

# 2019 ANNUAL MANAGEMENT PLAN

## GULKANA HATCHERY I and II

### Prince William Sound Aquaculture Corporation

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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 Prince William Sound Aquaculture Corporation (PWSAC) or Alaska Department of Fish and Game (ADF&G) may result in changes to this AMP in order to reach or maintain program objectives. PWSAC 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 PWSAC. This policy applies to all hatchery operations covered under the AMP.

#### I. OPERATIONAL PLAN

##### 1.1 Egg-take Goals by Species

**Sockeye Salmon, Gulkana I:** The maximum number of sockeye salmon eggs is 35.0 million. Broodstock requirements are 11,800 females and 7,100 males, assuming:

- a. 3,300 eggs/female
- b. 3:2 female to male spawning ratio
- c. 10% green/over-mature female at rack

**Sockeye Salmon, Gulkana II:** The maximum number of sockeye salmon eggs is 1.75 million. Broodstock requirements are 590 females and 350 males, assuming:

- a. 3,300 eggs/female
- b. 3:2 female to male spawning ratio
- c. 10% green/over-mature female at rack

##### 1.2 Broodstock Acquisition and Data Reporting

All data associated with egg-take and broodstock collection will be provided to the department by November 1 each year. Data will be provided in electronic format (Excel file) and include all the categories presented in the template attached as Table 5. Data to be collected specifically includes the numbers of green and over-ripe females from the broodstock and associated cost recovery. PWSAC planned egg-takes are shown in Table 2. PWSAC egg take schedules are shown in Table 3.

**Sockeye Salmon, Gulkana I:** August 15–October 15

**Sockeye Salmon, Gulkana II:** July 25–August 20

### 1.3 Egg-take Schedule

August 15 to September 5: 0.5–1.0 million/day  
September 6 to September 15: 1.0–1.5 million/day  
September 16 to October 5: 1.5–2.5 million/day  
October 6 to October 15: 1.0–1.5 million/day.

### 1.4 Egg Transport and Carcass Disposal Plans

**Sockeye Salmon, Gulkana I:** Eggs taken at Gulkana I (GHI) will be fertilized and water hardened on site. The eggs will be hand-carried (approximately 75 yards) to one of the 134 tote incubators.

Broodstock carcasses will be either given to residents of the area (for dog food) or will be disposed of in the Gulkana River to ensure adequate nutrient input into Paxson Lake in accordance with Alaska Department of Environmental Conservation (DEC) requirements. If an additional broodstock carcass disposal log is required by ADF&G, all disposals will be logged on the carcass disposal form and reported to the department within 30 days after egg take and disposals are completed.

If insufficient broodstock are available at the GHI facility, a broodstock collection area will be established at the outlet of Summit Lake and/or Pup Lake.

**Sockeye Salmon, Gulkana II:** Eggs taken for Gulkana II (GHII) will be fertilized and water hardened at GHI from GHII broodstock, then transferred to GHII for seeding in one of twelve incubation boxes.

Broodstock carcasses will be disposed of in the Gulkana River in accordance with DEC requirements. If an additional broodstock carcass disposal log is required by ADF&G, all disposals will be logged on the carcass disposal form and reported to the department within 30 days after egg take and disposals are completed.

### 1.5 Incubation Plans

**Hatchery Production Summary**

<b>Species</b>	<b>Facility</b>	<b>Green Eggs</b>	<b>Fry Released</b>
Sockeye Salmon	Gulkana I	35,000,000	20,700,000
Sockeye Salmon	Gulkana II	1,750,000	1,300,000

The incubators at GHI are “tote”-style incubators. At GHII, all incubators are “Kitoi”-style incubators. Sockeye salmon survival from green egg to fry release is estimated to be 75%.

All eggs will be incubated at GHI and GHII during 2019.

## 1.6 Rearing and Release Plans

**Sockeye Salmon, Gulkana I:** Eggs will hatch in gravel substrate inside stream-side tote incubators. Outmigration from the incubators is volitional, with enumeration by electronic counters. Fry surviving from the 2018 egg take will be released at Crosswind Lake (10 million), Summit Lake (6 million), and into Paxson Lake from the GHI site (up to 6 million). Release numbers to Crosswind, Paxson and Summit lakes are adjusted due to egg take shortage. Fry destined for Crosswind Lake will be reared approximately 10 days until all have accumulated for the aerial transport. Fry to be released in Summit Lake will be reared approximately two to four weeks, which allows for a more desirable open-water release.

**Sockeye Salmon, Gulkana II:** Eggs will hatch in gravel substrate incubators and the resulting fry will be fed prior to release. Outmigration from incubators is volitional, with enumeration by electronic counters. An estimated 0.4 million fry will be released from the 2018 egg take at the site. Fry from GHI may be used to cover a shortfall if the green-to-fry survival is lower than anticipated at the GHII facility to reach the 1.3 million fry release goal.

