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An Overview of the Subsistence Fisheries of the Bristol Bay Management Area, Alaska

by

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and

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November 2022

Alaska Department of Fish and Game **Division of Subsistence**

Symbols and Abbreviations

The following symbols and abbreviations, and others approved for the Système International d'Unités (SI), are used without definition in the reports by the Division of Subsistence. 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) (Jan,...,Dec)	first three letters
registered trademark	®
trademark	™
United States (adjective)	U.S.
United States of America (noun)	USA
U.S.C.	United States Code
U.S. state	two-letter abbreviations (e.g., AK, WA)

Measures (fisheries)

fork length	FL
mideye-to-fork	MEF
mideye-to-tail-fork	METF
standard length	SL
total length	TL

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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AN OVERVIEW OF THE SUBSISTENCE FISHERIES OF THE BRISTOL BAY AREA

by

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EXECUTIVE SUMMARY

- Bristol Bay subsistence fisheries are an essential component of the local economy and way of life of Bristol Bay communities. About 58% of the subsistence harvest by local community residents, as measured in pounds usable weight, is Pacific salmon *Oncorhynchus* and about 9% is other fishes.
- The Alaska Board of Fisheries (board) has found that all species of finfishes of the Bristol Bay Area (BBA) are customarily taken or used for subsistence purposes. As established by the board, amounts reasonably necessary for subsistence uses (ANS) include 157,000–172,171 salmon (including 55,000–65,000 Kvichak River drainage sockeye salmon *O. nerka*) and 250,000 pounds usable weight of other finfishes.
- The number of Bristol Bay subsistence salmon permits issued has been stable since 1990. The previous 5-year average (2016–2020) is 1,099 permits.
- Most subsistence permit holders are residents of Bristol Bay communities: for the previous 10-year (2011–2020) period 79% of permit holders were Bristol Bay residents.
- From 2011–2020, of the five Bristol Bay districts, the Naknek-Kvichak District accounted for the largest portion of the subsistence harvest at 51% (59,300 estimated salmon); the Nushagak District ranked second at 43% (50,119), followed by Togiak at 4% (5,158), Egegik at 1% (1,462) and Ugashik at 1% (986).
- Most subsistence permits are issued for the Nushagak and Naknek-Kvichak districts.
- Sockeye salmon make up the largest portion of the Bristol Bay subsistence salmon harvest. As reported on subsistence permits: sockeye compose 78% of the historical average (1985–2021), followed by king *O. tshawytscha* (10%), coho *O. kisutch* (6%), chum *O. keta* (4%), and pink salmon *O. gorbuscha* (2%).
- Annual subsistence salmon harvests in the Bristol Bay Area (BBA) declined from the early 1990s to the early 2000s. Since 1985, the average annual harvest has been approximately 136,399 salmon whereas the previous 5-year average (2016–2020) was 107,077 salmon. Estimated harvests in 2019–2021 (96,876, 96,561, and 92,211 respectively), are among some of the lowest since the inception of the permit program.
- Within the BBA, the Nushagak District continues to support the largest king salmon subsistence harvest, followed by the Naknek-Kvichak District, and this is reflected in the previous 5-year average of both watersheds. Permits issued for subsistence are the highest for the Nushagak District (599 permits between 2016–2020), followed by the Naknek-Kvichak District (426 permits).
- A general decline has occurred since 1991 in the Kvichak River watershed subsistence sockeye salmon fishery, historically the largest component of the Bristol Bay subsistence salmon harvest. The long term (1985–2020) average annual harvest for this fishery is 60,046 sockeye salmon. The previous 5-year average annual harvest is 25,506 sockeye salmon. Harvests in 2019 (21,835), 2020 (21,826), and 2021 (16,160) were some of the lowest on record. Declines are due to lower harvests per permit rather than less fishing effort, since the number of permits issued has remained stable.
- Other fishes taken for subsistence purposes in the BBA include Pacific herring *Clupea pallasii*, various species of smelt; Dolly Varden *Salvelinus malma*; lake trout *S. namaycush*; rainbow trout *O. mykiss*; Arctic grayling *Thymallus arcticus*; northern pike *Esox lucius*; various species of whitefishes *Coregonus, Prosopia;* burbot *Lota lota*; and Alaska blackfish *Dallia pectoralis*. Although there are no Alaska Department of Fish and Game (department) annual subsistence harvest assessment programs for these species, harvest estimates are available through periodic

subsistence household surveys. These fishes are taken throughout the year with a variety of harvest methods and are an important part of annual subsistence uses in the general Bristol Bay area.

Key words: subsistence fishing, Kvichak River, Nushagak River, Naknek River, Egegik River, Ugashik River, Togiak River, Bristol Bay, subsistence permit, sockeye salmon, Board of Fisheries.

1. INTRODUCTION

In an area that is world-renowned for its commercial fisheries and its sport fishing opportunities, subsistence uses of wild renewable resources remain the most consistent and the most reliable component of the local economy of Bristol Bay communities (figures 1-1 and 1-2). Each year subsistence fishing, hunting, and gathering provide hundreds of pounds of highly nutritious food for residents of the area. Much of the seasonal round of activities is shaped by the natural cycles of fishes, birds, mammals, and plants. Knowledge that is fundamental to making a living in the region is preserved and communicated through gathering and processing of wild resources, including fishing and hunting activities. Values that support families and communities express, emphasize, and teach the values that support a subsistence lifestyle through the harvest, preparation, and sharing of wild foods. In the 20th century, much economic, social, cultural, and demographic change took place in Bristol Bay during the evolution of its economy, which is a mixture of cash and subsistence sectors. In the 21st century, subsistence activities and values remain a cornerstone of area residents' way of life, a link to the traditions of the past, and one of their bases for survival, sustainability, and prosperity.

This report briefly describes the subsistence fisheries of the Bristol Bay Area (BBA), with a primary focus on the fisheries for Pacific salmon *Oncorhynchus*. It is based on information gathered from the subsistence salmon permit program administered by the department's divisions of Subsistence and Commercial Fisheries and on ethnographic research conducted by the Division of Subsistence. This current 2022 report contains updated harvest and permit information, as well as historical harvest and permit number values that remain relevant for the Bristol Bay Area. The Alaska Board of Fisheries (board) last heard a report on the subsistence fisheries of Bristol Bay in 2018 at the last board meeting (Halas and Neufeld 2018). The data presented in this report for 2020 and 2021 are preliminary.

THE BRISTOL BAY REGION

Population, Communities, and Cash Economy

According to the Alaska Department of Labor and Workforce Development, the population of the general Bristol Bay area in 2021 was 6,654 in 26 communities, which also includes those remainder populations outside of established communities (Table 1-1). There are two regional centers: Dillingham (population 2,209 in 2021) and the Bristol Bay Borough, which consists of Naknek, South Naknek, and King Salmon (population 822 in 2021). The portion of the Lake and Peninsula Borough that is within the Bristol Bay Management Area had a 2021 total population of 1,114 and spread across 13 communities. According to the 5-year American Community Survey average (2015–2019), the Alaska Native population of the BBA was 4,549 people, or 67% (Table 1-1). The Dillingham Census Area has the highest Alaska Native population at 72%, followed by the Lake and Peninsula Borough at 70%. Alaska Native peoples of the area include Central Yup'ik, Dena'ina Athabascan, and Alutiiq.

Commercial fishing and services dominate the cash economy of the area, and thus the economy is highly seasonal. According to the (2015–2019) American Community Survey,[1] the 5-year estimated per capita income for the Dillingham area is $25,993, $44,168 for the Bristol Bay Borough, and $24,836 for the Lake and Peninsula Borough, which all range around the Alaska average of $36,978 (U.S. Census Bureau 2021). Studies by the Division of Subsistence have also documented a pattern of seasonal employment, reliance on commercial fishing, and relatively low cash incomes (Fall et al. 2006; Holen et al. 2011; 2012b; Krieg et al. 2009) (see also the Division of Subsistence Community Subsistence Information System.[2])

1. U.S. Census Bureau, "Explore Census Data,": https://data.census.gov/cedsci/. Accessed 7/20/2022
2. ADF&G Community Subsistence Information System: http://www.subsistence.adfg.state.ak.us/CSIS. Hereinafter cited as CSIS.

General Patterns of Subsistence Harvests

Since 1990, under state regulations, all Alaska state residents have been eligible to participate in subsistence salmon fishing in all Bristol Bay drainages. Subsistence harvests in the BBA are among the largest in the state and are very diverse. Based on the results of the most recent comparative analysis of permit returns and postseason household surveys conducted by the Division of Subsistence, the 2014 estimated annual BBA harvest of salmon was 194 usable pounds per person (Figure 1-3) (Fall 2018). The BBA has the highest percentage of the total noncommercial harvest of wild resources that is composed of salmon (58%); this is more than any other management area or the combined urban Alaska areas (nonsubsistence areas) (Figure 1-4). As shown in Figure 1-5, based on Division of Subsistence comprehensive surveys, salmon made up 58% of the estimated harvest over time from 1987-2018; land mammals (mostly moose *Alces alces* and caribou *Rangifer tarandus*) were 21%, fishes other than salmon composed 9%, and other resources, such as marine mammals, birds and eggs, marine invertebrates, and wild plants, provided 13% of the harvest.

Wild resource harvests are generally higher in the smaller communities of the BBA than in the two regional centers of Dillingham and the Bristol Bay Borough. The harvest estimate from the 1980s–2000s for the smaller communities was 426 pounds per person per year, with a household average of 1,541 pounds. The composition of subsistence harvests in the smaller communities for this same period was similar to that of the area overall at 51% salmon, 25% land mammals, 11% other fishes, and 13% other resources.

THE BRISTOL BAY AREA SUBSISTENCE SALMON FISHERIES

Regulations

The board has found that salmon of the BBA support customary and traditional (subsistence) uses (5 AAC 01.336). In 1993, the board established a range of 157,000–172,171 salmon as the amount reasonably necessary for subsistence uses (ANS). The ANS provides the board with guidelines on typical numbers of fish harvested for customary and traditional uses under normal conditions. Fishing regulations can be re-examined if harvests for customary and traditional uses consistently fall below the ANS. This may be for many reasons: fishing regulations, changes in abundance or distribution, or changes in human use patterns, just to name a few. The 2021 harvest and the previous 5-year, 10-year, and 20-year averages for the total BBA subsistence salmon harvest show that harvests were below the ANS, with high harvest years (over 157,000 fish) occurring prior to 1994 (Table 1-2). In 2001, the finding was amended to specify that, of the total ANS, 55,000–65,000 Kvichak River drainage sockeye salmon *O. nerka* (excluding Alagnak River stocks) were necessary to provide a reasonable opportunity for subsistence uses. For historical context, subsistence fishing seasons were tied to commercial opening dates when the subsistence permit system began in 1960 (5 AAC 104.90 to 5 AAC 104.93). In 1969, the first weekly fishing periods was established in the Naknek River drainage, which opened subsistence fishing for one 24-hour period and closed the remaining six days. This restriction was put in place to reduce alleged illegal fishing and resulted in most subsistence fishers choosing to retain their subsistence fish off their commercial catch[3] (Morris 1985). This regulation was repealed in 1971 (5 AAC 06.920, Register 37). In 1974 the Nushagak District restricted subsistence fishing for three 24-hour periods between June 16 through July 17 (5 AAC 06.920). No historical reference was found for the three 24-hour restrictions in the subsistence fishery for the Nushagak District, but they may be related to a similar condition as the Naknek River restriction. Anecdotal evidence suggests that waste of salmon by inexperienced subsistence fishers and an increased human population in the early 1980s and onwards for the Dillingham area prompted restrictions by day and time in the subsistence fishery.

In 2016, the board adopted Global Positioning System (GPS) coordinates for all boundaries of the Nushagak District, which clarified subsistence areas and boundaries [5 AAC 01.310(d)] (Elison et al. 2018). Starting

3. Bristol Bay Data Report No.19 Subsistence Fishing in Bristol Bay, 1963- 1969. ADF&G Division of Commercial Fisheries, Dillingham, Alaska, March 27, 1970.

in the 2017–2018 regulatory year, subsistence fishing in the Naknek, Ugashik, and Egegik districts opened 7 days per week, repealing the 24-hour subsistence openers which had previously characterized those areas [5 AAC 01.310(e), repealed 4/16/2016]. The following is a synopsis of the key provisions of state subsistence salmon fishing regulations for the BBA.

- Permits: Required. Limit of one per household (Appendix A). Must be returned with a record of harvest including if the permit was not fished.
- Seasonal limits: With one exception, none established in regulation. The exception is in the Naknek District, where there is an annual possession limit of 200 sockeye salmon taken after August 15, with additional fish allowed upon request.
- Gear: Drift and set gillnets in waters open to commercial fishing. Set gillnets only in other waters, with certain exceptions. Spears and drift gear may be used in the Togiak River. Nets may be up to 25 fathoms in length except in the Naknek, Egegik, and Ugashik rivers, in Dillingham beach areas, and during emergency openings in the Nushagak District, where they may be no more than 10 fathoms in length. In December 2009, the board allowed 25 fathom nets to be used in the Nushagak River above Lewis Point and Red Bluff. Subsistence fishing by hook and line, unless through the ice, is prohibited. In 2018, the board adopted new regulations to allow subsistence fishing for salmon from shore by dip net in parts of the Wood River and the Igushik, Weary, and Snake rivers upstream of the commercial fishing district.
- In 1998, the board adopted new regulations for the taking of "redfish" (spawning sockeye salmon) in portions of the Naknek District. In 2006, the board adopted regulations to allow harvest of salmon by spear in Lake Clark (excluding its tributaries) and by beach seines in Iliamna Lake, Sixmile Lake, and Lake Clark. Beach seines may not exceed 25 fathoms in length. In 2016, beach seines were added as an allowable gear type in various sections of Naknek Lake [5 AAC 01.320(b)(2-6)]. In 2016, subsistence fishing was also opened from August 30 through December 31, including fishing in the mouth of the Brooks River, which opens from September 18 through December 31. These dates reflect the "redfish" season for spawning sockeye salmon. Gillnets, spears, and dip nets may also be used along a 100-yard portion of the west shore of Naknek Lake near its outlet to the Naknek River and at Johnny's Lake from August 30 through December 31.
- Seasons: Except as follows, fishing is open at any time.
  - In areas open to commercial fishing, except for special harvest areas: from May 1–31 and October 1–31, from 9:00 a.m. Monday to 9:00 a.m. Friday; from June 1–September 30, during open commercial fishing periods. When the district is closed to commercial fishing, subsistence is also closed except for the Nushagak District where the commissioner, by emergency order, shall provide for subsistence during periods of extended closure.

Brief Synopsis of Federal Subsistence Regulations

Federal subsistence regulations apply on waters within or adjacent to the Togiak National Wildlife Refuge (NWR), Becharof NWR, Alaska Peninsula NWR, Alagnak Wild and Scenic River corridor, Katmai National Preserve (not Park), and the Lake Clark National Park and Preserve. Subsistence regulations on federal lands in Bristol Bay closely follow state statutes and regulations, and permits are required for all federally qualified subsistence users fishing for salmon. Unlike state regulations, there is no limit for salmon for residents of the Naknek and Kvichak River drainages. Special provisions include the use of beach seine for salmon in Lake Clark, excluding its tributaries, by federally qualified residents. Subsistence salmon can also be harvested by snagging (by handline or rod and reel), without a permit, in Lake Clark, including its tributaries.

The Subsistence Permit Program

As noted above, subsistence salmon fishers in the BBA are required to obtain an annual subsistence permit from the department. These permits are issued free of charge and are issued only to Alaska residents. The permit includes a harvest calendar for recording daily harvests by species and location. These permits are available at the ADF&G online store, department offices in Dillingham, King Salmon, and Anchorage, and from vendors in most area communities. Permits for the Naknek River drainage must be obtained from the ADF&G office in King Salmon (5 AAC 01.330). The divisions of Subsistence and Commercial Fisheries share the responsibility of administering the Bristol Bay subsistence permit program.

Since 1963, subsistence salmon harvest data based on permit returns have been reported in the department's Bristol Bay Annual Management Report series (AMRs) prepared by the Division of Commercial Fisheries. Since 1983, the Division of Subsistence has performed data entry and analysis for the permit program. To ensure high permit return rates, staff mail three reminder letters to permit holders, visit area communities, and contact permit recipients by telephone, as time and funding permit. According to Jones et al. (2013), "Most fishermen are obtaining permits and reporting their catches, and overall permit returns have averaged between 85% and 90% annually. However, fish removed for home use from commercial catches are not included in most reported subsistence harvest totals and therefore not included in the subsistence harvest estimates. Also, fish caught later in the season, such as coho salmon and spawning salmon, are probably not documented as consistently as king and sockeye salmon" (Jones et al. 2013:18). Most households in the BBA that obtain salmon permits also return them along with the harvest record on the back of the permit.

Participation

Figure 1-6 illustrates the number of subsistence permits issued for the BBA from 1992 through 2021 (see also Table 1-2, Appendix Table B1). The historical average from 1985–2020 of Bristol Bay subsistence permits issued is 1,113 annually, with the harvest per permit estimated at 123 fish. The previous 10-year average (2011–2020) is 1,121 permits and the average salmon harvest per permit for this date range is 104. Since the early 1990s, the number of subsistence permits issued annually for Bristol Bay has been stable, which is also reflected in the previous 5-year average of 1,099 issued permits. Appendix Table B2 reports participation and harvest levels by district and subdistrict for 2021, the previous study year for which data are available. The Nushagak District reported the highest number of issued permits (656), followed by the Naknek-Kvichak District (307 permits).

The majority of participants in the Bristol Bay subsistence salmon fishery are year-round residents of Bristol Bay communities. For the 10-year period from 2011–2020, 79% of the permits were issued to Bristol Bay residents and 21% to other Alaska residents. These percentages have been fairly steady since 1992 (Figure 1-6).

Subsistence Salmon Harvests

Figure 1-7 illustrates the estimated subsistence salmon harvests for the BBA for 1983–2021 (see also Table 1-2 and Appendix Table B1). The estimate is based on permit returns and then expanded using a weight that takes into consideration nonreturned permits. The expansion method is (Wt = Pi/Pr), where *Wt* is the weight, *Pi* is the number of permits issued by community, and *Pr* is the number of permits returned by community.

The BBA 36-year average estimated harvest is 136,399 salmon, the previous 10-year (2011–2020) average is 117,035 salmon, and the most previous 5-year average is 107,077 salmon (Table 1-2). These data show that after about two decades of relative stability through the 1990s, a downward trend in total subsistence salmon harvests began in Bristol Bay. Although harvests in 2003–2009 rebounded from near record lows from 2000–2002, these were still years of low returns of sockeye salmon and low subsistence salmon harvests in the BBA. The lowest subsistence harvest for the BBA occurred in 2002 (109,587 fish) but rebounded the following year to 131,667 fish. A relatively high harvest persisted for six years after 2003 yet dropped again to 113,238 fish in 2010. Another reduction in total harvest began in 2017 (116,303

salmon) and continued to decline the following years: 104,502 salmon were harvested in 2018, 96,876 salmon in 2019, 96,561 salmon in 2020, and 92,211 salmon in 2021, further research and analysis is needed to understand why this decline has occurred.

These low harvest years coincided with equally low numbers of salmon harvested per permit, which had a consistent decline from 1985 onwards. The 1990s show a steady drop in salmon per permit, beginning at 157 fish in 1990, and ending at 119 fish per permit in 1999. Since then, harvests have not reached greater than 120 fish per permit except in 2005 (Table 1-2).

Average harvests per permit in the BBA subsistence salmon fishery declined over the 1985–2002 period and especially from 1991–2002 (Figure 1-8). They remained above 100 salmon per permit from 2002 until 2017. Since 2017, the number of salmon harvested per permit has remained below 96 fish. For the overall period from 1985–2020, the average harvest per permit is about 123 salmon; for the previous 10-year period, this average is 104 salmon; and for the previous 5-year period, the average is 97 salmon. The average harvest per permit in 2021 was 91 salmon (Table 1-2).

From 1983–2021, sockeye salmon has been the dominant species for subsistence fishers in the BBA, with a historical harvest of 78% of the total subsistence salmon harvest (Table 1-2 and Figure 1-9). King salmon *O. tshawytscha* ranked second at 10%, followed by coho salmon *O. kisutch* (6%), chum salmon *O. keta* (4%), and pink salmon *O. gorbuscha* (2%). This composition has remained relatively stable over time.

Figure 1-10 and Table 1-3 illustrate the previous 10-year (2011–2020) average subsistence salmon harvest for each of the five Bristol Bay districts. The Naknek-Kvichak District accounted for the largest portion of the subsistence harvest at 51% (59,300 estimated salmon); the Nushagak District ranked second at 43% (50,119), followed by Togiak at 4% (5,158), Egegik at 1% (1,462) and Ugashik at 1% (986)

For the previous 10-year period (2011–2020), 87% of the total harvest was taken by local permit holders (who account for 79% of the permits), and 13% by other Alaska residents (who account for 21% of the permits) (figures 1-11 and 1-12). Within the BBA, average subsistence salmon harvests per permit differ by district. The largest annual average harvest from 2011 through 2020 occurred in the Naknek-Kvichak District at 131 fish per permit, followed by the Togiak District (98 salmon/permit), Nushagak District (87 salmon/permit), Ugashik District (61 salmon/permit), and the Egegik District (49 salmon/permit) (Table 1-3 and Figure 1-12).

Table 1-1.– Population of the Bristol Bay Management Area, 1980, 1990, 2000, 2010, 2020 and 2021.

	U.S. Census													5-year American Community Survey (2015–2019)			ADLWD 2021
	1980	1990			2000			2010			2020						
	total	Total	Alaska Native		Total	Alaska Native		Total	Alaska Native		Total	Alaska Native		Total	Alaska Native		Total
Area	population	population	Number	Percent	population	Number	Percent	population	Number	Percent	population	Number[a]	Percent	population	Number	Percent	population
Dillingham Census Area																	
Aleknagik	154	185	154	83.2%	221	187	84.6%	219	185	84.5%	211	-	-	179	139	77.7%	191
Clarks Point	79	60	53	88.3%	75	69	92.0%	62	55	88.7%	62	-	-	44	44	100.0%	75
Dillingham	1,563	2,017	1,125	55.8%	2,466	1,503	60.9%	2,329	1,549	66.5%	2,249	-	-	2,215	1,302	58.8%	2,209
Ekuk	7	3	2	66.7%	[a]	[a]	[a]	[a]	[a]	[a]				[b]	[b]	[b]	[b]
Ekwok	77	77	67	87.0%	130	122	93.8%	115	109	94.8%	111	-	-	78	75	96.2%	103
Koliganek	117	181	174	96.1%	182	159	87.4%	209	202	96.7%	183	-	-	202	180	89.1%	176
Manokotak	294	385	368	95.6%	399	378	94.7%	442	425	96.2%	488	-	-	733	582	79.4%	477
New Stuyahok	331	391	375	95.9%	471	452	96.0%	510	491	96.3%	512	-	-	546	490	89.7%	480
Portage Creek	48	5	3	60.0%	36	31	86.1%	2	1	50.0%	4	-	-	3	3	100.0%	4
Togiak	470	613	535	87.3%	809	750	92.7%	817	767	93.9%	817	-	-	815	658	80.7%	807
Twin Hills	70	66	61	92.4%	69	65	94.2%	74	72	97.3%	103	-	-	67	59	88.1%	85
Remainder	22	29	8	27.6%	64	37	57.8%	68	39	57.4%	112	-	-	[d]	[d]	[d]	111
Subtotal	*3,232*	*4,012*	*2,925*	*72.9%*	*4,922*	*3,753*	*76.2%*	*4,847*	*3,895*	*80.4%*	*4,852*	-	-	*4,882*	*3,532*	*72.3%*	*4,718*
Bristol Bay Borough																	
King Salmon	545	696	108	15.5%	442	133	30.1%	374	132	35.3%	307	-	-	361	66	18.3%	297
Naknek	318	575	236	41.0%	678	319	47.1%	544	283	52.0%	470	-	-	468	192	41.0%	464
South Naknek	145	136	108	79.4%	137	115	83.9%	79	66	83.5%	67	-	-	67	34	50.7%	61
Remainder	86	3	3	100.0%	1	0	0.0%	0	0	0.0%	0	-	-	[d]	[d]	[d]	0
Subtotal	*1,094*	*1,410*	*455*	*32.3%*	*1,258*	*567*	*45.1%*	*997*	*481*	*48.2%*	*6,728*	-	-	*896*	*292*	*32.6%*	*822*
Lake and Peninsula Borough [b]																	
Egegik	75	122	86	70.5%	116	89	76.7%	109	51	46.8%	39	-	-	58	9	15.5%	39
Igiugig	33	33	26	78.8%	53	44	83.0%	50	35	70.0%	68	-	-	71	64	90.1%	61
Iliamna	94	94	62	66.0%	102	59	57.8%	109	71	65.1%	108	-	-	55	33	60.0%	112
Kokhonak	83	152	137	90.1%	174	158	90.8%	170	153	90.0%	152	-	-	180	168	93.3%	139
Levelock	79	105	87	82.9%	122	116	95.1%	69	62	89.9%	69	-	-	67	66	98.5%	65
Newhalen	87	160	151	94.4%	160	146	91.3%	190	175	92.1%	168	-	-	131	114	87.0%	178
Nondalton	173	178	159	89.3%	221	199	90.0%	164	137	83.5%	133	-	-	110	85	77.3%	129
Pedro Bay	33	42	38	90.5%	50	32	64.0%	42	30	71.4%	43	-	-	31	22	71.0%	40
Pilot Point	66	53	45	84.9%	100	86	86.0%	68	57	83.8%	70	-	-	101	64	63.4%	59

-continued-

Table 1-1.–Page 2 of 2.

	U.S. Census													5-year American Community Survey (2015–2019)			ADLWD 2021
	1980	1990			2000			2010			2020						
	total	Total	Alaska Native		Total	Alaska Native		Total	Alaska Native		Total	Alaska Native		Total	Alaska Native		Total
Area	population	population	Number	Percent	population	Number	Percent	population	Number	Percent	population	Number[a]	Percent	population	Number	Percent	population
Lake and Peninsula Borough[c] (continued)																	
Pope-Vannoy Landing		[d]	[d]	[d]	8	4	50.0%	6	3	50.0%	6	-	-	0	0	0.0%	5
Port Alsworth	22	55	1	1.8%	104	23	22.1%	159	42	26.4%	186	-	-	134	21	15.7%	181
Port Heiden	92	119	86	72.3%	119	93	78.2%	102	87	85.3%	100	-	-	88	72	81.8%	91
Ugashik	13	7	6	85.7%	11	9	81.8%	12	9	75.0%	4	-	-	9	7	77.8%	3
Remainder	19	31	5	16.1%	22	9	40.9%	19	4	21.1%	11	-	-	[e]	[e]	[e]	12
Subtotal	*869*	*1,151*	*889*	*77.2%*	*1,362*	*1,067*	*78.3%*	*1,269*	*916*	*72.2%*	*1,157*	-	-	*1,035*	*725*	*70.0%*	*1,114*
Total	**5,195**	**6,573**	**4,269**	**64.9%**	**7,542**	**5,387**	**71.4%**	**7,113**	**5,292**	**74.4%**	**12,737**	**-**	-	**6,813**	**4,549**	**66.8%**	**6,654**

Sources Alaska Department of Labor and Workforce Development (ADLWD), Research and Analysis Section, "2010–1880 Census Data for Alaska: Year: Places," http://live.laborstats.alaska.gov/cen/hist.cfm (accessed September 2018) for 1980, 1990, 2000, 2010 and 2020; U.S. Census Bureau for American Community Survey (ACS) 2020 estimate (5-year average: 2015–2019), "Community Facts," https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml (accessed September 2018) for 2016; and Alaska Department of Labor and Workforce Development, Research and Analysis Section, "Alaska Population Estimates by Cities and Census Designated Place (CDP), 2010–2021," http://live.laborstats.alaska.gov/pop/index.cfm (accessed June 2022) for 2021.

a. 2020 US Census anonymization prevents community-level summary of Alaska Native households

b. The community of Ekuk is now counted with neighboring Clarks Point since the only resident is a cannery security guard.

c. Port Heiden is in the Alaska Peninsula Management Area; Chignik, Chignik Lagoon, Chignik Lake, Ivanof Bay, and Perryville of this borough are in the Chignik Management Area and are excluded from this table. The "remainder" may include some population living outside the Bristol Bay Management Area.

d. Pope-Vannoy Landing residents were previously counted with the remainder of the Lake and Peninsula Borough.

e. These data are not available from the American Community Survey's 5-year average data set.

