2019 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. 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

- Sufficient adult pink salmon returns are expected at Port Graham Hatchery (PGH) to meet the goal of 84 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 2019.*

1.2.5 Projected Return and Cost-recovery Changes

- At a 3% fry-to-adult survival rate, CIAA is expecting approximately 625,500 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 (FTPs) or Amendments Needed This Year

No new permits, the following permits are extensions and have been requested:

- 14A-0062 for the collection of broodstock, egg take, incubation, and short-term rearing and release of resulting progeny pink salmon. (expires June 30, 2019).
- 14A-0071 for the transfer of gametes from Port Graham Hatchery to Tutka Bay Lagoon Hatchery, and the subsequent transfer of eyed eggs back to Port Graham Hatchery (expires July 31, 2019).

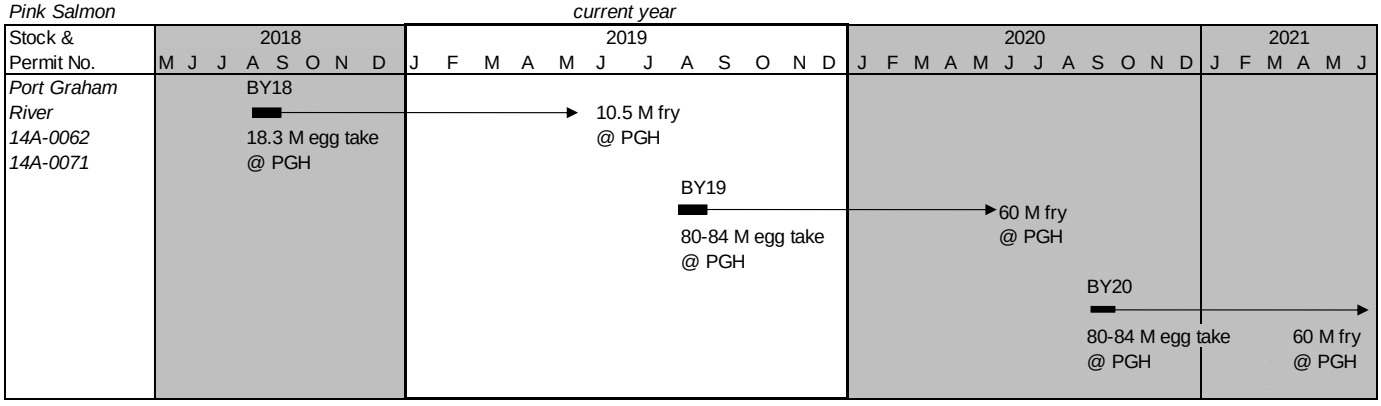
1.4 Expected Return

To estimate adult pink salmon production from PGH projects, it is assumed there is 80% green egg-to-fry survival and 3% 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 2019 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	2017	625,500	625,500	0	0	108,000	12,800
	Combined Age Classes			**625,500**	**625,500**	**0**	**0**	**108,000**	**517,500**
	% of Total				**100%**	**0%**	**0%**	**17%**	**83%**

1.5 Production Summary



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.

Port Graham Hatchery FTP Schedule

Pink Salmon

FTP Number	Stock	Action	Expiration Date	Purpose
14A-0062	Port Graham Bay	Egg take, release	6/30/2019	Allows the egg take of up to 84 M green pink salmon eggs, rearing, and release of resultant progeny at Port Graham Hatchery
14A-0071	Port Graham Bay	Transfer	7/31/2019	Allows the transfer of gametes (84 million green pink salmon eggs) from Port Graham Bay to Tutka Bay Lagoon Hatchery for incubation, and the subsquent return to PGH as eyed eggs
15A-0070	Bruin Bay	Egg take, incubation, release	6/30/2020	Allows egg take of up to 4 million eggs from Bruin Bay pink salmon adults held in net pens at Tutka Bay Lagoon Hatchery, fertilization and incubation at PGH and stocking of unfed fry into Paint River.