PWSAC's anticipated releases are shown in Table 4.

## 1.7 Fry Transport Methods

Fry from the incubation site will be air dropped at Crosswind Lake by a Thrush aircraft with a 500 gallon, oxygen-supported tank with approximately 1.7 million fry per load. Fry will be transported to Summit Lake in a 300-gallon fish stocking tank with approximately 330,000 fry per load and will be primarily released into Gunn Creek, or may be released directly into Summit Lake via boat transports.

## 1.8 Permitted Capacity

Gulkana Hatchery was issued PNP Hatchery Permit #42 in 2000. It is currently permitted to incubate 36.75 million sockeye salmon eggs.

### **Fish Transport Permit Summary**

<b>FTP Number</b>	<b>Expiration Date</b>	<b>Purpose</b>
<b>SOCKEYE SALMON</b>		
96A-0034	4/30/26	Allows transfer and release of 10 million fry from GHI into Crosswind Lake.
96A-0038	4/30/26	Allows transfer and release of 6 million fry from GHI into Paxson Lake.
96A-0039	4/30/26	Allows transfer and release of 6 million fry from GHI into Summit Lake.
97A-0048	7/17/20	Allows egg take and incubation of 35 million East Fork Gulkana River stock sockeye salmon eggs at the GHI location.
97A-0049	7/17/20	Allows egg take, incubation, and resultant release of 1.75 million East Fork Gulkana River stock sockeye salmon eggs at GHII.
16A-0054	4/30/22	Allows the egg take of 35 million East Fork Gulkana River stock sockeye salmon eggs at the Summit Lake adult weir location. Eggs will be incubated at the GHI location.

16A-0055	4/30/22	Allows the egg take of 35 million East Fork Gulkana River stock sockeye salmon eggs at the Pup Lake adult weir location. Eggs will be incubated at the GHI location.
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## II. DONOR STOCK MANAGEMENT

The hatchery sockeye salmon runs will be sufficient to meet broodstock goals for 2019 and no donor stock management is anticipated. It is recognized that the broodstock in the brood collection area is a mixture of natural and hatchery-spawned fish. Hatchery escapement is managed in the commercial fishery months earlier and management cannot take further action if a shortfall of broodstock occurs.

### 2.1 Fish Collection Techniques

**Sockeye Salmon, Gulkana I:** Fish are captured by dip net and seine at the hatchery site or from adjacent springs. A weir is installed annually at the Summit Lake and Pup Lake (downstream from Crosswind Lake) outlets for otolith mark recovery. In the event of a broodstock shortfall, either or both of these weirs will be used to capture the necessary broodstock.

**Sockeye Salmon, Gulkana II:** A weir in the Gulkana River is used to hold fish while dip nets, seines, and snagging gear are used to capture fish from behind the weir for the egg take. Enhanced returns that enter the hatchery site stream are captured by dip net and seine.

## III. HATCHERY RETURN MANAGEMENT

PWSAC operates five facilities: Armin F. Koernig Hatchery (AFK), Cannery Creek Hatchery (CCH), GH, Main Bay Hatchery (MBH), and Wally Noerenberg Hatchery (WNH). The corporation generates revenues for annual operations from a 2% enhancement tax and from the sale of hatchery-produced salmon returning to the facilities.

In 1997, the PWSAC Board of Directors (BOD) elected to have corporate cost recovery based upon revenue goals specific to the seine and gillnet salmon fisheries rather than a goal of harvesting a fixed percentage of the returning adults. This results in each gear group paying for enhanced production from which they benefit. PWSAC calculates these revenue goals by allocating production costs between the seine-caught and gillnet-caught salmon fisheries.

On March 5, 2019, the PWSAC BOD approved the annual corporate budget for Fiscal Year 2020 detailing potential sources of revenue and expenditures. The pink and WNH chum salmon revenue goals are \$5,968,865 and \$5,607,053 respectively. Cost recovery goals are anticipated to be met with pink and chum salmon sales. Additional revenue may be generated through PWSAC's raceway fish sales during its egg-take full utilization program.

PWSAC uses preseason assumptions for the number of returning fish, price per pound, and average adult weight to calculate the total projected value of the returning hatchery-produced salmon. Based on these assumptions, PWSAC estimates that approximately 27% of the total value of the run will be required to meet the revenue goal in the Fiscal Year 2020 financial plan.

**Pink Salmon Returns:** The AFK, CCH, and WNH pink salmon runs will be managed collectively through openings and closures of respective hatchery subdistricts. Managing the enhanced pink salmon runs in aggregate may result in site-specific CPF contribution rates being above or below the approximate target of an 87% CPF pink salmon harvest.

