

2023 ANNUAL MANAGEMENT PLAN

Port Armstrong Hatchery

Armstrong-Keta, Inc.

This Annual Management Plan (AMP) plan is prepared to fulfill the requirements of 5 AAC 40.840. This plan must organize and guide the hatchery's operations, for each calendar year, regarding production goals, broodstock development, and harvest management of hatchery returns. Egg take through release details are included in planning for succeeding calendar years. In-season assessments and project alterations by Armstrong-Keta, Inc. (AKI) or Alaska Department of Fish and Game (ADF&G) may result in changes to this AMP in order to reach or maintain program objectives. AKI 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 AKI. This policy applies to all hatchery operations covered under the AMP.

1.0 Executive Summary

1.1 Background

The Port Armstrong Hatchery (PAH) is a PNP facility owned and operated by AKI. The hatchery is located at the outlet of Jetty Lake, in Port Armstrong, near the southeastern tip of Baranof Island along Chatham Strait (Figure 1). Fed by water from two lakes perched 285 feet above the facility, up to 30 cfs of water is seasonally available for hatchery use and hydropower generation. The hatchery facilities include a primary incubation building, a Chinook and coho salmon building, ten freshwater raceways, and three saltwater net pen complexes. The hatchery operates 365 days per year.

PAH is currently producing pink, chum, and coho salmon, and is also permitted to produce Chinook salmon. Because of the timing overlap of its Chinook and chum runs, AKI has been focusing on coho instead of Chinook salmon. Currently, PAH-permitted production is released at or near Port Armstrong, except for the limited portion of chums, pinks and cohos that are permitted to be vessel transported for release closer to the open ocean.

Fish from Port Armstrong contribute to common property fisheries in southern Chatham Strait and other areas of Southeast Alaska. PAH is located in a productive traditional troll fishery area, and seine fisheries exist immediately north and east of Port Armstrong. Salmon returning to Port Armstrong not harvested in common property fisheries are used for hatchery cost recovery and broodstock.

AKI believes that nearshore predation on salmon fry is negatively impacting marine survival. Since 2015, AKI has been trialing different release strategies to boost marine survivals. In 2015, AKI towed a differentially thermal marked cohort of PAH pink salmon fry up to one mile offshore into Chatham Strait for release to avoid the narrow bottleneck at the entrance of Port Armstrong.

In most years since 2017 AKI has released a cohort of PAH pink salmon fry offshore of the hatchery in southern Chatham Strait via a fry transport vessel. While data has been inconclusive due to differences in timing and average fry size at release between the vessel transport and control cohorts as well as weather-related problems releasing the vessel transport fry in the target zone, the available data points to pink returns from the vessel transport fish returning with higher marine survivals back to the hatchery than the net pen tow-out or Port Armstrong released groups.

In 2022, 2.9 million chum fry and 206,000 coho smolts were transported by vessel south in Chatham for release while the pink fry were released in Port Armstrong. The Fish Transport Permit (FTP) for vessel transporting pink salmon was not approved in time for 2022, so pink salmon were not vessel transported. Vessel-transported fish are reared in pens at PAH and when they are ready for release into the wild during the spring, they are transferred to holding tanks on the transport vessel. Aboard the transport vessel, ocean water is pumped into the fish holds during transport to ensure the fry have contact with the same water they would have otherwise traveled through during out-migration. All vessel transports are carried out in the direction of the open ocean near the southern tip of Baranof Island, within the distances and parameters defined by separate FTPs for each species. It is hoped the vessel-transport method will better ensure the departure of the fry from the nearshore area, while still allowing them to imprint on the water signature at PAH and along the migration route.

1.2 *New this Year (production, harvest management, culture techniques, etc.)*

In 2023, PAH intends to reduce its chum salmon egg take to 20 million, and at the same time make use of the incubation capacity to increase its pink salmon egg take to its full permitted 105 million capacity. Despite many years of intensive efforts to maximize chum marine survivals, the results have been discouraging over the past decade apart from a decent run in 2017. Because the feed and labor costs of rearing chums are much higher than with pinks, and the pink marine survivals have been somewhat better than the chums, AKI's intention is to reduce its operating costs by focusing on pink salmon, while achieving better common property contribution with the pinks caught primarily by the seine fleet. AKI is in the planning stages of renovating its original incubation building, and as it puts the new facilities into service, expects in future years to take additional chum green eggs up to the 60 million green eggs that the current permit allows.

Additionally, PAH has expanded its coho production from five million to six million green egg take because of the Notice of Permit Alteration (NPA) issued in April 2022. AKI plans to submit a Permit Alteration Request to increase coho egg capacity to eight million in the future.

1.3 *New Permits or Permit Amendments*

There are no new permits or permit amendments for 2023.

1.4 *Expected Returns*

Species, Run	Release Location	Total Return	Common Property Harvest	Return to Hatchery	Broodstock Needed	Available for Cost Recovery
Pink salmon, BY21	Port Armstrong	569,417	261,932	307,485	300,000	7,485
Coho salmon, BY20	Port Armstrong	110,198	55,099	55,099	7,000	48,099
Chum salmon, BY17-20	Port Armstrong	212,369	21,237	191,132	20,000	171,132

Additional detail on adult salmon returns from PAH projects can be found in Table 1.

1.5 *Production Summary*

Program Name	Brood Year	Planned Release Date	Number to Release	Life Stage	Type of Mark, Percent or Number Marked
Armstrong pink salmon; Tow out release	2022	May 15, 2023	29 million	fed fry	TM, 100% 3H
Armstrong pink salmon; S. Chatham boat release	2022	May 15, 2023	18.2 million	fed fry	TM, 100% 3H4
Armstrong coho salmon	2021	May 25, 2023	2.8 million	smolt	CWT, 1.57%
Armstrong chum salmon; Tow out release	2022	May 25, 2023	23 million	fed fry	TM, 100% 1,2,2H
Armstrong chum salmon; Boat release	2022	May 25, 2023	9.2 million	fed fry	TM, 100% 5H4

1.6 *Egg Takes*

In 2023, the egg-take goal at PAH will be 105 million pink salmon eggs; 20 million chum salmon eggs; six million coho salmon eggs; and zero Chinook salmon eggs.

1.7 *Current Permitting*

The permitted capacity of PAH is 105 million pink salmon eggs, 60 million chum salmon eggs, and six million combined Chinook and coho salmon eggs with no more than two million being Chinook salmon eggs.

2.0 **Late Summer Pink Salmon Production**

2.1 *Program Details*

Since 1983, PAH has been producing pink salmon. In previous years, PAH strived to annually release 97 million, 0.5-gram to 1.2-gram, otolith-marked pink salmon fry. Due to the increase in chum production, the hatchery has had insufficient capacity for the past several years to continue releasing pink salmon at its full permitted level without procuring additional net pens and incubation space. With the change in production goals for 2023, PAH's pink egg take goal for 2023 is the full permitted 105 million. The purpose of the program is to provide pink salmon to common

property fisheries in lower Chatham Strait, as well as provide sufficient pink salmon returns to the hatchery to meet PAH cost-recovery and broodstock requirements.

Average marine survival of PAH pink salmon has been approximately 2.0%, with a high of 6.9% in return year 1990 and a low of 0.12% in return year 2008 (Table 2), with relatively depressed average returns during the past decade. In 2015, PAH began investigating the effects of release location on marine survival by towing a cohort of differentially marked pink salmon into Chatham Strait for release. In 2017, PAH began releasing a portion of their pink salmon production at Port Herbert SHA (Figure 2). In 2017, there were four pink salmon release strategies: traditional rearing and release at PAH; traditional rearing at PAH with release in Chatham Strait; remote rearing and release at Port Herbert; and release via vessel transport of fed fry to lower Chatham Strait, approximately seven miles from PAH towards the mouth of Chatham Strait, presumably in the direction of their normal outmigration. For 2018 releases and subsequent years until additional rearing facilities can be acquired, the hatchery has chosen not to rear pink fry at the Port Herbert site due to the reduced egg take number, requiring that all the pinks be released from Port Armstrong Hatchery in order to ensure sufficient broodstock. AKI has a multi-pronged release strategy again in 2023, via net pen tow-outs into Chatham Strait, and when necessary due to weather or health conditions, within Port Armstrong, where the pinks are subject to predation by the coho smolts released a couple of weeks later.

Years ago, ADF&G area staff reviewed historical catch records to estimate that PAH pink salmon are harvested in the lower Chatham seine fishery (District 109). Changes in fishing effort, opportunity for common property harvest in District 9, and the department’s understanding of PAH pink salmon contribution to fisheries outside of District 9 warrant further investigation into updating contribution to fisheries.

2.2 *Egg Takes*

Program Name	Ancestral Stock(s)	Egg-Take Site & Stat Area	Primary or Alternate Source?	Current Year Egg Goal	Permitted Maximum
Armstrong pink salmon	Sashin Creek	Port Armstrong Hatchery 109-10	primary	105,000,000	105,000,000

2.3 *Broodstock Capture Method*

Pink salmon returning to the hatchery are an enhanced run. Sex ratios are sampled during the harvest to monitor run timing. Broodstock mature in the inner bay over the course of the run. In early September, when broodstock have sufficiently matured, two fish ladders are opened and adults are recruited into raceways. An electro-anesthesia unit attached to the raceways is used during egg take.

