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Norton Sound Subdistricts 2-3 Chum Salmon Stock Status and Fishery Overview, 2019: A Report to the Alaska Board of Fisheries

by

Jim Menard

December 2018

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

Symbols and Abbreviations

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

Weights and measures (metric)

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

Weights and measures (English)

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

Time and temperature

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

Physics and chemistry

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

General

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

Mathematics, statistics

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

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NORTON SOUND SUBDISTRICTS 2-3 CHUM SALMON STOCK STATUS AND FISHERY OVERVIEW, 2019: A REPORT TO THE ALASKA BOARD OF FISHERIES

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TABLE OF CONTENTS

Page

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

The *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222) directs the Alaska Department of Fish and Game (department) to assess salmon stocks during Alaska Board of Fisheries (board) regulatory cycles, to identify stocks of concern and to reassess the stock of concern status for stocks previously designated. In 2000, the board classified Norton Sound Subdistricts 2 and 3 chum salmon *Oncorhynchus keta* as a stock of yield concern. An action plan was developed for these stocks by the department and acted upon by the board in January 2001. Subdistricts 2 and 3 chum salmon have maintained yield concern classification throughout subsequent board cycles. Subdistricts 2 and 3 chum salmon runs have improved during the last five years and the department recommended discontinuing Norton Sound Subdistricts 2 and 3 chum salmon as a yield concern during the board work session in October 2018.

Key words: Norton Sound, chum salmon, *Oncorhynchus keta*, stock of concern, commercial, fishing, department, sustainable salmon fisheries policy, Alaska Board of Fisheries, Alaska

INTRODUCTION

The *Policy for the Management of Sustainable Salmon Fisheries* (SSFP; 5 AAC 39.222, 2001) directs the Alaska Department of Fish and Game (department) to provide the Alaska Board of Fisheries (board) with reports on the status of salmon stocks and identify any salmon stocks that present a concern related to yield, management, or conservation during regular board meetings (ADF&G 2000). In response to guidelines established in the SSFP, the board classified the Norton Sound Subdistricts 2 and 3 (Figure 1) chum salmon *Oncorhynchus keta* stocks as a yield concern at the September 2000 work session. A stock of yield concern is defined as "a concern arising from a chronic inability, despite use of specific management measures, to maintain expected yields, or harvestable surpluses, above a stock's escapement needs (5 AAC 39.222(f)(42)). In Subdistricts 2 and 3, the determination as a yield concern for chum salmon stocks was based on low harvest levels for the previous 5-year period (1995–1999). An action plan was subsequently developed by the department (Bue 2000) and acted upon by the board in January 2001. The classification as a yield concern was continued at subsequent board meetings 2004–2016 (Menard and Bergstrom, 2003, 2006, 2009, 2012, 2015).

At the October 2018 board work session, the department recommended discontinuation of Norton Sound Subdistricts 2 and 3 chum salmon stock as a yield concern. The department recommendation to discontinue Subdistricts 2 and 3 as a stock of yield concern was based on escapement and harvest trends over the past 5 years, 2014–2018. During that time, the Kwiniuk River optimal escapement goal (OEG) of 11,500–23,000 chum salmon has been exceeded 4 times (Table 1), subsistence fishing time has not been restricted and directed commercial chum salmon fishing has occurred each year resulting in the highest commercial chum salmon harvests in Subdistricts 2 and 3 since 1988 (Tables 2 and 3).

SUBDISTRICT 2 AND 3 STOCK ASSESSMENT BACKGROUND

Most fresh water subsistence fishing occurs in the Fish and Niukluk rivers that drain Subdistrict 2, and the Kwiniuk and Tubutulik rivers that drain Subdistrict 3 (Figure 2). Renewed buyer interest in the chum salmon fishery in Subdistrict 2 began in 2008 and Subdistrict 3 in 2007, respectively (Menard et al. 2017). Historical Subdistrict 2 and Subdistrict 3 management actions are listed in Table 4. The Fish, Niukluk, Kwiniuk, and Tubutulik rivers are index rivers to determine salmon run strength for those two subdistricts.

ESCAPEMENT

In the early 2000s, escapement goals were established in Subdistricts 2 and 3. In 2001, the department established Subdistrict 3 biological escapement goals (BEG) for Kwiniuk River and Tubutulik River of 10,000 to 20,000 and 8,000 to 16,000 chum salmon, respectively (Clark 2001). In 2004, in Subdistrict 2 the department established a threshold sustainable escapement goal (SEG) of greater than 30,000 chum salmon for Niukluk River tower (ADF&G 2004). In 2010, the department recommended a lower-bound SEG of 23,000 chum salmon for Niukluk River tower (Bernard et al. 2009). Beginning in 2013, the Niukluk River tower project was discontinued (Table 5, Figure 3), but in 2014 a new counting tower project was initiated farther downstream on the Fish River, and it continues in development (Table 6). Previous radio telemetry work indicates that one-third of the Fish River chum salmon run spawns in the Niukluk River drainage (Todd 2004; Todd et al. 2005). Chum salmon escapements observed at the Fish River tower have been used to support commercial fishing in recent years (Figure 4).

In January 2001, the board established OEG ranges for chum salmon in Kwiniuk River and Tubutulik River by adding an additional 15% to the BEG range to account for subsistence harvests that may occur above the tower site on Kwiniuk River and inriver on Tubutulik River. Based on escapement counts from Kwiniuk River counting tower project, the OEG of 11,500 to 23,000 chum salmon has been exceeded in 4 of the 5 recent years (Table 1 and Figure 5). The OEG for the Tubutulik River is 9,200 to 18,400 chum salmon, but there is not an escapement counting project on the river and escapement is assessed via aerial survey. It is difficult to determine if the OEG was achieved in most years because aerial surveys were often incomplete due to poor weather conditions or lack of aircraft. Aerial surveys have also become more problematic because of huge numbers of pink salmon *O. gorbuscha* that have been arriving at the same time as chum salmon in even-numbered years and also in some odd-numbered years as occurred in 2017. Hundreds of thousands to millions of pink salmon in the rivers obscure all other fish making any accurate count of chum salmon impossible and in the last 5 years the only accurate escapement estimate in Subdistrict 3 was from Kwiniuk River tower project (Figure 5).

YIELD

During the last 5 years (2014–2018), the available yield has been similar to above average yields of the 1970s and 1980s, but the commercial harvest has been limited because of buyer capacity (Tables 2 and 3; Figures 4 and 6). Except for reduced fishing time in 2016 because of a lower than expected chum salmon run, the department allowed commercial fishing whenever a market was available.

SUBDISTRICT 2 AND 3 STOCK OF CONCERN RECOMMENDATION

Given the above average harvest during the most recent 5-year period, Norton Sound Subdistricts 2 and 3 chum salmon stocks no longer meet the criteria for a stock of yield concern. Therefore, based on the definitions provided in the *Policy for the Management of Sustainable Salmon Fisheries* of 5 AAC 39.222(f)(42), the department recommended that the board remove the yield concern classification for the Norton Sound Subdistricts 2 and 3 chum salmon stocks at the October 2018 work session.

OUTLOOK

The 2019 chum salmon run in Norton Sound Subdistricts 2 and 3 is expected to be above average based on the age-0.3 chum salmon samples from the commercial catch and Kwiniuk River escapement in 2018 and from the parent year escapement numbers. Also, with the above average age-0.3 fish return in 2018, age-0.4 fish return is expected to be above average.

ALASKA BOARD OF FISHERIES ACTION

The board is expected to take up the recommendation to remove Norton Sound Subdistricts 2 and 3 chum salmon as stocks of yield concern during its January 2019 meeting.

ESCAPEMENT GOAL EVALUATION

The department has undertaken a review of escapement goals for several Norton Sound salmon stocks where sufficient long-term escapement, catch, and/or age composition data exist that enable the development of BEGs or SEGs based on analysis of production consistent with the escapement goal policy.

The department has recently recommended revising Kwiniuk River and Tubutulik River escapement goals. A revised goal of 9,100–32,600 chum salmon escapement is recommended for Kwiniuk River based of the 15th–65th percentiles of historical tower escapements using the percentile method. A revised goal of 3,100–9,900 is recommended for Tubutulik River based on the 20th–60th percentiles of historical unexpanded aerial survey escapements using the percentile method.

Current goals and proposed goals for Subdistrict 3 chum salmon stocks are as follows:

Stream	Current Goal	Proposed Goal
Kwiniuk River Counting Tower	10,000–20,000 BEG	9,100–32,600 SEG
Kwiniuk River Counting Tower	11,500–23,000 OEG	
Tubutulik River Aerial Survey expanded	8,000–16,000 BEG	3,100–9,900 SEG
Tubutulik River Aerial Survey expanded	9,200–18,400 OEG	

MANAGEMENT ACTION PLAN OPTIONS FOR ADDRESSING STOCKS OF CONCERN AS OUTLINED IN THE SUSTAINABLE FISHERIES POLICY

NORTON SOUND SUBDISTRICTS 2 AND 3 CHUM SALMON MANAGEMENT PLAN REVIEW/DEVELOPMENT

Current Stock Status

In response to guidelines established in the SSFP (5 AAC 39.222), the department recommended discontinuation of Norton Sound Subdistricts 2 and 3 chum salmon as stocks of yield concern at the October 2018 board work session. This determination was based on the harvestable surpluses above the stock's escapement needs during the last 5 years (2014–2018).