**WNH Chum and MBH Sockeye Salmon Runs:** The WNH chum salmon and MBH sockeye salmon runs will be managed collectively through openings and closures of respective hatchery subdistricts. The collective management will be managed initially for the WNH chum salmon revenue goal. If inseason, PWSAC, in consultation with the department, determines that the WNH chum salmon corporate escapement may not be met, cost-recovery harvest at MBH may be conducted to achieve the balance of the revenue goal. Managing the returns in aggregate may result in site-specific CPF contribution rates being above or below the approximate targets of 58% and 99% for the WNH chum and MBH sockeye salmon harvest, respectively.

The AFK Hatchery and Port Chalmers remote release chum salmon runs are expected to have a 100% CPF harvest.

Reduction of CPF opportunity in hatchery subdistricts may be necessary to ensure corporate escapement objectives are met. PWSAC will work closely with local ADF&G management biologists to achieve the seine and gillnet fisheries revenue goals as rapidly as possible to allow for an orderly and consistent CPF.

### 3.1 Probable Hatchery Fish Migration Routes and Timing

Sockeye salmon stocks from both GHI and II coincide with some wild stock run timing. The peak enhanced sockeye salmon return coincides with some Copper River Delta and some Upper Copper River wild stocks. Management priority is to sustain wild stock yield and diversity. The harvest of hatchery-produced sockeye salmon is based on the forecasted return and management of wild stocks. Therefore, hatchery stocks will be harvested at the same rate as wild stocks.

Sockeye salmon returns from the three release sites for GHI fry occur throughout the commercial fishery and escapement timing. Returns from the GH II release site occurs throughout the early and middle segments of the escapement period. Each release site has demonstrated somewhat different timing as determined by coded-wire-tag recoveries in the commercial fishery and historical timing data. Gulkana I and II sockeye salmon are intermingled with other stocks of sockeye salmon and other species of salmon to such an extent that no targeted harvest can occur within the commercial fishery or mainstream inriver fisheries. However, harvests can occur at terminal return points, especially Summit and Crosswind Lakes where the fish are segregated from any natural stocks.

Harvest management is limited to development of daily timing and abundance data for each enhanced stock release group, which, when used in conjunction with natural stock timing data, ensures protection of natural-stock components of the return.

Based on tag and otolith mark recoveries in commercial harvest areas, returning hatchery fish migrate through the Copper River commercial fishery in two surges, where GHII fish overlap early upriver and Delta wild stocks. Gulkana I returns coincide with the lower Delta wild stocks and the later component of the upriver wild stocks. Hatchery and lower Delta stocks are present in the commercial catch from the beginning of the commercial fishing season (mid-May). These fish are possibly milling in the deep waters offshore of the Copper River Delta and are harvested

by commercial fisherman offshore. See Figure 1 for a map of the Copper River watershed.

### 3.2 Special Harvest Area

The Crosswind Special Harvest Area (SHA) was established in accordance with 5 AAC 40.005 and consists of the waters of Dog Creek west of approximately 145°52.83'W long downstream to a weir located at approximately 62°34.70'N lat, 145°53.7'W long (Figure 2). All longitude and latitude coordinates are based on the North American Datum of 1983. PWSAC may construct a weir or series of weirs to conduct a cost-recovery harvest. Seines, traps, or dip nets may also be used to harvest cost-recovery fish in the SHA. PWSAC, or its contractor, may harvest sockeye salmon during periods established by emergency order (EO). All other species must be allowed free upstream or downstream passage.

The intent for developing this SHA is to limit the return of surplus hatchery-produced sockeye salmon into Crosswind Lake, provide local economic opportunity, and provide state residents with a source of salmon. There is negligible salmon spawning habitat at Crosswind Lake and no natural production escapement goal has been established. This SHA will prevent most of the returning sockeye from migrating into the system while providing benefits to both PWSAC and state residents.

In order to provide state residents with the opportunity to use excess production from Crosswind Lake, PWSAC, or its contractor, may at their discretion, give away up to 30 sockeye salmon per household to residents who come to the site and request fish. PWSAC will work with the Divisions of Sport and Commercial Fisheries area management biologists for harvest record requirements as applicable.

If PWSAC is unable to harvest the surplus hatchery-produced sockeye salmon in the SHA, they will, under authority of ADF&G, destroy all sockeye salmon in excess of broodstock and escapement needs. Disposal of these fish is undesirable; however, allowing them to escape into Crosswind Lake is also problematic. Excess destroyed sockeye salmon will be left in the stream below the weir in the SHA.

### 3.3 Hatchery Returns

**Sockeye Salmon, Gulkana I:** PWSAC's historical records indicate that >70% of the returning Gulkana adults are 5 year olds. In 2018, the Gulkana Hatchery run was low for all age classes. The sibling relationship between 4-year old fish last year and 5-year old fish this year indicates lowered expected survivals at all locations.