Table 1-2.–Estimated historical subsistence salmon harvests, Bristol Bay Area, Alaska, 1985–2021.

Year	Permits		Estimated salmon harvest						Salmon per permit
	Issued	Returned	King	Sockeye	Coho	Chum	Pink	Total	
1985	1,015	808	9,737	142,755	8,122	5,776	825	167,215	165
1986	930	723	14,893	129,487	11,005	11,268	7,458	174,112	187
1987	996	866	14,424	135,782	8,854	8,161	673	167,894	169
1988	938	835	11,848	125,556	7,333	9,575	7,341	161,652	172
1989	955	831	9,678	125,243	12,069	7,283	801	155,074	162
1990	1,042	870	13,462	128,343	8,389	9,224	4,455	163,874	157
1991	1,194	1,045	15,245	137,837	14,024	6,574	572	174,251	146
1992	1,203	1,028	16,425	133,605	10,722	10,661	5,325	176,739	147
1993	1,206	1,005	20,527	134,050	8,915	6,539	1,051	171,082	142
1994	1,193	1,019	18,873	120,782	9,279	6,144	2,708	157,787	132
1995	1,119	990	15,921	107,717	7,423	4,566	691	136,319	122
1996	1,110	928	18,072	107,737	7,519	5,813	2,434	141,575	128
1997	1,166	1,051	19,074	118,250	6,196	2,962	674	147,156	126
1998	1,234	1,155	15,621	113,289	8,126	3,869	2,424	143,330	116
1999	1,219	1,157	13,009	122,281	6,143	3,653	420	145,506	119
2000	1,219	1,109	11,547	92,050	7,991	4,637	2,599	118,824	97
2001	1,226	1,137	14,412	92,041	8,406	4,158	839	119,856	98
2002	1,093	994	12,936	81,088	6,565	6,658	2,341	109,587	100
2003	1,182	1,058	21,231	95,690	7,816	5,868	1,062	131,667	111
2004	1,100	940	18,012	93,819	6,667	5,141	3,225	126,865	115
2005	1,076	979	15,212	98,511	7,889	6,102	1,098	128,812	120
2006	1,050	904	12,617	95,201	5,697	5,321	2,726	121,564	116
2007	1,063	917	15,444	99,549	4,880	3,991	815	124,679	117
2008	1,178	1,083	15,153	103,583	7,627	5,710	2,851	134,924	115
2009	1,063	950	14,020	98,951	7,982	5,052	442	126,447	119
2010	1,082	979	10,852	90,444	4,623	4,692	2,627	113,238	105
2011	1,122	1,039	14,106	101,017	7,493	3,794	333	126,744	113
2012	1,107	932	12,136	100,728	3,837	4,007	1,874	122,582	111
2013	1,162	986	12,858	98,765	8,635	5,173	333	125,764	108
2014	1,158	1,031	17,417	99,008	8,984	6,677	2,689	134,775	116
2015	1,169	1,072	13,874	99,535	7,659	3,573	458	125,100	107
2016	1,172	1,057	18,712	85,989	6,255	5,243	4,945	121,144	103
2017	1,110	1,000	12,985	89,704	8,154	4,907	553	116,303	105
2018	1,105	925	13,758	78,666	6,913	4,030	1,135	104,502	95
2019	1,106	860	11,488	75,320	6,219	3,451	398	96,876	88
2020[a]	1,001	749	9,369	78,679	5,493	2,425	595	96,561	96
2021[a]	1,012	340	5,685	78,779	6,311	1,262	174	92,211	91
5-year average (2016–2020)	1,099	918	13,262	81,672	6,607	4,011	1,525	107,077	97
10-year average (2011–2020)	1,121	965	13,670	90,741	6,964	4,328	1,331	117,035	104
Historical average (1985–2020)	1,113	973	14,582	106,418	7,775	5,630	1,994	136,399	123

Source ADF&G Division of Subsistence, ASFDB 2021 (ADF&G 2021).

a. Data are preliminary.

Table 1-3.–Ten-year average subsistence salmon harvest by district, Bristol Bay Area, Alaska, 2011–2020.

District	Permits issued	Average salmon harvest[a]						Salmon per permit
		King	Sockeye	Coho	Chum	Pink	Total	
Naknek–Kvichak District	452	661	57,477	724	239	199	59,300	131
Nushagak District	579	12,097	27,936	5,398	3,646	1,042	50,119	87
Togiak District	53	792	3,478	386	419	83	5,158	98
Egegik District	30	73	1,076	295	14	5	1,462	49
Ugashik District	16	45	767	161	9	3	986	61
Total Bristol Bay Area	**1,121**	**13,671**	**90,666**	**6,958**	**4,331**	**1,332**	**116,956**	**104**

Source ADF&G Division of Subsistence, Bristol Bay subsistence salmon permit database.

a. *Note* The data for 2020 that were used in calculating these averages are preliminary.

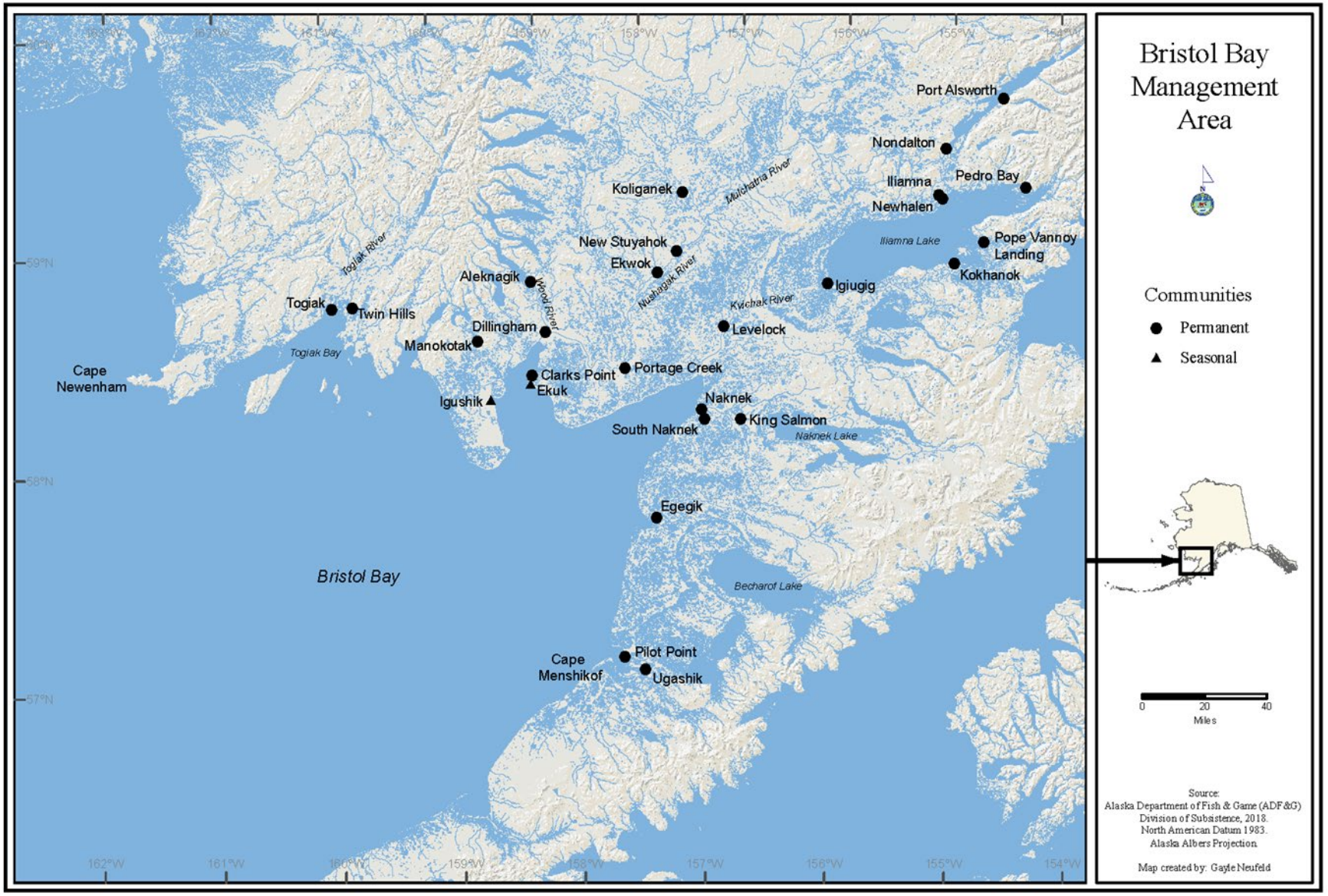


Figure 1-1.–Map of the Bristol Bay Area.

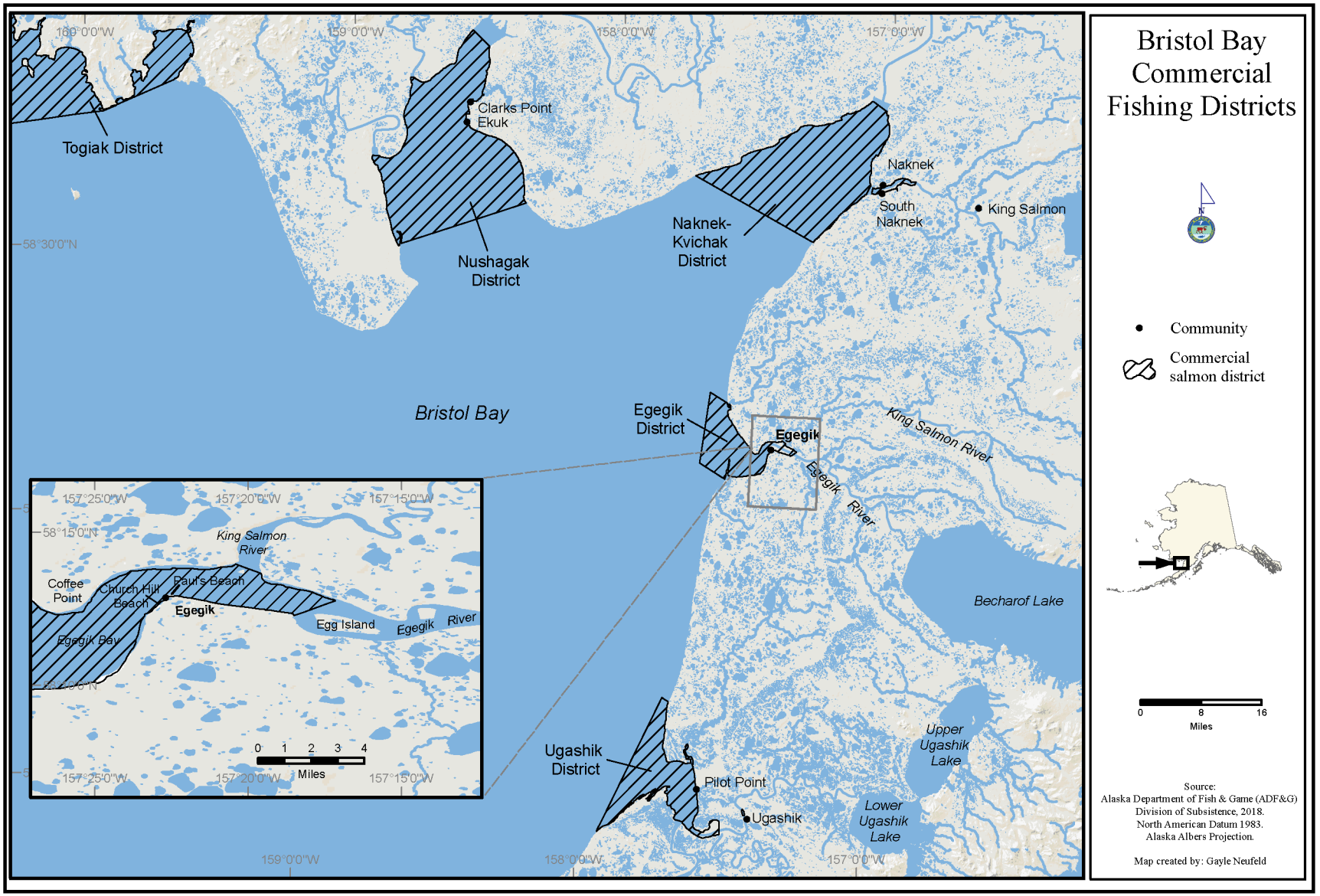


Figure 1-2.–Bristol Bay, Alaska commercial fishing districts.

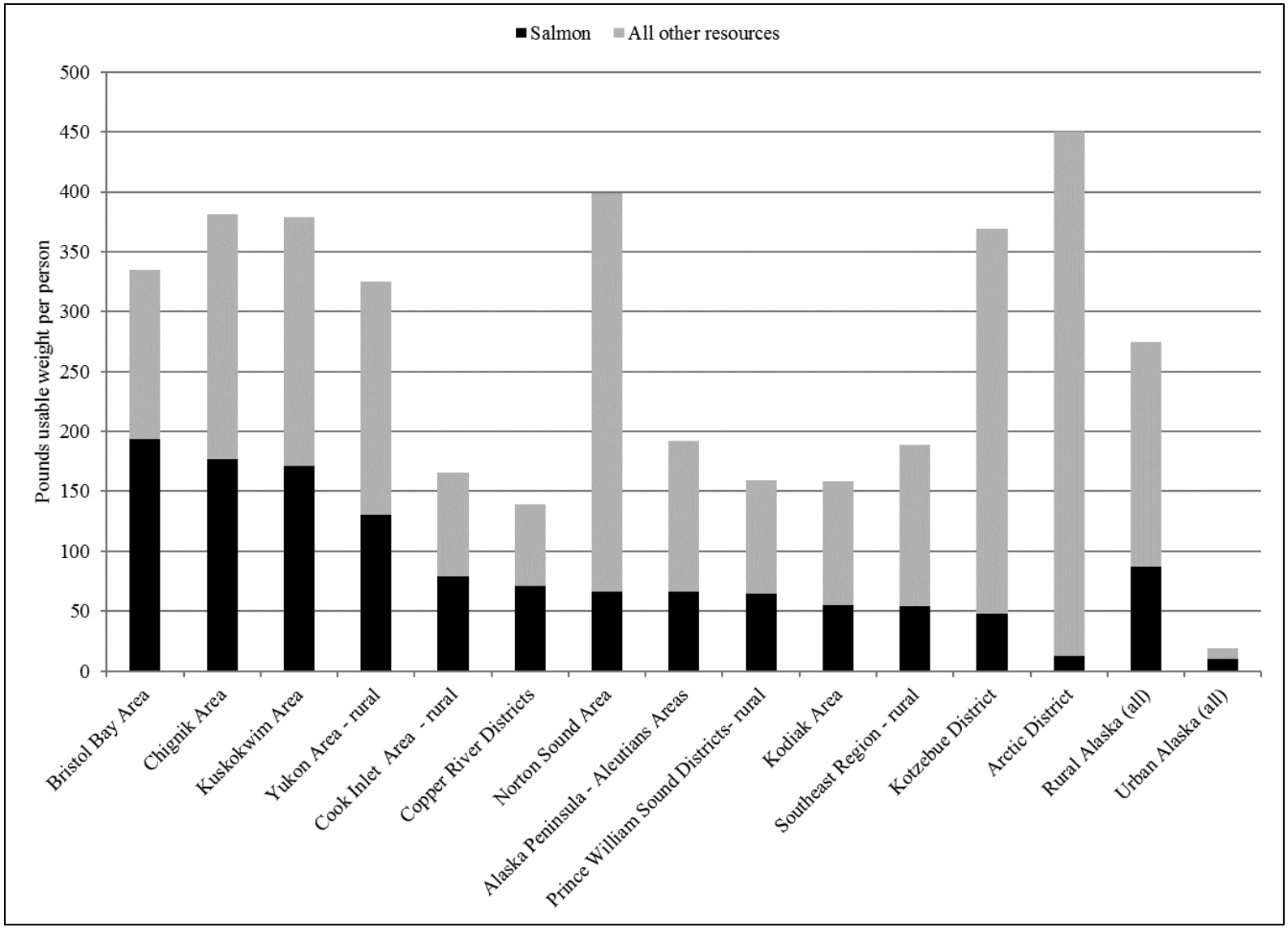


Figure 1-3.–Estimated noncommercial harvests of salmon and other resources in pounds usable weight per person, by residents of Alaska salmon management areas, 2014.

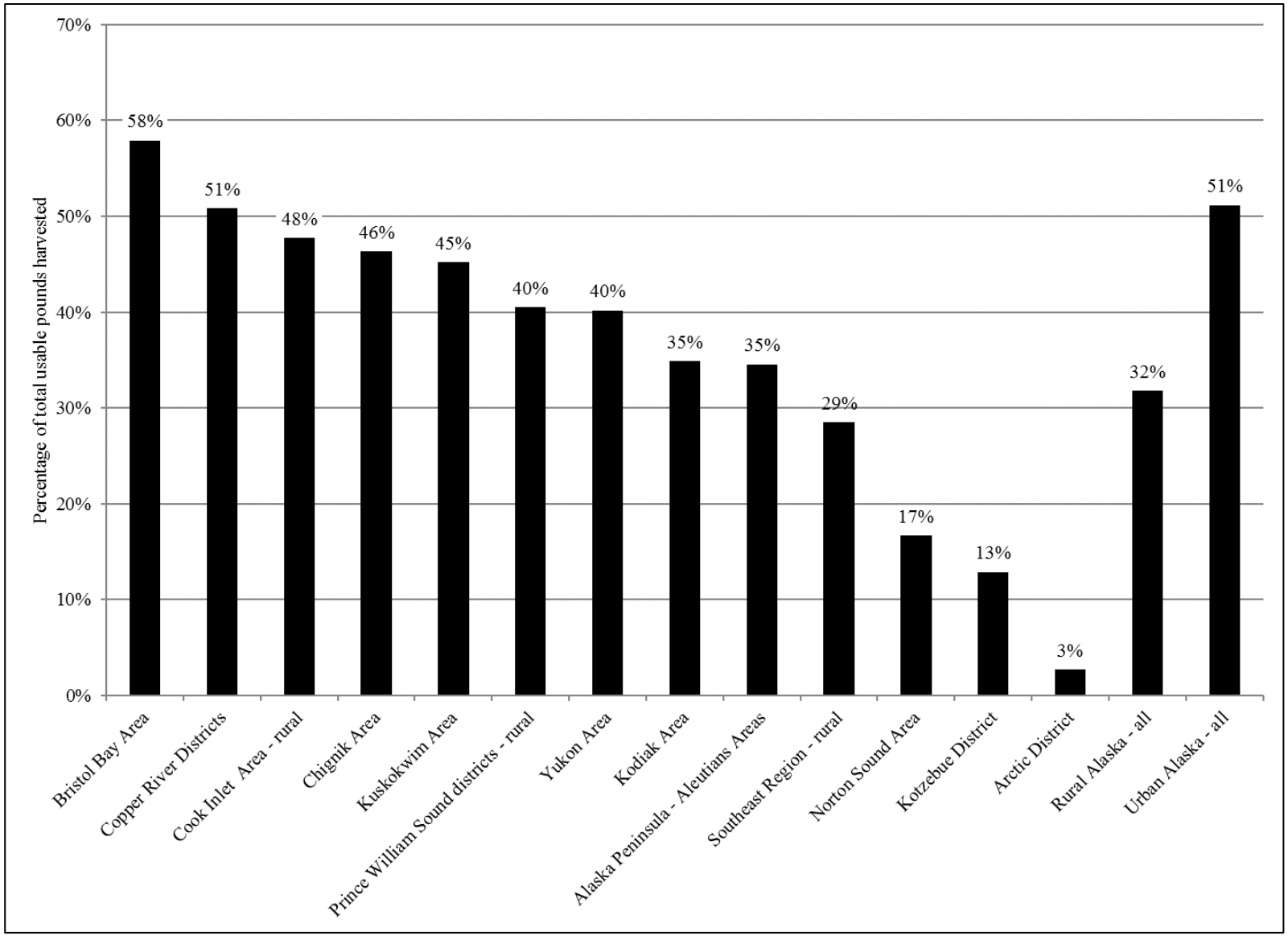


Figure 1-4.–Percentage of total noncommercial harvest composed of salmon, residents of Alaska salmon management areas, 2014.

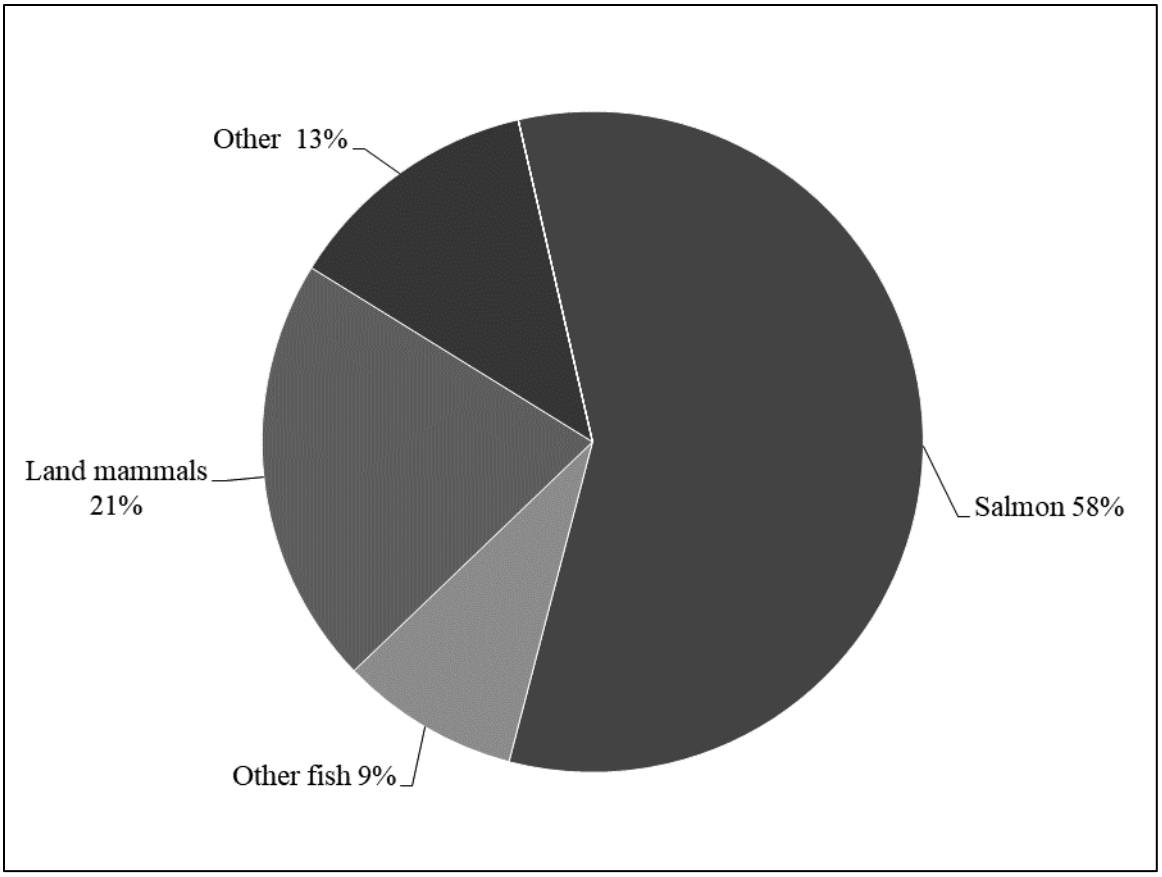


Figure 1-5.–Composition of wild food harvests, Bristol Bay Area, Alaska, 1987–2018.

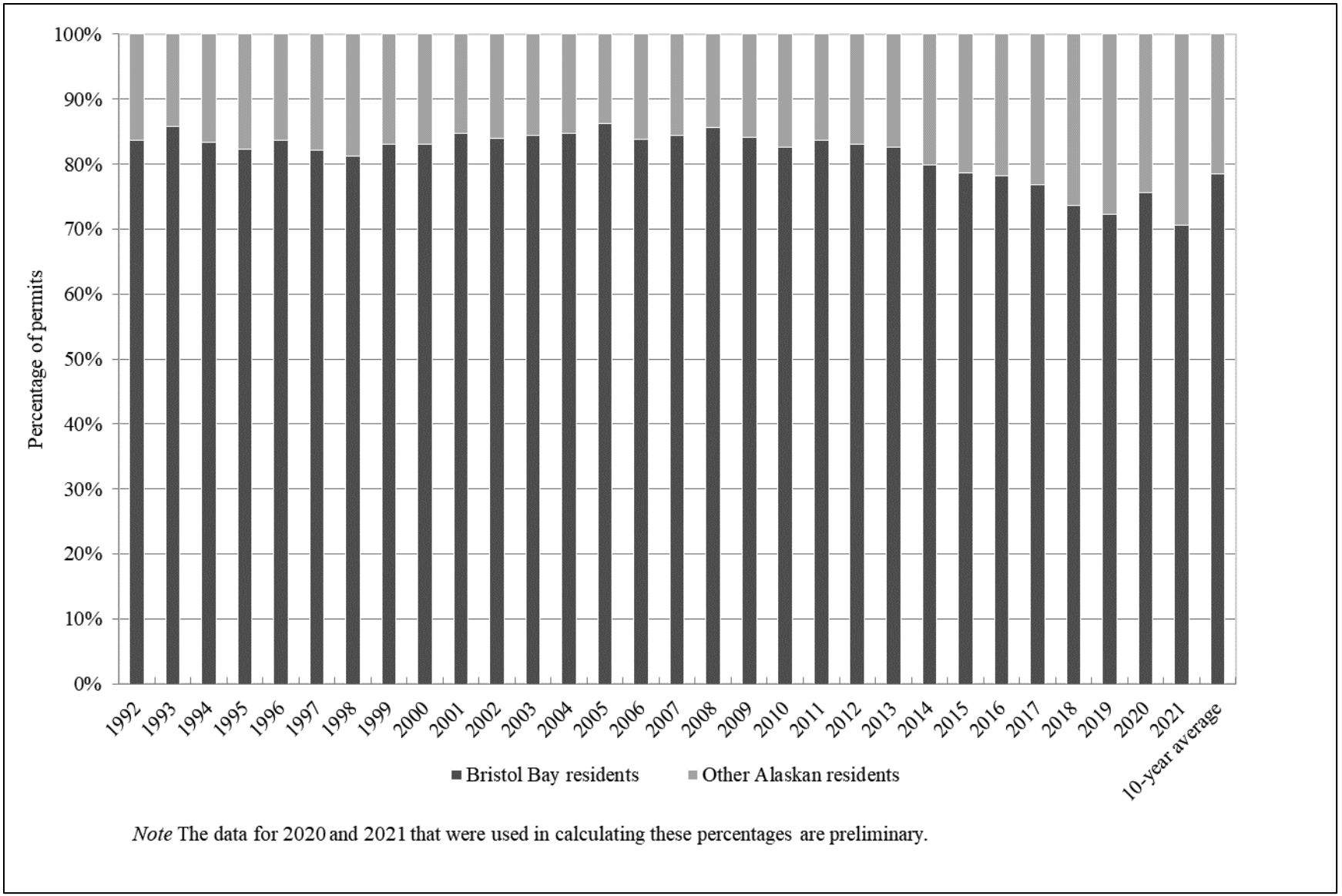


Figure 1-6.–Percentage of Bristol Bay subsistence salmon permits issued by area of residence of permit holder, 1992–2021.