2.4 *Spawning*

Approximately 300,000 pink salmon will be required for broodstock. Spawning takes place on a covered deck adjacent to the broodstock raceways. After being stunned with an electro-anesthesia unit, males and females are sorted and their gametes are collected. The eggs are transported by

hand cart to the incubation building, where fertilization and rinsing takes place. The fertilized eggs are loaded into R-48 bulk incubators for incubation to the eyed stage.

2.5 Egg-take Schedule

Egg take typically begins around September 10 and lasts for two to three weeks but may be extended due to run timing and pace of recruitment to the fish ladder. Egg take should approximate the normal run curve since broodstock will be allowed to accumulate at the mouth of the creek proportionally during the course of the run. Depending on the number of ripe females and fecundity, between five and 10 million eggs can be taken in a day.

2.6 Carcass Disposal

The majority of carcasses are expected to be given away or sold to processors. Those carcasses not sold are collected daily in a small barge. Carcasses may also be given away and/or sold as bait. All remaining carcasses are driven approximately one mile offshore and discarded in Chatham Strait at a DEC-approved carcass disposal area.

2.7 Planned Releases this Calendar Year of Previous Brood Years' Production

Program Name	Brood Year	Planned Release Date	Number to Release	Life Stage	Type of Mark, Percent or Number Marked
Armstrong pink salmon; Tow out release	2022	May 15, 2023	29 million	fed fry	TM, 100% 3H
Armstrong pink salmon; S. Chatham boat release	2022	May 12-15, 2023	18.2 million	fed fry	TM, 100% 3H4
Total			47.2 million		

2.8 Operational Diagram



2.9 Fish Transport Permits

FTP #	Egg Take, Transport or Release	Transport From & To	Maximal # & Life Stage	Expires
98J-1009	egg take & release	PAH to PAH	105 million eggs	1/31/2025
21J-1013	transport & release	PAH to Port Herbert	55 million eggs	3/31/2031
15J-1015	egg take & transport	Sashin Creek to PAH	105 million eggs	12/31/2025
22J-1009	transport & release	PAH to offshore of PAH ^a	20 million fry	4/1/2026

^a Release is approximately 10 miles offshore near the mouth of Chatham Strait.

Egg take at Sashin Creek under 15J-1015 cannot commence until the ADF&G Division of Commercial Fisheries area management biologist has authorized it for that year. The escapement

target for Sashin Creek is a peak aerial survey count of between 20,000 and 40,000 pink salmon. This includes fish above and below the weir site. The weir may be installed once a 20,000 pink salmon peak aerial survey count has been made. No hatchery broodstock may be collected until an estimated 20,000 fish are above the weir. Once 20,000 fish are estimated above the weir, 20% of the daily return may be collected for hatchery broodstock until an estimated 50,000 fish are above the weir. Once 50,000 fish are estimated above the weir, 50% of the daily return may be collected for hatchery broodstock until an estimated 100,000 fish are above the weir. Once 100,000 fish are estimated above the weir, 80% of the daily return may be collected for hatchery broodstock.

Fish transport Permit 17J-1010 was issued for 2017 and 2018 to trial a release strategy, vessel transporting fry out of the near-shore environment at the time of release in an attempt to improve the marine survival of PAH pink salmon. AKI was issued a new fish transport permit, 19J-1006, effective from March 2019 through May 2021 to allow two additional years of this alternate release strategy. AKI was issued a four-year fish transport permit in 2022 to vessel release pink fry, 22J-1009, contingent on a department-reviewed evaluation plan. Fry will be reared in net pens at PAH per usual practice, but at time of release up to 20 million fed fry will be transferred to a vessel which will transport them for around two hours to a point specified in the FTP as approximately 10 miles offshore near the mouth of Chatham Strait.

3.0 Fall Coho Salmon

3.1 Program Details

The purpose of the program is to provide coho salmon to common property fisheries in lower Chatham Strait and outer Baranof Island, as well as provide a sufficient coho salmon return to the hatchery to meet PAH cost recovery and broodstock requirements.

In 1988, PAH began its coho salmon program with broodstock taken from Blanchard Lake donor stock, of Deep Cove ancestral stock. In 1989 and 1990, broodstock was taken from NSRAA's Mist Cove return site, of Sashin Creek ancestral stock. In 2005, the permitted capacity of PAH coho salmon increased from two million to three million eggs. In 2007, the permitted capacity increased to a possible five million coho salmon eggs, if no Chinook salmon eggs are collected (permitted capacity is five million combined Chinook and coho salmon eggs with no more than two million being Chinook salmon eggs). In 2022, the permitted capacity for coho/Chinook eggs increased to six million, with no more than two million being Chinook. Coded wire tag (CWT) recoveries indicate that an average of approximately 50% of the total PAH return contributes to the troll fishery. Overall marine survivals for brood year (BY) 88 through BY18 releases average 6.9% (Table 3). The highest marine survival was 23.5% (BY99) and the lowest was 0.9% (BY18). PAH strives to annually release at least 4.8 million, 25 to 35-gram coho salmon smolt, maintain a green egg to smolt survival rate over 80%, maintain marine survivals comparable to, or exceeding, those experienced at Hidden Falls Hatchery (HFH) and NSRAA's release site Mist Cove, and maintain a fishery contribution rate of 50% or higher. Bacterial kidney disease (BKD) is managed by strict family tracking with culling of positive families prior to hatching, isolation between brood years and stocks, and early diagnosis and possible treatment. Fish may be fed Aqua 100 at fry stage as a BKD preventative.

Starting with BY19, coho salmon will be 100% otolith thermal-marked with a pre-hatch code. We will differentially tag any distinct rearing or release groups with coded-wire tags.

In 2022, approximately 44,000 BY21 coho salmon smolt were coded wire tagged. These tags are to be recovered by AKI at the rack and by ADF&G during sampling of the commercial and sport fisheries.

3.2 *Egg Takes*

Program Name	Ancestral Stock(s)	Egg-Take Site & Stat Area	Primary or Alternate Source?	Current Year Egg Goal	Permitted Maximum
Armstrong coho salmon	Deep Cove/Sashin Creek	Port Armstrong Hatchery	primary	6,000,000	6,000,000 ^a
Armstrong coho salmon	Deep Cove/Sashin Creek	Hidden Falls Hatchery	alternate	0	3,000,000
Species Total				6,000,000	6,000,000

^a Six million combined Chinook and coho salmon eggs, with no more than two million being Chinook salmon eggs.

3.3 *Broodstock Capture Method*

Coho salmon returning to the hatchery are from an enhanced run. In October, two fish ladders are opened and adult coho salmon are recruited into several holding raceways. Males and females are monitored for the next several weeks for ripeness.

3.4 *Spawning*

Approximately 7,000 adults are required for broodstock. Spawning takes place on a covered deck adjacent to the broodstock raceways. After being stunned with an electro-anesthesia unit, males and females are sorted and their gametes are collected and transported to the coho and Chinook salmon incubation building. Initial incubation takes place in Heath tray incubators. Iodophor is used to disinfect eggs. Eggs are family-tracked and are culled from parents identified to be BKD-positive.

3.5 *Egg-take Schedule*

Egg take usually occurs between late October and early November, over a one to two-week period, as females ripen. Eggs will be taken in lots of approximately 500,000, or greater, until the egg-take goal has been reached. In the event that sufficient broodstock is not available at PAH, additional eggs may be taken at HFH.

3.6 *Carcass Disposal*

Carcasses are sold to processors when possible. Carcasses that are not sold are collected in a small barge and made available to local residents or fishermen for bait. Any remaining carcasses are

disposed of in Chatham Strait, approximately one mile offshore at a DEC-approved carcass disposal area.

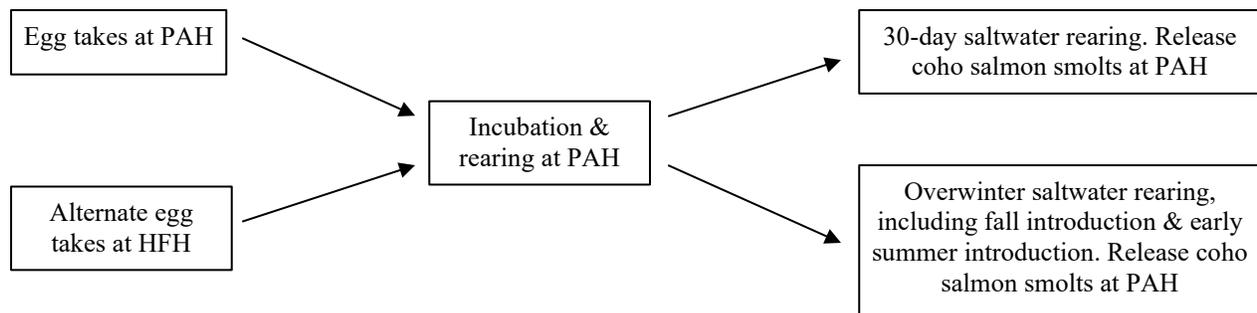
3.7 *Planned Releases this Calendar Year of Previous Brood Years' Production*

Program Name	Brood Year	Release Date	Number to Release	Life Stage	Type of Mark & Number Marked
Armstrong coho salmon	2021	5/25/2023	2.8 million	smolt	CWT, 44,000

3.8 *Previous Brood Years that will Remain in Culture during the Entire Calendar Year*

Program Name	Brood Year	Number Live	Life Stage	Type of Mark & Number Marked	Number to Release & Date
Armstrong coho salmon	2022	4.2 million	fry	CWT, 100,000 & Otolith, 100%	4.0 million, May 2024

3.9 *Operational Diagram*



3.10 *Fish Transport Permits*

FTP #	Stock	Egg take, Transport, or Release	Transportation From & To	Maximal # & Life Stage	Expires
98J-1010	Sashin Creek	egg take & release	PAH to PAH	6,000,000 eggs ^a	8/31/2025
93J-1036	Sashin Creek	egg take, transport & release	HFH to PAH	3,000,000 eggs ^a	8/31/2025
17J-1027	Deep Cove	egg take & release	PAH to PAH	6,000,000 eggs ^a	8/31/2025
17J-1028	Deep Cove	egg take, transport & release	HFH to PAH	3,000,000 eggs ^a	8/31/2025
20J-1020	Sashin Creek	transport & release	PAH to PAH ^b	2,500,000 juveniles	6/30/2023

^a Total not to exceed six million eggs when combined with Chinook salmon eggs.