Customary and Traditional Use Finding and Amount Necessary for Subsistence

The board has made a positive customary and traditional use (C&T) finding for salmon in the Norton Sound-Port Clarence Area and determined the amount necessary for subsistence (ANS) to be 96,000–160,000 salmon for the Norton Sound-Port Clarence Area.

HABITAT FACTORS ADVERSELY AFFECTING CHUM SALMON STOCKS

Subdistrict 2

The Norton Sound/Bering Strait Regional Comprehensive Salmon Plan 1996–2010 (Norton Sound/Bering Strait Regional Planning Team 1996) briefly mentions that the population of Council, on Niukluk River, was 10,000 people during the 1895 Gold Rush. Damage to fish habitat would have occurred over 110 years ago and is not thought by area staff to be the limiting factor now in chum salmon production. Available spawning habitat appears to be more than adequate for the numbers of fish returning. The extent to which mining reduced the available spawning and rearing habitat is not known. There is occasional small-scale mining activity on Ophir Creek, which is not currently known for chum salmon production. Oral history indicated Ophir Creek used to be predominately a chum salmon producer. Historically, dredging left numerous dredge ponds. Beaver activity has intensified morphological changes in the creek. The system now primarily produces coho salmon *O. kisutch*. The increasing presence of beavers appears to be a common agent of habitat change. There are probably other habitat changes with very small impacts that could indicate a trend in changing environment. Casadepaga River has both small-scale mining and significant chum salmon production.

Subdistrict 3

In the late 1990s, there was a perched culvert on Iron Creek on the Moses Point to Elim Road that was a barrier to fish passage (pink, chum, and coho salmon) at all but high tidal stages. Local residents manually transported spawning stocks around the culvert in some years. The culvert was initially installed by the Bureau of Indian Affairs (BIA) and a retrofit has now provided easier fish passage. Beaver dams are becoming more prevalent on Iron Creek and this stream has been transformed from a chum salmon producer to a coho salmon producer. Many hook and line subsistence fishermen report harvesting coho salmon from Iron Creek. Kroeker (2006) reported the effect of beaver activity on Kwiniuk River and Iron Creek.

EXISTING MANAGEMENT PLAN

5 AAC 04.390. Subdistricts 2 and 3 of the Norton Sound District Salmon Management Plan.

ACTION PLAN DEVELOPMENT

NORTON SOUND SUBDISTRICTS 2 AND 3 CHUM SALMON ACTION PLAN GOAL

The goal of the plan is to reduce fishing mortality in order to meet spawning escapement goals, to provide opportunity for subsistence harvest levels within the ANS range, and to reestablish an historical range of harvest levels by other users.

REVIEW OF MANAGEMENT ACTION PLAN

Regulation Changes Adopted in January 2001

In January 2001, after review of the management action plan options addressing this stock of concern, the board adopted the following plan:

5 AAC 04.390. Subdistricts 2 and 3 of the Norton Sound District Salmon Management Plan.

(a) The purpose of this management plan is to provide the department with management guidelines for sustained yield of salmon stocks in Subdistricts 2 and 3 in the Norton Sound District. The department shall manage, to the extent practicable, the commercial, sport, subsistence, and personal use fisheries in Subdistricts 2 and 3 to achieve escapement goals.

(b) The department shall manage salmon fisheries in the Subdistricts 2 and 3 as follows:

(1) in the commercial chum salmon fishery,

(A) the department shall manage the fisheries to achieve the following optimal escapement goals ranges:

i. Kwiniuk River: 11,500–23,000 chum salmon; and

ii. Tubutulik River: 9,200–18,400 chum salmon;

(B) the chum salmon harvest may not exceed 15,000 fish before the departments mid-July run assessment in Subdistrict 2;

(C) the fishery may occur only if the department projects that chum salmon escapement goals will be achieved and the harvestable surplus will more than meet subsistence needs;

(2) in the commercial pink salmon fishery, the fishery may occur only if subsistence needs are expected to be met and chum salmon escapement goals achieved;

(3) in the commercial coho salmon fishery, the fishery may occur only when the chum salmon escapement goals for the Norton Sound District index rivers specified in 5 AAC 04.358 are achieved or when the department determines that further restrictions would have no impact on achieving chum salmon escapement goals;

(4) the commissioner may not place restrictions on subsistence fishing for chum salmon by emergency order, unless all directed chum salmon commercial fishing has been closed and sport fishing has been appropriately restricted in the subdistrict as provided in 5 AAC 01.180–5 AAC 01.184.

The board adopted subsistence hook and line attached to a rod or pole as a lawful gear for all species in northern Norton Sound and southern Kotzebue Sound. Sport fishing bag limits and methods and means restrictions were adopted, except when a subsistence fishing permit is required; then, the catch limits specified in the subsistence fishing permit will apply, except when fishing through the ice.

Regulation Changes Adopted in January 2004

In January 2004, after review of the management action plan options addressing this stock of concern (Menard and Bergstrom 2003), the board adopted a regulation requiring subsistence salmon permits in all waters of Subdistricts 2 and 3. No harvest limits were established for Subdistricts 2 and 3.

Regulation Changes Adopted in January 2007

In January 2007, after review of the management action plan options addressing this stock of concern (Menard and Bergstrom 2006), the board (1) eliminated the commercial fishing period schedule of two 48-hour fishing periods per week in Subdistrict 2 and allowed the department to set periods by emergency order, and (2) eliminated the commercial fishing period schedule in Subdistrict 3 of two 24-hour fishing periods per week and allowed the department to set periods by emergency order.

Regulation Changes Adopted in January 2010

In January 2010, after review of the management action plan options addressing this stock of concern (Menard and Bergstrom 2009), the board allowed for a directed pink salmon commercial fishery after July 6 in Subdistrict 3 and after July 14 in Subdistrict 2 if there was a harvestable pink salmon surplus even though chum salmon escapement goals had not been reached.

Regulation Changes Adopted in January 2013

In January 2013, after review of the management action plan options addressing this stock of concern (Menard and Bergstrom 2012), the board repealed the regulatory requirement that chum salmon goals in Subdistrict 1 be achieved before allowing for commercial coho salmon fishing in Subdistricts 2 and 3.

Regulation Changes Adopted in January 2016

In January 2016, after review of the management action plan options addressing this stock of concern (Menard and Bergstrom 2015), the board adopted the proposal allowing cast nets and dip nets as a legal gear type in subsistence fisheries throughout Norton Sound.

Management Review

Historical management actions in Subdistricts 2 and 3 are listed in Table 4. From 2002 through 2006 there was no commercial fishing in either subdistrict, mainly because of no market interest; however, in the case of chum salmon there were some years of poor runs.

Beginning in 2007, one buyer was interested in purchasing salmon from Subdistrict 3 and expanded to Subdistrict 2 in 2008. Commercial fishing was allowed in 2007 for chum salmon in Subdistrict 3. In 2008 and 2009, the chum salmon runs were too weak in both subdistricts to allow for commercial fishing, but in 2010 and 2011 chum salmon fishing was the best in over 20 years. Two weak chum salmon runs occurred in 2012 and 2013, followed by two strong chum runs in

2014–2015, and 2017–2018. Since 2014 fishing time was liberalized to allow harvest of surplus chum salmon and pink salmon; however, the buyer had limited tendering and processing capacity.

Although there have been large pink salmon runs in even-numbered years there have been a few pink salmon directed commercial fishing periods because of limited buyer interest. Commercial fishing for coho salmon has occurred yearly since 2008 in both subdistricts. There have been record commercial harvests of coho salmon in a number of years since 2008.

Subsistence salmon harvests in the 2000s, in Subdistricts 2 and 3, have usually been higher in even-numbered years compared to odd-numbered years due to fishermen taking advantage of the larger runs of pink salmon in the even-numbered years. There have been no subsistence chum salmon fishing restrictions since 2003.

RESEARCH

The Regional Planning Team (RPT) met in the spring of 2012 after several years of inactivity. The RPT board members are made up of 3 department personnel and 3 members appointed by the Northern Bering Sea Regional Aquaculture Association (NoBSRAA). The RPT recently updated the *Norton Sound/Bering Strait Regional Comprehensive Salmon Plan, 1996–2010* and continues to meet yearly.

Additional salmon research and assessment in this area continues to be conducted in cooperation and coordination with multiple local entities in the area, including Norton Sound Economic Development Corporation, Bering Straits Native Corporation, Elim Native Corporation and White Mountain Native Corporation. The efforts of these organizations contribute to strengthening knowledge of these stocks and improving the management capabilities of the department.

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TABLES AND FIGURES

Table 1.–Historical salmon migration at Kwiniuk River counting tower, 1965–2018.

