

2018 ANNUAL MANAGEMENT PLAN

SOLOMON GULCH HATCHERY

Valdez Fisheries Development Association, Inc.

I. OPERATIONAL PLAN

This plan remains in effect until superseded by a new Solomon Gulch Hatchery (SGH) Annual Management Plan (AMP) in the following year. Valdez Fisheries Development Association (VFDA) will notify the department in a timely manner of any variation or deviation from this AMP. That notification will be in the form of a request to amend the AMP. No variation or deviation will be implemented until an AMP amendment has been officially approved by both the Alaska Department of Fish and Game (ADF&G) and VFDA. This policy applies to all hatchery operations covered under the AMP.

1.1 Egg-take Limits

Pink Salmon: The target number of pink salmon eggs is 270.0 million. Broodstock requirement is 408,702 fish, assuming:

- a. 1,700 eggs/female
- b. 50/50 female to male sex ratio
- c. 10% holding mortality
- d. 5% overripe/green fish
- e. 35,000 creek spawners (above and below weir)
- f. Adequate brood fish return to the brood exclusion zone (BEZ) and volitionally enter the hatchery. The escapement to the hatchery should be adequate to satisfy all broodstock needs and donors from other sources will not be required.

Coho Salmon: The target number of coho salmon eggs is 2.0 million. Broodstock minimum requirement is 1,000 fish, assuming:

- a. 4,700 eggs/female
- b. 50/50 female to male sex ratio
- c. 10% holding mortality
- d. 5% overripe/green fish

All eggs will be taken at SGH.

1.2 Broodstock Acquisition Schedule

Pink salmon

A minimum of 408,702 pink salmon are needed for entry into the fish ladder. VFDA will be guided in its broodstock collection as follows:

- 1) To ensure that the run timing is proportionally represented in broodstock, a collection schedule will be implemented based on the run-timing percentages by date, to establish a broodstock collection

goal by week. The collection schedule is based on historical run-entry data (Table 1).

- 2) Broodstock collection will be prioritized above cost recovery.
- 3) A BEZ will be established between SGH and Allison Point. This zone will be used to regulate the cost-recovery fleet to ensure broodstock and quality of sales fish. The BEZ is the area adjacent to the hatchery and inside Allison Point where brood fish traditionally stage.

Coho salmon

Broodstock collection will begin as fish return to the hatchery facility in late August through the end of September (Table 2). A formalin fungal treatment may be administered to these brood fish according to Investigational New Animal Drug (INAD) regulations to reduce broodstock losses while being held.

In the event that coho salmon broodstock needs cannot be met due to inadequate adult returns to SGH, coho salmon eggs may be collected from Corbin Creek for use at SGH in order to satisfy egg-take goals (FTP 12A-0123). The following conditions apply:

- 1) Regional ADF&G Division of Sport Fish staff (Prince William Sound (PWS) area management biologist (AMB)) and Division of Commercial Fisheries staff (PWS purse seine AMB) shall be notified far enough in advance to schedule a survey of Corbin Creek prior to any egg takes;
- 2) No egg takes will be allowed without escapement surveys conducted by representatives of VFDA or ADFG.
- 3) The following removal schedule will be adhered to:
 Stream Name: Corbin Creek
 AWC Code: 221-60-1138-2095
 Minimum Escapement Goal: 1,600 coho salmon
 Desired Escapement Goal (DEG): 2,500 coho salmon

If total escapement enumeration is:	Left in stream:	Removed for hatchery ¹
Less than 1,600 fish	1,600 + (60% over 1,600)	None
More than 1,600 fish	1,735 + (50% over 1,825)	90 + (50% over 1,825)
More than 1,825 fish	1,848 + (40% over 2,050)	203 + (60% over 2,050)
More than 2,275 fish	1,938 + (30% over 2,275)	338 + (70% over 2,275)
More than 4,149 fish	2,500	1,649

¹No more than half may be female and total take shall not exceed the specified egg-take goal. All pre egg-take mortalities count as part of the hatchery’s allocation. Such mortalities can only be replaced after the stream’s DEG is obtained and shall not exceed 25% of the hatchery’s adult take goal.

1.3 Egg take Schedule

The pink salmon egg-take schedule for 2018 is detailed in (Table 3) and is based on recent trends.

The coho salmon egg take will occur as fish ripen at the hatchery facility, from mid-September through the end of October. It is the intent of VFDA to keep the early coho salmon run on its historical schedule to optimize the sport fishery and processing markets.

1.4 Egg Transport and Broodstock Carcass Disposal Plans

Fertilized eggs or gametes intended for incubation will not be transported off-station. The carcass of a salmon from which the milt or eggs are extracted for lawful use as broodstock and not used for fertilization may be disposed if egg-take and carcass disposal information is recorded on ADF&G Salmon Hatchery Carcass Disposal Log (5 AAC 93.350(d)). If carcasses are disposed of, eggs not used for fertilization will not be removed from more than 10% of the female broodstock. If the carcasses disposed of, in which eggs are removed and sold, exceeds 10% of the female broodstock, the department will be notified immediately and proceeds from the sale of the eggs will be surrendered to the state. Broodstock carcasses will be processed in accordance with Alaska Department of Environmental Conservation (DEC) requirements and discarded into deep water. However, VFDA may sell broodstock carcasses if a market is available. Roe in excess of 10% of broodstock requirements may be removed, if a lawful use of those carcasses is available, and revenue from the roe is considered part of cost recovery.

Pink Salmon: Eggs taken at SGH will be fertilized and delivered (approximately 50 yards) to the incubation building for seeding and water hardening in deep matrix incubators. In 2018, VFDA will continue to establish nonhuman consumption markets for hatchery broodstock carcasses. Those broodstock carcasses that cannot be sold will be given away or ground and transported to deep water in Port Valdez. VFDA has received general hatchery operators and seafood processors permits to discharge ground fish waste (DEC permit 9240 DB006 2M and AK-G5200548). Grinding equipment was installed in 1995 to allow for efficient carcass disposal in the event there is no market for salmon broodstock carcasses. Nontraditional markets for utilization of this byproduct may also be sought. Beginning in 2010, a complete utilization of pink salmon carcasses associated with the egg-take and roe recovery was realized. Final sales and distribution agreements and procedures for 2018 have not been prepared at this time.

