

**2022 ANNUAL MANAGEMENT  
PLAN  
Port Graham 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. In season 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*

- Sufficient adult pink salmon returns are expected at Port Graham Hatchery (PGH) to meet the goal of 35 million green eggs. If hatchery returns are insufficient additional broodstock may be collected from wild returns that are excess to escapement or are purchased from the commercial fishery.

#### *1.2.3 Fish Culture Changes*

- No changes to fish culture are planned this year.

#### *1.2.4 Evaluation Changes*

- No changes to evaluation of programs are planned in 2022.

#### *1.2.5 Projected Return and Cost-recovery Changes*

- At a 3.2% fry-to-adult survival rate (based on average of past four even-year survival with (2.8%) and without (3.6%) 2014, which possibly had anomalously low survival ). CIAA is expecting approximately 716,245 adult pink salmon to return to Port Graham Bay. CIAA anticipates a cost recovery harvest from Port Graham SHA to occur.

### 1.3 Fish Transport Permits (FTP) or Amendments Needed This Year

No new permits or amendments needed this year.

### 1.4 Expected Return

To estimate adult pink salmon production from PGH projects, it is assumed there is 80% green egg-to-fry survival and 3.2% fry-to-adult survival. These values are estimates only and are not based on current observed survival data. These survival rates may be adjusted as hatchery operations continue and data becomes available.

The 2022 projected adult production from PGH pink salmon enhancement project is:

Species	Stock	Return Site	Brood Year	Total Return	Enhanced Return	Natural Return	Cost Recovery	Broodstock /Escapement	Common Property Harvest
Pinks	Port Graham	Port Graham Bay	20	716,245	716,245	0	586,121	65,000	65,124
	<b>Combined Age Classes</b>			<b>716,245</b>	<b>716,245</b>	<b>0</b>	<b>586,121</b>	<b>65,000</b>	<b>65,124</b>
	<b>% of Total</b>				<b>100%</b>	<b>0%</b>	<b>82%</b>	<b>9%</b>	<b>9%</b>

### 1.5 Production Summary

Port Graham Hatchery

Stock & Permit No.	Pink Salmon																									
	2021				2022				2023				2024													
	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
Port Graham River 14A-0062 14A-0071	BY21 6M egg take @ PGH				1.8 M fry @ PGH				BY22 35 M egg take @ PGH				28 M fry @ PGH				BY23 80-84 M egg take @ PGH		60 M fry @ PGH							

### 1.6 Permitted Capacity

PGH operates under Private Nonprofit Hatchery Permit #46 issued in 2014 and has a maximum permitted capacity of 125,000,000 pink salmon green eggs. CIAA recognizes that the current system and water availability limits the maximum production goal. Current capacity has been calculated at 84,000,000 green pink salmon eggs.

The FTPs under which CIAA operates PGH are:

<b>FTP #</b>	<b>Donor Stock/ Ancestral Stock</b>	<b>Egg take, transport, or release</b>	<b>Maximum #, Life Stage</b>	<b>Transport from To</b>	<b>Expires</b>
14A-0062	Port Graham R/ Port Graham R	Egg take and release	84,000,000 eggs	PGH to Port Graham	6/30/2024
14A-0071	Port Graham R/ Port Graham R	Transfer	84,000,000 eggs	PGH to TBLH to PGH	7/31/2024

### 1.7 Project Evaluation

Adult pink salmon are expected to return from pink salmon releases that occurred in 2021 at Port Graham Bay.

Fish tickets submitted to ADFG as well as counts during egg take will be used to enumerate returns to the area.

All fish will be thermally marked.

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

All species of adult salmon migrating into the Paint River system will be monitored with a video weir.

