

## 2021 ANNUAL MANAGEMENT PLAN

### CANNERY CREEK HATCHERY

#### 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

**Pink Salmon:** The pink salmon egg-take goal is 187 million. Broodstock requirements are 201,100 females and 342,500 males, and 60,400 additional fish (to account for an assumed 10% loss to sea lion predation) for a total of 604,000 fish, assuming:

- (a) Average fecundity of 1,326 eggs/female
- (b) 37% historic 5 odd-year female %
- (c) 15% holding mortality
- (d) 15% green/over-mature spawners

##### 1.2 Broodstock

The expected broodstock collection schedule is derived from the historic run curve for Cannery Creek Hatchery (CCH) pink salmon. The run curve is an aggregate of all odd years (2009–2017) SHA hatchery harvests and the Cannery Creek Subdistrict commercial fishery catch data from the 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 return is earlier or later than the historic run curve would suggest, PWSAC will consult with the department prior to altering the hatchery escapement schedule, accordingly, to match the actual return. 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 the 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 a decreased PWSAC salmon harvest and potentially an earlier timed CCPF.

Broodstock fish will be collected by volitional entry through the fishway leading to the brood holding pond and raceways located just above the tidal influence at the hatchery.

1.3 Egg-Take Schedule and Data Reporting

Ultimately, the egg-take schedule depends upon broodstock recruitment and the 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 (1998–2018). All data associated with egg-take and broodstock collection will be provided to the department by November 1. Data will be provided in electronic format (Excel file) and include all the categories presented in the template attached as Table 7. 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**

<b>Percent Complete</b>	<b>Pink Salmon</b>
25%	September 3
50%	September 7
75%	September 11
100%	September 17

For a complete listing of all PWSAC hatchery egg-take schedules see Table 4. PWSAC’s planned egg takes are shown in Table 2.

1.4 Egg-Take Transport and Carcass Disposal Plans

No eggs will be transported off-station.

During egg take PWSAC may sell broodstock carcasses and inviable eggs if a market is available. 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. If carcasses are not sold, inviable eggs and carcasses will be disposed of in accordance with Alaska 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>Green Eggs</b>	<b>Eyed Eggs</b>	<b>Fry Released</b>
Pink Salmon	187,000,000	176,700,000	168,800,000

The above table was generated with the following assumptions:

- 1) 94.5% survival from green to eyed stage;
- 2) 96.0% survival from eyed stage to emergent; and
- 3) 99.5% survival from emergence to release.

All eggs will be incubated at CCH. During the fall incubation period, 100% of pink salmon production will be thermally otolith-marked at the eyed stage.

1.6 Rearing and Release Plans

Pink salmon fry will emerge volitionally from incubators, pass via floor troughs through electronic counters, then into a collection box. A fry pump attached to the collection box will pump the fry through a six-inch pipeline to net pens anchored in Unakwik Inlet. The saltwater net pen rearing complex consists of 18 12.2m x 12.2m x 3.0m rearing pens. Maximum loading densities will be 11 kg/m<sup>3</sup>.

Approximately 117.7 million pink salmon fry will be released in 2021. Based on predicted outmigration curve and zooplankton bloom timing, all pink salmon fry will be reared for an average of 28 days and released in three groups into the zooplankton bloom. PWSAC’s anticipated salmon releases are shown in Table 5.

1.7 Fry Transport Methods

No CCH pink salmon fry will be transported off-station for release.

1.8 Permitted Capacity

CCH was issued PNP Hatchery Permit #26 in 1988 after assuming operations from the State of Alaska. It is permitted to incubate 187 million pink salmon eggs. All permitted releases are from the CCH facility.

### Fish Transport Permit Summary

FTP Number	Expiration Date	Purpose
<b>PINK SALMON</b>		
96A-0040	4/30/26	Allows the egg take, incubation, and resultant release of 187 million Cannery Creek stock pink salmon eggs.

### II. DONOR STOCK MANAGEMENT – N/A

### III. HATCHERY RETURN MANAGEMENT

PWSAC operates five facilities: Armin F. Koernig Hatchery (AFK), CCH, Gulkana Hatchery (GH), Main Bay Hatchery (MBH), and Wally Noerenberg Hatchery (WNH). The corporation generates revenues for annual operations from a 2% enhancement tax and 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 10, 2021, the PWSAC BOD approved the annual corporate budget for Fiscal Year 2021 detailing potential sources of revenue and expenditures. The pink salmon cost-recovery revenue goal is \$9,409,435. The WNH chum and MBH sockeye salmon cost-recovery will utilize and aggregate management strategy with a revenue goal of \$6,539,387. 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 38% of the total value of the run will be required to meet the revenue goal in the Fiscal Year 2022 financial plan.

**Pink Salmon Returns:** AFK, CCH, and WNH pink salmon runs will be managed collectively through openings and closures of nearby subdistricts or hatchery management areas. Managing the enhanced pink salmon runs in aggregate may result in site-specific common property fishery (CPF) contribution rates being above or below the approximate target of a 74% CPF pink salmon harvest.