Year	Operating period	Chum [a]	Pink	King	Coho
1965	June 18 - Jul 19	32,861	8,668	19	0
1966	June 19 - Jul 28	32,786	10,629	7	0
1967	June 18 - Jul 28	26,661	3,587	13	0
1968	June 18 - Jul 24	19,976	129,052	27	0
1969	June 26 - Jul 26	19,687	56,683	12	0
1970	June 25 - Jul 29	66,604	226,831	0	0
1971	June 29 - Jul 29	38,679	16,634	0	0
1972	June 28 - Jul 27	30,686	62,461	65	0
1973	June 25 - Jul 25	28,029	37,070	57	0
1974	June 20 - Jul 26	35,161	39,375	62	0
1975	July 04 - Jul 26	14,049	55,293	44	0
1976	July 04 - Jul 25	8,508	35,226	12	0
1977	June 26 - Jul 25	21,798	47,934	0	0
1978	July 04 - Jul 22	11,049	70,148	0	0
1979	June 28 - Jul 25	12,355	167,492	107	0
1980	June 22 - Jul 28	19,374	319,363	177	0
1981	June 19 - Aug 02	34,565	566,534	136	0
1982	June 21 - Jul 26	44,099	469,674	138	0
1983	June 19 - Jul 27	56,907	251,965	267	0
1984	June 19 - Jul 25	54,043	736,544	736	0
1985	June 26 - Jul 28	9,013	18,237	955	0
1986	June 19 - Jul 26	24,700	241,446	654	0
1987	June 25 - Jul 23	16,133	5,566	317	0
1988	June18 - Jul 26	13,303	187,907	321	0
1989	June 27 - Jul 27	14,529	27,488	248	0
1990	June 21 - Jul 25	13,957	416,512	900	0
1991	June 18 - Jul 27	19,801	53,499	708	0
1992	June 27 - Jul 28	12,077	1,464,716	479	0
1993	June 27 - Jul 27	15,824	43,063	600	0
1994	June 23 - Aug 09	33,012	2,303,114	625	2,547
1995	June 21 - Jul 26	42,500	17,511	498	114
1996	June 20 - Jul 25	28,493	907,893	577	461
1997	June 18 - Jul 27	20,119	9,535	974	0
1998	June 18 - Jul 27	24,247	655,934	303	0
1999	June 25 - Jul 28	8,763	607	116	0
2000	June 22 - Jul 27	12,879	750,173	144	41
2001	June 27 - Sept 15	16,598	8,423	261	9,532
2002	June 17 - Sept 11	37,995	1,114,410	778	6,459
2003	June 15 - Sept 15	12,123	22,329	744	5,490
2004	June 16 - Sept 14	10,362	3,054,684	663	11,240
2005	June 17 - Sept 13	12,083	341,048	342	12,950
2006	June 22 - Sept 12	39,519	1,347,090	195	22,341
2007	June 21 - Sept 10	27,756	54,255	258	9,429
2008	June 23 - Sept 07	9,483	1,444,228	237	10,462
2009	June 24 - Sept 13	8,739	42,963	444	8,705
2010	June 25 - Sept 07	71,403	634,169	138	8,058
2011	June 20 - Sept 11	32,239	30,913	57	3,290
2012	June 23 - Aug 16	5,577	393,030	60	781
2013	June 24 - Sept 16	5,625	13,212	15	3,729
2014	June 15 - Sept 08	39,759	322,830	438	14,637

-continued-

Table 1.–Page 2 of 2.

Year	Operating period	Chum [a]	Pink	King	Coho
2015	June 15 - Sept 03	37,812	67,295	318	6,252
2016	June 17 - Sept 16	8,526	1,909,949	135	9,210
2017	June 15 - Sept 12	32,553	506,445	57	13,593
2018	July 04 - Sept 16	41,658	1,804,480	87	17,074
2014-2018 avg.		32,062	922,200	207	12,153

[a] Since 2001, BEG range is 10,000 – 20,000 fish and the OEG range is 11,500 – 23,000 fish.

Table 2.–Commercial and subsistence salmon catch by species, by year in Subdistrict 2, Norton Sound District, 1962–2018.

	SUBDISTRICT 2 (GOLOVIN)																	
	Commercial						Subsistence						Combined					
Year	King	Sockeye	Coho	Pink	Chum	Total	King	Sockeye	Coho	Pink	Chum	Total	King	Sockeye	Coho	Pink	Chum	Total
1962	45	11	264	10,276	68,720	79,316	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1963	40	40	0	19,677	49,850	69,607	0	0	118	5,702	9,319	15,139	40	40	118	25,379	59,169	84,746
1964	27	40	3	7,236	58,301	65,607	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1965	0	0	0	0	0	0	2	0	49	1,523	3,847	5,421	2	0	49	1,523	3,847	5,421
1966	17	14	584	4,665	29,791	35,071	4	0	176	1,573	3,520	5,273	21	14	760	6,238	33,311	40,344
1967	10	0	747	5,790	31,193	37,740	3	0	185	2,774	4,803	7,765	13	0	932	8,564	35,996	45,505
1968	12	0	205	18,428	10,011	28,656	4	0	181	4,955	1,744	6,884	16	0	386	23,383	11,755	35,540
1969	28	0	1,224	23,208	20,949	45,409	2	0	190	2,760	2,514	5,466	30	0	1,414	25,968	23,463	50,875
1970	13	0	3	18,721	20,566	39,303	4	0	353	2,046	2,614	5,017	17	0	356	20,767	23,180	44,320
1971	37	0	197	2,735	33,824	36,793	7	0	191	1,544	1,936	3,678	44	0	388	4,279	35,760	40,471
1972	36	0	20	6,562	27,097	33,715	4	0	62	1,735	2,028	3,829	40	0	82	8,297	29,125	37,544
1973	70	0	183	14,145	41,689	56,087	1	0	48	9	74	132	71	0	231	14,154	41,763	56,219
1974	30	0	3	28,340	30,173	58,546	3	0	0	967	205	1,175	33	0	3	29,307	30,378	59,721
1975	17	0	206	10,770	41,761	52,754	0	0	1	2,011	2,025	4,037	17	0	207	12,781	43,786	56,791
1976	12	0	1,311	24,051	30,219	55,593	0	0	0	1,995	1,128	3,123	12	0	1,311	26,046	31,347	58,716
1977	26	0	426	7,928	53,912	62,292	3	0	80	703	2,915	3,701	29	0	506	8,631	56,827	65,993
1978	22	0	94	72,033	41,462	113,611	1	0	0	2,470	1,061	3,532	23	0	94	74,503	42,523	117,143
1979	75	49	1,606	45,948	30,201	77,879	0	0	845	2,546	2,840	6,231	75	49	2,451	48,494	33,041	84,110
1980	36	36	328	10,774	52,609	63,783	12	0	692	10,727	4,057	15,488	48	36	1,020	21,501	56,666	79,271
1981	23	5	13	49,755	58,323	108,119	8	0	1,520	5,158	5,543	12,229	31	5	1,533	54,913	63,866	120,348
1982	78	5	4,281	39,510	51,970	95,844	7	0	1,289	4,752	1,868	7,916	85	5	5,570	44,262	53,838	103,760
1983	52	10	295	17,414	48,283	66,054	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	31	0	2,462	88,588	54,153	145,234	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1985	193	113	1,196	3,019	55,781	60,302	12	2	430	1,904	9,577	11,925	205	115	1,626	4,923	65,358	72,227
1986	81	8	958	25,425	69,725	96,197	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1987	166	51	2,203	1,579	44,334	48,333	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1988	108	921	2,149	31,559	33,348	68,085	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1989	0	0	0	0	0	0	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1990	52	21	0	0	15,993	16,066	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1991	49	1	0	0	14,839	14,889	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1992	6	9	2,085	0	1,002	3,102	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]

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Table 2.–Page 2 of 2.