Coho Salmon: Eggs taken at SGH will be treated the same as the pink salmon eggs, with the exception that an iodophor egg disinfection treatment will also be given immediately after all eggs are loaded into the incubators. Coho salmon broodstock carcasses will be offered to the public for dog food, other nonhuman consumption uses or disposed of as needed by grinding and pumping into deep water if no other markets can be found.

1.5 Incubation Plans

Standard incubation plans for eggs spawned at SGH are summarized below:

Species	Incubator Type	Number of Units	Eyed Egg Loading (per unit)	Total Eyed Eggs	Total Green Eggs Required	Estimated Fry to Release
Pink salmon	NOPAD	672	283,196	190,307,712		
	S48	56	1,423,077	79,692,312	270,000,000	254,000,000
Coho salmon	NOPAD	16	125,000	2,000,000	2,000,000	1,780,000

The above table was generated with the following assumptions:

1. 94% survival from green egg to fry release for pink salmon.
2. 89% survival from green egg to smolt release for coho salmon.

All eggs will be incubated at the SGH during 2018.

1.6 Rearing and Release Plans

Pink Salmon: All pink salmon fry surviving from the 250 million eggs taken in 2017 will be reared and released at the SGH site in the spring of 2018. Fry will be pumped via a six-inch plastic pipe to the net pens. Outmigration from the incubators is non-volitional with enumeration by book inventory. Fish will be fed either by hand or with mechanical feeders using commercial rations. Pink salmon will be released by lowering a portion of the net pen’s side. Staggered releases will occur based on previous growth and the measured plankton population growth curve. It has been the experience at SGH, through extensive research, that the best runs occur from an early release on the zooplankton bloom rise and a very late release of large 0.75 to 1.0 gram fry. Approximately 65% of the fingerlings will be released at the plankton bloom and approximately 35% of the fingerlings held for late release. This schedule avoids the possible interference and hazards occurring near shore to the whole year class. Release timing may vary due to environmental conditions, work schedules, and abundance of predators.

Coho Salmon: VFDA is currently rearing approximately 1.95 million coho salmon fingerlings from the 2016 brood year. Rearing will continue in aluminum raceways until May 2018 when they will be transferred to saltwater net pens for grow-out to 18 to 20 grams. They will be released as yearling smolts in mid-June 2018. Feeding is done by a mechanical feeder using commercial rations. Twenty-thousand coho salmon smolts may be transferred to Tatitlek in May. They will be held in net pens for approximately 2-4 weeks for imprinting, fed commercial rations and released in mid-June. In October 2017, approximately 2.0 million coho salmon eggs were taken at SGH. They will be held in NOPAD incubators until swim-up in May 2018. The resultant fry will be reared in freshwater raceways until May 2019, when they will be transferred to saltwater net pens for grow-out to 18 to 20 grams. They will be released as yearling smolts in mid-June of 2019.

King salmon: ADF&G Division of Sport Fish has discontinued its stocking program of king salmon in the Valdez area. ADF&G continues to work with VFDA and the City of Valdez to locate a suitable king salmon terminal harvest release site. VFDA will be available to consult and assist with the program where necessary.

1.7 Fry Transport Methods

Twenty-thousand coho salmon smolts may be transported in tanks, by boat, to a saltwater net pen near Tatitlek. The transport will be done in fresh water, with salt added for stress reduction. Standard fish transport equipment, using recirculation and bottled oxygen, will be used and carried on board a transport vessel provided by the Village of Tatitlek.

1.8 Permitted Capacity

In 1981, VFDA was issued Private Nonprofit (PNP) hatchery permit #15. SGH is presently permitted for 270.0 million green pink salmon eggs, 2.0 million green coho salmon eggs, and 300,000 green king salmon eggs. All permitted releases are from the SGH, except for a 20,000 coho salmon smolt release at Tatitlek. In 2012, SGH experienced a poor run of coho salmon and as a result of minimal brood fish escapement to the hatchery, received FTP 12A-0123. If the coho salmon run to SGH is inadequate to meet egg-take goals, broodstock may be taken from the original donor stock of Corbin Creek as conditioned by the local AMB. The following table summarizes the current fish transport permits (FTPs) issued to VFDA.

Fish Transport Permit Number (FTP)	Expiration Date	Species	Purpose
16A-0018	8/15/2021	pink salmon	Allows the egg take, incubation, and resultant release of 270.0 million Vlassof/Gregorieff perpetual stock pink salmon eggs at SGH.
16A-0017	8/15/2021	pink salmon	Allows the egg take, incubation, and resultant release of 270.0 million Siwash stock pink salmon eggs at SGH.
86A-1007	12/31/2020	coho salmon	Allows the egg take, incubation, and resultant release of 2.0 million coho salmon at SGH.
15A-0072	6/30/2020	coho salmon	Allows transport of 20,000 coho salmon smolt from SGH to Boulder Bay for release at Tatitlek.
12A-0123	12/31/2022	coho salmon	Allows the egg take of 2.0 million from Corbin Creek to supplement egg-take goals if inadequate returns to SGH.

II. DONOR STOCK MANAGEMENT

Hatchery runs of pink and coho salmon are anticipated to be sufficient to meet broodstock goals in 2018 and no other donor stock management is anticipated.

III. HATCHERY RETURN MANAGEMENT

3.1 Probable Hatchery Fish Migration Routes and Timing

Data from tagging and commercial harvest indicates that returning hatchery fish normally follow the east and west shoreline of Valdez Arm and Narrows when entering Port Valdez. Hatchery fish often school inside Jack Bay on the north shore, and along both the northern and southern shores of Port Valdez.

Pink salmon broodstock selection for SGH has emphasized the earliest feasible timing to minimize intermixing of hatchery and wild stocks. Most of the hatchery pink salmon run should be present in the approach and terminal areas of Port Valdez between mid-June and mid-July. The run should be complete by the end of July.