^b Release up to five miles east and 7.5 miles south of PAH.

4.0 **Spring Chinook salmon**

4.1 *Program Details*

No Chinook salmon eggs have been taken at PAH since 2015, and the last Chinook salmon smolts released were zero-checks released by June 30, 2016. Details of the Chinook salmon program can

be found in past AMPs (2022 and before). Past Chinook salmon production details can be found in Table 4.

4.2 *Egg Takes*

There is currently no egg-take goal for Chinook at PAH.

4.3 *Broodstock Capture Method*

No Chinook salmon have been taken for broodstock since 2015.

4.4 *Spawning*

Not applicable because no egg takes are planned.

4.5 *Egg-take Schedule*

No egg takes are planned.

4.6 *Carcass Disposal*

Not applicable because no egg takes are planned.

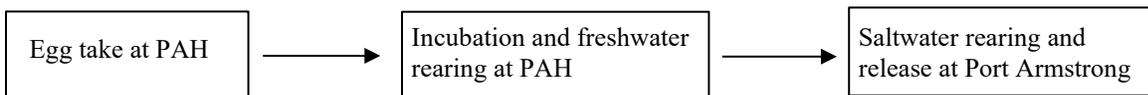
4.7 *Planned Releases this Calendar Year of Previous Brood Years' Production.*

No previous brood year fish available for release.

4.8 *Previous Brood Years that will Remain in Culture During the Entire Calendar Year.*

No previous brood year fish to remain in culture during this year.

4.9 *Operational diagram*



4.10 *Fish Transport Permits*

FTP #	Ancestral Stock	Egg Take, Transport, or Release	Transportation From & To	Maximal # & Life Stage	Expires
01J-1005	Unuk	egg take, transport & release	LPW to PAH	2,000,000 eggs ^a	9/30/2025
11J-1004	Unuk	egg take, transport & release	PAH to PAH	2,000,000 eggs ^a	12/31/2025

^a Total not to exceed six million eggs when combined with coho salmon eggs.

5.0 Summer Chum Salmon

5.1 Program Details

In 2003, PAH began its summer chum salmon program utilizing the enhanced-return chum salmon stock from Gunnuk Creek Hatchery (GCH) and HFH. The purpose of the program is to establish a chum salmon return at PAH that will provide opportunities for common property harvest of chum salmon in Lower Chatham Strait, as well as broodstock and cost recovery fish for PAH. Since 2009, a full complement of chum salmon year-classes has returned to PAH. It is anticipated that all future egg-take goals will be achieved from returns to PAH. In 2015, permitted chum salmon production at PAH increased from 30 million to 60 million green eggs, and a permitted remote release site was added at Port Lucy (Figure 3). The eventual production goal has been to annually release over 55 million two gram or larger thermal marked chum salmon fry split between both Port Armstrong and from Port Lucy, once the program is at full production, but poor returns over the past decade have prompted AKI to change focus to the pink and coho programs in 2022. The 2023 goal is to take 20 million chum eggs this year. Of these fish, up to seven million, or half, may be released by vessel transport to a point defined in the FTP as no more than 7.5 miles offshore near the mouth of Chatham Strait and the other half by net pen towing just outside the mouth of Port Armstrong, or inside the bay if necessary. Chum salmon will be released from each location as a single group, near the beginning of May. PAH strives to maintain a green egg to fry survival rate above 90%.

AKI strives to thermal mark 100% of the chum salmon incubated at PAH.

5.2 Egg Takes

Program Name	Ancestral stock(s)	Egg-Take Site	Primary or Alternate Source?	Current Year Egg Goal	Permitted Maximum
Armstrong chum salmon	Kadashan	PAH	primary	20,000,000	60,000,000
Armstrong chum salmon	Kadashan	HFH	alternate	0 ^a	30,000,000
Species/Run Totals				20,000,000	60,000,000

^aAn FTP is required before this activity can occur (renewal of activities previously permitted under 03J-1009).

5.3 Broodstock Capture Method

Returning chum salmon are from an enhanced run. Sex ratios will be sampled during the harvest to monitor run timing. In late July, when broodstock have sufficiently matured, three fish ladders are opened and adults recruit into raceways. An electro-anesthesia unit, attached to the raceways, is used during egg take.

5.4 Spawning

Approximately 20,000 chum salmon will be required for broodstock. Additional broodstock may be required if eggs are taken for HFH. Spawning takes place on a covered deck adjacent to the brood raceways. After being stunned with an electro-anesthesia unit, males and females are sorted and their gametes are collected. The eggs are transported by handcart to the incubation building, where fertilization and rinsing takes place. The fertilized eggs are loaded into R48 bulk incubators for incubation to the eyed stage.

5.5 Egg-take Schedule

Egg take generally begins around mid-July, and lasts for one to two weeks; however, it may be extended depending on run timing and pace of recruitment into the fish ladder. Between three and six million eggs can be taken in a day, depending on the number of ripe females available and their fecundities.

5.6 Carcass Disposal

The majority of carcasses will be sold to processors. Those carcasses not sold are collected daily in a small barge. Carcasses may also be given away and/or sold as bait. All remaining carcasses are driven approximately one mile offshore and discarded in Chatham Strait at a DEC-approved carcass disposal area.

5.7 Planned Releases this Calendar Year of Previous Brood Years' Production

Program Name	Brood Year	Release Date	Number to Release	Life Stage	Type of Mark & % Marked
Armstrong chum salmon	BY22	5/15/2023	32 million	fed fry	TM, 100%

5.8 Operational Diagram

Egg take, incubation, rearing & release at PAH or release in Chatham Strait

5.9 Fish Transport Permits

FTP #	Egg Take, Transport, or Release	Transport From & To	Maximal # & Life Stage	Expires
06J-1011	egg take & release	PAH to PAH	60,000,000 eggs	12/31/2025
15J-1016	transport & release	PAH to Port Lucy	30,000,000 eggs	12/31/2025
19J-1012	transport & release	PAH to offshore of PAH ^a	20,000,000 fed fry	06/01/2023

^a Vessel-transport release to be no more than 7.5 miles south and five miles east of PAH.

6.0 Evaluation

Coded wire tag and otolith sampling allows for apportioning returns to brood year, rearing strategy, and release strategy. AKI obtains CWT and otolith samples from three locations: common property commercial harvest, cost recovery harvest, and rack returns. AKI samples the rack and typically cost recovery harvest. Typically, other hatchery operators and ADF&G sample chum and coho salmon fisheries for CWTs and otoliths that include PAH returns. AKI strives to sample otoliths from pink salmon fisheries nearby to the hatchery, for example in District 9, when they occur. Our goal is for sampling to be representative of the return.

PAH's coho salmon contributions to common property fisheries are estimated by CWT recoveries, with sampling by AKI, ADF&G, and others. AKI's contribution to pink salmon common property fisheries will be estimated with the best available data, including otolith samples obtained by AKI from District 9 and possibly other areas. AKI's contribution to chum salmon common property fisheries will be estimated with the best available data, including otolith mark recoveries from NSRAA, SSRAA, and DIPAC's fishery evaluation programs.

AKI samples CWTs (coho salmon) and otoliths (pink and chum salmon) from cost recovery harvests and from the rack in years where there are two or more rearing and/or release groups (i.e., when fish are released in Chatham Strait or when coho are early-saltwater reared).

7.0 Harvest Management

7.1 *Special Harvest Areas*

Described in 5 AAC 40.081 District 9: Port Armstrong Special Harvest Area.

The AKI Special Harvest Area (SHA) for Chinook salmon is defined in regulation as the waters of Port Armstrong west of 134°39.47' W. longitude and is open for harvest by the hatchery permit holder beginning April 15. The SHA for chum, pink, and coho salmon includes the waters of Port Armstrong Bay enclosed by a line from Point Eliza at 56°17.73' N. latitude, 134°38.75' W. longitude to a point on the Baranof Island shoreline at 56°17.98' N. latitude, 134°38.35' W. longitude (Figure 1) and is open to harvest to the hatchery permit holder from June 15 through October 31. This area will be closed to common property commercial fishing by regulation from July 31 through September 30, unless opened by emergency order (EO) to harvest salmon surplus to cost recovery and broodstock needs, or for continued trolling by request of PAH.

Sport fishing will be open in the SHA. Sport fisheries will be managed by regional sport fishing regulations in effect for the Port Armstrong SHA. If necessary to protect broodstock, sport fishing may be closed by EO.

Port Herbert Special Harvest Area–Terminal Harvest Area.

