

2018 ANNUAL MANAGEMENT PLAN

WALLY NOERENBERG HATCHERY

Prince William Sound Aquaculture Corporation

This plan remains in effect until superseded by a new annual management plan (AMP) in the following year. Prince William Sound Aquaculture Corporation (PWSAC) will notify the Alaska Department of Fish and Game (ADF&G) private nonprofit (PNP) hatchery program coordinator in a timely manner of any departure from the AMP. That notification will be in the form of a request to amend the AMP. 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

Chum Salmon: The chum salmon egg-take goal is 153 million (131 million plus 22 million permitted for AFK per section 1.8). Broodstock requirements of 100,500 females and 100,500 males, assuming:

- (a) Average fecundity of 2,110 eggs/female
- (b) 1/1 female to male ratio
- (c) 15% holding mortality
- (d) 15% green/over-mature spawners

Pink Salmon: The pink salmon egg-take goal is 148 million. Broodstock requirements are 141,500 females and 141,500 males, assuming:

- (a) Average fecundity of 1,450 eggs/female
- (b) 1/1 female to male ratio
- (c) 15% holding mortality
- (d) 15% green/over-mature spawners

If the required broodstock for pink salmon egg-take goal at Wally Noerenberg Hatchery (WNH) is not available for returning fish to the hatchery, PWSAC will consult with ADF&G staff to implement broodstock collection in order to conduct an egg-take at Armin F. Koernig Hatchery (AFK) to collect up to 148 million additional green eggs in order to reach the WNH goal. After eyeing at AFK, eggs will be transferred to WNH for rearing and release.

If the required broodstock for pink salmon egg-take goal at AFK is not available for returning fish to the hatchery, PWSAC will consult with ADF&G staff to implement broodstock collection in order to conduct an egg-take at WNH to collect up to 162 million additional green eggs in order to reach the AFK goal. After eyeing at WNH, eggs will be transferred to AFK for rearing and release.

Coho Salmon: The coho salmon egg-take goal is 4.0 million eggs. Broodstock requirements are 1,350 females and 1,350 males assuming:

- (a) Average fecundity of 4,100 eggs/female
- (b) 1/1 female to male ratio
- (c) 15% holding mortality
- (d) 15% green/over-mature spawners

If the required broodstock for the coho salmon egg-take goal is not available from returning fish to the hatchery, PWSAC will conduct an egg take at the remote release location in Cordova (Fleming Spit Pond) to make up the balance of the goal.

1.2 Broodstock

The expected broodstock collection schedules for chum and pink salmon are derived from historic run timing curves for Wally Noerenberg Hatchery (WNH). The chum and pink salmon curves are an aggregate of all years (chum salmon 1987–2016; pink salmon 2008–2016 even years) SHA hatchery harvests and Esther Subdistrict commercial fishery catch data from ADF&G Annual Management Reports and preliminary inseason estimates. The adult return summary includes the projected total return, hatchery escapement schedule, and fish available for common property fishery harvest (Table 3).

To ensure that run timing is proportionally represented in broodstock, a hatchery escapement schedule that includes the broodstock acquisition schedule will be implemented based on run-timing percentages, by date, in the AMP tables to establish a hatchery escapement goal by week. These goals will be measured according to the total number of fish estimated in the hatchery SHAs.

If inseason catch data indicate the run is earlier or later than the historical run curve would suggest, then PWSAC must consult with the department prior to altering the hatchery escapement schedule, accordingly, to match the actual run.

The hatchery escapement exclusion zone (HEEZ), outlined in section 3.4, protects potential broodstock fish staging directly in front of the hatchery from being harvested in common property fisheries. These fish include those that will eventually become broodstock along with those needed to ensure a high quality, efficient and successful egg collection process.

Any fish collected beyond those utilized as broodstock will be sold for cost recovery to fund PWSAC's salmon fisheries enhancement program. Historically, PWSAC has carried forward revenues from the hatchery raceway fish sales and full-utilization programs to the following year as a reduction in the cost recovery revenue goal calculation. This provides benefits to the commercial common property fisheries (CCPF) with an increased PWSAC salmon harvest and potentially an earlier timed CCPF.

A portion of the SHA hatchery escapement is kept separate by means of a barrier net near the mouth of Esther Creek. Brood fish will be collected by volitional entry through the fishway

leading to the brood holding pond.

1.3 Egg-take Schedule and Data Reporting

Ultimately, the egg-take schedule depends upon broodstock recruitment and maturation rate of the broodstock in salt and fresh water. The table below summarizes an anticipated egg-take schedule based on the average historical egg-take percent completion 1996–2016. 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 6. Data to be collected specifically includes the numbers of green and over-ripe females from the broodstock and associated cost recovery.

Anticipated Egg-take Schedule

Percent Complete	Chum Salmon	Pink Salmon	Coho Salmon
25%	July 7	August 29	October 19
50%	July 13	September 3	October 27
75%	July 18	September 7	November 4
100%	July 27	September 15	November 11

For a complete listing of PWSAC hatchery egg-take schedules, see Table 4. For a complete listing of PWSAC’s egg-take goals, see Table 2.

1.4 Egg Transport and Carcass Disposal Plans

Approximately 22 million green chum salmon eggs will be allowed to develop to the eyed-egg stage, and then transported off-station to Armin F. Koernig Hatchery (AFK) for incubation, rearing, and release.

If the required broodstock for pink salmon egg-take goal at Wally Noerenberg Hatchery (WNH) is not available for returning fish to the hatchery, PWSAC will consult with ADF&G staff to implement broodstock collection in order to conduct an egg-take at Armin F. Koernig Hatchery (AFK) to collect up to 148 million additional green eggs in order to reach the WNH goal. After eyeing at AFK, eggs will be transferred to WNH for rearing and release.

If the required broodstock for pink salmon egg-take goal at AFK is not available for returning fish to the hatchery, PWSAC will consult with ADF&G staff to implement broodstock collection in order to conduct an egg-take at WNH to collect up to 162 million additional green eggs in order to reach the AFK goal. After eyeing at WNH, eggs will be transferred to AFK for rearing and release.

Approximately 50,000 BY18 king salmon eyed eggs will be transferred from the William Jack Hernandez Sport Fish Hatchery to WNH to complete the incubation cycle. The resultant fry will emerge volitionally into a freshwater raceway and reared at WNH. In May 2020, the smolt will be transported to saltwater net pens in Chenega. The king salmon smolt will be reared for approximately two weeks and released.

PWSAC may sell broodstock carcasses if a market is available. If carcasses are not sold, eggs that are not used for fertilization may be harvested in accord with 5 AAC 93.350(d)(1). The carcass of a salmon from which milt or eggs are extracted for lawful use as broodstock may be disposed of in accordance with Alaska Department of Environmental Conservation (DEC) requirements. Broodstock carcass disposals, as well as the number of carcasses disposed of from fish used for roe sales, will be logged on the carcass disposal form and reported to the Cordova ADF&G staff on a weekly basis.

1.5 Incubation Plans

Hatchery Production Summary

Species	Green Eggs	Eyed Eggs	Fry/Smolt Released
Chum Salmon	131,000,000	120,000,000	115,000,000
Chum Salmon	22,000,000	* 20,000,000	**
Pink Salmon	148,000,000	140,000,000	134,000,000
Pink Salmon	***162,000,000	153,100,000	****
Coho Salmon	4,000,000	3,800,000	3,500,000

* Approximately 20 million chum salmon will be transferred to the AFK hatchery at the eyed-egg developmental stage.

** Fry release provided in AFK Hatchery AMP

*** Up to 162 million green eggs may be taken at AFKH and transferred to WNH at the eyed-egg development stage for release at Lake Bay.

