

# **Northern Southeast Alaska Chinook Salmon Stock Status and Action Plan, 2022**

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June 2022

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Alaska Department of Fish and Game

Divisions of Sport Fish and Commercial Fisheries



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Weights and measures (metric)		General		Measures (fisheries)	
centimeter	cm	Alaska Administrative		fork length	FL
deciliter	dL	Code	AAC	mid-eye-to-fork	MEF
gram	g	all commonly accepted		mid-eye-to-tail-fork	METF
hectare	ha	abbreviations	e.g., Mr., Mrs., AM, PM, etc.	standard length	SL
kilogram	kg			total length	TL
kilometer	km	all commonly accepted			
liter	L	professional titles	e.g., Dr., Ph.D., R.N., etc.	<b>Mathematics, statistics</b>	
meter	m			<i>all standard mathematical</i>	
milliliter	mL	at	@	<i>signs, symbols and</i>	
millimeter	mm	compass directions:		<i>abbreviations</i>	
		east	E	alternate hypothesis	H <sub>A</sub>
		north	N	base of natural logarithm	e
		south	S	catch per unit effort	CPUE
		west	W	coefficient of variation	CV
		copyright	©	common test statistics	(F, t, $\chi^2$ , etc.)
		corporate suffixes:		confidence interval	CI
		Company	Co.	correlation coefficient	
		Corporation	Corp.	(multiple)	R
		Incorporated	Inc.	correlation coefficient	
		Limited	Ltd.	(simple)	r
		District of Columbia	D.C.	covariance	cov
		et alii (and others)	et al.	degree (angular)	°
		et cetera (and so forth)	etc.	degrees of freedom	df
		exempli gratia		expected value	E
		(for example)	e.g.	greater than	>
		Federal Information		greater than or equal to	≥
		Code	FIC	harvest per unit effort	HPUE
		id est (that is)	i.e.	less than	<
		latitude or longitude	lat. or long.	less than or equal to	≤
		monetary symbols		logarithm (natural)	ln
		(U.S.)	\$, ¢	logarithm (base 10)	log
		months (tables and		logarithm (specify base)	log <sub>2</sub> , etc.
		figures): first three		minute (angular)	'
		letters	Jan,...,Dec	not significant	NS
		registered trademark	®	null hypothesis	H <sub>0</sub>
		trademark	™	percent	%
		United States		probability	P
		(adjective)	U.S.	probability of a type I error	
		United States of		(rejection of the null	
		America (noun)	USA	hypothesis when true)	α
		U.S.C.	United States	probability of a type II error	
			Code	(acceptance of the null	
		U.S. state	use two-letter	hypothesis when false)	β
			abbreviations	second (angular)	"
			(e.g., AK, WA)	standard deviation	SD
				standard error	SE
				variance	
				population	Var
				sample	var
<b>Weights and measures (English)</b>					
cubic feet per second	ft <sup>3</sup> /s				
foot	ft				
gallon	gal				
inch	in				
mile	mi				
nautical mile	nmi				
ounce	oz				
pound	lb				
quart	qt				
yard	yd				
<b>Time and temperature</b>					
day	d				
degrees Celsius	°C				
degrees Fahrenheit	°F				
degrees kelvin	K				
hour	h				
minute	min				
second	s				
<b>Physics and chemistry</b>					
all atomic symbols					
alternating current	AC				
ampere	A				
calorie	cal				
direct current	DC				
hertz	Hz				
horsepower	hp				
hydrogen ion activity	pH				
(negative log of)					
parts per million	ppm				
parts per thousand	ppt, ‰				
volts	V				
watts	W				

***REGIONAL INFORMATION REPORT NO. 1J22-17***

**NORTHERN SOUTHEAST ALASKA CHINOOK SALMON STOCK  
STATUS AND ACTION PLAN, 2022**

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June 2022

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*Hagerman, G. T., D. K. Harris, J. T. Williams, D. J. Teske, B. W. Elliott, N. L. Zeiser, and R. S. Chapell. Northern Southeast Alaska Chinook salmon stock status and action plan, 2022. Alaska Department of Fish and Game, Regional Information Report No. 1J22-17, Douglas, Alaska.*

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# ABSTRACT

Escapements of Chinook salmon have fallen below the lower bound of the current BEG range for Chilkat River in 3 of the past 5 years, for King Salmon River in 4 of the past 5 years, and for the Taku River in 5 of the past 5 years. In response to guidelines established in the *Policy for the management of sustainable salmon fisheries* (SSFP), the Alaska Department of Fish and Game (department) recommended the Chilkat and King Salmon River Chinook salmon (*Oncorhynchus tshawytscha*) stocks be designated as stocks of “management concern” in 2017 followed by approval from the Alaska Board of Fisheries at the 2018 Southeast and Yakutat Finfish and Shellfish meeting. In October 2020, the department recommended the continuation of stock of management concern status for the Chilkat and King Salmon Rivers and to add the Taku River Chinook salmon stock at 2021 Southeast Alaska and Yakutat meeting. A “management concern” is defined as “a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a salmon stock within the bounds of the SEG [sustainable escapement goal], BEG [biological escapement goal], OEG [optimum escapement goal], or other specified management objectives for the fishery.” Since 2012, the department has implemented conservative management measures to reduce the harvest of the Chilkat River stock of Chinook salmon and increase escapement. Through these measures, and from actions taken to reduce the harvest of the Taku River stock of Chinook salmon, by extension, harvest on the stock of Chinook salmon from the King Salmon River may likewise have been reduced. Although these management actions have been effective at reducing overall harvest rates, the poor runs have been so low that achievement of BEGs has been problematic.

Keywords: Chinook salmon, *Oncorhynchus tshawytscha*, Chilkat River, King Salmon River, Taku River, Southeast Alaska, stock of concern, fishing, sustainable salmon fisheries policy, Alaska Board of Fisheries.

# INTRODUCTION

The *Policy for the management of sustainable salmon fisheries* (SSFP; 5 AAC 39.222) 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 regularly scheduled board meetings. Herein, the Chilkat, King Salmon, and Taku Rivers stocks of Chinook salmon *Oncorhynchus tshawytscha* will be referred to as Chilkat River Chinook salmon, King Salmon River Chinook salmon, and Taku River Chinook salmon.

In January 2018, the board designated Chinook salmon stocks from the Chilkat and King Salmon Rivers as stocks of management concern. Subsequently, the department developed the 2018 Chilkat and King Salmon Rivers king salmon action plan (Lum and Fair 2018a). In October 2020, the department recommended to continue to designate Chinook salmon stocks from the Chilkat and King Salmon Rivers and add the Taku River Chinook salmon stock as stocks of management concern at the regulatory board meeting for the Southeast Alaska (SEAK) and Yakutat Management Area 2021 board cycle. The stock of concern recommendations were based on guidelines established in the SSFP. The SSFP states that a management concern is “a concern arising from a chronic inability, despite use of specific management measures, to maintain escapements for a salmon stock within the bounds” of the established escapement goal whether it be a sustainable escapement goal (SEG), biological escapement goal (BEG), optimal escapement goal (OEG), or other specified management objective. Chronic inability is defined in the SSFP as the “continuing or anticipated inability to meet escapement thresholds over a 4-to-5-year period, which is approximately the generation time of most salmon species.” Escapements of Chinook salmon in the Chilkat River were below the lower bound of the BEG range of 1,750 to 3,500 fish in 6 out of 9 years from 2012 to 2020 (Tables 1 and 2); escapements of Chinook salmon in the King Salmon River were below the lower bound of the BEG range of 120 to 240 fish in 7 out of 9 years from 2012 to 2020 (Table 3); and escapements of Chinook salmon to the Taku River were below the lower bound of the BEG range of 19,000 to 36,000 fish in 7 out of 9 years from 2012 to

2020 and in the previous 5 consecutive years from 2016 to 2020 (Table 4). It is important to note that while escapements for these 3 Chinook salmon stocks have consistently failed to achieve the lower bound of their escapement goal ranges, harvest rates have declined significantly over the past 3 years through conservative management actions.

The Taku River originates in Canada and approximately 10% of the drainage is in Alaska. Management of shared fishery stocks is conducted on a cooperative basis under the auspices of the Pacific Salmon Treaty (PST) negotiated between the 2 countries; the latest agreement was finalized in 2018, implemented in 2019, and will be in effect through 2028.

Poor production and declines of Chinook salmon runs over at least the past decade have been well documented throughout much of the species' range (ADFG 2013). Below average survival rates and abundance of SEAK stocks have persisted since 2007. Although freshwater factors may be contributing to these declines, the wide geographic scope of the effect suggests poor production primarily stems from factors in the ocean. This idea is supported by information produced through the department's SEAK Chinook salmon stock assessment program, which includes estimating marine survival rates for 4 wild Chinook salmon stocks originating in the Chilkat, Taku, Stikine, and Unuk Rivers. Freshwater survival is also estimated for wild Chinook salmon stocks originating from the Chilkat and Unuk Rivers. The long times series of detailed stock assessment information available for these stocks, including survival rates, is unique to the SEAK program, and is not available for wild Chinook salmon stocks found elsewhere along the coast. Freshwater survival rates of these 4 SEAK Chinook salmon indicator stocks have fluctuated similarly over time and do not show long-term trends; however, marine survival rates for these same stocks have severely declined and are currently far below prior long-term averages.

This draft action plan provides the department's assessment of the stocks of Chinook salmon from the Chilkat, King Salmon, and Taku Rivers as stocks of management concern, summarizes historical assessments of annual run sizes, and describes the existing regulations and emergency order (EO) authority that the department follows to manage for escapement goals. Options are then presented for potential management actions for sport, commercial, personal use, and subsistence fisheries, and research projects for these Chinook salmon stocks. Because of similar migration routes through Icy Strait and Chatham Strait, management actions for these 3 Chinook salmon stocks in the mixed stock fisheries that occur in Chatham Strait and Icy Strait (sport, troll, and purse seine) overlap and affect one another. Consequently, the Taku River has been included with the Chilkat and King Salmon Rivers in this northern southeast plan.

## **STOCK ASSESSMENT BACKGROUND**

### **CHILKAT RIVER**

The Chilkat River is a glacial system that empties into Chilkat Inlet in northern Lynn Canal, near Haines (Figure 1) that supports the fifth largest stock of Chinook salmon in SEAK. Chilkat River Chinook salmon predominantly rear in the inside waters of SEAK (Pahlke 2008). Among the 11 SEAK Chinook salmon stocks that are monitored for escapement, the Chilkat River is 1 of 4 stocks for which a full stock assessment is performed annually by the department. This includes coded-wire-tagging (CWT) juveniles and smolt, and in combination with adult sampling programs provides estimates of smolt abundance, parr to smolt survival rates, marine survival rates, and total run size along with harvest (calendar year) and exploitation (brood year) rates. Coded-wire-tagging of juvenile Chilkat River Chinook salmon was conducted from 1988 to 1990 and at relatively high

tag rates (8–10%) since 1999. Estimates of escapement are germane to age-1.3 and older fish, hereto referred to as “large” fish (Chinook salmon  $\geq 660$  mm mideye to tail fork length; primarily fish age 1.3 and older) and are based on mark-recapture (MR) estimates conducted annually since 1991.

## Escapement

Since 1991, estimated escapements of large Chinook salmon to the Chilkat River have averaged 3,344 fish; during the most recent 10-year period (2011–2020) escapements have averaged 1,873 fish and during the most recent 5-year period (2016–2020) escapements have averaged 1,727 Chinook salmon (Tables 1 and 2). The recent 10-year average is 46% and the recent 5-year average is 42% of the 1991 to 2010 average. Over the last 10 years, Chinook salmon escapements to the Chilkat River were within the BEG range in only 4 years (2011, 2015, 2019, and 2020).

## Harvest

Chilkat River Chinook salmon are harvested directly in a small terminal marine sport fishery in Chilkat Inlet, but otherwise are harvested in mixed stock sport fisheries, commercial drift gillnet (Lynn Canal) and commercial troll (primarily in northern SEAK) fisheries. This stock is also harvested incidentally in sockeye salmon (*O. nerka*) subsistence fisheries in Chilkat Inlet and the Chilkat River. Lynn Canal fisheries that harvest Chilkat River Chinook salmon stocks are managed according to the *Lynn Canal and Chilkat River King Salmon Fishery Management Plan* (5 AAC 33.384) to achieve escapements within the BEG range. CWT recovery information shows calendar year harvest rates on Chilkat River Chinook salmon have historically been low, averaging 26% from 2005 to 2015. However, harvest rates were reduced to an average of 13% from 2016 to 2020 after additional conservative management actions were implemented. Management actions outlined in the 2018 Chilkat and King Salmon Rivers king salmon action plan, further served to reduce harvest of Chilkat River Chinook salmon in the commercial, sport, and subsistence fisheries in Lynn Canal. As a result of these additional restrictions, the 2018 to 2020 harvest rates for Chilkat River Chinook salmon averaged 9%. Over the most recent 10-year period (2011–2020), the SEAK sport fishery accounted for 41% of the harvest, followed by commercial net (37%), commercial troll (15%), and local subsistence (7%). Since the inception of the action plan, Chilkat River Chinook salmon harvests from all SEAK fisheries have averaged 123 fish annually.

Harvests of Chilkat River Chinook salmon in the SEAK sport fishery occur primarily from May through August. The estimated sport harvest of this stock averaged 214 fish between 2011 and 2020 with a range of 0 fish in 2019 to 449 fish in 2014, as estimated using CWT recovery information (Table 2). Most of this harvest (96%) occurred in the Northern Inside area (Districts 9 through 12, and 15) while the remaining occurred in the Northern Outside area (Districts 13, 14, and 16 through 18; Figure 4). No harvests were identified in the Southern Inside and Outside areas (Districts 1 through 8).

Harvests of Chilkat River Chinook salmon in SEAK commercial net and troll fisheries averaged 272 fish from 2011 to 2020 (Table 2), most of which occurred in the net fishery (193 fish). Since 2018, the average commercial harvest has been reduced to 75 fish. Management actions implemented in the 2019 and 2020 District 15 drift gillnet fishery exceeded the restrictions outlined in the 2018 Chilkat and King Salmon Rivers king salmon action plan and as a result, estimated harvest rates were at an all-time low of 4% in 2019 and 2% in 2020 (Table 1). Commercial troll fisheries also harvest this stock, most of which occurs in the spring troll fishery, and averaged 79 fish from 2011 to 2020 (Table 2).

Chilkat River Chinook salmon are harvested in a subsistence fishery that operates in the terminal area of Chilkat Inlet and in the Chilkat River. Subsistence harvest represents the smallest percentage (7%) of overall harvest, averaging 38 fish since 2011 (Table 2).

## **KING SALMON RIVER**

The King Salmon River is a clearwater system located about 30 km (19 mi) south of Juneau on Admiralty Island. This river has the only documented island stock of Chinook salmon in SEAK (Mecum and Kissner 1989). This stock does not support directed fisheries but presumably is harvested incidentally in SEAK marine waters in sport and commercial fisheries. Harvest estimates of the King Salmon River Chinook salmon are not available because the stock contribution in marine fisheries has not been determined.

### **Escapement**

The King Salmon River Chinook salmon stock is 1 of 11 Chinook salmon indicator stocks in SEAK, each of which are monitored annually for escapement of large fish. Escapements are based on weir counts from 1983 to 1992, expanded index counts using helicopter or foot surveys from 1971 to 1982 and 1993 to 2011, and foot surveys from 2012 to 2020. Ten years of concurrent weir and index count data were used to estimate a survey expansion factor of 1.52. Information gathered at the weir indicate the peak run timing for this stock occurs about mid-July, with all fish in the river by about July 31 (Josephson et al. 1993).

Since 1975, Chinook salmon escapements in the King Salmon River have averaged 157 fish. Escapements during the recent 10-year period (2011–2020) averaged 95 Chinook salmon and the recent 5-year period (2016–2020) averaged 78 Chinook salmon (Table 3). King salmon escapements to the King Salmon River over the last 5 years, including the 2020 estimate, have been below the lower bound of the BEG in every year except 2016 (Table 3).

