, 2021.

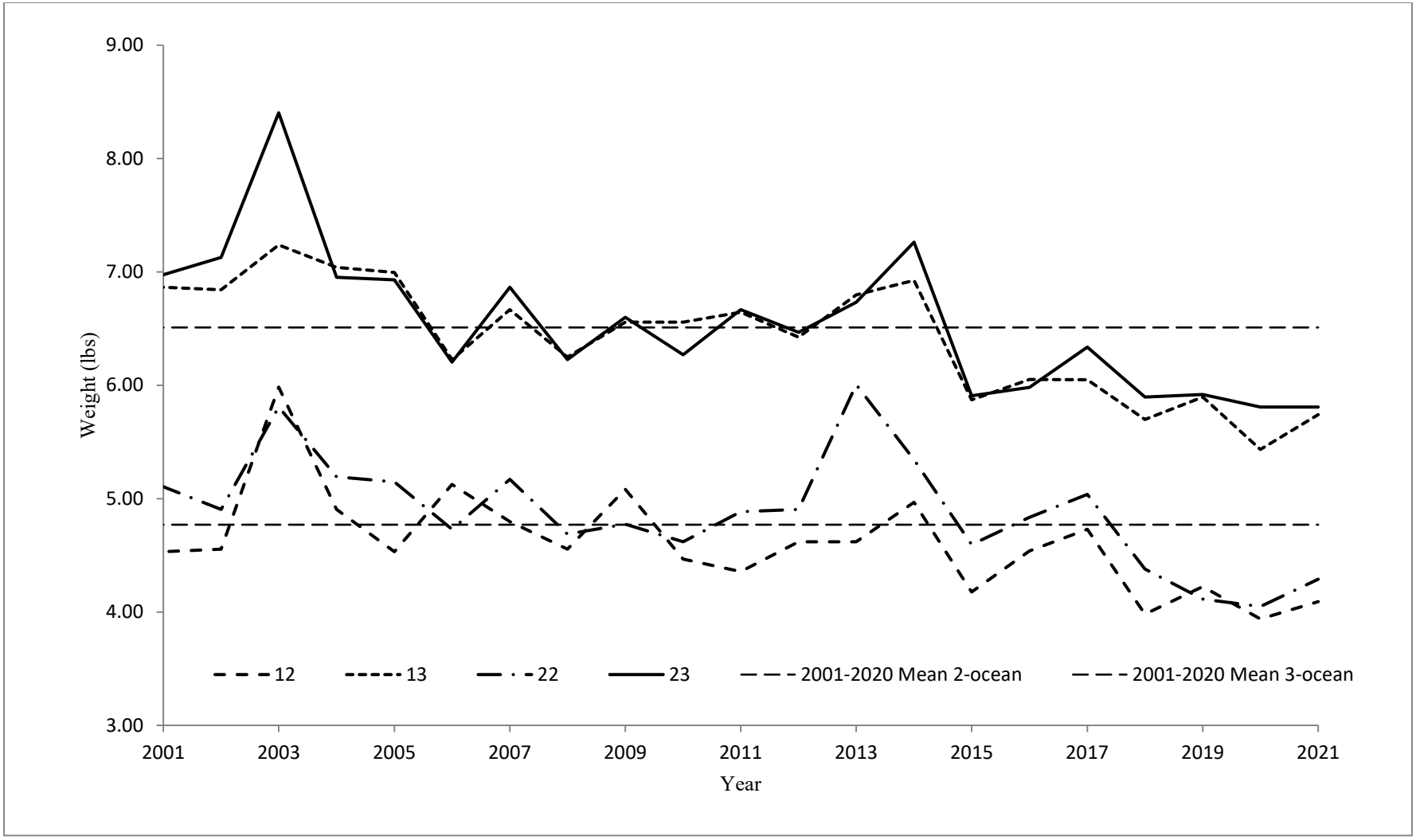

Figure 3.–Average weight (lb), by age-class, of Bristol Bay sockeye salmon sampled in the commercial fishery catch, 2001–2021.

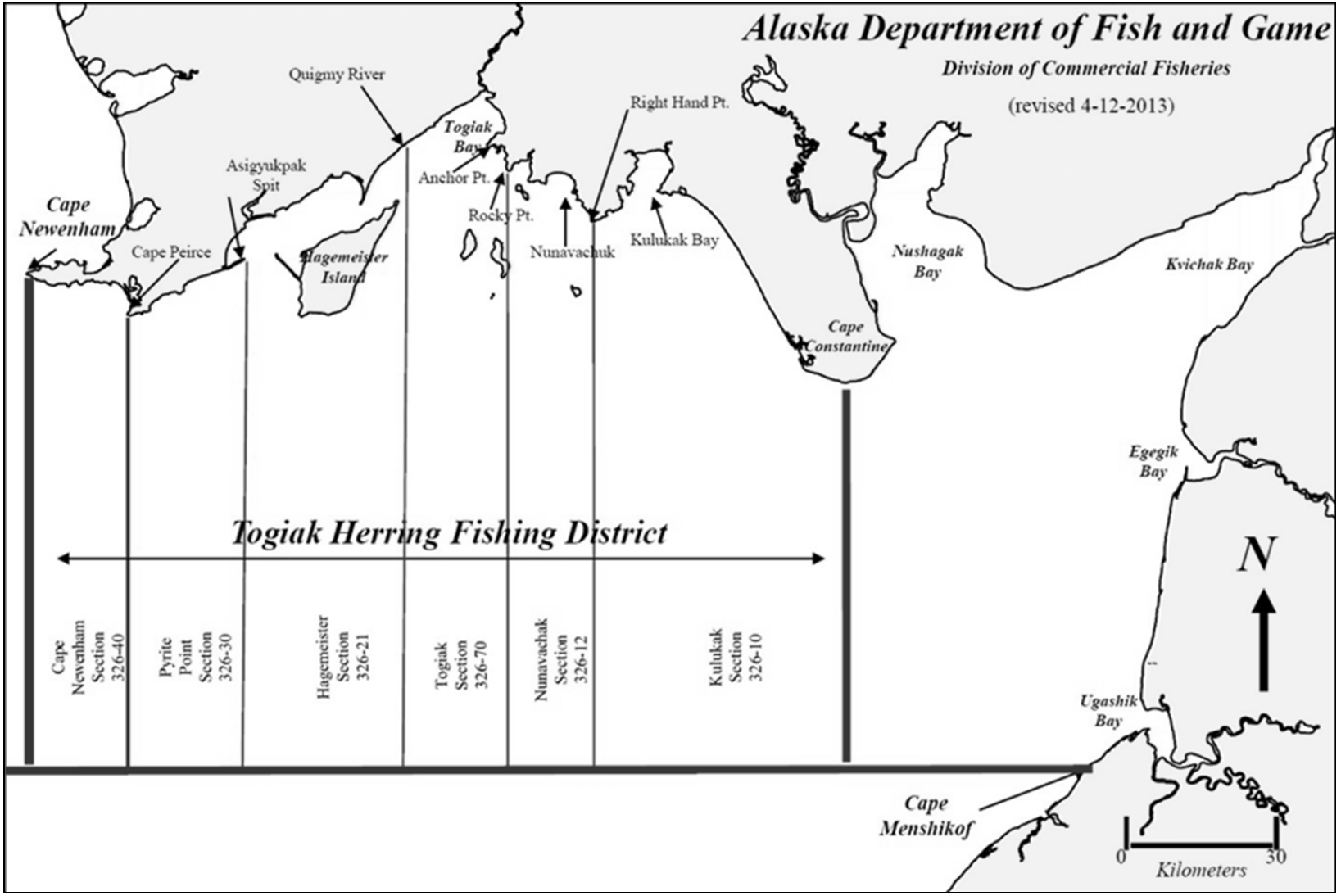

Figure 4.–Togiak Herring District, Bristol Bay.

APPENDIX A: SALMON

Appendix A1.–Escapement goal ranges and actual counts of sockeye salmon by river system, in thousands of fish, Bristol Bay, 2001–2021.