3.2 Special Harvest Area

A 1,000 yard special harvest area (SHA) adjacent to the hatchery is described in the *SGH Management Plan* (5 AAC 24.366). This area is designated for the cost-recovery harvest of pink salmon in excess of broodstock needs. The SHA boundary prior to July 5 has been extended westward to include the terminal harvest area (THA), as shown in Figure 1. The hatchery operator will be permitted to harvest sales fish inside the THA until July 5. Beginning July 5, the SHA is redefined as all waters within a 1,000 yard radius of the terminus of Solomon Gulch Creek. In consultation with ADF&G, boundaries may be adjusted by emergency order (EO) in season for various run timing and run-size criteria.

Coho salmon taken for cost-recovery will be removed from the hatchery raceways. After September 3, 2018 (Labor Day), common property openings may occur in the THA and/or SHA to harvest surplus coho salmon. Based upon inseason assessment of wild stock escapement and other inseason considerations, the THA and SHA boundaries may be changed by EO to include portions, or all, of the Valdez Narrows subdistrict.

In the event the SHA is opened to the common property fisheries (CPF), the boundaries will be designated by a combination of shore markers and anchored buoys, or GPS lines. Shore markers may also be installed to designate boundaries of the THA. It will be the responsibility of VFDA to ensure the SHA markers and buoys are in place and meet the requirements of Alaska Wildlife Troopers (AWT). It is the responsibility of AWT to enforce the boundaries.

3.3 Hatchery Run to the Special Harvest Area (SHA)

Pink Salmon: VFDA's 2018 anticipated pink salmon run to SGH is 16.932 million fish, assuming a 7.01% marine survival from the 2016 fry release of 241,542,706 million fish. A total of 408,702 salmon will be needed to meet egg-take objectives at the hatchery. The 2018 harvest revenue goal is approximately \$4,535,596. The 2018 VFDA pink salmon run will be managed on meeting the revenue goal.

The number of pink salmon available to the CPF will depend on a combination of marine survival, average adult fish weight, and the price per pound received by VFDA for cost-recovery fish. Average adult weight and price per pound assumptions are the same for each case. The even-year brood marine survival rate varies from 0.65% at the low range to 15.5% at the high range.

VFDA's standard business plan is based on the average marine survival of 6.32% over its 35-year history. VFDA's projected marine survival for 2018 is 7.01%, based on the average of the last four, even-year runs. The ranges are based on the average of SGH's last four even-year runs, with a 50% reduction for the low and a 50% increase for the high. These projections are based on calculations from historical high and low mean data. The forecast range assumptions are generic predictions showing possible revenue scenarios for VFDA and CPF harvests. At the midrange, VFDA would achieve the revenue goal and the CPF harvest will approach 79.7% of the run. At the high range, VFDA would achieve the revenue goal and the common property harvest will approach 86.5% of the run. At the low range, VFDA will achieve its revenue goal and the CPF harvest will approach 59.4% of the run. If run strength falls below the low-range projection, VFDA may suffer a revenue shortfall. If there is a run failure, and revenue shortfall, VFDA would reduce the operating budget to an existence basis, pursue emergency loan relief, and use a portion of its run failure fund. The CPF would be reduced as much as possible.

VFDA will place all revenue from pink salmon roe sales into the operating budget to reduce any deficits from pink salmon fish sales. Any revenue generated from pink salmon roe or flesh sales in excess of the operating budget will be applied to debt retirement, CIPs, emergency funds, or carried to next year's revenue.

VFDA Pink Salmon Return Assumptions for 2018			
	Return Range		
	Low	Mid	High
% Survival	3.505%	7.010%	10.515%
Adult Return Estimate	8,466,072	16,932,144	25,398,216
Adult Average Weight	3.33	3.33	3.33
Price/lb.	\$0.45	\$0.45	\$0.45
Revenue Goal	\$4,535,596	\$4,535,596	\$4,535,596
Brood stock	408,702	408,702	408,702
Sales Fish Needed (Cost Recovery)	3,026,757	3,026,757	3,026,757
Total Fish Required by VFDA	3,435,459	3,435,459	3,435,459
Fish Surplus to Hatchery Needs (CPF Harvest)	5,030,612	13,496,684	21,962,756
% Contribution to CPF	59.4%	79.7%	86.5%

NOTE: This table does not provide an actual price/lb. because no fish sales have occurred. Therefore, all fish required by VFDA, and adult average weights are only estimates at this time.

Coho Salmon: The 2018 adult run of coho salmon to the hatchery is anticipated to be 85,111 fish,

assuming a 4.50% (last 5-year avg.) marine survival for the 2015 smolt release of 1,891,364. A total of 1,000 coho salmon will be needed to meet egg-take objectives. The harvest of coho salmon includes carcasses for human and animal consumption, and the harvest of roe for human consumption. The sales harvest goal of \$30,000 is based on an average weight of one pound of roe per coho salmon and an average price of \$3.00 per pound, 50% female. Due to unpredictable interception rates, surplus into the hatchery (cost-recovery sales), is highly variable and unpredictable, so VFDA will place all revenue from coho salmon sales into the operating budget to reduce any deficits from pink salmon sales. Any revenue generated from coho salmon roe or flesh sales, in excess of the operating budget, will either be used for debt retirement, CIPs, emergency funds, or the balance carried to next year's revenue.

VFDA's Coho Salmon Return Assumptions:

The 2018 VFDA coho salmon forecast is 85,111 fish, based on the last five-year average. Estimated harvest by hatchery and CPF groups vary greatly due to abundance, effort, and management goals. Below are estimates based on historic averages and best sampling surveys available at this time.