	SUBDISTRICT 2 (GOLOVIN)																	
	Commercial						Subsistence						Combined					
Year	King	Sockeye	Coho	Pink	Chum	Total	King	Sockeye	Coho	Pink	Chum	Total	King	Sockeye	Coho	Pink	Chum	Total
1993	1	4	2	8,480	2,803	11,290	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1994 [b]	0	0	3,424	0	111	3,535	253	168	733	8,410	1,337	10,901	253	168	4,157	8,410	1,448	14,436
1995 [b]	0	0	1,616	4,296	1,987	7,899	165	34	1,649	7,818	10,373	20,039	165	34	3,265	12,114	12,360	27,938
1996 [b]	0	0	638	0	0	638	86	134	3,014	17,399	2,867	23,500	86	134	3,652	17,399	2,867	24,138
1997 [b]	19	2	102	20	8,003	8,146	138	427	555	4,570	4,891	10,581	157	429	657	4,590	12,894	18,727
1998 [b]	1	0	3	106,761	723	107,488	184	37	1,292	13,340	1,893	16,746	185	37	1,295	120,101	2,616	124,234
1999 [b]	0	0	0	0	0	0	60	48	1,234	469	3,656	5,467	60	48	1,234	469	3,656	5,467
2000 [b]	0	0	1,645	17,408	164	19,217	169	18	2,335	10,906	1,155	14,583	169	18	3,980	28,314	1,319	33,800
2001 [b]	0	43	30	0	7,094	7,167	89	72	880	1,665	3,291	5,997	89	115	910	1,665	10,385	13,164
2002 [b]	0	0	0	0	0	0	69	66	1,640	14,430	1,882	18,087	69	66	1,640	14,430	1,882	18,087
2003 [b]	0	0	0	0	0	0	166	28	309	5,012	1,477	6,992	166	28	309	5,012	1,477	6,992
2004 [c]	0	0	0	0	0	0	164	6	654	19,936	880	21,640	164	6	654	19,936	880	21,640
2005 [c]	0	0	0	0	0	0	96	15	686	11,467	1,852	14,116	96	15	686	11,467	1,852	14,116
2006 [c]	0	0	0	0	0	0	136	38	1,760	14,670	722	17,326	136	38	1,760	14,670	722	17,326
2007 [c]	0	0	0	0	0	0	188	321	1,179	3,980	4,217	9,885	188	321	1,179	3,980	4,217	9,885
2008 [c]	0	0	256	2,699	623	3,578	146	95	2,337	10,155	350	13,083	146	95	2,593	12,854	973	16,661
2009 [c]	0	0	2,452	0	87	2,539	237	33	1,377	3,787	1,694	7,128	237	33	3,829	3,787	1,781	9,667
2010 [c]	3	2	5,586	2,039	17,212	24,842	59	32	2,020	9,620	1,133	12,864	62	34	7,606	11,659	18,345	37,706
2011 [c]	7	0	859	3	20,075	20,944	99	74	1,345	5,652	2,122	9,292	106	74	2,204	5,655	22,197	30,236
2012 [c]	2	14	573	31,055	3,791	35,435	57	52	1,143	7,635	1,056	9,943	59	66	1,716	38,690	4,847	45,378
2013 [c]	0	0	5,362	1,180	3,113	9,655	47	15	964	3,655	3,256	7,937	47	15	6,326	4,835	6,369	17,592
2014 [c]	28	47	4,156	7,888	13,560	25,679	36	91	1,720	7,363	1,719	10,929	64	138	5,876	15,251	15,279	36,608
2015 [c]	73	1,214	2,996	1,596	20,525	26,404	147	71	1,091	4,443	2,250	8,002	220	1,285	4,087	6,039	22,775	34,406
2016 [c]	17	157	880	15,346	5,331	21,731	35	29	844	6,747	1,006	8,661	52	186	1,724	22,093	6,337	30,392
2017 [c]	4	83	710	331	7,173	8,301	25	12	1,631	3,756	1,037	6,461	29	95	2,341	4,087	8,210	14,762
2018 [cd]	31	75	2,995	4,171	25,070	32,342	45	83	1,317	6,499	531	8,475	76	158	4,312	10,670	25,601	40,817
2014-2018 average	31	315	2,347	5,866	14,332	22,891	58	57	1,321	5,762	1,309	8,506	88	372	3,668	11,628	15,640	31,397

[a] Subsistence surveys were not conducted.

[b] Subsistence harvests were estimated from Division of Subsistence household surveys. Previous surveys often were partial surveys and did not capture later season harvests like coho salmon.

[c] Beginning in 2004, a permit was required for the subdistrict that replaced household surveys. The permit system helped to record harvest by residents living outside the subdistrict.

[d] Preliminary.

Table 3.–Commercial and subsistence salmon catch by species, by year in Subdistrict 3, Norton Sound District, 1962–2018.

	SUBDISTRICT 3 (ELIM)																	
	Commercial						Subsistence						Combined					
Year	King	Sockeye	Coho	Pink	Chum	Total	King	Sockeye	Coho	Pink	Chum	Total	King	Sockeye	Coho	Pink	Chum	Total
1962	27	0	0	11,100	50,683	61,810	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1963	15	0	0	2,549	46,274	48,838	5	0	0	5,808	8,316	14,129	20	0	0	8,357	54,590	62,967
1964	32	3	0	3,372	28,568	31,975	0	0	0	63	348	411	0	0	0	3,435	28,916	32,386
1965	0	0	0	0	0	0	16	0	72	1,325	9,857	11,270	16	0	72	1,325	9,857	11,270
1966	17	0	0	2,745	24,741	27,503	14	0	250	2,511	5,409	8,184	31	0	0	5,256	30,150	35,687
1967	0	0	0	0	0	0	39	0	116	1,322	9,913	11,390	39	0	116	1,322	9,913	11,390
1968	12	0	1	9,012	17,908	26,933	2	0	80	6,135	2,527	8,744	14	0	81	15,147	20,435	35,677
1969	29	0	0	11,807	26,594	38,430	9	0	109	1,790	1,303	3,211	38	0	0	13,597	27,897	41,641
1970	39	0	0	13,052	29,726	42,817	16	0	160	4,661	6,960	11,797	55	0	0	17,713	36,686	54,614
1971	95	0	4	922	43,831	44,852	16	0	271	1,046	2,227	3,560	111	0	275	1,968	46,058	48,412
1972	190	0	11	5,866	30,919	36,986	44	0	108	1,579	2,070	3,801	234	0	119	7,445	32,989	40,787
1973	134	0	0	10,603	31,389	42,126	2	0	0		298	300	136	0	0	10,603	31,687	42,426
1974	198	0	9	12,821	55,276	68,304	3	0	0	2,382	1,723	4,108	201	0	0	15,203	56,999	72,412
1975	16	0	0	4,407	46,699	51,122	2	0	6	1,280	508	1,796	18	0	0	5,687	47,207	52,918
1976	24	0	232	5,072	10,890	16,218	22	0	0	5,016	1,548	6,586	46	0	0	10,088	12,438	22,804
1977	96	0	6	9,443	47,455	57,000	22	0	225	1,145	1,170	2,562	118	0	231	10,588	48,625	59,562
1978	444	0	244	39,694	44,595	84,977	38	0	407	1,995	1,229	3,669	482	0	651	41,689	45,824	88,646
1979	1,035	0	177	40,811	37,123	79,146	16	0	890	6,078	1,195	8,179	1,051	0	1,067	46,889	38,318	87,325
1980	502	0	0	1,435	14,755	16,692	131	0	229	4,232	1,393	5,985	633	0	0	5,667	16,148	22,677
1981	198	0	5	26,417	29,325	55,945	32	0	2,345	6,530	2,819	11,726	230	0	2,350	32,947	32,144	67,671
1982	253	0	318	9,849	40,030	50,450	1	0	1,835	3,785	3,537	9,158	254	0	2,153	13,634	43,567	59,608
1983	254	0	0	17,027	65,776	83,057	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1984	0	0	5,959	28,035	9,477	43,471	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1985	816	32	1,803	559	24,466	27,676	67	0	1,389	1,212	947	3,615	883	0	3,192	1,771	25,413	31,291
1986	600	41	5,874	15,795	20,668	42,978	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1987	907	15	64	568	17,278	18,832	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1988	663	93	3,974	13,703	18,585	37,018	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1989	62	0	0	0	167	229	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1990	202	0	0	501	3,723	4,426	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]	[a]
1991 [b]	161	0	0	0	804	965	312	0	2,153	3,555	2,660	8,680	473	0	2,153	3,555	3,464	9,645
1992 [b]	0	0	3,531	0	6	3,537	100	0	1,281	6,152	1,260	8,793	100	0	4,812	6,152	1,266	12,330

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Table 3.–Page 2 of 2.