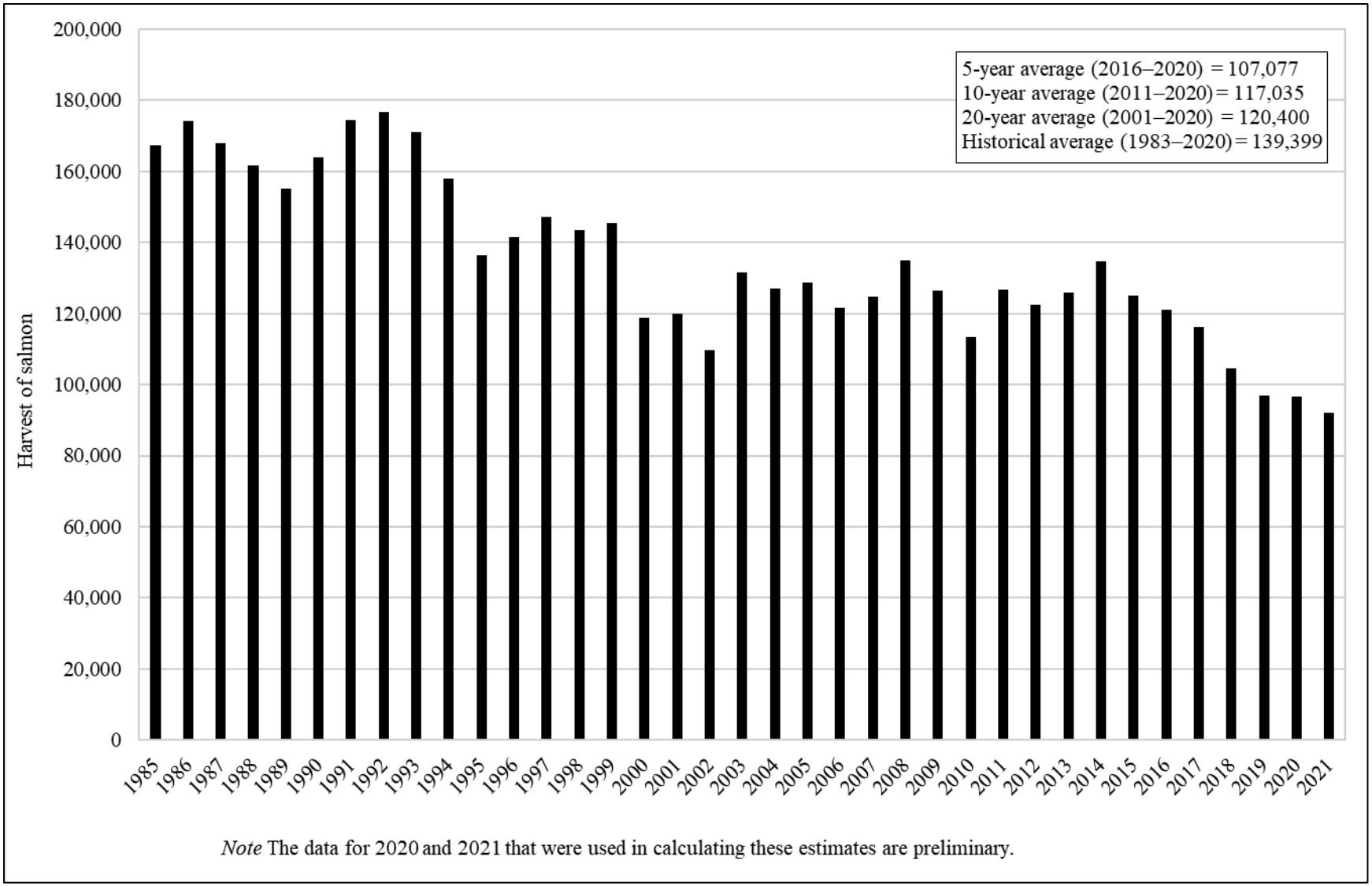


Figure 1-7.–Estimated subsistence salmon harvests, Bristol Bay Area, Alaska, 1985–2021.

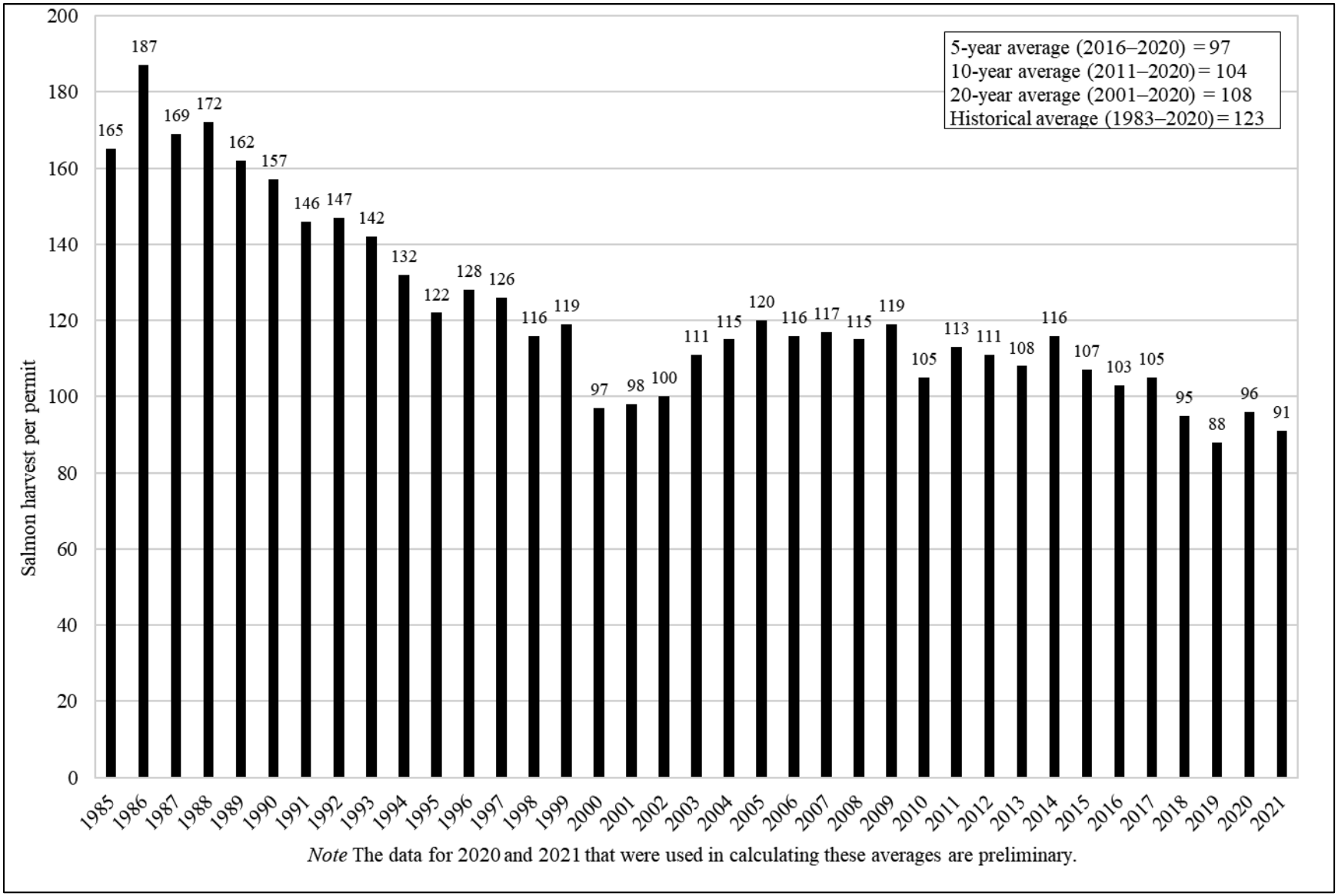
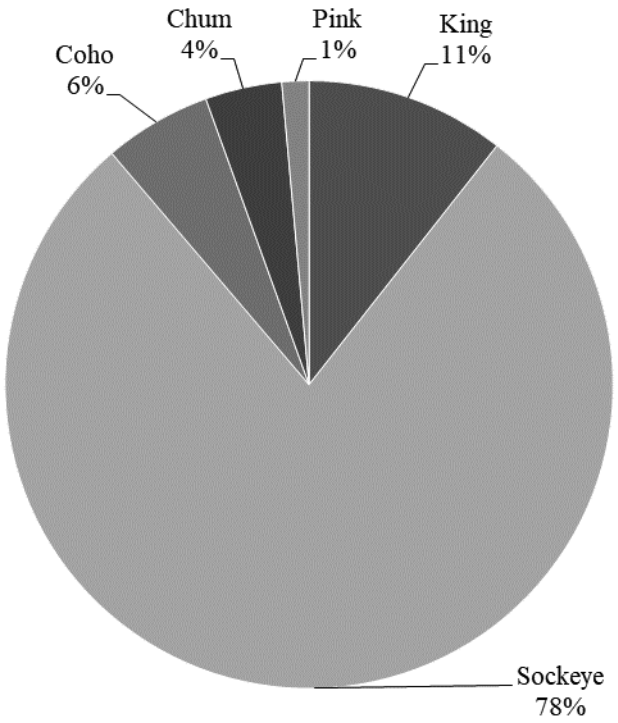


Figure 1-8.–Average harvests per permit, Bristol Bay Area, Alaska, 1985–2021.



Note The data for 2020 and 2021 that were used in calculating these percentages are preliminary.

Figure 1-9.–Composition of total subsistence salmon harvest, Bristol Bay Area, Alaska, 1985–2021.

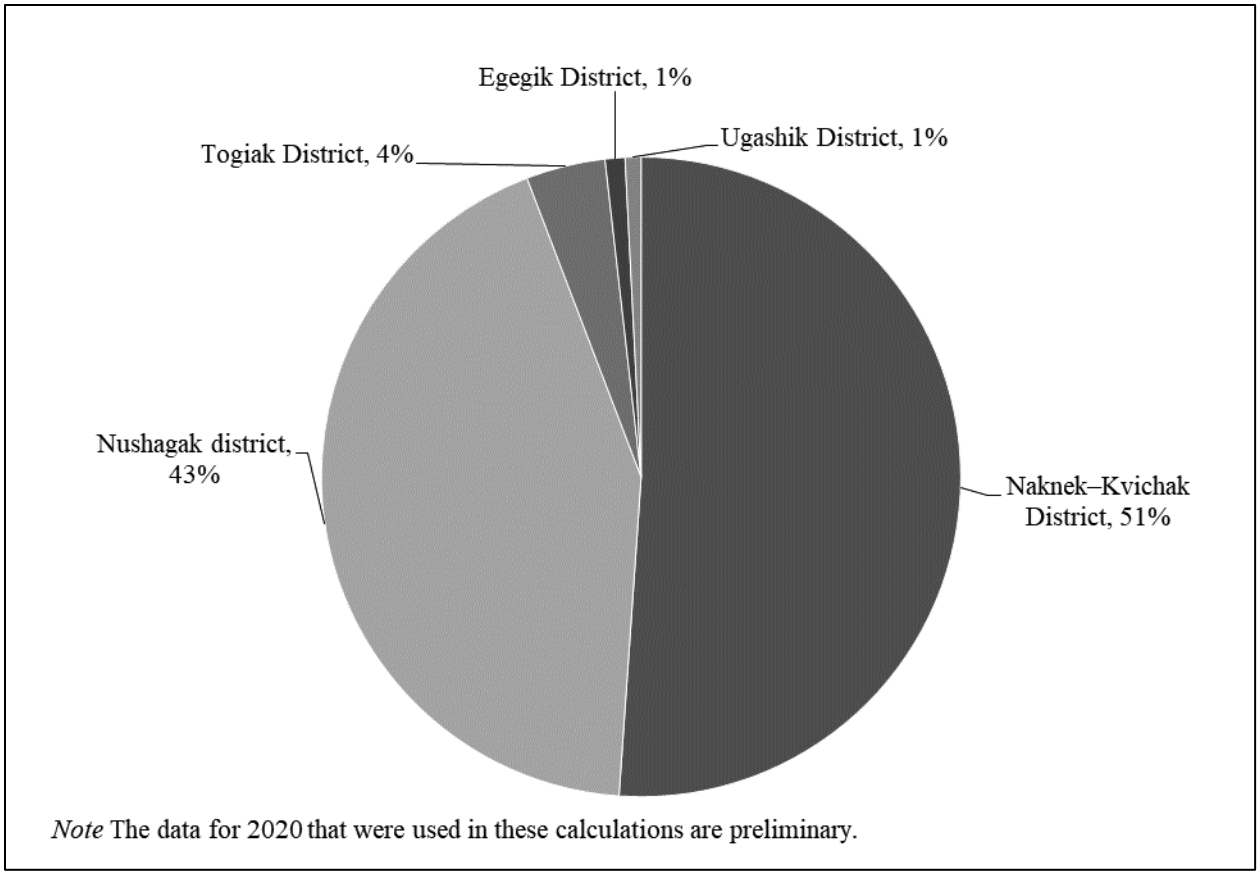


Figure 1-10.–Comparison of Bristol Bay subsistence salmon harvest by district, 2011–2020.

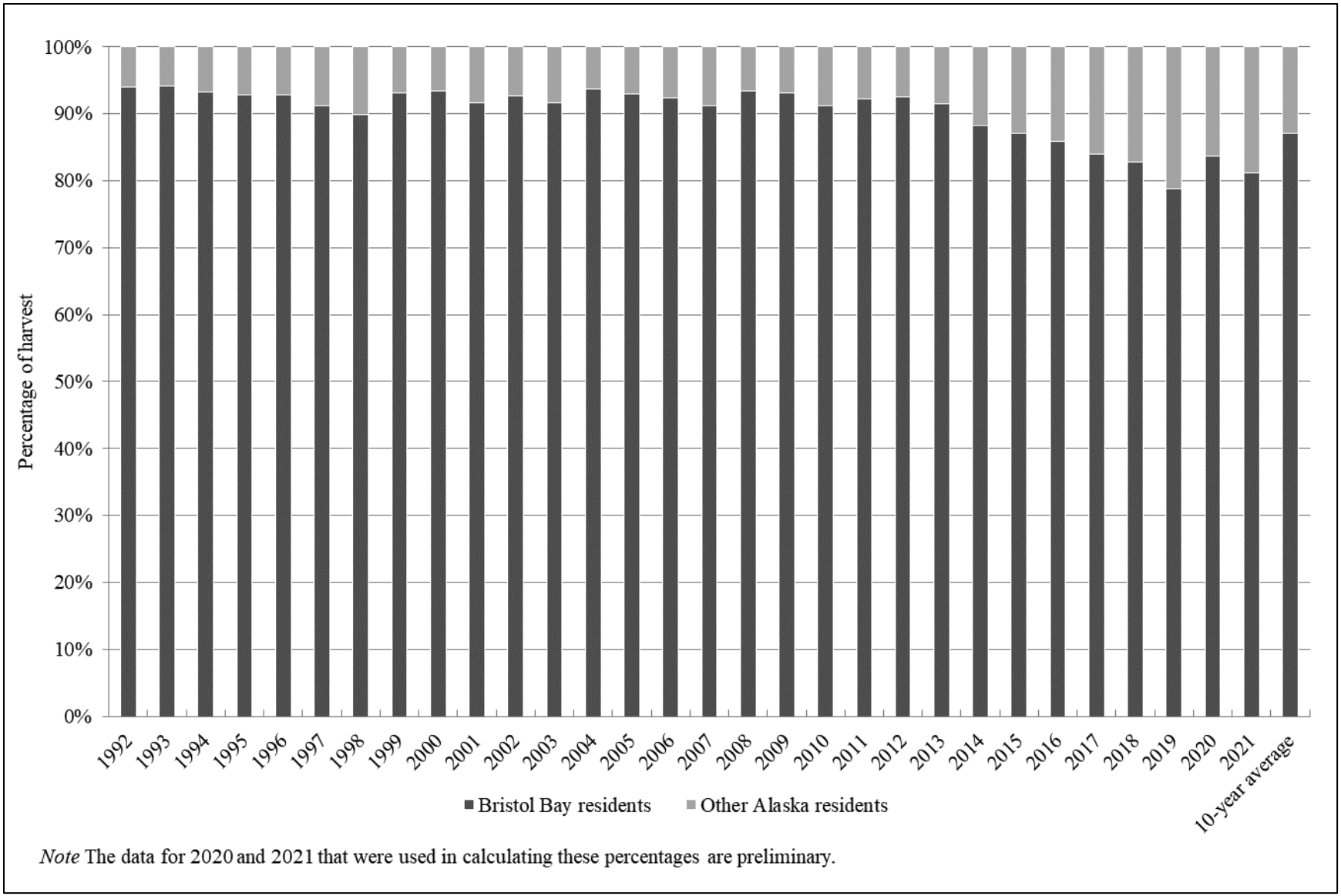


Figure 1-11.–Percentage of Bristol Bay subsistence harvest by area of residence, 1992–2021.

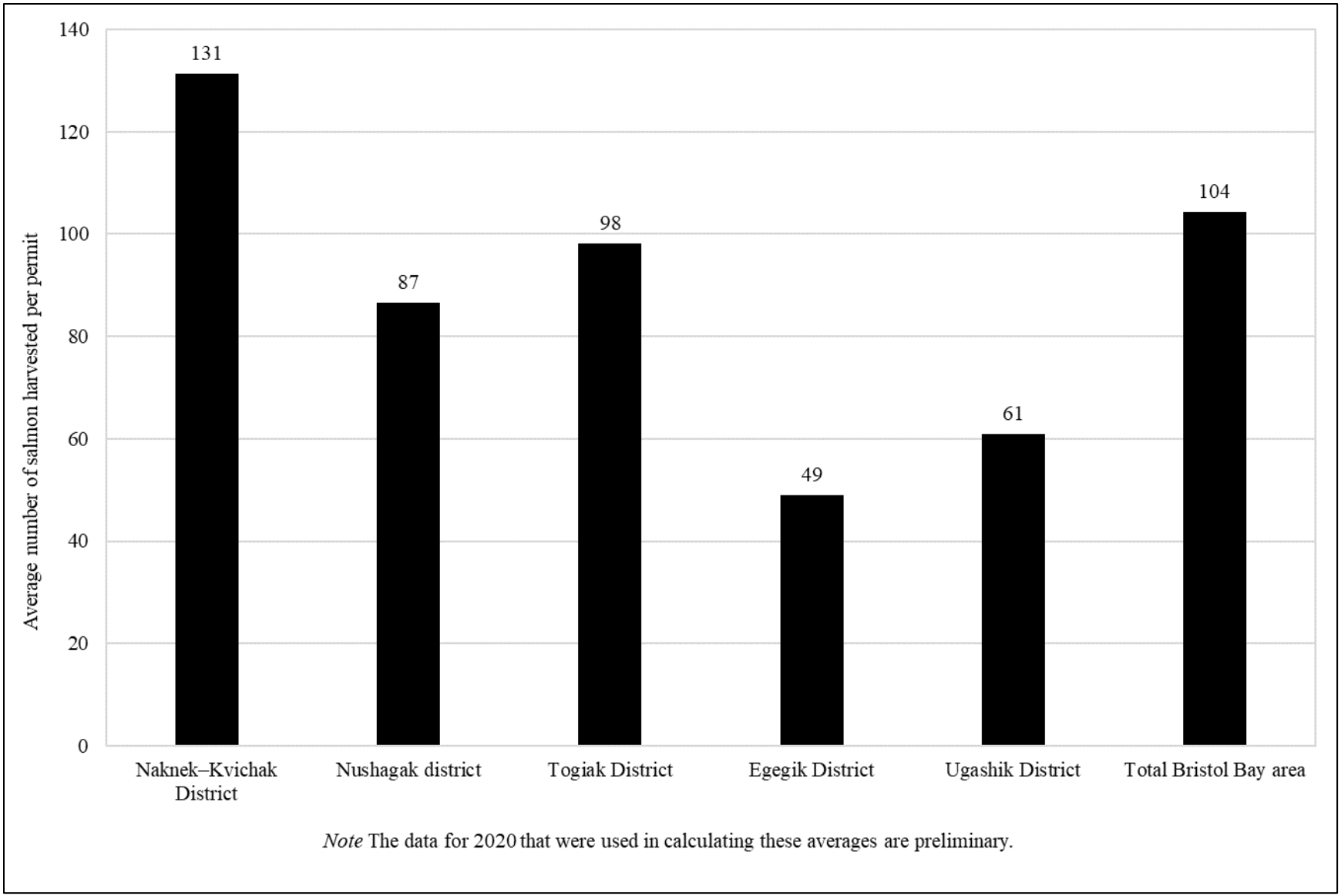


Figure 1-12.–Average subsistence salmon harvest per permit, 10-year average, 2011–2020, Bristol Bay Area, Alaska, by district.

2. NAKNEK-KVICHAK DISTRICT SALMON SUBSISTENCE FISHERY

Communities and Population

Historically, subsistence salmon harvests in the Naknek-Kvichak District have been the largest within the BBA. There are eight year-round communities within the Kvichak watershed and three communities within the Naknek River drainage. For the Kvichak communities, the 2021 populations were estimated as: Igiugig (61), Iliamna (112), Kokhanok (139), Levelock (65), Newhalen (178), Nondalton (129), Pedro Bay (40), and Port Alsworth (181). The most recent household-based subsistence salmon research to take place in Kvichak District communities occurred in 2008 (Iliamna, Newhalen, Nondalton, Port Alsworth), 2005 (Igiugig, Kokhanok, Levelock), and 2004 (Pedro Bay) and those data may be found in their respective technical reports as well as in the online Community Subsistence Information System (CSIS) (Fall et al. 2006; 2010; Krieg et al. 2009)

For the Naknek River drainage communities, the 2021 populations were estimated as: Naknek (464), King Salmon (297), and South Naknek (61) (Table 1-1). The most recent household-based subsistence salmon research to take place in the Naknek River drainage communities occurred in 2017 and 2018 and those data may be found in Jones and Cunningham (2020) as well as in the online Community Subsistence Information System (CSIS).

Table 2-2 shows the historical harvest by Kvichak watershed community from 1985–2021. Virtually all the subsistence salmon harvest in the watershed is sockeye salmon; other salmon species are much less abundant upstream of the confluence of the Alagnak (Branch) River with the Kvichak River. Table 2-3 shows the harvest by Naknek River drainage communities from 1997–2021. Sockeye salmon are the most harvested salmon species in the Naknek River drainage: this salmon species composes 91% of the historical average (1997–2021), followed by coho salmon (3%), king salmon (3%), pink salmon (2%), and chum salmon (1%).

Kvichak Watershed General Patterns of Subsistence Harvests

The number of subsistence salmon permits issued for fishing in the Kvichak River watershed has been relatively stable since the early 1990s, when nonlocal residents were again allowed to obtain permits (Table 2-1). Note the number of issued permits dropped in 2003 to 175, the lowest number issued since 1991 (Table 2-1). This reflects, in part, a prohibition by the National Park Service (NPS) against subsistence fishing in Lake Clark National Park and Preserve except by federally-qualified local rural residents, a prohibition that took effect in May 2001 (Weiland et al. 2002:40). The prohibition especially affected seasonal residents of Port Alsworth (Fall et al. 2010). However, the NPS prohibition does not account for drops in subsistence harvests because most subsistence fishers in the Kvichak River watershed live in area communities (Fall et al. 2010). This is evident for the previous 10-year period (2008–2017) and the 25-year average (1993–2017), when 80% and 84%, respectively, of the subsistence permits were issued to local community residents (Table 2-1). Figure 2-1 illustrates that in 2016 issued permits decreased to 159, the lowest since 1987. Since 2014, the permits have remained below 200 (Figure 2-1).

Estimated subsistence sockeye salmon harvests from the Kvichak River watershed for the period 1985–2020 average an estimated 50,737sockeye salmon (Table 2-2 and Figure 2-2). Figure 2-2 shows the historical average (1985–2020) sockeye harvest was 50,737, compared to the 20-year average from 2001 to 2020 of 39,411 salmon. As shown in Table 2-2 and Figure 2-2, subsistence sockeye salmon harvests by residents of this drainage declined markedly from the early 1990s to the early 2000s, with an especially low harvest in 2001, when residents reported that salmon returned "in 'bunches' and 'spurts', unlike the steadier runs of previous years" (Holen et al. 2005:7). The average annual harvest for the previous 10-year period (2011–2020) was 34,798 salmon. Although 2001 and 2002 were two of the lowest harvests of sockeye

salmon (32,808 and 33,001, respectively) recorded, beginning in 2017 the lowest annual harvests to date have occurred. The previous 5-year (2016–2020) average was 25,506 fish (Table 2-2, Figure 2-2). In previous years, opportunity to harvest sockeye salmon for subsistence in the watershed has not been restricted in regulation or by emergency order. As discussed in Krieg et al. (2015), the number of permit holders has remained somewhat steady, with fewer fish being harvested.

As illustrated in (Figure 2-3), average sockeye salmon harvests per subsistence permit in the Kvichak River watershed declined from the late 1980s to a low of 158 sockeye salmon per permit in 2001. For all Kvichak watershed permit holders, an increase of sockeye salmon per permit occurred after 2001 and continued until 2006. Variable harvests were recorded until 2017, which then saw another relatively low harvest per permit of 176 sockeye salmon. Since 2017 the number of sockeye salmon per permit has remained below 146, with a record low of 134 sockeye salmon per permit in 2019 (Figure 2-3). Likewise, permit holders who were local community residents of the Kvichak River drainage show a similar pattern of declining subsistence harvests per permit from the early 1990s to 2001, when a low average harvest per permit, 182 sockeye salmon in 2001, was recorded (Figure 2-4). The average sockeye salmon harvest per permit for local residents followed a similar pattern, with a low in 2001, followed by an increase in 2006 (314 salmon/permit), and variable harvests until 2017, which saw 210 sockeye salmon per permit. Since 2017 the average sockeye salmon harvest per permit for local residents has remained below 175 (Figure 2-4).

History of Naknek River Drainage Subsistence Permits

With the advent of statehood (1959), subsistence salmon fishing permits in Bristol Bay, by state regulation, were required for harvesting salmon for subsistence (Morris 1985:126). Although the permits had been required since statehood, the permit program was gradually introduced throughout the Bristol Bay region in the late 1960s to document the harvest of salmon for subsistence uses. Initially compliance was low for Naknek River communities until people learned more about the permit process (Morris 1985:131).

From 1979 to 1980 a substantial increase in the number of people who obtained subsistence salmon permits for the Naknek River occurred: in 1979, 243 permits were issued, and in 1980, 358 permits were issued. Of the 358 permits issued in 1980, 41% were issued to people with an address in a community outside of the Bristol Bay area. Additionally, a portion of the permits was issued to people with a General Delivery address in Naknek and King Salmon. The General Delivery addresses were considered likely to be summer transients (Behnke 1980:5). In December 1980, the board adopted new regulations to require that subsistence salmon fishing permits for the Naknek River drainage be issued only to persons domiciled in the Naknek and Kvichak River drainages, and Naknek River drainage subsistence salmon fishing permits were only to be issued through the department's King Salmon office. The reasoning for the latter part of the regulation was “local [subsistence permit] issuance allows the staff to closely monitor the number of units fishing per area and to screen applicants for residency requirement” (Nelson et al. 1982:52).