## 2.0 Port Graham Pink Salmon

### 2.1 Purpose and History

PGH began production in 1992, primarily focusing on pink salmon production. In 1998, a fire destroyed the original hatchery building, including incubation modules containing pink and sockeye salmon eggs collected the previous year. A separate building that housed the empty coho salmon module was undamaged. This building was converted to pink and sockeye salmon production to allow for incubation of eggs collected during the upcoming summer. In 2006, the loss of a hatchery manager, combined with financial limitations, resulted in pink and sockeye salmon releases ending in 2006 and 2007 respectively. Consequently, in 2007 the Port Graham Hatchery Corporation (PGHC) contracted with CIAA to assist with the collection of 510,000 sockeye salmon eggs from returning English Bay Lakes adult salmon. Eggs were incubated at Trail Lakes Hatchery (TLH) and released as presmolt to English Bay Lakes and as smolt to Port Graham Bay. In 2010, the PGHC approached CIAA to take over the sockeye salmon program and resume operations of PGH for pink salmon production.

CIAA received Hatchery PNP Permit #46 for the operation of Port Graham Hatchery and undertook a major renovation of the facility in 2014. The majority of this renovation is complete and CIAA put the first eggs into the renovated facility in 2015.

### 2.2 Operational Plan

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

Pink salmon returning to the PGH will be used as the primary brood source. Operations are planned at a production number of 35 million green pink salmon eggs. To meet this goal, CIAA will capture approximately 45,000 pink salmon from within the SHA for broodstock. If there are not enough hatchery-produced pink salmon adults returning in 2022 to meet this production target, CIAA will capture broodstock from Port Graham River as per the broodstock development section outlined in the Basic Management Plan and depicted in the table below with hatchery harvest occurring in the closed waters area after the common property fleet has been provided opportunity to harvest these excess wild fish. CIAA may also purchase live adult pink salmon returning to Port Graham Bay from the fleet.

Table 1. Port Graham River pink salmon donor broodstock removal based on the current escapement goal.

Total Number of Port Graham River Pinks Returning:	Escapement allowed into Port Graham River:	Escapement utilized for Hatchery Broodstock:
Less than 7,700	100%	0
7,700–33,000	First 7,700, plus 50% of fish in excess of 7,700, until 20,000 fish total escapement is reached	50% of fish in excess of 7,700
More than 33,000	20,000	Remainder

<b>Fish Required to Meet Egg-Take Goal</b>		
<b>Stock</b>		Port Graham
<b>Species</b>		Pink Salmon
<b># Green Egg Goal</b>		35,000,000
<b>Fecundity</b>		1,400
<b>Female to Male Ratio</b>		2:1
	Female	25,000
	Male	12,500
	<b>Total Broodstock</b>	<b>37,500</b>
	Inviabile	7%
	Excess Males/Roe Recovery	10%
	Mortalities	3%
	<b>Grand Total</b>	<b>45,000</b>

### 2.2.2 *Egg Take, Transport of Eggs*

Brood year 2022 (BY2022) pink salmon broodstock will be collected via seine boat and placed into net pens until sexually mature. Passive broodstock collection system will also be utilized. Gametes will be collected at the floating complex and transferred in iced coolers to PGH via boat for delayed fertilization. Eggs will be fertilized 2:1 female to male ratio, rinsed and disinfected in a 100 ppm ovadine (buffered iodophor) solution for 3–5 minutes before being placed into NOPAD incubators. Incubators will be loaded with green eggs at a planned loading rate of 80 kg per incubator.

### 2.2.3 *Incubation Plans*

Once BY2022 eggs have reached the eyed stage, they will be shocked, picked, and inventoried before being placed back into incubators until emergence. All eggs will be thermally marked. Incubators will be loaded with eyed eggs at a planned loading rate of 40 kg per incubator.

### 2.2.4 *Rearing and Release Plans*

BY21 fry will non-volitionally migrate from the incubators to net pens located in Port Graham Bay for short-term rearing before release.

Table 2. Planned releases this calendar year.