	SUBDISTRICT 3 (ELIM)																	
	Commercial						Subsistence						Combined					
Year	King	Sockeye	Coho	Pink	Chum	Total	King	Sockeye	Coho	Pink	Chum	Total	King	Sockeye	Coho	Pink	Chum	Total
1993 [b]	3	0	4,065	0	167	4,235	368	0	1,217	1,726	1,635	4,946	371	0	5,282	1,726	1,802	9,181
1994 [b]	0	0	5,345	0	414	5,759	322	104	1,180	9,345	3,476	14,427	322	104	6,525	9,345	3,890	20,186
1995 [b]	4	44	3,742	2,962	1,171	7,923	284	17	1,353	2,046	3,774	7,474	288	61	5,095	5,008	4,945	15,397
1996 [b]	0	0	1,915	68,609	0	70,524	417	52	1,720	9,442	2,319	13,950	417	52	3,635	78,051	2,319	84,474
1997 [b]	844	0	1,409	0	2,683	4,936	619	50	1,213	1,314	2,064	5,260	1,463	50	2,622	1,314	4,747	10,196
1998 [b]	105	0	1,462	145,669	2,311	149,547	414	49	1,831	6,891	1,376	10,561	519	49	3,293	152,560	3,687	160,108
1999 [b]	0	0	0	0	0	0	424	13	975	1,564	744	3,720	424	13	975	1,564	744	3,720
2000 [b]	10	0	5,182	46,369	535	52,096	248	46	1,429	5,983	1,173	8,879	258	46	6,611	52,352	1,708	60,975
2001 [b]	7	0	1,696	0	681	2,384	427	70	1,352	1,390	898	4,137	434	70	3,048	1,390	1,579	6,521
2002 [b]	0	0	0	0	0	0	565	14	1,801	8,345	1,451	12,176	565	14	1,801	8,345	1,451	12,176
2003 [b]	0	0	0	0	0	0	660	39	1,143	2,524	1,687	6,053	660	39	1,143	2,524	1,687	6,053
2004 [c]	0	0	0	0	0	0	412	0	704	7,858	683	9,657	412	0	704	7,858	683	9,657
2005 [c]	0	0	0	0	0	0	225	9	1,011	3,721	598	5,564	225	9	1,011	3,721	598	5,564
2006 [c]	0	0	0	0	0	0	179	13	1,769	5,216	1,267	8,444	179	13	1,769	5,216	1,267	8,444
2007 [c]	1	0	5,908	1,648	4,567	12,124	260	0	2,295	1,742	2,334	6,631	261	0	8,203	3,390	6,901	18,755
2008 [c]	5	0	4,602	14,536	304	19,447	269	0	1,804	7,655	1,284	11,012	274	0	6,406	22,191	1,588	30,459
2009 [c]	0	1	9,582	35	597	10,215	545	13	2,434	1,522	600	5,114	545	14	12,016	1,557	1,197	15,329
2010 [c]	9	5	10,180	11,658	23,453	45,305	97	7	1,679	7,830	3,925	13,538	106	12	11,859	19,488	27,378	58,843
2011 [c]	4	12	8,336	165	23,531	32,048	160	3	1,688	704	3,671	6,226	164	15	10,024	869	27,202	38,274
2012 [c]	3	1	2,003	52,775	2,262	57,044	42	0	1,302	10,848	1,494	13,686	45	1	3,305	63,623	3,756	70,730
2013 [c]	6	27	6,675	601	1,434	8,743	39	15	1,515	1,134	1,218	3,921	45	42	8,190	1,735	2,652	12,664
2014 [c]	101	164	15,938	28,507	17,525	62,235	276	38	1,808	4,595	2,081	8,798	377	202	17,746	33,102	19,606	71,033
2015 [c]	533	1,535	14,155	2,787	30,116	49,126	198	154	1,158	1,828	1,573	4,911	731	1,639	15,313	4,615	31,689	54,037
2016 [c]	69	728	14,197	39,028	6,736	60,758	163	60	1,164	6,717	830	8,934	232	788	15,361	45,745	7,566	69,692
2017 [c]	51	538	19,410	2,877	11,779	34,655	51	35	2,362	3,664	1,109	7,221	102	573	21,772	6,541	12,888	41,876
2018 [cd]	138	482	20,002	9,474	38,419	68,515	47	35	1,610	3,422	509	5,623	185	517	21,612	12,896	38,928	74,138
2014-2018 average	178	689	16,740	16,535	20,915	55,058	147	64	1,620	4,045	1,220	7,097	325	744	18,361	20,580	22,135	62,155

[a] Subsistence surveys were not conducted.

[b] Subsistence harvests were estimated from Division of Subsistence household surveys. Previous surveys often were partial surveys and did not capture later season harvests like coho salmon.

[c] Beginning in 2004, a permit was required for the subdistrict that replaced household surveys. The permit system helped to record harvest by residents living outside the subdistrict.

[d] Preliminary.

Table 4.–Subdistricts 2 and 3 (Golovin and Elim) historical management actions.

1961	Districtwide fishing schedule standard two 48-hour periods per week.
	Commercial fishing allowed in marine waters only.
	100 fathoms maximum length allowable gillnet gear.
1962	Formation of 6 management subdistricts.
1969	Beach seines allowed in Subdistrict 2 as commercial gear for pink salmon by emergency order.
1977	Kwiniuk River escapement goal of 20,000 chum salmon established due to low returns in 1975 and 1976.
1979	Kwiniuk River escapement goal of 25,000 chum salmon established due to low returns in 1975 and 1976 and intended to rebuild the stock.
1980	Management authority to restrict gillnet mesh size to 4.5 inch maximum allowed the ability to open pink salmon directed fishing periods.
	Subdistrict 3 fishing period duration reduced to half the standard length.
1985	Commercial seasons to be opened by emergency order between June 8 and June 20 and close by regulation on August 31.
	Subdistrict 3 returned to the standard two 48-hour fishing periods per week schedule.
	Half of Subdistrict 3 closed to commercial fishing due to low chum salmon returns.
1986	Four commercial fishing periods closed in Subdistrict 3 due to low chum salmon returns.
1987	Five commercial fishing periods closed in Subdistrict 3 due to low chum salmon returns.
1988	Management authority to restrict gillnet mesh size to 6-inch maximum allowed the ability to direct the fishery toward a target species.
	Management restricted Subdistrict 3 to pink salmon gear only and closed fishing periods to protect the weak chum salmon return.
1989	Management reduced period length in Subdistrict 2 and closed Subdistrict 3 during most of the chum salmon run to protect the weak return.
1990	Subdistrict 3 commercial fishery was restricted half the season to pink salmon gear during weak chum salmon run.
1991	Subdistrict 3 commercial fishery was open only one period during weak chum salmon run.
1992	Management plan for Subdistrict 2 established a maximum harvest level of 10,000 chum salmon to preserve the stock and allowed directed fisheries on other species only if survey data indicated adequate chum salmon escapements would probably be achieved.
	The Kwiniuk River escapement goal was reduced to 19,500 chum salmon.
	Only one directed chum salmon commercial period during the anticipated weak chum salmon run.
1993	Management restricted Subdistrict 2 to special pink salmon periods, with limited gear and harvest areas to avoid high incidental catches of chum salmon.
	The Subdistrict 3 did not open for king or pink salmon due to the chance of potentially harvesting a portion of the depressed chum salmon stocks.

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	Subsistence fishing restrictions were imposed that protected chum salmon on the spawning grounds.
1994	Subdistrict 2 continued to operate under the 10,000 chum salmon cap management plan, but no harvest occurred due to lack of market.
	Subdistrict 3 had no directed commercial chum salmon fishery, with plan to only allow a pink salmon fishery if adequate chum salmon were available; however, no market interest.
1995	No change in management plans in either subdistrict with some chum salmon caught during directed pink salmon and coho salmon fisheries.
1996	No change in management plans in either subdistrict with some chum salmon caught during directed pink salmon and coho salmon fisheries.
1997	No change in management plans in either subdistrict with some chum salmon caught during directed king salmon periods, except for the Subdistrict 2 chum salmon guideline was liberalized to 15,000 fish prior to July 15.
1998	One commercial king salmon period allowed in consideration of incidental catches when chum salmon periods were common.
	Pink salmon-directed commercial harvest opened continuously with the buyer scheduling fishing to maximize transport and production. Good coho salmon run attracted limited market.
1999	No commercial periods for any salmon species due to poor returns.
	Sport and subsistence coho salmon closures in Subdistrict 2.
2000	Directed pink and coho salmon fisheries land small numbers of chum salmon through use of gear and time restrictions.
2001	New chum salmon optimal escapement goals established for Kwiniuk River (11,500–23,000) and Tubutulik River (9,200–18,400); board establishes Subdistricts 2 and 3 salmon management plan.
2002	Lack of buyer results in no commercial fishing. Sport and subsistence restrictions for coho salmon in Subdistrict 2. However, run determined to be very late and escapement was good.
2003	No commercial fishing in either subdistrict because of poor runs. Sport and subsistence restrictions for chum salmon and coho salmon in Subdistrict 2.
2004	Subsistence and sport restrictions on coho salmon. New goal for chum salmon established for Niukluk River tower (SEG >30,000 chums).
2005	Sport restrictions for coho salmon in Subdistrict 2.
2006	No restrictions.
2007	For the first time in 6 years, a buyer returns to Subdistrict 3 and commercial chum salmon and coho salmon fishing periods allowed.
2008	For the first time in 7 years, a buyer returns to Subdistrict 2 and commercial coho salmon fishing periods occur.
	After one commercial chum salmon period, Subdistrict 3 is closed because inseason projection indicated the chum salmon escapement goal will not be met.
	Pink salmon and coho salmon commercial periods occur in Subdistrict 3.