The 1981–1984 permit regulations were as follows:

1. Subsistence salmon fishing permits:
    a. Were required and limited to one per household, 5 AAC 01.330 (a) and (c);
    b. Were to be “issued only to those persons domiciled in the Naknek and Kvichak River drainages,” 5 AAC 01.330 (d); and
    c. Were to be issued only through the Department of Fish and Game office in King Salmon, 5 AAC 01.300 (a) and (d). (Morris 1982)

In 1982, a personal use fishery was established in the Naknek River, allowing nonlocal residents to fish for salmon under personal use regulations (Morris 1985:130). For two years (1985 and 1986) the subsistence fishery was open to all Alaska residents. The eligibility regulations changed back to permitting only local residents for the next three years (1987–1990). As a result of the case *McDowell et al. v. State of Alaska*, from 1990 to today, the state subsistence fishery is open to all Alaska residents; however, the provision that

subsistence permits for the Naknek River drainage must be obtained from the ADF&G office in King Salmon is still in regulation (5 AAC 01.330). This regulation is proposed by ADF&G to be repealed during the 2022 BOF meeting.

Naknek River Drainage General Patterns of Subsistence Harvests

Table 2-3 and Figure 2-5 report estimated subsistence salmon harvests based on permit return data from the Naknek River drainage for the period 1997–2021. From 1997–2019 salmon harvests in the Naknek River drainage had remained relatively stable. However, based on the preliminary permit returns from 2020 and 2021 the harvest amounts declined in these previous years. In 2020, a total of 18,355 salmon were harvested, and in 2021 a total of 15,321 salmon were harvested in the Naknek River drainage (Table 2-3). These harvest amounts are lower than the 5-year (2016–2020), 10-year (2011–2020), and the historical averages (1997–2020) at 23,442, 24,128 and 24,863 respectively. Table 2-4 presents the estimated subsistence harvest of salmon by community, by individual fish, and number of permits issued from 1997–2021. With exception of 2020 and 2021, the number of subsistence salmon permits issued in the Naknek River drainage has remained relatively stable since 1997 (Table 2-4). The number of permits issued in the most previous two years were the lowest number on record (229 permits in 2020 and 196 permits in 2021), compared to the historical average (1997–2020) at 287. The lower-than-average 2020 and 2021 harvest amounts and number of permits issued may be the result of COVID-19 travel restrictions. For example, the number of permits issued to nonlocal Alaska residents in 2020 and 2021 (76 permits both years) was lower compared to the previous two years (109 permits in 2019 and 94 permits in 2018) (Table 2-5).

As Table 2-3 and Figure 2-6 illustrate, sockeye salmon consistently compose the majority of the total salmon harvest in the Naknek River drainage (see also Appendix Table B1). However, the number of sockeye salmon harvested in the Naknek River drainage in 2021 (14,541 fish) was the lowest harvest amount on record. Coho salmon are the second most harvested salmon species in the Naknek River drainage. In 2021 the coho harvest was 405 fish, which was lower than the 5-year (2016–2020), 10-year (2011–2020), and the historical averages (1997–2020) at 854, 706, and 804 respectively. The 2021 harvest of king salmon (191 fish) was also significantly lower than the 5-year (685), 10-year (604), and the historical averages (791).

As previously mentioned, the number of subsistence salmon permits issued in the Naknek River drainage has remained relatively consistent over time as illustrated through the previous 5-year (2016–2020) average of 263 permits, the 10-year (2011–2020) average of 269 permits, and the historical average (1997–2020) of 287 permits (Table 2-4). The average number of salmon harvested per permit has also remained relatively stable since 1997. The average salmon harvested per permit in 2020 was 85 and in 2021 the average harvest was 78 fish. The 2020 and 2021 average salmon harvest per permit were slightly lower than the previous 5-year (2016–2020) average of 89 salmon per permit, the 10-year (2011–2020) average of 90 fish, and the historical average (1997–2020) of 87 salmon per permit (Table 2-4 and Figure 2-7).

Naknek River Drainage Permit and Harvest Averages by Residency

Table 2-5 reports the number of subsistence permits issued by residency for the Naknek River drainage, 1997–2021. Table 2-6 provides the estimated number of salmon harvested per subsistence permit issued in the Naknek River drainage, 1997–2021. In 2021, the number of permits issued by place of residency was the lowest amount for each area of residence since 1997 (56 permits were issue for Naknek residents, 51 for King Salmon, 13 for South Naknek, and 76 for other Alaska) (Table 2-5). The average number of permits issued during the previous 5-year period (2016–2020) by place of residency is as follows: 84 permits issued to Naknek residents, 71 to King Salmon residents, 16 to South Naknek residents, and 92 permits issued to other Alaska residents (Table 2-5).

The number of permits issued for residents of the Bristol Bay Brough has decreased slightly over time, while the number of permits issued to other Alaska residents has increased slightly since 1997. The historical average (1997–2020) of 206 permits issued to local Bristol Bay Borough residents declined to

182 permits for the 10-year period (2011–2020), and further declined to 171 permits for the more previous 5-year average (2016–2020). The historical average (1997–2020) of 82 permits issued to other Alaska residents increased to 87 for the 10-year period (2011–2020), and the most previous 5-year average (2016–2020) was 92 permits issued (Table 2-5).

In contrast, the estimated number of salmon harvested per permit by local Bristol Bay Borough residents is higher than the number of salmon harvested per permit by other Alaska residents, as illustrated through the previous 5-year (2016–2020) average of 94 salmon harvested per permit by Bristol Bay Borough residents, and 80 salmon harvested per permit by other Alaska residents (Table 2-6) The estimated number of salmon harvested per permit has remained relatively consistent over time for residents of the Bristol Bay Borough as illustrated by the 25-,10-, and 5-year averages of 93 salmon, 95 salmon, and 94 salmon, respectively. Regarding other Alaska residents, the estimated number of salmon harvested per permit has increased, as illustrated by the 25-,10-, and 5-year averages of 70 salmon, 77 salmon, and 80 salmon, respectively (Table 2-6).

Table 2-1.–Number of subsistence permits issued, Kvichak River watershed, Alaska, 1985–2021.

Year	Igiugig	Iliamna/ Newhalen	Kokhanok	Levelock	Nondalton	Pedro Bay	Port Alsworth	Other Kvichak residents	Subtotal, local residents	Other Alaska residents	Total
1985	4	66	15	17	37	20	23	2	184	74	258
1986	6	58	20	21	29	17	24	5	180	3	183
1987	0	57	17	19	29	17	21	0	160	1	161
1988	0	59	22	18	31	14	19	1	164	5	169
1989	4	56	16	17	39	14	18	1	165	5	170
1990	7	49	14	18	37	17	23	1	166	17	183
1991	8	48	17	3	18	26	26	0	146	25	171
1992	4	61	14	16	24	23	27	0	169	33	202
1993	7	57	22	14	49	22	28	0	199	35	234
1994	5	51	21	7	38	17	29	0	168	41	209
1995	7	54	21	15	14	18	28	0	157	44	201
1996	6	60	21	9	28	20	25	0	169	42	211
1997	4	59	16	6	32	14	24	0	155	37	192
1998	4	55	15	6	36	18	29	0	163	42	205
1999	5	45	18	4	26	17	44	0	159	57	216
2000	8	47	22	14	24	10	38	1	164	48	212
2001	8	49	24	9	33	17	30	0	170	37	207
2002	8	53	27	7	20	15	19	0	149	31	180
2003	9	48	26	8	27	11	22	0	151	24	175
2004	6	60	25	3	40	22	25	0	181	25	206
2005	6	48	33	11	33	16	24	0	171	23	194
2006	7	44	28	2	25	21	24	0	151	28	179
2007	6	54	29	1	29	19	30	0	168	28	196
2008	7	58	25	1	28	18	38	0	175	40	215
2009	8	39	27	3	19	21	37	0	154	33	187

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Table 2-1.–Page 2 of 2.

Year	Igiugig	Iliamna/ Newhalen	Kokhanok	Levelock	Nondalton	Pedro Bay	Port Alsworth	Other Kvichak residents	Subtotal, local residents	Other Alaska residents	Total
2010	11	36	26	7	13	20	43	0	156	24	180
2011	14	50	25	9	24	20	50	0	192	20	212
2012	11	43	26	2	30	15	50	0	177	30	207
2013	6	30	28	4	28	16	44	0	156	35	191
2014	6	41	13	9	29	16	47	0	161	39	200
2015	7	40	19	6	22	14	51	0	159	40	199
2016	6	28	23	7	9	13	38	0	124	35	159
2017	4	27	19	2	14	12	39	0	117	41	158
2018	3	35	18	4	14	16	42	0	132	44	176
2019	3	42	17	4	9	15	36	0	126	37	163
2020[a]	2	36	20	0	6	9	41	0	114	38	152
2021[a]	1	27	17	0	2	9	41	0	97	14	111
5-year average (2016–2020)	4	34	19	3	10	13	39	0	123	39	162
10-year average (2011–2020)	6	37	21	5	19	15	44	0	146	36	182
Historical average (1983–2020)	6	48	21	8	26	17	32	0	160	32	192

Source ADF&G Division of Subsistence, Bristol Bay subsistence salmon permit database.

Note For 1985 and 1986, includes a small number of permits issued for fishing in areas outside the Kvichak watershed to local residents.

Note In 1986 through 1989, only local watershed residents were eligible for permits.

Note Due to updates to the database, these data may differ slightly from those published in annual management reports.

a. Data are preliminary.

Table 2-2.–Estimated subsistence harvest of sockeye salmon by community, in numbers of fish, Kvichak River drainage, Bristol Bay, Alaska, 1985–2021.

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna/ Newhalen	Nondalton	Port Alsworth	All local communities	Other [c]	Total
1985	6,600	3,400	12,900	21,900	22,300	14,900	4,500	86,500		86,500
1986	6,400	1,600	6,700	18,300	17,000	6,600	3,300	59,900		59,900
1987	5,700	[a]	7,300	16,500	27,500	11,800	3,200	72,000		72,000
1988	3,500	[a]	5,500	14,400	29,800	20,700	3,200	77,100	[b]	77,100
1989	5,100	1,200	6,700	13,000	24,700	18,500	2,200	71,400	[b]	71,400
1990	4,700	2,200	6,600	12,400	18,800	27,300	3,200	75,200	1,400	76,600
1991	1,029	1,712	9,739	17,184	29,094	4,163	2,755	65,676	1,110	66,786
1992	4,374	1,056	6,932	11,477	29,633	13,163	2,954	69,589	2,559	72,148
1993	4,699	1,397	6,226	18,810	19,067	17,890	3,254	71,343	2,780	74,123
1994	1,467	1,201	8,747	15,771	15,553	15,246	3,074	61,059	3,284	64,343
1995	3,756	497	5,359	14,412	20,134	4,188	2,892	51,238	3,441	54,679
1996	1,120	2,309	5,219	14,011	14,787	11,856	3,263	52,565	2,307	54,872
1997	1,062	2,067	5,501	8,722	19,513	17,194	2,348	56,407	3,101	59,508
1998	2,454	1,659	3,511	10,418	16,165	13,136	2,678	50,021	3,635	53,656
1999	1,276	1,608	5,005	10,725	14,129	17,864	4,282	54,889	2,834	57,723
2000	1,467	1,981	1,815	7,175	6,679	11,953	3,200	34,270	2,720	36,990
2001	908	779	2,118	9,447	8,132	7,566	1,958	30,908	1,901	32,808
2002	625	2,138	2,687	9,847	9,417	5,508	1,201	31,423	1,578	33,001
2003	737	1,081	2,135	9,771	13,824	8,016	1,370	36,934	1,591	38,525
2004	1,000	1,026	4,803	11,869	21,652	8,789	2,455	51,594	1,631	53,225
2005	914	1,017	4,162	16,801	12,010	8,824	2,457	46,185	2,078	48,263
2006	0	1,252	4,319	19,028	11,488	8,885	2,418	47,390	2,460	49,850
2007	102	1,803	5,487	15,106	11,453	7,902	3,211	45,064	2,474	47,538
2008	30	1,558	4,884	14,755	13,569	8,917	3,307	47,020	2,543	49,563
2009	759	1,457	7,802	15,759	9,871	5,709	3,155	44,512	2,260	46,771

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Table 2-2.–Page 2 of 2.

Year	Levelock	Igiugig	Pedro Bay	Kokhanok	Iliamna/ Newhalen	Nondalton	Port Alsworth	All local communities	Other [c]	Total
2010	940	2,901	2,609	13,973	8,815	3,185	3,250	35,673	5,015	40,688
2011	933	1,931	3,898	9,895	15,433	7,947	4,026	44,062	1,164	45,226
2012	750	2,608	4,028	16,530	12,933	9,247	4,420	50,516	1,855	52,371
2013	984	345	3,972	13,392	7,635	10,550	3,379	40,257	2,307	42,564
2014	1,170	513	3,999	6,440	11,388	9,004	4,296	36,810	4,206	41,016
2015	398	1,153	2,519	8,098	9,691	8,722	6,588	37,169	2,109	39,279
2016	1,275	297	2,036	7,103	9,895	2,320	4,090	27,016	3,241	30,257
2017	168	700	1,678	5,430	6,403	6,548	3,638	24,565	3,282	27,847
2018	401	410	1,228	4,558	8,567	4,228	3,753	23,145	2,618	25,764
2019	38	412	1,731	4,708	6,872	1,367	3,778	18,904	2,931	21,835
2020[d]	a	296	1,290	6,942	7,064	1,398	2,633	19,622	2,204	21,826
2021[d]	a	101	765	4,611	5,160	1,478	3,206	15,321	839	16,160
5-year average (2016–2020)	470	423	1,593	5,748	7,760	3,172	3,578	22,650	2,855	25,506
10-year average (2011–2020)	680	867	2,638	8,310	9,588	6,133	4,060	32,207	2,592	34,798
Historical average (1985–2020)	1,910	1,399	4,754	12,352	15,027	10,030	3,213	48,554	2,536	50,737

Sources Weiland et al. (2003:112) for 2000 to 2002; ADF&G (2000:120) for 1985 to 1999. ADF&G Division of Subsistence, ASFDB (ADF&G 2021) for 2002–2021.

Note Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates from before 1991 are rounded to the nearest hundred fish. This table reports harvest estimates as they have appeared in Annual Management Reports. Harvest estimates prior to 1990 are based on the community where the permit was issued; estimates from 1990 to the present are based on community of residence and include fish caught only in the Kvichak District.

a. No permits issued.

b. No permits issued. Only residents of the Naknek/Kvichak watershed could obtain subsistence permits.

c. Subsistence harvests by non-Kvichak River watershed residents.

d. Data are preliminary.

Table 2-3.–Estimated harvests of salmon in the Naknek River drainage, 1997–2021.

	Estimated salmon harvest					
Year	Sockeye	King	Chum	Pink	Coho	Total
1997	27,354	2,304	422	214	1,408	31,702
1998	28,852	1,994	767	884	1,574	34,072
1999	27,592	568	528	159	701	29,549
2000	24,827	736	502	756	858	27,680
2001	24,092	769	551	343	707	26,463
2002	19,297	692	517	717	607	21,830
2003	22,948	1,080	233	195	672	25,128
2004	17,488	949	419	1,033	493	20,381
2005	20,947	886	205	132	742	22,912
2006	19,247	869	324	749	706	21,895
2007	22,364	664	375	260	1,078	24,742
2008	20,260	684	345	769	1,397	23,456
2009	21,199	350	135	36	648	22,368
2010	21,621	407	220	360	642	23,250
2011	21,938	525	208	55	666	23,392
2012	20,338	607	104	384	396	21,828
2013	19,613	349	225	85	375	20,647
2014	24,439	530	243	368	559	26,139
2015	30,305	604	234	126	792	32,062
2016	22,005	892	249	338	600	24,084
2017	22,770	742	316	155	1,330	25,314
2018	22,956	930	172	178	1,151	25,387
2019	21,514	570	281	90	544	22,999
2020[a]	18,355	289	68	70	645	19,428
2021[a]	14,541	191	111	73	405	15,321
5-year average (2016–2020)	21,520	685	217	166	854	23,442
10-year average (2011–2020)	22,423	604	210	319	706	24,128
Historical average (1997–2020)	22,597	791	319	352	804	24,863

Source ADF&G Division of Subsistence, ASFDB 2021 (ADF&G 2021).

a. Data are preliminary.

Table 2-4.–Estimated subsistence harvest of salmon by community, by individual fish, Naknek River drainage, Bristol Bay, 1997–2021.

Year	Permits issued	King Salmon	Naknek	South Naknek	Subtotal, local residents	Other Alaska residents[a]	Total	Salmon per permit
1997	338	7,368	17,155	298	24,820	6,882	31,702	94
1998	362	6,568	15,682	2,623	24,873	9,198	34,072	94
1999	312	7,059	13,447	2,627	23,133	6,415	29,549	95
2000	350	7,418	11,500	3,311	22,229	5,451	27,680	79
2001	299	6,970	11,540	3,614	22,124	4,339	26,463	89
2002	290	4,628	10,623	3,451	18,702	3,127	21,830	75
2003	316	5,924	10,155	3,607	19,686	5,443	25,128	80
2004	277	4,731	10,227	2,806	17,764	2,617	20,381	74
2005	268	6,258	10,285	2,216	18,759	4,153	22,912	85
2006	289	5,528	10,211	2,467	18,206	3,690	21,895	76
2007	287	5,614	11,156	2,676	19,446	5,296	24,742	86
2008	271	5,599	10,260	2,602	18,462	4,995	23,456	87
2009	279	6,093	10,422	1,215	17,730	4,638	22,368	80
2010	261	6,519	11,450	1,048	19,016	4,233	23,250	89
2011	272	5,697	11,175	1,154	18,026	5,367	23,392	86
2012	280	5,667	10,667	942	17,276	4,552	21,828	78
2013	269	4,821	8,759	1,281	14,860	5,787	20,647	77
2014	270	6,202	11,894	1,695	19,791	6,348	26,139	97
2015	286	7,536	12,457	3,143	23,137	8,926	32,062	112
2016	259	4,017	10,076	1,259	15,352	8,732	24,084	93
2017	283	5,488	10,821	1,554	17,863	7,451	25,314	89
2018	273	6,765	10,254	1,280	18,299	7,089	25,387	93
2019	270	5,815	7,628	1,506	14,949	8,050	22,999	85
2020[b]	229	5,127	8,734	296	14,158	5,270	19,428	85
2021[b]	196	3,568	6,055	336	9,958	5,363	15,321	78
5-year average (2016–2020)	263	5,442	9,503	1,179	16,124	7,318	23,442	89
10-year average (2011–2020)	269	5,713	10,247	1,411	17,371	6,757	24,128	90
Historical average (1997–2020)	287	5,976	11,107	2,028	19,111	5,752	24,863	87

Source ADF&G Division of Subsistence, ASFDB 2021 (ADF&G 2021)

Note Harvests are extrapolated for all permits issued, based on those returned.

a. Subsistence harvests by non-Nanknek River residents.

b. Data are preliminary.

Table 2-5–Number of subsistence permits issued, Naknek River drainage, Bristol Bay, 1997–2021.

	Number of permits issued					
Year	King Salmon	Naknek	South Naknek	Subtotal, local residents	Other Alaska residents[a]	Total
1997	105	133	6	244	94	338
1998	99	115	34	248	114	362
1999	96	102	38	236	76	312
2000	109	102	42	253	97	350
2001	90	104	37	231	68	299
2002	80	100	39	219	71	290
2003	90	109	39	238	78	316
2004	83	101	34	218	59	277
2005	81	99	31	211	57	268
2006	75	104	33	212	77	289
2007	92	90	26	208	79	287
2008	75	97	26	198	73	271
2009	72	99	27	198	81	279
2010	77	98	21	196	65	261
2011	71	97	22	190	82	272
2012	80	104	18	202	78	280
2013	75	91	19	185	84	269
2014	74	95	22	191	79	270
2015	84	92	22	198	88	286
2016	72	82	18	172	87	259
2017	74	100	17	191	92	283
2018	74	87	18	179	94	273
2019	66	76	19	161	109	270
2020[b]	68	77	8	153	76	229
2021[b]	51	56	13	120	76	196
5-year average (2016–2020)	71	84	16	171	92	263
10-year average (2011–2020)	74	90	18	182	87	269
Historical average (1997–2020)	82	98	26	206	82	287

Source ADF&G Division of Subsistence, ASFDB 2021 (ADF&G 2021)

Note Harvests are extrapolated for all permits issued, based on those returned.

a. Subsistence harvests by non-Nanknek River residents.

b. Data are preliminary.

Table 2-6–Estimated number of salmon harvested per subsistence permits issued, Naknek River drainage, Bristol Bay, 1997–2021.

	Estimated salmon per permit					
Year	King Salmon	Naknek	South Naknek	Subtotal, local residents	Other Alaska residents[a]	Total
1997	70	129	50	102	73	94
1998	66	136	77	100	81	94
1999	74	132	69	98	84	95
2000	68	113	79	88	56	79
2001	77	111	98	96	64	89
2002	58	106	88	85	44	75
2003	66	93	92	83	70	80
2004	57	101	83	81	44	74
2005	77	104	71	89	73	85
2006	74	98	75	86	48	76
2007	61	124	103	93	67	86
2008	75	106	100	93	68	87
2009	85	105	45	90	57	80
2010	85	117	50	97	65	89
2011	80	115	52	95	65	86
2012	71	103	52	86	58	78
2013	64	96	67	80	69	77
2014	84	125	77	104	80	97
2015	90	135	143	117	101	112
2016	56	123	70	89	100	93
2017	74	108	91	94	81	89
2018	91	118	71	102	75	93
2019	88	100	79	93	74	85
2020[b]	75	113	37	93	69	85
2021[b]	70	108	26	83	71	78
5-year average (2016–2020)	77	113	70	94	80	89
10-year average (2011–2020)	77	114	74	95	77	90
Historical average (1997–2020)	74	113	76	93	70	87

Source ADF&G Division of Subsistence, ASFDB 2021 (ADF&G 2021)

Note Harvests are extrapolated for all permits issued, based on those returned.

a. Subsistence harvests by non-Nanknek River residents.

b. Data are preliminary.

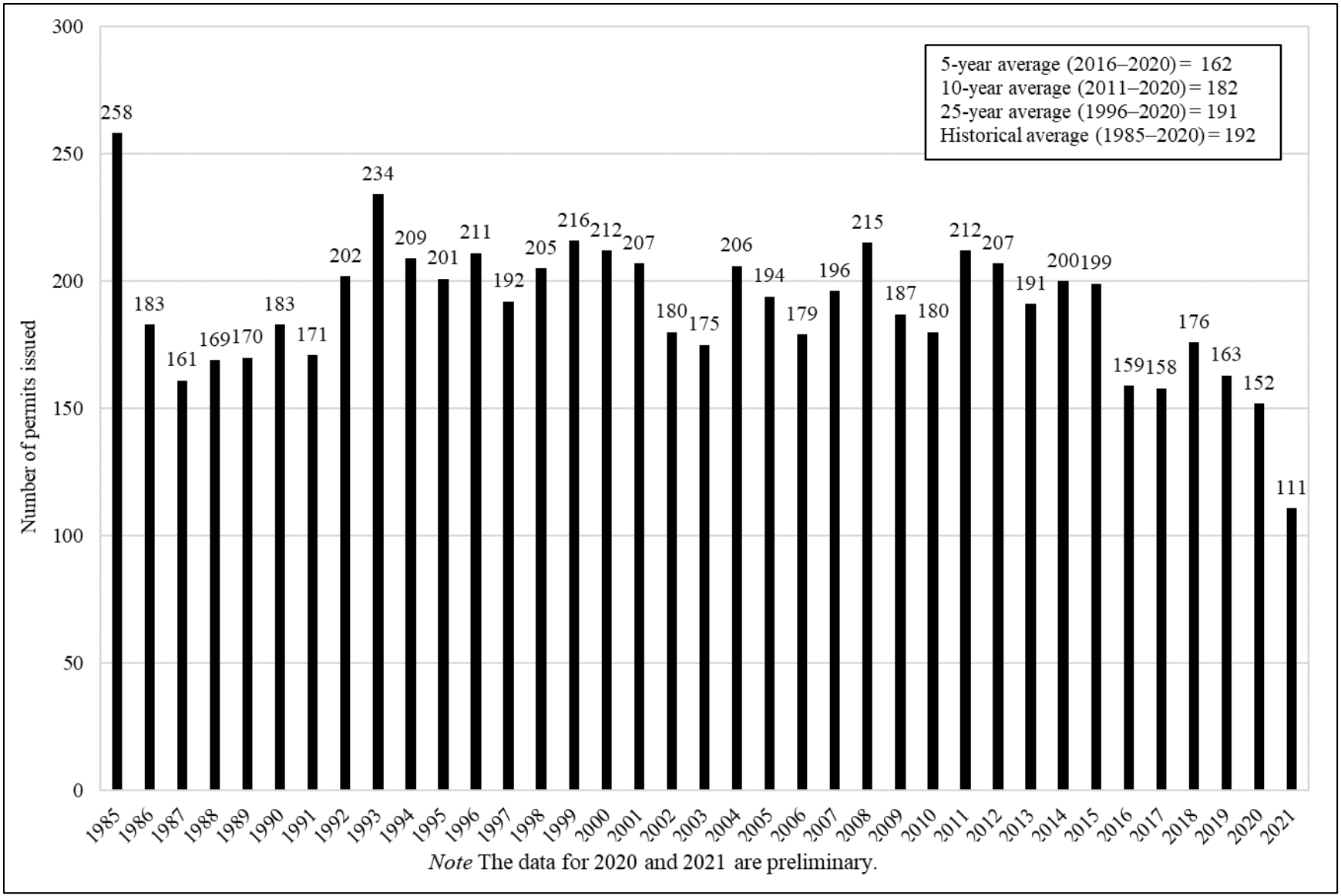

Figure 2-1.–Number of subsistence salmon permits issued, Kvichak watershed, Bristol Bay Area, Alaska, 1985–2021.