New Permit in 2019

To Be Renewed in 2019

1.7 Project Evaluation

Adult pink salmon are expected to return from pink salmon releases that occurred in 2018 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 capacity of 84 million green pink salmon eggs. To meet this goal, CIAA will capture approximately 108,000 pink salmon from within the SHA for broodstock. If there are not enough hatchery-produced pink salmon adults returning in 2019 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

Fish Required to Meet Egg-Take Goal		
Stock		Port Graham
Species		Pink Salmon
# Green Egg Goal		84,000,000
Fecundity		1,400
Female to Male Ratio		2:1
	Female	60,000
	Male	30,000
	Total Broodstock	90,000
Inviable	7%	6,300
Excess Males/Roe Recovery	10%	9,000
Mortalities	3%	2,700
	Grand Total	**108,000**

2.2.2 Egg Take, Transport of Eggs

Brood year 2019 (BY19) pink salmon broodstock will be collected via seine boat and placed into net pens until sexually mature. 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 BY19 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

BY18 fry will non-volitionally migrate from the incubators to net pens located in Port Graham Bay for short-term rearing before release.

The table below describes anticipated releases for 2019 from eggs collected in 2018.

Stock	Port Graham				**Species**: Pink		
Brood Year	**Life Stage**	**Release Site**	**Release Goal**	**Year Stocked**	**Migration Year**	**Estimated Adult Return**	**Return Years**
18	Fry	Port Graham	10,500,000	2019	2019	315,000	2020

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 2019. 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 2019.

3.2.2 Egg Take; Transport of Eggs

CIAA will not collect eggs from pink salmon returning to Bruin River in 2019.

3.2.3 Incubation Plans

CIAA will not collect eggs from pink salmon returning to Bruin River in 2019.

3.2.4 Rearing and Release Plans

CIAA will not collect eggs from pink salmon returning to Bruin River in 2019.

Species	Pink						
Stock	Bruin Bay						
Brood Year	**Life Stage**	**Release Site**	**Release**	**Year Stocked**	**Migration Year**	**Estimated Adult Return**	**Return Years**
17	Fry	Paint River	305,000	2018	2018	9,150	2019

3.3 Donor Stock Management

3.3.1 Management Strategies

CIAA will not collect eggs from pink salmon returning to Bruin River in 2019.

3.3.2 Escapement Requirements

CIAA will not collect eggs from pink salmon returning to Bruin River in 2019.

3.4 Evaluation Plans

CIAA will not collect eggs from pink salmon returning to Paint River in 2019.

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 Trail Lakes Hatchery (TLH), Tutka Bay Lagoon Hatchery (TBLH), PGH, 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 Tutka Bay sockeye and pink salmon, and if needed Port Graham Bay.

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., 59º22.00' 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 small cost-recovery harvest is anticipated in 2019 under the PGH permit. CIAA anticipates most of the cost recovery harvest will be 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 59º09.50′ N. lat, 154º12.83′ W. long to 59º10′ N. lat, 154º12.5′ W. long, including the lagoon at Paint River mouth and intertidal fish ladder (Figure 3).

4.2.2.2 Fishery Management

Adult hatchery pink salmon are expected back to Paint River in 2019. 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.