	Kvichak River			Naknek River[a]		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
2001	2,000	10,000	1,095	800	2,000	1,830
2002	2,000	10,000	704	800	2,000	1,264
2003	2,000	10,000	1,687	800	2,000	1,831
2004	2,000	10,000	5,500	800	2,000	1,939
2005	2,000	10,000	2,320	800	2,000	2,745
2006	2,000	10,000	3,068	800	2,000	1,953
2007	2,000	10,000	2,810	800	2,000	2,945
2008	2,000	10,000	2,758	800	1,400	2,473
2009	2,000	10,000	2,266	800	1,400	1,170
2010	2,000	10,000	4,207	800	1,400	1,464
2011	2,000	10,000	2,264	800	1,400	1,177
2012	2,000	10,000	4,164	800	1,400	900
2013	2,000	10,000	2,089	800	1,400	938
2014	2,000	10,000	4,459	800	1,400	1,474
2015	2,000	10,000	7,342	800	2,000	1,921
2016	2,000	10,000	4,463	800	2,000	1,692
2017	2,000	10,000	3,163	800	2,000	1,900
2018	2,000	10,000	4,399	800	2,000	2,221
2019	2,000	10,000	2,371	800	2,000	2,911
2020	2,000	10,000	4,031	800	2,000	4,112
2021	2,000	10,000	4,704	800	2,000	2,797
20-Year Avg.			3,258			1,943
2001–2010 Avg.			2,642			1,961
2011–2020 Avg.			3,875			1,925

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	Egegik River			Ugashik River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
2001	800	1,400	969	500	1,200	834
2002	800	1,400	1,036	500	1,200	892
2003	800	1,400	1,152	500	1,200	759
2004	800	1,400	1,290	500	1,200	776
2005	800	1,400	1,622	500	1,200	779
2006	800	1,400	1,465	500	1,200	978
2007	800	1,400	1,433	500	1,200	2,599
2008	800	1,400	1,260	500	1,200	569
2009	800	1,400	1,146	500	1,200	1,346
2010	800	1,400	927	500	1,200	805
2011	800	1,400	961	500	1,200	1,030
2012	800	1,400	1,234	500	1,200	671
2013	800	1,400	1,114	500	1,200	898
2014	800	1,400	1,382	500	1,200	640
2015	800	2,000	2,161	500	1,400	1,565
2016	800	2,000	1,837	500	1,400	1,635
2017	800	2,000	2,601	500	1,400	1,186
2018	800	2,000	1,608	500	1,400	1,168
2019	800	2,000	2,340	500	1,400	1,547
2020	800	2,000	2,389	500	1,400	1,745
2021	800	2,000	1,832	500	1,400	2,860
20-Year Avg.			1,496			1,121
2001–2010 Avg.			1,230			1,034
2011–2020 Avg.			1,763			1,209

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	Wood River			Igushik River		
	Range			Range		
Year	Lower	Upper	Actual	Lower	Upper	Actual
2001	700	1,500	1,459	150	300	410
2002	700	1,500	1,284	150	300	123
2003	700	1,500	1,460	150	300	194
2004	700	1,500	1,543	150	300	110
2005	700	1,500	1,497	150	300	366
2006	700	1,500	4,008	150	300	305
2007	700	1,500	1,528	150	300	415
2008	700	1,500	1,725	150	300	1,055
2009	700	1,500	1,319	150	300	514
2010	700	1,500	1,804	150	300	518
2011	700	1,500	1,098	150	300	421
2012	700	1,500	764	150	300	193
2013	700	1,500	1,183	150	300	387
2014	700	1,500	2,765	150	300	341
2015	700	1,800	1,941	150	400	651
2016	700	1,800	1,310	150	400	469
2017	700	1,800	4,274	150	400	579
2018	700	1,800	7,507	150	400	771
2019	700	1,800	2,073	150	400	256
2020	700	1,800	2,244	150	400	324
2021	700	1,800	4,410	150	400	879
20-Year Avg.			2,139			420
2001–2010 Avg.			1,763			401
2011–2020 Avg.			2,516			439

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	Nushagak River			Togiak River		
	Range			Range		
Year	Lower[b]	Upper	Actual[c]	Lower	Upper	Actual
2001	340	760	897	100	200	297
2002	235	760	349	100	200	162
2003	340	760	642	100	200	232
2004	340	760	544	100	200	129
2005	340	760	1,107	100	200	149
2006	340	760	541	100	200	312
2007	340	760	518	120	270	270
2008	340	760	493	120	270	206
2009	340	760	484	120	270	314
2010	340	760	469	120	270	188
2011	340	760	428	120	270	191
2012	340	760	432	120	270	203
2013	370	840	895	120	270	128
2014	370	840	618	120	270	152
2015	370	900	797	120	270	219
2016	370	900	1,226	120	270	200
2017	370	900	2,852	120	270	195
2018	370	900	1,247	120	270	512
2019	370	900	1,459	120	270	351
2020	370	900	1,228	120	270	261
2021	370	900	4,697	120	270	281
20-Year Avg.			861			234
2001–2010 Avg.			604			226
2011–2020 Avg.			1,118			243

[a] An optimal escapement goal of up to 2.0 million sockeye was set by the BOF in 2001, when fishing in the Naknek River Special Harvest Area (SHA).

[b] The optimum escapement goal of 235,000 sockeye was set by the Alaska Board of Fisheries (BOF) in 1999.

[c] Nushagak River sonar escapement estimates prior to 2006 were adjusted due to a change in sonar technology (Buck et al. 2012).

Appendix A2.–Salmon entry permit registration by gear and residency, Bristol Bay, 2001–2021.

	Drift net[a]						Set net[a]						Total
Year	Resident	Non-resident	Drift total	Permits fished	% Fished	Interim use	Resident	Non-resident	Set total	Permits fished	% Fished	Interim use	Drift and set[b]
2001	958	925	1,883	1,566	82	24	729	281	1,010	834	82	2	2,893
2002	945	933	1,878	1,183	62	16	717	289	1,006	680	67	2	2,884
2003	923	944	1,867	1,389	74	7	713	288	1,001	714	71	1	2,868
2004	912	948	1,860	1,426	77	3	703	286	989	797	81	1	2,849
2005	895	967	1,862	1,526	82	3	688	300	988	829	84	1	2,850
2006	893	966	1,859	1,567	84	1	683	302	985	844	86	0	2,844
2007	881	981	1,862	1,621	87	1	672	311	983	836	85	0	2,845
2008	887	976	1,863	1,636	88	0	678	302	980	850	87	0	2,843
2009	864	999	1,863	1,642	88	0	674	307	981	855	87	0	2,844
2010	866	997	1,863	1,731	93	0	672	311	983	861	88	0	2,846
2011	1005	857	1,862	1,747	94	0	660	321	981	878	90	0	2,843
2012	849	1,013	1,862	1,740	93	0	654	325	979	883	90	0	2,841
2013	862	1,000	1,862	1,709	92	0	646	332	978	854	87	0	2,840
2014	848	1,015	1,863	1,751	94	0	636	341	977	881	90	0	2,840
2015	834	1,030	1,864	1,744	94	0	639	336	975	885	91	0	2,839
2016	826	1,038	1,864	1,715	92	0	637	336	973	858	88	0	2,837
2017	842	1,021	1,863	1,728	93	0	635	337	972	881	91	0	2,835
2018	838	1,025	1,863	1,735	94	0	634	336	970	879	91	0	2,833
2019	840	1,022	1,862	1,767	95	0	632	333	965	893	93	0	2,827
2020	825	1,037	1,862	1,724	93	0	627	337	964	841	87	0	2,826
2021	832	1,030	1,862	1,753	94	0	612	352	964	870	90	0	2,826
20-Year Avg.	880	985	1,864	1,632	88	3	666	316	982	842	86	0	2,846
2001–2010 Avg.	902	964	1,866	1,529	82	6	693	298	991	810	82	1	2,857
2011–2020 Avg.	857	1,006	1,863	1,736	93	0	640	333	973	873	90	0	2,836

[a] Allowable permit gear: 150 fathoms for drift and 50 fathoms for set.

[b] Includes interim use permits.

Appendix A3.–Sockeye salmon commercial catch by district, in numbers of fish, Bristol Bay, 2001–2021.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
2001	5,280,538	2,872,662	480,509	4,734,800	810,096	14,178,605
2002	1,418,938	4,610,374	1,573,234	2,839,424	233,743	10,675,713
2003	3,348,504	2,291,502	1,748,934	6,665,965	706,008	14,760,913
2004[a]	4,715,070	10,209,227	3,139,229	6,104,048	437,234	26,261,802
2005	6,728,469	8,015,950	2,216,635	7,096,031	465,094	24,522,179
2006	7,151,741	7,408,983	2,429,637	10,876,552	626,442	28,493,355
2007	9,022,511	6,495,908	5,026,615	8,404,111	816,581	29,765,726
2008	10,381,844	7,403,885	2,334,022	6,903,157	651,315	27,674,223
2009	8,514,944	11,527,462	2,555,263	7,730,168	559,442	30,887,279
2010	10,858,209	5,070,816	4,031,832	8,424,030	667,850	29,052,737
2011	9,016,321	4,810,362	2,643,495	4,886,552	744,626	22,101,356
2012	10,152,917	5,062,390	2,418,653	2,663,014	622,909	20,919,883
2013	4,853,030	4,779,133	2,168,216	3,163,805	467,329	15,431,513
2014[b]	13,791,290	6,928,621	1,511,416	6,448,463	443,287	29,127,035
2015	16,531,193	8,749,567	5,473,800	5,592,816	371,903	36,719,279
2016	13,466,245	8,739,699	6,630,231	8,109,797	645,797	37,591,769
2017	8,256,304	11,980,502	5,705,712	12,322,519	516,488	38,781,525
2018	8,917,710	5,149,621	2,771,945	24,230,150	867,770	41,937,196
2019	11,527,837	14,683,614	1,037,030	14,755,905	1,018,644	43,023,030
2020	14,311,034	13,364,669	2,598,269	8,860,302	445,572	39,579,846
2021	9,253,721	8,552,456	5,205,169	18,283,479	676,163	41,970,988
20-Year Avg.	8,912,232	7,507,747	2,924,734	8,040,580	605,907	28,074,248
2001–2010 Avg.	6,742,077	6,590,677	2,553,591	6,977,829	597,381	23,627,253
2011–2020 Avg.	11,082,388	8,424,818	3,295,877	9,103,332	614,433	32,521,243

[a] Total includes General District harvest of 1,656,994 fish.

[b] Includes 3,958 fish that were not assigned to a district.