The SHA for Port Herbert is designated within the PNP hatchery permit as waters within Port Herbert west of 134°39.70' W longitude,. Prior to August 15th, Port Herbert will be closed west of 134°44.30' W longitude. Prior to September 1st, waters off Nakvassin Creek will be closed inside a line from 56°26.51' N. latitude, 134°44.85' W. longitude to 56°26.33' N. latitude, 134°44.64' W. longitude to 56°26.53' N. latitude, 134°44.55' W. longitude (Figure 2). A hatchery permit holder

harvesting salmon within the SHA is exempt from the provisions of 5 AAC 33.310. Fishing periods for the hatchery permit holder will be opened and closed by emergency order by gear type. Notwithstanding 5 AAC 33.330, legal gear type for the hatchery permit holder in the SHA is purse seine, beach seine, gillnet, troll gear, and dip net. Additionally, AKI may be required to remove unharvested pink salmon remaining in the terminal harvest area should a significant number remain after common property fisheries have ceased.

Port Lucy Special Harvest Area–Terminal Harvest Area.

The SHA for Port Lucy is designated in the PNP hatchery permit as all waters of Port Lucy west of 134°40.0'W longitude (Figure 3). A hatchery permit holder harvesting salmon within the SHA is exempt from the provisions of 5 AAC 33.310. Fishing periods for the hatchery permit holder will be opened and closed by emergency order by gear type. Notwithstanding 5 AAC 33.330, legal gear type for the hatchery permit holder in the SHA is purse seine, beach seine, gillnet, troll gear, and dip net. AKI will be required to remove unharvested hatchery-produced chum salmon remaining in the terminal harvest area should a significant number remain after common property fisheries have ceased.

7.2 *Projected Return this Year*

Species, Run	Program Name	Projected Common Property Harvest	Return to Hatchery ¹	Total Projected Return & Current Year
Pink salmon BY 21	Port Armstrong	261,932	307,485	569,417
Pink salmon BY 20	Port Herbert	0	0	0
Coho salmon BY 20	Port Armstrong	55,099	55,099	110,198
Chum salmon BY 17-20	Port Armstrong	21,237	191,132	212,369
Chinook salmon	Port Armstrong	0	0	0

¹ Includes broodstock, cost recovery, escapement, etc.

7.3 *Common Property Fisheries Management*

Commercial Fisheries

Chinook Salmon

In 2023, PAH is not expecting any of their released adult Chinook salmon to return.

Chum Salmon

In 2023, PAH is expecting approximately 191,132 adult chum salmon to return to the hatchery at 0.5% ocean survival. The ancestral stock is HFH chum salmon, which return in July. If PAH chum salmon return through lower Chatham Strait, very few will likely be harvested in traditional purse seine fisheries, because lower Chatham Strait purse seine fisheries do not occur until August. Conversely, if PAH chum salmon enter inside waters through Cross Sound, harvest would be expected in traditional seine fisheries in northern Chatham and Icy Straits and the Hidden Falls THA. All chum salmon returning to the SHA in excess of broodstock requirements will be harvested for cost recovery by PAH. Common property openings targeting PAH chum salmon are not anticipated in the SHA; however, the outer bay portion of the SHA may be kept open for troll access when the inner bay is closed. Though unlikely, common property openings may be

necessary to harvest surplus fish in the SHA if cost-recovery harvesting is overwhelmed. PAH will maintain close contact with the Sitka Area ADF&G management staff throughout the return so the department can respond to unharvested surplus fish in a timely manner, should the need arise. PAH may request the outer bay be closed if broodstock collection or cost recovery falls below projection.

Pink Salmon

In 2023, AKI is predicting a return to Port Armstrong of approximately 307,485 adult pink salmon at 1.0% ocean survival. All pink salmon returning to the SHA in excess of broodstock requirements will be harvested by PAH for cost recovery. No common property openings targeting PAH pink salmon are anticipated in the SHA. Though unlikely, common property openings may be necessary to harvest surplus fish in the SHA if cost-recovery harvesting is overwhelmed. No pinks are expected to return to the Port Herbert rearing and release site this year. PAH will maintain close contact with the Sitka Area ADF&G management staff throughout the return so the department can respond to unharvested surplus in a timely manner, should the need arise.

Wild stock run timing in the most southerly portions of sections 9-A and 9-B overlap with the run timing of returning PAH pink salmon; therefore, a significant interception of pink salmon returning to PAH would be expected in these fisheries should they occur during mid to late August. Opportunities for traditional purse seine fisheries in the southern portions of sections 9-A and 9-B will be determined in season based on observations and abundance. In Section 9-A, traditional purse seine fisheries occur north of Armstrong Point. In recent years, few if any common property openings for seining have occurred in Section 9-A.

Coho Salmon

In 2023, PAH is expecting a total return of about 110,198 coho salmon. This estimate is based on an assumed 3.0% marine survival of a release of 3,673,263 brood-year 2020 smolts. Historically, about 50% of PAH coho salmon are harvested in common property fisheries, predominantly the traditional summer troll fishery in the outer coastal waters and lower Chatham Strait. That would lead to a return to the SHA in Port Armstrong of about 55,099 fish. All coho salmon returning to the SHA in excess of broodstock requirements will be harvested for cost recovery by PAH.

Sport Fisheries

Relatively small numbers of PAH salmon are caught in sport fisheries in Chatham Strait. Some targeted fishing may occur near Port Armstrong hatchery for coho salmon. Sport fisheries will be managed as described in regional codified regulations for the waters of Southeast Alaska. There are no special regulations for Port Armstrong. The department may use EO authority to address additional issues as they arise in season.

7.4 *Cost Recovery Harvest Management*

Species	CR goal
Chinook salmon	All Chinook salmon in terminal area.
Chum salmon	All chum salmon in terminal area.
Pink salmon	All pink salmon in terminal areas.
Coho salmon	All coho salmon in terminal area.

Pink salmon run timing is monitored via daily sex ratio sampling during the harvest activities. Initially, the early portion of the pink salmon return is managed to provide the highest quality flesh condition, as the preponderance of these fish are excess males. As the run progresses and more females begin to account for a larger share of the return, management emphasis may turn to harvesting strategies aimed at maximum roe value, with flesh quality being secondary. As a general practice, PAH and its contracted processor's harvester will strive to keep the outer portion of the SHA fully harvested each day in order to minimize any potential straying. PAH anticipates 7,485 pink salmon to be available for cost recovery, not counting fish that are lost to sea lion predation. Sufficient processing and tendering capabilities will be contracted to handle daily harvest amounts of nearly 800,000 lbs. if necessary.

In 2023, PAH anticipates a return of 171,132 chum salmon to be available for cost recovery in the SHA, again, not counting sea lion predation. Chum salmon should make a significant contribution to PAH's cost-recovery harvest. The chum salmon run generally ends before the first week of August, one to two weeks before the pink salmon harvest begins. PAH plans to contract a seiner to fish at least twice a week, to keep the SHA fully harvested.

Based on historical CWT and catch data, PAH anticipates that approximately 50% of returning coho salmon will be captured in the traditional summer troll fishery in the outer coastal waters of Baranof Island and lower Chatham Strait. Adult coho salmon not caught in common property fisheries typically begin arriving in the SHA in late August. The coho salmon return usually overlaps with the end of the pink salmon return. If requested by the processor, efforts may be made to harvest coho salmon and pink salmon separately. Coho salmon often completely segregate themselves from pink salmon within the inner bay. Definitive coho salmon harvest strategies may vary with changing conditions and different fish behavior.

8.0 APPROVAL

Recommendation for Approval: Port Armstrong Hatchery Annual Management Plan, 2023

Bryanna Torgeson, General Manager, Armstrong-Keta, Inc. 5/29/2023

Troy Tydingco, Area Management Biologist, Division of Sport Fish 5/31/2023

Aaron Dupuis, Area Management Biologist, Division of Commercial Fisheries 6/6/2023

Matt Catterson for Judy Lum, Regional Supervisor, Division of Sport Fish 6/2/2023

Lowell Fair, Regional Supervisor, Division of Commercial Fisheries 5/30/2023

Lorraine Vercessi, PNP Hatchery Program Coordinator, Div. of Commercial Fisheries 6/13/2023

Approval:

The 2023 Port Armstrong Hatchery Annual Management Plan is hereby approved:

Tom Taube, Deputy Director, Division of Sport Fish 6/15/2023

Forrest Bowers, Deputy Director, Division of Commercial Fisheries 6/22/2023

APPENDICES

Maps:

Figure 1. Location of Port Armstrong (SHA) in Southeast Alaska.

Historic production tables:

Table 1. Projected returns for the 2020 season.

Table 2. Pink salmon egg take, release, and survival data for Port Armstrong Hatchery.

Table 3. Coho salmon egg take, release, and survival data for Port Armstrong Hatchery.

Table 4. Chinook salmon egg take, release, and survival data for Port Armstrong Hatchery.

Table 5. Chum salmon egg take, release, and survival data for Port Armstrong Hatchery.

Table 6. Production summary.