### **Harvest**

Harvest of King Salmon River Chinook salmon has never been quantified. No historical coded-wire- tagging has occurred and use of genetic stock identification (GSI) is not realistic given the low magnitude of production and resulting insufficient representation in any mixed stock fishery. However, King Salmon River Chinook salmon were used as a source of broodstock for fish released from several hatcheries in SEAK in the 1970s and 1980s. Information from those hatchery releases and resulting CWT recoveries indicates a portion of the King Salmon River stock rears in SEAK (inside rearing). As a result, this stock presumably has harvest rates similar to other SEAK Chinook salmon stocks (e.g., Chilkat River) having inside rearing behavior. At one time, King Salmon River Chinook salmon was used as an escapement indicator stock by the Chinook Technical Committee (CTC) of the Pacific Salmon Commission (PSC). Overall productivity of the stock was monitored annually and harvest rates on Chinook salmon released at nearby Crystal Lake, which used Andrew Creek Chinook salmon as brood stock, served as a surrogate in this process and since 2011 harvest rates of these Chinook salmon have averaged 46%.

## **TAKU RIVER**

The Taku River is a transboundary glacial system that supports an outside rearing stock of Chinook salmon. The Taku River originates in British Columbia and drains over 17,000 square kilometers before its terminus at Taku Inlet, approximately 40 km northeast of Juneau. The Taku River

Chinook salmon run spawns entirely in Canada and is managed through provisions of Chapter 1 of the PST.

## **Escapement**

The Taku River stock of Chinook salmon is 1 of 11 Chinook salmon indicator stocks in SEAK, each of which are annually monitored for escapement of large fish. Coded-wire-tagging of wild Chinook salmon smolt occurred from 1976 to 1981 and from 1993 to present. Total escapement was estimated using MR studies conducted 1989 to 1990, 1995 to 1997, 1999 to 2010, and 2014 to 2020. In all other years, escapements were estimated from expanded peak aerial survey index counts. Since 1989, escapements averaged 36,400 large fish; however, the recent 10-year average escapement of 15,330 fish and the recent 5-year average of 10,360 fish are substantially lower and have been below the escapement goal range for 5 consecutive years (Table 4).

## **Harvest**

Taku River Chinook salmon are harvested in marine waters in mixed stock sport fisheries, primarily in District 11 as well as in Icy Strait, Chatham Strait, and Lynn Canal (Figure 5); in the late winter and spring commercial troll fisheries primarily in the northern and central outside areas (Figures 8 and 9); and in commercial drift gillnet fisheries in District 11 and 15 (Figures 4, 6, and 7). This stock is also harvested in the Taku River: incidentally in sockeye salmon personal use fisheries, and in Canadian commercial gillnet, assessment, recreational, and First Nation (FN) fisheries (Figure 3). Information from CWT recovery and GSI indicates the recent 10-year average (2011–2020) harvest rate on Taku River Chinook salmon is 20% (Table 4).

In 2005, 2006, 2009, and 2012, surplus production was identified for Taku River Chinook salmon allowing directed commercial and liberalized sport fisheries in terminal marine waters in District 11 and in the Canadian inriver commercial, recreational and FN fisheries. Total harvest rates during these years averaged 40%. With the 2017 preseason forecast below the escapement goal range, conservation measures were enacted in the U.S. and Canada that reduced the harvest rate to 14%. As a result of further restrictions included in the 2018 Chilkat and King Salmon Rivers king salmon action plan intended to conserve King Salmon and Chilkat Rivers Chinook salmon, along with further restrictions in U.S. and Canadian fisheries due to low run size, the 2018 to 2020 harvest rate for Taku River Chinook salmon has averaged 10% (Table 4).

Harvests of Taku River Chinook salmon in the SEAK sport fishery occur primarily during the spring as mature adults return to spawn. The estimated sport harvest of this stock averaged 575 fish from 2011 to 2016. The average annual sport harvest from 2017 to 2020 was reduced to 63 fish as restrictions were implemented following preseason forecasts below the escapement goal range as well as restrictions to conserve King Salmon and Chilkat Rivers Chinook salmon.

Harvests of Taku River Chinook salmon in SEAK commercial fisheries have historically been highest in the troll fisheries (except in years when run strength provided for directed District 11 gillnet and liberalized sport fisheries). From 2011 to 2016, total troll harvests averaged 2,618 Taku River Chinook salmon annually, and with conservation measures in place from 2017 through 2020, the annual troll harvest has averaged 160 fish. Commercial gillnet fishery harvests, predominantly from District 11, averaged 414 fish annually from 2011 to 2016, and with conservation measures in place from 2017 through 2020, the annual gillnet harvest has averaged 218 fish.

Taku River Chinook salmon are incidentally harvested in a sockeye salmon personal use fishery that operates in the U.S. portion of the Taku River during the month of July. Beginning in 2017, opening of this fishery has been delayed up to 2 weeks to avoid the later portion of the historical Chinook salmon run. The 2011 to 2016 average personal use harvest was 30 fish and the average harvest from 2017 to 2020 was 10 fish.

Canadian inriver harvests of Taku River Chinook salmon averaged 2,255 fish from 2011 to 2016 and 90 fish from 2017 to 2020. From 2011 to 2016, the commercial fishery average harvest was 1,211 fish, and with restrictions in place, harvest was reduced to 246 fish in 2017. Since 2018, retention of Chinook salmon in the commercial fishery has been prohibited and no harvest has been reported. In years without a directed Chinook salmon fishery under the PST, treaty language provides for a 1,400 fish assessment fishery to determine run strength inseason. This fishery has not taken place since 2016. Recreational fishery harvests were reported as 105 fish annually between 1995 and 2015, 10 fish in 2016, and since 2017, annual regulations have stipulated nonretention of Chinook salmon in recreational fisheries. FN fishery harvest averaged 96 fish from 2011 to 2016. While not restricted by regulation, FN fishermen have been asked to focus their harvests on sockeye and coho (*O. kisutch*) salmon, and the FN harvest of Chinook salmon since 2017 has averaged 29 fish (Table 5).

## ESCAPEMENT GOAL EVALUATION

The *Policy for Statewide Salmon Escapement Goals* (SSEGP; 5 AAC 39.223), adopted by the board in 2001, established the formal process for setting escapement goals. Prior to this the department followed its *Salmon Escapement Goal Policy* adopted in 1992 that established a formal process to set, evaluate, and modify existing escapement goals (Fried 1994). The SSEGP and the SSFP require the department to report on salmon stock status and escapement goals to the board on a regular basis, document and review existing salmon escapement goals, establish goals for stocks for which escapement can be reliably measured, and prepare scientific analyses with supporting data when goals are created, modified, or recommended for elimination.

### CHILKAT RIVER

From 1975 to 1992, aerial survey counts were conducted each year on 2 small, clear-water tributaries within the Chilkat River watershed to index Chinook salmon escapement. In 1981, the department established an escapement goal of 2,000 large fish, based on the assumed fraction of the escapement represented by survey counts. However, MR and radiotelemetry studies conducted in 1991 and 1992 indicated the survey counts were not representative of the actual drainage-wide escapement so the surveys were discontinued in favor of annual MR studies designed to estimate abundance of large and non-large (age-1.2 fish) Chinook salmon in the Chilkat River drainage. The inriver stock assessment program (1991–2003) coupled with marine catch sampling of the drift gillnet fisheries in Lynn Canal and Taku Inlet, the commercial troll, and the sport fishery near Haines and Juneau, provided the information necessary to perform stock-recruit analyses in 2003 and develop the BEG range of 1,750 to 3,500 large Chinook salmon (Ericksen and McPherson 2004). The department adopted the BEG following the 2003 board meeting on Southeast and Yakutat Finfish and Shellfish. Additionally, the board adopted the *Chilkat River King Salmon Fishery Management Plan* (5 AAC 33.384) and an inriver goal of 1,850 to 3,600 large Chinook salmon to account for harvest in the inriver subsistence fishery. Finally, the Chilkat River Chinook salmon BEG was adopted by the PSC CTC in 2004 (CTC 2005).

## **KING SALMON RIVER**

In 1981, the department established a peak index escapement goal of 200 large Chinook salmon, based on maximum survey counts of 200 spawners in 1957 and 211 spawners in 1973. In the mid-1980s, the goal was revised to 250 large spawners as enumerated through a weir across the lower river.

An escapement goal range for King Salmon River Chinook salmon was developed in 1997 with information on escapement, age composition, and harvests collected from 1991 to 1997 (McPherson and Clark 2001). Ten years of weir operations (1983–1992) provided the basis for estimating total escapement and age composition in other years. From 1971 to 1997, annual foot and aerial surveys were conducted to count peak numbers of large spawners. Large spawner abundance from 1971 to 1982 and 1993 to 1997 was estimated by using the average fraction counted from 1983 to 1992 (67.5%). The inriver return for each brood year was estimated from the estimated number of large spawners each year coupled with age composition data. The number of jacks (age-1.2 fish) from 1971 to 1982 and 1993 to 1995 was estimated by using the average percent of jacks (22%) for the 1979 to 1986 broods (known from weir counts). Harvests were estimated from exploitation rates from nearby Crystal Lake Hatchery, applied to the estimated inriver returns of wild Chinook salmon estimated for King Salmon River. From these data, total returns were calculated for 21 brood years (1971–1991) allowing spawner-recruit analysis and development of the BEG range of 120 to 240 large Chinook salmon (McPherson and Clark 2001).

## **TAKU RIVER**

In 1981, ADF&G established an index goal of 9,000 fish in the Nakina River, the largest Chinook salmon producing tributary in the Taku River, based on the highest historical survey observed in 1952. The first system-wide goals were expressed in about 1985 as a range from 25,600 (U.S. estimate) to 30,000 (Canadian estimate) fish, and both estimates were based on professional judgment. In 1991, the PSC Transboundary Technical Committee (TTC) revisited the goal and recommended an index goal of 13,200 fish counted in aerial surveys which was adopted by the parties and implemented in 1992 (PSC 1992). This goal, and all prior Chinook salmon goals in the Taku River, were indices of escapement and based on limited data. By 1999, ADF&G and Canada Department of Fisheries and Oceans (DFO) cooperatively developed a new escapement goal range of 30,000 to 55,000 large spawners (not an index) in an analysis of adult and smolt production, which was reviewed and approved by the PSC CTC (CTC 1999), PSC TTC, ADF&G, DFO, and the Pacific Scientific Advice and Review Committee (McPherson et al. 2000). Then in 2009, the current biological escapement goal range of 19,000 to 36,000 large Chinook salmon was established based on a spawner-recruit analysis and accepted both domestically by the board and bilaterally by the PSC (McPherson et al. 2009).

## **ESCAPEMENT GOAL RECOMMENDATION**

The department has reviewed salmon escapement goals for these systems every 3 years prior to the Southeast and Yakutat board meeting and recommended no changes to the Chilkat River since adoption in 2003, King Salmon River since adoption in 2003, or Taku River Chinook salmon escapement goals since adoption in 1997 and 2010 (Geiger and McPherson 2004; Der Hovanisian and Geiger 2005; Der Hovanisian et al. 2011; Heintz et al. 2014; Heintz et al. *In press*; McPherson et al. 2010).

## **STOCK OF CONCERN RECOMMENDATION**

Escapements of Chinook salmon have fallen below the lower bound of the current BEG range for Chilkat River in 3 of the past 5 years, for King Salmon River in 4 of the past 5 years, and for the Taku River in 5 of the past 5 years, including the 2020 escapement estimates. Recent inseason management actions implemented in the sport, commercial, subsistence and personal use fisheries since 2012 have been effective at reducing harvest rates. In October 2017, the department recommended that the board designate Chilkat River and King Salmon River stocks in northern SEAK and the Unuk River stock in southern SEAK as stocks of management concern at the regulatory board meeting for Southeast and Yakutat in January 2018. In October 2020, the department recommended the board continue with these designations and add Chinook salmon stocks from the Taku River in northern SEAK, the Stikine River and Andrew Creek in central SEAK, and the Chickamin River in southern SEAK.

### **OUTLOOK**

By December each year, the department produces preseason forecasts of total run for Situk, Chilkat, and Unuk Rivers and terminal run forecasts for Taku and Stikine Rivers in SEAK.

The preseason forecast for the total run of Chilkat River Chinook salmon in 2021 is 1,500 large fish, which, even with no harvest, is below the lower bound of the escapement goal range of 1,750 to 3,500 large fish.

The preseason forecast for the terminal run of Taku River large Chinook salmon in 2021 is 10,300 fish, which, even with no harvest, is below the lower bound of the escapement goal range of 19,000 to 36,000 large fish.

The department does not produce preseason forecasts for the other 6 indicator stocks in the region, including the King Salmon River and Andrew Creek stocks, due to a lack of sibling model information and harvest contributions. However, continued poor Chinook salmon production throughout SEAK is expected into the near future.

## **HABITAT ASSESSMENT**

### **CHILKAT RIVER**

The Chilkat River is a mainland glacial system that originates in British Columbia, Canada that traverses rugged mountainous terrain and terminates in the Chilkat Inlet in northern Lynn Canal (Figure 1). The main channels and major tributaries comprise approximately 600 km of fluvial habitat in a watershed covering about 1,600 square kilometers (618 square miles; Bugliosi 1988). The Chilkat River is typically the fifth largest producer of Chinook salmon (McPherson et al. 2003), the second largest producer of coho salmon, and the largest producer of sockeye salmon in SEAK (Eggers et al. 2010).

Unlike most other large mainland watersheds in SEAK, the Chilkat River watershed has significant road access and proximity to a population center and associated infrastructure. As such, the risk of negative anthropomorphic impacts is higher in the Chilkat River mainstem drainage than in other remote salmon producing watersheds on the mainland of SEAK. The watershed contains over 300 km of roads, a large portion of which are near the Chilkat River mainstem, including some major tributaries used by Chinook salmon for spawning, rearing, or migration. The roads cross several anadromous tributaries of the Chilkat River, which have the potential to obstruct or hinder fish



passage, although Chinook salmon are likely the least impacted salmonid given their preferred habitat and the location of such crossings. The ongoing Haines Highway Reconstruction project between mileposts 3.9 and 25.0 involves the largest modification of riparian and wetland habitat immediately adjacent to the mainstem Chilkat River. This project follows the Chilkat River for approximately 35 km and crosses 106 culverts. The highway embankment along the Chilkat River was conceptually designed for erosion and depth of scour protection. Following an initial environmental assessment released in 2013, a final revised environmental assessment was prepared in response to public input (ADOT 2016). Ultimately, a finding of “no significant impact” from this project was the official agency determination summarized below:

- (1) Due to the proposed conservation measures, short-term impacts from construction activities would be temporary and minimal.
- (2) The avoidance, minimization, and mitigation measures outlined in Section 4 of this document would, at least, offset the quality and quantity of essential fish habitat and, consequently, the overall effects would not be adverse.

Approximately 382,300 cubic meters of gravel were mined from the river near the Haines airport runway during the winter of 1990–91 for construction of the Haines airport. Otherwise, no mining activities within the Chilkat River mainstem currently exist. No instream mining of gravel material is planned for the Haines Highway project.

Iron, gold, copper, platinum, and palladium deposits exist within the Chilkat River watershed. Placer mining is ongoing in the Porcupine Creek mining district. Exploration of a volcanogenic massive sulfide deposit is underway in a tributary of the Klehini River, but mining permit applications have not been submitted.

The Haines State Forest includes the sub-basins of some of the major tributaries to the Chilkat River. About 15% of the state forest is dedicated to timber harvest, which has occurred since the 1960s. The annual allowable harvest is 5.88 million board feet. Timber operations on state lands follow *Standards and Guidelines* and *Best Management Practices* established in the Forest Resources Practices Act (FRPA), which are designed to minimize impacts on fish habitat. While historical timber extraction/harvest in the watershed potentially occurred in less restrictive settings, all planned timber harvest in future years will be guided by the FRPA and as such, should have minimal impacts on anadromous fish.