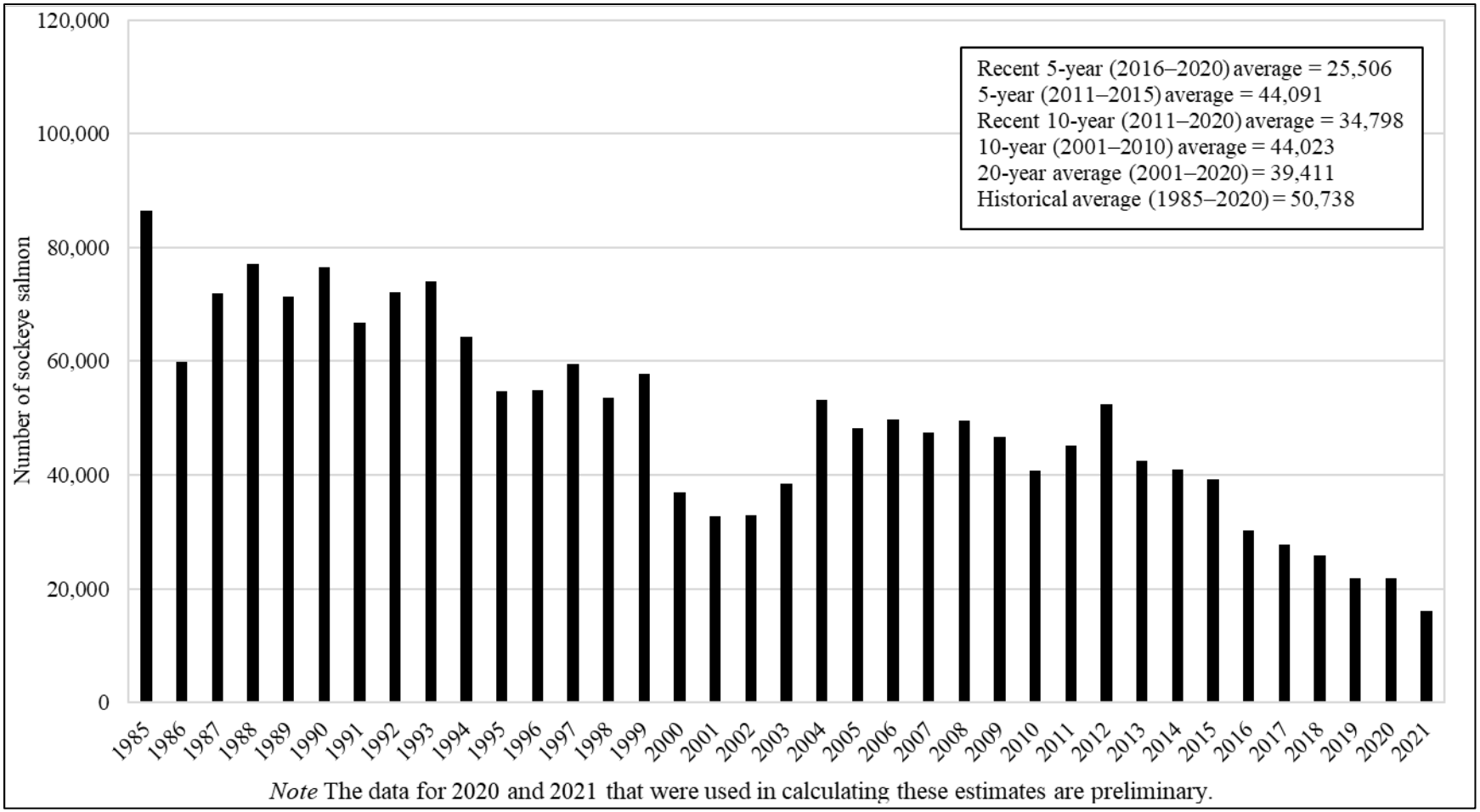

Figure 2-2.–Estimated subsistence harvests of sockeye salmon, Kvichak watershed, Alaska, 1985–2021.

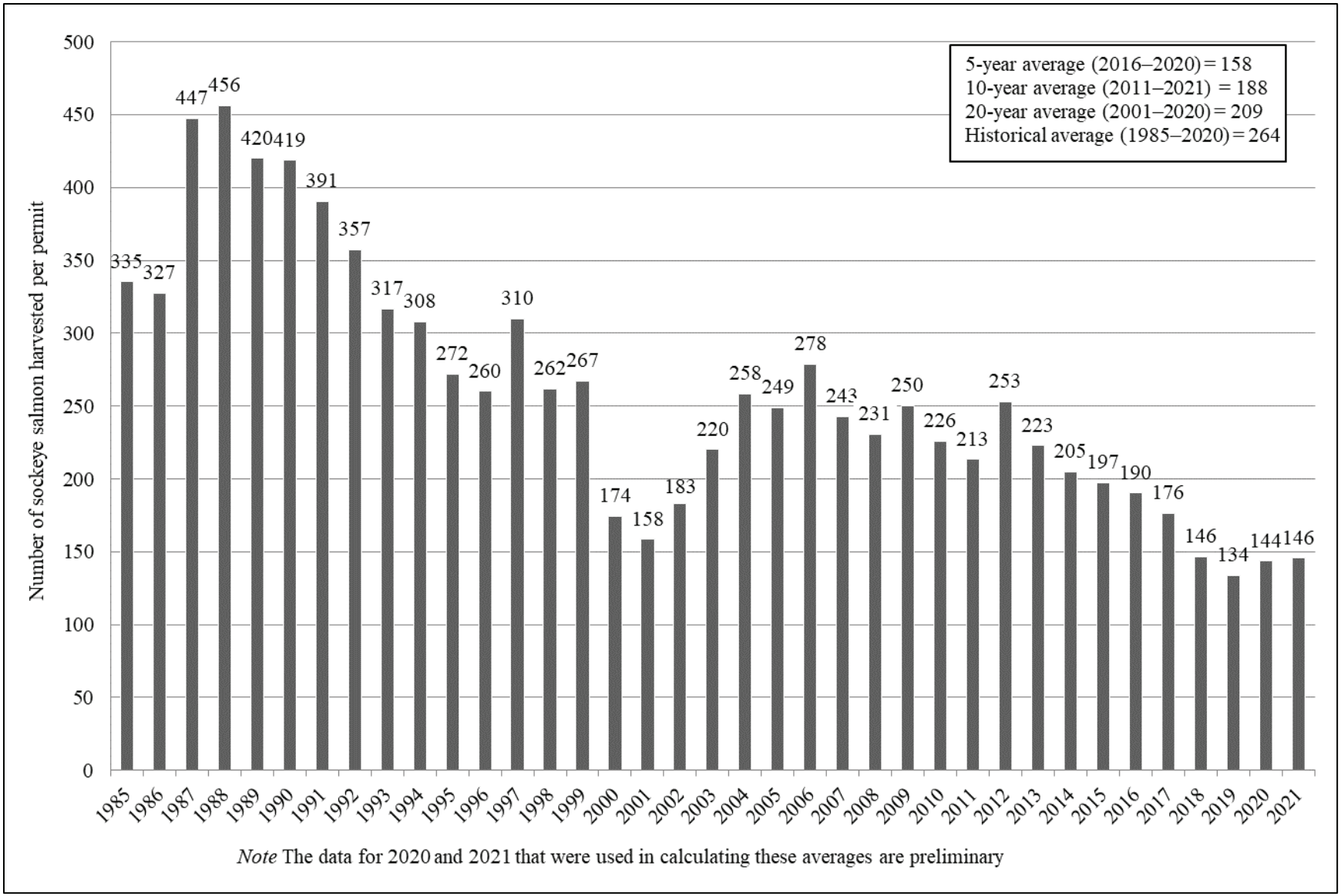

Figure 2-3.–Average subsistence sockeye salmon harvest per permit, Kvichak watershed, Alaska, 1985–2021.

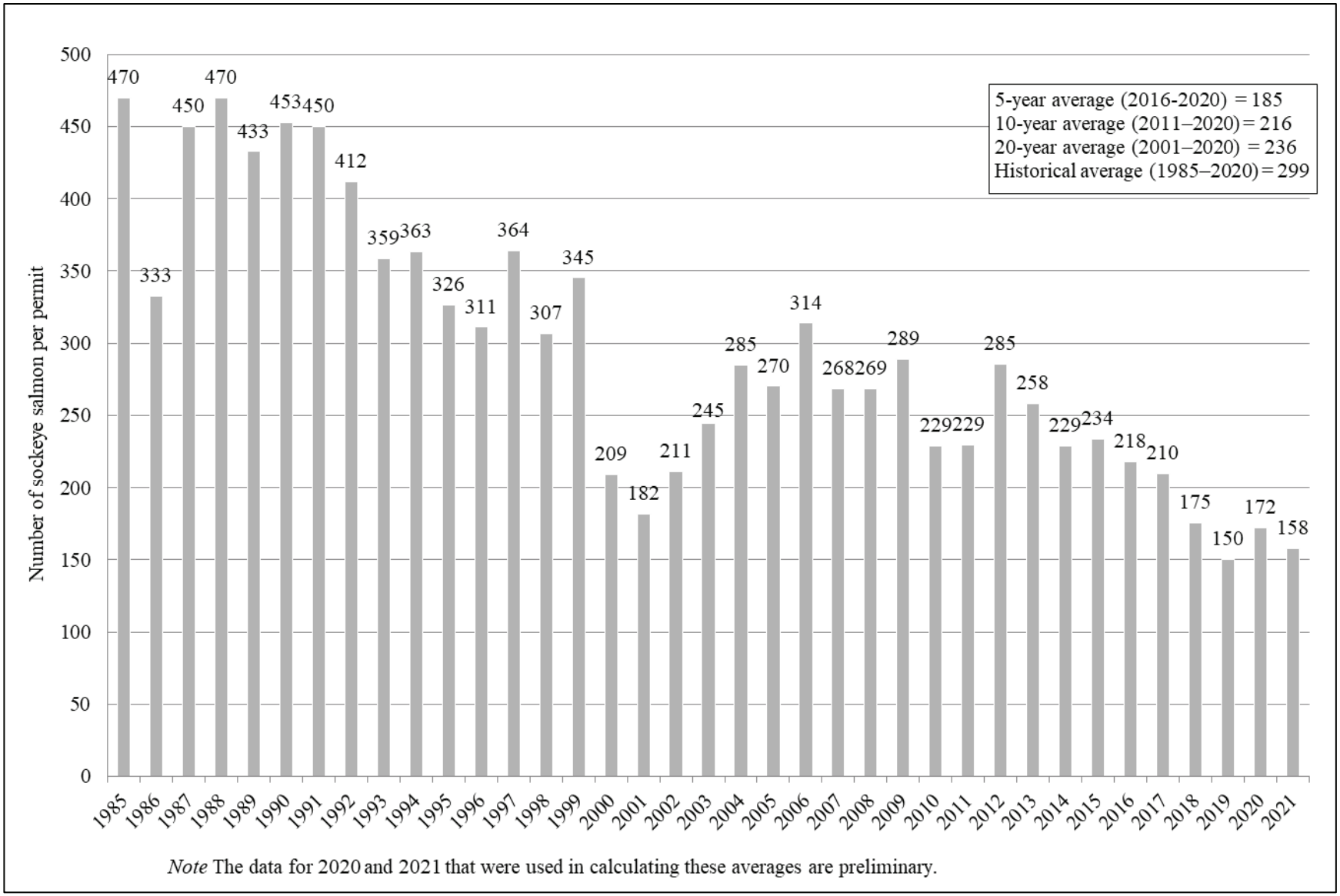

Figure 2-4.–Average subsistence sockeye salmon harvest per permit, local community residents, Kvichak River watershed, Alaska, 1985–2021.

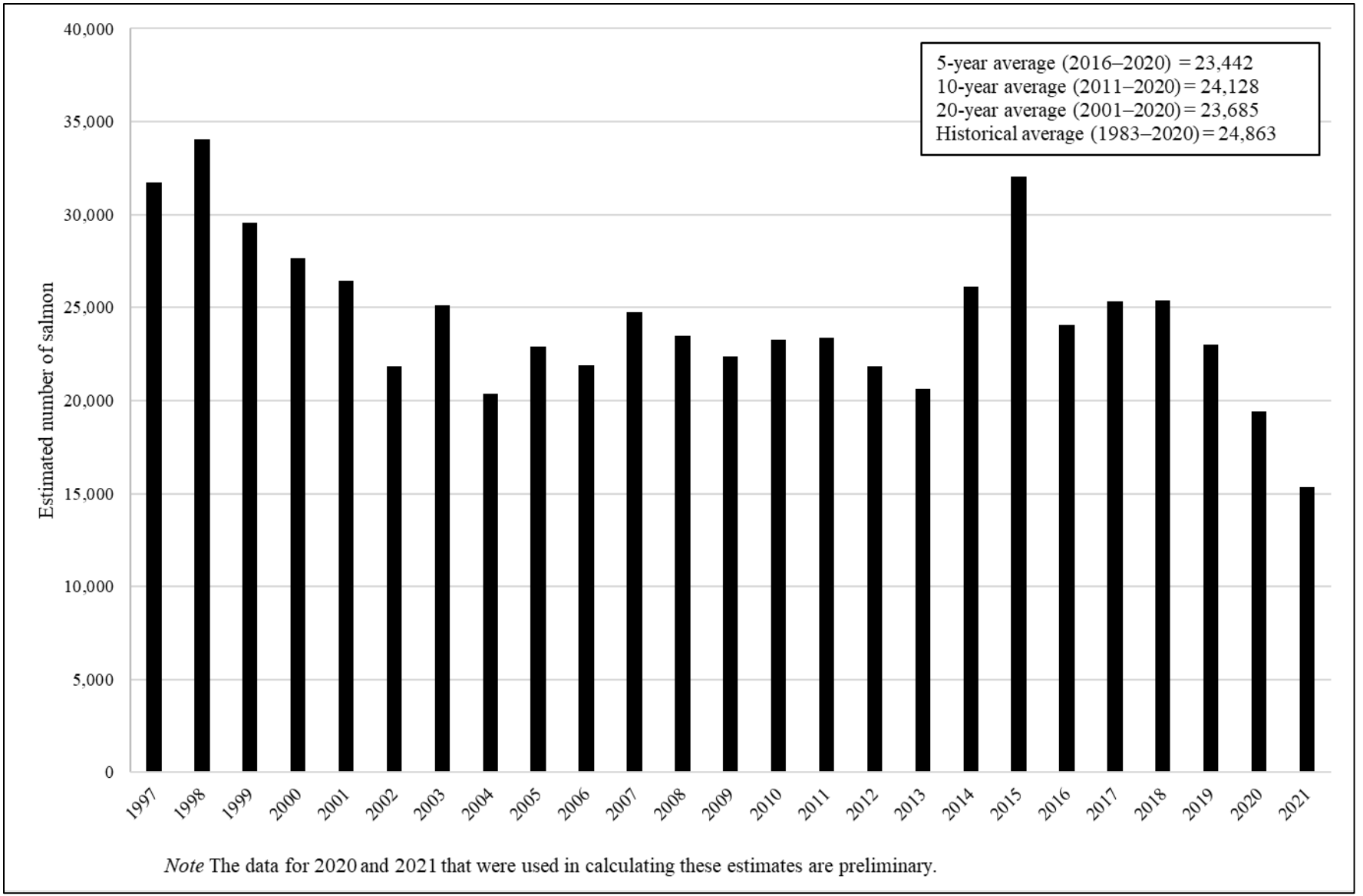

Figure 2-5.–Estimated subsistence harvests of salmon, Naknek River drainage, 1997–2021.

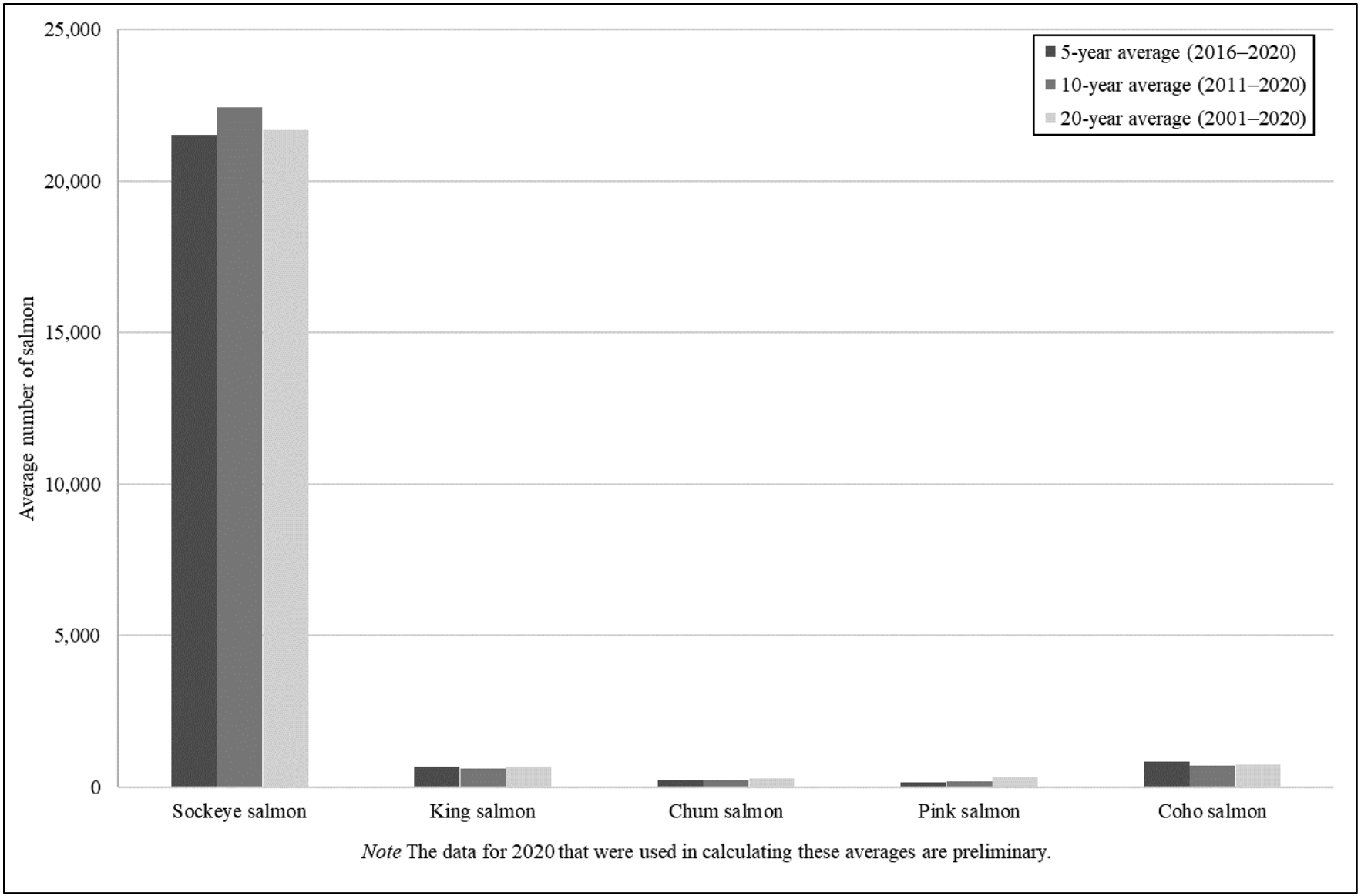

Figure 2-6.–Average number of salmon harvested in the Naknek River drainage, 2001–2020.

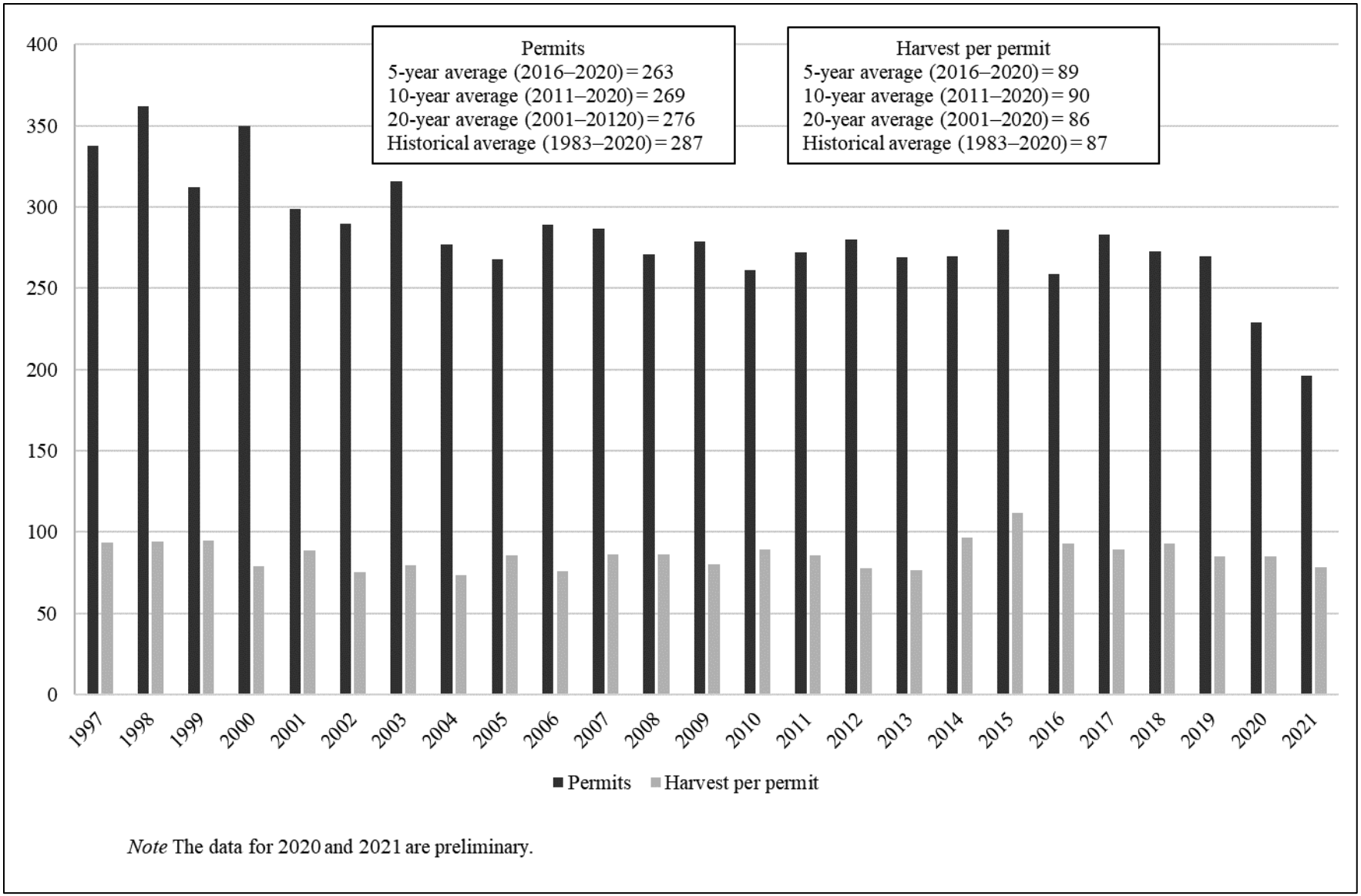

Figure 2-7.–Number of permits issued in the Naknek River, 1997–2021.

3. NUSHAGAK SALMON SUBSISTENCE FISHERY

Communities and Population

The communities in the Nushagak District and their 2021 estimated populations include Dillingham (2,209), Manokotak (477), Aleknagik (191), New Stuyahok (480), Ekwok (103), Clarks Point (which also includes Ekuk) (75) and Koliganek (176) (Table 1-1). The most recent household-based salmon research occurred in these communities in 2008, 2013, and 2014 (Halas and Cunningham 2019; Holen et al. 2012b).

General Patterns of Subsistence Harvests

In 2021, based on permit returns, 55,350 salmon were harvested in the Nushagak District (Table 3-1). The 2021 harvest is higher than the 5-year (2016–2020), 10-year (2011–2020), and the historical averages (1985–2020) at 50,976, 50,119 and 51,853 respectively. As Figure 3-1 shows, the salmon harvest in the Nushagak District is varied across species, with sockeye salmon composing most of the 2021 salmon harvest (see also Appendix Table B1). Figure 3-1 illustrates the previous 5-, 10-, and 20-year harvest averages of the five Pacific salmon species in the Nushagak District. Table 3-1 shows the historical harvest by community from 1985–2021. In 2021, the number of king salmon harvested in the Nushagak District (5,349) was the lowest harvest amount on record. The 2021 harvest of king salmon was significantly lower than the 5-year (2016–2020), 10-year (2011–2020), and the historical averages (1985–2020) at 11,677, 12,097, and 12,485 respectively.

Table 3-1 and Figure 3-2 report estimated subsistence salmon harvests based on permit return data from the Nushagak District watershed for the period 1985–2021. Since 1985 and prior to 2014, salmon harvests have shown an overall decline in the Nushagak District, from a high of 86,400 fish in 1986 to a low of 37,960 salmon in 2012. However, the 2021 harvest of 55,350 salmon was higher than the previous 5-year (2016–2020) average of 50,976 salmon, the 10-year (2011–2020) average of 50,119, and the historical average (1985–2020) of 51,853 salmon (Table 3-1 and Figure 3-2).

Table 3-2 presents the estimated subsistence harvest of salmon by community, by number of fish, and number of permits issued from 1985–2021. The greatest number of permits issued since the inception of the permit program occurred in 2021 when 656 permits were issued. This is higher than the 5-year average of 599 permits, and higher than the 10-year (580) and historical (522) averages of permits issued (Table 3-2). As illustrated in Figure 3-3, average salmon harvests per subsistence permit (expanded to estimate harvest by nonreturned permits holders) in the Nushagak District began to decline in 1993, even though the number of permits issued increased. The average salmon harvests per subsistence permit reached a low of 73 fish per permit in 2012 (see also Table 3-2). A slight increase appeared in 2013 (93 fish per permit) and then the average decreased again to 78 fish per permit in 2015. In 2021 the average salmon per permit was 84, which is comparable to the previous 5-year average (2016–2020) of 85 fish per permit, and slightly lower than the 20-year average (2001–2020) of 88 salmon per permit. The historical average (1985–2020) of harvest per permit was 101 fish (Table 3-2). Overall, permits issued have increased for the Nushagak District (Figure 3-3). Since the most recent lowest year in 2006 (461 permits), permits have steadily risen. The number of permits issued has been over 581 since 2014 with a peak of 656 permits issued in 2021.

As mentioned above, king salmon returns and subsistence harvests are larger in the Nushagak River than in the other Bristol Bay watersheds. Technical Paper 453 by the Division of Subsistence funded under the Chinook Salmon Research Initiative (CSRI) project documented local and traditional knowledge of the subsistence salmon fishery of Dillingham, Clarks Point, Ekwok, New Stuyahok, and Koliganek. This multi-year study incorporated three years of harvest survey information for these communities (Halas and Cunningham 2019).

The Nushagak District continues to produce more king salmon for subsistence than all other Bristol Bay districts combined. In 2021, 5,686 king salmon were harvested for subsistence in the entire BBA, with 5,349 exclusively in the Nushagak. In addition, for 2021, 43,712 sockeye, 1,077 chum, 5,133 coho, and 79

pink salmon (which are strongest in even-numbered years) were harvested in the Nushagak (Appendix Table B1, Appendix Table B2).

Nushagak Noncommercial Harvest

The Nushagak District subsistence salmon harvest requires, by regulation, that permit holders record the date and areas of all salmon harvested. The district includes the following areas identified as general subsistence use locations: Igushik/Snake River, Nushagak Bay Commercial, Nushagak Bay Noncommercial, Nushagak River, Wood River, and "site unknown." Each subsistence permit should have more specific harvest location information identified by the permit holder. Within the Nushagak Bay Noncommercial category are the local areas known as the "Dillingham beaches," which include Snag Point, and the Scandinavian, Kanakanak, and "City Dock" areas. Also included are both sides of the lower Wood River from Red Bluff (59º 9.58″ N. lat. 158º 32.36″ W. long), and the Nushagak River to Lewis Point (58º 59.46′ N. lat. 158º 05.57′ W. long).

Nushagak noncommercial areas produced the largest proportion of subsistence salmon harvest within the district (29,302 estimated salmon for 2021) and had the highest portion of issued permits (63%) (Appendix Table B2). Figure 3-4 shows salmon harvests by Bristol Bay and non-Bristol Bay residents within this area and includes the totals for each group combined for the lower Wood River and the Nushagak Bay noncommercial areas. The harvest per permit for Bristol Bay residents has remained stable since 1997, with a 5-year average of 82 fish (2016–2020) and a 10-year average of 77 fish (2011–2020). Likewise, the non-Bristol Bay residents (other Alaskans) harvest per permit is also stable over time, with a 5-year average of 45 fish per permit and a 10-year average of 46 fish. Similarly, for permits fished in the lower Wood River and the noncommercial areas, Bristol Bay residents were issued 213 permits (5-year average 2016–2020), a slight decrease than the 10-year average (2011–2020) of 237 permits. For other Alaskan residents who fish Bristol Bay for subsistence, permits issued have increased from 55 for a 10-year average, to 69 for a 10-year average (Figure 3-5). In 2021 a total of 412 permits were issued, 243 were issued to Bristol Bay residents and 169 were issued to other Alaskan residents (Figure 3-5).

Table 3-3 shows the estimated historical (1997–2020) subsistence salmon harvests for the lower Wood River and the noncommercial areas by species. Non-Bristol Bay residents harvested on average (2016–2020) 281 king salmon (8%), compared to 3,415 (92%) harvested by Bristol Bay residents. The same pattern can be seen for all species combined. Other Alaskan residents, over the last 10 years, have harvested 12% of all the subsistence salmon in the above-mentioned specific areas around Dillingham and the lower Wood River, compared to 88% harvested by Bristol Bay residents.