Broodstock	1,000	Sales harvest goal = \$30,000
Surplus in hatchery	<u>6,418</u>	
Total hatchery use	(8.7%) 7,418	
Commercial harvest (47.7%)	40,622	
Sport	(43.6%) <u>37,071</u>	
Total return	85,111	

NOTE:

- 1) VFDA average broodstock/surplus over previous 10-year period.
- 2) Commercial harvest available is remaining fish after Total hatchery use and Sport components were removed from the Total return.
- 3) Sport harvest 10-year avg. = 43.6% taken from ADF&G report 17-44 from 2007-2016.

3.4 Other Cost-recovery Harvests and Carcass Disposal

VFDA has pursued the option of selling surplus salmon roe for corporate revenue. A surplus results from fish rejected at the rack due to ripeness or eggs in excess of incubation needs. Since 2003, VFDA has processed surplus eggs into caviar with positive results. The results are intended to reduce round fish sales for cost recovery in the future.

Carcasses from broodstock with eggs rejected at the egg-take rack will be utilized and disposed in a manner consistent with appropriate salmon regulations and permitting requirements (5 AAC 93.350). Carcasses resulting from on-water egg recovery may be frozen and shipped to human and nonhuman consumption markets depending on quality.

3.5 Separation of Brood and Sales Fish

In 1993, VFDA designated a BEZ within and adjacent to the SHA (Figure 1). The purpose for minimizing

commercial harvesting in this exclusion zone is to protect broodstock fish that have staged along the tide flats inside of Allison Point and adjacent to SGH. This method of protection has proven to be very effective at giving sanctuary to broodstock fish, while still allowing cost-recovery harvesting to proceed elsewhere in the SHA. Both cost-recovery and common property harvesting may occur within the BEZ should circumstances favor a commercial opening.

Broodstock will be collected by volitional entry through the fish ladder leading into the concrete raceways located just above tidal influence at the hatchery.

3.6 Probable CPF Exploitation Rates of Hatchery Fish

It is the intent of ADF&G to provide an escapement for the stated corporate revenue goal. Effective management of mixed stock fisheries is difficult. Achievement of this goal depends upon precise inseason assessment of both wild stock and hatchery run strengths. Depending upon the precision of inseason run assessment, the actual percentage provided for corporate escapement may fall above or below the stated goal.

Pink Salmon: The exploitation rate of hatchery fish (the percent contribution to the CPF) ultimately depends on the strength of the hatchery run, the average weight, fish price and management actions taken by the ADF&G in the Valdez Arm area to assist the hatchery in meeting its economic escapement goals. VFDA's goal is to provide as much of its hatchery production as possible to the CPF.

Coho Salmon: If the anticipated hatchery run of 85,111 is realized, a CPF exploitation rate of 91.3% would allow sufficient fish into the hatchery to meet sales and broodstock objectives. It is possible that the combined exploitation rates of the commercial and sport fleets will be substantially below this level, thereby allowing significant numbers of surplus fish to move into the hatchery. In this case, these fish will be harvested and sold by the hatchery operator.

3.7 Management Strategies

This will be the 35th year of pink salmon returns to SGH. Management of the SGH pink salmon run is governed by a regulatory management plan adopted by the Alaska Board of Fisheries in December 1986 (5 AAC 24.366). This plan directs ADF&G to manage the Valdez Narrows subdistrict and waters of Valdez Arm north of the latitude of Rocky Point to assist in achievement of SGH pink salmon cost-recovery and broodstock escapement goals.

Pink Salmon Returns: The SGH THA will be opened by EO for the hatchery operator to harvest fish for sale beginning in middle to late June. VFDA hatchery staff will conduct a daily sampling program that will provide sex ratio and daily cost-recovery harvest data for the hatchery run. Hatchery staff will provide this information to ADF&G Cordova Division of Commercial Fisheries area management biologists on a daily basis to facilitate a regulated harvest of surplus fish. Daily data collection will be evaluated against the anticipated run entry and revenue table built from historical timing data of the Solomon Gulch stock (Table 1). As the run progresses, cost-recovery information and run strength estimates will be updated each day.

The season opening in the Eastern and Northern districts is based on the strength of the early natural pink

and chum salmon stocks returning to these districts. Because these districts have the earliest wild stock systems in the Sound, the Eastern and Northern districts are generally the first seine districts to open. Openers are not likely to occur until wild stock escapements can be evaluated.

The cost-recovery fleet will fish aggressively to keep the cumulative cost-recovery revenue on or ahead of the cost-recovery goal (Table 1). ADF&G will manage the commercial CPF in the Valdez Narrows subdistrict according to the cost-recovery revenue goal. If sex ratio trends and harvest rates indicate that the broodstock and sales goals cannot be met, then more extensive closures expanding into Valdez Arm may be implemented on subsequent Eastern District openings.

Closed waters at the head of Port Valdez described in 5 AAC 24.350(3) (O) create a boundary near the hatchery that is difficult for seiners to legally fish during openings inside Port Valdez. This important boundary protects hatchery broodstock and sales fish during Port Valdez openings, and as a result, often commands attention by enforcement personnel. After wild stock and corporate escapement needs have been adequately addressed, VFDA recommends that ADF&G adjust the closed water boundaries, as necessary inside Port Valdez, to efficiently harvest available surpluses near the hatchery. Should boundaries near the hatchery be adjusted for openings inside Port Valdez, VFDA will ensure that closed waters protecting its corporate escapement are clearly marked by buoys prior to a fishery. Changes to boundaries will be described in ADF&G fishery announcements.

When inseason timing data indicates that broodstock and sales goals will likely be achieved, the Valdez Narrows subdistrict may be opened for a common property seine harvest. The preferred strategy for openings inside Port Valdez will be to provide a minimum of a 200-yard closure to seining off Allison Point. This closure will protect broodstock in the BEZ, provide fish for cost-recovery harvesting and reduce conflict between sport and commercial fisheries.

Aggressive cost-recovery harvesting and timely commercial openings will be used to prevent a large buildup of pink salmon inside Port Valdez. VFDA will provide daily estimates to ADF&G of the quantity and quality of fish being harvested near the hatchery. If surplus fish build up in front of the hatchery, a common property opening may occur in waters of the THA, SHA, and/or BEZ to harvest fish surplus to hatchery needs.