As a result, PWSAC's anticipated 2019 adult run of GHI stock is 105,000 fish, assuming a 0.03% fry to adult survival at Summit Lake, 0.48% at Paxson, and 0.81% at Crosswind (Table 1).

**Sockeye Salmon Projected Run Summary**

<b>Total Run</b>	<b>Broodstock</b>	<b>CPF Harvest and Escapement</b>
105,000	19,840	85,160
<b>% of Total</b>	<b>19%</b>	<b>81%</b>

**Sockeye Salmon Projected Run, Age-Composition Summary**

Nursery Lake	BY	Fry Released	Anticipated Fry-Adult Survival	Anticipated Total BY Return	Return Age	2019 Projected Run	% of Total
<b>Crosswind Lake</b>	2014	10,000,000	0.55%	55,643	Age-5	43,000	53%
	2015	10,000,000	1.67 %	167,161	Age-4	38,000	47%
					<b>Total</b>	<b>81,000</b>	<b>100.0%</b>

<b>Paxson Lake</b>	2014	4,660,000	0.30 %	13,918	Age-5	10,900	48.7%
	2015	4,690,000	1.15 %	53,872	Age-4	11,500	51.3%
					<b>Total</b>	<b>22,400</b>	<b>100.0%</b>

<b>Summit Lake</b>	2014	5,990,000	0.04 %	2,272	Age-5	1,600	100%
	2015	0	0.30 %	0	Age-4	0	0%
					<b>Total</b>	<b>1,600</b>	<b>100.0%</b>

Historical average return age composition: 80% age-5 and 20% age-4.

**Sockeye Salmon, Gulkana II:** PWSAC’s anticipated 2019 adult run of GHII stock is 4,200 fish, assuming a 0.32% fry to adult survival (Table 1).

**Sockeye Salmon Projected Return Summary**

Total Run	Broodstock	CPF Harvest and Escapement
4,200	969	3,231
<b>% of Total</b>	<b>23%</b>	<b>77%</b>

**Sockeye Salmon Projected Run, Age-Composition Summary**

Nursery Lake	BY	Fry Released	Anticipated Fry-Adult Survival	Anticipated Total BY Return	Return Age	2019 Projected Run	% of Total
<b>Paxson Lake</b>	2014	1,337,000	0.21 %	2,762	Age-5	2,100	50%
	2015	1,314,000	0.73 %	9,603	Age-4	2,100	50%
					<b>Total</b>	<b>4,200</b>	<b>100.0%</b>

Historical average return age composition: 80% age-5 and 20% age-4.

3.4 Separation of Brood and Sales Fish

Historically, only brood fish have been harvested by the Gulkana Hatchery operator. Under ADF&G management, hatcheries were operated through general fund appropriations and were not subject to or permitted to conduct cost-recovery operations. Since PWSAC has managed the Gulkana Hatchery, facility operating and capital costs have been met through the 2%

enhancement tax and through corporate revenues made by the sale of MBH sockeye salmon and WNH chum salmon. In an effort to avoid excess fish entering Crosswind Lake, a special harvest area (SHA) has been designated to allow the hatchery operator the opportunity to harvest the returning adults. Although no directed management is required to meet the adult return objectives, the fish that incidentally escape into the Crosswind Lake drainage and are harvested for sale will be considered cost-recovery fish.

### 3.5 Cost Recovery of Hatchery Fish

No cost recovery harvest will occur in the Copper River District due to the mixed-stock fishery. However, cost recovery harvest may occur within the designated SHA for Gulkana, which provides a harvest opportunity on fish returning to Crosswind Lake.

### 3.6 Special Management Strategies

Mixed-stock, mixed-species management occurs in the commercial, sport, personal use, and subsistence fisheries. Commercial harvest rates cannot be increased due to the potential to overharvest natural stocks. Commercial harvest interception of 60% is anticipated. Since hatchery fish may be able to withstand a higher harvest rate than wild stocks, the upriver harvest rate for hatchery fish may differ from downriver exploitation rate.

#### 3.6.1 On and Off-Station Returns (Crosswind, Summit, Hatchery Site)

Off-station returns will occur at Crosswind and Summit Lake, with the only on-station return occurring at the hatchery facility. No special management strategy is required since the locations of the returns are above the commercial fishery.

#### 3.6.2 Wild and Hatchery Stock Management

Hatchery and wild stocks are intermingled in all fisheries in the Copper River, as well as at the Miles Lake sonar. Recoveries of otolith-marked fish are presently being used to estimate numbers and timing of the enhanced stock for inseason management. Managing for wild stock escapement is the priority in the commercial fishery, which could result in excessive escapement of the enhanced stock return to the hatchery and lake stocking sites.