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2009	Both Subdistricts 2 and 3 remain closed to commercial chum salmon fishing because projections show chum salmon escapement goals will not be reached.
	Kwiniuk River counting tower recorded one of the worst chum salmon escapements on record.
	Commercial coho salmon harvest in Subdistrict 3 surpasses the previous record by over 50%.
	Commercial coho salmon harvest was the fourth best on record in the Golovin Subdistrict.
2010	Both Subdistricts 2 and 3 have record commercial coho salmon harvests and the best commercial chum salmon harvests in over 20 years.
	Kwiniuk River counting tower has a record chum salmon escapement.
2011	Both Subdistricts 2 and 3 have the best commercial chum salmon harvests in over 20 years.
2012	Both Subdistricts 2 and 3 have the best commercial pink salmon harvests since 1998.
	Only one commercial chum salmon fishing period in Subdistrict 2 and none in Subdistrict 3.
	Kwiniuk River has the lowest chum salmon escapement on record.
	Stormy August weather greatly curtails coho salmon fishing and floods out escapement counting projects in mid-August for the remainder of the year.
2013	Only 2 commercial chum salmon fishing periods in Subdisricts 2 and 3.
	Kwiniuk River has the lowest king salmon and second lowest chum escapement on record.
	Commercial coho salmon harvests are second highest all-time in Subdistrict 2 and fourth highest all time in Subdistrict 3.
2014	Both Subdistricts 2 and 3 have sport and subsistence hook and line closures for king salmon.
	Kwiniuk River king salmon escapement is reached for the first time since 2009.
	Commercial chum salmon harvests are third highest in over 25 years in Subdistrict 3 and fifth highest in over 25 years in Subdistrict 2.
	Commercial coho salmon harvests are a record in Subdistrict 3 and fourth highest of all time in Subdistrict 2.
2015	Commercial chum salmon harvests are the highest in over 25 years in Subdistrict 3 and third highest in over 25 years in Subdistrict 2.
	Commercial coho salmon harvests are second highest all time a record in Subdistrict 3 and fifth highest of all time in Subdistrict 2.
2016	Commercial chum salmon harvests drop off and pink salmon harvests exceed chum catch by over 4 to 1 in both subdistricts.
	Commercial coho salmon harvests are second highest of all time in Subdistrict 3, but poor in Subdistrict 2.
2017	Chum salmon runs well above average, but buyer has capacity concerns and limits fishing time.
	Commercial coho salmon harvests are a record in Subdistrict 3, but poor in Subdistrict 2.
2018	Commercial chum salmon harvests are highest in 30 years in Subdistrict 2 and highest in 35 years in Subdistrict 3, but buyer has capacity concerns and limits fishing time.
	Commercial coho salmon harvests are a record in Subdistrict 3, and 7th highest in Subdistrict 2.

Table 5.–Historical salmon escapement at Niukluk River counting tower, 1995–2012.

Year	Operating Period	Chum	Pink	King	Coho
1995	June 29–Sept 12	86,332	17,088	123	4,713
1996	June 23–Sept 12	80,178	1,154,922	243	12,781
1997	June 28–Sept 09	57,305	10,468	259	3,994
1998	July 04–Aug 09	45,588	1,624,438	260	840
1999	June 04–Sept 04	35,239	20,351	40	4,260
2000	July 04–Aug 27	29,573	961,603	48	11,382
2001	July 10–Sept 08	30,662	41,625	30	3,468
2002	June 25–Sept 10	35,307	645,141	621	7,391
2003	June 25–Sept 10	20,018	75,855	179	1,282
2004	June 25–Sept 08	10,770	975,895	141	2,064
2005	June 28–Sept 09	25,598	270,424	41	2,727
2006	June 26–Sept 08	29,199	1,371,919	39	11,169
2007	July 01–Sept 04	50,994	43,617	30	3,498
2008	July 01–Sept 06	12,078	669,234	33	13,779
2009	July 03–Sept 02	15,879	24,204	204	6,861
2010	July 01–Sept 01	48,561	434,205	15	9,042
2011	June 28–Sept 06	23,607	15,425	18	2,405
2012	July 04–Aug 16	19,576	249,412	21	1,729

Table 6.–Historical salmon escapement at Fish River counting tower, 2014–2018.

Year		Operating Period	Chum	Pink	King	Coho
2014	[a]	June 18 - Aug 25	63,348	312,498	1,205	18,278
2015		June 19 - Aug 26	144,690	217,396	2,299	14,729
2016		June 18 - July 30	71,005	1,282,892	838	3,300
2017		June 16 - Aug 25	158,411	1,496,916	181	12,132
2018	[b]	July 10 - Aug 25	36,612	2,705,742	72	17,719

[a] Only one tower was operational until late July and counts would be minimal.

[b] Project became operational after the midpoint of run for all species, except coho salmon.

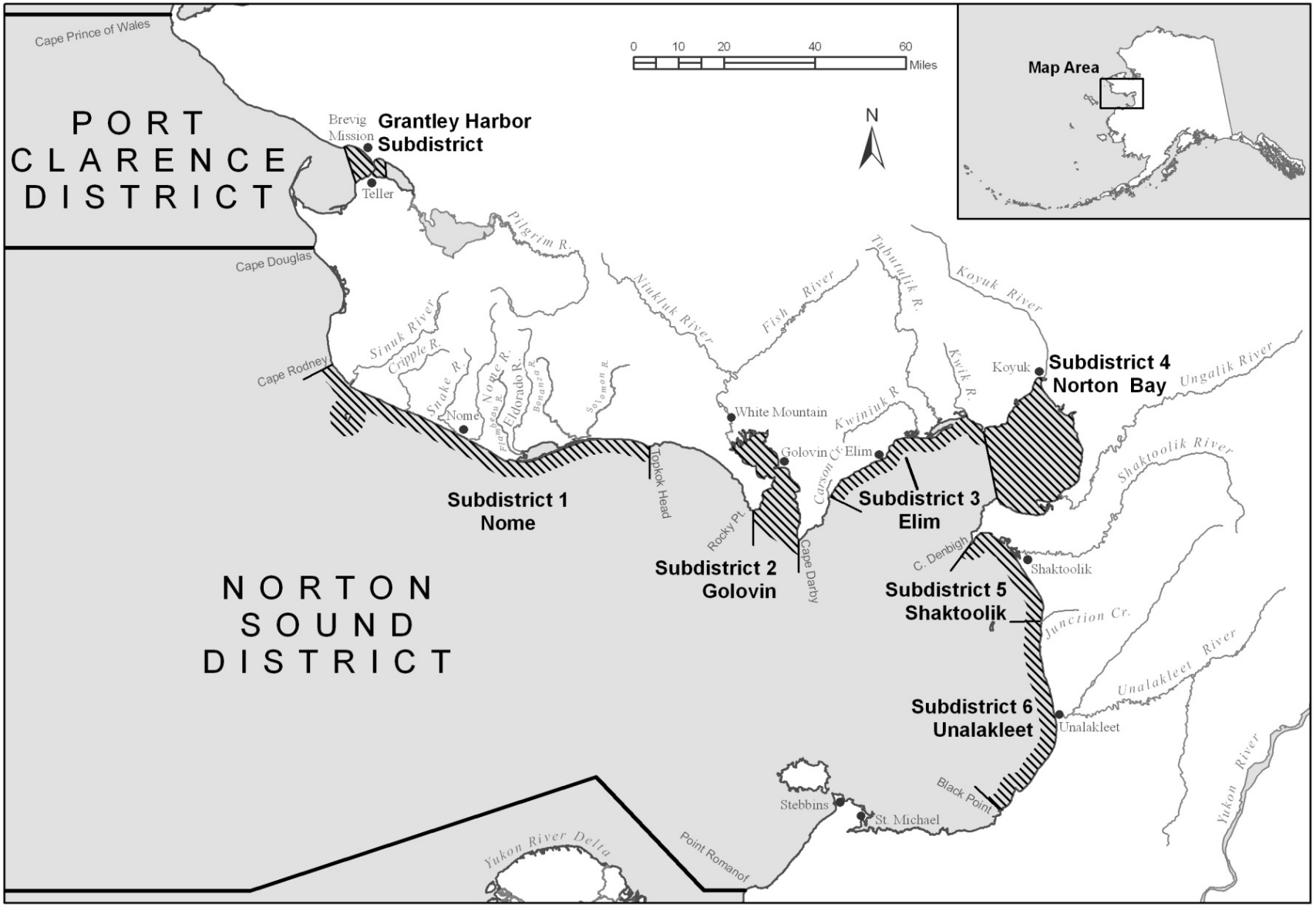

Figure 1.–Norton Sound commercial salmon fishing districts and subdistricts.