Appendix A4.–Chinook salmon commercial catch by district, in numbers of fish, Bristol Bay, 2001–2021.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
2001	995	967	1,021	11,746	1,021	15,750
2002	1,002	284	623	40,039	2,801	44,749
2003	611	135	478	43,485	3,231	47,940
2004	1,496	1,632	891	96,759	9,310	114,280[a]
2005	1,458	486	1,818	62,764	10,759	77,285
2006	2,333	915	2,608	84,881	16,225	106,962
2007	1,520	528	1,473	51,831	7,769	63,121
2008	1,344	416	1,191	18,968	3,087	25,006
2009	1,026	308	948	24,693	4,602	31,577
2010	1,060	223	460	26,056	5,553	33,352
2011	1,962	567	372	26,927	6,731	36,559
2012	2,306	282	212	11,952	4,829	19,581
2013	1,360	144	52	10,213	2,718	14,487
2014	1,648	461	83	11,862	1,841	15,895
2015	2,926	753	226	50,675	2,663	57,243
2016	2,797	1,144	1,435	23,783	3,831	32,990
2017	2,477	866	1,219	32,194	4,643	41,399
2018	2,398	1,520	1,407	35,938	3,457	44,720
2019	2,743	3,344	2,062	21,509	3,568	33,226
2020	816	711	1,349	6,363	767	10,006
2021	990	475	444	4,306	729	6,944
20-Year Avg.	1,714	784	996	34,632	4,970	39,571
2001–2010 Avg.	1,285	589	1,151	46,122	6,436	49,527
2011–2020 Avg.	2,143	979	842	23,142	3,505	30,611

[a] Total includes General District harvest of 4,624 fish.

Appendix A5.–Chum salmon commercial catch by district, in numbers of fish, Bristol Bay, 2001–2021.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
2001	16,526	33,579	43,404	526,739	211,701	831,949
2002	19,189	23,516	35,792	276,787	112,987	468,271
2003	34,481	37,116	52,908	740,372	68,154	933,031
2004	29,972	75,061	49,358	458,916	94,025	732,481
2005	204,777	62,029	39,513	966,069	124,695	1,397,083
2006	457,855	153,777	168,428	1,240,235	223,364	2,243,659
2007	383,927	157,991	242,025	953,292	202,486	1,939,721
2008	237,260	92,901	135,292	492,341	301,967	1,259,761
2009	255,520	118,212	64,974	745,161	141,375	1,325,242
2010	337,911	57,324	62,987	424,234	118,767	1,001,223
2011	218,710	39,246	34,287	296,909	113,234	702,386
2012	133,959	35,375	31,352	272,163	206,614	679,463
2013	272,754	36,792	32,624	586,117	209,946	1,138,233
2014 [a]	87,188	33,173	19,677	242,261	100,195	482,531
2015	350,169	69,057	69,967	502,820	103,773	1,095,786
2016	237,035	74,641	72,534	397,761	187,508	969,479
2017	249,696	147,330	88,126	804,878	204,518	1,494,548
2018	310,872	75,524	71,854	1,020,227	158,329	1,636,806
2019	134,517	156,260	20,249	855,428	227,731	1,394,185
2020	36,381	50,055	16,339	136,605	53,510	292,890
2021	34,338	20,317	20,793	115,456	21,346	212,250
20-year Avg.	200,435	76,448	67,585	596,966	158,244	1,100,936
2001–2010 Avg.	197,742	81,151	89,468	682,415	159,952	1,213,242
2011–2020 Avg.	203,128	71,745	45,701	511,517	156,536	988,631

[a] Includes 37 fish that were not assigned to a district.

Appendix A6.–Pink salmon commercial catch by district, in numbers of fish, Bristol Bay, 2001–2021.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
2001	23	0	0	308	97	428
2002	10	1	1	204	311	527
2003	24	0	0	188	32	244
2004 [a]	7,749	0	187	26,150	18,293	52,380
2005	32	0	1	554	2,108	2,695
2006	25,149	700	0	39,011	80,748	145,608
2007	9	9	2	384	533	937
2008	20,682	1,033	16	138,284	125,409	285,424
2009	23	0	1	320	544	888
2010	8,237	1,655	0	1,289,970	39,734	1,339,596
2011	13	0	5	257	352	627
2012	3,535	285	0	877,466	28,055	909,341
2013	467	0	0	208	187	862
2014	7,473	4,835	227	1,166,997	118,682	1,298,214
2015	112	0	2	807	1,219	2,140
2016	12,058	343	1,498	537,525	217,190	768,614
2017	174	214	143	7,230	26,797	34,558
2018	30,507	2,742	971	142,287	67,747	244,254
2019	530	221	183	2,021	3,875	6,830
2020	1,345	1,755	381	26,216	42,216	71,913
2021	224	281	28	1,122	1,941	3,596
20-Year Avg.	11,675	1,335	328	424,411	73,839	511,587
2001–2010 Avg.	12,365	678	41	298,724	52,899	364,707
2011–2020 Avg.	10,984	1,992	615	550,098	94,778	658,467

Note: Averages include even numbered years only.

[a] Total includes General District harvest of 1.

Appendix A7.–Coho salmon commercial catch by district, in numbers of fish, Bristol Bay, 2001–2021.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
2001	3	12,603	976	3,218	284	17,084
2002	0	7,099	464	93	754	8,410
2003	42	40,577	994	583	1,047	43,243
2004	2,142	2,324	4,744	47,706	15,463	72,379
2005	3,314	20,611	8,162	42,456	8	74,551
2006	5,163	26,788	3,087	44,385	449	79,872
2007	2,180	18,111	1,954	29,578	157	51,980
2008	7,059	29,682	2,220	76,932	1,159	117,052
2009	732	10,594	2,602	35,171	9,209	58,308
2010	901	9,984	407	72,909	24,065	108,266
2011	633	440	84	4,712	7,605	13,474
2012	431	2,493	0	97,382	15,977	116,283
2013	467	812	479	124,182	11,420	137,360
2014	646	11,473	435	242,604	32,134	287,292
2015	1,253	730	2,533	6,614	26,080	37,210
2016	1,110	546	171	79,538	9,346	90,711
2017	4,754	14,274	7	167,347	54,503	240,885
2018	11,549	21,139	1,633	84,320	43,243	161,884
2019	1,418	18,233	550	33,018	27,778	80,997
2020	1,033	26,342	818	76,133	10,095	114,421
2021	1,053	15,952	151	27,467	3,583	48,206
20-Year Avg.	2,242	13,743	1,616	63,444	14,539	95,583
2001–2010 Avg.	2,154	17,837	2,561	35,303	5,260	63,115
2011–2020 Avg.	2,329	9,648	671	91,585	23,818	128,052

Appendix A8.–Total salmon commercial catch by district, in numbers of fish, Bristol Bay, 2001–2021.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak	Togiak	Total
2001	5,299,384	2,919,874	526,114	5,277,729	1,032,116	15,055,217
2002	1,439,831	4,641,902	1,610,548	3,157,042	350,596	11,199,919
2003	3,385,814	2,369,459	1,804,199	7,452,178	778,472	15,790,122
2004[a]	4,758,330	10,288,807	3,194,507	6,734,064	574,325	27,233,322
2005	6,940,395	8,099,368	2,266,400	8,168,138	602,660	26,076,961
2006	7,641,821	7,591,163	2,603,760	12,285,064	947,228	31,069,036
2007	9,414,797	6,674,941	5,272,187	9,440,219	1,027,528	31,829,672
2008	10,651,517	7,528,622	2,472,742	7,629,892	1,082,937	29,365,710
2009	8,774,759	11,658,846	2,623,819	8,774,759	714,804	32,546,987
2010	11,208,947	5,144,104	4,095,854	10,222,381	866,201	31,537,487
2011	9,240,963	4,853,480	2,678,405	5,216,149	872,551	22,403,764
2012	10,293,536	5,101,370	2,450,220	3,918,549	878,294	22,641,969
2013	5,127,632	4,816,881	2,201,371	3,884,525	691,600	16,722,009
2014[b]	13,888,262	6,978,563	1,531,838	8,112,236	696,139	31,211,033
2015	16,885,517	8,819,956	5,546,460	6,152,464	505,638	37,910,035
2016	13,719,245	8,816,373	6,705,869	9,148,404	1,063,672	39,453,563
2017	8,513,405	12,143,186	5,795,207	13,334,168	806,949	40,592,915
2018	9,273,036	5,250,546	2,847,810	25,512,922	1,140,546	44,024,860
2019	11,667,045	14,861,672	1,060,074	15,667,881	1,281,596	44,538,268
2020	14,350,609	13,443,532	2,617,156	9,105,619	552,160	40,069,076
2021	9,290,326	8,589,481	5,226,585	18,431,830	703,762	42,241,984
20-Year Avg.	9,123,742	7,600,132	2,995,227	8,959,719	823,301	29,563,596
2001–2010 Avg.	6,951,560	6,691,709	2,647,013	7,914,147	797,687	25,170,443
2011–2020 Avg.	11,295,925	8,508,556	3,343,441	10,005,292	848,915	33,956,749

[a] Total includes General District harvest.

[b] Total includes 3,995 fish that were not assigned to a district.

Appendix A9.–Commercial sockeye salmon catch, in percent, by gear type and district, Bristol Bay, 2001–2021.