Table 3-1.–Estimated harvests of salmon in the Nushagak District subsistence fishery, 1985–2021.

	Estimated salmon harvest					
Year	Sockeye	King	Chum	Pink	Coho	Total
1985	38,000	7,900	4,000	600	6,100	56,600
1986	49,000	12,600	10,000	5,400	9,400	86,400
1987	40,900	12,200	6,000	200	6,200	65,500
1988	31,086	10,079	8,234	6,316	5,223	60,938
1989	34,535	8,122	5,704	407	8,679	57,447
1990	33,003	12,407	7,808	3,183	5,919	62,320
1991	33,161	13,627	4,688	292	10,784	62,552
1992	30,640	13,588	7,076	3,519	7,103	61,926
1993	27,114	17,709	3,257	240	5,038	53,358
1994	26,501	15,490	5,055	2,042	5,338	54,426
1995	22,793	13,701	2,786	188	3,905	43,373
1996	22,935	15,941	4,704	1,573	5,217	50,370
1997	25,080	15,318	2,056	218	3,433	46,106
1998	25,217	12,258	2,487	1,076	5,316	46,355
1999	29,387	10,057	2,409	124	3,993	45,969
2000	24,451	9,470	3,463	1,662	5,983	45,029
2001	26,939	11,760	3,011	378	5,993	48,080
2002	22,777	11,281	5,096	1,179	4,565	44,897
2003	25,491	18,686	5,064	403	5,432	55,076
2004	17,491	15,610	3,869	1,944	4,240	43,154
2005	23,916	12,529	5,006	793	5,596	47,841
2006	20,773	9,971	4,448	1,591	3,590	40,373
2007	25,127	13,330	3,006	430	3,050	44,944
2008	26,828	12,960	4,552	1,923	5,133	51,395
2009	26,922	12,737	4,510	355	6,777	51,300
2010	22,326	9,150	3,660	1,672	2,983	39,791
2011	28,006	12,461	3,055	230	5,746	49,497
2012	20,587	10,350	3,072	1,309	2,642	37,960
2013	30,283	11,602	4,368	206	7,717	54,176
2014	27,073	16,049	5,731	2,110	7,463	58,425
2015	25,240	12,117	2,953	295	5,644	46,248
2016	27,369	16,502	4,592	4,394	4,766	57,624
2017	31,310	11,122	4,026	257	5,720	52,434

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Table 3-1.–Page 2 of 2.

Year	Estimated salmon harvest					
	Sockeye	King	Chum	Pink	Coho	Total
2018	25,547	12,206	3,635	840	4,735	46,963
2019	28,563	10,206	2,996	267	5,229	47,262
2020[a]	35,379	8,350	2,040	508	4,320	50,597
2021[a]	43,712	5,349	1,077	79	5,133	55,350
5-year average (2016–2020)	29,634	11,677	3,458	1,253	4,954	50,976
10-year average (2011–2020)	27,936	12,097	3,647	1,042	5,398	50,119
Historical average (1985–2020)	28,104	12,485	4,400	1,337	5,527	51,853

Source ADF&G Division of Subsistence, ASFDB 2021 (ADF&G 2021).

a. Data are preliminary.

Table 3-2.–Estimated subsistence harvest of salmon by community, by individual fish, Nushagak District, Bristol Bay, Alaska, 1985–2021.

Year	Permits issued	Dillingham[c]	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other Alaska residents[d]	Total	Salmon per permit
1985	406	22,900	3,600	1,600	7,000	14,500	6,800		56,400	139
1986	424	31,900	5,500	6,900	7,800	26,400	8,200		86,700	204
1987	474	33,500	5,900	3,100	6,400	11,400	4,900		65,200	138
1988	441	29,600 [b]	5,500	2,400	6,100	11,700	5,700	[a]	61,000	138
1989	432	31,800 [b]	5,800	2,000	4,700	9,700	3,800	[a]	57,800	134
1990	441	28,860 [b]	6,600	2,300	4,900	9,900	8,000	700	61,260	139
1991	528	34,399 [b]	5,873	3,043	4,532	8,326	5,438	2,163	63,774	121
1992	476	31,702 [b]	4,317	2,184	5,971	11,325	3,708	2,635	61,842	130
1993	500	25,315 [b]	3,048	2,593	2,936	12,169	4,180	2,538	52,779	106
1994	523	30,145 [b]	3,491	2,289	4,343	8,056	4,513	2,322	55,159	105
1995	484	24,998 [b]	2,453	1,468	2,046	6,911	2,983	2,406	43,265	89
1996	481	27,161 [b]	3,883	1,733	2,866	8,892	3,319	2,113	49,967	104
1997	538	23,255 [b]	3,988	1,989	1,797	6,427	4,179	4,598	46,233	86
1998	562	24,072 [b]	4,069	1,112	3,555	5,419	3,166	4,958	46,351	82
1999	548	26,502 [b]	3,413	1,532	1,805	4,556	2,772	5,389	45,969	84
2000	541	27,931 [b]	3,173	1,111	3,946	3,715	2,792	2,362	45,029	83
2001	554	26,435 [b]	3,700	2,129	2,218	7,294	2,209	4,096	48,080	87
2002	520	25,004 [b]	3,254	1,517	2,735	6,043	3,098	3,247	44,897	86
2003	527	26,955 [b]	4,214	2,044	2,291	10,817	5,721	3,034	55,076	105
2004	511	23,308 [b]	2,052	2,206	1,891	6,714	3,619	3,364	43,154	84
2005	502	21,898 [b]	1,576	1,795	1,388	9,673	8,422	3,088	47,841	95
2006	461	22,081 [b]	1,654	2,047	1,499	6,160	3,885	3,047	40,373	88
2007	496	25,190 [b]	2,443	1,382	1,267	8,284	3,054	3,324	44,944	91

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Table 3-2.–Page 2 of 2.

Year	Permits issued	Dillingham[c]	Manokotak	Aleknagik	Ekwok	New Stuyahok	Koliganek	Other Alaska residents[d]	Total	Salmon per permit
2008	571	27,388 [b]	5,429	3,309	1,902	5,690	4,423	3,255	51,395	90
2009	530	30,117 [b]	2,068	2,646	2,345	6,855	3,700	3,568	51,300	97
2010	528	22,842 [b]	2,665	1,570	1,380	5,608	2,406	3,320	39,791	75
2011	525	26,850 [b]	1,433	3,016	1,805	7,980	3,539	4,875	49,498	94
2012	517	22,037 [b]	1,212	2,457	1,253	5,062	2,834	3,106	37,961	73
2013	590	26,348 [b]	1,378	2,373	2,300	11,890	6,854	3,274	54,417	93
2014	581	31,838 [b]	1,658	3,560	2,700	7,613	4,654	6,403	58,426	101
2015	591	26,049 [b]	2,946	2,186	1,618	5,860	2,085	5,504	46,248	78
2016	643	37,233 [b]	2,486	2,346	1,418	5,716	2,510	5,913	57,624	90
2017	563	30,411 [b]	2,320	2,767	1,622	5,785	2,286	7,243	52,434	93
2018	589	25,867 [b]	722	2,351	965	5,213	2,807	9,037	46,963	80
2019	616	26,944 [b]	1,667	1,257	570	3,889	2,752	10,184	47,262	77
2020[e]	585	29,696 [b]	920	2,076	1,251	4,517	2,723	9,413	50,597	86
2021[e]	656	30,705 [b]	1,044	1,694	1,143	5,351	3,767	11,646	55,350	84
5-year average (2016–2020)	599	30,030	1,623	2,159	1,165	5,024	2,616	8,358	50,976	85
10-year average (2011–2020)	580	28,327	1,674	2,439	1,550	6,353	3,305	6,495	50,143	87
Historical average (1985–2020)	522	27,459	3,233	2,289	2,920	8,224	4,112	4,209	51,861	101

Source ADF&G Division of Subsistence, ASFDB 2021 (ADF&G 2021)

Note Harvests are extrapolated for all permits issued, based on those returned. Harvest estimates prior to 1991 are rounded to the nearest hundred fish.

Note Harvest estimates prior to 1990 are based on the community where the permit was issued; estimates from 1990 to the present are based on community of residence and include fish caught only in the Nushagak District.

a. No permits issued. Only residents of the Nushagak watershed could obtain subsistence permits.

b. Includes permits issued in Clarks Point and Ekuk.

c. Includes the village of Portage Creek and Clarks Point.

d. Subsistence harvests by non-Nushagak watershed residents.

e. Data are preliminary.

Table 3-3.–Estimated historical subsistence salmon harvests, lower Wood River and Nushagak Bay noncommercial fisheries, Alaska, 1997–2021.

	Sockeye			King			Coho		
Year	Bristol Bay resident	Other Alaska resident	Total	Bristol Bay resident	Other Alaska resident	Total	Bristol Bay resident	Other Alaska resident	Total
1997	8,549	1,115	9,664	5,420	325	5,745	1,591	50	1,641
1998	8,535	395	8,930	3,476	146	3,622	2,631	20	2,651
1999	12,929	1,197	14,126	2,267	174	2,441	1,905	158	2,062
2000	10,465	425	10,889	2,782	139	2,921	2,926	28	2,954
2001	9,250	710	9,960	3,492	148	3,641	2,442	114	2,556
2002	7,718	377	8,095	3,567	96	3,663	2,603	78	2,681
2003	8,481	968	9,449	9,282	127	9,409	3,042	73	3,115
2004	8,012	840	8,852	7,892	250	8,142	2,285	21	2,305
2005	8,885	616	9,501	5,124	179	5,303	2,973	227	3,200
2006	9,499	770	10,269	4,184	132	4,316	1,795	181	1,976
2007	12,663	1,418	14,081	6,003	612	6,615	1,581	53	1,634
2008	10,328	1,302	11,630	5,558	442	6,000	2,729	107	2,836
2009	13,442	1,283	14,725	6,592	204	6,795	3,624	233	3,857
2010	9,873	1,283	11,156	3,873	151	4,024	1,588	22	1,610
2011	12,685	1,108	13,793	5,612	321	5,933	3,530	172	3,702
2012	10,082	878	10,961	4,108	217	4,325	1,230	143	1,374
2013	11,708	1,423	13,131	2,972	93	3,065	3,602	166	3,767
2014	9,571	1,940	11,512	5,018	344	5,363	2,586	114	2,701
2015	7,363	1,649	9,012	3,909	186	4,095	2,239	100	2,339
2016	7,133	1,163	8,296	4,538	497	5,035	1,378	47	1,425
2017	10,212	1,803	12,015	3,221	277	3,498	1,837	221	2,057
2018	7,290	2,559	9,850	3,375	349	3,725	1,479	228	1,707
2019	9,501	3,698	13,199	3,327	199	3,525	2,249	63	2,313
2020[a]	15,808	2,695	18,503	2,614	83	2,696	2,467	69	2,536
2021[a]	16,917	7,592	24,509	1,491	135	1,626	2,439	213	2,652
5-year average (2016–2020)	9,989	2,384	12,372	3,415	281	3,696	1,882	126	2,008
10-year average (2011–2020)	10,135	1,892	12,027	3,869	257	4,126	2,260	132	2,392
Historical Average (1997–2020)	9,999	1,317	11,317	4,509	237	4,746	2,346	112	2,458

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Table 3-3.–Page 2 of 2.

Year	Chum			Pink			Total		
	Bristol Bay resident	Other Alaska resident	Total	Bristol Bay resident	Other Alaska resident	Total	Bristol Bay resident	Other Alaska resident	Total
1997	727	68	795	92	0	92	16,380	1,558	17,938
1998	989	39	1,028	746	8	754	16,377	608	16,985
1999	1,005	38	1,043	36	0	36	18,142	1,567	19,709
2000	892	68	960	1,035	5	1,040	18,101	663	18,764
2001	997	76	1,073	127	19	146	16,308	1,067	17,375
2002	1,490	89	1,579	747	52	799	16,125	692	16,817
2003	1,046	55	1,101	75	10	85	21,926	1,234	23,160
2004	1,627	50	1,677	1,176	7	1,184	20,993	1,168	22,161
2005	963	49	1,012	170	6	176	18,114	1,077	19,191
2006	1,603	52	1,655	1,080	41	1,121	18,160	1,177	19,337
2007	1,109	109	1,218	183	1	184	21,539	2,194	23,733
2008	1,465	126	1,591	1,027	11	1,038	21,106	1,988	23,094
2009	2,037	129	2,165	164	4	168	25,858	1,852	27,710
2010	1,326	77	1,403	984	2	986	17,644	1,535	19,179
2011	1,368	107	1,475	166	3	169	23,362	1,711	25,073
2012	1,142	42	1,184	562	90	652	17,125	1,370	18,495
2013	1,128	64	1,193	78	2	80	19,488	1,748	21,236
2014	2,096	172	2,269	990	74	1,063	20,262	2,645	22,907
2015	920	71	992	189	2	191	14,620	2,009	16,629
2016	1,249	133	1,382	951	95	1,046	15,249	1,935	17,183
2017	2,564	135	2,699	114	12	127	17,948	2,447	20,396
2018	1,729	93	1,823	445	55	500	14,319	3,285	17,604
2019	1,076	147	1,223	157	13	171	16,280	4,120	20,400
2020[a]	936	49	985	344	10	354	22,169	2,905	25,073
2021[a]	453	44	497	11	7	18	21,311	7,991	29,302
5-year average (2016–2020)	1,511	111	1,622	402	37	439	17,193	2,938	20,131
10-year average (2011–2020)	1,421	101	1,522	400	36	435	18,082	2,417	20,500
Historical Average (1997–2020)	1,312	85	1,397	485	22	507	18,650	1,773	20,423

a. Data are preliminary.

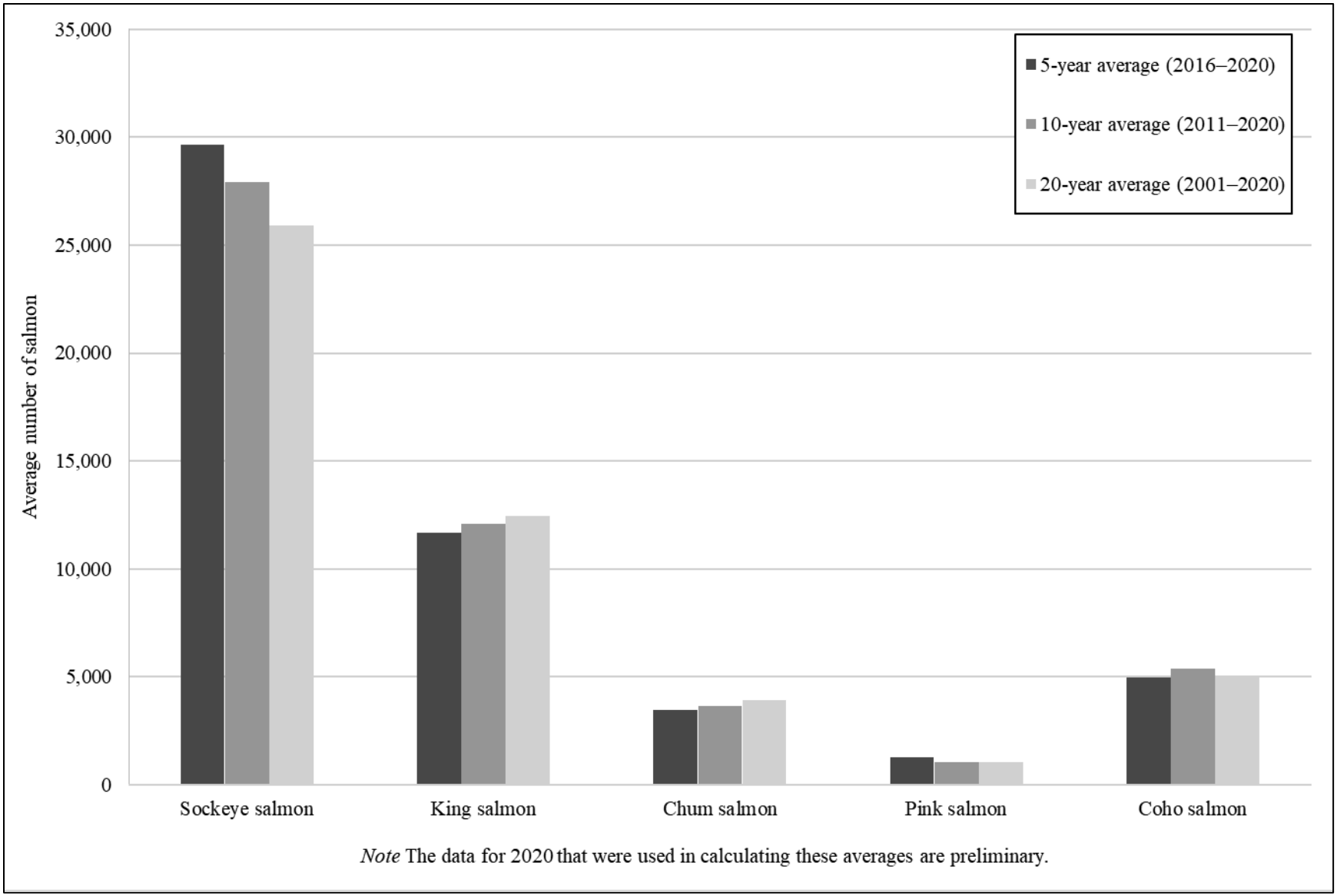

Figure 3-1.–Average number of salmon harvested in the Nushagak District subsistence fishery, Alaska, 1998–2020.

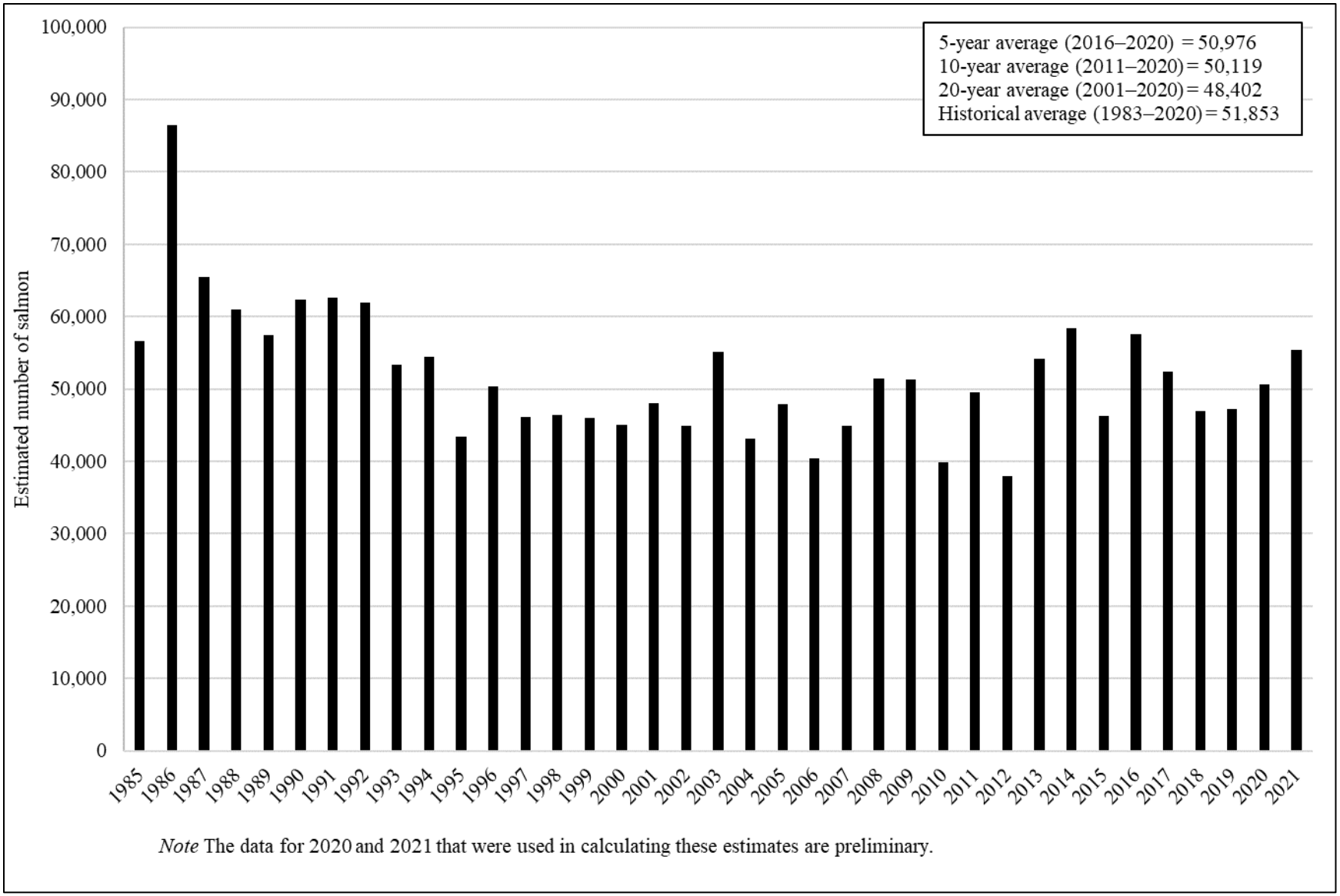

Figure 3-2.–Estimated subsistence harvests of salmon, Nushagak District, Alaska, 1985–2021.

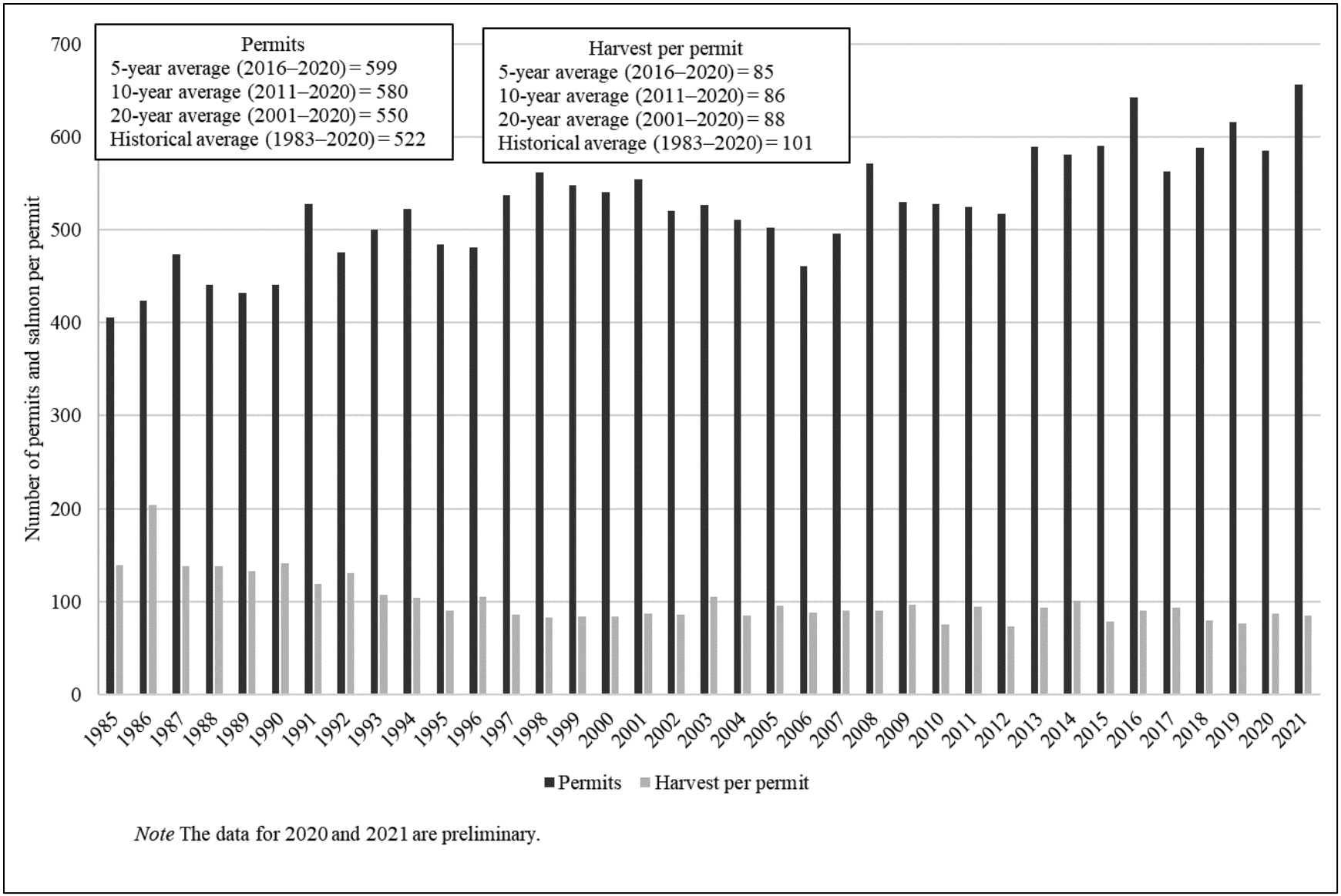

Figure 3-3.–Number of permits issued and harvest per permit in the Nushagak District, Alaska, 1985–2021.

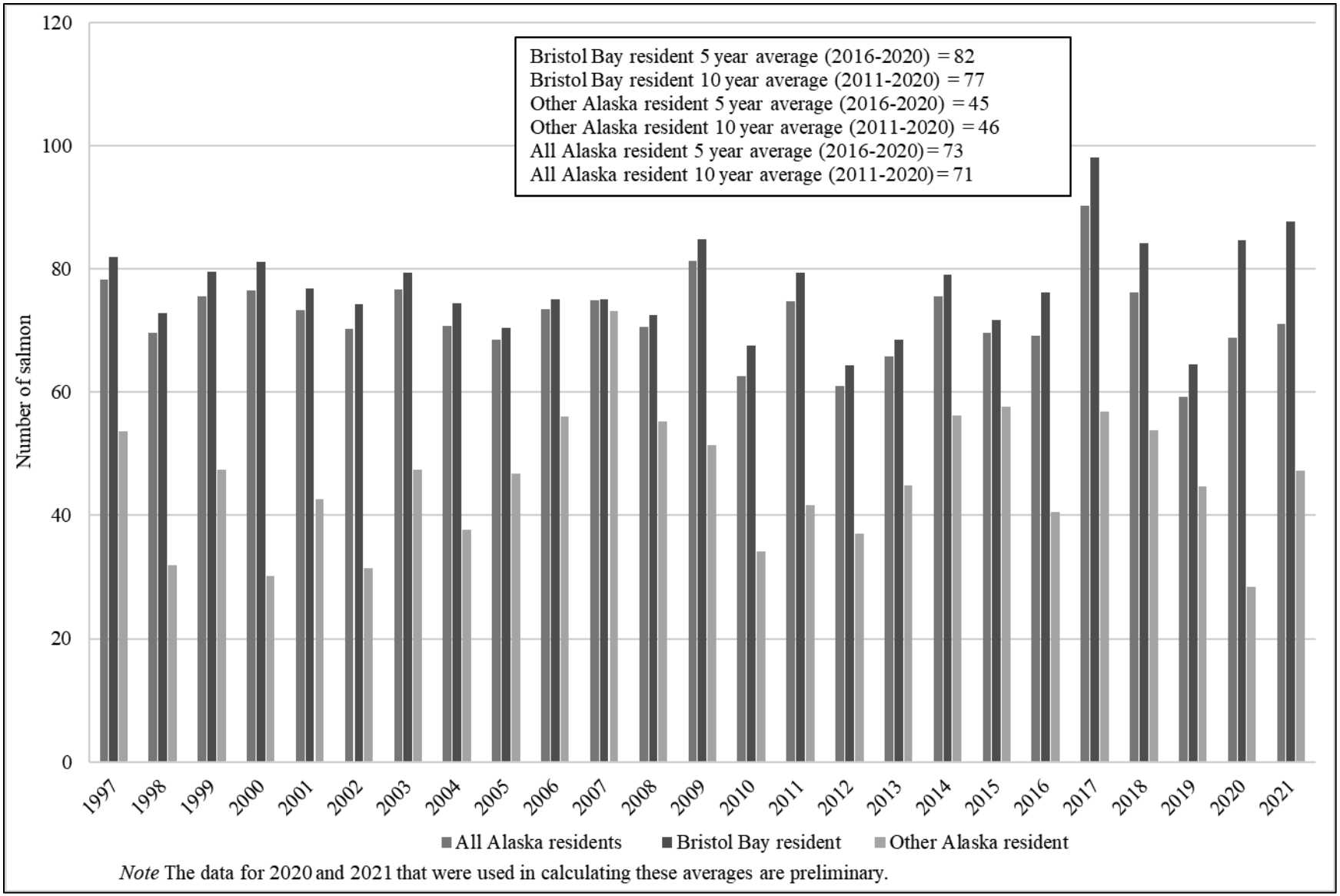

Figure 3-4.–Average harvest per permit, lower Wood River and Nushagak Bay noncommercial subsistence fisheries, Alaska, 1997–2021.