### 3.7 Commercial Harvests

The commercial harvest occurs at the mouth of the Copper River. The outer boundary of the Copper River District, as described in 5 AAC 24.301, is a line three miles due south of a line from Cape Suckling to Pinnacle Rock to Hook Point. There are 535 commercial drift gillnet permits in Area E. Only driftnets 150 fathoms or less may be fished in the Copper River District. Openings are by EO only.

### 3.8 Sport Fish Harvest

The current estimated sockeye salmon harvest in the Gulkana River is less than 1,500 fish, with the majority caught prior to arrival of GHI and II stocks. Sport fishermen on the Gulkana River harvest less than five percent of the Gulkana River sockeye salmon escapement. Due to this early-season effort, a lesser percentage of these fish would be hatchery-produced. To encourage



participants of this fishery to fish later in the season, SHAs will almost certainly be needed on the Gulkana River to fully utilize available fish. From 1988 through 1990, Paxson Lake, Summit Lake, and Gunn Creek were open to sport fishing of sockeye salmon during times when hatchery returns were available. In 1991, additional area was opened, and Crosswind Lake is already open to sport harvest. In 2000, the West Fork Gulkana sport limit was increased from 3 to 6 salmon after August 1 to target hatchery surplus. However, these management accommodations have failed to attract sport anglers to target these hatchery stocks due to difficult access to the fishing locations and the late timing of the returns.

### 3.9 Subsistence and Personal Use Harvests

Subsistence: Gear is limited to fish wheels and dip nets (plus rod and reel under federal subsistence regulations) in the Glennallen Subdistrict of the Upper Copper River District. and drift gillnets in the Copper River District. Currently, fish wheel and dipnet fishermen in the Glennallen Subdistrict are allocated 61,000–82,500 of the upriver sockeye salmon escapement while actual harvests have ranged from 52,000–108,000 sockeye salmon. In 2013 and 2014, 21–24% of the subsistence sockeye harvest consisted of hatchery-produced fish. The subsistence fishery tends to occur concurrently with fish availability throughout the season. Escapement goals at the Miles Lake sonar station include sufficient wild stock sockeye salmon to satisfy this harvest without jeopardizing the spawning escapement.

Personal Use: Gear is limited to dip nets (plus fish wheel and rod and reel under federal subsistence regulations) in the Chitina Subdistrict (below Chitina-McCarthy Bridge). Current allocations allow for the harvest of 100,000 to 150,000 salmon in this subdistrict. In recent years this harvest has included up to 32,000 hatchery-produced sockeye salmon. However, the dipnet fishery pattern, in the past, has concentrated effort on the early portion of the escapement; thus, a lower harvest rate has occurred on enhanced stocks than natural stocks. Recently, effort has increased on late-run sockeye salmon. This is primarily due to increased harvest success during the hatchery fish return period and recent restrictions on retention of king salmon, which return primarily during June. Wild stocks with equivalent timing may have been jeopardized by overharvest in this fishery due to recent increased effort; however, adjustment of sonar escapement expectations in future years should provide adequate protection.

### 3.10 Avoidance of Nontarget species

Gulkana I: No nontarget species issues.

Gulkana II: No nontarget species issues.

## **IV. EVALUATION STUDIES**

### 4.1 Otolith Recovery in Returning Adults

The recovery of otolith-marked fish from the 2019 runs of Gulkana Hatchery sockeye salmon will be directed at collecting from the commercial fishery, personal use fishery, Glennallen Subdistrict subsistence fishery, hatchery harvests, and broodstock. Otolith mark data will be used by ADF&G and PWSAC to measure fishery contribution and marine survival of salmon. ADF&G will provide PWSAC preliminary otolith mark-recovery data from fishery samples by December 1 each year, and any additional otolith data from straying studies and other projects by April 1 each year. Similarly, PWSAC will provide ADF&G independently-collected otolith

mark-recovery data by April 1 each year. These data are to be the individual specimen otolith-mark results.

#### 4.2 Nursery Lake Monitoring

Outmigrating juvenile sockeye salmon will be sampled and evaluated from Summit and Crosswind lakes daily from approximately May 20 through July 15. The samples will provide information on the quantity and condition of the juvenile sockeye salmon, which helps to indicate the potential for over or under-utilization. Zooplankton will be sampled and evaluated from Summit, Paxson, and Crosswind lakes at approximately three-week intervals from June–September. The samples provide information on quantity of the juvenile sockeye salmon food source, which helps to indicate the potential for over or under-utilization. Raw data from both of these projects will be provided to ADF&G in a timely manner as specified in sections 5.3 and 5.4 of the Gulkana Hatchery Basic Management Plan (BMP).