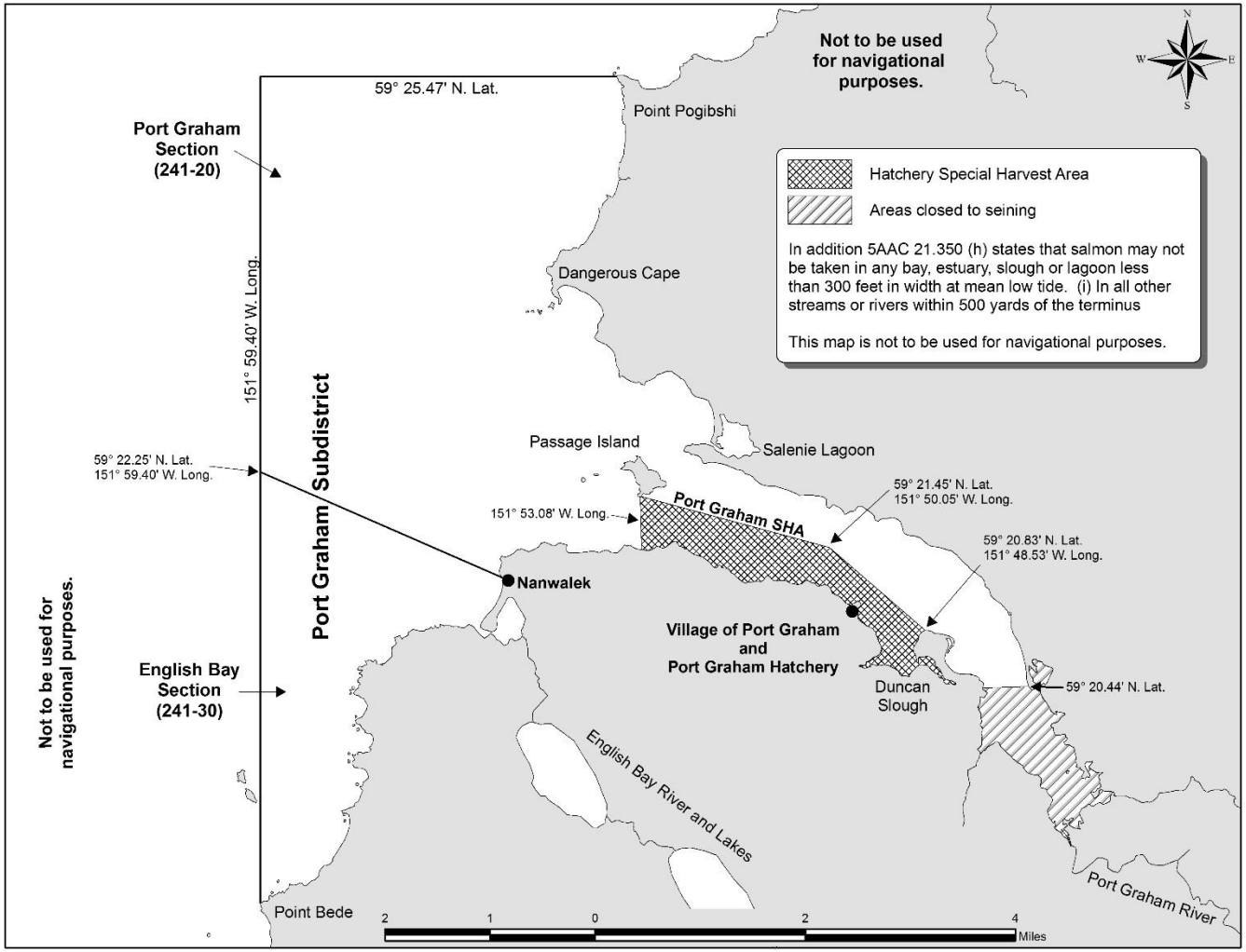