<b>Stock</b>	Port Graham					
<b>Brood Year</b>	<b>Life Stage</b>	<b>Release Site</b>	<b>Release Goal</b>	<b>Mark Type</b>	<b>Percent marked</b>	<b>Hatch code</b>
21	Fry	Port Graham	1,820,000	Otolith	100%	5H3

## 2.3 Donor Stock Management

### 2.3.1 *Management Strategies*

Hatchery returns to PGH are anticipated to be sufficient to meet the target broodstock goal. The management of returns will occur as follows:

- (1) CIAA will attempt to capture all necessary broodstock from adult hatchery produced pink salmon returns to the Port Graham SHA. These fish may be caught by purse or beach seines. The SHA shall be opened and closed to commercial fishing by emergency order (EO). Sport fisheries will be managed in accordance with regulations as provide in 5 AAC 47-5 AAC 75. Emergency orders may be issued to liberalize or restrict sport fisheries based on achievement of broodstock goals. In case of low wild stock returns for pink and chum salmon to Port Graham River, it may be necessary to limit fishing pressure in the SHA by reducing time or boundaries of the SHA.
- (2) In the event that hatchery returns are insufficient to meet target broodstock goals, CIAA may: (a) purchase live broodstock from the common property fishery during scheduled openings and only in waters open for fishing, or (b) collect broodstock from those fish which are excess to escapement as per the guidelines provided in (Section 2.2.1)

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

## 2.4 Evaluation Plans

All eggs will be thermally marked. CIAA will collect otoliths from those fish used in the egg take and may assist ADF&G staff in the collecting of otoliths from those fish caught in the common property fishery to determine hatchery contribution.

### **3.0 Paint River Stocking Program**

#### **3.1 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 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.

In 2018, CIAA released 305,000 pink salmon fry from Bruin Bay into the Paint River system. Broodstock will not be collected from Bruin Bay in 2022. The fish ladder will be open between June and September to allow for any possible natural colonization of the watershed. A video camera will be installed to document the returns through the fish ladder.

#### **3.2 Operational Plan**

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

CIAA will not collect eggs from pink salmon returning to Bruin River in 2022.

##### *3.2.2 Egg Take; Transport of Eggs*

CIAA will not collect eggs from pink salmon returning to Bruin River in 2022.

##### *3.2.3 Incubation Plans*

CIAA will not collect eggs from pink salmon returning to Bruin River in 2022.

##### *3.2.4 Rearing and Release Plans*

CIAA will not collect eggs from pink salmon returning to Bruin River in 2022.

#### **3.3 Donor Stock Management**

##### *3.3.1 Management Strategies*

CIAA will not collect eggs from pink salmon returning to Bruin River in 2022.

##### *3.3.2 Escapement Requirements*

CIAA will not collect eggs from pink salmon returning to Bruin River in 2022.

### 3.4 Evaluation Plans

CIAA will not collect eggs from pink salmon returning to Paint River in 2022.

A video camera will be installed to document all adult returns through the fish ladder at Paint River.

## 4.0 **Harvest Management**

### 4.1 Cost-recovery Plan

CIAA funds the cost of operating TLH, TBLH, PGH, and Eklutna Salmon Hatchery (ESH) and associated field projects by licensing for harvest a portion of the fish returning to the hatchery's release sites. CIAA will begin cost recovery in Resurrection Bay/Bear Lake followed by Kirschner Lake sockeye, then 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 2022.

<b>CIAA 2022 Cost Recovery Target</b>	
<b>SHA/AREA</b>	<b>Financial Target</b>
Bear Lake/Resurrection Bay Sockeye	\$1,005,207.79
Kirschner Lake Sockeye	\$239,090.44
Tutka Bay (sockeye and pink)	\$2,488,723.36
Port Graham Pink	\$865,934.43

The Division of Commercial Fisheries Area Management Biologist (AMB), in consultation with the hatchery operator, will employ management strategies within waters of the Port Graham SHA 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 the Port Graham Hatchery SHA outside of holding pens as well as Port Graham Bay outside of the SHA.