	Naknek-Kvichak									Nushagak								
		Setnet Sec.		NRSHA[a]		Egegik		Ugashik			Setnet Sec.		WRSHA[b]		Togiak		Total	
Year	Drift	Nak	Kvi	Drift	Set	Drift	Set	Drift	Set	Drift	Nush	Igushik	Drift	Set	Drift	Set	Drift	Set
2001	82	16	2	74[c]	26[c]	86	14	80	20	77	18	5	–	–	66	34	80	20
2002	–	–	–	64[c]	36[c]	85	15	88	12	77	22	1	67	33	62	38	79	21
2003	91	9	0	65[c]	35[c]	81	19	89	11	83	15	2	–	–	63	37	79	21
2004	79	11	10	88	12	86	14	88	12	84	15	1	–	–	55	45	79	21
2005	–	–	–	81	19	82	18	87	13	84	14	2	–	–	56	44	66	34
2006	86	8	5	81	19	84	16	88	12	87	11	2	–	–	53	47	85	15
2007	82	12	6	80	12	84	16	92	8	80	17	3	–	–	59	41	81	19
2008	81	12	7	–	–	85	15	92	8	79	16	5	–	–	60	40	82	18
2009	80	12	9	–	–	85	15	87	13	76	20	4	–	–	60	40	82	18
2010	81	10	9	–	–	84	16	90	10	78	17	6	71	29	61	39	82	18
2011	84	10	7	–	–	83	17	87	13	76	16	7	–	–	60	40	81	19
2012	85	7	8	–	–	83	17	90	10	67	27	6	45	55	67	33	73	27
2013	84	9	7	–	–	85	15	90	10	78	17	5	–	–	65	35	84	16
2014	83	9	8	–	–	89	11	82	18	73	16	7	–	–	58	42	82	18
2015	84	8	8	–	–	81	19	91	9	69	22	9	–	–	50	50	81	19
2016	83	8	9	–	–	82	18	91	9	67	22	11	–	–	56	44	81	19
2017	70	17	13	–	–	87	13	92	8	76	18	4	–	–	56	44	80	20
2018	71	17	12	84	16	80	20	78	22	82	13	2	–	100	51	49	81	19
2019	77	14	9	–	–	81	19	66	34	78	18	3	–	100	49	51	79	21
2020	80	12	8	–	–	86	14	74	26	69	26	3	100	–	47	53	79	21
2021	75	13	12	–	–	84	16	87	13	84	13	3	–	100	44	56	81	19
2001–2010 Avg.	83	11	6	76	23	84	16	88	12	81	17	3	69	31	60	41	80	21
2011–2020 Avg.	80	11	9	84	16	84	16	84	16	74	20	6	73	85	56	44	80	20
Allocation[d]	84	8	8	84	16	86	14	90	10	74	20	6	NA	NA	NA	NA	NA	NA

Note: Cells with an en dash (–) indicate no data.

[a] Naknek River Special Harvest Area (NRSHA), Naknek-Kvichak District; allocation plan enacted in December 2003.

[b] Wood River Special Harvest Area (WRSHA), Nushagak District.

[c] NRSHA prior to allocation plan; fishing periods were alternated between gear types.

[d] The Alaska Board of Fisheries enacted an allocation plan in 1998; it was reviewed in December 2003.

Appendix A10.–Sockeye salmon escapement by district, in numbers of fish, Bristol Bay, 2001–2021.

Year	Naknek-Kvichak [a]	Egegik [b]	Ugashik [c]	Nushagak [d]	Togiak [e]	Total
2001	3,194,708	968,872	866,368	2,765,440 [f]	338,616 [g]	8,134,004
2002	2,303,463	1,036,092	905,584	1,755,993 [f]	199,507	6,200,639
2003	5,627,974 [h]	1,152,120	790,202	2,295,963 [f]	261,851 [g]	10,128,110
2004	12,836,100 [h]	1,290,144	815,104	2,196,864 [f]	154,681 [g]	17,292,893
2005	9,283,980 [h]	1,621,734	799,612	2,968,962 [f]	155,778 [g]	14,830,066
2006	6,795,420 [h]	1,465,158	1,003,158	4,861,780 [f]	312,126 [i]	14,437,642
2007	8,221,926 [h]	1,432,500	2,599,186	2,461,579 [f]	269,646 [i]	14,984,837
2008	7,411,104 [h]	1,259,568	596,332	3,271,926 [f]	205,680 [i]	12,744,610
2009	4,406,424 [h]	1,146,276	1,364,338	2,317,569 [f]	313,946 [i]	9,548,553
2010	6,859,068 [h]	927,054	830,886	2,791,080 [f]	188,298 [i]	11,596,386
2011	4,325,220 [h]	961,200	1,029,853	1,947,577	190,970 [i]	8,454,820
2012	5,926,503	1,233,900	695,018	1,389,975	203,148 [i]	9,448,544
2013	4,122,686	1,113,630	898,110	2,465,791	128,118 [i]	8,728,335
2014	6,133,492	1,382,466	640,158	3,723,697	151,934 [i]	12,031,747
2015	15,033,216	2,160,792	1,564,638	3,389,330	218,700 [i]	22,366,676
2016	7,930,458	1,837,260	1,635,270	2,459,450	200,046 [i]	14,062,484
2017	7,105,200 [h]	2,600,982	1,186,446	7,705,277	195,330 [i]	18,793,235
2018	8,201,286 [h]	1,608,354	1,167,792	9,525,486	511,770 [i]	21,014,688
2019	6,103,170 [h]	2,340,210	1,547,748	3,038,781	351,846 [i]	13,381,755
2020	10,529,646 [h]	2,389,728	1,745,940	3,795,795	261,126 [i]	18,722,235
2021	10,736,958 [h]	1,832,196	2,859,930	9,986,407	280,836 [i]	25,696,327
20-Year Avg.	7,117,552	1,496,402	1,134,087	3,356,416	240,656	13,345,113
2001–2010 Avg.	6,694,017	1,229,952	1,057,077	2,768,716	240,013	11,989,774
2011–2020 Avg.	7,541,088	1,762,852	1,211,097	3,944,116	241,299	14,700,452

[a] Includes counts from Kvichak tower, Alagnak aerial survey, and Naknek tower.

[b] Includes Egegik River. May include King Salmon River and Shosky Creek.

[c] Includes Ugashik River. Also includes Mother Goose River and Dog Salmon River system in 1991–2004.

[d] Includes Igushik, Nushagak-Mulchatna, Nuyakuk, Snake, and Wood Rivers. Nushagak River sonar escapement estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology in 2006 (Buck et al. 2012).

[e] Includes Togiak River, Lake tributaries, Kulukak system, and other miscellaneous river systems, except where noted.

[f] Snake River not surveyed.

[g] Only partial and/or late survey of Togiak streams.

[h] Alagnak tower count.

[i] Togiak River tower count.

Appendix A11.–Inshore total run of sockeye salmon by district, in numbers of fish, Bristol Bay, 2001–2021.

Year	Naknek-Kvichak	Egegik	Ugashik	Nushagak[a]	Togiak	Total
2001	8,475,246	3,841,534	1,346,877	7,500,240	1,148,712	22,312,609
2002	3,722,401	5,646,466	2,478,818	4,595,417	433,250	16,876,352
2003	8,976,478	3,443,622	2,539,136	8,961,928	967,859	24,889,023
2004	17,551,170	11,499,371	3,954,333	8,300,912	591,915	41,897,701
2005	16,012,449	9,637,684	3,016,247	10,064,993	620,872	39,352,245
2006	13,947,161	8,874,141	3,432,795	15,738,332	938,568	42,930,997
2007	17,244,437	7,928,408	7,625,801	10,865,690	1,086,227	44,750,563
2008	17,792,948	8,663,453	2,930,354	10,175,083	856,995	40,418,833
2009	12,921,368	12,673,738	3,919,601	10,047,737	873,388	40,435,832
2010	17,717,277	5,997,870	4,862,718	11,215,110	856,148	40,649,123
2011	13,341,541	5,771,562	3,673,348	6,834,129	935,596	30,556,176
2012	16,079,420	6,296,290	3,113,671	4,052,989	826,057	30,368,427
2013	9,148,587	5,950,083	3,070,893	5,648,098	621,670	24,439,331
2014	19,924,521	8,310,816	2,147,598	10,171,331	595,192	41,149,458
2015	31,565,141	10,631,593	7,038,933	8,983,050	590,604	58,809,321
2016	21,396,703	10,576,959	8,265,501	10,569,247	845,843	51,654,253
2017	15,361,504	14,581,484	6,892,158	20,027,749	711,818	57,574,713
2018	17,118,996	6,757,975	3,939,737	33,755,636	1,379,540	62,951,884
2019	17,638,837	17,023,824	2,584,778	17,794,604	1,370,490	56,412,533
2020	24,840,681	15,754,397	4,344,209	12,656,061	706,698	58,302,046
2021	19,990,679	10,384,206	8,065,099	28,269,886	956,999	67,666,869
20-Year Avg.	16,038,843	8,993,064	4,058,875	11,397,917	847,872	41,336,571
2001–2010 Avg.	13,436,094	7,820,629	3,610,668	9,746,544	837,393	35,451,328
2011–2020 Avg.	18,641,593	10,165,498	4,507,083	13,049,289	858,351	47,221,814

[a] Reflects a 2012 adjustment of Nushagak River sonar escapement estimates prior to 2006 to account for a transition in sonar technology in 2006 (Buck et al. 2012).

Appendix A12.–Inshore commercial catch and escapement of sockeye salmon in the Naknek-Kvichak District in numbers of fish, Bristol Bay, 2001–2021.