**WNH Chum and MBH Sockeye Salmon Runs:** The WNH chum salmon and MBH sockeye salmon returns will be managed collectively through openings and closures of nearby subdistricts or hatchery management areas. The collective management will be managed concurrently for the WNH chum and MBH sockeye salmon revenue goal. Managing the returns in aggregate may result in site-specific CPF contribution rates being above or below the approximate targets of 53% and 47% 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.

Reductions 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 Hatchery Fish Migration Routes and Timing

Data indicate that Cannery Creek pink salmon enter Prince William Sound through island passes of southwest PWS and follow a complex path through Knight Island Passage and other sections of the northwestern part of the Sound. Hatchery stocks pass through both purse seine and gillnet fisheries in the Southwestern, Eshamy, Northwestern, Coghill, Northern, and Unakwik districts at about the same time as wild stocks in these districts and should be exploited at approximately the same rate. The Cannery Creek pink salmon run peaks about August 11 (Table 3).

### 3.2 Special Harvest Area

The boundaries of the CCH SHA and terminal harvest area (THA) are illustrated in Figure 1. 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 Cannery Creek Subdistrict except during subsistence only openers. The THA may be opened for cost recovery by emergency order (EO). After reaching broodstock and sales fish goals, the SHA may be opened to the CPF until the end of the run. All latitude and longitude coordinates are based on the North American Datum of 1983.

Harvest of salmon in the SHA by sport anglers and personal use fishermen is managed by the ADF&G Division of Sport Fish 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 SHA consists of waters of Unakwik Inlet in the Northern District north and east of a line from 61°00.97'N lat, 147°32.62'W long, southward to a point on the shore at 60°59.96'N lat, 147°31.48'W long.

The THA consists of water of Unakwik Inlet in the Northern District north and east of a line from 61°00.97'N lat, 147°33.12'W long, southward to a point on the shore at 60°59.79'N lat, 147°32.40'W long, excluding the CCH SHA.

The department is willing to permit cost-recovery operations in waters outside of the SHA/THA boundaries to maintain fish quality. The department views PWSAC achieving its revenue goals in a timely and efficient manner as being beneficial for maintaining fish quality and providing for increased CPF opportunity.

There is concern over the harvest of wild stock salmon outside of the prescribed cost-recovery SHAs and THAs. The following requirements must be adhered to for cost-recovery operations to be conducted outside the SHA/THA:

- 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 operation(s) to request an EO permitting the activity and to provide notice for scheduling of sampling personnel.
- All EOs issued permitting 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 to the Special Harvest Area

**Pink Salmon:** PWSAC’s anticipated 2021 adult return of pink salmon to CCH is 6,000,000 fish, assuming a 5.84% marine survival (5 odd-year average), from the BY19 fry release of 102.9 million (Table 1). Assuming a hatchery broodstock goal of 604,000 fish and approximately 1,048,000 pink salmon sold for cost recovery, the hatchery harvest will be 27%.

**Pink Salmon Projected Return Summary**

<b>Total Return</b>	<b>Broodstock</b>	<b>Cost Recovery</b>	<b>Hatchery Harvest</b>	<b>CPF Harvest</b>
6,000,000	604,000	1,048,000	1,652,000	4,348,000
<b>% of Total</b>	<b>10%</b>	<b>17%</b>	<b>27%</b>	<b>73%</b>

### 3.4 Separation of Hatchery Escapement

The hatchery escapement goal of 1,652,000 pink salmon is the midpoint of the special harvest area (SHA) escapement goal range 1,423,000 – 1,944,000 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.

In 2006, PWSAC designated a HEEZ within the SHA as an alternative to using a barrier net (Figure 2). The HEEZ consists of the waters of the CCH SHA north and east of a line from 61.00.97N lat, 147.32.62W long southward to a point on the shore at 61.00.444N lat, 147.31.497W long.

### 3.5 Special Management Strategies

The CCH is located in Unakwik Inlet in the Northern District. Returning hatchery pink salmon will influence management of traditional fisheries, particularly in the Northern District. Present management strategies for the remaining seine districts are based on escapement observations of wild stocks of pink and chum salmon throughout the Sound. Poor wild stock escapement will require closures or reduced fishing time in the remaining districts, which in turn, may shift harvest of hatchery returns to the terminal areas of Unakwik Inlet (including the CCH THA and SHA).

Conversely, a strong wild-stock return could result in a heavy interception of the hatchery return in other fishing districts and result in an insufficient return to meet broodstock and cost-recovery goals. Selected closures of the waters of Unakwik Inlet may be necessary to permit sufficient escapement to meet cost-recovery and broodstock needs. The principal tool available to manage the hatchery fishery is EO manipulation.