### 4.2 Special Harvest Areas

#### 4.2.1 *Port Graham Special Harvest Area*

##### 4.2.1.1 Area Definition

The Port Graham Special Harvest Area (SHA), as defined in 5AAC 21.377(b), consists of the marine waters of the Port Graham Subdistrict in the Southern



District south of a line from the southern tip of Passage Island at 151° 53.08' W. long., 59° 22.00' N. lat., to a point off shore at 59° 20.83' N. lat., 151° 48.53' W. long. (Figure 1).

#### 4.2.1.2 Fishery Management

ADF&G will be responsible for fishery management as it relates to

sustainable escapement goals (SEGs) for Port Graham River pink and chum salmon. This includes common property and hatchery-related fisheries.

A cost-recovery harvest is anticipated in 2022 under the PGH permit. CIAA cost recovery harvest will include surplus broodstock.

The SHA shall be opened and closed to commercial fishing by emergency order (EO). Areas within the SHA where hatchery harvest is permitted, as well as the SHA boundaries, may be adjusted by the department as needed based on wild stock escapement and hatchery returns. 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.

### 4.2.2 *Paint River Special Harvest Area*

#### 4.2.2.1 Area Definition

The Paint River SHA is defined in 5AAC 21.372 Tutka Bay Lagoon Salmon Hatchery Management Plan as the marine waters of Akjemguiga Cove west of a line from 59° 09.50' N. lat., 154° 12.83' W. long. to 59° 10' N. lat., 154° 12.5' W. long, including the lagoon at Paint River mouth and intertidal fish ladder (Figure 2).

#### 4.2.2.2 Fishery Management

No adult hatchery pink salmon are expected back to Paint River in 2022. ADF&G will be responsible for fishery management for Paint River and the common property fishery.

The SHA shall be opened and closed to commercial fishing by EO. 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.

## 5.0 Approval

### **Recommendation for Approval: Port Graham Hatchery Annual Management Plan, 2022:**

Dean Day, Executive Director, Cook Inlet Aquaculture Association 6/1/2022

Matt Miller, Fish and Game Coordinator, Division of Sport Fish 6/7/2022

Glenn Hollowell, Area Management Biologist, Division of Commercial Fisheries 6/3/2022

Tom Vania, Regional Supervisor, Division of Sport Fish 6/7/2022

Bert Lewis, Regional Supervisor, Division of Commercial Fisheries 6/3/2022

Ethan Ford, Regional Resource Development Biologist, Division of Commercial Fisheries 6/3/2022

Lorraine Vercessi, PNP Hatchery Program Coordinator, Division of Commercial Fisheries 6/15/2022