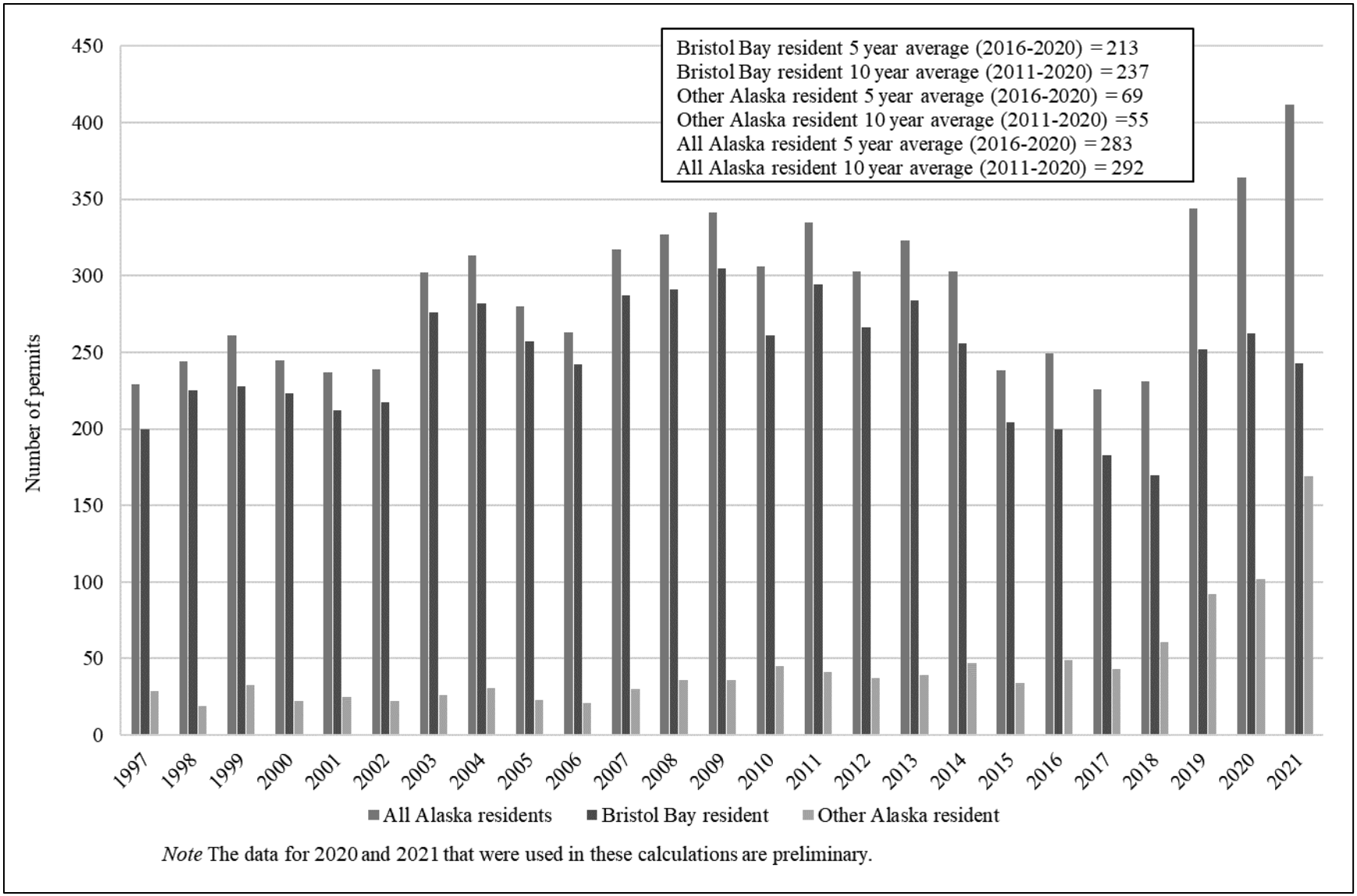

Figure 3-5.– Number of permits issued Lower Wood River and Nushagak Bay noncommercial subsistence fisheries, 1997–2021.

4. EGEGIK SALMON SUBSISTENCE FISHERY

Communities and Population

Egegik is within the Lake and Peninsula Borough (Figure 1-2) and had a 2021 population of 39 people (Table 1-1). The village is within the boundaries of the Egegik commercial fishing district. The most recent household-based subsistence salmon research to take place in Egegik occurred in 2014 and those data may be found in their respective technical reports as well as in the online Community Subsistence Information System (CSIS) (Sill et al. 2022).

General Patterns of Subsistence Harvests

Historical subsistence salmon harvest has been stable in Egegik and dominated by sockeye salmon harvests (Appendix Table B1). The highest year for total estimated salmon harvested was 2013 with a harvest of 2,380 fish. The second highest year was 2011 with 2,264 estimated salmon. The historical (1985–2020) average for all salmon harvested was 2,439 fish, and the previous 5-year (2016–2020) average for salmon harvested was 1,075 (Appendix Table B1). 2021 was the year with lowest number of salmon harvests (399) and the lowest number of permits issued (5) to date; however, at the time of this report, the 2021 data are still preliminary. The number of permits issued have declined over time, with a historical average of 42 permits issued and a 5-year average (2016–2020) of 22 permits issued. Locations of subsistence salmon fishing occur primarily within the district. (Table 4-1).

The majority of permits issued in Egegik are fished by residents from outside of the district. Table 4-2 shows the number of permits issued to Egegik residents and other Alaskan residents from 2008–2021. According to the 10-year average (2011–2020) of 30 permits issued, 22 were issued to other Alaska residents, while 8 were issued to Egegik residents.

Egegik Subsistence Harvest by Location

For the period of 2008–2021, the 2008 and 2009 subsistence permits did not identify specific Egegik salmon harvest locations (Table 4-1). For these two years, Egegik was the general location fished, with sockeye salmon as the primary species harvested, followed by coho. From 2010 onward, more specific harvest locations were identified on permits issued and fished in the Egegik Area. Egegik subsistence permits request location information but leave the specificity up to the individual fisher. The locations reported on subsistence permits by fishers include the Commercial District, Egegik, Coffee Point, Egegik Beach, Egegik District Site Unknown, and the King Salmon River. Based on available data, the only location reported that was outside of the commercial fishing boundary was the King Salmon River. Harvest locations may have also been used east of the boundary of the district which ends on the western side of Egg Island, but no specific place names were given. Since 2014, 15 total permits were fished in the King Salmon River, with an average of 66 salmon harvested per permit (Table 4-1). Most of all other subsistence salmon harvested were taken within the Egegik District and accounted for a total of 407 permits fished from 2008–2021. During this period, sockeye and coho salmon were the main species harvested with total harvests of 14,355 and 3,714 fish, respectively. Since the community of Egegik is within the Commercial District, and subsistence fishing is only open during commercial fishing times, the majority of subsistence salmon harvested are during the commercial openings within the district.[1] Between 2008 and 2021 an average of 37 salmon were harvested per permit in the district, (excluding the locations outside of the commercial fishing boundary: King Salmon River and Egegik District unknown site).

1. Only the Nushagak District has a subsistence regulation that indicates that the commissioner shall (by emergency order) open the subsistence fishery when commercial fishing is closed [5 AAC 01.310(b)].

Egegik Local and Nonlocal Permit Information

Between 2008 and 2021, an average of 8 permits were issued to Egegik residents, compared to an average of 21 permits issued to nonlocal Alaskans (Table 4-2). During the 10-year period 2011–2020, an average of eight permits were issued to Egegik residents, which then declined to seven for the previous 5-year average during 2016–2020. The 10- and 5-year average number of permits issued to other Alaska residents were 22 and 15, respectively. Although other Alaskans who are nonlocal residents travel to Egegik to subsistence fish, this does not necessarily mean they do not have ties to the community; in fact, the opposite is more often the case. Community members regularly mentioned to department staff conducting household-based research in Egegik in 2017 that past residents who no longer live year-round in Egegik maintain strong ties to family as well as to the economy and way of life in the region (Hutchinson-Scarbrough et al. 2020).

Table 4-1.–Estimated subsistence harvest by site, Egegik District, Alaska, 2008–2021.

Year	Site	Permits issued	King	Sockeye	Coho	Chum	Pink	Total	Harvest per permit
2008	Egegik	37	91	1,502	295	35	4	1,928	52
2009	Egegik	26	31	778	133	6	5	953	37
2010	Commercial District	2	1	20	0	0	0	21	11
	Egegik	36	92	1637	275	59	8	2070	58
	Coffee Point	2	3	1	71	1	0	76	38
2011	Commercial District	1	0	0	0	0	0	0	0
	Egegik	36	91	1,772	377	23	2	2,264	63
2012	Egegik	36	37	1,165	178	19	7	1,406	39
	Egegik Beach	3	0	7	12	0	0	19	6
2013	Coffee Point	2	1	69	1	1	0	71	36
	Commercial District	2	2	116	13	0	0	131	66
	Egegik	42	42	1894	168	16	6	2126	51
	Egegik Beach	1	0	30	25	0	1	56	56
2014	Coffee Point	5	0	0	0	0	0	0	0
	Commercial District	1	0	0	0	0	0	0	0
	Egegik	29	133	956	237	4	2	1,333	46
	Egegik District Site (Unknown)	2	0	0	0	0	0	0	0
	King Salmon River	1	17	16	0	0	0	33	33
2015	Coffee Point	2	0	0	0	0	0	0	0
	Commercial District	2	0	41	0	0	0	41	21
	Egegik	12	42	427	250	5	1	725	60
	Egegik Beach	9	17	401	76	13	8	514	57
	Egegik District Site (Unknown)	1	0	0	0	0	0	0	0
	King Salmon River	7	91	384	27	20	4	526	75

-continued-

Table 4-1.–Page 2 of 2.

Year	Site	Permits issued	King	Sockeye	Coho	Chum	Pink	Total	Harvest per permit
2016	Coffee Point	4	0	0	0	0	0	0	0
	Egegik	17	11	292	164	3	0	470	28
	Egegik Beach	3	16	49	3	0	0	68	23
	Egegik District Site (Unknown)	3	0	0	0	0	0	0	0
	King Salmon River	1	0	25	0	0	0	25	25
2017	Coffee Point	2	0	0	0	0	0	0	0
	Egegik	20	19	1,071	430	13	6	1,539	77
	Egegik Beach	1	1	22	0	0	0	23	23
	King Salmon River	2	109	150	0	0	0	259	130
2018	Coffee Point	1	0	0	0	0	0	0	0
	Commercial District	1	0	0	0	0	0	0	0
	Egegik	15	21	386	489	8	7	911	61
	Egegik Beach	5	27	153	59	8	2	249	50
	Egegik District Site (Unknown)	2	0	0	0	0	0	0	0
2019	Coffee Point	1	34	97	0	0	0	131	131
	Egegik	20	5	553	284	1	0	842	42
	King Salmon River (Egegik)	4	0	120	0	5	2	127	32
2020[a]	Egegik	17	11	530	157	0	0	698	41
	Egegik Beach	1	2	30	0	2	0	34	34
2021[a]	Egegik	5	24	355	20	0	0	399	80

Source ADF&G Division of Subsistence.

a. Data are preliminary.

Table 4-2.–Number of subsistence permits issued, Egegik District, Alaska, 2008–2021.

	Number of permits issued		
Year	Egegik resident	Other Alaska resident	Total
2008	11	26	37
2009	8	18	26
2010	10	27	37
2011	10	27	37
2012	9	29	38
2013	10	34	44
2014	8	28	36
2015	6	26	32
2016	14	12	26
2017	2	21	23
2018	8	14	22
2019	6	18	24
2020[a]	5	12	17
2021[a]	2	3	5
5-year average (2016–2020)	7	15	22
10-year average (2011–2020)	8	22	30

Source ADF&G Division of Subsistence

a. Data are preliminary.

5. UGASHIK SALMON SUBSISTENCE FISHERY

Communities and Population

The Ugashik District contains the community of Pilot Point with a population of 59 (2021). The community of Ugashik is upstream of the Ugashik District and had a 2021 population of 3 (Table 1-1). The most recent household-based subsistence salmon research to take place in Ugashik occurred in 2014, and those data may be found in their respective technical reports as well as in the online Community Subsistence Information System (CSIS) (Sill et al. 2022).

General Patterns of Subsistence Harvests

Subsistence salmon harvest has been stable in the Ugashik District and dominated by sockeye salmon harvests (Appendix Table B1). The highest year for total estimated salmon harvested was 2008 with a harvest of 1,955 fish. The historical (1985–2020) average for all salmon harvested was 1,571 fish, the previous 10-year average (2011–2020) was 986 salmon, and the previous 5-year (2016–2020) average for salmon harvested was 1,033 (Appendix Table B1). A sharp decline was reported for 2020 with only 291 salmon harvested; however, in 2021 the harvest increased to 833 fish. The 2020 harvest amount is likely a result of lower fishing effort due to travel restrictions resulting from COVID-19: in 2020 only 4 permits were issued compared to 17 in 2019 and 15 in 2021. Overall, permits issued have declined with a historical average (1985–2021) of 22 permits issued and a 5-year average of 15 permits issued.

6. TOGIAK SALMON SUBSISTENCE FISHERY

Communities and Population

The Togiak District is home to two communities, Togiak and Twin Hills, with 2021 populations of 807 and 85, respectively (Table 1-1). The most recent household-based subsistence salmon research project to take place in the communities of Togiak and Twin Hills occurred in 2016 and 2017 and those data may be found in their respective technical reports as well as in the online Community Subsistence Information System (CSIS) (Jones et al. 2019).

General Patterns of Subsistence Harvests

The first subsistence gear exception for Bristol Bay, outside of using gillnets, occurred in the Togiak District, where spear fishing was allowed under subsistence regulations. Subsistence drift gillnetting (with a 10-fathom net) may also occur between the mouth of the Togiak River and upstream approximately two miles to a specific line across the river designated by latitude and longitude locations. Appendix Table B1 shows the historical harvest in the Togiak District from 1985–2021. The majority of salmon harvested was sockeye salmon, followed by king salmon. Harvest in the Togiak District has declined slightly, with a 5-year average (2016–2020) of 4,587 salmon from a historical average (1985–2021) of 5,013 estimated salmon. Permits issued have also remained stable with a historical average of 49 permits issued and a 5-year average of 47 permits issued (Appendix Table B1).

7. OTHER SUBSISTENCE FISHERIES

SUBSISTENCE REGULATIONS

The board has determined that all finfishes of the BBA support customary and traditional uses (5 AAC 01.336) with an ANS of 250,000 pounds usable weight. This amount was based upon estimates of nonsalmon fish harvests derived from systematic household surveys conducted by the Division of Subsistence (CSIS; CPDB). The board did not establish ANSs for specific species or more specific stocks of nonsalmon fishes due to the subsistence pattern of use of these resources.

For the most part, subsistence fishing for fishes other than salmon and rainbow trout *O. mykiss* is open year-round in the BBA with gear listed in 5 AAC 01.010. There are no seasonal limits established by regulation. The board repealed a subsistence permit requirement for trout and char in December 2003. The following regulations apply to subsistence fishing for fishes other than salmon in the area:

- Rainbow trout taken incidentally in other subsistence net fisheries or through the ice are lawfully taken and may be retained for subsistence uses [5 AAC 01.310(g)].
- Subsistence fishing with a line attached to a rod or pole is prohibited except when fishing through the ice [5 AAC 01.320(*l*)].
- Subsistence fishing with nets is prohibited in 18 waters of the Kvichak-Iliamna Lake drainage and within one-fourth mile of the terminus of those waters from September 1 through June 14 [5 AAC 01.325(c)].

SUBSISTENCE HARVESTS AND USES

A detailed description of subsistence uses of freshwater fishes in the BBA appears in Fall et al. (1996), and specifically for the Kvichak River watershed in Krieg et al. (2005). Wright and Chythlook (1985) describe uses of Pacific herring *Clupea pallasii* spawn on kelp in the Togiak District. Other previous reports documenting subsistence harvest of freshwater fishes in Bristol Bay include BBNA and ADF&G (1996), Coiley-Kenner et al. (2003), Fall et al. (2006), Hazell et al. (2015), Holen at al. (2011; 2012a), Krieg et al. (2005; 2009), and Jones et al. (2021). Fishes other than salmon generally rank third behind salmon and land mammals in their contribution to total subsistence harvests in Bristol Bay communities.

Although subsistence harvests of fishes other than salmon are not annually monitored by the department, some findings of Division of Subsistence research regarding nonsalmon fishes are summarized in Table 7-1. The majority of households in the general Bristol Bay area use fishes other than salmon for subsistence purposes. Most households also participate in the harvest of these fishes. Harvests, as measured in pounds usable weight per person for available study years, vary from community to community, but are generally substantial. As shown in Figure 1-4 harvests of fishes other than salmon contributed about 9% of the annual subsistence harvests of wild foods in the general Bristol Bay area from 1984–2018. Table 7-1 shows that for communities outside the regional centers (Dillingham and the Bristol Bay Borough) the harvest is about 44 pounds per person. Harvests ranged from a low of eight pounds per person (South Naknek in 2007) to 141 pounds per person (Ugashik in 2014) (Table 7-1). Harvests in five communities exceeded 50 pounds per person per year out of a total of 24 communities. Table 7-2 presents only those nonsalmon fish species reported as both harvested and used by residents of Bristol Bay communities. Harvests and uses of other species may occur.

Generally, nonsalmon fishes taken in the largest quantities in the area include various species of smelt and whitefishes, as well as Dolly Varden *Salvelinus malma*, Arctic grayling *Thymallus arcticus*, and northern pike *Esox lucius*.[5]

[5]. See Fall et al. 1996 for more a more detailed discussion of harvest quantities, as reported, by species and by community.

In the general Bristol Bay area, harvests of nonsalmon finfishes occur throughout the year. Harvest effort by Bristol Bay residents for these fishes is generally lower in the summer because attention is focused on salmon. Spring is an important harvest time for herring, herring spawn on kelp, and smelt. Substantial harvests of nonsalmon fishes occur in winter: effort increases in late winter prior to breakup as temperatures warm and daylight increases. Smelt harvesting is a popular activity in October and in late winter when these fish can be caught by jigging (Holen et al. 2011; Wright et al. 1985).

Many gear types are used to harvest nonsalmon fishes for home use in the general Bristol Bay area. Rod and reel[6] is used for most fish, and some, such as Dolly Varden/Arctic char *S. malma*, herring, and some marine fishes, are removed from commercial catches. Other methods are used, including (but not necessarily limited to) the following:

- Fyke nets ("traps"): Alaska blackfish *Dallia pectoralis*, burbot;
- Set lines: burbot;
- Handline jigging during winter: Arctic grayling, Dolly Varden/Arctic char, lake trout *S. namaycush*, smelt, rainbow trout, whitefishes, northern pike;
- Set gillnets: Arctic grayling, Dolly Varden/Arctic char, lake trout, various species of suckers, rainbow trout, herring, northern pike, burbot, whitefishes;
- Beach seines: Dolly Varden/Arctic char, lake trout, whitefishes, smelt, herring;
- Handlines in summer: Pacific halibut *Hippoglossus stenolepis*, rainbow trout;
- Dipnets: smelt, herring.

Herring spawn on kelp is usually picked by hand, although rakes, knives, and *uluaqs* (woman's knife) are also used (Schichnes and Chythlook 1988:127).

Maps of areas used by Bristol Bay communities to harvest nonsalmon fishes appear in the *Alaska Habitat Management Guide Reference Atlas Series* (ADF&G 1985), in Wright et al. (1985), Krieg et al. (2005) for Kvichak River drainage communities only, Fall et al. (2006), Krieg et al. (2009), Holen et al. (2011), and (Jones et al. 2021). Harvest activities occur throughout the region in most rivers and lakes, as well as along shorelines. It is likely that most effort occurs near each community and near seasonal camps, such as at Kulukak.[7]

BBA residents use a wide variety of methods to process and preserve their harvests of fishes other than salmon. These vary by species and community. Freezing of many species occurs and other methods include the following:

- Arctic grayling: dried, half-dried, fresh frozen, aged frozen and eaten with seal oil;
- Dolly Varden: dried, smoked, half dried (*egamaarrluk*);
- Northern pike: dried, half-dried, fresh frozen, aged frozen and eaten with seal oil;
- Rainbow trout: dried, half-dried, smoked;
- Whitefishes: dried, fresh frozen, aged frozen and eaten with seal oil.

Dried fish are often eaten with seal oil. Some consumption of fat from brown bears *Ursus arctos* with dried fish also occurs. Smelt are fried, boiled, dried, or eaten frozen with seal oil (Fall et al. 1986:100). Herring

6. Respondents to Division of Subsistence harvest surveys generally do not describe or mention that their subsistence fishing efforts occur under state sport fishing regulations or federal subsistence regulations. Therefore, effort could occur under state sport fishing regulations or federal subsistence regulations.
7. See Wright and Chythlook 1985 and Schichnes and Chythlook 1988 for maps of herring camps at Kulukak Bay. For frequency of use of various areas for freshwater fishing by Nushagak River communities, see Schichnes and Chythlook 1991.

are salted or split, dried, and smoked (Schichnes and Chythlook 1988:126). The heads and stomachs of northern pike are boiled and eaten (Schichnes and Chythlook 1991:139). Freshwater fishes that are usually eaten frozen with seal oil also form a category called *kumlaneq*. This includes Arctic grayling, whitefishes, lake trout, and northern pike (Fall et al. 1986:102).

Much traditional knowledge is associated with nonsalmon fishes. For example, a Central Yup'ik taxonomic classification system for freshwater fishes has three entries, and thus three taxa, for the fish that fisheries biologists classify as Dolly Varden char. Distinctions in Central Yup'ik taxonomy depend on the season of harvest; harvest location; condition of the fish; fish appearance; and the harvest, processing, and preparation methods of the fish (Jones et al. 2021).

Table 7-1.–Uses and harvests of fishes other than salmon, Bristol Bay, Alaska communities.

		Percentage of households					Average pounds harvested	
Community	Year[a]	Use	Fish for	Harvest	Receive	Give	Per household	Per person
Aleknagik	2008	78	69	66	50	44	95	26
Clarks Point	2008	100	100	100	73	73	71	34
Dillingham	2010	69	42	41	53	29	23	7
Egegik	2014	75	65	60	24	35	219	77
Ekwok	1987	76	72	62	62	38	229	69
Igiugig	2013	94	78	61	83	61	14	5
Iliamna	2013	79	69	69	59	31	79	30
King Salmon	2007	57	55	49	16	12	15	5
Kokhanok	2005	74	66	66	51	57	137	36
Koliganek	2005	96	93	93	75	68	323	90
Levelock	2005	86	86	86	50	57	71	40
Manokotak	2008	93	80	80	84	56	173	44
Naknek	2007	76	68	65	48	32	47	18
New Stuyahok	2005	88	78	78	67	47	123	28
Newhalen	2013	88	70	67	73	33	38	12
Nondalton	2013	84	73	73	62	60	147	45
Pedro Bay	2013	73	64	46	55	36	41	17
Pilot Point	2014	76	53	53	35	35	118	43
Port Alsworth	2013	41	37	37	14	8	14	4
Port Heiden	2018	41	26	26	26	26	9	3
South Naknek	2007	86	52	52	67	43	16	8
Togiak	2019	97	8	81	91	80	169	338
Twin Hills	2019	95	70	70	70	55	232	75
Ugashik	2014	100	100	100	0	50	177	141

Sources CSIS; BBNA and ADF&G 1996; Coiley-Kenner (2003); Krieg et al. (2005); Fall et al. (2006); Krieg et al. (2009); Holen et al. (2011); Holen et al. (2012); Fall et al. (2013), Evans et al. (2013), and Hazell et al. (2015); Jones et al (*in prep*).

a. Most recent year for which data are available.

Table 7-2.–Nonsalmon finfishes reported to be used for subsistence purposes in the general Bristol Bay Area, Alaska.

Common English name	Scientific name	Yup'ik name(s)	Dena'ina name(s)
Arctic grayling	*Thymallus arcticus*	*Nakrullugpak* *Culugpauk*	*Ch'dat'an*
Alaska blackfish	*Dallia pectoralis*	*Can'giiq*	*Huzhegh*
Burbot	*Lota lota*	*Manignaq* [a] *Atgiaq* [b]	*Ch'unya*
Dolly Varden[c]	*Salvelinus malma*	*Yugyaq* [d] *Anerrluaq* *Anyuk*	*Qak'elay*
Lake trout	*Salvelinus namaycush*	*Cikignaq*	*Zhuk'udghuzha*
Longnose sucker	*Catostomus catostomus*	*Cungartak*	*Duch'ehdi*
Northern pike	*Esox lucius*	*Cuukvak*	*Ghelguts'i*
Rainbow smelt	*Osmerus mordax*	*Iqalluaq*	
Rainbow trout	*Oncorhynchus mykiss*	*Talaariq*	*Tuni*
Broad whitefish[e]	*Coregonus nasus*	*Akakiik*	*Telay*
Humpback whitefish[e]	*Coregonus pidschian*	*Uraruq*	*Q'untuq'*
Round whitefish[e]	*Prosopium cylindraceum*	*Uraruq*	*Hesten*
Least cisco	*Coregonus sardinella*	*Cavirrutnaq*	*Ghelguts'i k'una*
Pacific herring	*Clupea pallasii*	*Iqalluarpak*	
Herring spawn on kelp		*Melucuaq*	
Starry flounder	*Platichthys stellatus*	*Naternaq*	
Pacific halibut	*Hippoglossus stenolepis*	*Naternarpak*	
Pacific cod	*Gadus macrocephalus*	*Ceturrnaq*	
Sculpin	Various species	*Kayutaq*	
Capelin	*Mallotus villosus*	*Cikaaq*	
Yellowfin sole	*Limanda aspera*	*Sagiq*	

Source Fall et al. 1996.

a. Nushagak River villages.

b. Manokotak, Aleknagik, Twin Hills, Togiak.

c. Also includes the closely related Arctic char.

d. At Togiak, Manokotak, and Aleknagik, and perhaps elsewhere, there are 3 Yup'ik names for Dolly Varden/Arctic char. *Yugyak* probably refers to resident Dolly Varden/Arctic char. *Anerrluak* , called "Togiak trout" in the local English dialect, probably refers to anadromous fish taken in fresh water. Finally, *anyuk* , or "sea-run Dollies," are Dolly Varden or Arctic char taken in salt waters. See Fall et al. (1996:16–20) for further discussion of these distinctions.

e. Broad whitefish are rare to absent in the Bristol Bay region. *Akakiik* is the word used at Aleknagik and Manokotak to refer to whitefishes they receive from Kuskokwim River communities, where broad whitefish are common. Humpback whitefish are harvested in the Iliamna Lake subregion and are called *uraruq* . *Uraruq* is also used for round whitefish in the Togiak and Nushagak drainages.