Fishing in the SHA and THA is expected to be limited to cost-recovery operations from the start of the pink salmon return in the Northern District, and is expected to remain so throughout the completion of the cost-recovery harvest. However, if significant numbers of fish build up in excess of corporate needs, these areas, or portions of them, could be opened to the commercial fleet. If the hatchery return requires additional protection to meet broodstock or cost-recovery goals, the Cannery Creek Subdistrict may be closed. During periods when the Cannery Creek Subdistrict closure is in effect to provide protection to cost-recovery fish, ADF&G may allow the hatchery operator to harvest fish in Unakwik Inlet outside the SHA boundaries (Figure 2) to maintain fish quality. This will occur only if escapement of local wild stocks is adequate. When Unakwik Inlet is open to the CPF, the SHA will not be expanded.

Performance of the hatchery return is evaluated by comparison of daily harvest to the predicted run entry (Table 3). In addition, daily sex ratios in the hatchery harvest predict, by a regression equation, what percentage of the total run has accumulated 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 left in the fish 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, subdistrict closures will be made based upon the magnitude of the shortfall and the stage of the run.

The effective management of mixed-stock fisheries is difficult. It is the intent of the ADF&G to provide the stated PWSAC corporate escapement goals by species. Achieving the target revenue goal will depend upon the timing and magnitude of the PWSAC salmon returns, 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, actual percentages of PWSAC total returns, by species, which provide 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.

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; fish in the raceways or brood holding ponds will be defined as broodstock.

To ensure accurate and clear reporting, the AMP Adult Return Summary table for each hatchery and species will be submitted to the department, in association with written management recommendations.

It will be the responsibility of PWSAC staff, 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 return 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 returns 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.

### 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. Due to the remote location of CCH and species involved, no significant sport fishery has developed to date, nor is anticipated.



### 3.7 Subsistence Harvest

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

### 3.8 Avoidance of Nontarget Species

No particular problem is anticipated at CCH. By mid-July, when harvest and brood collection begins, the Cowpen Lake sockeye salmon run is over. The Miners Lake sockeye salmon run is later, but adults do not appear to migrate through the hatchery SHA. There is also no evidence suggesting chum salmon from the Siwash and Jonah systems migrate through the SHA. When surplus hatchery production warrants CPF openings beyond those permitted by wild-stock strength, fishing will be restricted to portions of Unakwik Inlet that will minimize interception of Jonah and Siwash wild-stock pink and chum salmon. Exact areas to be opened will be determined inseason and detailed in EOs.

## **IV. EVALUATION STUDIES**

### 4.1 Otolith Marking

During the fall incubation period (October–December 2021), 100% of pink salmon production will be marked at the eyed-egg stage. The table below summarizes the 2021 thermal otolith mark assignment by the ADF&G Mark, Tag, and Age Lab (MTAL). Voucher samples are collected and submitted, along with data as per the ADF&G MTAL sampling protocol.

<b>Species</b>	<b>Number of Eyed Eggs</b>	<b>Thermal Otolith Mark</b>	<b>Intended Release Location</b>
Pink Salmon	176,700,000	3,3H	CCH (Unakwik Inlet)

### 4.2 Otolith Recovery in Returning Adults and Data Reporting

Recovery of otoliths from returning adult pink 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 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.

## V. ATTACHMENTS

FIGURE 1. CCH Fishery Management Areas

FIGURE 2. CCH Hatchery Escapement Exclusion Zone

TABLE 1. 2020 PWSAC Hatchery Return Forecast

TABLE 2. 2020 Planned Egg Takes

TABLE 3. 2020 CCH Adult Return Summary

TABLE 4. 2020 PWSAC Hatchery Egg Take Schedules

TABLE 5. 2020 PWSAC Estimated Salmon Releases

TABLE 6. 2021 PWSAC Estimated Salmon Releases

TABLE 7. Egg-take Data Template For Each Species at Each Hatchery

## VI. APPROVAL

### **Recommendation for Approval: Cannery Creek Hatchery Annual Management Plan, 2021**

Geoff Clark, PWSAC, General Manager 4/23/2021

Jay Baumer, Area Management Biologist, Division of Sport Fish 5/10/2021

Charlie Russell, Area Management Biologist, Division of Commercial Fisheries 5/19/2021

Tom Vania, Regional Supervisor, Division of Sport Fish 5/19/2021

Bert Lewis, Regional Supervisor, Division of Commercial Fisheries 4/26/2021

Ethan Ford, Regional Resource Development Biologist, Div. of Commercial Fisheries 5/19/2021

Lorraine Vercessi, PNP Hatchery Program Coordinator, Div. of Commercial Fisheries 5/19/2021