### **The 2022 Port Graham Hatchery Management Plan is hereby approved:**

Tom Taube, Deputy Director, Division of Sport Fish 6/21/2022

Peter Bangs, Assistant Director, Division of Commercial Fisheries 6/22/2022

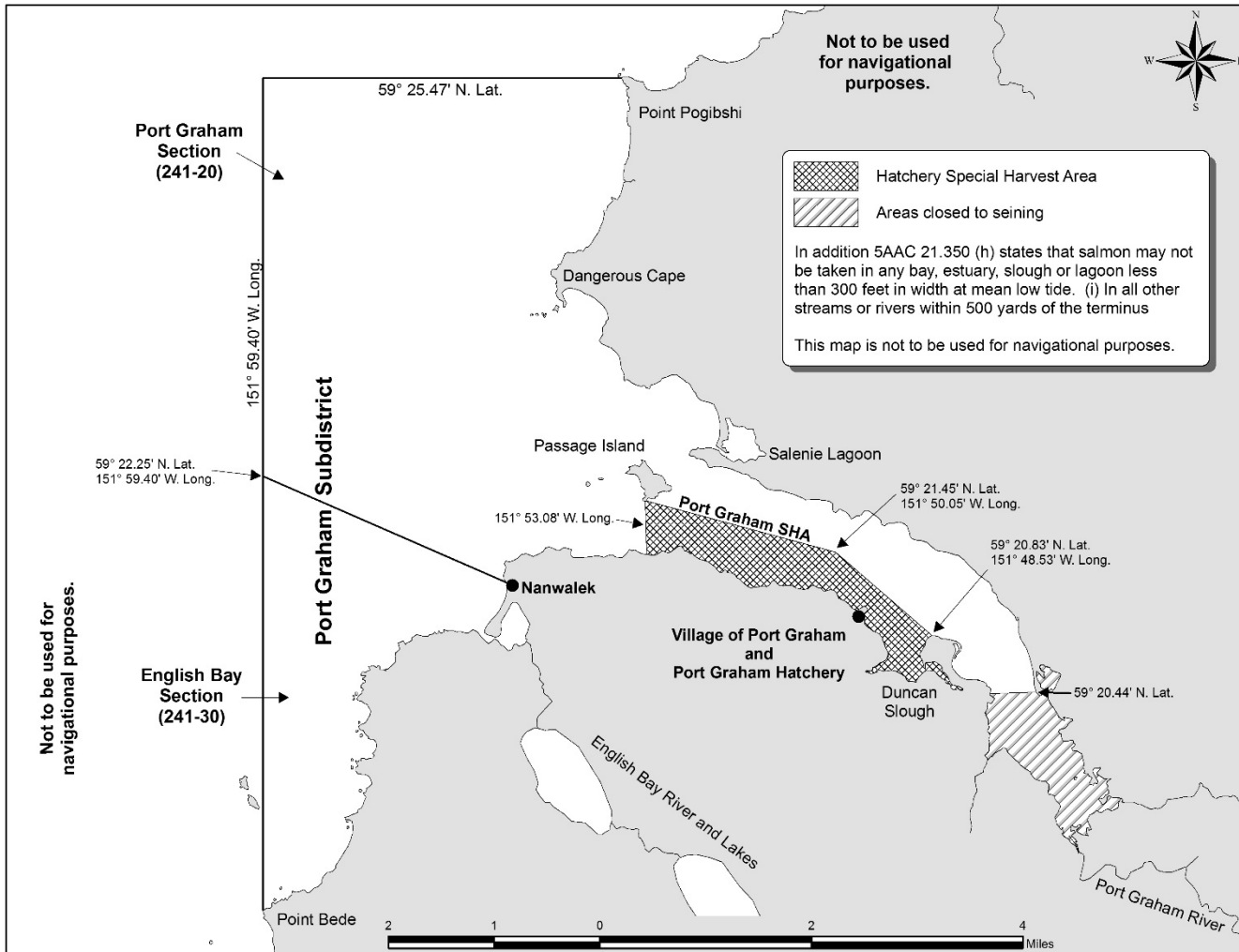
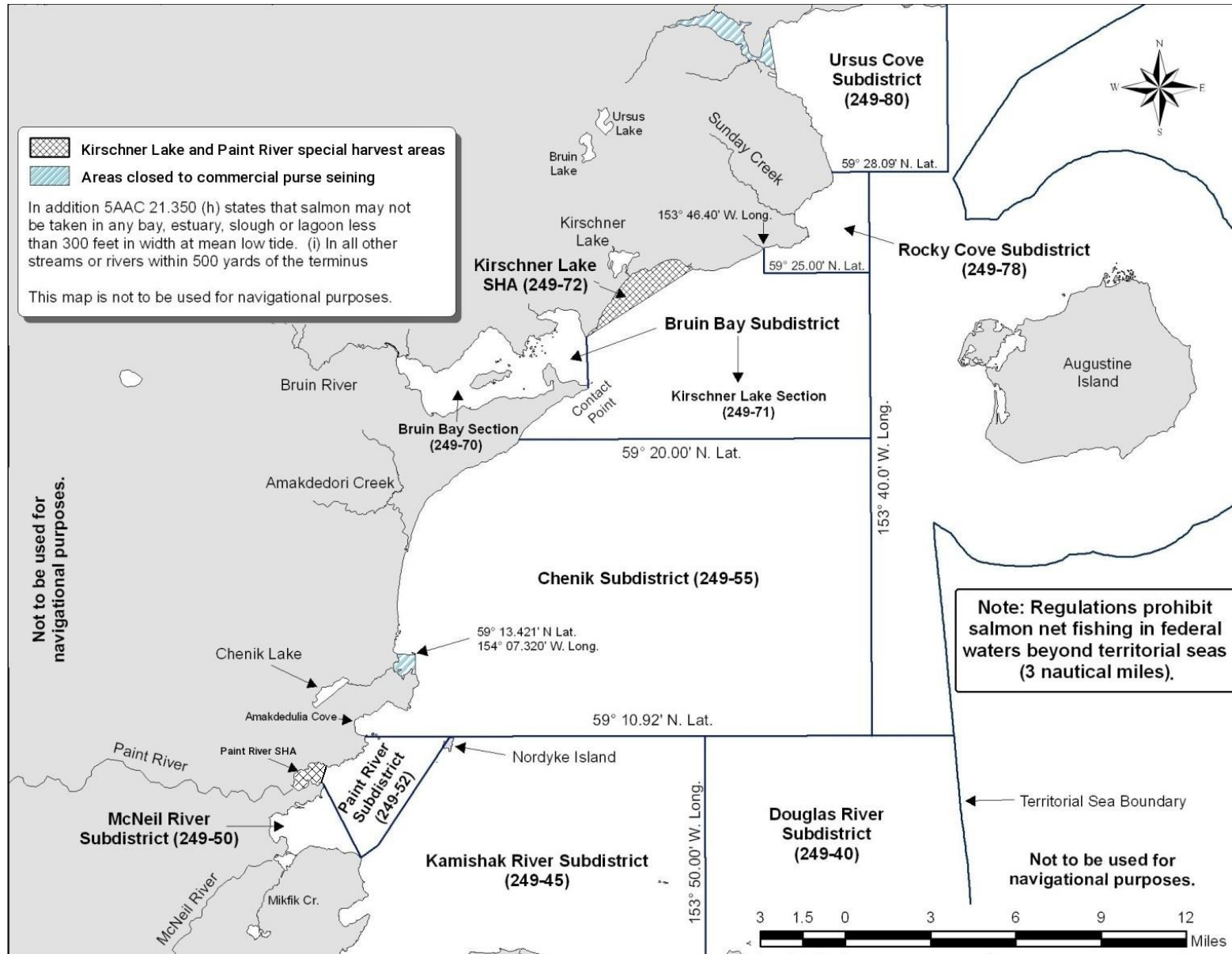


