

**2023 ANNUAL MANAGEMENT PLAN**  
**Tutka Bay Lagoon Hatchery**  
**Cook Inlet Aquaculture Association**

**1.0 Executive Summary**

**1.1 Introduction**

This Annual Management Plan (AMP) plan is prepared to fulfill the requirements of 5 AAC 40.840. This plan must organize and guide the hatchery's operations, for each calendar year, regarding production goals, broodstock development, and harvest management of hatchery returns. Egg take through release details are included in planning for succeeding calendar years. Inseason assessments and project alterations by Cook Inlet Aquaculture Association (CIAA) or Alaska Department of Fish and Game (ADF&G) may result in changes to this AMP in order to reach or maintain program objectives. CIAA will notify the ADF&G private nonprofit (PNP) hatchery program coordinator in a timely manner of any departure from the AMP. The ADF&G PNP coordinator will advise as to whether an amendment, exception report, or other action is warranted. No variation or deviation will be implemented until an AMP amendment has been approved or waived by both the department and CIAA. This policy applies to all hatchery operations covered under the AMP.

**1.2 New This Year: (production, harvest management, culture techniques, etc.)**

*1.2.1 Facility Changes*

No major modifications to the facility are anticipated this year.

*1.2.2 Production Changes*

No major production changes anticipated in 2023.

*1.2.3 Fish Culture Changes*

No major changes anticipated in 2023.

*1.2.4 Projected Return and Cost-recovery Changes*

- At a 2.8% fry-to-adult survival rate (based on average of past 5 odd-year survival to this facility), CIAA is expecting approximately 1,542,579 adult pink salmon to return to Tutka Bay Lagoon Hatchery (TBLH). An estimated 85,716 fish will be required to meet the number of broodstock necessary to meet the egg-take goal and 6,500–17,000 for escapement. The remaining fish will be available for common property and cost recovery harvests. Any remaining fish will be harvested by the common property or cost recovery harvesters or removed by the hatchery operator.

**1.3 Fish Transport Permits or Amendments Needed This Year**

No new permits or amendments needed in 2023.

**1.4 Expected Return**

In order to estimate adult production from TBLH projects, it is assumed that there is 80% green egg-to-fry survival and a 2.8% adult return.

The projected adult production from TBLH enhancement projects this year are:

Species	Stock	Return Site	Brood Year	Total Return	Enhanced Return	Natural Return	Cost Recovery	Broodstock/ Escapement	Common Property Harvest
Pinks	Tutka	Tutka Bay Lagoon	2021	1,542,579	1,542,579	0	1,299,478	98,715	144,386
	<b>Combined Age Classes</b>			<b>1,542,579</b>	<b>1,542,579</b>	<b>0</b>	<b>1,299,478</b>	<b>98,715</b>	<b>144,386</b>
	<b>% of Total</b>				<b>100%</b>	<b>0%</b>	<b>84%</b>	<b>6%</b>	<b>9%</b>

**1.5 Production Summary**

*Tutka Bay Lagoon Hatchery  
Pink*

Stock & Permit No.	current year																									
	2022					2023					2024					2025										
	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Tutka Cr. 00A-0073(4) 11A-0060	9.2 M egg take @ Tutka Bay Lagoon					8M fry release @ Tutka @ Tutka Bay Lagoon					Up to 40M fry release @ Tutka Bay Lagoon															
						Up to 50M egg take @Tutka Creek					Up to 125 M egg take @ Tutka Bay Creek															

## 1.6 Permitted Capacity

TBLH operates under PNP Hatchery Permit #32 issued in 1994 and has a permitted capacity of 125,000,000 pink salmon green eggs and 660,000 sockeye salmon green eggs.

The FTPs under which CIAA operates TBLH programs are:

FTP #	Donor Stock/ Ancestral Stock	Maximum #, Life Stage	Action	Expiration Date	Transport from, to
<b>Pink salmon</b>					
00A-0073	Tutka Cr/ Tutka Cr	125 million green eggs	Egg take, rearing, release	12/31/2026	TBLH to Tutka Bay and Tutka Bay Lagoon
12A-0114	Tutka Bay/ Bruin Bay	4,714 adults	Transfer	6/30/2027	Bruin Bay to TBLH
<b>Sockeye salmon</b>					
11A-0051 <sup>a</sup>	Tutka Lagoon/English Bay Lk	1,000,000 smolts	Transfer, rearing, release	12/31/2025	TLH to Tutka Bay

<sup>a</sup>FTP for TLH.