**The 2021 Cannery Creek Hatchery Annual Management Plan is hereby approved:**

Tom Taube, Deputy Director, Division of Sport Fish 5/27/2021

Peter Bangs, Assistant Director, Division of Commercial Fisheries 6/2/2021

Figure 1. CCH Fishery Management Areas

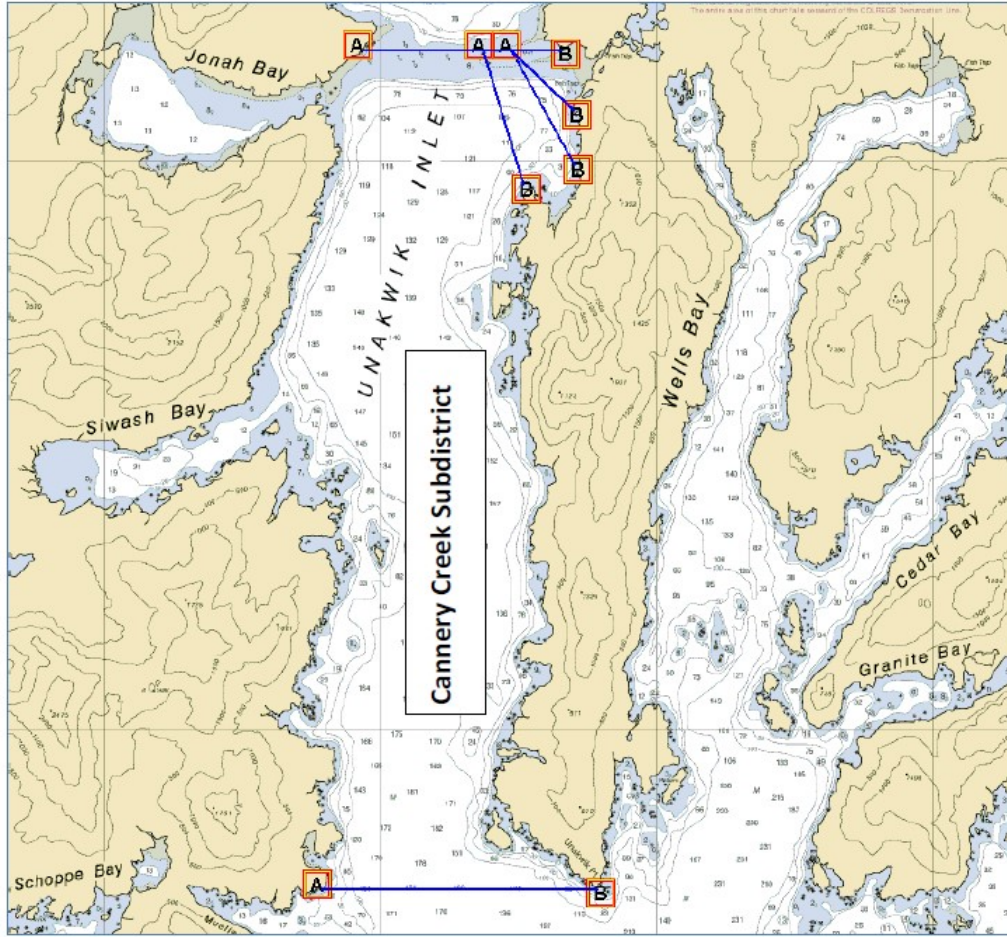


Figure 2. CCH Escapement Exclusion Zone, Special Harvest Area, Terminal Harvest Area