Figure 1—Port Graham Bay SHA

Figure 2.—Paint River SHA



## 7.0 Attachments

### 7.1 Port Graham 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
2014	3,195,649	2,205,000	69.00%	18,525	0.84%	0.58%	Eggs were incubated at TBLH due to renovation schedule. Fry were shipped unfed to PGH for short-term rearing in net pens before release
2015	2,248,000	1,310,800	58.31%	78,516	5.99%	3.49%	Broodstock survival was a challenge due to atypical environmental conditions
2016	9,076,400	6,060,000	66.77%	460,050	7.59%	5.07%	Large size of pink salmon >4.5 lb but low returns
2017	35,213,400	20,850,000	59.21%	17,469	0.08%	0.05%	
2018	18,385,026	10,144,850	55.18%	248,151	2.45%	1.35%	
2019	8,045,233	5,948,143	73.93%	27,958	0.47%	0.35%	
2020	34,853,545	22,362,661	64.16%				
2021	6,081,714						
Total	117,098,967	68,881,454	63.79%	850,669	2.90%	1.81%	

7.2

CIAA Enhancement Project Summary – 2022**Port Graham Hatchery BY2021 Production Data as of 3/16/22**

BY	Species	Stock	Green	Eyed	Hatched	Fry/Smolt	Release Site *	Target Release #	Current or Release Size (g)	Released or Transferred	
21	Pink	Port Graham	6,081,714	2,392,422	1,975,920	-	Port Graham	1,818,240	-	-	-