A 162 km<sup>2</sup> portion of the Alaska Chilkat Bald Eagle Preserve (CBEP, ADNR 2002) surrounds the Chilkat River and its tributaries upstream of Haines Highway milepost 8 and contains the drainage’s waterways and riparian lowlands. These lands and waters provide essential habitat for Chinook salmon juvenile rearing, emigrating smolt corridors, immigrating adult corridors, and spawning areas. Two of the purposes of the CBEP, as described in the CBEP Management Plan (September 2002), are directly related to Chilkat River Chinook salmon:

- *protect and sustain the natural spawning and rearing areas of the Chilkat River system in perpetuity; and*
- *maintain water quality and necessary water quantity.*

The management guidelines in the CBEP Management Plan require that proposed activities in the preserve that may affect water quality, fish or game habitat disturbance, or stream modification will include department review.

## **KING SALMON RIVER**

The habitat in the King Salmon River watershed is considered pristine being within the Admiralty Island National Monument and the Kootznoowoo Wilderness Area, both of which provide habitat protection. There are no freshwater or riparian habitat related concerns identified for this stock and there have been no documented timber or mining activities in the watershed. This island watershed drains an area of approximately 108 km<sup>2</sup> and contains 95 km of stream habitat of which about 11 km is designated anadromous (Figure 2).

## **TAKU RIVER**

The Taku River originates in British Columbia and drains over 17,000 km<sup>2</sup> before its terminus in Taku Inlet, with almost all the drainage accessible to anadromous salmon. The 2 main tributaries are the Nakina and Inklin Rivers. The Inklin River drains a larger area and is comprised of several large tributaries that provide Chinook salmon spawning and rearing habitat. Most of the tributaries are clear or slightly occluded by glacial flour, especially in the lower Nakina and Sheslay Rivers and Kowatua Creek. Escapement is monitored in 5 spawning tributaries: the Nakina, Nahlin, and Dudidontu Rivers and Kowatua and Tatsatua Creeks (Figure 3). Although road access once existed in the far upper reaches of the Sheslay River to allow access to the Muddy Lake mine, that road has been decommissioned and the Taku River is the only major river on the Pacific coast of North America that lacks road access to any of its tributaries. Mining activities have occurred in various areas in the Canadian portions of the drainage and exploratory work is ongoing in the Sheslay River drainage, among others. In the lower river, the Tulsequah Chief, Big Bull, and Polaris mine operations near the U.S./Canada border appear dormant and abandoned. The Tulsequah Chief mine site continues releasing small amounts of acid mine drainage into the Tulsequah River about 10 km upstream of the confluence with the Taku River.

## **FISHERY MANAGEMENT OVERVIEW AND BACKGROUND**

### **PACIFIC SALMON TREATY**

Taku River Chinook salmon are managed through provisions of Chapter 1 of the PST. The department manages the Taku River stock of Chinook salmon in accordance with the PST and as required by the *United States-Canada Salmon Management Plan* (5 AAC 33.361). Per the treaty, annual terminal run size and terminal harvest estimates of the Taku River stock are developed bilaterally from inriver escapement surveys, MR projects, and GSI analyses. The PST directs both countries to take actions necessary to ensure that escapement objectives are achieved. Paragraph 4 of Chapter 1 outlines steps to be taken by both countries if the escapement goal is not achieved in 3 consecutive years. Management plans in Canadian and Alaska terminal fisheries are reviewed prior to the season and resultant harvest and escapement are reviewed postseason by the Transboundary River Panel. Management actions are predicated on preseason forecasts of terminal run abundance and are evaluated weekly based on inseason estimates of run size. Management actions in the U.S. terminal District 11 and Canadian Taku River fisheries are agreed-to annually prior to the season and included in the PSC TTC Salmon Management and Enhancement Plans for the Stikine, Taku and Alsek Rivers (e.g., TCTR [20]-01) and the Southeast Alaska Drift Gillnet Management Plan developed prior to each fishing season.

The preseason forecast serves as the principal run size estimator until inseason run projections become available (typically by statistical week [SW] 21). Inseason projections are generated by a MR estimate between an inriver tangle net capture and marking of Chinook salmon near the Wright River and fish wheels operated at Canyon Island for event 1 on the U.S. portion of the river, and the recapture event 2 in the assessment fishery above the U.S./Canada border (Figure 3). If available, inseason MR estimates are used as the principal run size estimator. If insufficient data are available to develop a valid MR estimate, the preseason forecast is utilized to inform management decisions until sufficient data to generate an estimate of run size are obtained.

In 2016, the preseason forecast suggested the Taku River Chinook salmon run would meet the escapement goal; as a result, the inriver Chinook salmon assessment fishery in Canada, designed to operate as a recapture event for the stock assessment project, operated in SWs 19–23. However, inseason MR results indicated the run would be insufficient to achieve the escapement goal so the last 2 weeks of the assessment fishery in SWs 24–25 were cancelled. In addition, area and gear restrictions were imposed in the first week of the District 11 directed sockeye salmon commercial drift gillnet fishery in SW 26 to conserve Taku River Chinook salmon.

From 2017 to 2020, preseason forecasts indicated the annual Taku River Chinook salmon runs would be below the escapement goal range triggering management actions in U.S. and Canadian fisheries per the PST. These included delaying the start of the commercial fishery by up to 2 weeks, nonretention in commercial and recreational fisheries, mesh size restrictions in the commercial fishery, and voluntary reduction in the FN fishery. In addition, the inriver Chinook salmon assessment fishery conducted in Canada as part of the MR program did not operate. In SEAK, additional management actions included time, area, and mesh size restrictions in the District 11 commercial drift gillnet fishery, nonretention of Chinook salmon in the sport fishery through the end of June, nonretention of Chinook salmon in commercial troll fisheries through mid-July, and delayed openings of the Taku River personal use sockeye salmon fishery by up to 2 weeks.

## **SPORT FISHERIES**

### **Chilkat River**

A May and June marine sport fishery in Chilkat and Chilkoot Inlets near Haines harvests a variety of Chinook salmon stocks including those returning to the Chilkat River. The Chinook salmon bag limits and the Chilkat Inlet terminal area provisions pertaining to sport fishing are set according to the preseason forecast of Chilkat River Chinook salmon abundance, or inseason data when available, following provisions in the *Lynn Canal and Chilkat River King Salmon Fishery Management Plan*. The plan specifies an inriver abundance goal range of 1,850 to 3,500 large Chinook salmon and prescribes sport regulations based on the projected inriver run of Chilkat River Chinook salmon. When the preseason forecast of inriver abundance is below the goal range (< 1,850 large fish) the plan specifies that sport fishing for Chinook salmon is closed in Chilkat Inlet as follows: north of a department regulatory marker located immediately north of Seduction Point through June 30; and north of a line extending from a department regulatory marker located approximately 1 mile south of Anchorage Point to a department regulatory marker directly north of the Letnikof Cove boat ramp, through July 15; and in the remainder of Chilkat Inlet north of Seduction Point, from July 1 to 15 the bag and possession limit is 1 Chinook salmon. When the preseason forecast is within the goal range (1,850–3,500 large fish) the plan specifies that Chilkat Inlet is closed to sport fishing for Chinook salmon north of a line extending from a department marker located approximately 1 mile south of Anchorage Point to a department regulatory marker

directly north of the Letnikof Cove boat ramp from April 15 to July 15. When the preseason forecast is above the upper bound of the BEG ( $>3,500$  large fish), bag and possession limits may be increased in Chilkat Inlet. Chinook salmon sport fishing is closed in northern Chilkat Inlet near the mouth of the Chilkat River from April 15 to July 15 to conserve milling Chinook salmon (5 AAC 47.021(c)).

### **King Salmon River**

King Salmon River Chinook salmon are harvested incidentally in SEAK marine waters. While there is no CWT information available for the King Salmon River stock of Chinook salmon, harvest of Taku, Chilkat and Stikine Rivers and Andrew Creek stocks of Chinook salmon can serve as indicators for when and where King Salmon River fish are harvested since the King Salmon River is geographically close to these systems and likely share partial overlap of patterns in migration timing and rearing. The PSC CTC formerly used King Salmon River Chinook salmon as an indicator stock in coastwide escapement and production monitoring and during that time exploitation rates observed in nearby Crystal Lake hatchery Chinook salmon, minus any terminal harvests, were used as surrogate values (CTC 2013). Crystal Lake Hatchery uses Andrew Creek as a brood source, and like the King Salmon River stock, both stocks are inside rearing, centrally located, and are available to harvest as rearing and mature fish in SEAK. The Juneau area marine boat sport fishery targets Chinook salmon primarily from April to June, with continued effort the remainder of the year. In recent years, the bulk of the Juneau area harvests have consisted of Alaska hatchery fish released from nearby Macaulay Salmon Hatchery; however, harvest of Taku River Chinook salmon can be substantial and in larger runs can make up the bulk of the harvest. Chilkat River Chinook salmon are also harvested, primarily in early spring, as mature run fish and as immature rearing fish in the late summer and winter months. Regulations for the Juneau area sport fishery are set by EO as directed by the *Southeast Alaska King Salmon Management Plan* (5 AAC 47.055), special provisions for District 11 (5 AAC 47.021[e]), and when the Macaulay Salmon Hatchery broodstock needs are met, the designated terminal harvest area (THA) in Juneau may be liberalized.

### **Taku River**

The Chinook salmon sport fishery in the saltwater near the Taku River is managed based on whether an allowable catch is available as outlined in Chapter 2 of the PST. These special provisions for the waters of District 11 prescribe sport regulations based on the preseason forecast and inseason projections of total terminal run relative to the Taku River escapement goal of 19,000 to 36,000 large fish. During years when an allowable catch is available, sport fishing regulations are liberalized with increased bag, possession and annual limits, and the use of 2 rods allowed. During years with no allowable catch, upper Taku Inlet is closed from April 16 to June 14, bag and possession limits may be reduced, and additional time and/or area closures in terminal areas or migration corridors may be implemented. Typically, the designated hatchery sport harvest area (DHSHA) around Macaulay Salmon Hatchery and remote release sites in Auke Bay and Fritz Cove (Fish Creek) are open June 1 to August 31, with a bag and possession limit of 4 fish of any size, which does not count towards the nonresident annual limit. If lack of hatchery broodstock concerns arise, the (DHSHA) opening may be delayed, or a sport fishing closure may be implemented near the hatchery.

## **Past Sport Fishery Management Actions**

Extensive management actions that were taken in all fisheries to protect Chilkat, King Salmon, and Taku Rivers Chinook salmon stocks prior to 2018 are described in the 2018 Chilkat and King Salmon Rivers king salmon action plan. The Taku River was not listed as a stock of concern (SOC) in 2018, but restrictive management actions were implemented in all fisheries to meet escapement in these rivers as is mandated by the PST. Management actions taken to protect Chinook salmon returning to the Chilkat and Taku Rivers likely protected King Salmon River Chinook salmon. Below is an outline of the management measures implemented in the sport fishery to reduce harvest and increase escapement of Chinook salmon stocks from the Chilkat and Taku Rivers and, by default, the King Salmon River in 2018 to 2020.

### ***Chilkat River***

#### **2018**

- The preseason total run forecast of 928 large Chinook salmon was below the BEG range. Through EO, closed entire Chilkat Inlet to Chinook salmon sport fishing April 1 through June 30.
- In Section 15-A, Lynn Canal north of the latitude of Sherman Rock, Chinook salmon retention prohibited April 1 through December 31 (EO 1-KS-R-02-18).
- In waters of District 11, District 12, Sections 14-B, 14-C, 15-B, and 15-C, Chinook salmon retention was prohibited April 1 through June 14.

#### **2019**

- The preseason total run forecast of 1,000 large Chinook salmon was below the BEG range. Through EO, closed entire Chilkat Inlet to Chinook salmon sport fishing April 1 through June 30.
- In Section 15-A, Lynn Canal north of the latitude of Sherman Rock, Chinook salmon retention was prohibited April 1 through December 31 (EO 1-KS-R-03-19).
- In waters of District 11, District 12, Sections 14-B, 14-C, 15-B, and 15-C, Chinook salmon retention was prohibited April 1 through June 14.

#### **2020**

- The preseason total run forecast of 1,550 large Chinook salmon was below the BEG range. Through EO, closed entire Chilkat Inlet to Chinook salmon sport fishing April 1 through July 15.
- In Section 15-A, Lynn Canal north of the latitude of Sherman Rock, Chinook salmon retention was prohibited April 1 through December 31 (EO 1-KS-R-6-20). In addition, in waters of District 11, District 12, Sections 14-B, 14-C, 15-B, and 15-C, Chinook salmon retention was prohibited April 1 through June 14.

### ***Taku and King Salmon Rivers***

#### **2018**

- The preseason forecast of 4,700 large Chinook salmon indicated that even with zero harvest of Taku River Chinook salmon it was unlikely the BEG would be achieved.
- To reduce harvest, sport fishing for Chinook salmon in most marine waters in the Juneau Area (the northern portion of District 9, District 10, Sections 11-A, 11-B, 11-C, District

12, southeast portion of Section 13-C, Sections 14-B and 14-C, and District 15 south of the latitude of Sherman Rock) was restricted: the retention of Chinook salmon was prohibited April 1 through June 14.

- The waters of Seymour Canal near King Salmon River (Section 11-D) were closed to Chinook salmon fishing from April 1 through June 30 (EO 1-KS-R-02-18).

## **2019**

- The preseason forecast of 9,050 large Chinook salmon indicated that even with zero harvest of Taku River Chinook salmon it was unlikely the BEG would be achieved.
- To reduce harvest, sport fishing for Chinook salmon in most marine waters in the Juneau Area (the northern portion of District 9, District 10, Sections 11-A, 11-B, 11-C, District 12, southeast portion of Section 13-C, Sections 14-B and 14-C, and District 15 south of the latitude of Sherman Rock) was restricted: the retention of Chinook salmon was prohibited April 1 through June 14.
- The waters of Seymour Canal near King Salmon River (Section 11-D) were closed to Chinook salmon fishing from April 1 through June 30 (EO 1-KS-R-03-19).

## **2020**

- The preseason forecast of 12,400 large Chinook salmon indicated that even with zero harvest of Taku River Chinook salmon it was unlikely the BEG would be achieved. To reduce harvest, sport fishing for Chinook salmon in most marine waters in the Juneau Area (the waters of District 9 north of a line from Patterson Point to Point Ellis, District 10, Sections 11-A, 11-B, 11-C, District 12, Portion of Section 13-C southeast of a line between Nismeni Point and a point on the Chichagof Island shoreline at 57°35.59' N lat, 135°22.33' W long, Sections 14-B and 14-C, and District 15 south of the latitude of Sherman Rock) were restricted: the retention of Chinook salmon was prohibited April 1 through June 14.
- The waters of Seymour Canal near King Salmon River (Section 11-D) were closed to Chinook salmon fishing from April 1 through June 30 (EO 1-KS-R-06-20). Inseason information indicated that the return of Taku River Chinook salmon was poor and an additional 2-week nonretention period (June 15 through June 30) was implemented in the marine waters of Taku Inlet north of a line from Point Bishop to Point Greely to reduce harvest (EO 1-KS-R-17-20).

## **COMMERCIAL FISHERIES**

### **Drift Gillnet Fisheries**

#### ***Chilkat River***

Run timing of Chilkat River Chinook salmon coincides with the beginning of Lynn Canal (District 15) drift gillnet fisheries and sockeye salmon stocks returning to Chilkoot Lake, Chilkat River mainstem, and Chilkat Lake as well as hatchery-produced chum (*O. keta*) salmon returning to the Boat Harbor and Amalga Harbor remote release sites. Management actions to reduce harvest of Chilkat River Chinook salmon in the District 15 drift gillnet fishery have included reduced time and area, night closures, and mesh size restrictions. Limiting the duration of weekly openings throughout Lynn Canal (Sections 15-A and 15-C) reduces commercial fishing opportunity for other targeted species that can have economic impacts on the commercial fishing fleet. Night closures minimize the catch of smaller, feeder Chinook salmon that are rearing in Lynn Canal and

exhibit diurnal vertical migration behavior. Restricting maximum allowable mesh size reduces the harvest of mature Chinook salmon while allowing opportunity to harvest other species such as sockeye and chum salmon.