		Escapement				
Year	Catch	Kvichak [a]	Alagnak	Naknek [a]	Total	Total run
2001	5,281,837	1,095,348	267,000 [b]	1,830,360	3,192,708	8,473,246
2002	1,419,630	703,884	335,661 [b]	1,263,918	2,303,463	3,722,401
2003	3,350,656	1,686,804	3,676,146 [a]	1,831,170	7,194,120	10,542,573
2004	4,716,715	5,500,134	5,396,592 [a]	1,939,374	12,836,100	17,551,170
2005	6,730,812	2,320,422	4,219,026 [a]	2,744,622	9,284,070	15,990,456
2006	7,151,741	3,068,226	1,773,966 [a]	1,953,228	6,795,420	13,949,170
2007	9,027,161	2,810,208	2,466,414 [a]	2,945,304	8,221,926	17,244,437
2008	10,385,172	2,757,912	2,180,502 [a]	2,472,690	7,411,104	17,792,948
2009	8,517,450	2,266,140	970,818 [a]	1,169,466	4,406,424	12,925,769
2010	10,861,016	4,207,410	1,187,730 [a]	1,463,928	6,859,068	17,720,084
2011	9,019,372	2,264,352	883,794 [a]	1,177,074	4,325,220	13,344,592
2012	10,152,917	4,164,444	861,747 [b]	900,312	5,926,503	16,079,420
2013	4,853,030	2,088,576	1,095,950 [b]	938,160	4,122,686	8,975,716
2014	13,791,053	4,458,540	200,500 [b]	1,474,428	6,133,468	19,924,521
2015	16,531,193	7,349,712	5,770,650 [b]	1,920,954	15,041,316	31,572,509
2016	13,466,245	4,462,728	1,775,820 [b]	1,691,910	7,930,458	21,396,703
2017	8,256,304	3,163,404	2,047,894 [a]	1,899,426	7,110,724	15,367,028
2018	8,917,710	4,398,708	1,581,426 [a]	2,221,152	8,201,286	17,118,996
2019	11,527,837	2,371,242	820,458 [a]	2,911,470	6,103,170	17,631,007
2020	14,311,035	4,030,968	2,386,518 [a]	4,112,160	10,529,646	24,840,861
2021	9,253,721	4,703,520	3,236,904	2,796,534	10,736,958	19,990,679
20-Year Avg.	8,913,444	3,258,458	1,994,931	1,943,055	7,196,444	16,108,180
2001–2010 Avg.	6,744,219	2,641,649	2,247,386	1,961,406	6,850,440	13,591,225
2011–2020 Avg.	11,082,670	3,875,267	1,742,476	1,924,705	7,542,448	18,625,135

[a] Tower counts.

[b] Aerial surveys estimates expanded by a factor of 2.55 (Clark 2005).

Appendix A13.–Inshore commercial catch and escapement of sockeye salmon in the Egegik District, by river system, in numbers of fish, Bristol Bay, 2001–2021.

		Escapement			
Year	Catch	Egegik[a]	Shosky Creek[b]	King Salmon River[b]	Total run
2001	2,836,555	968,862	10	–	3,805,427
2002	4,525,293	1,036,092	–	–	5,561,385
2003	2,253,721	1,152,030	–	90	3,405,841
2004	9,881,907	1,290,144	–	–	11,172,051
2005	8,015,950	1,621,584	0	–	9,637,534
2006	7,388,027	1,465,128	0	–	8,853,155
2007	6,474,027	1,432,500	0	1,500	7,908,027
2008	7,379,871	1,259,568	0	250	8,639,689
2009	11,527,282	1,146,276	0	4	12,673,562
2010	5,059,029	926,904	–	150	5,986,083
2011	4,806,939	961,200	–	–	5,768,139
2012	5,057,490	1,233,900	–	300	6,291,690
2013	4,779,133	1,113,630	–[c]	–[c]	5,892,763
2014	6,928,655	1,382,466	–[c]	–[c]	8,311,121
2015	8,325,956	2,160,792	–[c]	–[c]	10,486,748
2016	8,739,699	1,837,260	–[c]	–[c]	10,576,959
2017	11,980,502	2,600,982	–[c]	–[c]	14,581,484
2018	5,149,621	1,608,354	–[c]	–[c]	6,757,975
2019	14,683,614	2,340,210	–[c]	–[c]	17,023,824
2020	13,364,669	2,389,728	–[c]	–[c]	15,754,397
2021	8,552,456	1,832,196	–[c]	–[c]	10,384,652
20-Year Avg.	7,457,897	1,496,381	–	–	8,954,393
2001–2010 Avg.	6,534,166	1,229,909	–	–	7,764,275
2011–2020 Avg.	8,381,628	1,762,852	–	–	10,144,510

Note: Cells with an en dash (–) indicate no data.

[a] Tower counts.

[b] Aerial survey.

[c] No survey conducted.

Appendix A14.–Inshore commercial catch and escapement of sockeye salmon in the Ugashik District, by river system, in numbers of fish, Bristol Bay, 2001–2021.

		Escapement			
Year	Catch	Ugashik[a] River	King Salmon[b] River	Dog Salmon[b] River	Total run
2001	474,759	833,628	22,940	9,800	1,341,127
2002	1,570,418	892,104	11,460	2,020	2,476,002
2003	1,731,657	758,532	27,620	4,000	2,521,809
2004	3,077,745	776,364	22,850	15,890	3,892,849
2005	2,216,906	779,172	–[c]	20,440	3,016,518
2006	2,428,334	978,718	–[c]	24,440	3,431,492
2007	4,996,077	2,523,686	5,420	70,020	7,595,203
2008	2,319,790	588,632	–[c]	7,700	2,916,122
2009	2,555,268	1,346,630	–[c]	17,920	3,919,818
2010	4,031,625	805,686	–[c]	25,200	4,862,511
2011	2,641,882	1,003,753	–[c]	26,100	3,671,735
2012	2,415,580	670,578	8	24,432	3,110,598
2013	2,168,216	898,110	–[c]	–[c]	3,066,326
2014	1,507,440	640,158	–[c]	–[c]	2,147,598
2015	5,473,800	1,564,638	–[c]	–[c]	7,038,438
2016	6,630,231	1,635,270	–[c]	–[c]	8,265,501
2017	5,705,712	1,186,446	–[c]	–[c]	6,892,158
2018	2,771,945	1,167,792	–[c]	–[c]	3,939,737
2019	1,037,030	1,547,748	–[c]	–[c]	2,584,778
2020	2,598,269	1,745,940	–[c]	–[c]	4,344,209
2021	5,205,169	2,859,930	–[c]	–[c]	8,065,099
20-Year Avg.	2,917,634	1,117,179	15,050	20,664	4,051,726
2001–2010 Avg.	2,540,258	1,028,315	18,058	19,743	3,597,345
2011–2020 Avg.	3,295,011	1,206,043	8	25,266	4,506,108

Note: Cells with an en dash (–) indicate no data.

[a] Tower counts plus fish observed during post season surveys.

[b] Aerial surveys.

[c] Not surveyed.

Appendix A15.–Inshore commercial catch and escapement of sockeye salmon in the Nushagak District by river system, in numbers of fish, Bristol Bay, 2001–2021.

		Escapement				
Year	Catch	Wood[a]	Igushik[a]	Nushagak[b,c]	Total	Total run
2001	4,735,718	1,458,732	409,596	897,112	2,765,440	7,501,158
2002	2,839,918	1,283,682	123,156	349,155	1,755,993	4,595,911
2003	6,667,538	1,459,782	194,088	642,093	2,295,963	8,963,501
2004	6,104,492	1,543,342	109,650	543,872	2,196,864	8,301,356
2005	7,096,296	1,496,550	365,709	1,106,703	2,968,962	10,065,258
2006	10,876,552	4,008,102	305,268	548,410	4,861,780	15,738,332
2007	8,404,532	1,528,086	415,452	518,041	2,461,579	10,866,111
2008	6,903,367	1,724,676	1,054,704	492,546	3,271,926	10,175,293
2009	7,731,518	1,319,232	514,188	484,149	2,317,569	10,049,087
2010	8,424,702	1,804,344	518,040	468,696	2,818,215	11,242,917[d]
2011	4,887,305	1,098,006	421,380	428,191	1,968,744	6,856,049[d]
2012	2,663,014	764,202	193,770	432,438	1,392,410	4,055,424[d]
2013	3,163,805	1,183,348	387,744	894,172	2,466,552	5,630,357[d]
2014	6,447,650	2,764,614	340,590	618,477	3,723,681	10,171,331
2015	5,593,702	1,941,474	651,172	796,648	3,389,294	8,982,996
2016	8,886,077	1,309,707	469,230	680,513	2,459,450	11,345,527
2017	12,322,519	4,274,224	578,700	2,852,306	7,705,230	20,027,749
2018	24,230,150	7,507,254	770,772	1,247,460	9,525,486	33,755,636
2019	14,755,905	2,073,276	256,074	709,349	3,038,699	17,794,604
2020	8,860,302	2,243,886	323,814	1,228,059	3,795,759	12,656,061
2021	18,283,479	4,410,156	878,952	4,697,299	9,986,407	28,269,886
20-year Avg.	8,079,753	2,139,326	420,155	796,920	3,358,980	11,438,733
2001–2010 Avg.	6,978,463	1,762,653	400,985	605,078	2,771,429	9,749,892
2011–2020 Avg.	9,181,043	2,515,999	439,325	988,761	3,946,531	13,127,573

[a] Tower counts.