**** Fry release provided in AFK Hatchery AMP

The above table was generated with the following assumptions:

(a) survival from green to eyed stage of:

94.5% for pink salmon

91.5% for chum salmon

95.0% for coho salmon

(b) survival from eyed stage to emergence of:

96.0% for pink, chum, and coho salmon

(c) survival from emergence to fed fry of:

99.5% for pink salmon

99.5% for chum salmon

97.0% for coho salmon

(d) survival from fed fry to smolt release of 99.5% for coho salmon.

All eggs will be incubated at WNH. During the fall incubation period, 100% of pink, chum, king and coho salmon production will be thermally otolith-marked at the eyed-egg stage. See section 4.1 for more details.

1.6 Rearing and Release Plans

Pink Salmon: Pink salmon fry will emerge nonvolitionally from incubators, pass via separate flume and then into saltwater rearing pens. The saltwater net pen rearing complex consists of 16 12.2m x 12.2m x 3.0m rearing pens. Maximum loading densities will be 11 kg/m³.

Approximately 134 million pink salmon will be released at WNH in 2018. Based on the predicted outmigration curve and zooplankton bloom timing, all of the pink salmon fry will be reared for an average of six weeks and released in two groups into the zooplankton bloom.

Chum Salmon: Chum salmon fry destined to be released in Lake Bay will emerge nonvolitionally from incubators, pass via separate flume, and then into saltwater rearing pens. The Lake Bay saltwater net pen rearing complex consists of 34 12.2m x 12.2m x 3.0m rearing pens. Maximum loading densities will be 11 kg/m³.

Approximately 132.5 million chum salmon fry will be released in three locations in 2018. Approximately 73 million will be released at WNH, 40.5 million at Port Chalmers, and 19 million at AFK.

The AFK saltwater net pen rearing complex consists of three 15.2m x 15.2m x 4.6m rearing pens. Maximum loading densities will be 11 kg/m³.

Based on the predicted outmigration curve and zooplankton bloom timing, all of the chum salmon fry will be reared for an average of 12 weeks in saltwater net pens and released in one group per release site at a target size of 1.8 grams.

Coho Salmon: Approximately 2.8 million brood year 2016 (BY16) coho salmon smolt will be released in three locations in 2018. Approximately 2.6 million will be released at WNH, 100,000 at Whittier, and 50,000 at Chenega. The coho salmon will be reared in raceways at WNH. At WNH, the smolt will be transferred to saltwater pens for 4 to 6 weeks prior to release. The smolt released at Whittier and Chenega will receive at least 14 days of saltwater rearing at their release location. Maximum rearing densities will be 50 kg/m³ in fresh water and 11 kg/m³ in salt water. All coho salmon smolt will be released in mid-May with a target size of 15 grams.

Coho Salmon: Approximately 2.7 million BY17 coho salmon fry will begin feeding in the raceways in mid-June 2018 and remain there until the spring of 2019.

King Salmon: Approximately 49,000 BY16 king salmon smolt will be released in Chenega and will receive at least 14 days of saltwater rearing prior to release in mid-May with a target size of 18 grams.

For a complete listing of PWSAC's estimated 2018 releases see Table 5.

1.7 Fry Transport Methods

Coho Salmon:

All coho salmon smolt will be transported by barge in eight 600-gallon stainless steel tanks with

supplemental oxygen at 100–200% saturation. The water source used during transport will be Esther Lake, with the addition of NaCl and potassium chloride (KCl) to achieve a five ppt saline solution. The saline solution helps to reduce stress to the fish during transport. Maximum transfer densities will be 120kg/m³.

1.8 Permitted Capacity

WNH was issued PNP Hatchery Permit #20 in 1983. It is permitted to incubate 148 million pink salmon eggs, 131 million chum salmon eggs, 4 million coho salmon eggs, and 4 million king salmon eggs. An additional 34 million chum salmon eggs permitted for AFK may be taken and incubated at WNH annually (see FTP # 15A-0051).

Fish Transport Permit Summary

FTP Number	Expiration Date	Purpose
PINK SALMON		
96A-0048	6/30/21	Allows the egg take, incubation, and resultant release of 148 million Larsen, Ewan, and Galena Creek stocks pink salmon eggs at WNH.
16A-0058	4/30/26	Allows for backup egg take of 162 million pink salmon green eggs at WNH, transport to AFK for incubation and release.
16A-0059	4/30/26	Allows for backup egg take of 148 million pink salmon green eggs at AFK, transport to WNH for incubation and release.
CHUM SALMON		
94A-0006	6/30/20	Allows transport of 41 million WNH/Wells River/Bear Trap stocks chum salmon fry for release at Port Chalmers.
16A-0056	4/30/26	Allows the egg take of up to 131 million green eggs, incubation, and release of resultant progeny of 111 million Wells River/Bear Trap stocks chum salmon eggs at WNH.

COHO SALMON

17A-0050	04/30/27	Allows transport and release of 100,000 Mile 18 Copper River Delta stock coho salmon smolt at Fleming Spit, Cordova.
98A-0053	6/30/19	Allows transport and release of 100,000 Mile 18 Copper River Delta stock coho salmon smolt at Whittier, near a freshwater outlet.
99A-0049	6/30/20	Allows transport and release of 50,000 Mile 18 Copper River Delta stock coho salmon smolt at Chenega Bay, Chenega.
99A-0073	12/31/20	Allows for the backup egg take at Fleming Spit of 1.18 million Mile 18 Copper River Delta stock coho salmon eggs for WNH. Eggs will be incubated, reared, and resultant progeny released at WNH.
08A-0042	6/30/18	Allows for the egg take, incubation, and rearing of 4.0 million Mile 18 Copper River Delta stock coho salmon eggs at WNH.
08A-0043	6/30/18	Allows release of 1.75 million Mile 18 Copper River Delta stock coho salmon smolt at WNH.
16A-0051	4/30/26	Allows for egg take and transport of 4.0 million backup Corbin Creek stock coho salmon eggs from Solomon Gulch Hatchery.
16A-0062	4/30/26	Allows for the backup egg take of 2.0 million coho salmon eggs from Mile 18.

KING SALMON

11A-0061	6/30/21	Allows transport of up to 50,000 William Jack Hernandez Sport Fish Hatchery/Ship Creek stock king salmon eyed eggs for incubation and freshwater rearing to the smolt stage at WNH and then release in Chenega Bay, Chenega.
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II. DONOR STOCK MANAGEMENT

If the required broodstock for the coho salmon egg-take goal is not available from fish returning to the hatchery, PWSAC will conduct an egg take at the remote release location in Cordova (Fleming Spit Pond) to make up the balance of the goal.

III. HATCHERY RETURN MANAGEMENT

The PWSAC operates five facilities: AFK, Cannery Creek Hatchery (CCH), Gulkana Hatchery (GH), Main Bay Hatchery (MBH), and 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 the 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 2, 2018, the PWSAC BOD approved the annual corporate budget for Fiscal Year 2018 detailing potential sources of revenue and expenditures. The pink and WNH chum salmon revenue goals are \$6,304,696 and \$3,547,905 respectively. 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 returning hatchery-produced salmon. Based on these assumptions, PWSAC estimates that approximately 31% of the total value of the enhanced run will be required to meet the revenue goal in the Fiscal Year 2019 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 common property fisheries (CPF) contribution rates being above or below the approximate target of an 80% CPF pink salmon harvest.

WNH Chum and MBH Sockeye Salmon Runs: The WNH chum salmon and the 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 runs in aggregate may result in site-specific CPF contribution rates being above or below the approximate targets of 79% and 99% for the WNH chum and MBH sockeye salmon harvest, respectively.

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

Reduction of CPF opportunity in respective 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 orderly and consistent CPF.

3.1 Hatchery Fish Migration Routes and Timing

Chum Salmon: WNH chum salmon donor stocks were originally selected to contribute primarily to the early drift gillnet fishery in the Coghill District, and to the mixed seine and drift gillnet fishery later in the season.