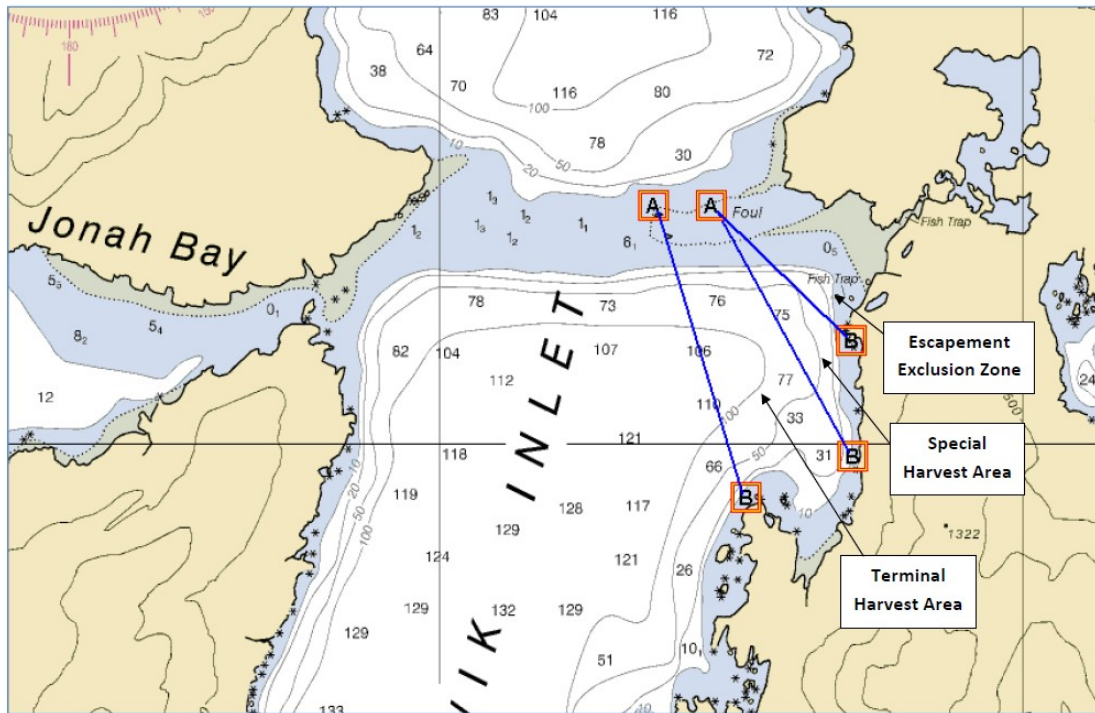


TABLE 1. 2021 PWSAC Hatchery Return Forecast  
**PRINCE WILLIAM SOUND AQUACULTURE CORPORATION**  
**2021 HATCHERY RETURN FORECAST**

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

**RETURNS TO THE HATCHERIES**

AFK	PINK	JUL 19 - SEP 05	2,500,000	5,000,000	7,500,000	4.03%
	CHUM	JUN 1 - JUL 27	100,000	150,000	200,000	0.69%

CCH	PINK	JUL 23 - SEP 07	4,000,000	6,000,000	8,100,000	5.84%

WNH	PINK	JUL 19 - SEP 05	3,200,000	6,600,000	11,800,000	5.01%
	CHUM	JUN 1 - JUL 27	1,500,000	1,680,000	1,870,000	2.30%
	COHO	AUG 01 - SEP 20	55,000	89,000	155,000	5.00%

MBH	COGHILL SOCKEYE	JUN 15 - AUG 01	941,000	1,076,000	1,211,000	10.09%

GH - Fry to Adult  
Survival

GH	CROSSWIND LAKE SOCKEYE	35,000	39,000	43,000	0.44%
	PAXSON LAKE - GI SOCKEYE	19,900	23,300	26,600	0.50%
	PAXSON LAKE - GII SOCKEYE	4,400	5,000	5,600	0.37%
	SUMMIT LAKE SOCKEYE	0	0	0	0.00%

### RETURNS TO REMOTE RELEASE LOCATIONS

PORT CHALMERS	CHUM	JUN 1 - JUL 27	260,000	320,000	370,000	0.86%
CORDOVA	COHO	AUG 01 - SEP 20	3,100	5,000	8,700	5.00%
WHITTIER	COHO	AUG 01 - SEP 20	3,100	5,000	8,700	5.00%
CHENEGA	COHO	AUG 01 - SEP 20	1,500	2,500	4,300	5.00%
CHENEGA	CHINOOK	MAY 25 - JULY 10	550	710	870	1.49%

### TOTAL PWSAC RETURNS

PINK	9,700,000	17,600,000	27,400,000	4.96%
CHUM	1,860,000	2,150,000	2,440,000	1.28%
COHO	62,700	101,500	176,700	5.00%
CHINOOK	550	710	870	1.49%
SOCKEYE -SOUND, MBH	941,000	1,076,000	1,211,000	10.09%
SOCKEYE - GH,COPPER RIVER	59,300	67,300	75,200	0.33%

TABLE 2. 2021 Planned Egg Takes.

**PRINCE WILLIAM SOUND AQUACULTURE CORPORATION**

**2021 EGG-TAKE GOALS**

<b>SPECIES</b>	<b>HATCHERY</b>	<b>ORIGINAL DONOR STOCK</b>	<b>EGG-TAKE LOCATION</b>	<b>EGG-TAKE GOAL</b>
<b>CHUM</b>	<b>WALLY NOERENBERG</b>	<b>WELLS RIVER</b>	<b>WNH</b>	<b>153,000,000</b>
<b>SOCKEYE</b>	<b>MAIN BAY</b>	<b>COGHILL LAKE</b>	<b>MBH</b>	<b>12,400,000</b>
	<b>GULKANA I</b>	<b>GULKANA RIVER</b>	<b>GHI</b>	<b>35,000,000</b>
	<b>GULKANA II</b>	<b>GULKANA RIVER</b>	<b>GHII</b>	<b>1,750,000</b>
				<b>TOTAL</b>
<b>PINK</b>	<b>ARMIN F. KOERNIG</b>	<b>LARSEN, EWAN, GALENA</b>	<b>AFK</b>	<b>190,000,000</b>
	<b>CANNERY CREEK</b>	<b>CANNERY CREEK</b>	<b>CCH</b>	<b>187,000,000</b>
	<b>WALLY NOERENBERG</b>	<b>LARSEN, EWAN, GALENA</b>	<b>WNH</b>	<b>148,000,000</b>
				<b>TOTAL</b>
<b>COHO</b>	<b>WALLY NOERENBERG</b>	<b>Corbin Creek</b>	<b>WNH</b>	<b>4,000,000</b>
<b>CHINOOK</b>	<b>WALLY NOERENBERG</b>	<b>WJHSFH</b>	<b>WNH</b>	<b>50,000</b>
			<b>TOTAL PWSAC</b>	<b>731,200,000</b>



TABLE 3. 2021 CCH Adult Return Summary.