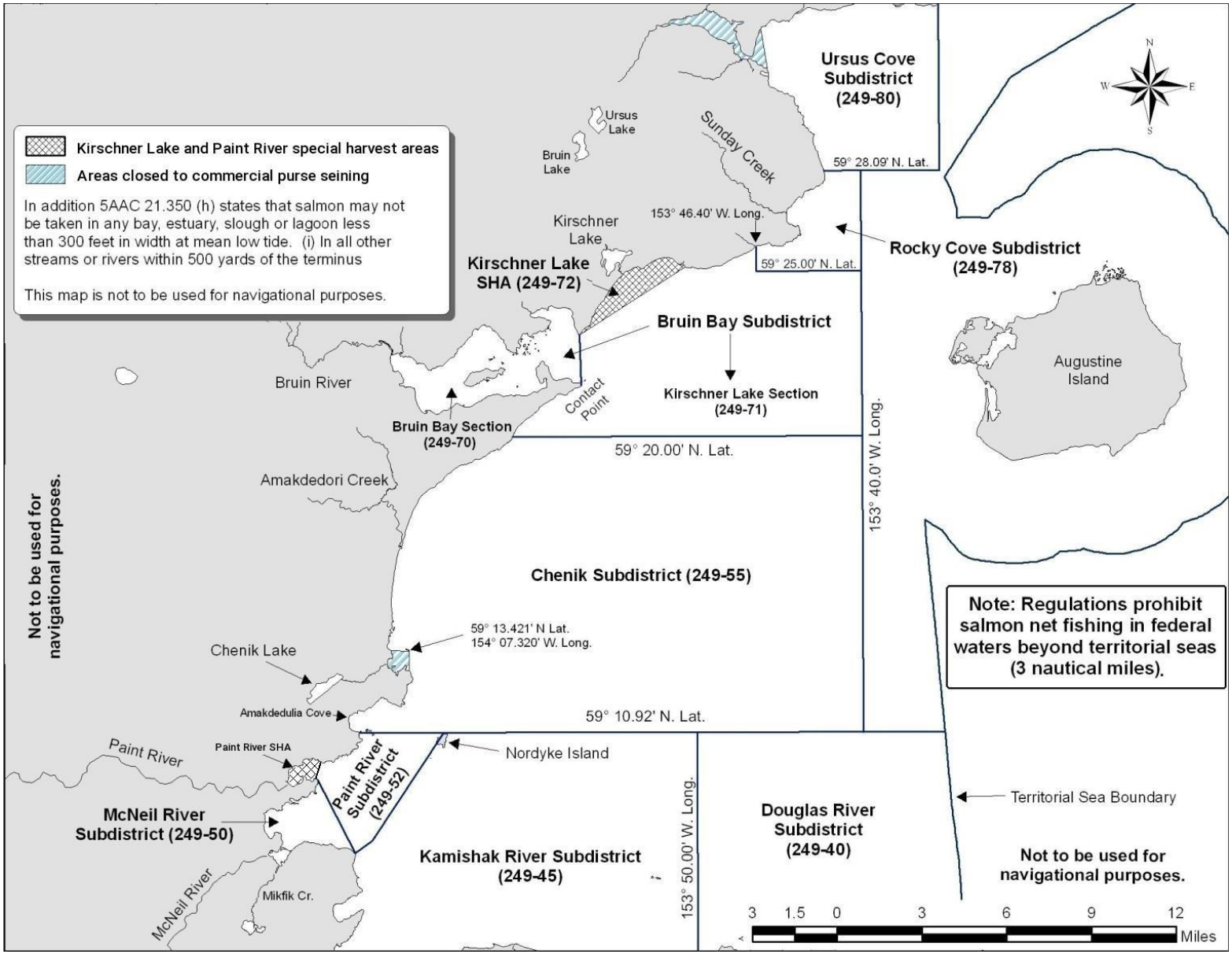