In 2005, the Alaska Board of Fisheries revised regulation 5 ACC 24.370 to utilize WNH and Port Chalmers chum salmon fisheries as a means of correcting exvessel value allocation disparities between the purse seine and drift gillnet fleets. The 2012–2016 five-year average value percentages calculated by ADF&G for each gear type are 46.7% drift gillnet, 53.3% purse seine, and 5.2% set gillnet. As a result, the purse seine gear group will have exclusive access to the Port Chalmers Subdistrict for the entire 2018 fishing season. WNH chum salmon released off-station at AFK will be harvested by the purse seine fleet in the AFK terminal harvest area (THA) and SHA between June 1 and July 20.

Pink Salmon: WNH pink salmon stock originated from the AFK Hatchery pink salmon stock. The timing and distribution of the two hatchery returns appear to be very similar. A percentage of WNH pink salmon are expected to be harvested by seiners in the Southwestern District, as well as in Perry Passage, Culross Passage, and other areas in the Northern District. Pink salmon are also expected to be harvested by both purse seiners and drift gillnetters in the Esther Subdistrict and by drift gillnetters and set gillnetters in the Eshamy District.

Coho Salmon: WNH coho salmon are present in the fishery from early August through September. Although some fish are undoubtedly intercepted in the southern areas of Prince William Sound, substantial portions of the coho salmon run are expected to be harvested by purse seine and drift gillnet fishermen in the Esther Subdistrict. There is no direct cost recovery from coho salmon; however, incidental catch of coho salmon during later pink salmon cost recovery and brood collection can amount up to 20% of the run.

The Esther and Perry Island subdistricts are shown in Figures 1–2.

3.2 Special Harvest Area

The boundaries of the hatchery SHA and the THA are illustrated in Figure 3. The SHA is used by the hatchery operator to harvest hatchery fish for cost recovery. The THA is normally closed to commercial and subsistence fishing and provides a buffer between the hatchery SHA and open waters of the Esther Subdistrict.

The SHA is defined as the waters of Lake Bay north of 60°47.56'N lat (5 AAC 24.368(d)). The THA includes all waters inside of a line from Hodgkin Point at 60° 46.93' N. lat., 148° 02.10' W. long. to Esther Light at 60° 47.14' N. lat., 148° 06.02' W. long., excluding the waters of the Wally Noerenberg Hatchery SHA (5 AAC 24.368(c)). All latitude and longitude coordinates are based on the North American Datum of 1983.

During periods when the Esther Subdistrict closure is in effect to provide protection to cost-recovery fish, the department is willing to permit cost-recovery operations in waters outside of the regulatory SHA/THA boundaries to maintain fish quality. While the department views

PWSAC achieving its revenue goals using existing hatchery subdistricts in a timely and efficient manner as beneficial for maintaining fish quality and providing for increased common property fishing opportunity outside of those districts, there is concern over the harvest of wild stock salmon outside of the SHA. When the Esther Subdistrict is open to the CPF, the SHA will not be expanded.

The SHA shall be opened and closed to commercial fishing by emergency order (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.

The following requirements must be adhered to for permitted cost-recovery operations to be conducted outside the regulatory SHA/THA boundaries:

- PWSAC will agree to pay all costs associated with sampling, otolith preparation, and reading of otoliths from permitted cost-recovery harvest(s).
- PWSAC will notify the department with reasonable time prior to any cost-recovery operations to request an emergency order (EO) permitting the activity and to provide notice for scheduling of sampling personnel.
- All EOs issued to permit cost-recovery operations will be for discrete dates.
- Cost-recovery harvest(s) from these areas will not be mixed with any other harvest at any time until after sampling. No sorting of cost-recovery harvest(s) is permitted until after sampling.
- No further EOs permitting cost-recovery operations outside the SHA will be issued until the previous harvest has been evaluated for wild stock interception.
- The department may discontinue permitted cost-recovery operations outside the SHA at any time.

3.3 Hatchery Returns

3.3.1 On-Station Returns

Chum Salmon: PWSAC's anticipated 2018 run of chum salmon to WNH is 3,120,000 assuming a 3.99% marine survival (Table 1). Assuming a broodstock goal of 201,000 fish, and approximately 455,000 chum salmon sold for cost recovery, the total hatchery harvest will be approximately 21% of the run.

Chum Salmon Projected Run Summary

Total Return	Broodstock	Cost Recovery	Hatchery Harvest	CPF Harvest
3,120,000	201,000	455,000	656,000	2,464,000
% of Total	6%	15%	21%	79%

Chum Salmon Projected Run and Age Composition Summary

BY	Fry Released	Anticipated Marine Survival	Anticipated Total BY Return	Return Age	2017 Projected Run	% of Total
2011	75,000,000	3.29 %	2,467,843	Age-6	45,000	1.4%
2012	76,300,000	7.15 %	5,453,995	Age-5	1,509,000	48.4%
2014	81,000,000	2.77 %	2,240,861	Age-4	1,461,000	46.8%
2015	71,700,000	2.77 %	1,983,577	Age-3	104,000	3.3%
				Total	3,120,000	100.0%

Historical average return age composition: 2% age-6, 28% age-5, 65% age-4, and 5% age-3.

Pink Salmon: PWSAC’s anticipated 2018 adult return of pink salmon to WNH is 4,600,000 fish, assuming 3.48% marine survival (BY08–14 even-year average) from the BY16 fry release of 130.9 million (Table 1). Assuming a broodstock goal of 283,000 fish and approximately 605,000 pink salmon sold for cost recovery, the hatchery harvest will be approximately 19% of the return.

Pink Salmon Projected Return Summary

Total Return	Broodstock	Cost Recovery	Hatchery Harvest	CPF Harvest
4,600,000	283,000	605,000	888,000	3,712,000
% of Total	6%	13%	19%	81%

Coho Salmon: PWSAC’s expected 2018 return of coho salmon to WNH is 87,000 fish, assuming a marine survival of 7.34% (BY85–11 average) from the BY15 smolt release of 1,19 million (Table 1). Assuming the hatchery harvest rate will be insignificant (interception during pink salmon cost recovery) and a broodstock goal of 2,700 fish, approximately 99% of the coho salmon will be available for the CPF.

Coho Salmon Projected Return Summary

Total Return	Broodstock	Cost Recovery	Hatchery Harvest	CPF Harvest
87,000	2,700	-0-	2,700	84,300
% of Total	1%	0%	1%	99%

3.3.2 Off-Station Returns

Chum Salmon: PWSAC’s expected 2018 run of chum salmon to Port Chalmers is 150,000, assuming a 0.34% marine survival (Table 1). All fish will be harvested by the CPF. The expected 2018 run of chum salmon to Sawmill Bay is covered under a separate plan (AFK Hatchery Annual Management Plan).

Port Chalmers - Chum Salmon Projected Run Summary

Total Return	Broodstock	Cost Recovery	Hatchery Harvest	CPF Harvest
150,000	-0-	-0-	-0-	150,000
% of Total	0%	0%	0%	100%

Chum Salmon Projected Run and Age Composition Summary

BY	Fry Released	Anticipated Marine Survival	Anticipated Total BY Return	Return Age	2017 Projected Run	% of Total
2012	41,000,000	0.10 %	41,726	Age-6	1,000	0.7%
2013	43,600,000	0.81%	352,771	Age-5	130,000	89.7%
2014	0	0.94 %	0	Age-4	0	0%
2015	38,300,000	0.94%	360,746	Age-3	14,000	9.7%
				Total	150,000	100.0%

Historical average return age composition: 2% age-6, 37% age-5, 57% age-4, and 4% age-3.