Figure 1.- Location of Port Armstrong SHA in Southeast AK

Port Armstrong SHA

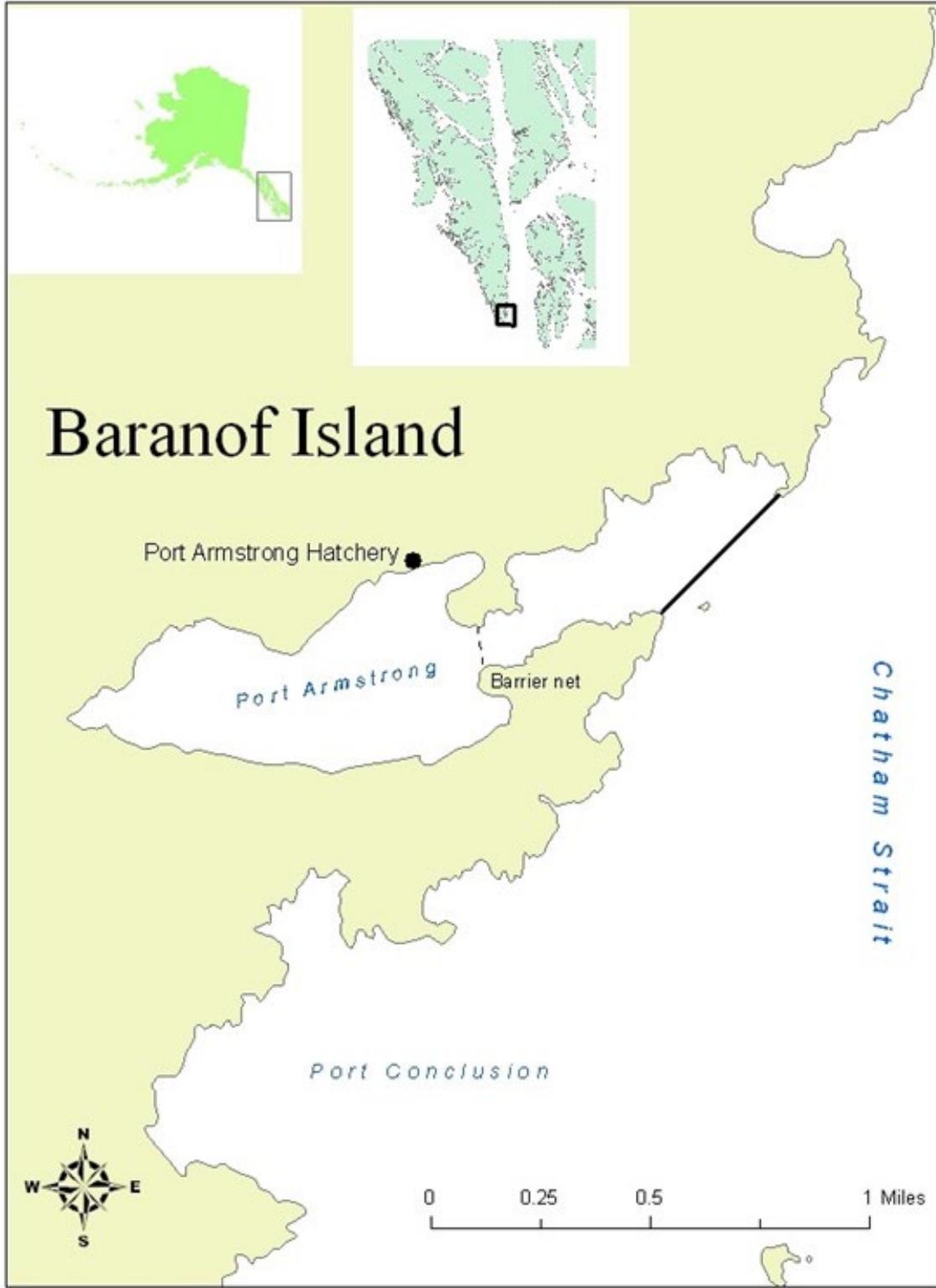


Table 1.-AKI projected returns for the 2023 season.

Species	Brood Year	Age	Fry/Smolt Released	Est. Marine Survival %	Percent at Age	Estimated Return	Estimated CP Harvest	Estimated Brood Stock	Estimated Cost Recovery
Pink	2021	2	56,941,710	1.00%	100%	569,417	261,932	300,000	7,485
							46%		
Coho	2020	3	3,673,263	3.00%	100%	110,198	55,099	7,000	48,099
							50%		
Chum	2020	3	13,208,266	0.5%	20%	13,208			
	2019	4	51,663,892	0.5%	70%	180,824			
	2018	5	37,185,005	0.5%	8%	14,874			
	2017	6	34,876,032	0.5%	2%	3,488			
	Total					212,394	21,237	20,000	171,132
							10%		

Table 2. – Pink salmon: egg take, release and survival data for Port Armstrong Hatchery, 1983-2022

Brood Year	Origin	Eggs Taken	Fry Released	% Fry Survival	Size Gram	Release Dates	Adult Return to Hatchery	% Return to Hatchery	Total Adult Return	% Marine Survival	Return Year
1983	Sashin Creek	2,900,000									
1983	Lovers Cove	6,100,000	7,400,000	82%	0.23	1984/3/5-4/12	74,000	1.00%	148,000	2.00%	1985
1984	Sashin Creek	2,800,000									
1984	Lovers Cove	8,400,000	7,500,000	67%	0.3	1985/4/29-5/23	30,098	0.40%	60,196	0.80%	1986
1985	Port Armstrong	13,630,000	9,676,000	71%	0.4	1986/5/1-7	275,976	2.85%	289,775	2.99%	1987
1986	Port Armstrong	14,520,000	12,350,000	85%	0.39	1987/4/15-25	24,061	0.19%	28,256	0.23%	1988
1987	Port Armstrong	20,940,000	19,370,000	93%	0.32	1988/4/18-24	75,066	0.39%	125,115	0.65%	1989
1988	Port Armstrong	17,150,000	16,040,000	94%	0.36	1989/4/24-29	903,378	5.63%	1,113,413	6.94%	1990
1989	Port Armstrong	24,000,000	22,420,000	93%	0.38	1990/4/28-5/1	1,097,622	4.90%	1,393,752	6.22%	1991
1990	Port Armstrong	53,710,000	50,116,000	93%	0.34	1991/5/5-15	2,041,595	4.07%	2,722,127	5.43%	1992
1991	Port Armstrong	41,849,000	39,616,000	95%	0.45	1992/5/2-6	358,967	0.91%	478,623	1.21%	1993
1992	Port Armstrong	58,108,000	51,189,000	88%	0.31	1993/4/27-5/5	1,260,758	2.46%	1,760,758	3.44%	1994
1993	Port Armstrong	58,668,000	43,000,000	73%	0.3	1994/4/26-5/4	843,954	1.96%	1,343,954	3.13%	1995
1994	Port Armstrong	59,416,000	53,839,000	91%	0.31	1995/4/24-5/3	1,266,381	2.35%	2,110,635	3.92%	1996
1995	Port Armstrong	81,360,000	72,480,000	91%	0.31	1996/4/27-5/7	1,246,342	1.72%	1,821,342	2.51%	1997
1996	Port Armstrong	91,286,000	81,012,000	89%	0.32	1997/4/25-5/10	1,426,978	1.76%	2,212,708	2.73%	1998
1997	Port Armstrong	80,071,739	75,776,850	95%	0.7	1998/3/31-4/27	3,522,588	4.65%	4,327,788	5.71%	1999
1998	Port Armstrong	86,619,007	73,269,304	85%	0.45	1999/4/26-6/7	204,618	0.28%	304,618	0.42%	2000
1999	Port Armstrong	89,082,366	85,638,750	96%	0.63	2000/4/24-5/8	1,362,561	1.59%	2,452,610	2.90%	2001
2000	Port Armstrong	52,992,615	52,343,525	96%	0.94	2001/4/20-6/4	1,104,959	2.10%	1,988,926	3.80%	2002
2001	Port Armstrong	78,906,537	72,663,780	92%	0.67	2002/5/1-6/12	598,569	0.82%	1,077,424	1.48%	2003
2002	Port Armstrong	90,366,055	83,470,980	92%	0.78	2003/4/24-5/29	1,184,027	1.42%	1,691,465	2.03%	2004
2003	Port Armstrong	89,675,516	83,835,050	94%	0.76	2004/4/21-6/2	1,015,299	1.21%	1,786,926	2.13%	2005
2004	Port Armstrong	88,040,126	80,110,972	91%	0.78	2005/4/28-5/31	356,371	0.44%	636,377	0.79%	2006
2005	Port Armstrong	87,610,268	78,172,288	89%	1.12	2006/5/27-6/1	672,207	0.86%	1,209,973	1.55%	2007
2006	Port Armstrong	85,617,687	78,211,021	91%	0.6	2007/6/2-6/7	52,113	0.07%	93,803	0.12%	2008
2007	Port Armstrong	64,478,274	61,734,194	96%	0.75	2008/5/20-5/28	793,488	1.29%	1,428,278	2.31%	2009
2008	Port Armstrong	23,204,712	21,438,507	92%	0.64	2009/5/6	759,488	3.54%	1,240,699	5.79%	2010
2009	Port Armstrong	59,858,384	53,677,075	89%	0.49	2010/4/29	658,638	1.23%	1,176,351	2.19%	2011
2010	Port Armstrong	85,090,195	75,506,078	89%	0.48	2011/5/3-5/7	163,538	0.22%	292,032	0.39%	2012
2011	Port Armstrong	85,870,462	82,734,292	96%	0.52	2012/5/1-2	1,086,035	1.31%	2,204,708	2.66%	2013
2012	Port Armstrong	53,598,205	52,120,334	97%	0.65	2013/4/25-5/4	310,959	0.60%	403,843	0.77%	2014
2013	Port Armstrong	87,840,626	79,659,097	91%	0.46	2014/4/18-5/7	451,741	0.51%	721,612	0.82%	2015
2014	Port Armstrong	93,185,785	87,664,878	94%	.5-.97	2015/4/20 – 5/6	151,347	0.17%	280,272	0.32%	2016
2015	Port Armstrong	103,883,660	97,116,922	94%	.61-.99	2016/ 4/13-4/19	758,455	0.78%	1,404,546	1.45%	2017
2016	Port Armstrong	55,134,038	52,820,574	96%	.52-.9	2019/4/28-5/14	194,535	0.37%	360,250	0.68%	2018
2017	Port Armstrong	82,198,745	77,904,453	95%	.42-.48	2018/4/30-5/8	212,640	0.27%	303,771	0.39%	2019
2018	Port Armstrong	40,206,672	36,787,073	91%	.77-.86	2019/5/5	802,469	2.18%	1,146,790	3.12%	2020
2019	Port Armstrong	41,737,626	38,930,384	93%	1.0-1.23	2020/4/28-5/12	170,226	0.44%	243,197	0.62%	2021
2020	Port Armstrong	64,671,802	60,706,053	94%	.65-.81	2021/5/12-5/17	286,118	0.47%	477,957	0.79%	2022
2021	Port Armstrong	65,248,359	56,941,710	87%	.60-.84	2022/5/23-5/24			569,417		2023
2022	Port Armstrong	53,604,539									2024