[b] Total escapements determined for the entire drainage using Nushagak River sonar (at Portage Creek) estimate.

[c] Nushagak River sonar escapement estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology in 2006 (Buck et al. 2012).

[d] Includes Snake River escapement.

Appendix A16.–Inshore commercial catch and escapement of sockeye salmon in the Togiak District by river system, in numbers of fish, Bristol Bay, 2001–2021.

Year	Catch[a]	Escapement[b]	Total run
2001[c]	810,097	296,676	1,106,773
2002	233,743	162,402	396,145
2003[c]	706,008	232,302	938,310
2004[c]	437,234	129,462	566,696
2005[c]	465,094	149,178	614,272
2006	626,442	312,126	938,568
2007	816,581	269,646	1,086,227
2008	651,315	205,680	856,995
2009	559,459	313,946	873,405
2010	667,885	190,970	858,855
2011	744,634	188,298	932,932
2012	622,820	203,148	825,968
2013	467,329	128,118	595,447
2014	443,258	151,934	595,192
2015	371,903	218,700	590,603
2016	645,797	200,046	845,843
2017	516,488	195,330	711,818
2018	867,770	511,770	1,379,540
2019	1,018,644	351,846	1,370,490
2020	445,572	261,126	706,698
2021	676,163	280,836	956,999
20-Year Avg.	605,904	233,635	839,539
2001–2010 Avg.	597,386	226,239	823,625
2011–2020 Avg.	614,422	241,032	855,453

[a] Catches in all sections were combined.

[b] Tower count.

[c] Aerial survey estimate included into escapement count.

Appendix A17.–Chinook salmon harvest, escapement, and total runs in the Nushagak District, in numbers of fish, Bristol Bay, 2001–2021.

	Harvests by fishery				Inriver	Spawning	Total
Year	Commercial[a]	Sport	Subsistence[b]	Total	abundance[c]	escapement[d]	run
2001	11,746	5,899	11,344	28,989	191,988	184,317	213,306
2002	40,039	3,693	11,049	54,781	181,307	174,704	229,485
2003	43,485	5,955	17,847	67,287	166,507	158,307	225,594
2004	100,846	6,906	15,066	122,818	242,183	233,422	356,240
2005	62,764	8,565	12,422	83,751	234,123	223,950	307,701
2006	84,881	7,473	9,143	101,497	124,683	117,364	218,861
2007	51,831	9,669	12,975	74,475	60,459	50,960	125,435
2008	18,968	6,700	11,720	37,388	97,330	91,364	128,752
2009	24,693	6,354	12,108	43,155	81,480	74,781	117,936
2010	26,056	3,907	8,190	38,153	60,185[e]	56,092	94,245
2011	26,927	4,844	11,466	43,237	108,278[e]	101,995	145,232
2012	11,952	5,931	9,634	27,517	174,085[e]	167,589	195,106
2013	10,213	6,685	11,090	27,988	113,709	104,794	132,782
2014	11,868	6,260	15,832	33,960	70,460	62,679	96,639
2015	50,675	7,234	11,714	69,623	98,019	91,090	160,713
2016	24,937	8,411	16,115	49,463	125,368	118,077	167,540
2017	33,376	5,671	10,739	49,786	56,961	52,297	102,083
2018	36,626	8,192	11,835	56,653	97,239	91,354	148,007
2019	22,725	6,306	10,129	39,160	46,763	41,258	80,418
2020	7,452	1,950	8,253	17,655	43,032	40,313	57,968
2021	4,820	6,106[f]	11,414[f]	22,340	55,222	50,009	72,349
20-Year Avg.	35,103	6,330	11,934	53,367	118,708	111,835	165,202
2001–2010 Avg.	46,531	6,512	12,186	65,229	144,025	136,526	201,756
2011–2020 Avg.	23,675	6,148	11,681	41,504	93,391	87,145	128,649

Note: 2021 Total run and spawning escapement are preliminary estimates, based on 5-year average harvests.

[a] Commercial harvest includes personal use reported from commercial harvest.

[b] Subsistence harvest is intended to represent Nushagak River bound king salmon. It excludes upper Wood River and Igushik harvest.

[c] Inriver abundance estimated by sonar below the village of Portage Creek. Estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology that occurred in 2006 (Buck et al 2012).

[d] Spawning escapement estimated from the following: 1997 from comprehensive aerial surveys. 1992–1996 and 1998–2021 from inriver abundance estimated by sonar minus inriver sport and subsistence harvests above the sonar.

[e] Revised passage estimates for 2010, 2011, and 2012 are 60,185, 108,278, and 174,085, respectively.

[f] Data not available at the time of publication. Five-year average used.

Appendix A18.–Chinook salmon harvest, escapement, and total runs in the Togiak River drainage, in numbers of fish, Togiak District, Bristol Bay, 2001–2021.

	Harvests by fishery				Spawning	Total
Year	Commercial	Sport[a]	Subsistence	Total	escapement[b]	run
2001	9,518	1,006	1,612	12,136	13,110	25,246
2002	2,682	76	703	3,461	9,515	12,976
2003	3,078	706	1,208	4,992	3,050[c]	–[d]
2004	7,673	1,388	1,094	10,155	12,324	22,479
2005	10,125	1,734	1,528	13,387	10,200	23,587
2006	15,078	1,064	1,630	17,772	–[e]	–[d]
2007	7,142	1,501	1,234	9,877	0[c]	–[d]
2008	2,891	592	1,337	4,820	2,140[c]	–[d]
2009	4,429	606	827	5,862	–[e]	–[d]
2010	5,160	591	1,162	6,913	10,096[f]	17,009
2011	5,780	871	966	7,617	2,140	9,757
2012	4,357	859	933	6,149	1,503	7,652
2013	2,458	900	691	4,049	–[e]	–[d]
2014	1,477	2,166	607	4,250	3,994	8,244
2015	2,448	983	876	4,307	2,922	7,229
2016	3,831	787	1,140	5,758	–[e]	–[d]
2017	3,413	978	949	5,340	–[e]	–[d]
2018	3,457	641	481	4,579	–[e]	–[d]
2019	3,568	1,617	599	5,784	–[e]	–[d]
2020	3,378	425	672	4,475	–[e]	–[d]
2021	729	890[g]	768[g]	2,387	–[e]	–[d]
20-Year Avg.	5,097	975	1,012	7,084	5,916	14,909
2001–2010 Avg.	6,778	926	1,234	8,938	7,554	20,259
2011–2020 Avg.	3,417	1,023	791	5,231	2,640	8,221

Note: Cells with an en dash (–) indicate no data.

[a] Sport fish harvest estimate only includes the Togiak River Section.

[b] Spawning escapement estimated from comprehensive aerial surveys.

[c] Partial survey.

[d] Total run size cannot be determined in the absence of complete escapement data.

[e] No survey conducted.

[f] USFWS radio telemetry-derived escapement estimate.

[g] Data not available at the time of publication. Five-year average used.

Appendix A19–Inshore commercial catch and escapement of chum salmon in the Nushagak and Togiak Districts, in numbers of fish, 2001–2021.

	Nushagak District			Togiak District		
Year	Catch	Escapement[a]	Total run	Catch	Escapement[b]	Total run
2001	526,739	716,850	1,243,589	211,701	252,610	464,311
2002	276,787	533,095	809,882	112,987	154,360	267,347
2003	740,372	374,992	1,115,364	68,154	39,090[c]	–[d]
2004	458,916	360,265	819,181	94,025	103,810	197,835
2005	966,069	519,618	1,485,687	124,695	108,346	233,041
2006	1,240,235	661,003	1,901,238	223,364	26,900[c]	–[d]
2007	953,292	161,483	1,114,775	202,486	–[e]	–[d]
2008	492,341	326,300	818,641	301,967	279,580[c]	–[d]
2009	745,161	438,481	1,183,642	141,375	–[e]	–[d]
2010	424,234	273,914	698,148	118,767	–[e]	–[d]
2011	296,909	248,278	545,187	113,234	–[e]	–[d]
2012	272,163	364,499	636,662	206,614	–[e]	–[d]
2013	340,881	623,326	628,134	208,786	–[e]	–[d]
2014	242,261	552,797	795,058	100,195	–[e]	–[d]
2015	502,981	288,929	791,910	103,773	–[e]	–[d]
2016	397,761	419,810	817,571	187,508	–[e]	–[d]
2017	804,878	415,488	1,220,366	204,518	–[e]	–[d]
2018	1,020,227	811,283	1,831,510	158,329	–[e]	–[d]
2019	855,428	651,164	1,506,592	227,731	–[e]	–[d]
2020	136,605	112,731	249,336	53,510	–[e]	–[d]
2021	115,456	125,352	240,808	21,346	–[e]	–[d]
20-Year Avg.	584,712	442,715	1,010,624	158,186	137,814[e]	58,127
2001–2010 Avg.	682,415	436,600	1,119,015	159,952	137,814	116,253
2011–2020 Avg.	487,009	448,831	902,233	156,420	–[e]	0

Note: Cells with an en dash (**–**) indicate no data.

[a] Escapement based on estimates from the Nushagak River sonar project at Portage Creek. Estimates prior to 2006 were adjusted after the 2012 season to account for a transition in sonar technology in 2006 (Buck et al. 2012).