Coho Salmon: PWSAC’s total expected 2018 return of coho salmon to Chenega, Cordova, and Whittier is 14,700 assuming a marine survival of 7.34% (BY85–11 average) from the BY15 smolt releases of 250,000 (Table 1). All Chenega and Whittier-released fish are designated to be harvested by the CPF. If the required broodstock for the coho salmon egg-take goal is not available from fish returning to the hatchery, PWSAC will conduct an egg-take at the remote release location in Cordova (Fleming Spit Pond) to make up the balance of the goal.

Chenega - Coho Salmon Projected Return Summary

Total Return	Broodstock	Cost Recovery	Hatchery Harvest	CPF Harvest
3,700	-0-	-0-	-0-	3,700
% of Total	0%	0%	0%	100%

Cordova - Coho Salmon Projected Return Summary

Total Return	Broodstock	Cost Recovery	Hatchery Harvest	CPF Harvest
5,500	-0-	-0-	-0-	5,500
% of Total	0%	0%	0%	100%

Whittier - Coho Salmon Projected Return Summary

Total Return	Broodstock	Cost Recovery	Hatchery Harvest	CPF Harvest
5,500	-0-	-0-	-0-	5,500
% of Total	0%	0%	0%	100%

3.4 Separation of Hatchery Escapement

The hatchery escapement goals summarized in the table below are the midpoints of the special harvest area (SHA) escapement goal ranges, to provide for the broodstock and cost-recovery requirements based on these variables; sex ratio of fish available for broodstock, fecundity, holding mortality percentage, immature and over-mature spawner percentage, average fish size, and price per pound.

SHA Escapement Goals Summary

Species	Hatchery Escapement Goal	SHA Escapement Goal Range
Chum Salmon	656,000	563,000 – 767,000
Pink Salmon	888,000	767,000 – 1,045,000

In 2013, PWSAC designated a Hatchery Escapement Exclusion Zone (HEEZ) within the WNH SHA. The HEEZ consists of the waters of the SHA north of a latitude line at 60°47.78'N.

3.5 Special Management Strategies

Effective management of mixed-stock fisheries is difficult. It is the intent of ADF&G to provide stated PWSAC corporate escapement goals by species. Achieving the target revenue goal will depend upon the timing and magnitude of PWSAC salmon runs, average fish size, and price per pound PWSAC receives. It will also depend upon precise inseason assessment of both wild and hatchery run strengths. Depending upon the precision of inseason run assessment, the actual percentages of PWSAC total runs by species, which are provided for corporate escapement, may fall above or below the stated goals. If precise and timely stock identification data are available, ADF&G will use them to manage the fisheries inseason for an allocation of PWSAC-produced pink, chum, and sockeye salmon between the CPF and PWSAC. Pink salmon will be managed for PWSAC corporate escapement after July 20. Sockeye and chum salmon will be managed for PWSAC corporate escapement by stock.

Performance of the hatchery run is evaluated by comparison of daily harvest rates to a predicted run entry table. In addition, daily sex ratios in the hatchery harvest predict, by a regression equation, the fraction of the run that has returned to date. PWSAC will provide these two types of data from the cost-recovery harvest to ADF&G management staff on a daily basis during the season so the area management biologist can make estimates of the number of salmon remaining in the run. Once egg-take operations commence at the hatchery, progress towards the hatchery's final goal could determine future SHA openings dependent upon SHA fish abundance estimates. PWSAC will provide daily estimates of fish abundance inside the barrier seine (if applicable), within the HEEZ, and in the SHA outside of the HEEZ, along with egg-take progress updates to ADF&G management staff.

If corporate escapement problems occur at the hatchery, commercial CPF restrictions will be made in the Esther and/or Perry Island subdistricts based upon the magnitude of the shortfall and stage of the run.

PWSAC will submit written management recommendations to the department with clear justifications as to how the recommendations support achieving cost recovery and/or broodstock collection goals. Each recommendation, in the form of a brief email, will include, but not be limited to, current cost-recovery harvest data, HEEZ and outer SHA estimates, actual and anticipated run entry, and actual and anticipated cost-recovery progress. Each recommendation will also include a summary of actual and anticipated hatchery escapement and broodstock collection progress as it relates to the weekly goals established in this AMP. For this reporting, hatchery escapement will be defined as fish in the HEEZ and outer SHA, both upstream and downstream of the barrier net, as appropriate. Fish in the raceways or brood holding ponds will be defined as broodstock.

To ensure accurate and clear reporting, the AMP Adult Run Summary table from the AMP for each hatchery and species will be submitted to the department when requested, as well as with written management recommendations.

It will be the responsibility of the PWSAC general manager or his designee, with written consent of the PWSAC Executive Committee, to advise ADF&G of any desired inseason adjustments to the preseason corporate escapement goals, and/or significant changes to the preseason management strategy. Recognizing the imprecision of preseason forecasts and inseason assessment of wild stock and hatchery contribution estimates, ADF&G will assess PWSAC's requested changes based upon the best available information. If, based on the assessment of ADF&G, the total hatchery run will be less than or greater than the original PWSAC forecasted return, then ADF&G will adjust openings, as necessary, to best provide for wild stock, corporate escapement, and CPF harvests. Total hatchery and wild stock runs will be estimated after a thorough postseason analysis of all available data. Postseason estimates may not coincide with ADF&G's or PWSAC's inseason estimates.

Chum Salmon: During the chum salmon run, the Esther and Granite Bay subdistricts are managed to attain chum salmon broodstock, cost-recovery objectives, and wild salmon escapement into Coghill District. If these objectives are on track, time and/or areas open to fishing may be expanded. If sockeye salmon escapement into Coghill Lake is weak and/or cost recovery and broodstock objectives are behind projections, restrictions in the Esther and/or Granite Bay subdistricts will be necessary. Given a shortfall in either wild or corporate escapement, fishing time and/or area in the Esther Subdistrict may be reduced. If management of the Esther Subdistrict is not achieving either wild or corporate escapement, fishing time and/or area in the Granite Bay Subdistrict may be reduced.

Pink Salmon: Because there is no way of isolating hatchery fish from wild stocks in waters of the general purse seine districts, these districts can only be opened and closed as the wild stock run strength will allow. When the hatchery return can withstand a higher exploitation rate than the returning wild stocks, hatchery fish that are not intercepted in the mixed stock areas of the general districts continue into the Esther Subdistrict and waters of Lake and Quillian bays. Wild

stock pink salmon escapement shortfalls have occurred several times in the Coghill District since 1988. Beginning in 1994, CPF openings in the Esther Subdistrict have been restricted to within one and a half miles of Esther Island to minimize harvest of weak pink salmon stocks destined for Port Wells. Recommendations discussed by the Salmon Harvest Task Force have included closing those waters west of Lake Bay to seine harvests during weak wild stock returns to provide a greater corridor for wild fish transiting the Esther Subdistrict.

The principal tool available to manage the hatchery pink salmon return is EO manipulation of the Esther and Perry Island subdistricts (figures 1–2). Closure of the subdistricts during the regular season can be used to decrease interception of hatchery fish to assure that the corporation can achieve its cost recovery and broodstock objectives. When it is apparent that a large hatchery surplus exists in the Esther or Perry Island subdistricts, efforts will be made to provide fishing time in such a manner to prevent a large buildup of fish from occurring and to allow for a timely harvest of the highest quality fish possible.

Coho Salmon: No special management action is anticipated for coho salmon, although fish entering the SHA will be available for PWSAC harvest. It is likely that a weekly fishing schedule in the Esther Subdistrict will be established for the coho salmon return. This schedule will be continued into mid-September to provide for harvest of coho salmon returning to the hatchery. Duration of openings may be modified dependent upon run performance.

3.6 Sport Fish Harvest

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.

A growing sport fishery has developed targeting chum, pink, and coho salmon in the WNH THA and SHA. Minor conflicts with cost-recovery operations and the integrity of the barrier net have occurred in the past. In an effort to protect WNH broodstock, the Alaska Board of Fisheries (BOF) has designated that the area within 100 feet of the WNH broodstock holding pen is closed to sport fishing (5 AAC 55.023(3)).