8. CONCLUSIONS

This overview has illustrated the continued importance of subsistence fisheries to the economy and way of life of the Bristol Bay area of Southwest Alaska. Salmon and other fishes provide the largest portion of the substantial subsistence harvests of Bristol Bay communities. In addition to their nutritional and economic value, the subsistence fisheries of the region support cultural and social values that form the foundation of life for Bristol Bay residents. Within the Bristol Bay Area, the Nushagak District ranks highest in subsistence permit use with 656 permits in 2021 (Appendix Table B2). The Naknek-Kvichak District is second highest, with 307 permits in 2021. Togiak District ranks third, with 34 permits issued, and then Ugashik and Egegik districts at 15 and 5 respectively. Similarly, the Nushagak District ranks highest in number of subsistence salmon harvested, followed by the Naknek-Kvichak District, the Togiak District, the Ugashik District, and the Egegik District.

Historically, subsistence harvests of salmon and other fishes have been fairly stable and reliable, especially compared to the cash sector of the local economy. For the Bristol Bay Area, the number of permits issued has remained relatively steady overtime although year-to-year variations occurred. Despite this stability, subsistence salmon permit records demonstrate a decline in subsistence salmon harvests in the Bristol Bay Area. For example, the previous 5-year average number of permits issued (1,099) is the same as the historical average (1,113 permits); however, the previous 5-year average harvest (107,077 salmon) and average salmon harvested per permit (97 salmon) are lower than the historical averages, with 139,608 total salmon harvested and 129,127 salmon per permit in the Bristol Bay Area (Table 1-2). This decline occurred primarily in the Nushagak and Naknek-Kvichak districts and is the result of lower average harvests per permit rather than less participation by local community residents or regulations, further research and analysis is needed to understand why this decline has occurred. Subsistence sockeye salmon harvests in the Kvichak River watershed, including Iliamna Lake and Lake Clark, which were historically the largest component of the Bristol Bay subsistence salmon fishery, declined by more than one-half during the 1990s and early 2000s. The number of sockeye salmon harvested annually since 2016 in the Kvichak River watershed have been the lowest since 1985. Kvichak River watershed subsistence fishers attribute these lowered harvests to poor returns and lower abundance at once reliable traditional harvest locations.

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APPENDIX A: BRISTOL BAY SUBSISTENCE FISHING PERMIT

Alaska Department of Fish and Game
2022 Bristol Bay Subsistence Salmon Fishery Permit

This permit is valid through December 31st, 2022

Permit Number

Last Name | First Name | M.I.

Mailing Address

City | State | Zip Code | Phone Number | Driver's License # | State

Anchorage | AK

E-Mail Address

Names of other household members authorized to fish this permit:

Drainage to be fished:_____

Other _____

Primary fishing location (specific):_____

Permit holders are responsible to verify allowed gear-types and fathoms of net permitted for the area they intend to fish. Click this link for the regulations:
https://www.adfg.alaska.gov/index.cfm?adfg=fishregulations.Subsistence

Gear type you will be using: _____ Other _____

I understand that I am applying for a subsistence fishing permit for my household in accordance with current regulations and hereby swear the information contained on this application is a true statement as witnessed by my signature below; and that I have been an Alaska resident for the last calendar year.

Applicant's signature _____ Date _____

1. Fish caught for subsistence use may not be sold or allowed to enter commercial use.
2. An accurate record of fish taken under authority of this permit must be returned to the Alaska Department of Fish and Game when the permit expires. Failure to return subsistence catch records is grounds for denial of future permit privileges.
3. Commercially-caught salmon may also be utilized for subsistence purposes and must be reported on the back of this form as well as on a Commercial Fish Ticket.

Return form to:
Division of Subsistence, ADF&G, 333 Raspberry Rd, Anchorage, AK 99518 Fax: 907-267-2450
or email dfg.sub.permits@alaska.gov
or online at https://www.adfg.alaska.gov/Harvest/

DAILY SUBSISTENCE SALMON CATCH TOTALS

Please record the dates and locations fished.

Please report spawned-out (red fish) in the "Spawned Red" column.

Online Permit
Permit #: ___
Year: 2022

DID NOT FISH ☐ Name: _____

Date	Location	Gear	Red / Sock-eye	Spawned Red/ Spawned Sockeye	King/ Chi-nook	Dog/ Chum	Hump back/ Pink	Silver/ Coho

Date	Location	Gear	Red / Sock-eye	Spawned Red/ Spawned Sockeye	King/ Chi-nook	Dog/ Chum	Humpback/ Pink	Sil-ver/ Coho

What was your total SUBSISTENCE harvest?

Does not include commercial fish retained for home use.

Record Total Here ▶

Sockeye	Spawned Red	King	Chum	Pink	Coho

Did you COMMERCIAL fish? YES ☐ **NO** ☐

Please record Salmon caught during Commercial Fishing for home use, even if you already recorded it on your fish ticket. Record Total Here ▶

Sockeye	King	Chum	Pink	Coho

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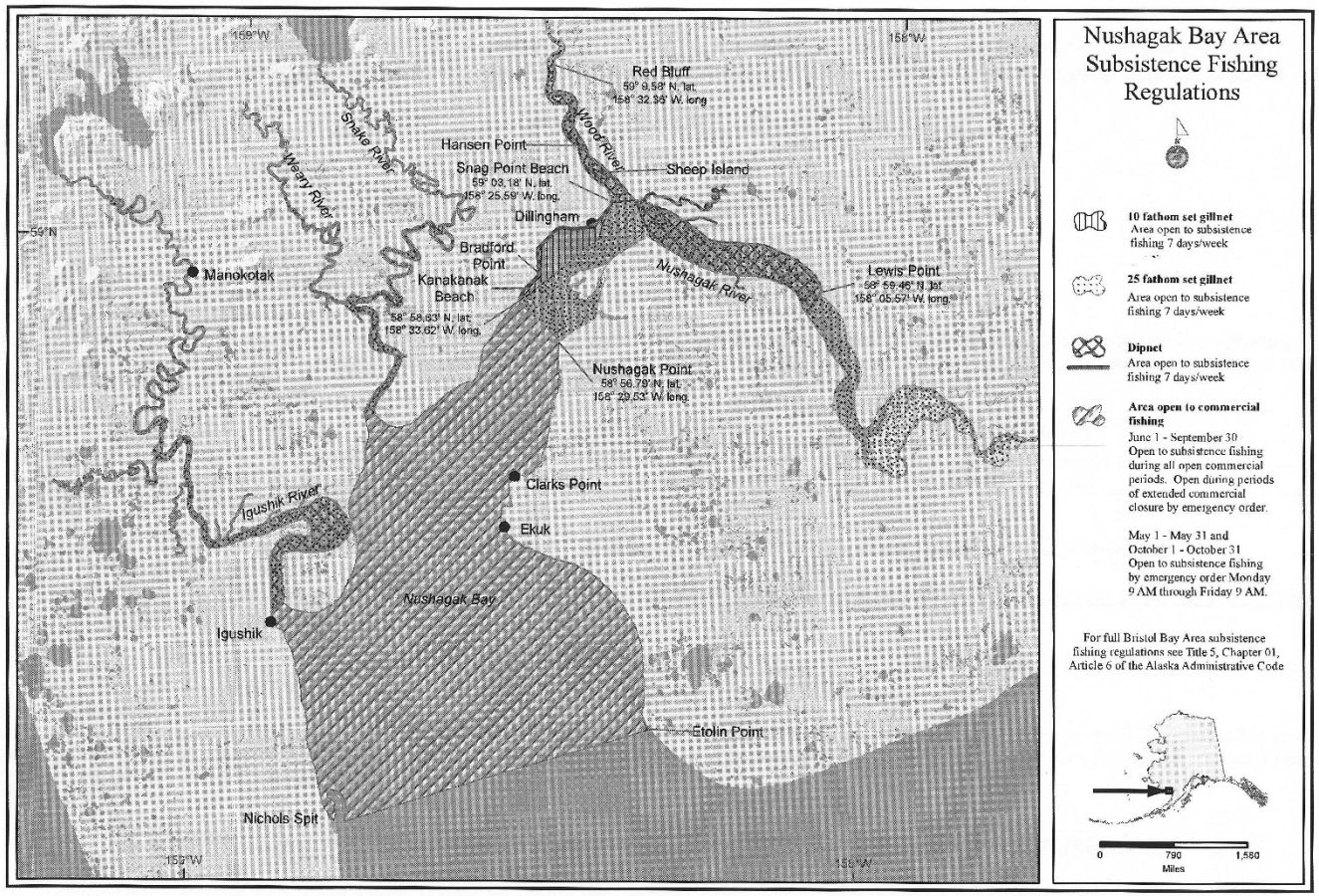
Nushagak Bay Area
Subsistence Fishing
Regulations
10 fathom set gillnet
Area open to subsistence fishing 7 days/week
25 fathom set gillnet
Area open to subsistence fishing 7 days/week
Dipnet
Area open to subsistence fishing 7 days/week
Area open to commercial fishing
June 1 - September 30
Open to subsistence fishing during all open commercial periods. Open during periods of extended commercial closure by emergency order.
May 1 - May 31 and
October 1 - October 31
Open to subsistence fishing by emergency order Monday 9 AM through Friday 9 AM.
For full Bristol Bay Area subsistence fishing regulations see Title 5, Chapter 01, Article 6 of the Alaska Administrative Code
0
790
1,580
Miles
159°W
158°W
59°N
Red Bluff
59° 9.58' N. lat.
158° 32.36' W. long
Hansen Point
Snag Point Beach
59° 03.18' N. lat.
158° 25.59' W. long.
Sheep Island
Wood River
Snake River
Weary River
Dillingham
Bradford Point
Kanakanak Beach
58° 56.83' N. lat.
158° 33.62' W. long.
Manokotak
Nushagak River
Lewis Point
58° 59.46' N. lat.
158° 05.57' W. long.
Nushagak Point
58° 56.78' N. lat.
158° 29.53' W. long.
Clarks Point
Ekuk
Igushik River
Nushagak Bay
Igushik
Etolin Point
Nichols Spit

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APPENDIX B: ADDITIONAL TABLES

Appendix Table B1.–Estimated subsistence salmon harvest by district and species, Bristol Bay, Alaska, 1985–2021.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
Naknek–Kvichak District							
1985	544	107,543	1,179	540	27	1,103	110,392
1986	412	77,283	1,295	695	2,007	650	81,930
1987	407	86,706	1,289	756	490	1,106	90,347
1988	391	88,145	1,057	588	917	813	91,520
1989	411	87,103	970	693	277	1,927	90,970
1990	466	92,326	985	861	1,032	726	95,930
1991	518	97,101	1,152	1,105	191	1,056	100,605
1992	571	94,304	1,444	2,721	1,601	1,152	101,222
1993	560	101,555	2,080	2,476	762	2,025	108,898
1994	555	87,662	1,843	503	460	1,807	92,275
1995	533	75,644	1,431	1,159	383	1,791	80,407
1996	540	81,305	1,574	816	794	1,482	85,971
1997	533	85,248	2,764	478	422	1,457	90,368
1998	567	83,095	2,433	784	1,063	1,592	88,967
1999	528	85,315	1,567	725	210	856	88,674
2000	562	61,817	894	560	845	937	65,053
2001	506	57,250	869	667	383	740	59,909
2002	471	52,805	837	909	1,137	943	56,632
2003	489	61,443	1,221	259	198	812	63,934
2004	481	71,110	1,075	469	1,080	566	74,300
2005	462	69,211	1,047	546	275	1,224	72,302
2006	468	69,097	881	341	757	720	71,796
2007	480	69,837	672	405	262	1,104	72,280
2008	481	69,823	719	404	801	1,437	73,184
2009	461	67,970	392	167	36	669	69,235
2010	437	62,309	422	233	835	645	64,445
2011	484	67,164	550	215	56	690	68,675
2012	483	72,708	785	127	474	485	74,579
2013	460	62,143	502	403	88	399	63,535
2014	473	65,810	562	272	386	573	67,603
2015	486	69,720	678	263	126	796	71,583
2016	420	53,373	936	252	345	603	55,508
2017	447	51,544	757	320	157	1,346	54,125
2018	452	48,775	943	174	183	1,155	51,230
2019	432	43,349	590	298	101	552	44,889
2020[a]	380	40,181	306	68	70	645	41,271
2021[a]	307	30,740	195	111	73	561	31,680

-continued-

Appendix Table B1.–Page 2 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
5-year average (2016–2020)	426	47,444	706	222	171	860	49,405
10-year average (2011–2020)	452	57,477	661	239	199	724	59,300
Historical Average (1985–2020)	482	72,716	1,075	618	534	1,016	75,960

continued

Appendix Table B1.–Page 3 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
Egegik District							
1985	23	582	14	21	1	203	821
1986	41	1,052	69	58	21	319	1,519
1988	52	1,405	97	87	54	333	1,976
1989	50	1,636	50	33	1	414	2,134
1990	61	1,105	53	85	39	331	1,613
1991	70	4,549	82	141	32	430	5,234
1992	80	3,322	124	270	51	729	4,496
1993	69	3,633	128	148	15	905	4,829
1994	59	3,208	166	84	153	857	4,468
1995	60	2,818	86	192	100	690	3,886
1996	44	2,321	99	89	85	579	3,173
1997	34	2,438	101	21	5	740	3,304
1998	36	1,795	44	33	52	389	2,314
1999	42	2,434	106	35	2	806	3,384
2000	31	842	16	11	0	262	1,131
2001	57	2,493	111	105	16	928	3,653
2002	53	1,892	65	34	12	356	2,359
2003	62	3,240	84	32	10	297	3,663
2004	46	2,618	169	410	91	1,423	4,711
2005	45	2,267	81	231	2	526	3,106
2006	41	1,641	94	34	7	641	2,418
2007	28	980	165	72	26	334	1,577
2008	37	1,502	91	35	4	295	1,928
2009	26	778	31	6	5	133	953
2010	37	1,657	93	59	8	275	2,091
2011	37	1,772	91	23	2	377	2,264
2012	38	1,172	37	19	7	190	1,425
2013	44	2,108	45	17	5	205	2,380
2014	36	972	150	4	2	237	1,366
2015	32	1,253	150	38	13	353	1,806
2016	26	366	27	3	0	167	563
2017	23	1,243	129	13	6	430	1,821
2018	22	540	48	16	9	548	1,161
2019	24	770	39	6	2	284	1,100
2020[a]	17	560	13	2	0	157	732
2021[a]	5	355	24	0	0	20	399

-continued-

Appendix Table B1.–Page 4 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
5-year average (2016–2020)	22	696	51	8	3	317	1,075
10-year average (2011–2020)	30	1,076	73	14	5	295	1,462
Historical Average (1985–2020)	42	1,799	84	70	24	461	2,439

continued

Appendix Table B1.–Page 5 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
Ugashik District							
1985	9	233	17	7		143	400
1986	27	1,080	83	48	21	335	1,567
1988	23	1,400	84	55	35	330	1,904
1989	22	1,309	32	35	2	214	1,592
1990	37	1,578	51	143	120	280	2,172
1991	38	1,403	121	168	42	614	2,348
1992	37	2,348	106	79	8	397	2,938
1993	39	1,766	86	107	24	495	2,478
1994	31	1,587	126	42	38	579	2,372
1995	20	1,513	56	18	6	290	1,883
1996	26	1,247	50	21	7	298	1,623
1997	28	2,785	169	39	23	311	3,327
1998	27	1,241	59	75	82	485	1,942
1999	25	1,365	35	5	0	271	1,675
2000	31	1,927	51	34	1	467	2,481
2001	24	1,197	61	8	2	357	1,624
2002	23	1,294	51	14	2	460	1,821
2003	23	1,113	31	30	0	392	1,567
2004	21	804	64	9	4	234	1,116
2005	22	818	27	18	2	249	1,114
2006	25	962	41	6	16	339	1,364
2007	17	1,056	43	88	79	281	1,546
2008	14	1,660	47	17	9	222	1,955
2009	15	1,061	33	4	41	131	1,270
2010	18	896	21	4	0	135	1,056
2011	15	531	15	3	2	136	687
2012	20	997	31	25	0	228	1,281
2013	14	537	19	10	0	106	672
2014	20	566	50	1	0	224	842
2015	20	935	53	8	0	217	1,214
2016	19	1,100	106	20	9	199	1,432
2107	15	444	18	5	2	113	581
2018	18	1,479	81	13	18	293	1,883
2019	17	859	54	7	2	57	980
2020[a]	4	225	28	0	0	38	291
2021[a]	15	812	5	2	2	12	833

-continued-

Appendix Table B1.–Page 6 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
5-year average (2016–2020)	15	821	57	9	6	140	1,033
10-year average (2011–2020)	16	767	45	9	3	161	986
Historical Average (1985–2020)	22	1,180	57	33	18	283	1,571

continued

Appendix Table B1.–Page 7 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
Nushagak District							
1985	406	38,000	7,900	4,000	600	6,100	56,600
1986	424	49,000	12,600	10,000	5,400	9,400	86,400
1988	441	31,086	10,079	8,234	6,316	5,223	60,938
1989	432	34,535	8,122	5,704	407	8,679	57,447
1990	441	33,003	12,407	7,808	3,183	5,919	62,320
1991	528	33,161	13,627	4,688	292	10,784	62,552
1992	476	30,640	13,588	7,076	3,519	7,103	61,926
1993	500	27,114	17,709	3,257	240	5,038	53,358
1994	523	26,501	15,490	5,055	2,042	5,338	54,426
1995	484	22,793	13,701	2,786	188	3,905	43,373
1996	481	22,935	15,941	4,704	1,573	5,217	50,370
1997	538	25,080	15,318	2,056	218	3,433	46,106
1998	562	25,217	12,258	2,487	1,076	5,316	46,355
1999	548	29,387	10,057	2,409	124	3,993	45,969
2000	541	24,451	9,470	3,463	1,662	5,983	45,029
2001	554	26,939	11,760	3,011	378	5,993	48,080
2002	520	22,777	11,281	5,096	1,179	4,565	44,897
2003	527	25,491	18,686	5,064	403	5,432	55,076
2004	511	17,491	15,610	3,869	1,944	4,240	43,154
2005	502	23,916	12,529	5,006	793	5,596	47,841
2006	461	20,773	9,971	4,448	1,591	3,590	40,373
2007	496	25,127	13,330	3,006	430	3,050	44,944
2008	571	26,828	12,960	4,552	1,923	5,133	51,395
2009	530	26,922	12,737	4,510	355	6,777	51,300
2010	528	22,326	9,150	3,660	1,672	2,983	39,791
2011	525	28,006	12,461	3,055	230	5,746	49,498
2012	517	20,587	10,350	3,072	1,309	2,642	37,960
2013	584	30,283	11,602	4,368	206	7,717	54,176
2014	581	27,073	16,049	5,731	2,110	7,463	58,425
2015	591	25,240	12,117	2,953	295	5,644	46,248
2016	643	27,370	16,502	4,592	4,394	4,766	57,624
2017	563	31,310	11,122	4,026	257	5,720	52,434
2018	589	25,547	12,206	3,635	840	4,735	46,963
2019	616	28,563	10,206	2,996	267	5,229	47,262
2020[a]	585	35,379	8,350	2,040	508	4,320	50,597
2021[a]	656	43,712	5,349	1,077	79	5,133	55,350

-continued-

Appendix Table B1.–Page 8 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
5-year average (2016–2020)	599	29,634	11,677	3,458	1,253	4,954	50,976
10-year average (2011–2020)	579	27,936	12,097	3,647	1,042	5,398	50,119
Historical Average (1985–2020)	523	27,739	12,493	4,355	1,369	5,508	51,463

continued

Appendix Table B1.–Page 9 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
Togiak District							
1985	51	3,400	600	1,000	100	1,500	6,600
1986	29	2,400	700	800	100	500	4,500
1987	46	3,600	700	1,000		1,600	6,900
1988	29	2,413	429	716	45	792	4,395
1989	40	2,825	551	891	112	976	5,355
1990	37	3,689	480	786	60	1,111	6,126
1991	43	3,517	470	553	27	1,238	5,805
1992	40	3,716	1,361	626	135	1,231	7,069
1993	38	2,139	784	571	8	743	4,245
1994	25	1,777	904	398	77	910	4,066
1995	22	1,318	448	425	0	703	2,894
1996	19	662	471	285	59	199	1,676
1997	31	1,440	667	380	0	260	2,747
1998	42	2,211	782	412	76	310	3,791
1999	76	3,780	1,244	479	84	217	5,804
2000	54	3,013	1,116	569	90	342	5,130
2001	92	4,162	1,612	367	61	388	6,590
2002	36	2,319	703	605	10	241	3,878
2003	92	4,403	1,208	483	451	883	7,428
2004	46	1,795	1,094	383	108	204	3,584
2005	45	2,299	1,528	301	26	295	4,448
2006	61	2,728	1,630	492	354	408	5,612
2007	48	2,548	1,234	420	19	110	4,332
2008	91	3,770	1,337	701	114	541	6,463
2009	40	2,220	827	365	5	272	3,689
2010	64	3,256	1,162	735	113	514	5,779
2011	68	3,462	966	497	42	545	5,512
2012	53	5,265	933	764	84	293	7,339
2013	64	3,695	691	375	33	208	5,002
2014	59	4,586	607	669	190	486	6,539
2015	48	2,387	876	312	23	650	4,249
2016	70	3,780	1,141	377	198	521	6,017
2017	70	5,163	959	544	131	545	7,341
2018	34	2,326	481	192	85	181	3,264
2019	28	1,779	599	143	26	98	2,645
2020[a]	32	2,333	672	314	17	333	3,670
2021[a]	34	3,159	114	72	20	585	3,949

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Appendix Table B1.–Page 10 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
5-year average (2016–2020)	47	3,076	770	314	91	336	4,587
10-year average (2011–2020)	53	3,478	792	419	83	386	5,158
Historical Average (1985–2020)	49	2,949	888	526	88	565	5,013

continued

Appendix Table B1.–Page 11 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
Total Bristol Bay area							
1985	1,015	142,755	9,737	5,776	825	8,122	167,215
1986	930	129,487	14,893	11,268	7,458	11,005	174,112
1987	996	135,782	14,424	8,161	673	8,854	167,894
1988	938	125,556	11,848	9,575	7,341	7,333	161,652
1989	955	125,243	9,678	7,283	801	12,069	155,074
1990	1,042	128,343	13,462	9,224	4,455	8,389	163,874
1991	1,194	137,837	15,245	6,574	572	14,024	174,251
1992	1,203	133,605	16,425	10,661	5,325	10,722	176,739
1993	1,206	134,050	20,527	6,539	1,051	8,915	171,082
1994	1,193	120,782	18,873	6,144	2,708	9,279	157,787
1995	1,119	107,717	15,921	4,566	691	7,423	136,319
1996	1,110	107,737	18,072	5,813	2,434	7,519	141,575
1997	1,166	118,250	19,074	2,962	674	6,196	147,156
1998	1,234	113,289	15,621	3,869	2,424	8,126	143,330
1999	1,219	122,281	13,009	3,653	420	6,143	145,506
2000	1,219	92,050	11,547	4,637	2,599	7,991	118,824
2001	1,226	92,041	14,412	4,158	839	8,406	119,856
2002	1,093	81,088	12,936	6,658	2,341	6,565	109,587
2003	1,182	95,690	21,231	5,868	1,062	7,816	131,667
2004	1,100	93,819	18,012	5,141	3,225	6,667	126,865
2005	1,076	98,511	15,212	6,102	1,098	7,889	128,812
2006	1,050	95,201	12,617	5,321	2,726	5,697	121,564
2007	1,063	99,549	15,444	3,991	815	4,880	124,679
2008	1,178	103,583	15,153	5,710	2,851	7,627	134,924
2009	1,063	98,951	14,020	5,052	442	7,982	126,447
2010	1,082	90,444	10,852	4,692	2,627	4,623	113,238
2011	1,122	101,017	14,106	3,794	333	7,493	126,744
2012	1,107	100,728	12,136	4,007	1,874	3,837	122,582
2013	1,162	98,765	12,858	5,173	333	8,635	125,764
2014	1,158	99,008	17,417	6,677	2,689	8,984	134,775
2015	1,169	99,535	13,874	3,573	458	7,659	125,100
2016	1,172	85,989	18,712	5,243	4,945	6,255	121,144
2017	1,110	89,704	12,985	4,907	553	8,154	116,303
2018	1,105	78,666	13,758	4,030	1,135	6,913	104,502
2019	1,106	75,320	11,488	3,451	398	6,219	96,876
2020[a]	1,001	78,679	9,369	2,425	595	5,493	96,561
2021[a]	1,012	78,779	5,685	1,262	174	6,311	92,211

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Appendix Table B1.–Page 12 of 12.

Year	Permits Issued	Sockeye	King	Chum	Pink	Coho	Total
5-year average (2016–2020)	1,099	81,672	13,262	4,011	1,525	6,607	107,077
10-year average (2011–2020)	1,121	90,741	13,670	4,328	1,331	6,964	117,035
Historical Average (1985–2020)	1,113	106,418	14,582	5,630	1,994	7,775	136,399

Note Harvests are extrapolated for all permits issued, based on those returned. Harvests prior to 1985 are rounded to the nearest hundred fish. Permit and harvest estimates prior to 1989 are based on the community where the permit was issued; estimates from 1989 to the present are based on the area fished, as first recorded on the permit.

a. Data are preliminary

Appendix Table B2–Estimated subsistence salmon harvests by district and location fished, Bristol Bay Area, Alaska, 2021.

Area and river system	Number of permits issued[a]	Estimated salmon harvest[b]					
		King	Sockeye	Coho	Chum	Pink	Total
Naknek-Kvichak District	307	195	30,740	561	111	73	31,680
Naknek River Subdistrict	196	191	14,580	405	111	73	15,360
Kvichak River/Iliamna Lake Subdistrict:	111	4	16,160	156	0	0	16,320
Iliamna Lake-general	14	1	1,079	1	0	0	1,081
Kokhanok	14	3	3,620	155	0	0	3,777
Kvichak River	11	0	1,405	0	0	0	1,405
Lake Clark	46	0	3,223	0	0	0	3,223
Newhalen River	20	0	5,099	0	0	0	5,099
Pedro Bay	7	0	566	0	0	0	566
Six Mile Lake	6	0	1,170	0	0	0	1,170
Egegik District	5	24	355	20	0	0	399
Ugashik District	15	5	812	12	2	2	833
Nushagak District	656	5,349	43,712	5,133	1,077	79	55,350
Igushik/Snake River	15	30	1,156	39	2	0	1,227
Nushagak Bay commercial	37	269	1,941	326	47	1	2,584
Nushagak Bay noncommercial	412	1,626	24,509	2,652	497	18	29,302
Nushagak River	90	2,506	6,524	1,051	389	57	10,527
Site unknown	9	204	1,171	144	50	0	1,569
Wood River	115	714	8,411	921	92	4	10,141
Togiak District	34	114	3,159	585	72	20	3,949
Total	1,012	5,686	78,779	6,311	1,262	174	92,211

Source ADF&G Division of Subsistence, ASFDB 2021.

Note Harvests are extrapolated for all permits issued, based on those returned and on the area fished as recorded on the permit. Due to rounding, the sum of columns and rows may not equal the estimated total. Of 1,012 permits issued for the management area, 340 were returned (33.6%).

a. Sum of sites may exceed district totals, and sum of districts may exceed area total, because permittees may use more than one site.

b. Data are preliminary