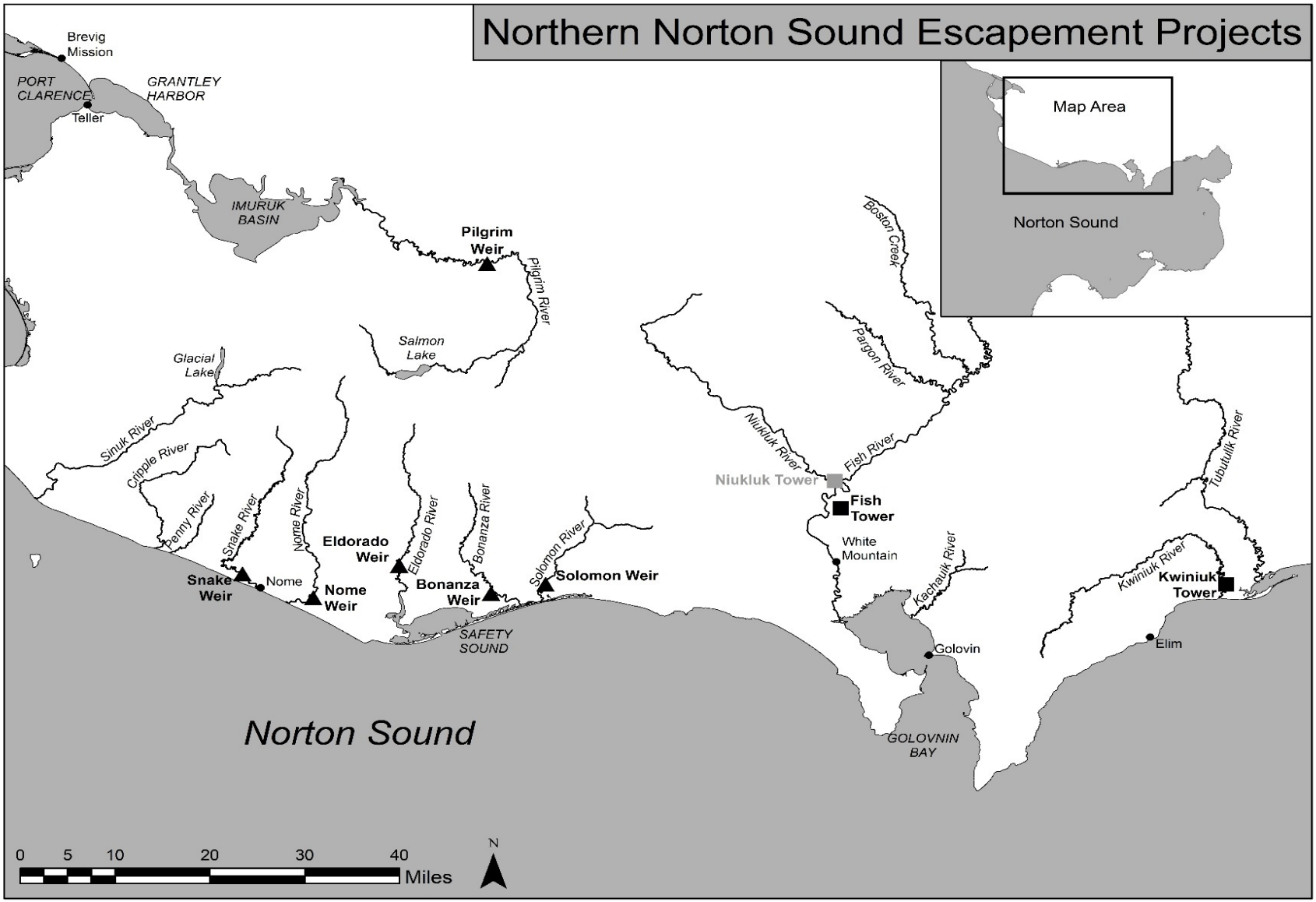

Figure 2.–Northern Norton Sound area rivers and escapement projects. Escapement project shown in gray is discontinued.

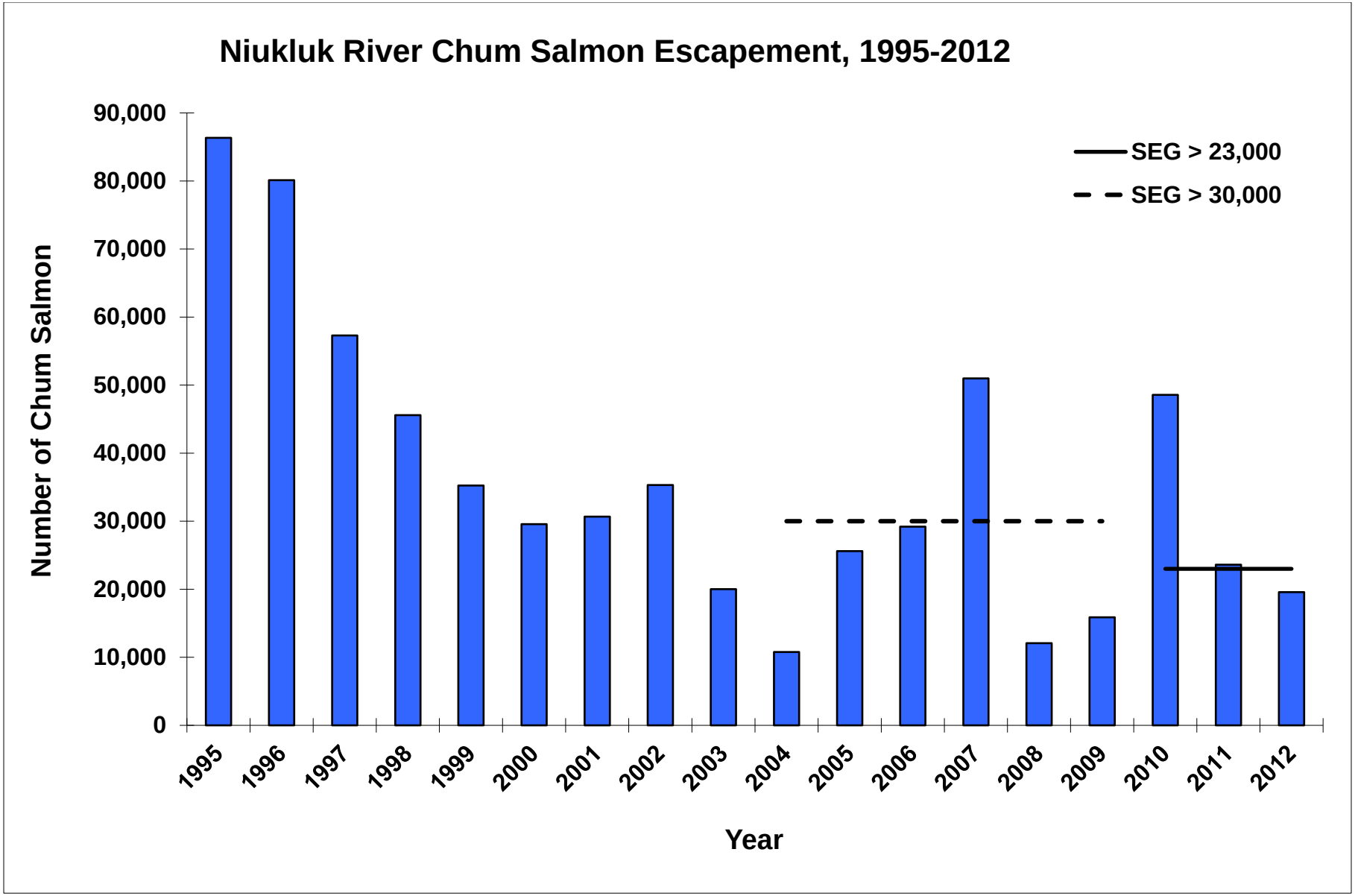

Figure 3.–Niukluk River chum salmon escapement, 1995–2012.

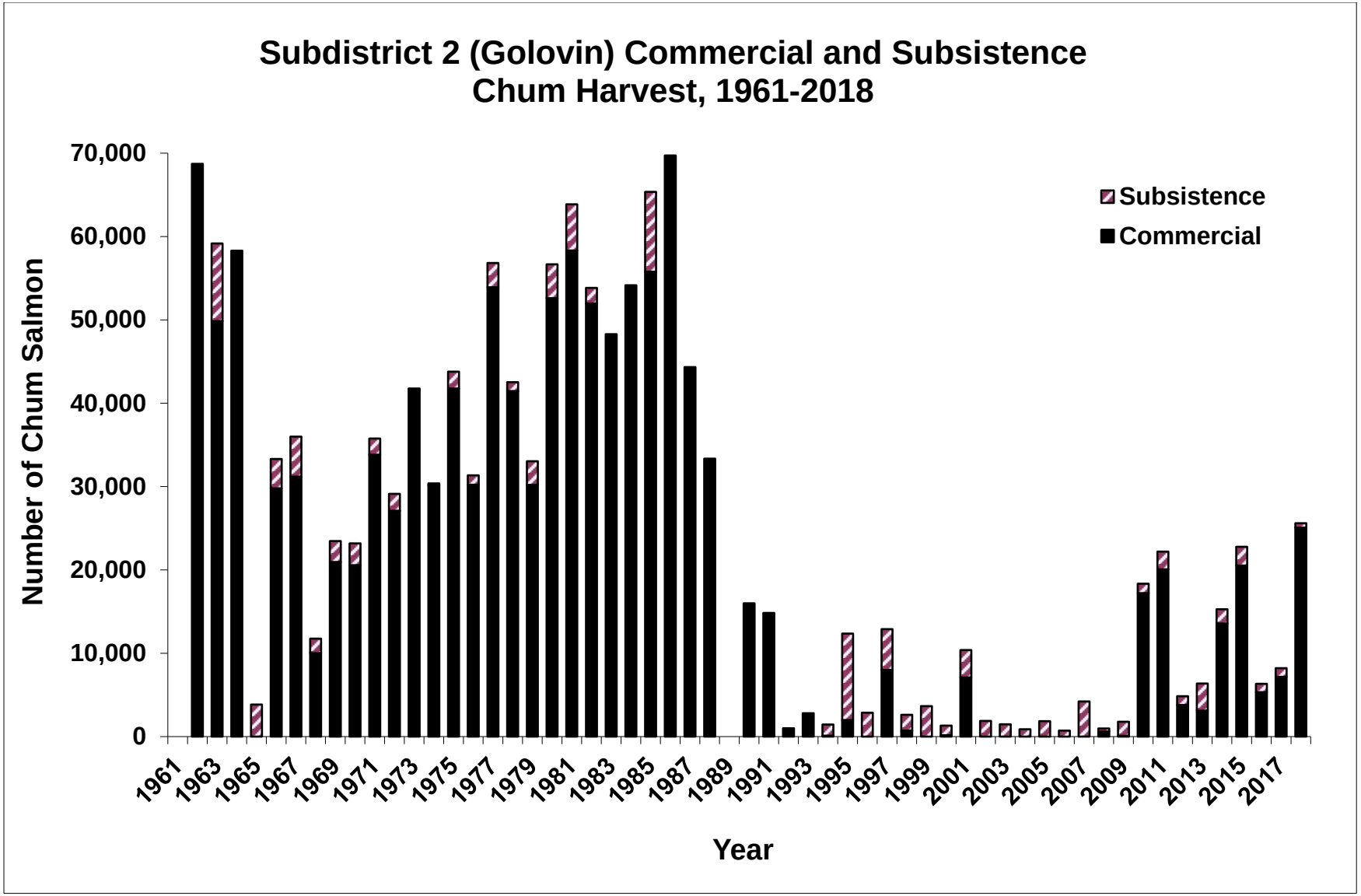

Figure 4.–Subdistrict 2 (Golovin) commercial and subsistence chum salmon harvest, 1961–2018.