PROJECT ED										ADULT RETURN SUMMARY															
RETURN:	6,000,000																								
BROODST K:	604,000									HATCHERY:	CCH														
FISH SALES:	1,048,000									SPECIES:	PINK														
HAT. TOTAL:	1,652,000									YEAR:	2021														
CPF TOTAL:	4,348,000																								
% EXPLOIT.:	72.5%	CPF																							
	27.5%	PWSC																							
RUN-TIMING PERCENTAGES				SHA HATCHERY ESCAPEMENT ESTIMATES				HATCHERY ESCAPEMENT SCHEDULE																	
Date	Projected		Actual		Fishway Estimate	INSIDE Barrier Seine Estimate	HEEZ Estimate	OUTSIDE HEEZ Estimate	BROODSTOCK				FISH SALES				C.P.F. HARVEST				TOTAL RETURN				
	% Cum.	% Female	% Cum.	% Female					Proj. Cum.	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	
8-Jul	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	
10-Jul	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	
12-Jul	0.0%								0	0	0		0	0	0		0	0	0		0	0	0	0	
13-Jul	0.0%								96	96	0		0	0	0		858	858	0		954	954	0	0	
14-Jul	0.2%								1,471	1,375	0		0	0	0		13,144	12,286	0		14,616	13,661	0	0	
15-Jul	0.2%								1,471	0	0		0	0	0		13,144	0	0		14,616	0	0	0	
16-Jul	0.3%								1,952	481	0		0	0	0		17,441	4,297	0		19,394	4,778	0	0	
17-Jul	0.3%								1,952	0	0		0	0	0		17,441	0	0		19,394	0	0	0	
18-Jul	0.5%								2,799	847	0		0	0	0		25,006	7,565	0		27,805	8,411	0	0	
19-Jul	0.5%								3,162	363	0		0	0	0		28,253	3,247	0		31,415	3,610	0	0	
20-Jul	0.6%								3,801	639	0		0	0	0		33,960	5,707	0		37,761	6,346	0	0	
21-Jul	1.2%								7,394	3,592	0		32,094	32,094	0		33,960	0	0		73,447	35,687	0	0	
22-Jul	1.2%								7,394	0	0		32,094	0	0		33,960	0	0		73,447	0	0	0	