If early wild stock returns of pink and chum salmon to the Eastern District are too weak to warrant regular openings in early July, surplus SGH pink salmon will be harvested in the Valdez Narrows subdistrict and the Solomon Gulch THA. The duration and frequency of openings of the Valdez Narrows subdistrict will depend upon the magnitude of the run. Recognizing the limitations of the hatchery run assessment in Port Valdez, efforts will be taken to harvest the surplus hatchery production expeditiously to preserve the highest possible quality.

Due to the early run timing of the SGH stock, broodstock and cost-recovery goals must be met by late July. After this time, the Valdez Narrows and Arm will be managed for wild stocks.

3.7.1 Wild Stock vs. Hatchery Stock

Some interception of naturally occurring wild pink salmon occurs, both in the CPF targeting SGH fish and in the hatchery cost-recovery harvest.

The waters at the head of Port Valdez east of 146°30'37" W longitude (THA) normally remain closed during August and September for protection of wild stock pink and chum salmon. This closure should allow sufficient protection for returning hatchery coho salmon and no further management action is anticipated. However, if a harvestable surplus of wild pink salmon exists, commercial CPF openings may occur.

3.7.2 Coho Salmon Hatchery Stock

VFDA requests that ADF&G manage the coho salmon run to ensure adequate broodstock at the hatchery (Table 2). Hatchery runs of coho salmon should be sufficient to meet desired egg-take goals.

3.8 Sport Fish Harvest

The Port of Valdez and Valdez Arm supports the largest component of the sport fishery in PWS. The pink salmon sport fishery is the largest in the state. Other species harvested include king, sockeye, coho, and chum salmon. The stocking of large numbers of pink and coho salmon was initiated by VFDA in the early 1980s. The contribution of these runs became noticeable in the sport fishery in 1985, with sharp increases in angler effort and pink salmon harvests. Coho salmon harvests also began increasing, but at a slower rate. The Port of Valdez and Valdez Arm freshwater and saltwater fisheries averaged 64,349 angler days of sport fishing for the last ten years, 2007-2016. This recreational activity provides a valuable economic resource for the community of Valdez.

The pink salmon sport fishery is primarily a shore-based fishery with an average of 65% of the harvest taken by shoreline anglers. The 2016 harvest of pink salmon by both shoreline and boat anglers was 12,748 fish. Important access locations for shoreline anglers include Allison Point, Dayville Road, and the city dock. This sport fishery is generally more active during weekends and usually peaks during the first week of July. Peak angler and commercial fishing activity typically coincides with the peak of the pink salmon run. Potential for conflict between the two user groups exists, especially at Allison Point.

The coho salmon sport fishery of Valdez area (Arm and Port) begins in late July and continues through Labor Day weekend. Based on a 10-year average (2007–2016) sport harvest of coho salmon in that area averaged 37,071 fish. ADF&G manages the Port of Valdez to reduce conflicts between the commercial and sport user groups by excluding commercial fishing within the Port of Valdez and the Valdez Narrows from August 15 through Labor Day. However, the department may designate open areas for commercial harvest within Port Valdez if a buildup of surplus salmon occurs during the August 15 to Labor Day closure. In 2018, the commercial fishery in Port Valdez will reopen on September 4 to target SGH produced coho salmon.

3.9 Personal Use and Subsistence Harvests

SGH contributes some fish to the sport and subsistence salmon harvest by Tatitlek residents. An agreement has been completed between VFDA and the Tatitlek Corporation to resume stocking 20,000 coho salmon in June 2011. This remote stocking program had been temporarily on hold from 2004 through 2010 due to transfer and rearing problems. When coho salmon smolts are transferred to Boulder Bay (near Tatitlek Creek) for remote release, 873 (4.50% smolt to adult survival rate) coho salmon are

expected to return annually. It is expected that after commercial interceptions, the majority of these fish will be taken for subsistence use. Subsistence fishing is not legal in the Solomon Gulch SHA.

3.10 Avoidance of Nontarget Species

The potential for interception of non-target fish in the SHA is not fully known; however, no significant harvest has been recorded. All non-target species found will be released when practical. Deliveries will be monitored for species composition and harvest by species will be recorded on fish tickets.

IV. EVALUATION STUDIES

4.1 Otolith Thermal Marking/Coded-Wire-Tagging

In 1997, otolith thermal marking replaced coded-wire-tagging as the preferred method for stock identification. Since 1997, all brood years of pink salmon fry have been otolith thermal marked at SGH. Thermal marking the otolith provides the ADF&G divisions of Commercial Fisheries and Sport Fish AMBs with more timely and accurate run information. ADF&G's Mark, Tag, and Age Laboratory in Juneau has issued SGH a 6H otolith thermal mark. BY18 pink salmon fry will be otolith thermal marked.

Coho salmon otolith thermal marking began with BY 2000. All coho salmon year classes will be otolith thermal marked with the same mark as the SGH pink salmon, 6H. Few wild coho salmon stocks exist near the hatchery, where most of the sport and commercial fishery takes place.

List of Tables

Table	Page
1. VFDA pink salmon run entry, CPF catch, fish sales, and broodstock collection schedule.....	15
2. VFDA 2018 adult coho salmon return projection	16
3. VFDA 2018 pink salmon egg-take projection schedule	17

List of Figures

Figure	Page
1. Solomon Gulch Hatchery fishing and protection zones of Port Valdez.....	18

Table 1: Pink salmon run entry for Solomon Gulch Hatchery, 2018

: First day brood collection based on anticipated % female at approximately 15%.
 : Marine Survival % and Expected Weight is based on last 4 even year return average.
 : Run entry % based on the historic odd and even returns using cost recovery and CPF harvests.
 : Price per pound may not be current with actual in season sales.