## 1.7 Project Evaluation

Fish tickets submitted to ADF&G as well as counts during egg take and escapement will be used to enumerate returns to Tutka Bay Lagoon Hatchery.

All fish will be thermally marked.

## 20 **Paint River Stocking Program**

### 21 Purpose and History

The Paint River system, which enters Akjemguiga Cove in Kamishak Bay over a forty-foot waterfall at tidewater, has never had a self-sustaining run of salmon, but has long been recognized by both ADF&G and CIAA as having significant salmon production potential. A fish ladder was completed in 1991. The next phase of this project is to develop salmon runs to Paint River.

In spring 2011, the fish ladder was opened to allow migration of adult salmon to the system and natural colonization of the watershed. The first anadromous fish (coho salmon) were documented in the system in 2014. In 2015, chum salmon were also documented in and above the ladder.

No stocking or egg-take programs planned for 2023. The fish ladder will be open from early June through September to allow natural colonization of this extensive watershed. A video camera will be installed to document fish passage through the fish ladder.

### 3.0 Tutka Pink Salmon

#### 3.1 Purpose and History

ADF&G initiated this project in 1975; CIAA assumed operation of the project in 1991.

The purpose of the project is enhancement of the pink salmon return to Tutka Bay Lagoon for the common property fishery and cost-recovery harvest.

In 2004, CIAA suspended the Tutka Bay Lagoon pink salmon project and year-round operations at TBLH. In 2009, after reviewing options for improving hatchery operations, CIAA elected to resume pink salmon production at the facility. In 2011, natural returns to Tutka Creek were sufficient to allow the use of adult fish for broodstock and hatchery operations resumed.

#### 3.2 Operational Plan

##### 3.2.1 *Egg-take Goal/Brood Sources*

Primarily hatchery-produced pink salmon returning to Tutka Bay Lagoon Hatchery will be used as the brood source. Sufficient adult pink salmon returns are expected in 2023 to meet the 2023 egg-take goal of 50 million green eggs. The actual number of eggs collected will be dependent on egg size and based on the loading of 239 incubators at up to 80 kg per incubator.

<b>Fish Required to meet Egg-Take Goal</b>		
<b>Stock</b>		Tutka
<b>Species</b>		Pinks
<b># Green Egg Goal</b>		50,000,000
<b>Fecundity</b>		1,400
<b>Female to Male Ratio</b>		1:1
	Female	35715
	Male	35715
	<b>Total Broodstock</b>	<b>71430</b>
Inviability	7%	5000
Excess Males/Roe Recovery	10%	7143
Mortalities	3%	2143
	<b>Grand Total</b>	<b>85716</b>

*3.2.2 Egg Take; Transport of Eggs*

BY23 pink salmon broodstock will be collected from Tutka Creek. A weir will be constructed to restrict access above the pump house to those fish required for escapement (6,500 - 17,000) under approved fish transport and habitat permits. Egg takes will occur at the creek side and eggs will be fertilized immediately at a 1:1 female to male ratio and placed into NOPAD incubators. Two-thirds of the 359 incubators will be loaded with green eggs at a loading rate of up to 80 kg per incubator.

*3.2.3 Incubation Plans*

Once BY23 eggs have reached the eyed stage, they will be shocked, picked, and inventoried before being placed back into the incubators until emergence. Incubators will be loaded with eyed eggs at a loading rate of up to 40 kg per incubator. The fish will be thermally marked.

*3.2.4 Rearing and Release Plans*

All pink salmon fry will non-volitionally migrate from the incubators to net pens located in Tutka Bay Lagoon for short-term rearing before release. Loading will be such that the final density at release will be up to 8 kg/m<sup>3</sup>.

Table 1. Anticipated releases this calendar year.

<b>Species</b>	<b>Pink</b>		<b>Stock</b>	<b>Tutka</b>		
<b>Brood Year</b>	<b>Life Stage</b>	<b>Release Site</b>	<b>Released</b>	<b>Mark Type</b>	<b>Percent marked</b>	<b>Hatch code</b>
2022	Fry	Tutka Lagoon	8,000,000	Otolith	100%	6,3H

**3.3 Donor Stock Management**

*3.3.1 Management Strategies*

Cost recovery and common property harvest efforts will be managed to allow sufficient escapement into Tutka Creek for both broodstock harvest as well as natural escapement.