WNH coho salmon returning to Chenega, Cordova, and Whittier release locations are expected to contribute to local sport fisheries. The locations were chosen to enhance sport fishing opportunities. These locations have been designated by the BOF as THAs, which allow for the sport harvest of up to six coho salmon instead of three, as is the case in the remaining portions of Prince William Sound.

3.7 Subsistence Harvest

The WNH facility is within the Prince William Sound general subsistence area. Alaska residents may harvest fish for subsistence use using the legal gear type for the Coghill District.

3.8 Avoidance of Nontarget Species

Numerical abundance of stocks of fish other than WNH stocks of salmon is insignificant in the WNH THA and SHA. No particular problems are expected to occur.

IV. EVALUATION STUDIES

4.1 Otolith Marking

During the fall incubation period (September–December 2018), 100% of the pink, chum, coho, and king salmon production will be marked at the eyed-egg stage. The table below summarizes the 2018 thermal 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.

Species	Number of Eyed Eggs	Thermal Otolith Mark	Intended Release Location
Chum Salmon	77,000,000	3,4nH	WNH, Lake Bay
Chum Salmon	25,000,000	1,3,3H	WNH or Port Chalmers
Chum Salmon	17,900,000	4,3,3H, 2n, 3H3	WNH or Port Chalmers
Pink Salmon	140,000,000	8H	WNH, Lake Bay
Coho Salmon	3,800,000	3H	WNH, Lake Bay Cordova, Whittier, Chenega
King Salmon	50,000	2,4H	Chenega

4.2 Otolith Recovery in Returning Adults

The recovery of otoliths from returning adult salmon will occur this year. Recovery efforts will be directed at the CPF and cost recovery and will be performed by field personnel at processing locations.

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, and any additional otolith data from straying studies and other projects by April 1. 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.

V. ATTACHMENTS

FIGURE 1. Coghill Fishery Management District

FIGURE 2. Esther and Granite Bay Subdistricts

FIGURE 3. WNH THA, SHA, and HEEZ

TABLE 1. 2018 PWSAC Hatchery Return Forecast Summary

TABLE 2. 2018 Planned Egg Takes

TABLE 3. 2018 WNH Chum Salmon Adult Return Summary
2018 WNH Pink Salmon Adult Return Summary

TABLE 4. 2018 Hatchery Egg Take Schedules

TABLE 5. 2018 PWSAC Estimated Salmon Releases

VI. APPROVAL

Recommendation for Approval: Wally Noerenberg Hatchery Annual Management Plan, 2018

Approved via email on 4/24/2018

Casey Campbell, PWSAC, General Manager

Approved via email on 4/30/2018

Jay Baumer, Area Management Biologist, Division of Sport Fish

Approved via email on 4/26/2018

Jeremy Botz, Area Management Biologist, Division of Commercial Fisheries

Approved via email on 5/1/2018

Charlie Russell, Area Management Biologist, Division of Commercial Fisheries

Approved via email on 5/1/2018

Tom Vania Regional Supervisor, Division of Sport Fish

Approved via email on 5/1/2018

Bert Lewis, Regional Supervisor, Division of Commercial Fisheries

Approved via email on 5/1/2018

Ethan Ford, Regional Resource Development Biologist,
Division of Commercial Fisheries

The 2018 Wally Noerenberg Hatchery Annual Management Plan is hereby recommended for approval by the Prince William Sound Regional Planning Team (RPT):

Approved via email on 5/10/2018

Thomas Sheridan, Prince William Sound RPT Chair

Approved via email on 5/10/2018

Lorraine Vercessi, PNP Hatchery Program Coordinator,
Division of Commercial Fisheries

The 2018 Wally Noerenberg Hatchery Annual Management Plan is hereby approved:

Approved via email on 5/17/2018

Tom Taube, Deputy Director, Division of Sport Fish

Approved via email on 5/16/2018

Peter Bangs, Assistant Director, Division of Commercial Fisheries

Figure 1. Coghill Fishery Management District

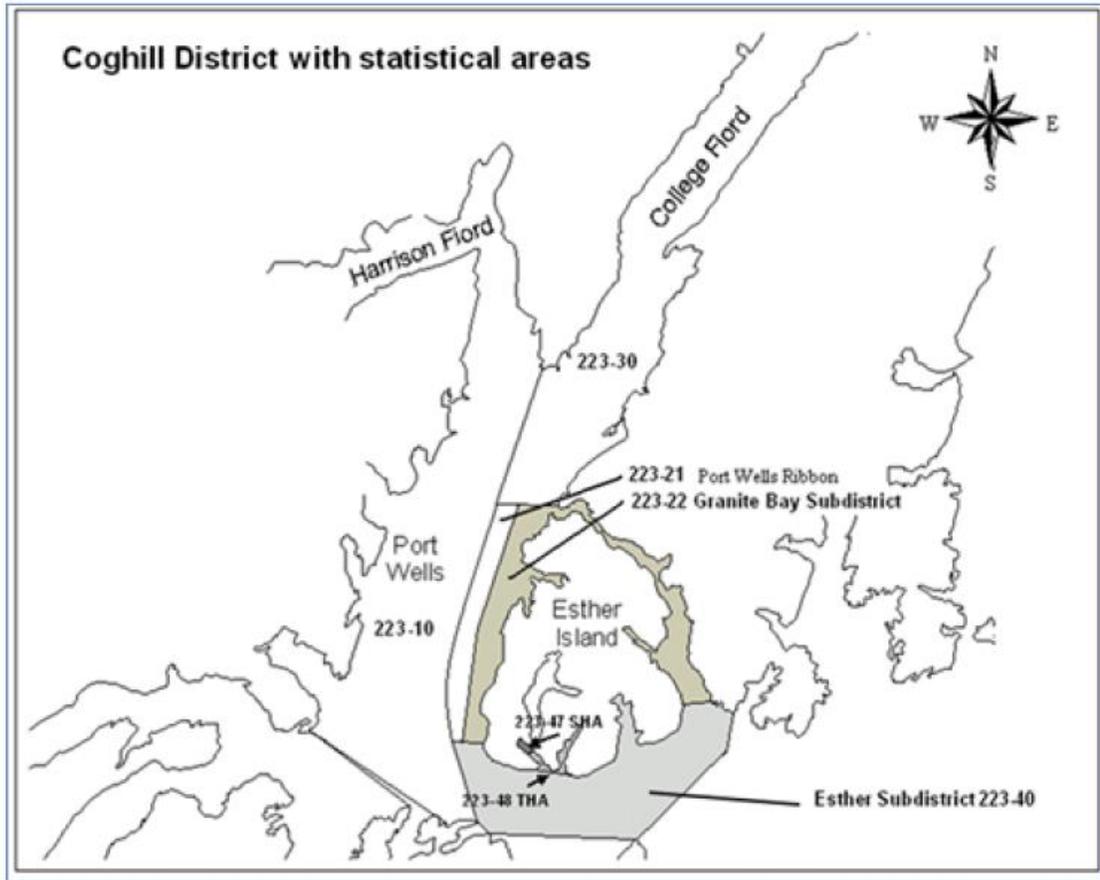


Figure 2. Esther and Granite Bay Subdistricts

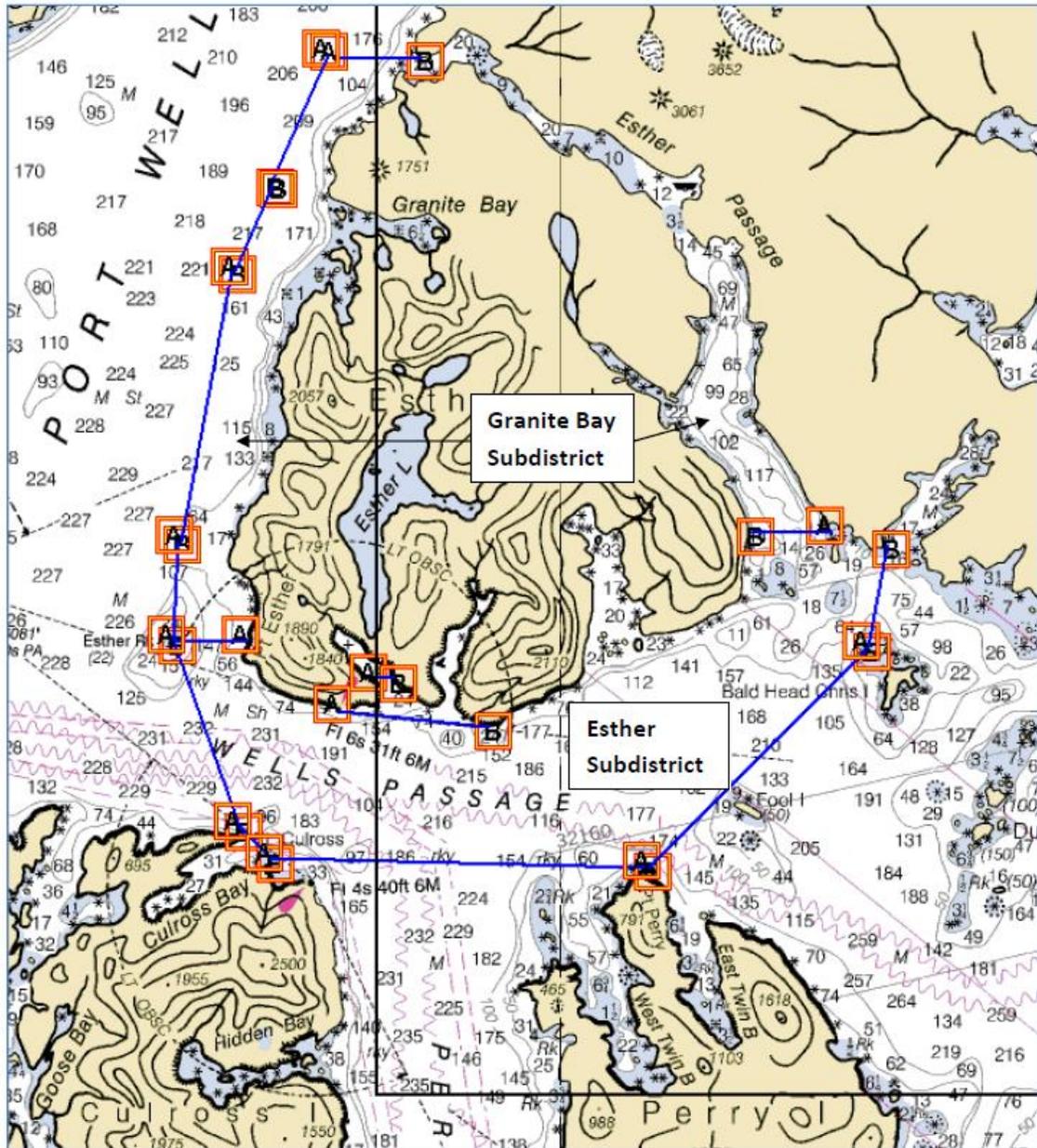


Table 1:
PRINCE WILLIAM SOUND AQUACULTURE CORPORATION
2017 HATCHERY RETURN FORECAST

SITE/ LOCATION	SPECIES	RUN TIME	ADULT RETURN ESTIMATE			EST. MARINE SURVIVAL
			LOW	POINT	HIGH	
MBH	COGHILL SOCKEYE	JUN 15 - AUG 01	687,000	763,000	839,000	7.56%
GH - Fry to Adult Survival						
GH	CROSSWIND LAKE SOCKEYE		43,000	56,000	70,000	0.56%
	PAXSON LAKE - GI SOCKEYE		18,700	24,600	30,500	0.53%
	PAXSON LAKE SOCKEYE		4,200	5,100	5,900	0.38%
	SUMMIT LAKE SOCKEYE		3,600	5,100	6,500	0.09%

RETURNS TO REMOTE RELEASE LOCATIONS

PORT CHALMERS	CHUM	JUN 1 - JUL 27	110,000	150,000	180,000	0.34%
CORDOVA	COHO	AUG 01 - SEP 20	2,900	5,500	8,300	7.34%
WHITTIER	COHO	AUG 01 - SEP 20	2,900	5,500	8,300	7.34%
CHENEGA	COHO	AUG 01 - SEP 20	1,900	3,700	5,500	7.34%
CHENEGA	CHINOOK	MAY 25 - JULY 10	510	660	820	1.49%

TOTAL PWSAC RETURNS

PINK			6,300,000	15,400,000	33,800,000	3.68%
CHUM			3,180,000	3,720,000	4,240,000	1.95%
COHO			53,700	101,700	153,100	7.34%
CHINOOK			510	660	820	0.00%
MBH - SOCKEYE - PWS			687,000	763,000	839,000	7.56%
GH - SOCKEYE - COPPER RIVER			69,500	90,800	112,900	0.39%

TABLE 2. 2018 Planned Egg Takes

le 2.

PRINCE WILLIAM SOUND AQUACULTURE CORPORATION

2018 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	MILE 18, COPPER RIVER	WNH	4,000,000
			TOTAL PWSAC	731,150,000

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TABLE 3. 2018 WNH Stock Adult Return Summary.