Marine Survival	7.010%	Green Egg Requirement	270,000,000
CPF Contribution	79.7%	Minimum Brood Req.	408,702
Fry Released	241,542,706	Fish Sales Required (\$4,535,596
Expected Return	16,932,144	Fish Sales Required (3,026,757
Expected Catch C	13,496,684	Expected Weight (lbs.	3.33
Expected Return C	3,435,459	Expected Average Pr	\$0.450
Revised	8-Jan-18		

Date	Total Run Entry				C. P. F. Catch		Cost Recovery Fish Sales				Brood Antici-			
	% Entry	Cum % Entry	Fish/ Day	Cum. Fish	Fish/ Day	Cum. Fish	Fish/ Day	Cum. Fish	Revenue	Cum \$	Collection	Brood Female	ated % Date	
11-Jun														11-Jun
12-Jun														12-Jun
13-Jun														13-Jun
14-Jun														14-Jun
15-Jun														15-Jun
16-Jun														16-Jun
17-Jun	0.0%	0.0%	0	0	0	0	0	0	\$0	\$0				17-Jun
18-Jun	0.0%	0.0%	169	169	139	139	30	30	\$45	\$45				18-Jun
19-Jun	0.0%	0.0%	169	339	139	278	30	61	\$45	\$91				19-Jun
20-Jun	0.1%	0.1%	8974	9313	7370	7648	1604	1665	\$2,404	\$2,495			12.2	20-Jun
21-Jun	0.1%	0.1%	9482	18795	7787	15435	1695	3360	\$2,540	\$5,035			14.2	21-Jun
22-Jun	0.1%	0.2%	13207	32002	10846	26281	2361	5721	\$3,538	\$8,572			9.9	22-Jun
23-Jun	0.2%	0.4%	30647	62649	25169	51500	5478	11999	\$8,209	\$16,782			10.6	23-Jun
24-Jun	0.2%	0.6%	39960	102609	27817	79267	7143	18342	\$10,704	\$27,486	5000	5000	16.3	24-Jun
25-Jun	0.8%	1.4%	138505	241114	103746	183013	24759	43101	\$37,101	\$64,587	10000	15000	13.8	25-Jun
26-Jun	0.8%	2.2%	135965	377079	96660	279673	24305	67406	\$36,421	\$101,008	15000	30000	16.3	26-Jun
27-Jun	1.2%	3.4%	198614	575693	148110	427783	35504	102910	\$53,203	\$154,210	15000	45000	14.4	27-Jun
28-Jun	2.4%	5.8%	404678	980371	317339	745122	72340	175249	\$108,401	\$262,611	15000	60000	17.1	28-Jun
29-Jun	2.0%	7.7%	330685	1311056	256572	1001694	59113	234362	\$88,580	\$351,191	15000	75000	17.9	29-Jun
30-Jun	2.2%	10.0%	377925	1688981	290368	1292062	67557	301919	\$101,235	\$452,426	20000	95000	15.2	30-Jun
1-Jul	2.4%	12.3%	401630	2090612	309836	1601898	71795	373714	\$107,584	\$560,010	20000	115000	19.5	1-Jul
2-Jul	6.0%	18.4%	7021855	3112467	819190	2421088	182665	556379	\$273,723	\$833,733	20000	135000	19.6	2-Jul
3-Jul	3.3%	21.6%	551988	3664455	433316	2854404	98672	655051	\$147,860	\$981,594	20000	155000	23.8	3-Jul
4-Jul	4.7%	26.3%	788699	4453154	627713	3482117	140986	796037	\$211,268	\$1,192,862	20000	175000	27.0	4-Jul
5-Jul	6.7%	33.0%	1138856	5592010	915276	4397393	203580	999617	\$305,064	\$1,497,926	20000	195000	30.9	5-Jul
6-Jul	6.5%	39.6%	1107870	6699880	889829	5287222	198041	1197658	\$296,764	\$1,794,690	20000	215000	26.8	6-Jul
7-Jul	2.8%	42.4%	480365	7180245	374496	5661718	85869	1283527	\$128,675	\$1,923,365	20000	235000	32.4	7-Jul
8-Jul	6.2%	48.6%	8224281	8324281	832406	6494124	186630	1470157	\$279,665	\$2,203,030	25000	260000	33.4	8-Jul
9-Jul	5.3%	53.9%	900282	9124563	714349	7208474	160933	1631089	\$241,158	\$2,444,187	25000	285000	37.4	9-Jul
10-Jul	5.7%	59.5%	958359	10082922	762045	7970518	171314	1802404	\$256,715	\$2,700,902	25000	310000	30.7	10-Jul
11-Jul	3.9%	63.5%	667804	10750726	523428	8493947	119375	1921779	\$178,884	\$2,879,786	25000	335000	42.0	11-Jul
12-Jul	4.1%	67.6%	691678	11442404	543035	9036982	123643	2045422	\$185,279	\$3,065,065	25000	360000	44.1	12-Jul
13-Jul	3.5%	71.1%	598213	12040617	466277	9503259	106935	2152357	\$160,243	\$3,225,308	25000	385000	48.8	13-Jul
14-Jul	3.4%	74.5%	574846	12615463	447088	9950347	102758	2255116	\$153,983	\$3,379,291	25000	410000	47.0	14-Jul
15-Jul	2.4%	76.9%	407895	13023358	309981	10260328	72915	2328030	\$109,263	\$3,488,554	25000	435000	53.6	15-Jul
16-Jul	4.4%	81.3%	747046	13770404	588506	10848933	133541	2461571	\$200,110	\$3,688,664	25000	460000	48.5	16-Jul
17-Jul	6.4%	87.7%	1082133	14852538	868693	11717527	193440	2655011	\$289,870	\$3,978,534	20000	480000	54.9	17-Jul
18-Jul	0.7%	88.5%	125975	14978513	88456	11805983	22519	2677530	\$33,745	\$4,012,279	15000	495000		18-Jul
19-Jul	2.5%	91.0%	428383	15406896	336806	12142789	76577	2754107	\$114,751	\$4,127,030	15000	510000	63.2	19-Jul
20-Jul	2.9%	93.9%	488662	15895558	391309	12534099	87352	2841459	\$130,897	\$4,257,927	10000	520000		20-Jul
21-Jul	0.7%	94.6%	125637	16021194	93178	12627276	22459	2863918	\$33,654	\$4,291,581	10000	530000	58.0	21-Jul
22-Jul	1.4%	96.0%	240606	16261800	192596	12819872	43010	2906928	\$64,451	\$4,356,032	5000	535000	36.0	22-Jul
23-Jul	1.1%	97.1%	181005	16442805	148649	12968521	32356	2939284	\$48,486	\$4,404,517		535000	50.5	23-Jul
24-Jul	0.8%	97.9%	136812	16579616	112356	13080876	24456	2963740	\$36,648	\$4,441,165		535000	58.5	24-Jul
25-Jul	0.6%	98.5%	94651	16674267	77731	13158607	16920	2980660	\$25,354	\$4,466,519		535000	49.0	25-Jul
26-Jul	0.2%	98.6%	25398	16699665	20858	13179465	4540	2985200	\$6,803	\$4,473,322		535000	45.0	26-Jul
27-Jul	0.9%	99.5%	152051	16851716	124870	13304336	27180	3012380	\$40,730	\$4,514,052		535000	49.0	27-Jul
28-Jul	0.0%	99.5%	0	16851716	0	13304336	0	3012380	\$0	\$4,514,052			55.5	28-Jul
29-Jul	0.3%	99.8%	46563	16898279	38240	13342575	8324	3020704	\$12,473	\$4,526,525			54.0	29-Jul
30-Jul	0.0%	99.8%	0	16898279	0	13342575	0	3020704	\$0	\$4,526,525			57.0	30-Jul
31-Jul	0.2%	100.0%	26076	16924355	21414	13363990	4661	3025365	\$6,985	\$4,533,510			61.0	31-Jul
1-Aug	0.0%	100.0%	0	16924355	0	13363990	0	3025365	\$0	\$4,533,510			53.0	1-Aug
2-Aug	0.0%	100.0%	7789	16932144	6396	13370386	1392	3026757	\$2,086	\$4,535,596			59.5	2-Aug
3-Aug	0.0%	100.0%	0	16932144	0	13370386	0	3026757	\$0	\$4,535,596			61.5	3-Aug