### ***King Salmon River***

Rearing areas, returning adult migration routes, and run timing for King Salmon River Chinook salmon are unknown but conservative management actions in District 11 and District 15 drift gillnet fisheries to conserve Taku and Chilkat Rivers stocks of Chinook salmon likely help minimize impacts on King Salmon River Chinook salmon.

### ***Taku River***

Taku River Chinook salmon, along with Chinook salmon stocks from the Situk, Alsek, and Stikine Rivers, rear outside of SEAK and returning adults begin to arrive in SEAK waters by mid-March. The District 11 commercial drift gillnet fishery opens on the third Sunday in June and by this time, on average, over 80% of the Taku River Chinook salmon run has entered the river. Restrictions designed to minimize the harvest of Taku River Chinook salmon are most effective in the initial weeks of the drift gillnet season. Restrictions in time, area, and gear are the most restrictive at the start of the District 11 drift gillnet season and are progressively reduced through SW 29, the end of the PST accounting period for Taku River Chinook salmon. Restrictions in the District 11 commercial drift gillnet areas designed to minimize the harvest of Taku River Chinook salmon also reduces the incidental harvest of King Salmon River Chinook salmon.

### **Troll Fisheries**

The commercial troll fishery in Southeast Alaska (Figure 8) occurs in State of Alaska waters and in the Federal Exclusive Economic Zone (EEZ) east of the longitude of Cape Suckling (5 AAC 29.010 and 5 AAC 29.020). All other waters of Alaska are closed to commercial trolling.

There are 3 commercial troll seasons in SEAK; winter, spring, and summer. The winter troll fishery is managed for a guideline harvest level (GHL) of 45,000 non-Alaska hatchery-produced Chinook salmon, with a guideline harvest range of 43,000–47,000 non-Alaska hatchery-produced fish, plus the number of Alaska hatchery-produced Chinook salmon harvested during the winter fishery. Under provisions of the 2018 Unuk River king salmon action plan (Lum and Fair 2018b) the winter troll fishery is conducted from October 11 through March 15, closing earlier than the allowable April 30 regulatory timeframe. Also provided in the action plan, following the closure of the winter troll fishery and prior to June 30, spring troll fisheries may open by EO to target Alaska hatchery-produced Chinook and chum salmon but are now limited to outer coastal areas or near hatcheries, hatchery release sites, and in areas of low wild SEAK Chinook salmon abundance (Figure 9). Terminal area fisheries occur adjacent to hatcheries or at remote release sites. Most of the annual troll Chinook salmon harvest is taken during the general summer troll fishery beginning July 1 when salmon may be taken throughout most of SEAK, including the outside waters of the EEZ. The summer troll Chinook salmon harvest is divided into 2 retention periods. The first retention period targets 70% of the remaining annual troll Chinook salmon allocation, after winter and spring troll non-Alaska hatchery-produced harvests are subtracted. Following the first retention period, any remaining portion of the annual troll allocation is harvested in a second Chinook salmon retention period, which typically occurs in mid-August, and follows any closure of the troll fishery for coho salmon conservation.

Commercial troll fishery management decisions that potentially result in the lowered harvests of Chilkat, Taku, and King Salmon Rivers stocks of Chinook salmon include reduced time (closures, delayed openings) and area. Both CWT and GSI analysis indicate SEAK wild Chinook salmon stocks are encountered at increasing rates in SEAK fisheries beginning in late March and early April. Closures of the late winter troll fishery from mid-March through April, and spring troll fisheries in May and June, are designed to reduce the harvests of these fish during the peak migration period. Additional actions such as delaying the spring troll directed chum fishery until mid-June and limiting the area open to the summer troll fishery in July (e.g., in northern Chilkat Inlet to protect Chilkat River Chinook salmon) further reduces harvests of SEAK wild Chinook salmon.

### **Purse Seine Fishery**

Regulations allow purse seine fishing in Districts 1 (Sections 1-C, 1-D, 1-E, and 1-F only), 2, 3, 4, 5, 6 (Sections 6-C and 6-D only), 7, 9, 10, 11 (Sections 11-A and 11-D only), 12, 13, and 14. Purse seine fishing is also allowed in hatchery THAs at Neets Bay, Kendrick Bay, Anita Bay, Southeast Cove, Thomas Bay, Deep Inlet, and Hidden Falls (Figure 10). Although the areas specified above are designated purse seine fishing areas, specific open areas and fishing times are established inseason by EO.

King salmon are not targeted in traditional purse seine fisheries but are harvested incidentally. King salmon less than 28 inches may be retained but not sold. King salmon greater than 28 inches may be retained only during periods established by EO. Purse seine fisheries can occur in northern Chatham Strait (District 12) and eastern Icy Strait (District 14) beginning in late June and early July, Frederick Sound (District 10) in early July, near the end or after the Chinook salmon runs to Chilkat, Taku, and King Salmon Rivers have migrated through. Regionwide, Chinook salmon retention periods typically do not begin until the third or fourth week of July (SWs 30 or 31).

### **Past Commercial Fishery Management Actions**

Commercial salmon fisheries are coordinated regionally by gear type and are opened and closed by EO. Fishery managers have adjusted time and area (all fisheries), implemented gear stipulations (drift gillnet), and enacted nonretention (troll and seine fisheries) by EO in response to conservation concerns. Management actions taken in the District 11 drift gillnet fishery (Figure 6) to protect Chinook salmon returning to the Taku River have provided protection to King Salmon River Chinook salmon given the proximity of the 2 rivers (Figure 4). Extensive management actions were taken in all fisheries prior to 2018 and were included in the 2018 Chilkat and King Salmon Rivers king salmon action plan. Below is an outline of significant additional management measures beyond those outlined in the 2018 action plan in the commercial net and troll fisheries (Figures 6–9) that further reduced harvests of Chinook salmon returning to the Chilkat and King Salmon Rivers and, by default, to the Taku River from 2018 to 2020.

#### ***Drift Gillnet Fisheries***

##### **District 15 Drift Gillnet**

Since 2018, the District 15 drift gillnet fishery has been managed by implementing and/or exceeding conservation measures outlined in the *Lynn Canal and Chilkat River King Salmon Fishery Management Plan* (5 AAC 33.384) and the 2018 Chilkat and King Salmon Rivers king salmon



action plan. Additional management measures taken in 2019, 2020 and 2021 are summarized below.

## 2018

- In Section 15-A fishing time was limited to 2 days and area was limited to the eastern shoreline from Eldred Rock Light to the latitude of Sherman Rock during the first 5 weeks of the fishery (SWs 25–29).
- In Section 15-A a 6-inch maximum mesh size restriction was implemented during the first three weeks (SWs 25–27) of the fishery and night closures were implemented during the first four weeks (SW's 25–28) of the fishery.
- In Section 15-C fishing time was limited to 2 days and area was limited to the “postage stamp” (small area in the southeastern portion of Section 15-C as depicted in Figure 7 opened to target hatchery chum salmon returning to Boat Harbor and Amalga Harbor THAs) the first week of the fishery (SW 25), area was limited to south of the latitude of Vanderbilt Reef Light in SW 26, area was limited to south of a line at 58°37.05' N lat in SWs 27 and 28, and area was limited to south of the latitude of Point Bridget in SW 29. Fishing time extensions were limited to the postage stamp in SWs 26–29.
- In Section 15-C, a 6-inch maximum mesh size restriction and night closures were implemented during the first 4 weeks (SWs 25–28) of the fishery.
- In the outside waters of the Boat Harbor THA, fishing time was limited to 2 days/week during the first 2 weeks (SWs 25 and 26), 4 days in SW 27, and 6 days in SW 28. The inside waters of the Boat Harbor THA were opened 7 days/week during the first 5 weeks (SWs 25–29) of the fishery.
- In the outside waters of the Boat Harbor THA, open area was reduced from within 2.0 nautical miles (nmi) to within 1.0 nmi of the western shoreline and the north boundary was restricted to south of Danger Point in weeks 4 and 5 (SWs 28 and 29) of the fishery.
- In the outside waters of the Boat Harbor THA, a 6-inch maximum mesh size restriction was implemented during the first 4 weeks (SWs 25–28) of the fishery.

## 2019

- In Section 15-A fishing time was limited to 2 days and area was limited to the eastern shoreline from Eldred Rock Light to the latitude of Sherman Rock during the first 5 weeks of the fishery (SWs 25–29).
- In Section 15-A night closures were implemented through SW 35 with the exception of SW 29.
- A 6-inch maximum mesh size restriction was implemented in all areas of District 15, excluding the Boat Harbor THA, during the first 5 weeks (SWs 25–29) of the fishery.
- In Section 15-C fishing time was limited to 2 days and the area was limited to the Postage Stamp during the first four weeks (SWs 25–28) of the fishery.
- In Section 15-C night closures were implemented in the first 4 weeks (SWs 25–28) of the fishery.
- In the outside waters of the Boat Harbor THA, fishing time was limited to 2 days/week and area was reduced to within 1.0 nmi of the western shoreline in the first 3 weeks (SWs 25–27).

- In the outside waters of the Boat Harbor THA, fishing time was limited to 2 days during week 4 (SW 28) and 4 days in week 5 (SW 29) of the fishery.
- In the outside waters of the Boat Harbor THA, a 6-inch maximum mesh restriction was implemented during the first 4 weeks (SWs 25–28).
- In the outside waters of the Boat Harbor THA, night closures were implemented during the first 2 weeks (SWs 25 and 26).

## 2020

- In Section 15-A fishing time was limited to 2 days/week and area was limited to the eastern shoreline from Eldred Rock Light to the latitude of Sherman Rock during the first 5 weeks of the fishery (SWs 26–30).
- A 6-inch maximum mesh restriction was implemented in all areas of District 15, excluding the Boat Harbor THA, during the first 5 weeks (SWs 26–30) of the fishery.
- In Section 15-C fishing time was limited to 2 days and the area was limited to the Postage Stamp during the first three weeks (SWs 25–28) of the fishery.
- In Section 15-C night closures were implemented for the first 4 weeks (SWs 26–29) of the fishery.
- In the outside waters of the Boat Harbor THA, fishing time was limited to 2 days/week and area was limited to within 1.0 nmi of the western shoreline during the first 3 weeks (SWs 26–28) of the fishery.
- In the outside waters of the Boat Harbor THA, fishing time was limited to 4 days in weeks 4 and 5 (SWs 29 and 30) of the fishery.
- In the outside waters of the Boat Harbor THA, a 6-inch maximum mesh restriction was implemented during the first 3 weeks (SWs 26–28) of the fishery.
- In the outside waters of the Boat Harbor THA, night closures were implemented for the first 3 weeks (SWs 26–28) of the fishery.

### District 11 Drift Gillnet

The District 11 drift gillnet fishery was managed in accordance with the 2018 Chilkat and King Salmon Rivers king salmon action plan and under provisions of annual management plans produced by the TTC and approved by the Transboundary Panel, as directed by Chapter 1 of the Pacific Salmon Treaty (TTC 2020). Management measures taken in District 11 from 2018 to 2020 included:

- Reduced time and area through SW 29.
- During SWs 25 and 26, open area was limited to the SE portion of Taku Inlet, with the north line of the open area shifted north incrementally through SW 29 (Figure 6).
- Open time was held to 2 days/week through SW 28.
- A 6-inch maximum mesh size restriction was implemented during the first 3 weeks of the fishery.

### *Purse Seine*

The purse seine fishery in Northern Southeast Alaska begins in terminal harvest area fisheries in mid to late June and traditional common property fisheries typically do not begin in earnest until mid to late July (SW 28). Northern Southeast Inside pink salmon fisheries were largely closed

from 2018 to 2020 due to poor pink salmon runs. Management measures taken in the 2018 to 2020 regionwide purse seine fishery included:

- The purse seine fishery was closed to retention of Chinook salmon throughout the 2018 season; through SW 29 in 2019; and through SW 31 in 2020.

### ***Troll Fishery***

The broadscale regional troll fishery provisions of the 2018 Unuk River king salmon action plan superseded most conservation restrictions adopted under the 2018 Chilkat and King Salmon Rivers king salmon action plan, however, the conservation measures implemented in 2017 would have taken precedence, had Unuk River Chinook salmon been delisted as a stock of management concern. In addition, the troll fishery is managed per Chapter 3 of the PST and requires that SEAK fisheries are managed to achieve escapement objectives for SEAK and Transboundary River (TBR) stocks. In addition, the troll fisheries are managed pursuant to the *United States-Canada Salmon Management Plan* (5 AAC 33.361) and the *Policy for the management of sustainable salmon fisheries* (5 AAC 39.222), whereas impacts of fishing on salmon escapement are assessed and considered in management decisions, and necessary conservation restrictions may be imposed in order to achieve escapement, rebuild, or in some other way conserve a specific salmon stock or group of stocks. The combination of actions taken under provisions of the 2018 action plans from 2018 to 2020 were as follows:

#### **2018**

- Notwithstanding any remaining portion of the seasonal guideline harvest level, the winter troll fishery closed by EO in all waters of SEAK on March 15, 6 weeks prior to the regulatory closure.
- Beginning May 1, spring troll Chinook salmon fisheries in northern SEAK were reduced to portions of the outer coast located in Districts 13 and 183, with all other districts remaining closed through June 30.
- The Districts 9, 10, 12, and 14 enhanced chum salmon fishery openings were delayed until June 15 and closed to the retention of Chinook salmon.
- Lynn Canal/Chilkat Inlet in Section 15-A north of the latitude of Sherman Rock was closed to commercial trolling from July 1 to December 31.

#### **2019–2020**

- The winter troll fishery closed by EO in all waters of SEAK on March 15, 6 weeks prior to the regulatory closure.
- Beginning May 1, spring troll Chinook salmon fisheries in northern SEAK were reduced to portions of the outer coast located in Districts 13 and 183, with all other districts remaining closed through June 30.
- All THA openings in northern Southeast were delayed until June 1.
- The Districts 9, 10, 12, and 14 enhanced chum salmon fishery openings were delayed until June 15 and closed to the retention of Chinook salmon.
- Lynn Canal/Chilkat Inlet in Section 15-A north of the latitude of Sherman Rock was closed to commercial trolling from July 1 to December 31.

## **SUBSISTENCE FISHERIES**

There is a customary and traditional use finding for salmon in all waters of the Chilkat River and Chilkat Inlet north of the latitude of Glacier Point (Figure 11). The amount reasonably necessary for salmon in all of District 15 is 7,174–10,414 salmon. Traditionally, this subsistence fishery targets early run sockeye salmon; however, Chinook salmon are harvested incidentally. The possession limit for Chinook salmon is 2 fish.

The King Salmon River and nearby drainages are located within the Juneau Nonsubsistence Area (5 AAC 99.015(a)(2)) and there are no customary and traditional use findings in the marine waters of Seymour Canal, therefore there are no subsistence fisheries on this stock.

The Taku River and its tributaries are located within the Juneau Nonsubsistence Area (5 AAC 99.015(a)(2)), therefore there are no subsistence fisheries on this stock.

### **Past Subsistence Fisheries Management Actions**

The Chilkat Inlet and Chilkat River subsistence fishery was managed by exceeding conservation measures of the *Lynn Canal and Chilkat River King Salmon Fishery Management Plan* and followed management actions outlined in the 2018 Chilkat and King Salmon Rivers king salmon action plan in 2018 through 2020. Since 2018, the department has been requesting that all live Chinook salmon be released immediately. No additional management actions were taken.

## **PERSONAL USE FISHERIES**

A personal use sockeye salmon fishery occurs in the U.S. waters of the Taku River. Up to 2 incidentally caught Chinook salmon may be retained while personal use fishing for sockeye salmon. The season opens by regulation July 1 to July 31. Reported harvests indicate most of the Chinook salmon harvest occurs in the first 10 days of the fishery. Taku River personal use salmon fisheries are managed under provisions of annual management plans produced by the Transboundary Technical Committee and approved by the Transboundary Panel, as directed by Chapter 1 of the Pacific Salmon Treaty. Since 2017 the start of the fishery has been delayed by up to 2 weeks by EO to reduce the incidental harvest of Taku River Chinook salmon.