Table 3a. – Coho salmon: egg take, release and survival data for Port Armstrong Hatchery, 1988-2013										
Brood Year	Origin	Eggs Taken	Smolt Released	% Smolt Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Total Adult Return	Return Year
1988	Blanchard Lake	140,000	121,730	86.95%	24.3	5/16/1990	2	2.0%	2,442	1990
	(Deep Cove)						3	22.3%	27,090	1991
1989	Deer Lake (Sashin)	280,000	206,724	73.83%	19.6	5/25-26/1991	2	0.2%	488	1991
							3	19.4%	40,140	1992
1990	Deer Lake (Sashin)	230,180	164,766	71.58%	18.5	5/17-18/1992	2	0.1%	100	1992
							3	7.0%	11,493	1993
1991	Deer Lake	613,504	81,673	13.31%	17.2	5/23/1993	2	0.0%	-	1993
	(Deep Cove) - Abnormally low fry survival due to pipeline failure.						3	4.7%	3,805	1994
1992	Deer Lake (Sashin)	893,000	828,199	92.74%	18.4	5/20-30/1994	2	0.0%	312	1994
							3	10.4%	86,244	1995
1993	PAH	663,000	457,281	68.97%	17.6	5/28-29/1995	2	0.0%	15	1995
	Hidden Falls	217,000	184,525	85.03%	15.5	5/28/1995	3	5.1%	32,443	1996
							4	0.0%	97	1997
1994	PAH	1,098,000	751,566	68.45%	20.8	6/2/1996	2	0.0%	-	1996
	Hidden Falls	703,333	633,203	90.03%	18.7	5/31/1996	3	5.5%	76,488	1997
1995	PAH	1,830,000	952,000	52.02%	19.7	5/19-6/6/1997	2	0.2%	1,500	1997
	199,800 sub quality SWOW smolt released not expected to survive post release.						3	3.6%	33,801	1998
1996	PAH	1,853,000	123,850	35.11%	21.4	5/23/1998	2	0.0%	-	1998
	1,500,300 unfed fry released. No marine survival expected.						3	16.4%	20,244	1999
1997	PAH	748,779	625,363	83.52%	22.6	5/19-26/1999	2	0.0%	-	1999
							3	3.1%	19,589	2000
1998	PAH	1,585,368	1,358,299	85.68%	22.9	5/15-28/2000	2	1.8%	25,000	2000
							3	15.0%	203,619	2001
1999	Hidden Falls	1,400,000	975,549	83.83%	24.2	5/22-23/2001	2	0.4%	3,690	2001
							3	23.2%	226,409	2002
2000	Hidden Falls	1,775,298	1,468,761	82.70%	21.5	5/24-31/2002	2	0.1%	700	2002
							3	4.5%	66,355	2003
2001	PAH	1,861,605	1,331,351	71.52%	22.2	5/30/2003	2	0.0%	-	2003
							3	2.6%	34,724	2004
2002	PAH	1,576,659	1,340,985	70.51%	27.3	6/3-4/2004	2	0.0%	-	2004
	Hidden Falls	325,171					3	1.5%	19,444	2005
2003	PAH	2,338,298	1,581,050	67.62%	26.7	6/9/2005	2	0.0%	-	2005
							3	2.3%	36,238	2006
2004	PAH	1,287,880	2,616,063	86.21%	19.3	6/8/2006	2	0.1%	1,666	2006
	Hidden Falls	1,746,625					3	5.6%	145,393	2007
2005	PAH	2,933,857	2,156,500	73.50%	20.7	6/15/2007	2	0.0%	751	2007
							3	2.7%	59,038	2008
2006	PAH	3,296,075	2,509,128	76.12%	18.9	6/5/2008	2	0.1%	2,572	2008
							3	4.5%	113,254	2009
2007	PAH	3,702,400	3,148,462	85.04%	15	5/28/2009	2	0.0%	217	2009
							3	3.9%	123,552	2010
2008	PAH	4,287,737	3,223,867	75.19%	16.5	5/8&27/2010	2	0.0%	1,031	2010
							3	4.6%	148,756	2011
2009	PAH	3,494,400	2,274,860	65.10%	19.5	5/15-27/2011	2	0.0%	695	2011
							3	2.6%	58,332	2012
2010	PAH	2,421,000	2,380,474	85.28%	19.6	5/18-28/2012	2	0.0%	477	2012
							3	5.7%	135,869	2013
2011	PAH	2,499,209	2,243,392	89.76%	23.6	5/19-27/2013	2	0.0%	788	2013
							3	9.7%	250,555	2014

Table 3a. – Coho salmon: egg take, release and survival data for Port Armstrong Hatchery, 1988-2013										
Brood Year	Origin	Eggs Taken	Smolt Released	% Smolt Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Total Adult Return	Return Year
2012	PAH	3,010,994	2,466,514	81.90%	24.4	2014	2	0.2%	3,701	2014
							3	9.1%	223,802	2015
2013	PAH	2,358,046	1,944,904	82.50%	24.5	2015	2	1.1%	20,740	2015
							3	5.3%	103,141	2016
2014	PAH	2,911,992	2,192,592	75.30%	29-36	2016	2	1.0%	22,236	2016
							3	6.6%	191,736	2017
2015	PAH	2,886,214	2,061,012	71%	25-52	2017	2	0.6%	17,522	2017
							3	2.0%	56,880	2018
2016	PAH	5,023,610	4,006,231	80%	20-30	2018	2	0.1%	4,658	2018
							Annual report states all returns were BY2015			
2017	PAH	6,438,400	3,732,285	58%	28-31	2019	2	0.5%	18,566	2019
							3	2.0%	75,163	2020
2018	PAH	4,828,800	3,652,153	76%	24-27	2020	2	0.2%	6,324	2020
							3	1.3%	48,618	2021
2019	PAH	4,828,400	3,892,791	81%	20-25	2021	2	0.2%	7,528	2021
							3	2.4%	92,197	2022
2020	PAH	4,828,800	3,673,263	76%	20-27	2022	2	0.3%	12,302	2022
							3			2023
2021	PAH	4,587,351				2023	2			2023
							3			2024
2022	PAH	5,803,708				2024	2			2024
							3			2025

Table 4a. – Chinook salmon: egg take, release and survival data for Port Armstrong Hatchery, 1985-2002

Brood Year	Origin	Eggs Taken	Fry Released	% Fry Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Adult Return	Return Year
1985	Sashin (Unuk)	n/a	69,949	n/a	24.13	6/3/1987	2(minijack)	0.21%	150	1987
							3(jack)	0.42%	295	1988
							4	0.50%	351	1989
							5	1.50%	1,051	1990
							6	1.28%	896	1991
							BY85 TOTAL	3.92%	2,743	
1986	Sashin (Unuk)	80,000	75,602	94.50%	6.21	7/2/1987	n/a	0.00%	-	
							BY86 TOTAL	0.00%	-	
1987	Sashin (Unuk)	130,000	89,942	69.20%	35.04	5/18/1989	2(minijack)	2.97%	2,667	1989
							3(jack)	0.29%	264	1990
							4	0.20%	180	1991
							5	0.68%	615	1992
							6	1.33%	1,192	1993
							BY87 TOTAL	5.47%	4,918	
1988	Sashin (Unuk)	166,000	144,323	86.90%	38.72	5/16/1990	2(minijack)	0.24%	340	1990
							3(jack)	0.08%	121	1991
							4	0.06%	88	1992
							5	0.40%	584	1993
							6	0.19%	275	1994
							BY88 TOTAL	0.98%	1,408	
1989	Sashin (Unuk)	154,588	62,176	40.20%	40.25	5/26/1991	2(minijack)	0.19%	120	1991
						5/27/1991	3(jack)	0.16%	100	1992
							4	0.27%	170	1993
							5	0.29%	181	1994
							6	0.08%	48	1995
							BY89 TOTAL	1.00%	619	
1990	Sashin (Unuk), PAH	160,316	88,964	55.50%	25.6	5/26/1992	2(minijack)	0.00%	-	1992
	Snettisham Smolt	n/a	306,701	n/a	10.5	6/11/1992	3(jack)	0.10%	413	1993
			395,665				4	0.19%	734	1994
							5	0.08%	315	1995
							6	0.10%	398	1996
							BY90 TOTAL	0.47%	1,860	
1991	Sashin (Unuk), PAH	32,000	-	0.00%	-	1/1/1994	2(minijack)	0.00%	-	1993
	Snettisham Smolt		1,275,041	n/a	8.87	6/9/1993	3(jack)	0.00%	-	1994
							4	0.05%	594	1995
							5	0.00%	-	1996
							6	0.00%	-	1997
							BY 91 PAH smolt lost due to pipeline failure.			
							BY91 TOTAL	0.05%	594	
1992-2000	No Eggs Taken									
2001	Sashin (Unuk)	181,228	106,756	58.90%	31.68	5/20/2003	2 (minijack)	0.00%	-	2003
	Little Port Walter						3 (jack)	1.12%	1,200	2004
							4 yr old	1.55%	1,656	2005
							5 yr old	1.54%	1,644	2006
							6 yr old	0.26%	277	2007
							BY01 TOTAL	4.47%	4,777	
2002	Sashin (Unuk)	172,915	96,285	55.70%	44.81	5/8/2004	2 (minijack)	0.09%	83	2004
	Little Port Walter						3 (jack)	0.01%	8	2005
							4 yr old	0.05%	45	2006
							5 yr old	0.90%	862	2007
							6 yr old	0.06%	60	2008
							BY02 TOTAL	1.10%	1,058	