PROJECTED				ADULT RETURN SUMMARY																								
RETURN:	4,600,000			HATCHERY: WNH																								
BROODSTK:	283,000			SPECIES: PINK																								
FISH SALES:	605,000			YEAR: 2018																								
HAT. TOTAL:	888,000																											
CPF TOTAL:	3,712,000																											
% EXPLOIT.:	80.7%	CPF																										
	19.3%	PWSAC																										
RUN-TIMING PERCENTAGES				SHA HATCHERY ESCAPEMENT ESTIMATES				HATCHERY ESCAPEMENT SCHEDULE						C.P.F. HARVEST					TOTAL RETURN									
Date	Projected % Cum.	Projected % Female	Actual % Cum.	Actual % Female	Fishway Estimate	INSIDE Barrier Seine Estimate	HEEZ Estimate	OUTSIDE HEEZ Estimate	BPOODSTOCK			FISH SALES			C.P.F. HARVEST					TOTAL RETURN								
									Proj.	Cum Proj.	Proj. Daily	Act. Cum.	Act. Daily	Proj.	Cum.	Proj. Daily	Act. Cum.	Act. Daily	Proj.	Cum.	Proj. Daily	Act. Cum.	Act. Daily	Proj.	Cum.	Proj. Daily	Act. Cum.	Act. Daily
7-Jul	0.0%								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8-Jul	0.0%								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9-Jul	0.0%								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-Jul	0.0%								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11-Jul	0.0%								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12-Jul	0.0%								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13-Jul	0.0%								99	99	0	1516	1516	0	0	0	0	0	0	0	0	0	0	1615	1615	0	0	0
14-Jul	0.0%								133	34	0	2,023	507	0	0	0	0	0	0	0	0	0	2,156	541	0	0	0	
15-Jul	0.1%								298	165	0	4,545	2,522	0	0	0	0	0	0	0	0	0	4,843	2,687	0	0	0	
16-Jul	0.1%								352	54	0	5,365	820	0	0	0	0	0	0	0	0	0	5,717	874	0	0	0	
17-Jul	0.1%	12.5%							382	30	0	5,826	461	0	0	0	0	0	0	0	0	0	6,208	491	0	0	0	
18-Jul	0.2%	11.9%							581	199	0	8,860	3,034	0	0	0	0	0	0	0	0	0	9,441	3,233	0	0	0	
19-Jul	0.2%	10.8%							628	47	0	9,573	713	0	0	0	0	0	0	0	0	0	10,201	760	0	0	0	
20-Jul	0.2%	12.2%							681	53	0	10,389	816	0	0	0	0	0	0	0	0	0	11,070	869	0	0	0	
21-Jul	0.2%	4.1%							693	12	0	10,570	181	0	0	0	0	0	0	0	0	0	11,263	193	0	0	0	
22-Jul	0.6%	11.8%							1,559	866	0	23,778	13,208	0	0	0	0	0	0	0	0	0	25,337	14,074	0	0	0	
23-Jul	0.6%	6.9%							1,744	185	0	26,607	2,829	0	0	0	0	0	0	0	0	0	28,351	3,014	0	0	0	
24-Jul	0.8%	9.8%							2,395	651	0	36,528	9,921	0	0	0	0	0	0	0	0	0	38,923	10,572	0	0	0	
25-Jul	1.0%	8.6%							2,849	454	0	43,464	6,936	0	0	0	0	0	0	0	0	0	46,313	7,390	0	0	0	
26-Jul	1.6%	10.5%							4,950	1,701	0	69,402	25,938	0	0	0	0	0	0	0	0	0	73,952	27,639	0	0	0	
27-Jul	1.8%	11%							5,147	597	0	78,521	3,199	0	0	0	0	0	0	0	0	0	83,668	9,716	0	0	0	
28-Jul	2.5%	17.8%							7,159	2,012	0	109,198	30,677	0	0	0	0	0	0	0	0	0	116,357	32,689	0	0	0	
29-Jul	3.4%	16.0%							9,682	2,523	0	147,696	38,498	0	0	0	0	0	0	0	0	0	157,378	41,021	0	0	0	
30-Jul	4.8%	13.3%							13,560	3,878	0	206,846	59,150	0	0	0	0	0	0	0	0	0	220,406	63,028	0	0	0	
31-Jul	5.8%	16.7%							16,431	2,871	0	250,648	43,802	0	0	0	0	0	0	0	0	0	267,079	46,673	0	0	0	
1-Aug	8.4%	17.6%							23,911	7,480	0	364,749	114,101	0	0	0	0	0	0	0	0	0	388,660	121,581	0	0	0	
2-Aug	10.5%	19.4%							29,629	5,718	0	451,975	87,226	0	0	0	0	0	0	0	0	0	481,604	92,944	0	0	0	
3-Aug	12.6%	20.3%							35,758	6,129	0	545,466	93,491	0	0	0	0	0	0	0	0	0	581,224	99,620	0	0	0	
4-Aug	14.7%	23.6%							41,675	5,917	0	635,723	90,287	0	0	0	0	0	0	0	0	0	677,398	96,174	0	0	0	
5-Aug	17.3%	26.3%							49,094	7,419	0	635,723	0	0	0	0	113,173	113,173	0	0	0	0	797,990	120,592	0	0	0	
6-Aug	20.3%	30.7%							57,346	8,252	0	635,723	0	0	0	0	239,062	125,889	0	0	0	0	932,131	134,141	0	0	0	
7-Aug	23.3%	30.3%							67,558	10,212	0	635,723	0	0	0	0	394,831	155,769	0	0	0	0	1,098,112	165,981	0	0	0	
8-Aug	27.4%	32.6%							77,425	9,867	0	635,723	0	0	0	0	545,352	150,521	0	0	0	0	1,258,500	160,388	0	0	0	
9-Aug	31.5%	37.9%							89,137	11,712	0	635,723	0	0	0	0	724,007	178,655	0	0	0	0	1,448,867	190,367	0	0	0	
10-Aug	34.1%	38.3%							96,509	7,372	0	635,723	0	0	0	0	836,472	112,465	0	0	0	0	1,568,704	119,837	0	0	0	
11-Aug	38.7%	40.3%							109,534	13,025	0	635,723	0	0	0	0	1,035,158	198,686	0	0	0	0	1,780,415	211,711	0	0	0	
12-Aug	42.6%	42.9%							121,211	11,677	0	635,723	0	0	0	0	1,213,281	178,123	0	0	0	0	1,970,215	193,800	0	0	0	
13-Aug	46.1%	44.6%							130,405	9,194	0	635,723	0	0	0	0	1,353,535	140,254	0	0	0	0	2,119,663	149,448	0	0	0	
14-Aug	49.6%	46.3%							140,434	10,029	0	635,723	0	0	0	0	1,506,511	152,976	0	0	0	0	2,282,668	163,005	0	0	0	
15-Aug	54.2%	48.4%							153,524	13,090	0	635,723	0	0	0	0	1,706,188	199,677	0	0	0	0	2,495,435	212,767	0	0	0	
16-Aug	59.6%	49.6%							168,544	15,020	0	635,723	0	0	0	0	1,935,310	229,122	0	0	0	0	2,739,577	244,142	0	0	0	
17-Aug	62.4%	54.2%							176,604	8,060	0	635,723	0	0	0	0	2,058,274	122,964	0	0	0	0	2,870,601	131,024	0	0	0	
18-Aug	66.2%	50.7%							187,210	10,606	0	635,723	0	0	0	0	2,220,051	161,777	0	0	0	0	3,042,984	172,383	0	0	0	
19-Aug	70.3%	54.7%							198,989	11,779	0	635,723	0	0	0	0	2,399,745	179,694	0	0	0	0	3,234,457	191,473	0	0	0	
20-Aug	73.4%	54.1%							207,833	8,944	0	635,723	0	0	0	0	2,534,849	134,904	0	0	0	0	3,378,205	143,748	0	0	0	
21-Aug	77.3%	57.6%							220,540	12,707	0	635,723	0	0	0	0	2,728,491	193,842	0	0	0	0	3,584,754	206,549	0	0	0	
22-Aug	80.2%	60.5%							227,024	6,484	0	635,723	0	0	0	0	2,827,390	98,899	0	0	0	0	3,690,137	105,383	0	0	0	
23-Aug	85.5%	63.7%							242,051	15,027	0	635,723	0	0	0	0	3,056,624	229,234	0	0	0	0	3,934,398	244,261	0	0	0	
24-Aug	87.8%	64.4%							248,564	6,513	0	635,723	0	0	0	0	3,155,972	99,348	0	0	0	0	4,040,259	105,861	0	0	0	
25-Aug	89.7%	56.6%							253,936	5,372	0	635,723	0	0	0	0	3,237,922	81,950	0	0	0	0	4,127,581	87,322	0	0	0	
26-Aug	92.2%	64.8%							260,964	7,028	0	635,723	0	0	0	0	3,346,125	107,203	0	0	0	0	4,241,812	114,231	0	0	0	
27-Aug	93.9%	59.8%							265,724	4,760	0	635,723	0	0	0	0	3,417,740	72,615	0	0	0	0	4,319,187	77,375	0	0	0	
28-Aug	95.4%								269,891	4,167	0	635,723	0	0	0	0	3,491,306	63,566	0	0	0	0	4,396,920	67,733	0	0	0	
29-Aug	96.6%	61.7%							273,256	3,965	0	635,723	0	0	0	0	3,532,633	51,927	0	0	0	0	4,441,612	54,692	0	0	0	
30-Aug	97.2%								275,212	1,956	0	635,723	0	0	0	0	3,562,483	29,890	0	0	0	0	4,473,418	31,806	0	0	0	
31-Aug	97.8%								276,732	1,520	0	635,723	0	0	0	0	3,585,665	23,182	0	0	0	0	4,498,120	24,702	0	0	0	
1-Sep	98.3%								278,115	1,383	0	635,723	0	0	0	0	3,606,753	21,088	0	0	0	0	4,520,591	22,471	0	0	0	
2-Sep	99.0%								280,084	1,969	0	635,723	0	0	0	0	3,636,791	30,038	0									

TABLE 3. Page 2 of 2. 2018 WNH Stock Adult Return Summary.