There are no personal use fisheries that target King Salmon River salmon.

### **Past Personal Use Fisheries Management Actions**

- **2017:** Season dates were adjusted to July 10 through August 9 by EO.
- **2018:** Season dates were adjusted to July 16 through August 15 by EO.
- **2019:** Season dates were adjusted to July 15 through August 14 by EO.
- **2020:** Season dates were adjusted to July 13 through August 12 by EO.

## **ACTION PLAN MANAGEMENT OPTIONS FOR ADDRESSING STOCKS OF CONCERN**

### **ACTION PLAN GOAL**

The primary goal of this action plan is to rebuild Chinook salmon runs in the Chilkat, King Salmon, and Taku Rivers to consistently achieve escapement goals while providing historical levels of fishing opportunity.

## ACTION PLAN ALTERNATIVES

Draft action plans were presented to the Board of Fisheries at the March 2022 meeting in Anchorage. The draft plans contained different options for each of the fisheries: commercial, sport, personal use, and subsistence. The board chose the options for each fishery that was the least restrictive and gave the department direction to apply more restrictive measures where and/or when appropriate. The board also gave the department direction to relax measures where and/or when the department determined there was opportunity to do so. The following actions for each fishery were the least restrictive actions presented in the draft action plan in Record Comment 6.

### ACTION #1—SPORT FISHERY

**Objective: Reduce the sport harvest of Chilkat River, King Salmon River, and Taku River Chinook salmon.**

Use department EO authority to implement conservative Chinook salmon regulations in Districts 9, 10, 11, 12, 13, 14, and 15 that are essentially identical to those implemented in 2018 to 2020 under the guidance of the 2018 Chilkat and King Salmon Rivers action plan. In 2018 through 2020, nonretention of Chinook salmon and closures to Chinook salmon fishing were started on April 1, 2 weeks earlier than Action #2: Sport Fishery in the 2018 Chilkat and King Salmon Rivers king salmon action plan. Regional Chinook salmon regulations established under the *Southeast Alaska King Salmon Management Plan* (5 AAC 47.055) would apply in the restricted areas during the remainder of the year when fishing is allowed. The management actions for the respective districts and sections are described below and depicted in Figure 5.

**Specific Actions to Implement the Objective:** Implement closures and nonretention periods inseason in the Haines, Skagway, and Juneau areas as follows:

- **District 15:** Chilkat Inlet closed to Chinook salmon fishing April 1 to July 15, and retention of Chinook salmon prohibited July 16 to December 31; remainder of Section 15-A, retention of Chinook salmon prohibited April 1 to December 31; Sections 15-B and 15-C, retention of Chinook salmon prohibited April 1 to June 14.
- **District 14:** In Sections 14-B and 14-C, retention of Chinook salmon prohibited April 1 through June 14. Inclusion of these sections expand the inside waters nonretention area in Action #2: Sport Fishery in the 2018 Chilkat and King Salmon Rivers king salmon action plan.
- **District 13:** In the waters of Section 13-C southeast of a line from Nismeni Point to a point on the Chichagof Island shoreline at 57°35.59' N. lat., 135°22.33' W. long., retention of Chinook salmon prohibited April 1 through June 14.
- **District 12:** Retention of Chinook salmon prohibited April 1 through June 14. The inclusion of section 12-A increases the inside waters nonretention area more than Action #2: Sport Fishery in the 2018 Chilkat and King Salmon Rivers king salmon action plan.
- **District 11:** Sections 11-A, 11-B and 11-C retention of Chinook salmon prohibited April 1 through June 14; Section 11-D closed to Chinook salmon fishing April 1 through June 30. The marine waters of Taku Inlet north of a line from Point Bishop to Point Greely, retention of Chinook salmon prohibited April 1 through June 30.
- **District 10:** Retention of Chinook salmon prohibited April 1 to June 14. Including District 10 expands the inside waters nonretention area in Action #2: Sport Fishery in the 2018 Chilkat and King Salmon Rivers king salmon action plan.

- **District 9:** In the waters of District 9 north of line between Point Ellis and Patterson Point, retention of Chinook salmon prohibited April 1 through June 14.
- **Designated Hatchery Sport Harvest Area DHSHA near Juneau:** If the surplus hatchery Chinook salmon return to the Macaulay Hatchery is in excess of broodstock needs, the DHSHA near Juneau will be liberalized with a bag and possession limit of 2 Chinook salmon any size, no annual limit from June 1 through August 31. The June 1 DHSHA fishing start date is 2 weeks earlier than Action #2: Sport Fishery in the 2018 Chilkat and King Salmon Rivers king salmon action plan.

## **ACTION #2—COMMERCIAL FISHERIES**

Manage per the 2018 action plans, manage the District 11 fisheries per annual management plans produced by the TTC under provisions of the PST and take additional actions when necessary.

### ***Drift Gillnet Fisheries***

#### **District 15**

- Continue to manage the District 15 drift gillnet fishery per the 2018 Chilkat and King Salmon Rivers king salmon action plan. The following management actions have been modified from the 2018 plan for clarity, but effective restrictions were not changed. The reference in weeks of the fishery is based on with the first week beginning the third Sunday in June.

#### **Section 15-A**

- Exceed conservation measures of the Lynn Canal and Chilkat River King Salmon Fishery Management Plan by closing area in Chilkat Inlet north of Eldred Rock Lighthouse through week 5.
- Close western half of Section 15-A through week 5.
- Impose a 6-inch maximum mesh size restriction through week 3.
- Impose night closures between 10:00 p.m. and 4:00 a.m. through week 4.

#### **Section 15-C**

- Impose night closures between 10:00 p.m. and 4:00 a.m. through week 4.
- Impose 6-inch maximum mesh restriction through week 2.
- Restrict area to the “postage stamp” and limit time to 2 days in in week 1.
- Restrict area to the area south of the latitude of Vanderbilt Reef and limit time to 2 days in week 2.

#### **Boat Harbor THA**

- Impose night closures between 10:00 p.m. and 4:00 a.m. in outside waters of Boat Harbor THA through week 4.
- Limit outside waters of Boat Harbor THA to 2 days/week and area to within 1 mile of western shoreline through week 2.
- Impose 6-inch maximum mesh restriction through week 2 in outside waters of Boat Harbor THA.
- The inside waters of the Boat Harbor THA (west of marker) would remain open 7 days/week through week 4 by regulation and will not have predetermined night closures or mesh restrictions.

## **District 11**

- Continue to manage the District 11 drift gillnet fishery per the 2018 Chilkat and King Salmon Rivers king salmon action plan and under provisions of annual management plans produced by the TTC and approved by the Transboundary Panel, as directed by Chapter 1 of the PST. Management actions per the annual management plan include but are not limited to reduced time and area open in Taku Inlet through SW 29 in the District 11 drift gillnet fishery; restrict the fishery to 2 days per week through SW 28; close Taku Inlet north and west of the latitude of Point Greely and 134°07.5' W long through SW 26, north of Cooper Point in SW 27, and Jaw Point in SWs 28–29; implement a 6-inch maximum mesh size restriction and night closures (between 10:00 p.m. and 4:00 a.m.) through at least SW 27; and keep Section 11-C closed through SW 29.

### ***Troll Fisheries***

- Continue to manage the troll fishery per the 2018 Chilkat and King Salmon Rivers king salmon action plan, the 2018 Unuk River king salmon action plan, and provisions of the PST including the following.
  - Using EO authority, close the winter troll fishery in all waters of Southeast and Yakutat beginning March 16, with Section 15-A in Lynn Canal/Chilkat Inlet north of the latitude of Sherman Rock remaining closed to commercial trolling through December 31.
  - Using EO authority, beginning May 1 and through June 30, reduce spring troll Chinook salmon fisheries in northern Southeast to areas of the outer coast near hatcheries, hatchery release sites, or areas with low proportion harvest of wild SEAK Chinook salmon located in Districts 113 and 183, with all other districts remaining closed.
  - Using EO authority, delay opening all THAs in northern SEAK until June 1.
  - Using EO authority, delay the Districts 109, 110, 112, and 114 hatchery chum salmon fishery openings until June 15 and close to the retention of Chinook salmon.

### ***Purse Seine Fishery***

- Continue to implement nonretention of Chinook salmon until at least the third week of July in traditional purse seine fishery and in THAs that do not have hatchery-produce Chinook salmon runs.

## **ACTION #3—SUBSISTENCE FISHERY**

Continue to manage the subsistence fishery per the 2018 Chilkat and King Salmon Rivers king salmon action plan and in accordance with the subsistence preference at AS 16.05.258.

- Using EO authority, reduce time and area open to subsistence fishing in Chilkat Inlet and in the Chilkat River by implementing and exceeding conservation measures of the *Lynn Canal and Chilkat River King Salmon Fishery Management Plan* (5 AAC 33.384):
  - Open Chilkat River to subsistence fishing from June 1 through June 14.
  - Close Chilkat River to subsistence fishing from June 15 to July 31, except for the portion of the river between Haines Highway mile 19 and the Wells Bridge—this section opens 4 days/week.
  - Close all waters of Chilkat Inlet to subsistence fishing through July 22.

## **ACTION #4 – PERSONAL USE FISHERY**

Continue to implement the following management action that began in 2017.

- Manage per the annual bilateral Transboundary River Management Plan of the PST. Actions taken to reduce incidental harvest of Chinook salmon include delaying the month-long personal use fishery by up to 2 weeks.

## **CONDITIONS FOR REDUCING RESTRICTIONS OR DELISTING A STOCK OF CONCERN**

1. If the lower bound of the BEG range is met or exceeded in 3 consecutive years or is met in 4 out of 6 consecutive years, the department may recommend removing the stock as a stock of “management concern” at the first Southeast and Yakutat board meeting after this condition is met.
2. Management measures could be relaxed in specific areas or during specific time periods if updated stock composition and harvest data indicates areas and/or times where and/or when restrictions are no longer needed to ensure the BEG is met.
3. In the event the upper bound of the BEG range is met or exceeded in 2 consecutive years, management restrictions may be relaxed or set aside.
4. Should the TTC determine that a harvestable surplus of Taku River Chinook salmon is available, directed Chinook salmon fisheries in District 11 may occur pursuant to the annual Transboundary River management plan under provisions of the PST.

Stock status, action plan performance (including information on harvest rate, distribution, and timing in commercial fisheries), and escapement goal review will be updated in a report to the board at the 2025 Southeast and Yakutat meeting.

## **CURRENT RESEARCH PROJECTS**

### **CHILKAT RIVER KING SALMON**

The department has conducted extensive research and monitoring projects on Chilkat River Chinook salmon. From 1975 to 1992, aerial survey counts were conducted on 2 small clear-water tributaries; however, radiotelemetry and MR studies conducted in 1991 and 1992 showed that these tributary survey counts were not representative of escapement in the entire drainage and the surveys were discontinued. Escapement estimates of large adults since 1991 have been based on MR experiments that provide precise estimates. King salmon juvenile coded-wire tagging began in 1999 with a relatively high mark fraction, averaging 8% to 10%. The Chilkat River stock of Chinook salmon is an escapement and exploitation rate indicator stock of the Chinook Technical Committee of the Pacific Salmon Commission. Obligations in the Pacific Salmon Treaty include producing the full suite of stock assessment data for Chilkat River Chinook salmon, including smolt production, overwinter and marine survival, harvest and exploitation rates, estimates of escapement, and escapement age-sex-length composition. The Chilkat River Chinook salmon run is 1 of the 11 indicator stocks used by the department to monitor Chinook salmon runs in SEAK. The following research programs have been and are being conducted to gather detailed information about Chilkat River Chinook salmon:

1. Chilkat River Chinook salmon are part of the coastwide Chinook salmon genetic baseline (Seeb et al. 2007); however, identifying these fish in mixed stock fisheries has been



convoluted because this stock has been used as a source of brood stock for hatchery releases in the upper Lynn Canal. Those releases and that issue no longer exist.

2. MR studies to estimate total escapement of Chilkat River Chinook salmon began in 1991 and continue to present (Elliott 2018).
3. CWT studies, 1988 to 1990 have been conducted annually since 1999 (Elliott and Peterson 2020).
4. Age, sex, and length composition of escapements have been conducted annually since 1991 (Elliott 2018).
5. Marine harvest sampling of commercial and sport fisheries is conducted by the department annually throughout SEAK. These programs include CWT and genetic sampling and various studies designed to estimate catch, harvest, fishing effort, and biological parameters such as age, sex, and size (Reynolds-Manney et al. 2020; Jaenicke et al. 2019).

## **KING SALMON RIVER KING SALMON**

The department has conducted annual assessments of Chinook salmon escapement in the King Salmon River since 1971, which included foot or helicopter counts from 1971 to 1982, adult weir counts from 1983 to 1992 (McPherson and Clark 2001), foot and helicopter counts from 1993 to 2011, and finally standardized foot surveys since 2012. The following research programs have been and are being conducted to gather detailed information about King Salmon River Chinook salmon:

1. King Salmon River Chinook salmon are part of the coastwide Chinook salmon genetic baseline (Seeb et al. 2007).
2. Standardized aerial and foot escapement surveys have been conducted annually since the 1970s (Richards and Frost 2018).
3. Age, sex, and length composition, CWT and escapement sampling have been conducted annually since 2003 (Richards et al. 2018).
4. The current marine harvest sampling of commercial and sport catch cannot account for the harvest of King Salmon River Chinook salmon.

## **TAKU RIVER KING SALMON**

The department has conducted extensive research and monitoring projects on Taku River Chinook salmon. From 1973 to 2020, standardized aerial survey counts were conducted on 5 clearwater tributaries in the upper Taku River drainage. Radiotelemetry studies were conducted in 1989 and 1990, and 2015 to 2020. Wild smolt were CWTeD from 1976 to 1981, and from 1993 to present. Total escapement was estimated from MR studies conducted in 1989 and 1990, 1995 to 1997, 1999 to 2010, and 2014 to 2020. In all other years, escapements were estimated from expanded helicopter survey index counts. The Taku River Chinook salmon stock is an escapement and exploitation rate indicator stock of the Chinook Technical Committee of the Pacific Salmon Commission. Requirements in the PST include producing the full suite of stock assessment data, including smolt production, marine survival, harvest and exploitation rates, estimates of escapement, and escapement age-sex-length composition. The following research programs have been and are being conducted to gather detailed information about Taku River Chinook salmon:

1. Taku River Chinook salmon are part of the coastwide Chinook salmon genetic baseline (Seeb et al. 2007).

2. MR studies to estimate total escapement of Taku River Chinook salmon were conducted in 1989 and 1990, 1995 to 1997, 1999 to 2010, and have been conducted annually since 2014 (Williams et al. 2016)
3. CWT studies were conducted 1976 to 1981 and annually since 1993 (Williams et al. 2016).
4. Age, sex, and length composition of escapements have been conducted annually since 1991 (Williams et al. 2016).
5. Marine harvest sampling of commercial and sport fisheries is conducted by the department annually throughout SEAK. These programs include CWT and genetic sampling with 20% minimum sample rate goal and various studies designed to estimate catch, harvest, and fishing effort and biological parameters such as age, sex, and size (Reynolds-Manney et al. 2020; Jaenicke et al. 2019).