Table 4b. – Chinook salmon: egg take, release and survival data for Port Armstrong Hatchery, 2003-2007

Brood Year	Origin	Eggs Taken	Fry Released	% Fry Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Adult Return	Return Year				
2003	Sashin (Unuk)	240,465	83,479	34.70%	52.83	5/21/2005	2 (minijack)	0.00%	-	2005				
	Little Port Walter						3 (jack)	0.07%	57	2006				
							4 yr old	0.31%	262	2007				
							5 yr old	0.35%	291	2008				
							6 yr old	0.20%	169	2009				
							BY03 TOTAL	0.93%	779					
2004	Sashin (Unuk)	907,633	273,788	30.20%	42	5/5/2006	2 (minijack)	0.01%	18	2006				
	Little Port Walter						3 (jack)	0.01%	20	2007				
							4 yr old	0.03%	75	2008				
							5 yr old	0.12%	337	2009				
							6 yr old	0.01%	34	2010				
							BY04 TOTAL	0.18%	484					
2005	Sashin (Unuk)	215,440	148,631	69.00%	44.2	5/7/2007	2 (minijack)	0.07%	111	2007				
	Little Port Walter						3 (jack)	0.41%	608	2008				
							4 yr old	0.79%	1,180	2009				
							5 yr old	1.43%	2,125	2010				
							6 yr old	0.00%	-	2011				
							BY05 TOTAL	2.71%	4,024					
2006	Sashin (Unuk)	1,352,379	938,557	69.40%	4.3	6/25/2007	0 ocean (mini)	0.00%	-	2007				
	PAH - 0 check						1 ocean (jack)	0.00%	-	2008				
							2 ocean zero	0.00%	-	2009				
							3 ocean zero	0.00%	-	2010				
							4 ocean zero	0.00%	-	2011				
							0 check total	0.00%	-					
							PAH - 1 check	275,251	28.97	5/5/2008	2 (minijack)	0.19%	523	2008
											3 (jack)	0.22%	597	2009
											4 yr old	0.74%	2,046	2010
											5 yr old	1.16%	3,192	2011
					6 yr old	0.08%	213	2012						
							1 check total	2.39%	6,571					
							BY06 TOTAL	0.70%	6,571					
2007	Sashin (Unuk)	844,492	606,070	71.80%	7.03	6/9/2008	0 ocean (mini)	0.00%	-	2008				
	PAH -0 check						1 ocean (jack)	0.00%	-	2009				
							2 ocean zero	0.00%	-	2010				
							3 ocean zero	0.03%	132	2011				
							4 ocean zero	0.01%	70	2012				
							0 check total	0.04%	202					
							PAH -1 check	123,017	30.7	5/2/2009	2 (minijack)	0.17%	208	2009
											3 (jack)	0.31%	384	2010
											4 yr old	0.42%	520	2011
											5 yr old	0.33%	407	2012
					6 yr old	0.02%	30	2013						
							1 check total	1.26%	1,549					
							BY07 TOTAL	0.29%	1,751					

Table 4c. – Chinook salmon: egg take, release and survival data for Port Armstrong Hatchery, 2008-2013

Brood Year	Origin	Eggs Taken	Fry Released	% Fry Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Adult Return	Return Year
2008	Sashin (Unuk)	973,421	555,988	57.10%						
	PAH -0 check		429,612		8.35	6/3/2009	0 ocean (mini)	0.00%	-	2009
							1 ocean (jack)	0.00%	16	2010
							2 ocean zero	0.00%	20	2011
							3 ocean zero	0.07%	286	2012
							4 ocean zero	0.02%	95	2013
							0 check total	0.10%	417	
	PAH -1 check		126,376		50.2	5/8/2010	2 (minijack)	0.49%	620	2010
							3 (jack)	0.07%	92	2011
							4 yr old	0.47%	594	2012
							5 yr old	0.39%	494	2013
							6 yr old	0.04%	52	2014
							1 check total	1.46%	1,852	
							6 yr old	0.00%	6	2015
							1 check total	0.35%	920	
							BY09 TOTAL	0.71%	1,824	
2010	Sashin (Unuk)	833,753	273,553	32.80%						
	PAH - 0 check		120,458		16.05	5/15/2011	0 ocean (mini)	0.03%	34	2011
							1 ocean (jack)	0.01%	10	2012
							2 ocean zero	0.08%	94	2013
							3 ocean zero	0.12%	140	2014
							4 ocean zero	0.03%	35	2015
							0 check total	0.26%	313	
	PAH - 1 check		153,095		53	5/18/2012	2 (minijack)	0.11%	172	2012
							3 (jack)	0.08%	123	2013
							4 yr old	0.25%	384	2014
							5 yr old	0.32%	488	2015
							6 yr old	0.00%		2016
							1 check total	0.19%	295	
							BY10 TOTAL	0.16%	433	
2011	Sashin (Unuk)	737,644	314,938	42.70%						
	PAH -0 check		96,224		19.6	5/12/2012	0 ocean (mini)	0.00%	-	2012
							1 ocean (jack)	0.00%	-	2013
							2 ocean zero	0.00%	6	2014
							3 ocean zero	0.03%	32	2015
							4 ocean zero	0.00%	3	2016
							0 check total	0.04%	41	
	PAH -1 check		218,748		43.24	5/18/2013	2 (minijack)	0.57%	870	2013
							3 (jack)	0.00%	128	2014
							4 yr old	0.00%	1,116	2015
							5 yr old	0.00%	45	2016
							6 yr old	0.00%	-	2017
							1 check total	0.97%	2,159	
							BY11 TOTAL	0.68%	2,200	
2012	Sashin (Unuk)									
	PAH -0 check	384,073	238,629	62.10%	13.55	5/14/13	0 ocean (mini)	0.00%	-	2013
							1 ocean (jack)	0.10%	230	2014
							2 ocean zero	0.19%	445	2015
							3 ocean zero	0.00%	-	2016
							4 ocean zero	0.01%	30	2017
							BY12 total	0.30%	706	
2013	Sashin (Unuk)									
	PAH - 0 check	327,100	161,355	49.33%	14.7	2014	0 ocean (mini)	0.00%	-	2014
							1 ocean (jack)	0.05%	76	2015
							2 ocean zero	0.00%	-	2016
							3 ocean zero	0.27%	437	2017
							4 ocean zero	0.02%	33	2018
							BY13 total	0.34%	545	

Table 4d. – Chinook salmon: egg take, release and survival data for Port Armstrong Hatchery, 2014-2015

Brood Year	Origin	Eggs Taken	Fry Released	% Fry Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Adult Return	Return Year
2014	Sashin (Unuk)									
	PAH - 0 check	293,450	196,994	67.13%	17.5	5/8/2015	0 ocean (mini)	0.00%	-	2015
	(100,170 of these smolts were released at LPW)					thru	1 ocean (jack)	0.00%	-	2016
						7/28/2015	2 ocean zero	0.09%	181	2017
							3 ocean zero	0.24%	473	2018
							4 ocean zero	0.00%	-	2019
							BY14 total	0.33%	654	
2015	Sashin (Unuk)									
	PAH - 0 check	406,030	231,839	57.10%	18	6/30/2016	0 ocean (mini)	0.00%	114	2016
							1 ocean (jack)	0.05%	105	2017
							2 ocean zero	0.08%	196	2018
							3 ocean zero	0.00%	-	2019
							4 ocean zero	0.00%	-	2020
The Port Armstrong Hatchery Chinook program was suspended in 2015.										