Broodstock will be collected directly from the creek below the weir and egg take will occur at the creek. CIAA will work with department staff to spread broodstock selection throughout the run based on historic run timing.

Any mortality problems associated with collection and holding of adults, and/or transportation of gametes will be immediately reported to the ADF&G Homer office.

### 3.3.2 Escapement Requirements

A weir will be established on Tutka Creek in early to mid-July just below the pump house. CIAA will work with department staff to manage freshwater spawning escapement in a manner that mimics historic run timing and distribution (both above and below the weir), while targeting a final stream-wide escapement by mid-August within the SEG range of 6,500–17,000 fish.

## 3.4 Evaluation Plans

CIAA and ADF&G personnel will cooperatively monitor the adult pink salmon return to assess abundance.

All BY23 eggs will be otolith marked.

CIAA will collect otoliths from adult pink salmon used as broodstock.

## 4.0 Harvest Management

### 4.1 Cost-recovery Plan

Cost recovery for sockeye salmon will be done under the Trail Lakes Hatchery (TLH) program and is detailed in the *Trail Lakes Hatchery 2023 Annual Management Plan*.

CIAA funds the cost of operating TLH, TBLH, PGH, Eklutna Salmon Hatchery (ESH) and associated field projects by licensing for harvest a portion of the fish returning to the hatcheries' release sites. CIAA will begin cost recovery in Resurrection Bay/Bear Lake followed by Leisure/Hazel Lake sockeye, Kirschner Lake sockeye, Tutka Bay Lagoon sockeye and pink salmon, and Port Graham Bay pink salmon until the cost recovery goal is met. The table below describes anticipated returns and revenue to the special harvest areas (SHAs) in which cost recovery licensing is possible in 2023.

<b>CIAA 2023 Cost Recovery Target</b>	
<b>SHA/AREA</b>	<b>Financial Target</b>
Bear Lake/Resurrection Bay Sockeye	1,100,000
Kirschner Lake Sockeye	200,000
Tutka Bay (sockeye and pink)	2,700,000
Leisure/Hazel Sockeye	\$175,000
Port Graham Pink	\$37,000

The Division of Commercial Fisheries Area Management Biologist (AMB), in consultation with the hatchery operator, will employ management strategies within waters of the Tutka Bay SHA, as well as other hatchery subdistricts listed in 5 AAC 21.372 *Tutka Bay Lagoon Salmon Hatchery Management Plan* that ensure achievement of broodstock and cost recovery licensing goals for CIAA, as well as to allow for an orderly common property fishery opportunity to harvest fish surplus to hatchery needs. Some reduction in the common property fishery opportunity in hatchery subdistricts may be necessary to ensure broodstock and cost recovery

licensing objectives are met in a timely and orderly fashion. In addition to weekly updates providing current levels of CIAA brood and cost recovery harvests to the Homer ADF&G office, CIAA will submit written hatchery subdistrict management recommendations to the AMB with clear justifications as to how the recommendations support achieving cost recovery and/or broodstock collection goals. Recommendations will be submitted in the form of a brief email and will include, but not be limited to, current cost recovery and brood harvest data, SHA estimates of fish in the water, as well as actual and anticipated run entry, and actual and anticipated cost recovery and brood harvest progress. SHA estimates may also include the number of fish within Tutka Lagoon outside of holding pens as well as in the creek.

## 4.2 Special Harvest Areas

### 4.2.1 *Tutka Bay Special Harvest Area*

#### 4.2.1.1 Area Definition

The Tutka Bay SHA is defined in 5 AAC 21.372 *Tutka Bay Lagoon Salmon Hatchery Management Plan* as the marine waters of Tutka Bay Subdistrict in the Southern District southeast and shoreward of a line from 59° 30.23' N. lat., 151° 28.23' W. long. to 59° 28.63' N. lat., 151° 30.37' W. long., including Tutka Bay Lagoon (Figure 1).