*Total brood collection includes volitional entrants

Table 2
2018 Adult Coho Salmon Return Projection for VFDA

DATE	% ENTRY	# Daily	# Cum.	BROOD	
				DAILY	CUM.
8/18/18	1.05%	890	890		
8/19/18	1.26%	1,070	1,960		
8/20/18	1.25%	1,068	3,028		
8/21/18	1.26%	1,070	4,098		
8/22/18	1.90%	1,614	5,712		
8/23/18	0.64%	549	6,261		
8/24/18	2.09%	1,780	8,041		
8/25/18	2.09%	1,780	9,822		
8/26/18	2.98%	2,532	12,354		
8/27/18	2.34%	1,988	14,342		
8/28/18	2.34%	1,988	16,329		
8/29/18	2.22%	1,886	18,216		
8/30/18	3.63%	3,088	21,304		
8/31/18	4.92%	4,183	25,487		
9/1/18	6.03%	5,133	30,620	50	50
9/2/18	6.64%	5,650	36,270	50	100
9/3/18	5.76%	4,905	41,175	50	150
9/4/18	4.35%	3,706	44,881	100	250
9/5/18	2.18%	1,859	46,740	100	350
9/6/18	3.84%	3,270	50,010	100	450
9/7/18	3.73%	3,178	53,188	100	550
9/8/18	3.87%	3,293	56,481	250	800
9/9/18	4.30%	3,662	60,143	200	1,000
9/10/18	4.75%	4,040	64,183		
9/11/18	1.98%	1,681	65,864		
9/12/18	2.93%	2,493	68,357		
9/13/18	2.11%	1,799	70,156		
9/14/18	1.86%	1,587	71,743		
9/15/18	1.60%	1,385	73,108		
9/16/18	1.63%	1,434	74,542		
9/17/18	0.73%	620	75,163		
9/18/18	0.46%	394	75,557		
9/19/18	0.45%	381	75,937		
9/20/18	0.26%	221	76,159		
9/21/18	0.25%	212	76,371		
9/22/18	0.28%	240	76,611		
9/23/18	0.27%	231	76,841		
9/24/18	0.11%	92	76,934		
9/25/18	0.11%	92	77,026		
9/26/18	0.21%	182	77,208		
9/27/18	0.18%	155	77,363		
9/28/18	0.18%	155	77,517		
9/29/18	0.18%	157	77,674		
9/30/18	0.18%	157	77,831		
10/1/18	0.01%	9	77,840		
10/2/18	0.01%	9	77,849		
10/3/18	0.54%	457	78,306		
10/4/18	0.54%	464	78,769		
10/5/18	0.55%	466	79,235		
10/6/18	0.91%	775	80,010		
10/7/18	0.91%	773	80,782		
10/8/18	0.91%	775	81,557		
10/9/18	0.91%	773	82,330		
10/10/18	0.39%	330	82,660		
10/11/18	0.38%	321	82,980		
10/12/18	0.48%	406	83,386		
10/13/18	0.12%	101	83,488		
10/14/18	0.12%	99	83,587		
10/15/18	0.42%	360	83,946		
10/16/18	0.42%	360	84,306		
10/17/18	0.32%	270	84,576		
10/18/18	0.32%	270	84,846		
10/19/18	0.31%	265	85,111		
		85,111			