ADULT RETURN SUMMARY																								
RETURN: 3,120,000 BROODSTK: 201,000 FISH SALES: 455,000 HAT. TOTAL: 656,000 C.F.F. TOTAL: 2,464,000 % EXPLOIT.: 79.0% CPF 21.0% PWSAC					HATCHERY: WNH SPECIES: CHUM YEAR: 2017																			
Date	RUN-TIMING PERCENTAGES		SHA HATCHERY ESCAPEMENT ESTIMATES				HATCHERY ESCAPEMENT SCHEDULE				C.F.F. HARVEST				TOTAL RETURN									
	Projected % Cum.	Projected % Female	Actual % Cum.	Actual % Female	Fishway Estimate	INSIDE Barrier Seined Estimate	HEEZ Estimate	OUTSIDE HEEZ Estimate	Proj. Cum.	Proj. Daily	Act. Cum.	Act. Daily	Proj. Cum.	Proj. Daily	Act. Cum.	Act. Daily	Proj. Cum.	Proj. Daily	Act. Cum.	Act. Daily				
26-Jun	48.3%	45.0%							98,205	1,486	0	0	490,461	0	0	0	837,396	21,575	0	0	1,524,372	23,061	0	0
27-Jun	49.2%	47.0%							98,948	743	0	0	490,461	0	0	0	848,183	10,787	0	0	1,535,902	11,530	0	0
28-Jun	49.6%	49.3%							99,625	678	0	0	490,461	0	0	0	858,025	9,841	0	0	1,546,421	10,519	0	0
29-Jun	50.3%	52.6%							102,265	2,640	0	0	490,461	0	0	0	896,366	38,341	0	0	1,587,402	40,981	0	0
30-Jun	52.6%	54.0%							105,486	3,221	0	0	490,461	0	0	0	943,138	46,772	0	0	1,637,395	49,992	0	0
1-Jul	54.8%	56.8%							110,093	4,607	0	0	490,461	0	0	0	1,010,045	66,907	0	0	1,708,909	71,515	0	0
2-Jul	57.1%	57.2%							114,817	4,724	0	0	490,461	0	0	0	1,078,644	68,599	0	0	1,782,232	73,323	0	0
3-Jul	60.5%	58.6%							121,667	6,850	0	0	490,461	0	0	0	1,178,122	99,478	0	0	1,888,560	106,328	0	0
4-Jul	63.3%	57.6%							128,470	6,803	0	0	490,461	0	0	0	1,276,915	98,793	0	0	1,994,156	105,596	0	0
5-Jul	68.0%	55.2%							136,743	8,274	0	0	490,461	0	0	0	1,397,067	120,152	0	0	2,122,591	123,425	0	0
6-Jul	72.5%	57.9%							145,694	8,951	0	0	490,461	0	0	0	1,527,050	129,893	0	0	2,261,515	138,334	0	0
7-Jul	76.2%	63.6%							153,200	7,506	0	0	490,461	0	0	0	1,636,061	109,011	0	0	2,378,032	116,518	0	0
8-Jul	79.6%	60.7%							160,031	6,831	0	0	490,461	0	0	0	1,735,268	99,206	0	0	2,484,070	106,038	0	0
9-Jul	82.3%	63.4%							165,418	5,386	0	0	490,461	0	0	0	1,813,492	78,225	0	0	2,567,681	83,611	0	0
10-Jul	86.0%								172,837	7,419	0	0	490,461	0	0	0	1,921,235	107,743	0	0	2,682,843	115,162	0	0
11-Jul	89.6%								180,171	7,334	0	0	490,461	0	0	0	2,027,742	106,507	0	0	2,796,683	113,841	0	0
12-Jul	92.7%								186,422	6,251	0	0	490,461	0	0	0	2,118,524	90,782	0	0	2,893,717	97,034	0	0
13-Jul	94.3%								190,793	4,371	0	0	490,461	0	0	0	2,182,004	63,480	0	0	2,961,568	67,851	0	0
14-Jul	96.3%								193,574	2,781	0	0	490,461	0	0	0	2,222,386	40,382	0	0	3,004,731	43,163	0	0
15-Jul	97.6%								196,225	2,651	0	0	490,461	0	0	0	2,260,891	38,505	0	0	3,045,888	41,157	0	0
16-Jul	98.8%								198,632	2,407	0	0	490,461	0	0	0	2,295,843	34,952	0	0	3,083,246	37,358	0	0
17-Jul	99.4%								199,883	1,251	0	0	490,461	0	0	0	2,314,009	18,166	0	0	3,102,662	19,416	0	0
18-Jul	99.8%								200,690	707	0	0	490,461	0	0	0	2,324,279	10,270	0	0	3,113,640	10,978	0	0
19-Jul	99.9%								200,817	226	0	0	490,461	0	0	0	2,327,566	3,287	0	0	3,117,154	3,514	0	0
20-Jul	100.0%								201,000	183	0	0	490,461	0	0	0	2,330,229	2,663	0	0	3,120,000	2,846	0	0
21-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
22-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
23-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
24-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
25-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
26-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
27-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
28-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
29-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
30-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
31-Jul	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
1-Aug	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
2-Aug	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
3-Aug	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
4-Aug	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
5-Aug	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
6-Aug	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0
7-Aug	100.0%								201,000	0	0	0	490,461	0	0	0	2,330,229	0	0	0	3,120,000	0	0	0

TABLE 4. 2018 PWSAC Hatchery Egg Take Schedules

TABLE 4

PRINCE WILLIAM SOUND AQUACULTURE CORPORATION

2017 EGG-TAKE SCHEDULE

SITE	SPECIES	DATE																			
		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								
GHI	SOCKEYE									15-Aug										15-Oct	
GHI	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 5. 2018 PWSAC Estimated Salmon Releases

Table 5.

PRINCE WILLIAM SOUND AQUACULTURE CORPORATION

2018 ANTICIPATED SALMON RELEASES

SPECIES	HATCHERY	ORIGINAL DONOR STOCK	BROOD YEAR	RELEASE LOCATION	ESTIMATED FRY/ SMOLT RELEASE
CHUM	WALLY NOERENBERG	WELLS RIVER	2017	WNH	73,000,000
			2017	PORT CHALMERS	40,400,000
			2017	AFK	19,000,000
			TOTAL		132,400,000
SOCKEYE	MAIN BAY	COGHILL LAKE	2016	MBH	10,000,000
	GULKANA I	GULKANA RIVER	2016	PAXSON LAKE	2,970,000
		GULKANA RIVER	2016	SUMMIT LAKE	0
		GULKANA RIVER	2016	CROSSWIND LAKE	10,000,000
	GULKANA II	GULKANA RIVER	2016	PAXSON LAKE	1,310,000
	TOTAL		24,280,000		
PINK	ARMIN F. KOERNIG	LARSEN, EWAN, GALENA	2017	AFK	173,800,000
	CANNERY CREEK	CANNERY CREEK	2017	CCH	163,000,000
	WALLY NOERENBERG	LARSEN, EWAN, GALENA	2017	WNH	134,000,000
	TOTAL		470,800,000		
COHO	WALLY NOERENBERG	CORBIN CREEK	2016	WNH	2,630,000
		CORBIN CREEK	2016	CORDOVA	0
		CORBIN CREEK	2016	WHITTIER	100,000
		CORBIN CREEK	2016	CHENEGA	50,000
		TOTAL		2,780,000	
CHINOOK	WALLY NOERENBERG	SHIP CREEK	2016	CHENEGA	49,000
GRAND TOTAL				630,309,000	