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## **TABLES AND FIGURES**

Table 1.—Escapement, harvest, total run, and harvest rate by fishery of large ( $\geq$  age 5) Chinook salmon in the Chilkat River, 2011–2020. Harvests include some age 4 fish.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 <sup>d</sup>	5-year Average <sup>e</sup>	10-year Average <sup>f</sup>
Escapement <sup>a</sup>	2,674	1,723	1,719	1,529	2,452	1,380	1,173	873	2,028	3,180	1,727	1,873
Harvest	1,094	1,032	398	1,090	706	323	239	196	87	79	185	524
Total Run	3,768	2,755	2,117	2,619	3,158	1,703	1,412	1,069	2,115	3,259	1,912	2,397
Harvest Rate:												
Troll Winter	0.03	0.04	0.00	0.00	0.00	0.02	0.04	0.00	0.00	0.00	0.01	0.01
Troll Spring	0.03	0.05	0.02	0.00	0.02	0.00	0.03	0.00	0.00	0.00	0.01	0.02
Troll Summer R1 <sup>b</sup>	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Troll Summer R2 <sup>b</sup>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Troll All	0.06	0.10	0.02	0.00	0.03	0.02	0.07	0.00	0.00	0.00	0.02	0.03
Sport Early <sup>c</sup>	0.08	0.11	0.07	0.14	0.09	0.00	0.09	0.12	0.00	0.00	0.04	0.07
Sport Late <sup>c</sup>	0.01	0.04	0.00	0.03	0.00	0.16	0.00	0.00	0.00	0.00	0.03	0.02
Sport All	0.09	0.15	0.07	0.17	0.09	0.16	0.09	0.12	0.00	0.00	0.07	0.09
Net All	0.11	0.10	0.07	0.21	0.10	0.00	0.01	0.06	0.04	0.02	0.03	0.07
Subsistence All	0.03	0.03	0.03	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01
U.S. All	0.29	0.37	0.19	0.42	0.22	0.19	0.17	0.18	0.04	0.02	0.12	0.21
Canada All	0	0	0	0	0	0	0	0	0	0	0	0
Total	0.29	0.37	0.19	0.42	0.22	0.19	0.17	0.18	0.04	0.02	0.12	0.21

<sup>a</sup> The BEG range for Chilkat River Chinook salmon is 1,750 to 3,500 large fish. Gray cells in this row indicate escapements below the lower bound of the BEG.

<sup>b</sup> Troll Summer retention period 1 (R1) occurs in July; Troll Summer R2 occurs from August through September.

<sup>c</sup> Sport Early occurs April through July of the current year; Sport Late occurs in August of the prior year.

<sup>d</sup> Preliminary estimates.

<sup>e</sup> 2016 to 2020.

<sup>f</sup> 2011 to 2020.

Table 2.—Escapement, harvest, and total run of large ( $\geq$  age 5) Chinook salmon in the Chilkat River, 2011–2020. Harvests include some age 4 fish.

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 <sup>d</sup>	5-year Average <sup>e</sup>	10-year Average <sup>f</sup>
Escapement <sup>a</sup>	2,674	1,723	1,719	1,529	2,452	1,380	1,173	873	2,028	3,180	1,727	1,873
Harvest	1,094	1,032	398	1,090	706	323	239	196	87	79	185	524
Total Run	3,784	2,774	2,117	2,631	3,187	1,726	1,412	1,077	2,115	3,259	1,918	2,408
Number of fish harvested by fishery												
Troll Winter	124	113	0	0	0	34	58	0	0	0	18	33
Troll Spring	119	150	40	0	57	0	45	0	0	0	9	41
Troll Summer R1 <sup>b</sup>	0	0	0	0	42	0	0	0	0	0	0	4
Troll Summer R2 <sup>b</sup>	0	0	0	0	0	0	0	0	0	10	2	1
Troll All	243	263	40	0	100	34	102	0	0	10	29	79
Sport Early <sup>c</sup>	304	307	141	360	290	0	125	127	0	0	50	165
Sport Late <sup>c</sup>	19	99	0	90	0	272	0	0	0	10	56	49
Sport All	323	405	141	449	290	272	125	127	0	10	107	214
Net All	415	268	152	561	301	7	11	69	87	59	47	193
Subsistence All	114	96	65	79	15	10	0	0	0	0	2	38
U.S. All	1,094	1,032	398	1,090	706	323	239	196	87	79	185	524
Canada All	0	0	0	0	0	0	0	0	0	0	0	0
Total	1,094	1,032	398	1,090	706	323	239	196	87	79	185	524

<sup>a</sup> The BEG range for Chilkat River Chinook salmon is 1,750 to 3,500 large fish. Gray cells in this row indicate escapements below the lower bound of the BEG.

<sup>b</sup> Troll Summer retention period 1 (R1) occurs in July; Troll Summer R2 occurs from August through September.

<sup>c</sup> Sport Early occurs April through July of the current year; Sport Late occurs in August of the prior year.

<sup>d</sup> Preliminary estimates.

<sup>e</sup> 2016 to 2020.

<sup>f</sup> 2011 to 2020.

Table 3.—Escapement of large ( $\geq$  age 5) Chinook salmon in the King Salmon River, 2011–2020.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	5-year Average <sup>b</sup>	10-year Average <sup>c</sup>
Escapement <sup>a</sup>	192	155	94	68	50	149	85	30	27	100	78	95

<sup>a</sup> The BEG range for King Salmon River Chinook salmon is 120 to 240 large Chinook salmon. Gray cells in this row indicate escapements below the lower bound of the BEG.

<sup>b</sup> 2016 to 2020.

<sup>c</sup> 2011 to 2020.



Table 4.—Escapement, harvest, and total run of large ( $\geq$  age 5) Chinook salmon in the Taku River, 2011–2020. Harvests include some age 4 fish.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020 <sup>d</sup>	5-year Average <sup>e</sup>	10-year Average <sup>f</sup>
Escapement <sup>a</sup>	19,672	16,713	18,002	23,532	23,567	9,177	8,214	7,271	11,558	15,593	10,363	15,330
Harvest	9,152	8,663	3,591	5,755	5,297	3,758	2,706	1,777	421	1,145	1,961	4,226
Total Run	28,824	25,376	21,553	29,287	28,864	12,935	10,920	9,048	11,979	16,738	12,324	19,556
Harvest Rate:												
Troll Winter	0.02	0.08	0.03	0.01	0.01		0.04				0.01	0.02
Troll Spring	0.12	0.08	0.07	0.06	0.03	0.10	0.01				0.02	0.04
Troll Summer	0.02				0.01					0.01		0.00
R1 <sup>b</sup>												
Troll Summer					0.01							0.00
R2 <sup>b</sup>												
Troll All	0.16	0.16	0.09	0.07	0.05	0.10	0.05			0.01	0.03	0.06
Sport NW					0.01							0.00
Sport Term	0.02	0.03	0.01	0.03	0.02	0.05	0.00	0.00	0.01	0.01	0.02	0.02
D11												
Sport All	0.02	0.03	0.01	0.03	0.02	0.05	0.00	0.00	0.01	0.01	0.02	0.02
Net Outside		0.1	0.1		0.01		0.01		0.02	0.00	0.01	0.00
Net Term D11	0.02	0.03	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Net All	0.02	0.03	0.02	0.02	0.02	0.01	0.02	0.01	0.3	0.02	0.02	0.02
Outside SEAK <sup>c</sup>				0.00				0.15	0.19			
Canada Comm	0.08	0.08	0.03	0.04	0.03	0.04	0.02				0.01	0.03
Canada	0.02	0.03		0.04	0.05	0.08					0.02	0.02
Assessment												
Canada Sport	0.00	0.00	0.00	0.00	0.00	0.00					0.00	0.00
Canada	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
Aboriginal												
Canada All	0.11	0.12	0.03	0.08	0.09	0.13	0.02	0.00	0.00	0.01	0.03	0.05
Total	0.32	0.34	0.17	0.20	0.18	0.29	0.25	0.20	0.04	0.07	0.12	0.22

<sup>a</sup> The BEG range for Taku River Chinook salmon is 19,000 to 36,000 large fish. Gray cells in this row indicate escapements below the lower bound of the BEG.

<sup>b</sup> Troll Summer retention period 1 (R1) occurs in July; Troll Summer R2 occurs from August through September.

<sup>c</sup> Outside southeast Net includes recoveries in trawl fisheries in other regions of Alaska (GOA) and drift gillnet recoveries from Cordova.

<sup>d</sup> Preliminary estimates.

<sup>e</sup> 2016 to 2020.

<sup>f</sup> 2011 to 2020.

Table 5.—Harvest by fishery of large ( $\geq$  age 5) Taku River Chinook salmon, 2011–2020. Harvests include some age 4 fish.

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2011– 2016 Average <sup>c</sup>	2017– 2020 Average <sup>d</sup>
Troll Winter	615	2,155	573	291	417	0	438	0	0	0	675	110
Troll Spring	3,506	2,017	1,419	1,672	854	1,304	88	0	0	113	1,795	50
Troll Summer R1 <sup>a</sup>	614	0	0	0	271	0	0	0	0	0	148	0
Troll Summer R2 <sup>a</sup>	0	0	0	0	0	0	0	0	0	0	0	0
Troll All	4,736	4,172	1,992	1,963	1,542	1,304	527	0	0	113	2,618	160
Sport NW	0	0	0	0	311	0	0	0	0	0	52	0
Sport Terminal D111	573	695	271	810	463	635	34	9	94	117	575	63
Sport All	573	695	271	810	774	635	34	9	94	117	626	63
outside D111 gillnet	0	129	126	0	213	0	125	0	181	78	78	128
D111 gillnet	518	668	356	489	292	159	143	31	124	189	414	122
Net All	518	668	356	489	292	159	268	31	250	267	414	232
Personal Use	48	34	20	21	29	30	1	11	11	17	30	10
Outside SEAK <sup>b</sup>	0	0	88	0	0	0	1,626	1,719	0	0	15	1,294
U.S. All	5,874	5,598	2,853	3,283	2,850	2,128	2,456	1,770	411	1,051	3,781	1,422
Canada Commercial	2,342	1,930	579	1,041	868	508	246	0	0	0	1,211	62
Canada Assessment	680	863	0	1,230	1,357	1,021	0	0	0	0	859	0
Canada Recreational	105	105	105	105	105	10	0	0	0	0	89	0
Canada FN	150	67	54	96	117	91	4	7	10	94	96	29
Canada All	3,277	2,965	738	2,472	2,447	1,630	250	7	10	94	2,255	90
Total	9,152	8,663	3,591	5,755	5,297	3,758	2,706	1,777	421	1,145	6,036	1,512

<sup>a</sup> Troll Summer retention period (R1) occurs in July; Troll Summer (R2) occurs from August through September.

<sup>b</sup> Outside southeast Net includes recoveries in trawl fisheries in other regions of Alaska (GOA) and drift gillnet recoveries from Cordova.

<sup>c</sup> Before significant management actions 2011–2016.

<sup>d</sup> After significant management actions 2017–2020.

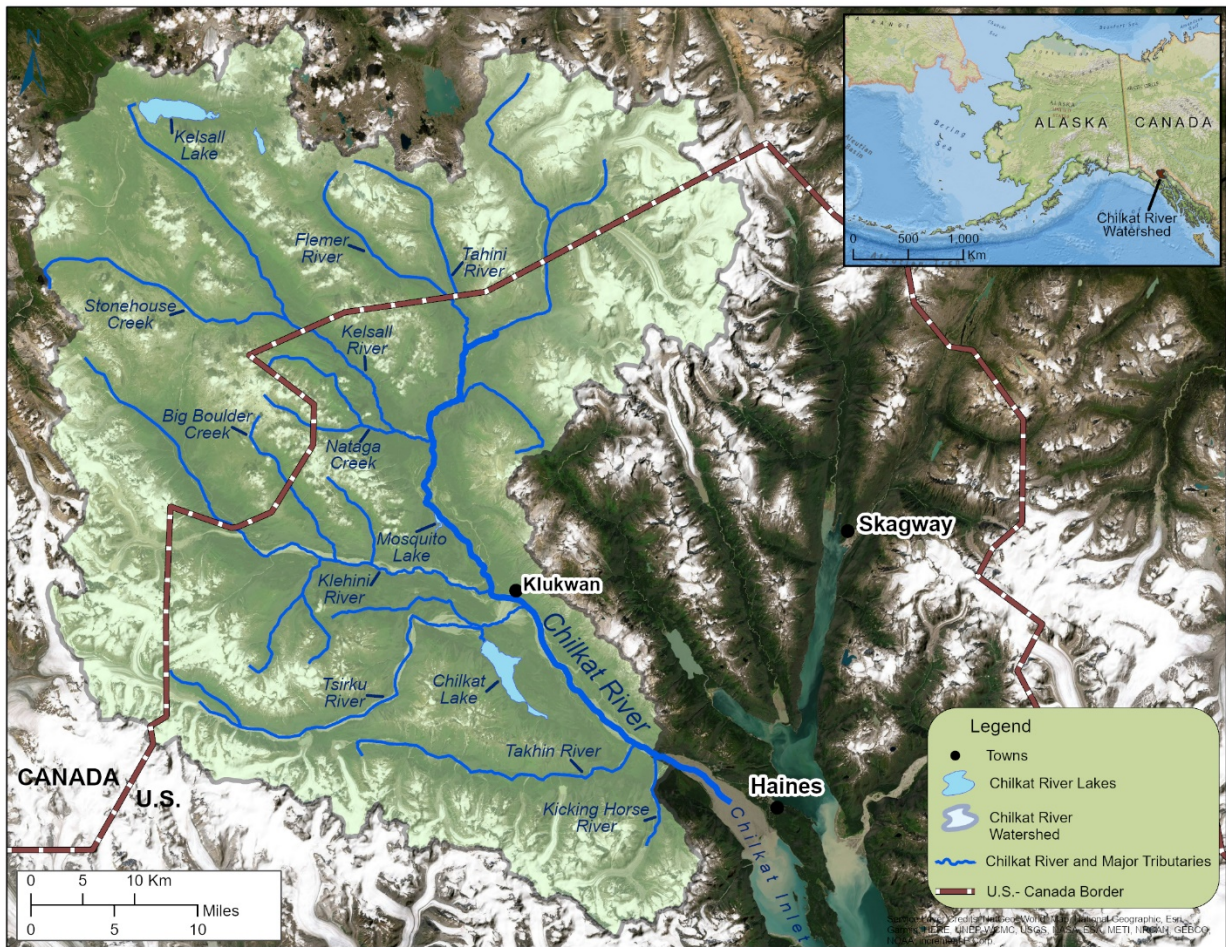


Figure 1.—Map of the Chilkat River watershed and primary Chinook salmon spawning tributaries, including the Kelsall, Tahini, and Klehini Rivers.





Figure 2.—Map of the King Salmon River watershed.

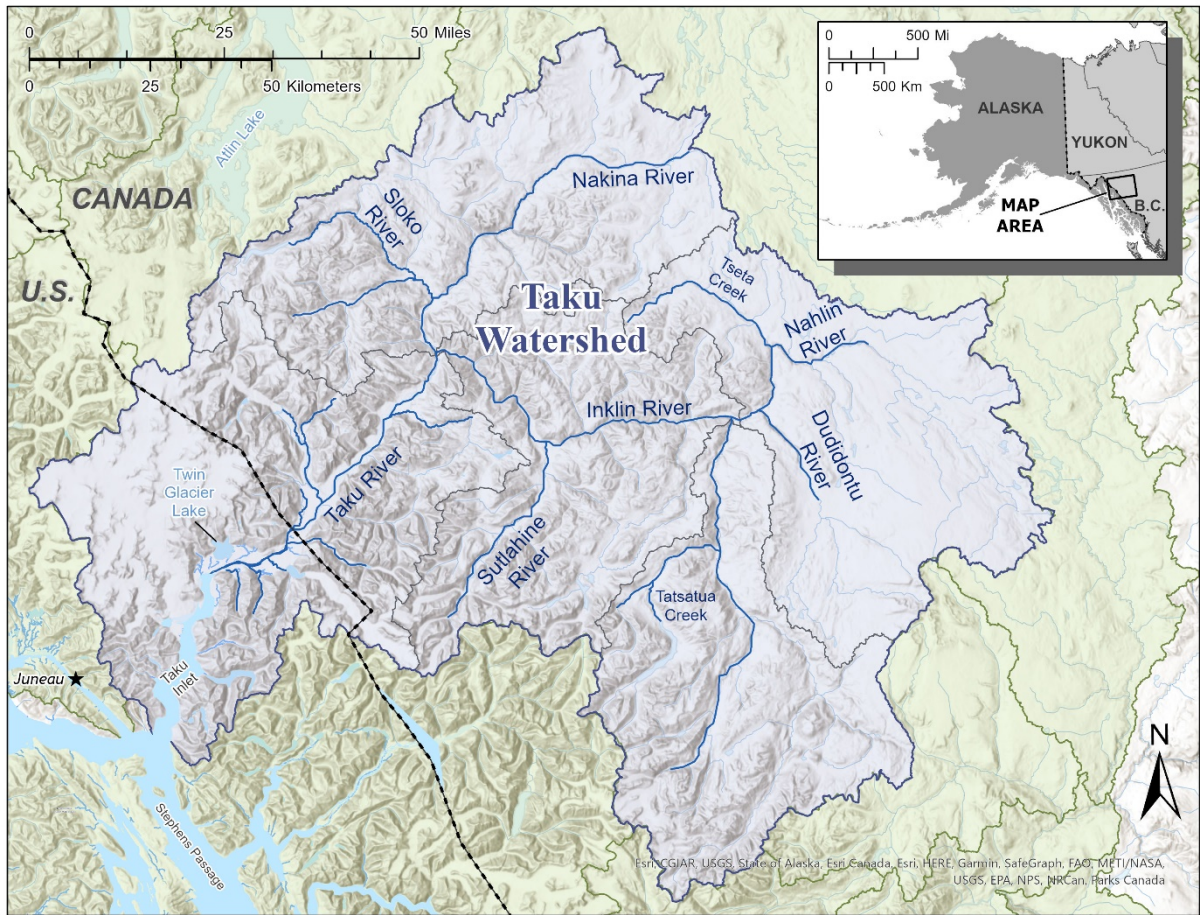


Figure 3.—Map of the Taku River watershed including the primary spawning tributaries in the Nakina, Nahlin, and Dudidontu, Rivers and Kowatua and Tatsatua Creeks.