Table 5a. – Chum salmon: egg take, release and survival data for Port Armstrong Hatchery, 1984-2006

Brood Year	Origin	Eggs Taken	Fry Released	% Fry Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Adult Return	Return Year
1984	Security Bay	1,236,400	702,540	56.8%	0.8	6/18/1985	3	0.00%	-	1987
	Camden	703,000	223,000	31.7%	1	6/6/1985	4	0.01%	90	1988
		1,939,400	925,540	47.7%			5	0.00%	2	1989
							BY84 TOTAL	0.01%	92	
1985	Security Bay	2,702,250	1,626,400	60.2%	0.84	5/19/1986	3	0.00%	27	1988
						6/9/1986	4	0.00%	46	1989
							5	0.00%	-	1990
							BY85 TOTAL	0.00%	73	
1986	Security Bay	2,171,103	1,982,450	91.3%	1.05	6/1/1987	3	0.01%	128	1989
							4	0.02%	363	1990
							5	0.00%	-	1991
							BY86 TOTAL	0.03%	491	
1987	Security Bay	1,506,500	1,287,060	85.4%	0.9	4/24/1988	3	0.07%	839	1990
							4	0.03%	396	1991
							5	0.00%	-	1992
							BY87 TOTAL	0.10%	1,235	
1988	Port Armstrong	46,571	42,500	91.3%	0.67	4/24/1989	3	2.17%	923	1991
						4/30/1989	4	0.30%	126	1992
							5	0.00%	-	1993
							BY88 TOTAL	2.47%	1,049	
1989	Port Armstrong	157,303	141,921	90.2%	0.56	5/1/1990	3	0.28%	400	1992
							4	0.00%	-	1993
							5	0.00%	-	1994
							BY89 TOTAL	0.28%	400	
1990	Port Armstrong	855,167	794,673	92.9%	0.51	5/5/1991	3	0.00%	-	1993
						5/15/1991	4	0.00%	-	1994
							5	0.00%	-	1995
							BY90 TOTAL	0.00%	-	
1991	Port Armstrong	444,453	423,000	95.2%	0.52	5/4/1992	3	0.00%	-	1994
							4	0.00%	-	1995
							5	0.00%	-	1996
							BY91 TOTAL	0.00%	-	
No eggs were taken from 1992-2002										
2003	Hidden Falls	10,000,826	9,306,909	93.1%	1.62	5/30/2004	3	0.06%	7,561	2006
	Gunnuk Creek	5,535,655	4,098,640	74.0%	1.99	4/21/2004	4	0.28%	37,471	2007
	TOTAL	15,536,481	13,405,549	86.3%	1.73		5	0.05%	7,098	2008
							6	0.01%	1,254	2009
						BY03 TOTAL	0.40%	53,384		
2004	Hidden Falls	12,914,888	574,958	4.5%	2.19	5/31/2005	3	0.05%	287	2007
							4	0.14%	799	2008
							5	1.09%	6,266	2009
							6	0.00%	-	2010
						BY04 TOTAL	1.28%	7,352		
2005	Hidden Falls	2,716,112	2,110,821	77.7%	2.93	6/1/2006	3	0.27%	10,294	2008
	Gunnuk Creek	1,911,488	1,770,390	92.6%	3.86	5/15/2006	4	2.91%	112,780	2009
	TOTAL	4,627,600	3,881,211	83.9%	3.35		5	0.21%	8,205	2010
							6	0.02%	719	2011
						BY05 TOTAL	3.41%	131,998		
2006	Hidden Falls	13,300,064	11,875,417	89.3%	1.59	6/2/2007	3	0.03%	5,012	2009
	Port Armstrong	5,049,447	4,654,882	92.2%	1.77	6/7/2007	4	0.18%	31,905	2010
	Gunnuk Creek	940,933	917,949	97.6%	3.27	5/24/2007	5	0.57%	100,239	2011
	TOTAL	19,290,444	17,448,248	90.5%			6	0.01%	2,476	2012
						BY06 TOTAL	0.79%	139,632		

Table 5b. – Chum salmon: egg take, release and survival data for Port Armstrong Hatchery, 2007-2017

Brood Year	Origin	Eggs Taken	Fry Released	% Fry Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Adult Return	Return Year	
2007	Port Armstrong	15,348,631	13,786,610	89.8%	2.14	5/28/2008	3	0.24%	33,501	2010	
							4	1.20%	166,072	2011	
							5	28.00%	38,726	2012	
							6	0.00%	587	2013	
							BY07 TOTAL	29.44%	238,886		
2008	Port Armstrong	13,104,587	12,417,244	94.8%	1.2	5/7/2009	3	0.06%	6,904	2011	
							4	1.03%	128,379	2012	
							5	0.31%	38,174	2013	
							6	0.00%	363	2014	
							BY08 TOTAL	1.40%	173,820		
2009	Port Armstrong	30,019,963	27,296,476	90.9%	1.21	4/27/2010	3	0.03%	7,520	2012	
							4	0.45%	128,029	2013	
							5	0.13%	38,070	2014	
							6	0.00%	762	2015	
							BY09 TOTAL	0.61%	174,381		
2010	Port Armstrong	30,479,861	28,444,881	93.3%	1.34	5/7/2011	3	0.01%	3,524	2013	
							4	0.08%	23,930	2014	
							5	0.08%	23,627	2015	
							6	0.00%	505	2016	
							BY10 TOTAL	0.18%	51,586		
2011	Port Armstrong	30,139,827	26,459,338	87.8%	1.91	5/1/2012	3	0.04%	10,152	2014	
						5/4/2012	4	0.19%	49,541	2015	
							5	0.06%	15,154	2016	
							6	0.02%	4,094	2017	
						BY11 TOTAL	0.30%	78,941			
2012	Port Armstrong	29,620,820	25,695,046	86.7%	1.78	4/25/2013	3	0.01%	2,286	2015	
						5/4/2014	4	0.12%	31,824	2016	
							5	0.48%	122,806	2017	
							6	0.01%	1,777	2018	
						BY12 TOTAL	0.62%	158,693			
2013	Port Armstrong	30,174,044	25,028,988	82.9%	2.42	4/30/2014	3	0.01%	3,031	2016	
								4	1.03%	257,892	2017
								5	0.21%	53,320	2018
								6	0.00%	526	2019
							BY13 TOTAL	1.25%	314,769		
2014	Port Armstrong	24,773,774	22,817,058	92.1%	3.04	4/11/2015	3	0.11%	24,561	2017	
								4	0.49%	111,971	2018
								5	0.10%	22,400	2019
								6	0.00%	301	2020
							BY14 TOTAL	0.70%	158,932		
2015	Port Armstrong	40,601,877	34,944,513	86.1%	2.66	3/23/2016	3	0.03%	10,664	2018	
						4/10/2016	4	0.44%	153,500	2019	
							5	0.00%	1,204	2020	
							6	0.00%	676	2021	
						BY15 TOTAL	0.48%	165,368			
2016	Port Armstrong	28,179,519	24,802,314	88.0%	2.01	5/5/2017	3	0.04%	10,800	2019	
								4	0.04%	10,539	2020
								5	0.01%	2,704	2021
								6	0.01%	2,683	2022
							BY16 TOTAL	0.11%	26,726		
2017	Port Armstrong	40,153,986	34,876,032	86.9%	1.34	5/4/2018	3	0.01%	3,011	2020	
								4	0.07%	23,659	2021
								5	0.03%	10,731	2022
								6	0.00%	0	2023
							BY17 TOTAL	0.11%	37,401		

Table 5c. – Chum salmon: egg take, release and survival data for Port Armstrong Hatchery, 2018-2022

Brood Year	Origin	Eggs Taken	Fry Released	% Fry Survival	Size Gram	Release Dates	Return Age	% Marine Survival	Adult Return	Return Year
2018	Port Armstrong	57,029,720	37,185,005	65.2%	1.99-2.76	5/8/2019-5/19	3	0.02%	6,760	2021
							4	0.25%	93,912	2022
							5	0.00%		2023
							6	0		2024
							BY18 TOTAL	0.27%	100,672	
2019	Port Armstrong	57,293,201	51,663,892	90.2%	1.99-2.76	5/6/2020-5/12	3	0.05%	26,832	2022
	box releases		17,723,855		2.74	5/8/2020-5/12	4	0.00%		2023
	white box		33,940,037		1.71	5/20/2020	5	0.00%		2024
							6	0.00%		2025
							BY19 TOTAL	0.05%	26,832	
2020	Port Armstrong	14,915,004	13,208,266	88.6%		5/11/2021	3	0.00%		2023
	larges		10,145,670			5/21/2021	4	0.00%		2024
	smalls		3,062,596			5/11/2021	5	0.00%		2025
	All chums released inside bay						6	0.00%		2026
							BY20 TOTAL	0.00%	-	
2021	Port Armstrong	17,285,000	15,817,167	91.5%			3	0.00%		2024
	Tow out		12,820,887				4	0.00%		2025
	Vessel release		2,996,280				5	0.00%		2026
							6	0.00%		2027
							BY21 TOTAL	0.00%	-	
2022	Port Armstrong	34,385,386		0.0%			3	0.00%		2025
							4	0.00%		2026
							5	0.00%		2027
							6	0.00%		2028
							BY22 TOTAL	0.00%	-	

Table 6. – Production Summary for Port Armstrong Hatchery 2021-2023

Species & Run	2021						2022												2023 (Current Year)								
	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June			
chum salmon	BY21	E		TM	TM						R		BY22	E	TM		TM							R			
		17.3M									15.8M				34.4M											~32.2M	
		PAH									PAH				PAH												PAH
pink salmon	BY21		E	TM				TM			R		BY22		E	TM		TM						R			
			65.2M								56.9M				53.6											~48M	
			PAH								PAH				PAH												PAH
coho salmon	BY20	E				TM		TM			R																
		4.8M									3.7M																
(Deep Cove/Sashin Stock)											PAH																
			BY21	E	TM			TM										T						R			
				4.6M																					~3M		
																									PAH		
															BY22	E	TM		TM								
														5.8M													
																	PAH										
Codes:		Egg take:	E				Tagging:	T				Release:	R				Thermal Marking:	TM									