Figure 1– Port Graham Bay SHA

Figure 2.–Paint River SHA



6.0 Attachments

6.1 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%	TBD	TBD	TBD	Expected adult return in 2019
2018	18,385,026	10,500,000	57.11%	TBD	TBD	TBD	Fry release is a projection
Total	68,118,475	40,925,800	60.08%	557,091	NA	NA	

6.2 CIAA Enhancement Project Summary – 2019

			Fry (F), Presmolt or Fall Fry (P) and Smolt (S) Projected Releases - 2019			
HATCHERY	PROJECT (release site)	[BROODSTOCK]	COHO	SOCKEYE	PINK	Project Status
TRAIL LAKES HATCHERY	Tutka Bay Lagoon	[English Bay]		435,000 (S)		518,000 in 2018
	Resurrection Bay	[Bear Lake]		1,450,000 (S)		1,488,000 in 2018
	Port Graham Hatchery	[English Bay Lakes]		0 (S)		0 in 2018
	Shell Lake	[Shell Lake]		15,290 (S)		46,000 in 2018
	Bear Creek	[Bear Lake]	65,238 (S)			70,000 in 2018
	Smolt Totals		65,238	1,900,290	0	2,122,000 in 2018
	English Bay Lakes	[English Bay Lakes]		0 (P)		0 in 2018
	Presmolt Totals		0	0	0	0 in 2018
	Bear Lake	[Bear Lake]		2,550,000 (F)		2,555,000 in 2018
	Leisure Lake	[English Bay Lakes]		1,000,000 (F)		1,948,000 in 2018
	Hazel Lake	[English Bay Lakes]		1,295,000 (F)		813,000 in 2018
	Kirschner Lake	[English Bay Lakes]		258,000 (F)		244,000 in 2018
	Hidden Lake	[Hidden Lake]		1,100,800 (F)		1,271,000 in 2018
	Bear Lake	[Bear Lake]	461,000 (F)			438,000 in 2018
	Fry Totals		461,000	6,203,800	0	7,269,000 in 2018
	HATCHERY TOTALS		526,238	8,104,090	0	9,391,000 in 2018

			Fry (F), Presmolt or Fall Fry(P) and Smolt (S) Projected Releases - 2019			
HATCHERY	PROJECT (release site)	[BROODSTOCK]	COHO	SOCKEYE	PINK	Project Status
TUTKA BAY LAGOON HATCHERY	Tutka Bay/Lagoon	[Tutka Creek/Lagoon]			90,000,000 (F)	50,040,000 in 2018
	Paint River	[Bruin Bay]			0 (F)	0 in 2018
	HATCHERY TOTALS		0	0	90,000,000	50,040,000 in 2018

			Fry (F), Presmolt or Fall Fry(P) and Smolt (S) Projected Releases - 2018			
HATCHERY	PROJECT (release site)	[BROODSTOCK]	COHO	SOCKEYE	PINK	Project Status
PORT GRAHAM HATCHERY	Port Graham Bay	[Port Graham Bay]			10,500,000 (F)	20,850,000 in 2018
	Paint River	[Bruin Bay]			0 (F)	305,000 in 2018
	HATCHERY TOTALS		0	0	10,500,000	21,155,000 in 2018

CIAA	CORPORATE TOTALS	526,238	8,104,090	100,500,000	80,586,000 in 2018

7.0 Approval

Recommendation for Approval: Port Graham Hatchery Annual Management Plan, 2019:

Dean Day, Executive Director, Cook Inlet Aquaculture Association 7/2/2019

Matt Miller, Fish and Game Coordinator, Division of Sport Fish 7/2/2019

Glenn Hollowell, Area Management Biologist, Division of Commercial Fisheries 6/13/2019

Tom Vania, Regional Supervisor, Division of Sport Fish 6/13/2019

Bert Lewis, Regional Supervisor, Division of Commercial Fisheries 6/13/2019

Ethan Ford, Regional Resource Development Biologist, Division of Commercial Fisheries 6/14/2019

The 2019 Port Graham Hatchery Annual Management Plan is hereby recommended for approval by the Cook Inlet Regional Planning Team (RPT):

Ethan Ford, Cook Inlet RPT Chair 6/14/2019

Lorraine Vercessi, PNP Hatchery Program Coordinator, Division of Commercial Fisheries 6/12/2019

The 2019 Port Graham Hatchery Management Plan is hereby approved:

Tom Taube, Deputy Director, Division of Sport Fish 7/3/2019

Peter Bangs, Assistant Director, Division of Commercial Fisheries 7/3/2019