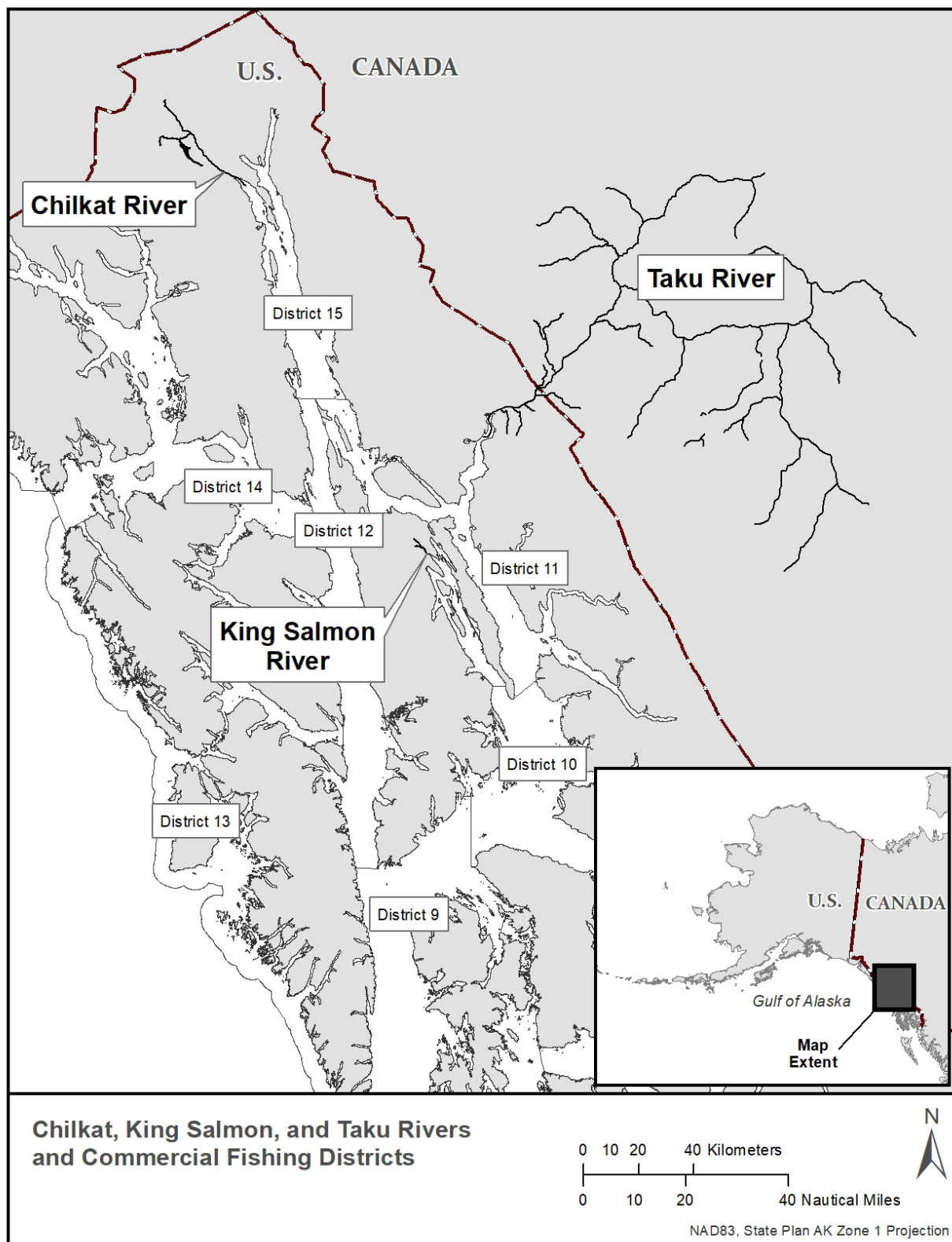


Figure 4.—Map showing the locations of Chilkat, King Salmon, and Taku Rivers and nearby fishing districts.

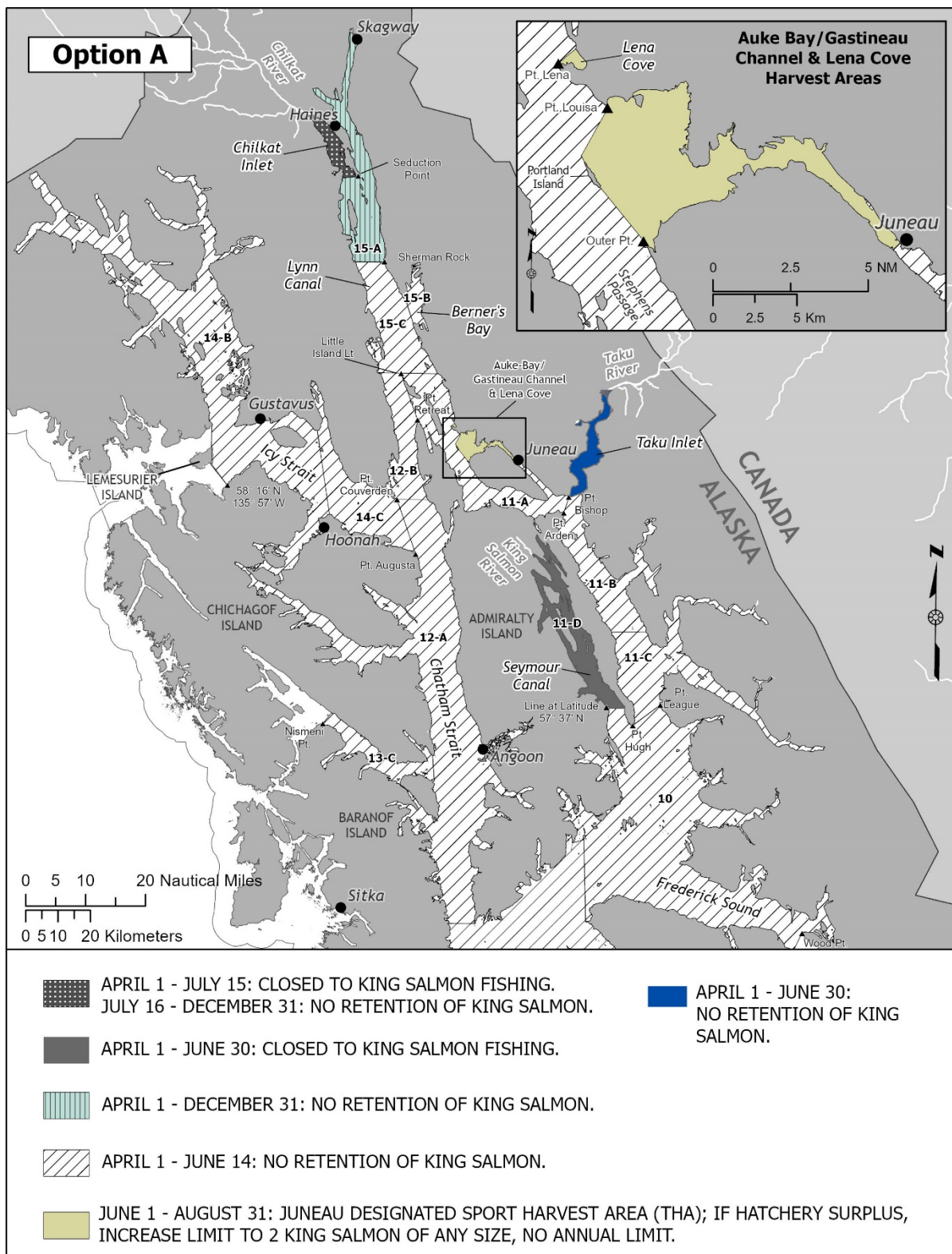


Figure 5.—Map of northern Southeast Alaska displaying sport fishing management actions.

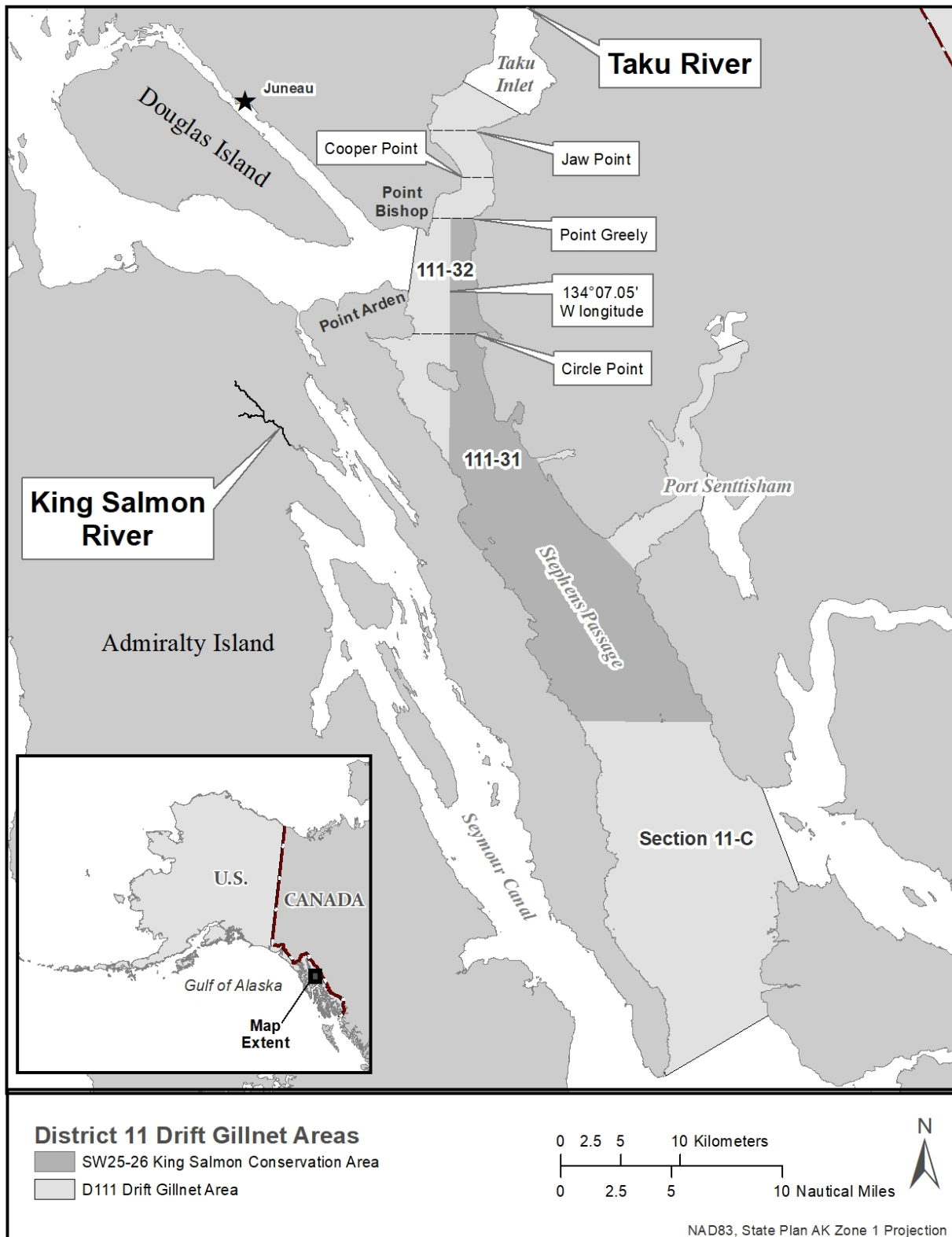


Figure 6.—Map of District 11 commercial drift gillnet fishing areas.



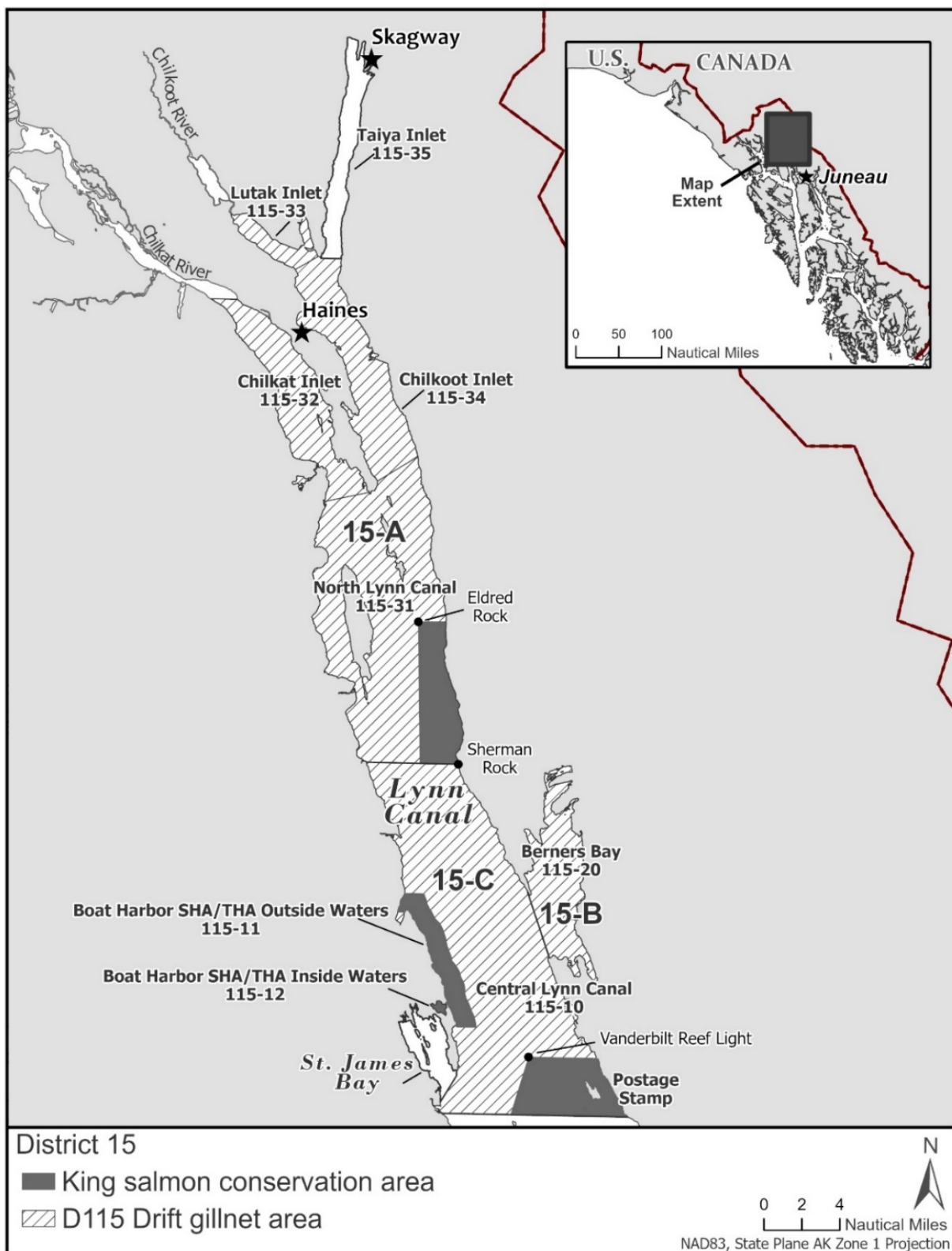


Figure 7.—Map of District 15 commercial drift gillnet fishing areas.