[b] Escapement estimates based on aerial surveys. Estimate includes Togiak, Kulukak, Matogak, Osviak, Slug, Quigmy, Negukthlik, and Ungalikthluk Rivers except where noted.

[c] Partial survey count.

[d] Total run size cannot be determined in the absence of complete escapement data.

[e] Chum salmon spawning escapement survey did not occur.

Appendix A20.–Average round weight (lb) of the commercial salmon catch by species, Bristol Bay, 2001–2021.

Year	Sockeye	Chinook	Chum	Pink	Coho
2001	6.7	17.4	8.2	2.8	7.1
2002	6.1	18.2	7.1	3.8	6.8
2003	6.3	16.0	6.5	4.0	6.9
2004	5.8	15.4	6.6	4.1	6.8
2005	6.3	16.6	7.1	3.5	6.3
2006	5.7	17.0	7.7	3.7	6.4
2007	5.8	13.5	6.1	3.5	6.4
2008	5.8	15.5	6.5	3.6	6.5
2009	5.9	15.2	6.3	3.3	6.5
2010	5.5	14.7	6.4	3.2	8.9
2011	6.2	13.0	7.0	3.2	6.8
2012	5.7	13.9	6.7	3.1	5.4
2013	6.0	15.3	6.4	3.9	6.0
2014	5.6	15.4	6.1	3.7	6.4
2015	5.2	15.1	6.1	3.7	6.7
2016	5.4	12.6	6.0	4.0	5.8
2017	5.5	11.2	6.4	3.9	6.3
2018	5.1	10.5	6.3	3.6	6.5
2019	5.1	11.6	6.2	3.2	6.0
2020	5.1	9.6	6.0	3.3	5.5
2021	4.7	9.4	5.3	3.3	6.2
20-Year Avg.	5.7	14.4	6.6	3.6	6.5
2001–2010 Avg.	6.0	16.0	6.8	3.5	6.9
2011–2020 Avg.	5.5	12.8	6.3	3.6	6.1

Appendix A21.–Average price paid in dollars per pound for salmon, by species, Bristol Bay, 2001–2021.

Year	Sockeye	Chinook	Chum	Pink	Coho
2001	0.42	0.31	0.11	0.09	0.33
2002	0.49	0.33	0.09	0.06	0.32
2003	0.51	0.32	0.08	0.07	0.27
2004	0.51	0.37	0.09	0.09	0.31
2005	0.62	0.58	0.11	0.02	0.29
2006	0.66	0.71	0.12	0.03	0.38
2007	0.67	0.64	0.13	0.03	0.41
2008	0.75	0.83	0.17	0.17	0.55
2009	0.80	0.89	0.17	0.07	0.56
2010	1.07	1.18	0.28	0.36	0.66
2011	1.17	1.04	0.37	0.29	0.74
2012	1.18	1.31	0.34	0.39	0.55
2013	1.61	1.48	0.30	0.14	0.79
2014	1.35	1.32	0.41	0.24	0.84
2015	0.64	0.56	0.30	0.06	0.39
2016	0.96	0.84	0.30	0.18	0.58
2017	1.30	0.94	0.29	0.15	0.70
2018	1.60	1.02	0.37	0.27	0.68
2019	1.53	0.83	0.32	0.10	0.70
2020	1.09	0.92	0.30	0.09	0.80
2021[a]	1.31	1.03	0.35	0.07	0.60
20-Year Avg.	0.95	0.82	0.23	0.15	0.54
2001–2010 Avg.	0.65	0.62	0.14	0.10	0.41
2011–2020 Avg.	1.24	1.03	0.33	0.19	0.68

Source: OCEANAK ADF&G Commercial Operators Annual Report (COAR) Buy Subject Area. ADF&G is not responsible for errors or deficiencies in reproduction, subsequent analysis, or interpretation.

Note: The exvessel value includes any postseason adjustments or bonuses paid after the fish was purchased. Prices represent a weighted average price per pound by species and area. Prices may reflect a mixture of gear types and delivery conditions.

[a] Price does not include postseason adjustments or bonuses.

Appendix A22.–Estimated exvessel value of the commercial salmon catch by species, in thousands of dollars, Bristol Bay, 2001–2021.

Year	Sockeye	Chinook	Chum	Pink[a]	Coho	Total[b]
2001	38,211	135	712	0	43	39,101
2002	31,962	277	287	0	18	32,544
2003	46,897	236	423	1	238	47,795
2004	76,175	634	423	171	150	77,553
2005	96,044	720	946	0	168	97,878
2006	110,372	1,240	1,441	19	191	113,263
2007	119,196	542	1,583	0	120	121,441
2008	118,028	297	1,344	170	401	120,240
2009	142,457	387	1,347	0	177	144,368
2010	176,784	495	1,743	1,567	470	181,059
2011	154,851	455	1,542	1	62	137,726
2012	139,675	338	1,475	860	345	142,693
2013	148,681	366	2,049	0	654	151,750
2014	217,311	311	1,214	1,209	1,990	222,035
2015	123,547	347	1,758	0	92	125,744
2016	192,349	361	1,688	547	312	195,257
2017	271,549	431	2,594	18	1,071	275,663
2018	345,093	477	2,891	238	720	349,419
2019	337,838	449	2,549	2	290	341,128
2020	223,287	87	511	21	437	224,343
2021[c]	248,343	66	430	2	247	249,088
20 Year Avg.	155,515	429	1,426	480	397	157,050
2001–10 Avg.	95,613	496	1,025	385	198	97,524
2011–20 Avg.	215,418	362	1,827	575	597	216,576

Source: OCEANAK ADF&G Commercial Operators Annual Report (COAR) Buy Subject Area. ADF&G is not responsible for errors or deficiencies in reproduction, subsequent analysis, or interpretation.

Note: The exvessel value includes any postseason adjustments or bonuses paid after the fish was purchased. Prices represent a weighted average price per pound by species and area. Prices may reflect a mixture of gear types and delivery conditions. Exvessel values not adjusted for inflation.

[a] Averages include even-years only.

[b] Total may vary from actual sum due to rounding.

[c] Preliminary exvessel value does not include post-season adjustments or bonuses. Derived from preliminary season summary price per pound times commercial catch.

APPENDIX B: HERRING

Appendix B1.–Sac roe herring industry participation, fishing effort and harvest, Togiak District, 2001–2021.

		Daily		Gillnet				Purse seine				
Year	Number of buyers	processing capacity[a]	Fishery dates	Effort[b]	Duration (hours)	Harvest[c]	Roe %	Effort[b]	Duration (hours)	Harvest[c]	Roe %	Total harvest[c]
2001	11	2,255	5/6–5/13	96	84	6,491	10.6	64	26.0	15,879	9.2	22,370
2002	8	1,920	5/3–5/13	82	102	5,216	10.9	37	57.5	11,833	9.3	17,049
2003	7	1,920	4/25–5/7	75	142	6,505	10.9	35	110.2	15,158	8.9	21,663
2004	6	2,150	4/29–5/9	54	162	4,980	10.4	31	78.0	13,888	9.5	18,868
2005	8	2,330	4/30–5/8	56	149	5,841	11.2	33	83.0	15,071	9.6	20,912
2006	7	2,060	5/12–5/21	49	144	7,132	10.8	28	113.0	16,821	9.2	23,953
2007	5	1,420	5/10–5/25	25	366	4,012	11.2	21	244.0	13,120	10.0	17,132
2008	7	1,950	5/16–5/31	27	312	4,832	11.4	28	292.0	15,691	8.4	20,523
2009	6	2,015	5/16–5/31	32	314	4,140	10.2	21	266.0	12,967	10.3	17,107
2010	6	2,690	5/11–5/27	35	338	7,540	10.1	26	266.0	18,816	9.7	26,356
2011	5	2,413	5/8–5/31	25	318	5,907	12.1	22	268.0	16,970	9.6	22,877
2012	4	1,970	5/14–6/1	18	534	4,027	12.1	16	328.0	12,994	9.4	17,021
2013	6	2,675	5/11–5/28	37	408	8,244	10.9	26	224.0	19,366	9.0	27,610
2014	6	3,065	4/27–5/13	24	412	6,016	11.9	17	412.0	19,544	9.7	25,560
2015	4	1,880	4/27–5/11	6	328	1,156	11.1	16	328.0	20,240	11.3	21,396
2016	4	2,530	4/17–5/2	3	366	80	12.2	17	306.0	14,799	12.3	14,879
2017	4	1,950	4/28–5/12	15	342	1,342	12.0	19	195.0	15,787	11.4	17,129
2018	4	1,950	4/22–5/14	1	378	–[d]	–[d]	20	254.0	15,856	10.0	15,856
2019	4	2,100	4/16–5/03	3	376	–[d]	–[d]	19	234.0	22,542	11.8	22,542
2020	1	–[d]	5/3–5/15	1	297	–[d]	–[d]	2	297.0	–[d]	–[d]	–[d]
2021	2	–[d]	5/3–5/15	3	204	–[d]	–[d]	10	262.0	–[d]	–[d]	–[d]
20-year Avg.	6	2,171	–	33	294	4,909	11	25	219	16,176	10	20,569
2001–2010 Avg.	7	2,071	–	53	211	5,669	11	32	154	14,924	9	20,593
2011–2020 Avg.	4	2,281	–	13	376	3,825	12	17	285	17,566	11	20,541

Note: Cells with an en dash (–) indicate no data.