#### 4.2.1.2 Fishery Management

The common property fishery will be managed to achieve the established pink salmon sustainable escapement goal (SEG) for Tutka Creek. In addition, an appropriate number of pink salmon will be allowed to escape the common property fishery to meet broodstock and cost recovery licensing needs. Pink salmon returning to Tutka Bay Lagoon are expected to be intermingled with English Bay Lakes sockeye salmon stock that will be harvested for cost recovery licensing and/or broodstock. To avoid capturing the pink salmon multiple times during collection efforts for sockeye salmon, CIAA will place captured pink salmon in net pens. Once the sockeye salmon broodstock capture is complete, the pink salmon being held in net pens will be released or sold for cost recovery. These numbers will be reported to ADF&G Homer office via fish tickets if sold for cost recovery.

CIAA's first priority is to ensure sufficient escapement to Tutka Creek followed by meeting the broodstock goal. If CIAA's cost recovery licensing goal has been met at other SHAs, the fish that are surplus to escapement and broodstock licensing requirements will be harvested in the common property fishery. Any unharvested fish at the end of the season will be harvested and sold by CIAA as part of clean-up operations. CIAA will also sell broodstock carcasses.

Sport fisheries will be managed in accordance with regulations as provided in 5 AAC 47–5 AAC 75. Emergency orders may be issued to liberalize or

restrict sport fisheries based on achievement of broodstock goals (5 AAC 21.372).

#### 4.2.2 *Port Graham Special Harvest Area*

##### 4.2.2.1 Area Definition

As described in 5AAC 21.377 *Port Graham Salmon Hatchery Management Plan*, the PGH SHA consists of the marine waters of Port Graham Subdistrict east of 151° 53.08' W. long., 59° 22.00' N. lat. to a point off shore at 59° 21.45' N. lat., 151° 50.05' W. long., to a point on shore at 59° 20.83' N. lat., 151° 48.53' W. long. (Figure 2).

##### 4.2.2.2 Fishery Management

Management of pink salmon returning to the Port Graham SHA is described in the Port Graham Hatchery AMP.



## 5.0 Approval

### Recommendation for Approval: Tutka Bay Lagoon Hatchery Annual Management Plan, 2023:

Dean Day, Executive Director, Cook Inlet Aquaculture Association 4/28/2023

Matt Miller, Fish and Game Coordinator, Division of Sport Fish 5/1/2023

Glenn Hollowell, Area Management Biologist, Division of Commercial Fisheries 5/1/2023

Jason Dye, Regional Supervisor, Division of Sport Fish 5/1/2023

Bert Lewis, Regional Supervisor, Division of Commercial Fisheries 5/1/2023

Ethan Ford, Regional Resource Development Biologist, Div. of Comm. Fisheries 5/1/2023

Lorraine Vercessi, PNP Hatchery Program Coordinator, Div. of Comm. Fisheries 5/15/2023

The 2022 Tutka Bay Lagoon Hatchery Management Plan is hereby approved:

Tom Taube, Deputy Director, Division of Sport Fish 5/18/2023

Forrest Bowers, Operations Manager, Division of Commercial Fisheries 5/17/2023

2023 Tutka Bay Lagoon Hatchery Annual Management Plan

6.0 Attachments

6.1 Tutka Bay Lagoon Hatchery Production

Pink Salmon							
Brood Year	Green Eggs	Fry Released	Egg to Fry Survival	Adult Return	Fry to Adult Survival	Egg to Adult Survival	Comments
1975	3,000,000	250,000	8.33%	undetermined			
1976	10,400,000	4,229,100	40.66%	151,968	3.59%	1.46%	Net pen accident resulted in the loss of more than 2.9 million fry.
1977	7,400,000	4,866,800	65.77%	368,887	7.58%	4.98%	
1978	13,033,200	9,427,586	72.34%	329,896	3.50%	2.53%	
1979	10,100,000	6,268,900	62.07%	1,016,345	16.21%	10.06%	
1980	15,800,000	9,848,200	62.33%	229,374	2.33%	1.45%	
1981	19,900,000	15,258,100	76.67%	666,517	4.37%	3.35%	
1982	18,996,533	14,733,208	77.56%	285,526	1.94%	1.50%	501,956 fry stocked remotely. Makes egg-to-fry survival 80.20% - No data on adult returns.
1983	26,775,619	19,618,325	73.27%	528,372	2.69%	1.97%	
1984	29,537,000	23,537,000	79.69%	441,323	1.88%	1.49%	
1985	32,274,000	25,091,200	77.74%	108,577	0.43%	0.34%	
1986	31,492,000	23,535,000	74.73%	919,629	3.91%	2.92%	559,000 fry stocked remotely. Makes egg-to-fry survival 76.51% - No data on adult returns.
1987	19,491,401	15,026,369	77.09%	954,047	6.35%	4.89%	562,991 fry stocked remotely. Makes egg-to-fry survival 79.98% - No data on adult returns.
1988	46,046,220	36,300,115	78.83%	257,101	0.71%	0.56%	657,075 fry stocked remotely. Makes egg-to-fry survival 80.26% - No data on adult returns.
1989	38,983,286	29,739,716	76.29%	326,915	1.10%	0.84%	614,946 fry stocked remotely. Makes egg-to-fry survival 77.87% - No data on adult returns.
1990	50,000,000	29,696,174	59.39%	469,290	1.58%	0.94%	303,000 fry stocked remotely. Makes egg-to-fry survival 60.00% - No data on adult returns.
1991	39,500,000	32,079,000	81.21%	772,886	2.41%	1.96%	302,000 fry stocked remotely. Makes egg-to-fry survival 81.98% - No data on adult returns.
1992	60,000,000	48,700,000	81.17%	1,735,647	3.56%	2.89%	
1993	77,000,000	61,100,000	79.35%	2,610,615	4.27%	3.39%	
1994	89,200,000	63,000,000	70.63%	568,578	0.90%	0.64%	
1995	125,600,000	105,000,000	83.60%	2,770,686	2.64%	2.21%	
1996	116,000,000	89,000,000	76.72%	1,470,354	1.65%	1.27%	
1997	117,400,000	90,000,000	76.66%	1,262,772	1.40%	1.08%	
1998	129,000,000	60,132,000	46.61%	1,253,303	2.08%	0.97%	
1999	114,091,000	65,120,000	57.08%	715,722	1.10%	0.63%	
2000	122,314,000	99,336,000	81.21%	906,745	0.91%	0.74%	
2001	134,384,000	99,370,000	73.94%	860,005	0.87%	0.64%	
2002	124,848,000	67,967,000	54.44%	1,196,195	1.76%	0.96%	
2003	73,196,000	47,964,000	65.53%	1,771,685	3.69%	2.42%	
2011	10,308,000	8,100,399	78.58%	215,840	2.66%	2.09%	
2011	4,300,000	3,146,000	73.16%	19,415	0.62%	0.45%	Windy Bay stock
2012	5,330,700	4,300,000	80.66%	56,552	1.32%	1.06%	
2012	16,439,000	14,250,000	86.68%	1,700	0.01%	0.01%	Port Graham Stock
2013	80,000,000	51,100,000	63.88%	2,472,394	4.84%	3.09%	
2013	373,000	188,000	50.40%	0	0.00%	0.00%	Port Graham stock. 95% of broodstock lost before spawning.
2014	13,495,000	11,249,250	83.36%	261,126	2.32%	1.93%	Large size pink (4.5 lb)
2014	1,367,000	1,025,000	74.98%	na	na	na	Bruin Bay stock for Paint River. Video weir was not working during the return of pink salmon to the ladder.
2015	29,126,000	11,433,500	39.26%	523,293	4.58%	1.80%	Issues with broodstock survival in the lagoon and high fungus
2016	66,003,000	54,245,400	82.19%	1,364,900	2.52%	2.07%	
2017	118,095,000	50,040,000	42.37%	243,115	0.49%	0.21%	Issues with high fall sediment loads in water supply
2018	114,383,665	85,580,538	74.82%	932,868	1.09%	0.82%	
2019	39,187,425	27,684,949	70.65%	466,633	1.69%	1.19%	
2020	91,573,034	71,907,183	78.52%	98,061	0.14%	0.11%	
2021	61,987,400	55,092,122	88.88%				
2022	9,202,835						
Total	2,356,933,318	1,645,536,134		31,604,857			
Avg.			69.53%		2.63%	1.80%	