23-Jul	1.5%							8,929	1,535	0		45,809	13,714	0		33,960	0	0		88,697	15,250	0	0
24-Jul	1.5%							9,107	178	0		47,402	1,593	0		33,960	0	0		90,469	1,772	0	0
25-Jul	2.5%	15.9%						15,400	6,292	0		103,617	56,215	0		33,960	0	0		152,976	62,507	0	0
26-Jul	2.8%	15.9%						16,888	1,488	0		116,914	13,297	0		33,960	0	0		167,762	14,785	0	0
27-Jul	4.1%	18.9%						24,925	8,037	0		188,718	71,804	0		33,960	0	0		247,603	79,842	0	0
28-Jul	4.4%	26.5%						26,678	1,752	0		204,372	15,653	0		33,960	0	0		265,009	17,405	0	0
29-Jul	5.4%	25.9%						32,790	6,112	0		258,975	54,603	0		33,960	0	0		325,724	60,715	0	0
30-Jul	6.2%	22.1%						37,722	4,932	0		303,039	44,064	0		33,960	0	0		374,720	48,997	0	0
31-Jul	7.9%	23.2%						47,778	10,056	0		392,879	89,840	0		33,960	0	0		474,617	99,897	0	0
1-Aug	9.0%	24.3%						54,524	6,746	0		453,150	60,270	0		33,960	0	0		541,634	67,017	0	0
2-Aug	10.6%	27.7%						64,009	9,484	0		537,880	84,731	0		33,960	0	0		635,849	94,215	0	0
3-Aug	12.7%	26.7%						76,881	12,872	0		652,875	114,995	0		33,960	0	0		763,715	127,866	0	0
4-Aug	14.6%	25.6%						87,909	11,028	0		751,400	98,525	0		33,960	0	0		873,268	109,553	0	0
5-Aug	17.4%	25.9%						105,031	17,122	0		904,365	152,965	0		33,960	0	0		1,043,356	170,088	0	0
6-Aug	20.0%	28.1%						120,756	15,725	0		1,044,848	140,482	0		33,960	(0)	0		1,199,563	156,207	0	0
7-Aug	23.0%	32.8%						139,051	18,295	0		1,048,000	3,152	0		194,249	160,289	0		1,381,299	181,736	0	0
8-Aug	26.3%	34.4%						158,558	19,507	0		1,048,000	0	0		368,518	174,269	0		1,575,075	193,776	0	0
9-Aug	29.3%	34.6%						176,977	18,420	0		1,048,000	0	0		533,076	164,558	0		1,758,052	182,978	0	0
10-Aug	33.0%	32.7%						199,209	22,231	0		1,048,000	0	0		731,687	198,611	0		1,978,895	220,843	0	0
11-Aug	36.2%	34.3%						218,925	19,716	0		1,048,000	0	0		907,824	176,137	0		2,174,748	195,853	0	0
12-Aug	40.0%	35.7%						241,461	22,537	0		1,048,000	0	0		1,109,163	201,339	0		2,398,624	223,876	0	0
13-Aug	43.1%	39.7%						260,340	18,879	0		1,048,000	0	0		1,277,824	168,660	0		2,586,163	187,539	0	0
14-Aug	46.9%	40.8%						283,386	23,046	0		1,048,000	0	0		1,483,708	205,884	0		2,815,093	228,930	0	0
15-Aug	50.5%	43.2%						304,745	21,359	0		1,048,000	0	0		1,674,523	190,816	0		3,027,267	212,175	0	0
16-Aug	54.2%	42.8%						327,170	22,425	0		1,048,000	0	0		1,874,861	200,338	0		3,250,030	222,762	0	0
17-Aug	57.3%	44.3%						345,880	18,711	0		1,048,000	0	0		2,042,018	167,157	0		3,435,898	185,868	0	0
18-Aug	61.7%	45.2%						372,911	27,031	0		1,048,000	0	0		2,283,505	241,487	0		3,704,416	268,518	0	0
19-Aug	65.2%	46.4%						393,909	20,998	0		1,048,000	0	0		2,471,093	187,587	0		3,913,000	208,585	0	0
20-Aug	69.0%	50.5%						416,765	22,856	0		1,048,000	0	0		2,675,287	204,194	0		4,140,051	227,050	0	0
21-Aug	71.7%	49.3%						432,877	16,112	0		1,048,000	0	0		2,819,229	143,942	0		4,300,105	160,054	0	0
22-Aug	74.1%	49.7%						447,281	14,404	0		1,048,000	0	0		2,947,908	128,680	0		4,443,188	143,083	0	0
23-Aug	76.8%	45.6%						463,857	16,576	0		1,048,000	0	0		3,095,992	148,083	0		4,607,848	164,659	0	0
24-Aug	78.9%	53.2%						476,620	12,763	0		1,048,000	0	0		3,210,017	114,025	0		4,734,636	126,788	0	0
25-Aug	79.9%	57.3%						482,734	6,114	0		1,048,000	0	0		3,264,642	54,625	0		4,795,376	60,740	0	0
26-Aug	81.3%	60.8%						490,999	8,264	0		1,048,000	0	0		3,338,475	73,833	0		4,877,473	82,097	0	0

<b>27-Aug</b>	82.6%	60.6%								498,851	7,852	0		1,048,000	0	0		3,408,627	70,152	0		4,955,477	78,004	0	0
<b>28-Aug</b>	85.0%	60.6%								513,415	14,564	0		1,048,000	0	0		3,538,734	130,107	0		5,100,148	144,671	0	0
<b>29-Aug</b>	86.4%	60.6%								521,966	8,551	0		1,048,000	0	0		3,615,130	76,395	0		5,185,095	84,947	0	0
<b>30-Aug</b>	90.5%	60.6%								546,577	24,611	0		1,048,000	0	0		3,834,999	219,869	0		5,429,575	244,480	0	0
<b>31-Aug</b>	92.6%									559,055	12,478	0		1,048,000	0	0		3,946,472	111,473	0		5,553,526	123,951	0	0
<b>1-Sep</b>	93.9%									566,976	7,921	0		1,048,000	0	0		4,017,233	70,761	0		5,632,208	78,682	0	0
<b>2-Sep</b>	95.2%									575,296	8,320	0		1,048,000	0	0		4,091,563	74,329	0		5,714,857	82,649	0	0
<b>3-Sep</b>	96.3%									581,657	6,361	0		1,048,000	0	0		4,148,391	56,829	0		5,778,047	63,190	0	0
<b>4-Sep</b>	96.9%									585,063	3,407	0		1,048,000	0	0		4,178,825	30,433	0		5,811,887	33,840	0	0
<b>5-Sep</b>	97.2%									587,027	1,963	0		1,048,000	0	0		4,196,365	17,540	0		5,831,390	19,503	0	0
<b>6-Sep</b>	97.4%									588,165	1,138	0		1,048,000	0	0		4,206,532	10,168	0		5,842,696	11,306	0	0
<b>7-Sep</b>	97.5%									589,127	963	0		1,048,000	0	0		4,215,132	8,599	0		5,852,258	9,562	0	0
<b>8-Sep</b>	97.9%									591,529	2,402	0		1,048,000	0	0		4,236,587	21,455	0		5,876,115	23,857	0	0
<b>9-Sep</b>	98.2%									592,859	1,330	0		1,048,000	0	0		4,248,465	11,878	0		5,889,323	13,208	0	0
<b>10-Sep</b>	98.4%									594,510	1,652	0		1,048,000	0	0		4,263,223	14,758	0		5,905,733	16,410	0	0
<b>11-Sep</b>	100.0%									604,000	9,490	0		1,048,000	0	0		4,348,002	84,777	0		6,000,000	94,267	0	0