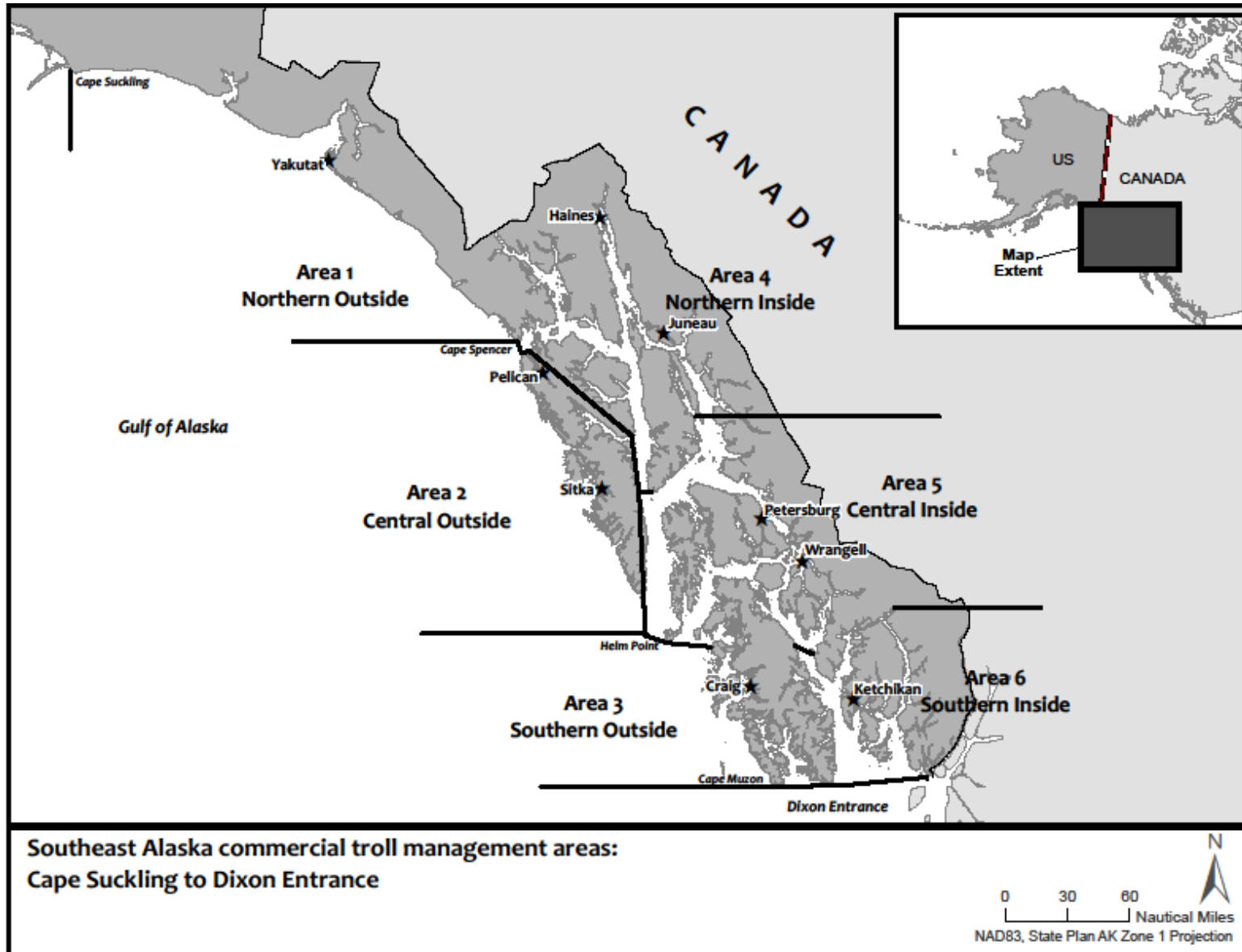


Figure 8.– Map of Southeast Alaska commercial troll fishing and Big Six management areas, Cape Suckling to Dixon Entrance.

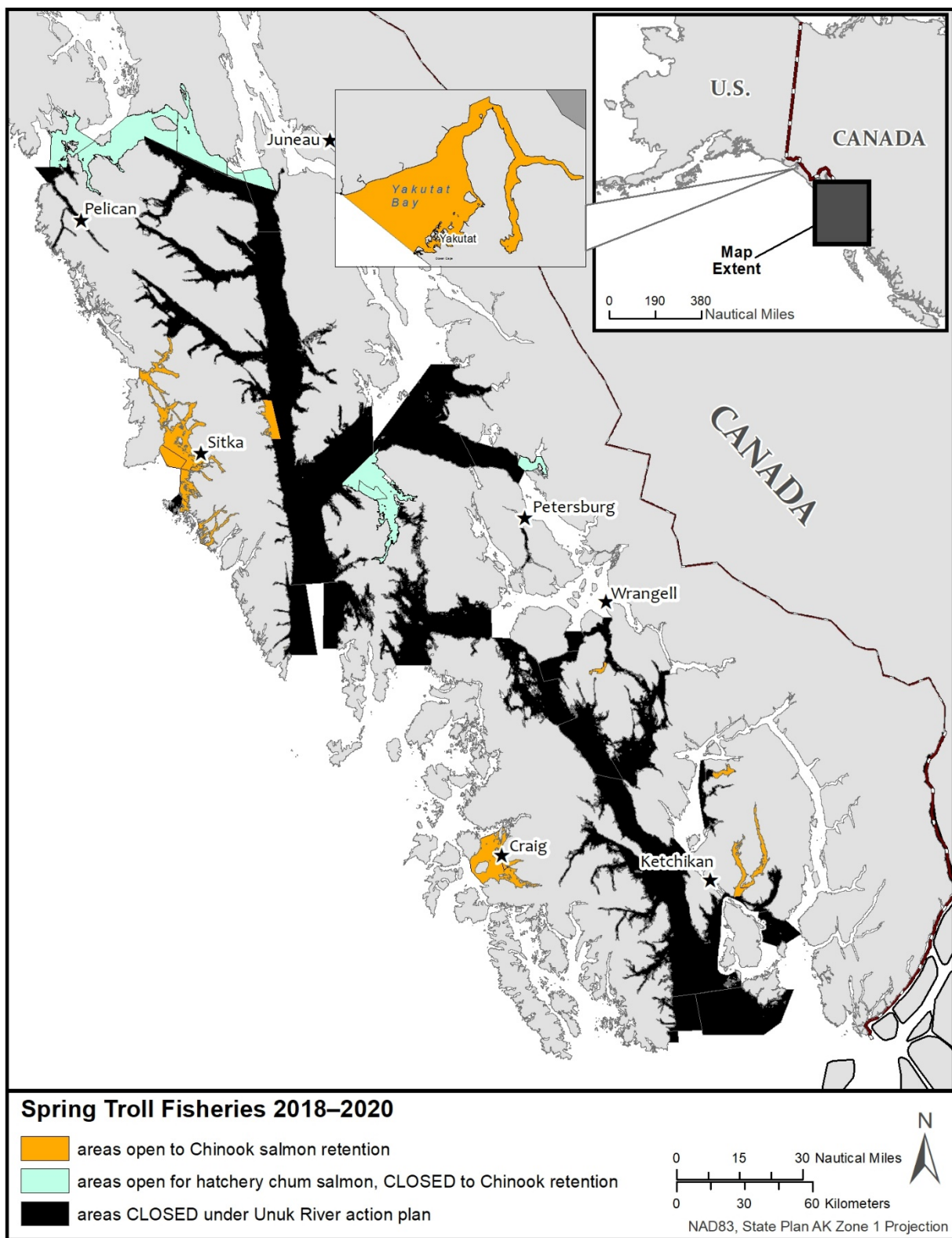


Figure 9.—Map of Southeast Alaska commercial spring troll fishing areas.

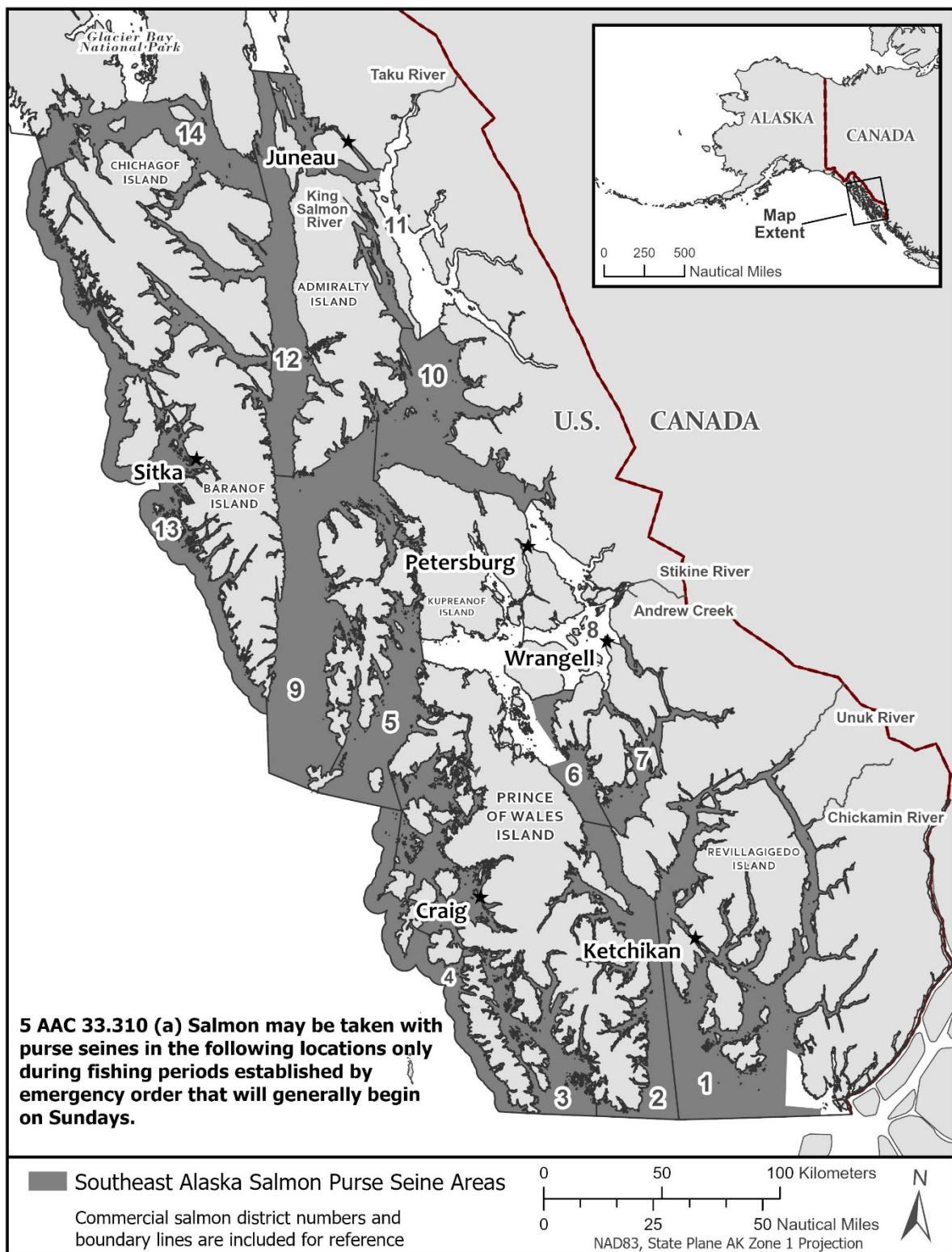


Figure 10.—Map of Southeast Alaska commercial purse seine fishing areas.



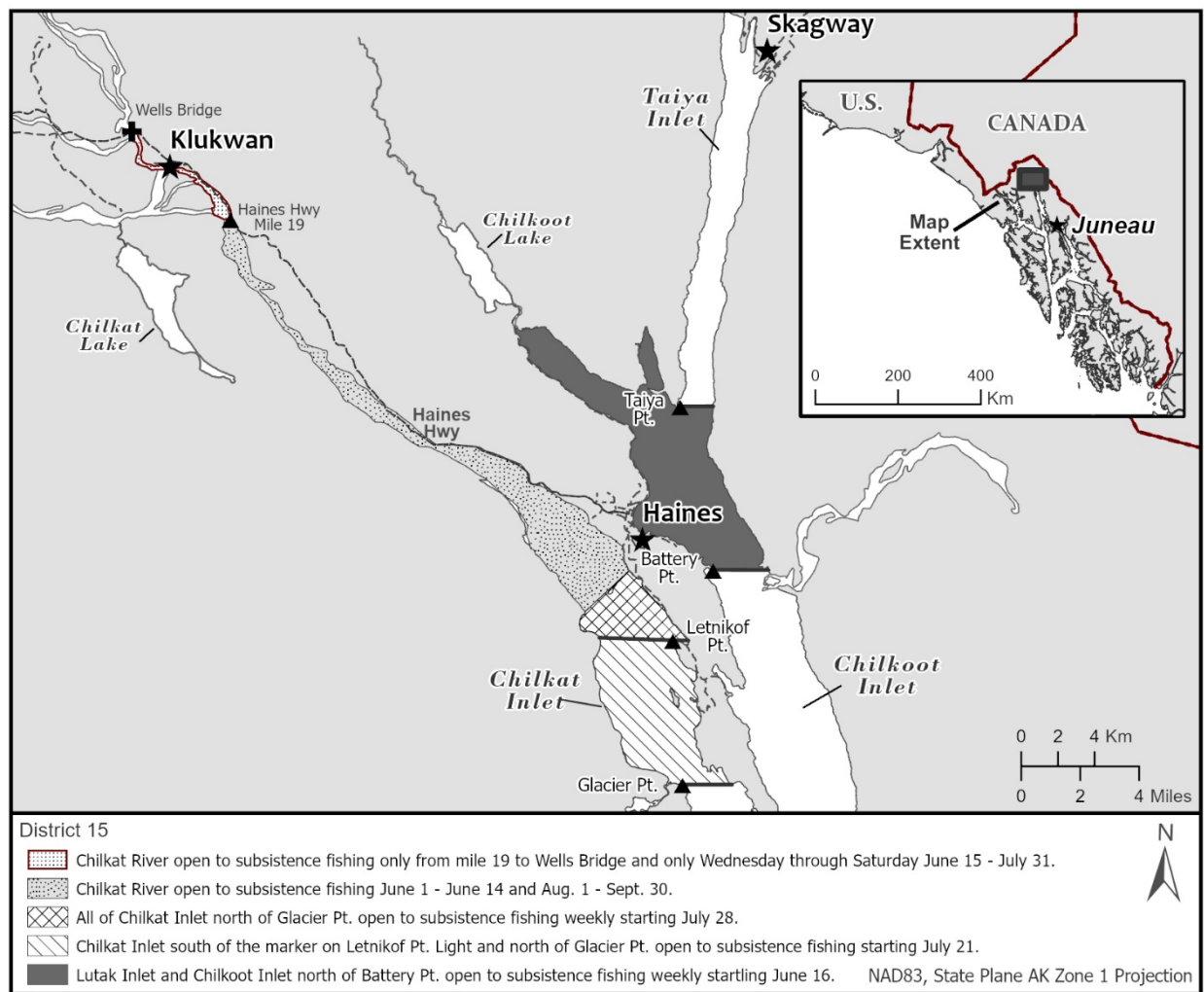


Figure 11.—Map of the Chilkat River and Inlet subsistence fishing areas (shaded area).