#### 4.3 Otolith Marking

PWSAC began otolith marking in 2000. During the spring outmigration period (March–May 2018), 100% of sockeye salmon production will be otolith-marked. All the fry will receive the same otolith mark by exposing them to 3,000 ppm strontium chloride solution for a 24-hour duration. Multiple marks to differentiate between nursery lakes may be possible in the future should the otolith-marking system be completely developed. The table below summarizes the 2019 strontium chloride otolith mark assignment by the ADF&G Mark, Tag, and Age Lab (MTAL). Voucher samples are collected and submitted along with data per the ADF&G MTAL sampling protocol.

<b>Species</b>	<b>Number of Fry</b>	<b>SrCl Otolith Mark</b>	<b>Intended Release Location</b>
Sockeye Salmon	10,000,000	Sr:E1	Crosswind Lake
Sockeye Salmon	6,000,000	Sr:E1	Paxson Lake
Sockeye Salmon	6,000,000	Sr:E1	Summit Lake

## **V. ATTACHMENTS**

FIGURE 1. Gulkana River Drainage

FIGURE 2. Copper River Commercial Fishery Management Areas

TABLE 1. 2019 PWSAC Hatchery Return Forecast Summary

TABLE 2. 2019 Planned Egg Takes

TABLE 3. 2019 PWSAC Hatchery Egg Take Schedules

TABLE 4. 2019 PWSAC Estimated Salmon Releases

TABLE 5. 2020 PWSAC Estimated Salmon Releases

TABLE 6. Egg take Data Template for Each Species at Each Hatchery

## VI. APPROVAL

### **Recommendation for Approval: Gulkana Hatchery Annual Management Plan, 2019**

Casey Campbell, PWSAC, General Manager 5/24/2019

Mark Somerville, Area Management Biologist, Division of Sport Fish 6/11/2019

Jeremy Botz, Area Management Biologist, Division of Commercial Fisheries 6/12/2019

Tom Vania, Regional Supervisor, Division of Sport Fish 6/12/2019

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

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

The 2019 Gulkana Hatchery I and II Annual Management Plan is hereby recommended for approval by the Prince William Sound Regional Planning Team (RPT):

Geoff Clark, Prince William Sound RPT Chair 5/24/2019

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

**The 2019 Gulkana Hatchery Annual Management Plan is hereby approved:**

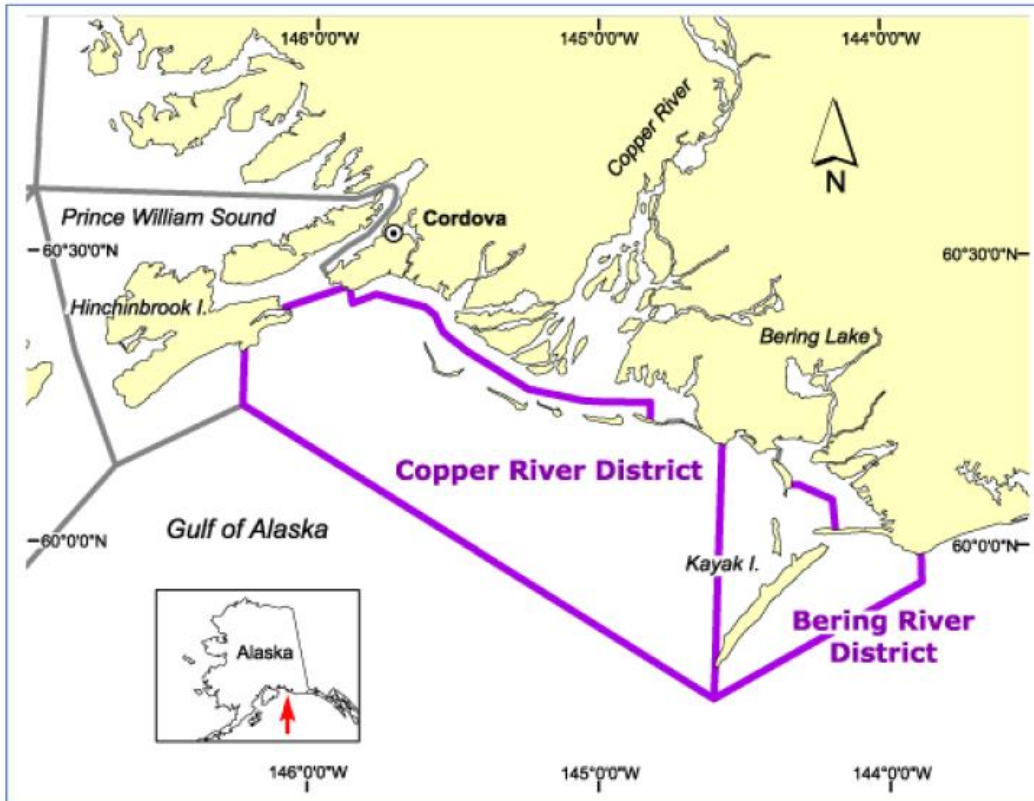
Tom Taube, Deputy Director, Division of Sport Fish 6/25/2019