TABLE 4. 2021 PWSAC Hatchery Egg Take Schedules

PRINCE WILLIAM SOUND AQUACULTURE CORPORATION

2021 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 GH II	SOCKEYE								15-Aug									15-Oct			
	SOCKEYE																				
							25-Jul			10-Aug											
MBH	SOCKEYE MBH-COGHILL								01-Aug				20-Aug								
WNH	CHUM	01-Jul						01-Aug													
	PINK																				
	COHO										24-Aug		15-Sep								
																		19-Oct			11-Nov

TABLE 5. 2021 PWSAC Estimated Salmon Releases

## PRINCE WILLIAM SOUND AQUACULTURE CORPORATION

## 2021 ANTICIPATED SALMON RELEASES

SPECIES	HATCHERY	ORIGINAL DONOR STOCK	BROOD YEAR	RELEASE LOCATION	ESTIMATED FRY/ SMOLT RELEASE
CHUM	WALLY NOERENBERG	WELLS RIVER	2020	WNH	78,072,000
			2020	PORT CHALMERS	41,150,000
			2020	AFK	19,200,000
			TOTAL		138,422,000
SOCKEYE	MAIN BAY	COGHILL LAKE	2019	MBH	10,850,000
			TOTAL		
	GULKANA I	GULKANA RIVER	2020	PAXSON LAKE	4,737,580
			2020	SUMMIT LAKE	0
			2020	CROSSWIND LAKE	5,807,100
	GULKANA II	GULKANA RIVER	2020	PAXSON LAKE	1,262,420
TOTAL				22,657,100	
PINK	ARMIN F. KOERNIG	LARSEN, EWAN, GALENA	2020	AFK	131,539,000
				CANNERY CREEK	117,709,000
	WALLY NOERENBERG	LARSEN, EWAN, GALENA	2020	WNH	88,343,000
				TOTAL	
COHO	WALLY NOERENBERG	CORBIN CREEK	2019	WNH	3,208,000
			2019	CORDOVA	0
		CORBIN CREEK	2019	WHITTIER	100,000
			2019	CHENEGA	50,000
		TOTAL		3,358,000	
CHINOOK	WALLY NOERENBERG	NINILCHIK	2019	CHENEGA	48,000
				GRAND TOTAL	502,076,100

TABLE 6. 2022 PWSAC Estimated Salmon Releases

## PRINCE WILLIAM SOUND AQUACULTURE CORPORATION

2022 ANTICIPATED SALMON RELEASES

SPECIES	HATCHERY	ORIGINAL DONOR STOCK	BROOD YEAR	RELEASE LOCATION	ESTIMATED FRY/ SMOLT RELEASE
CHUM	WALLY NOERENBERG	WELLS RIVER	2021	WNH	73,200,000
			2021	PORT CHALMERS	40,800,000
			2021	AFK	19,100,000
			TOTAL		133,100,000
SOCKEYE	MAIN BAY	COGHILL LAKE	2020	MBH	11,080,000
			TOTAL		
	GULKANA I	GULKANA RIVER	2021	PAXSON LAKE	6,000,000
			2021	SUMMIT LAKE	4,700,000
			2021	CROSSWIND LAKE	10,000,000
	GULKANA II	GULKANA RIVER	2021	PAXSON LAKE	1,300,000
TOTAL			33,080,000		
PINK	ARMIN F. KOERNIG	LARSEN, EWAN, GALENA	2021	AFK	171,600,000
			2021	CCH	168,800,000
	WALLY NOERENBERG	LARSEN, EWAN, GALENA	2021	WNH	133,600,000
			TOTAL		474,000,000
COHO	WALLY NOERENBERG	CORBIN CREEK	2020	WNH	3,000,000
			2020	CORDOVA	100,000
			2020	WHITTIER	100,000
			2020	CHENEGA	50,000
			TOTAL		3,250,000
CHINOOK	WALLY NOERENBERG	NINILCHIK	2020	CHENEGA	45,900
GRAND TOTAL					643,745,900

TABLE 7. Egg take 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	Daily Female	Daily Males	Daily Total		
									0	#DIV/0!												#DIV/0!	#DIV/0!	0	0	
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0
									0	#DIV/0!													#DIV/0!	#DIV/0!	0	0