Note: Subsistence data not available for all years.

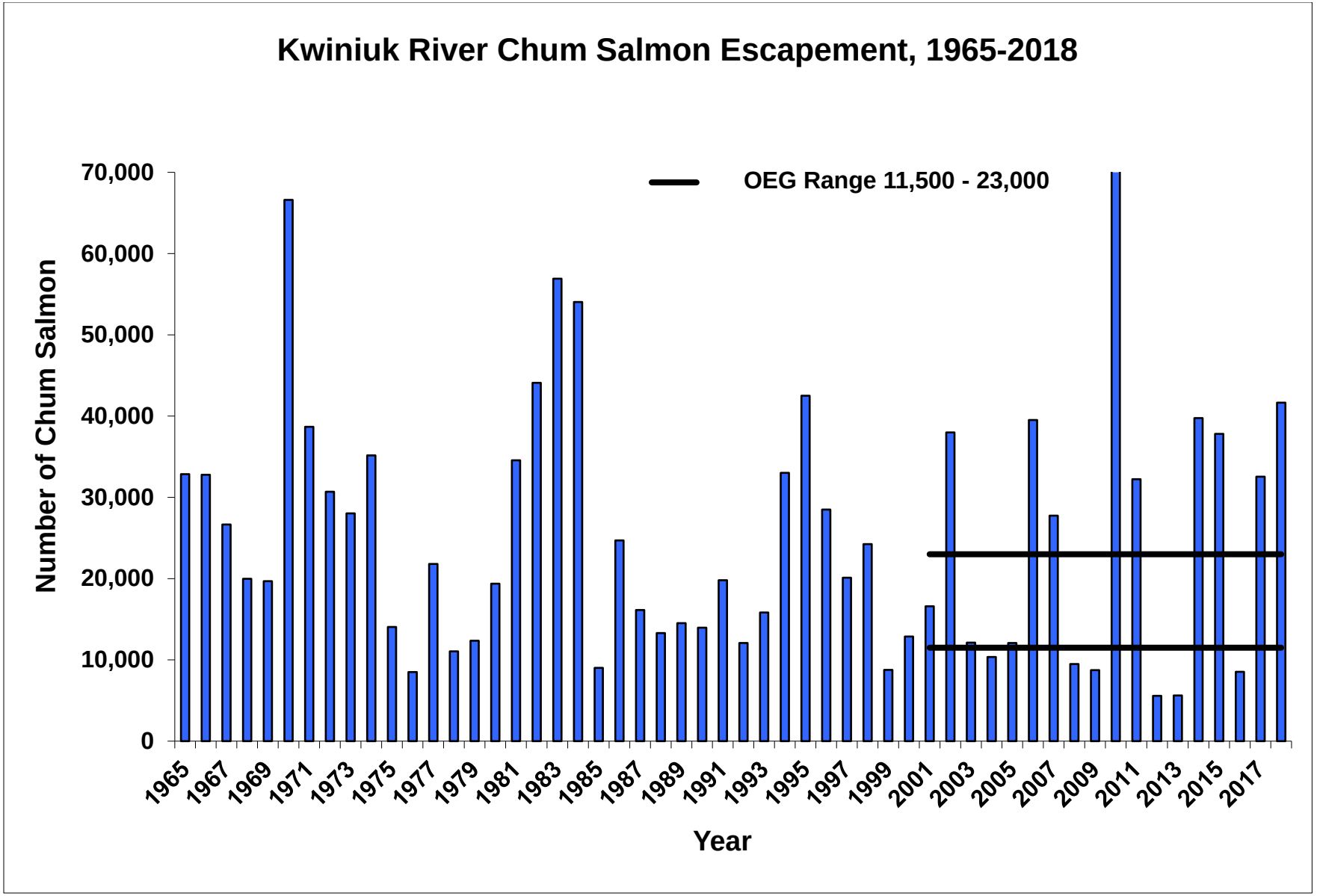

Figure 5.–Kwiniuk River chum salmon escapement, 1965–2018.

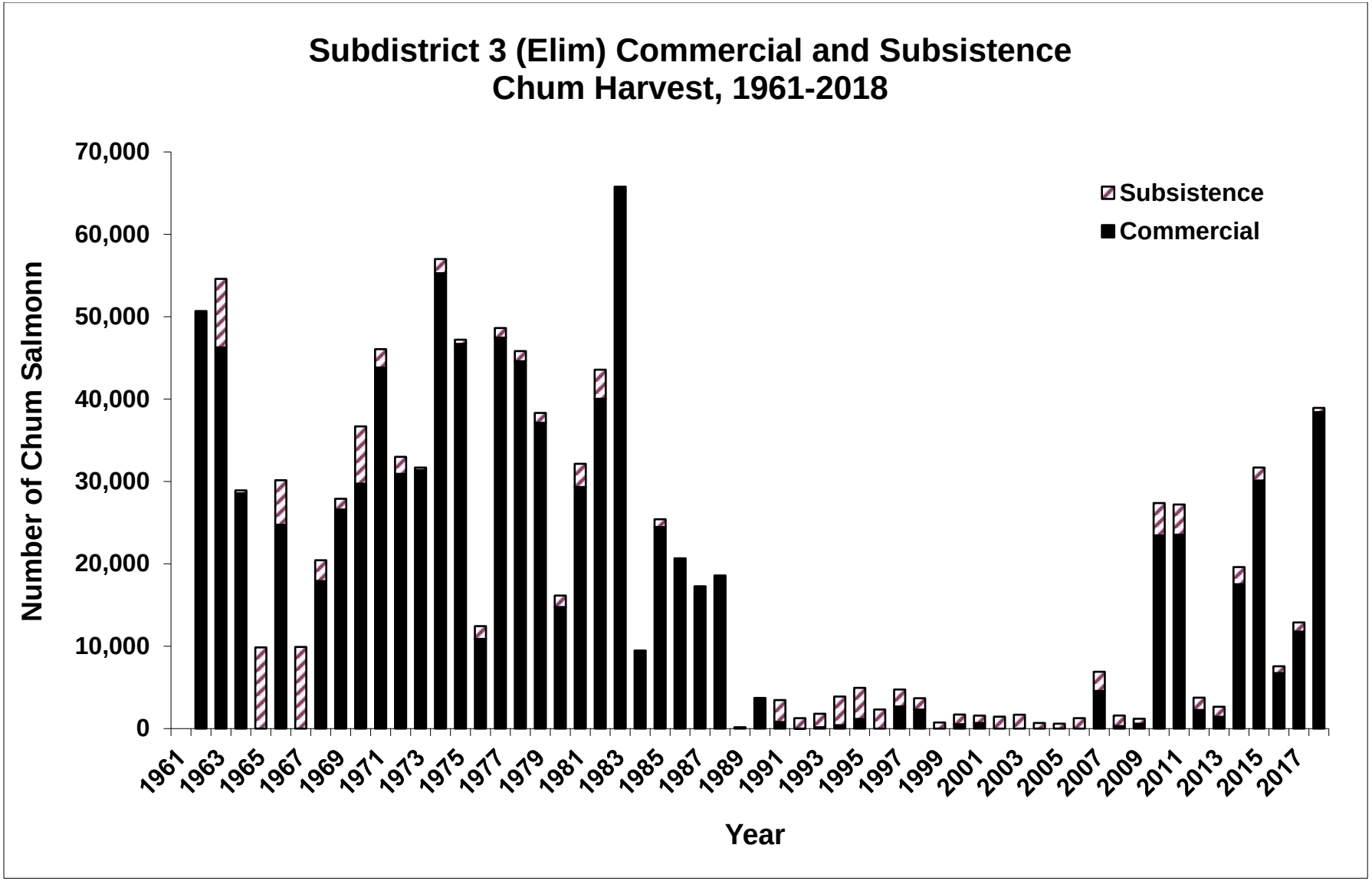

Figure 6.–Subdistrict 3 (Elim) commercial and subsistence chum salmon harvest, 1961–2018.

Note: Subsistence data not available for all years.