2023 Tutka Bay Lagoon Hatchery Annual Management Plan

CIAA Enhancement Project Summary – 2023

**Tutka Bay Lagoon Hatchery BY2022 Production Data as of 3/18/23**

BY	Species	Stock	Green	Eyed	Hatched	Fry/Smolt	Release Site *	Target Release #	Current or Release Size (g)	Released or Transferred	
22	Pink	Tutka	9202835	8371688	8287971	-	Tutka	8,000,000	-	-	-

Figure 1.—Tutka Bay

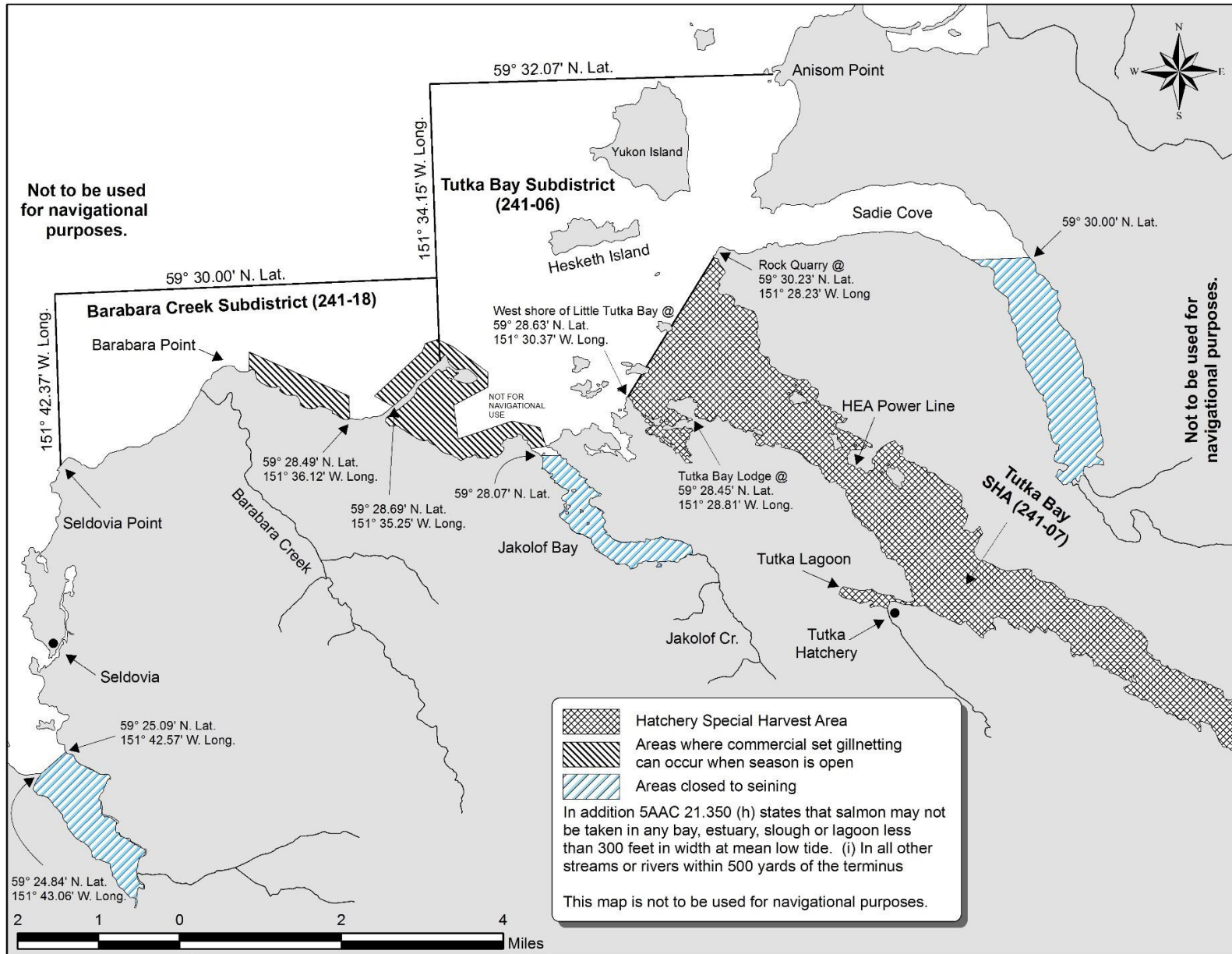


Figure 2. -Port Graham Bay