Date	Daily %	Daily # Eggs	Cummulative # Eggs
7/25/18	0.00%	-	-
7/26/18	3.57%	9,642,858	9,642,858
7/27/18	3.57%	9,642,858	19,285,716
7/28/18	0.00%	-	19,285,716
7/29/18	0.00%	-	19,285,716
7/30/18	5.36%	14,464,287	33,750,003
7/31/18	5.36%	14,464,287	48,214,290
8/1/18	7.14%	19,285,716	67,500,006
8/2/18	7.14%	19,285,716	86,785,722
8/3/18	7.14%	19,285,716	106,071,438
8/4/18	0.00%	-	106,071,438
8/5/18	0.00%	-	106,071,438
8/6/18	7.14%	19,285,716	125,357,154
8/7/18	7.14%	19,285,716	144,642,870
8/8/18	7.14%	19,285,716	163,928,586
8/9/18	7.14%	19,285,716	183,214,302
8/10/18	5.36%	14,464,287	197,678,589
8/11/18	0.00%	-	197,678,589
8/12/18	0.00%	-	197,678,589
8/13/18	5.36%	14,464,287	212,142,876
8/14/18	5.36%	14,464,287	226,607,163
8/15/18	5.36%	14,464,287	241,071,450
8/16/18	3.57%	9,642,858	250,714,308
8/17/18	3.57%	9,642,858	260,357,166
8/18/18	0.00%	-	260,357,166
8/19/18	3.57%	9,642,834	270,000,000
8/20/18	0.00%	-	270,000,000
8/21/18	0.00%	-	270,000,000
8/22/18	0.00%	-	270,000,000
8/23/18	0.00%	-	270,000,000
	100.00%	270,000,000	

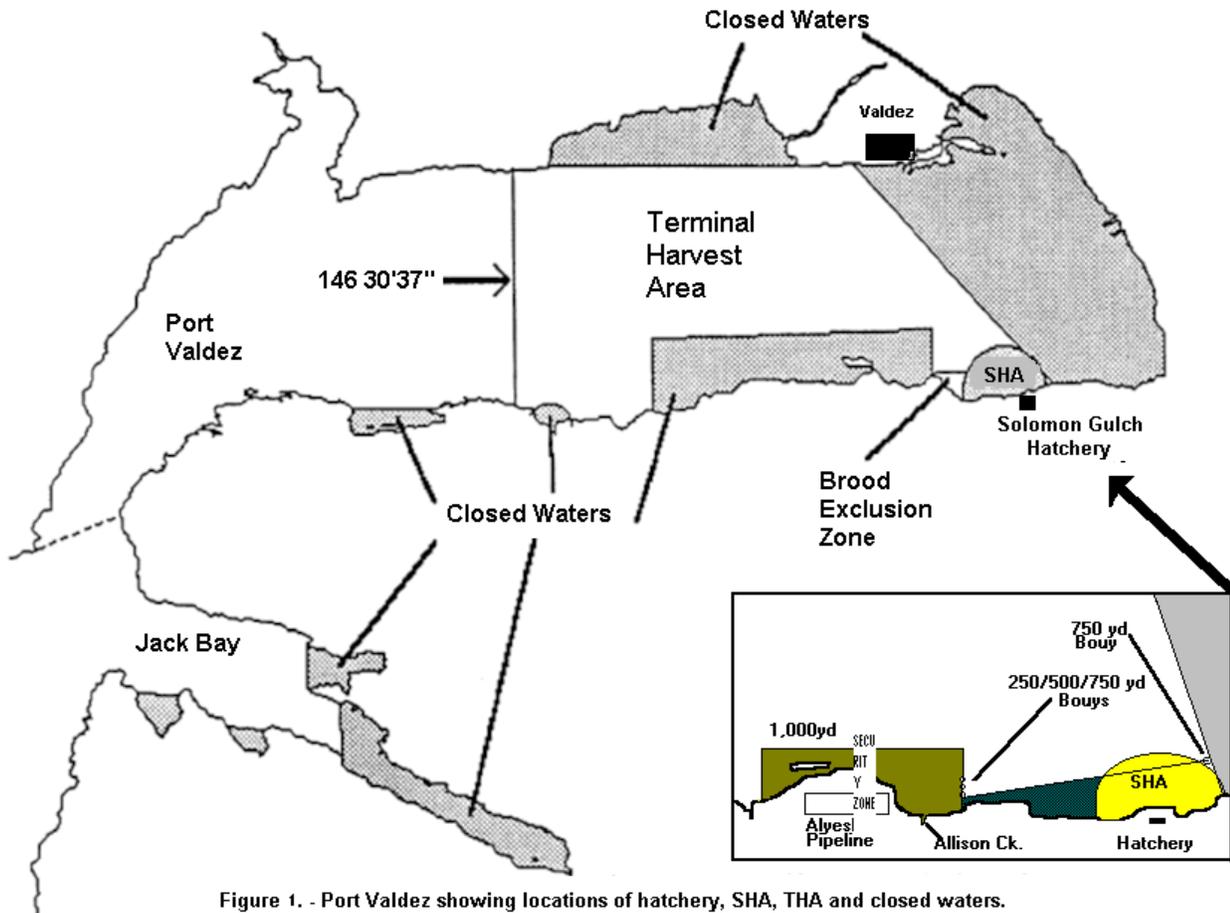


Figure 1. - Port Valdez showing locations of hatchery, SHA, THA and closed waters.

V. APPROVAL

Recommendation for Approval: Solomon Gulch Hatchery Annual Management Plan, 2018

Approved via email 4/26/2018

Bernard Culbertson, Board President, Valdez Fisheries Development Assoc.

Approved via email 4/30/2018

Jay Baumer, Area Management Biologist, Div. of Sport Fish

Approved via email 5/8/2018

Charles Russell, Area Management Biologist, Div. of Commercial Fisheries

Approved via email 5/1/2018

Tom Vania, Regional Supervisor, Div. of Sport Fish

Approved via email 5/1/2018

Bert Lewis, Regional Supervisor, Div. of Commercial Fisheries

Approved via email 5/8/2018

Ethan Ford, Regional Resource Development Biologist, Div. of Commercial Fisheries

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

Approved via email 5/10/2018

Thomas Sheridan, RPT Chairman

Approved via email 5/8/2018

Lorraine Vercessi, PNP Hatchery Program Coordinator, Div. of Commercial Fisheries

Approval: The 2018 Solomon Gulch Hatchery Annual Management Plan is hereby approved.

Approved via email 5/9/2018

Tom Taube, Deputy Director, Div. of Sport Fish

Approved via email 5/10/2018

Peter Bangs, Assistant Director, Div. of Commercial Fisheries