Peter Bangs, Assistant Director, Division of Commercial Fisheries 7/1/2019

Figure 1. Gulkana River Drainage



Figure 2. Copper River Commercial Fishery Management Areas



**TABLE 1. 2019 PWSAC Hatchery Return Forecast**

**PRINCE WILLIAM SOUND AQUACULTURE CORPORATION  
2019 HATCHERY RETURN FORECAST**

SITE/ LOCATION	SPECIES	RUN TIME	ADULT RETURN ESTIMATE			EST. MARINE SURVIVAL
			LOW	POINT	HIGH	

**RETURNS TO THE HATCHERIES**

AFK	PINK	JUL 19 - SEP 05	1,300,000	8,900,000	11,400,000	5.14%
	CHUM	JUN 1 - JUL 27	250,000	330,000	410,000	1.33%

CCH	PINK	JUL 23 - SEP 07	2,100,000	8,400,000	10,100,000	5.12%
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WNH	PINK	JUL 19 - SEP 05	900,000	5,000,000	12,400,000	3.84%
	CHUM	JUN 1 - JUL 27	1,780,000	1,990,000	2,200,000	2.75%
	COHO	AUG 01 - SEP 20	162,000	233,000	304,000	11.14%

MBH	COGHILL SOCKEYE	JUN 15 - AUG 01	1,203,000	1,378,000	1,553,000	13.41%
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GH - Fry to Adult Survival

GH	CROSSWIND LAKE SOCKEYE		70,000	81,000	92,000	0.81%
	PAXSON LAKE - GI SOCKEYE		18,900	22,400	26,100	0.48%
	PAXSON LAKE SOCKEYE		3,700	4,200	4,800	0.32%
	SUMMIT LAKE SOCKEYE		1,400	1,600	1,900	0.03%

**RETURNS TO REMOTE RELEASE LOCATIONS**

PORT CHALMERS	CHUM	JUN 1 - JUL 27	220,000	250,000	280,000	0.65%
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CORDOVA	COHO	AUG 01 - SEP 20	0	0	0	0.00%
Corbin Creek stock, no release for this BY						

WHITTIER	COHO	AUG 01 - SEP 20	7,800	11,100	14,500	11.14%
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CHENEGA	COHO	AUG 01 - SEP 20	3,900	5,600	7,300	11.14%
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CHENEGA	CHINOOK	MAY 25 - JULY 10	510	670	830	1.08%
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**TOTAL PWSAC RETURNS**

	PINK		4,300,000	22,300,000	33,900,000	4.70%
	CHUM		2,250,000	2,570,000	2,890,000	1.58%
	COHO		173,700	249,700	325,800	11.14%
	CHINOOK		510	670	830	0.00%
	MBH - SOCKEYE - PWS		1,203,000	1,378,000	1,553,000	13.41%
	GH - SOCKEYE - COPPER RIVER		94,000	109,200	124,800	0.41%

TABLE 2. 2019 Planned Egg Takes.

**PRINCE WILLIAM SOUND AQUACULTURE CORPORATION**

**2019 EGG-TAKE GOALS**

SPECIES	HATCHERY	ORIGINAL DONOR STOCK	EGG-TAKE LOCATION	EGG-TAKE GOAL
CHUM	WALLY NOERENBERG	WELLS RIVER	WNH	153,000,000
SOCKEYE	MAIN BAY	COGHILL LAKE	MBH	12,400,000
	GULKANA I	GULKANA RIVER	GHI	35,000,000
	GULKANA II	GULKANA RIVER	GHII	1,750,000
	TOTAL			49,150,000
PINK	ARMIN F. KOERNIG	LARSEN, EWAN, GALENA	AFK	190,000,000
	CANNERY CREEK	CANNERY CREEK	CCH	187,000,000
	WALLY NOERENBERG	LARSEN, EWAN, GALENA	WNH	148,000,000
	TOTAL			525,000,000
COHO	WALLY NOERENBERG	Corbin Creek	WNH	4,000,000
TOTAL PWSAC				731,150,000