[a] The number of short tons per day based on companies registered.

[b] Total vessels fished.

[c] Harvest in short tons and includes deadloss and test fish harvest.

[d] Less than 3 permit holders or companies operated, harvest confidential.

Appendix B2.–Exploitation of Togiak herring stock (in short tons), 2001–2021.

Year	Biomass estimate[a] (short tons)	Dutch Harbor food/bait	Sac roe				Total harvest	Exploitation rate (%)
			Gillnet[b]	Purse seine[c]	Waste[d]	Total[e]		
2001	119,818	1,439	6,491	15,660	219	22,151	23,590	19.7
2002	120,196	2,846	5,216	11,793	40	17,009	20,115	16.7
2003	126,213	1,487	6,505	14,778	380	21,283	22,825	18.1
2004	143,124	1,258	4,980	13,785	103	18,765	20,023	14.0
2005	108,585	1,154	5,841	14,287	784	20,128	21,282	19.6
2006	129,976	953	7,132	16,321	500	23,453	24,406	18.8
2007	134,566	1,214	4,012	12,800	320	16,812	18,026	13.4
2008	136,495	1,536	4,832	15,691	–	20,523	22,059	16.2
2009	121,800	1,941	4,140	12,967	–	17,107	19,048	15.6
2010	146,775	1,938	7,540	18,816	–	26,356	28,294	19.3
2011	140,860	1,795	5,907	16,970	–	22,877	24,672	17.5
2012	123,745	1,807	4,027	12,994	–	17,021	18,828	15.2
2013	169,020	1,764	8,243	19,366	1,593	27,609	29,373	17.4
2014	157,448	1,645	6,016	19,544	54	25,560	27,205	17.3
2015	163,480	1,972	1,156	20,240	500	21,396	23,368	14.3
2016	162,244	208	80	14,799	–	14,879	15,087	9.3
2017	130,852	1,270	1,342	15,787	466	17,129	18,399	14.1
2018	136,756	1,188	–[f]	15,856	–	15,856	17,044	12.5
2019	217,548	1,805	–[f]	22,542	1,000	23,542	25,347	11.7
2020	215,826	447	–[f]	–[f]	–	–	–	–
2021	236,742	–[f]	–[f]	–[f]	–	–	12,068	5.1
20-year Avg.	145,266	1,483	4,909	16,052	497	20,498	22,052	15.2
2001–2010 Avg.	128,755	1,577	5,669	14,690	335	20,359	21,967	17.1
2011–2020 Avg.	161,778	1,390	3,824	17,566	723	20,652	22,147	13.7

Note: Cells with an en dash (–) indicate no data.

[a] Preseason forecast unless peak biomass estimate inseason exceeded preseason forecast.

[b] Includes bait harvest.

[c] Includes test fish harvest.

[d] Aerial survey estimated waste.

[e] Does not include waste.

[f] Less than 3 permit holders or companies operated, harvest confidential.

Appendix B3.–Age composition by weight of total inshore herring run, Togiak District, 2001–2021.

	Age composition (%)						Spawning biomass[a]
Year	≤4	5	6	7	8	≥9	(short tons)
2000	[b]	1	2	17	16	63	93,214
2001	5	21	5	4	27	39	115,155
2002	1	25	28	4	5	36	61,377
2003	–[b]	3	37	25	4	31	47,074
2004	–[b]	–[b]	3.8	43.7	24.6	27.5	53,625
2005	–[b]	–[b]	0.8	11	41.4	46.4	163,737
2006	1.8	5.4	2.8	5.4	25.9	58.7	179,580
2007	0.7	7.3	15.5	5.5	9.4	61.7	143,827
2008	6.2	9	14.6	15.5	8.1	46.5	136,839
2009	9.4	14.7	14.5	14.9	12.2	34	142,154
2010	1.4	16.1	18.1	13.2	13.2	38.3	146,913
2011	[b]	4	25.3	21.7	15.7	33.3	62,333
2012	0.5	6.6	16.9	35.8	17.6	22.7	167,738
2013	0.1	2	9.6	24.7	28.8	34.8	169,020
2014	0.7	4.3	9.6	23.5	27.6	34.3	203,267
2015	1.0	4.0	12.8	11.4	24.7	46.1	228,807
2016[c]	–	–	–	–	–	–	136,993
2017	3.4	1.6	5.4	13.0	19.0	56.7	90,269
2018	10.3	15.3	7.5	12.7	16.8	37.4	16,001
2019	1.8	22.4	25.3	14.1	12.3	24.0	177,980
2020	12.7	14.4	22.4	20.3	11.0	19.2	177,337
2021	43.1	30.8	17.0	6.7	1.9	0.5	232,181

Note: Cells with an en dash (–) indicate no data.

[a] Includes commercial catch, escapement, and documented waste. Age contribution of the commercial purse seine harvest (by weight) was used to represent the total run. Dataset reviewed, fall 2017.

[b] Contribution of age class is less than 0.5%.

[c] Not available. The commercial harvest was not sampled.

Appendix B4.–Aerial survey estimates of herring biomass (in short tons) and spawn deposition (in miles), Togiak District, 2001–2021.

Year	Preseason forecast[a]	Biomass estimate	Spawn estimate
2001	119,818	115,155	57
2002	120,196	61,377	32
2003	126,213	47,074	95
2004	143,124	53,625	36
2005	96,029	163,737	28
2006	129,976	179,580	18
2007	134,566	143,827	19
2008	134,516	136,839	49
2009	121,800	142,154	15
2010	146,775	146,913	8
2011	140,860	62,333	36
2012	123,745	167,738	31
2013	169,094	169,020	47
2014	157,448	203,267	92
2015	163,480	228,807	63
2016	164,247	136,993	43
2017	130,852	90,269	–
2018	136,756	16,001	–
2019	217,548	177,980	71
2020	215,826	177,337	30
2021	236,742	232,181	59
2001–2020 Avg.	144,643	131,001	43
2011–2020 Avg.	161,986	142,974	52

Note: Cells with an en dash (–) indicate no data.

[a] Forecasts based on age structured analysis.

Appendix B5.–Exvessel value of the commercial herring and spawn-on-kelp harvest, in thousands of dollars, Togiak District, 2001–2021.

Year	Herring sac roe	Total
2001	3,283	3,090
2002	2,264	1,900
2003	2,664	2,914
2004	2,077	2,659
2005	3,308	3,308
2006	3,168	3,168
2007	2,254	2,254
2008	2,748	2,748
2009	2,803	2,803
2010	3,481	3,481
2011	2,555	2,555
2012	3,698	3,698
2013	4,204	4,204
2014	1,394	1,394
2015	1,031	1,031
2016	1,521	1,521
2017	1,907	1,907
2018	1,629	1,629
2019	1,706	1,706
2020	–[a]	–[a]
2021	–[a]	–[a]
20-year Avg.	2,510	2,525
2001–2010 Avg.	2,805	2,833
2011–2020 Avg.	2,183	2,183

Note: Exvessel value (value paid to the fishery participants) is derived by multiplying price/ton by the commercial harvest. These estimates do not include any postseason adjustments to fishery participants from processors and should therefore be treated as minimum estimates.

[a] Less than 3 permit holders or companies operated, harvest confidential. Cells with an en dash (–) indicate no data.

Appendix B6.–Guideline and actual harvests of sac roe herring (short tons) and spawn-on-kelp (lb), Togiak District, 2001–2021.

	Gillnet sac roe			Purse seine sac roe		
Year	Guideline[a]	Actual	% Difference[b]	Guideline[a]	Actual[c]	% Difference[b]
2001	6,268	6,491	4	14,624	15,879	9
2002	6,288	5,216	-17	14,673	11,833	-19
2003	6,624	6,505	-2	15,457	15,158	-2
2004	7,568	4,980	-34	17,658	13,888	-21
2005	5,667	5,841	3	13,224	15,071	14
2006	7,059	7,132	1	16,471	16,821	2
2007	7,090	4,012	-43	16,544	13,120	-21
2008	6,864	4,832	-30	16,017	15,602	-3
2009	6,378	4,167	-35	14,882	12,404	-17
2010	7,772	7,540	-3	18,134	18,816	4
2011	7,442	5,907	-21	17,364	16,970	-2
2012	6,487	4,027	-38	15,135	12,994	-14
2013	9,017	8,244	-9	21,040	19,366	-9
2014	8,367	6,468	-23	19,523	19,544	0
2015	8,704	1,220	-86	20,309	20,374	0
2016	8,635	80	-99	20,148	14,799	-27
2017	6,883	1,342	-81	16,060	15,787	-2
2018	7,212	–[d]	–	16,829	15,856	-6
2019	5,386	–[d]	–	24,800	23,542	-5
2020	7,750	–[d]	–	30,999	–[d]	–
2021	8,528	–[d]	–	34,111	–[d]	–
20-year Avg.	7,173	4,941	-29	17,995	16,201	-7
2001–2010 Avg.	6,665	5,653	-15	15,900	14,868	-6
2011–2020 Avg.	7,588	3,898	-51	20,221	17,692	-7

Note: Cells with an en dash (–) indicate no data.

[a] Harvest guideline derived from preseason forecast or inseason biomass estimate when larger.

[b] (Actual – guideline)/ guideline * 100.

[c] Includes deadloss and test fish harvest.

[d] Less than 3 permit holders or companies operated, harvest confidential.