TABLE 3. 2019 PWSAC Hatchery Egg Take Schedules

PRINCE WILLIAM SOUND AQUACULTURE CORPORATION

2019 EGG-TAKE SCHEDULE

		DATE																		
SITE	SPECIES	30-Jun	07-Jul	14-Jul	21-Jul	28-Jul	04-Aug	11-Aug	18-Aug	25-Aug	01-Sep	08-Sep	15-Sep	22-Sep	29-Sep	06-Oct	13-Oct	20-Oct	27-Oct	03-Nov
AFK	PINK									24-Aug			15-Sep							
CCH	PINK									24-Aug			17-Sep							
GH I	SOCKEYE								15-Aug										15-Oct	
GH II	SOCKEYE					25-Jul			10-Aug											
MBH	SOCKEYE MBH-COGHILL						01-Aug		20-Aug											
WNH	CHUM	01-Jul					01-Aug													
	PINK									24-Aug			15-Sep							
	COHO																	19-Oct		11-Nov



TABLE 4. 2019 PWSAC Estimated Salmon Releases

**PRINCE WILLIAM SOUND AQUACULTURE CORPORATION**

**2019 ANTICIPATED SALMON RELEASES**

SPECIES	HATCHERY	ORIGINAL DONOR STOCK	BROOD YEAR	RELEASE LOCATION	ESTIMATED FRY/ SMOLT RELEASE
CHUM	WALLY NOERENBERG	WELLS RIVER	2018	WNH	83,550,000
			2018	PORT CHALMERS	20,620,000
			2018	AFK	19,000,000
			TOTAL		123,170,000
SOCKEYE	MAIN BAY	COGHILL LAKE	2017	MBH	11,090,000
	GULKANA I	GULKANA RIVER	2018	PAXSON LAKE	5,554,000
		GULKANA RIVER	2018	SUMMIT LAKE	5,006,000
		GULKANA RIVER	2018	CROSSWIND LAKE	10,000,000
	GULKANA II	GULKANA RIVER	2018	PAXSON LAKE	446,000
	TOTAL		32,096,000		
PINK	ARMIN F. KOERNIG	LARSEN, EWAN, GALENA	2018	AFK	157,960,000
	CANNERY CREEK	CANNERY CREEK	2018	CCH	129,300,000
	WALLY NOERENBERG	LARSEN, EWAN, GALENA	2018	WNH	136,260,000
	TOTAL		423,520,000		
COHO	WALLY NOERENBERG	MILE 18	2017	WNH	1,850,000
		MILE 18	2017	CORDOVA	100,000
		MILE 18	2017	WHITTIER	100,000
		MILE 18	2017	CHENEGA	50,000
		TOTAL		2,100,000	
CHINOOK	WALLY NOERENBERG	SHIP CREEK	2017	CHENEGA	49,000
				GRAND TOTAL	580,935,000

TABLE 5. 2020 PWSAC Estimated Salmon Releases

PRINCE WILLIAM SOUND AQUACULTURE CORPORATION

2020 ANTICIPATED SALMON RELEASES

SPECIES	HATCHERY	ORIGINAL DONOR STOCK	BROOD YEAR	RELEASE LOCATION	ESTIMATED FRY/ SMOLT RELEASE
CHUM	WALLY NOERENBERG	WELLS RIVER	2019	WNH	73,200,000
			2019	PORT CHALMERS	40,800,000
			2019	AFK	19,100,000
			TOTAL		133,100,000
SOCKEYE	MAIN BAY	COGHILL LAKE	2018	MBH	11,090,000
	GULKANA I	GULKANA RIVER	2019	PAXSON LAKE	4,687,000
		GULKANA RIVER	2019	SUMMIT LAKE	6,000,000
		GULKANA RIVER	2019	CROSSWIND LAKE	10,000,000
	GULKANA II	GULKANA RIVER	2019	PAXSON LAKE	1,313,000
	TOTAL		33,090,000		
PINK	ARMIN F. KOERNIG	LARSEN, EWAN, GALENA	2019	AFK	171,600,000
	CANNERY CREEK	CANNERY CREEK	2019	CCH	168,800,000
	WALLY NOERENBERG	LARSEN, EWAN, GALENA	2019	WNH	133,600,000
	TOTAL		474,000,000		
COHO	WALLY NOERENBERG	MILE 18	2018	WNH	3,270,000
		MILE 18	2018	CORDOVA	100,000
		MILE 18	2018	WHITTIER	100,000
		MILE 18	2018	CHENEGA	50,000
		TOTAL		3,520,000	
CHINOOK	WALLY NOERENBERG	SHIP CREEK	2018	CHENEGA	0
GRAND TOTAL				643,710,000	

TABLE 6. Eggtake Data Template For Each Species at Each Hatchery

Egg Take Data for each species at each hatchery																										
Brood Year	MthDay	Date	Hatchery	Species	Stock	Lot #	Egg Grams	Eggs/gram	Green Eggs	Act Fecundity	Sample Fecundity	Fertility	Good Female	Grn Female	Bad Female	Mort Female	Good Male	Mort Male	Excess Male	% Green	% Bad	aily Femal	Daily Males	Daily Total		
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