BASIC MANAGEMENT PLAN
Klawock River Hatchery
Southern Southeast Regional Aquaculture Association

I. Introduction

In 1977, the State of Alaska built Klawock River Hatchery (KRH). The KRH is located in Klawock, Alaska, adjacent to Klawock River, on the west coast Prince of Wales Island, southern southeast Alaska. The facility is accessible by road; site location coordinates are 55.55003N, 133.04719W. The state has a land lease agreement with Klawock-Heenya Corporation for the KRH site.

The Alaska Department of Fish and Game (ADF&G) operated the hatchery from 1978 through mid-1993. The facility is state owned, with operations contracted to the City of Klawock in 1993 and permitted under private nonprofit (PNP) Hatchery Permit No. 36. Subsequently, Prince of Wales Hatchery Association, Inc. (POWHA) was contracted to operate the facility in 1996 and issued PNP Hatchery Permit No. 38.

Through the operation of KRH, POWHA has worked closely with the Southern Southeast Regional Aquaculture Association (SSRAA). In 2015, POWHA notified the state of their decision to relinquish their hatchery permit contingent upon approval of a permit for to operate KRH. In March 2016, SSRAA submitted a PNP hatchery permit application proposing to operate KRH. This basic management plan (BMP) describes SSRAA's planned operations and management of KRH production, with a maximum permitted capacity of 5 million coho salmon green eggs and 1 million sockeye salmon green eggs.

II. Goals

2.1 Production Goals

Production of coho salmon has occurred at KRH since 1980. Production of sockeye salmon occurred from 1990–2005. SSRAA has no immediate plans for sockeye salmon production, but will maintain the capacity for potential future projects.

Maximum permitted capacity: 5 million coho salmon green eggs and 1 million sockeye salmon green eggs.

2.2 Broodstock Source

The ancestral broodstock source for KRH coho salmon is Klawock River. The broodstock source for KRH coho salmon production is existing returns to KRH.

Klawock River was also the broodstock source for the former sockeye salmon program. The last sockeye salmon release from KRH was in 2005. No hatchery-produced sockeye salmon return to Klawock River.

2.3 Broodstock Development

Since 1980, KRH has been producing coho salmon. Returns to the hatchery are fully established.

Klawock River sockeye salmon may be used to develop broodstock in the future.

2.4 Release numbers and locations

The resultant progeny of up to 5 million Klawock River stock coho salmon green eggs will be released. Juvenile coho salmon may be transferred to freshwater net pens in Klawock Lake, reared to smolt stage, and released into the lake. After freshwater rearing in Klawock Lake, coho salmon smolt may be transferred to saltwater net pens in Klawock estuary for short-term rearing prior to release. Up to 250,000 juvenile coho salmon may be transported to a remote release site at Port Asumcion for short-term saltwater rearing and release. Fish transport permits and annual management plans may further limit release numbers at each location.

There are no permitted release sites for sockeye salmon.

2.5 Principal Project Goals

It is SSRAA's goal to provide salmon for local common property fisheries, to stimulate economic growth on Prince of Wales Island. Klawock River Hatchery will contribute an estimated 130,000 adult coho salmon annually to the common property fisheries (commercial, sport, personal use, and subsistence), along the west coast Prince of Wales Island, primarily within the Craig and Klawock areas. In addition to common property fisheries, local economic

benefit is provided through direct employment at the hatchery and indirectly to support industries.

2.6 Annual Fish Culture Objectives

1) Maintain adult broodstock capture and holding protocols to maximize adult survival to spawn.
2) Maximize egg to fry survival to attain 68% or better over the life of the program.
3) Produce quality smolt for release at optimum ocean conditions each year and thereby maximize marine survival.
4) Maximize facility efficiency and benefit-to-cost ratio.
5) Maximize contribution to common property fisheries.
6) Share knowledge of program with agencies through publications, presentations at conferences, and interaction with local colleges, schools, and colleagues in the Pacific Northwest.

III. Hatchery Operations

3.1 Water Supply and Distribution

KRH is located adjacent to Klawock River (Anadromous Waters Catalogue #103-60-10470). ADF&G has water rights for up to 20 cubic feet per second of water from Klawock Lake near the mouth of Klawock River for hatchery use (DNR ADL#79921). The water distribution system uses gravity flow from Klawock Lake. The pipeline is 650 feet of 30-inch high-density polyethylene (HDPE). The majority of the pipeline is buried between the water intake at the lake and the hatchery. Water use to all incubation and rearing containers is single-pass. A backup pump is available in case of water system failure.

The Klawock Lake watershed contains a natural run of sockeye salmon, which limits possible sockeye salmon production at KRH due to infectious hematopoietic necrosis virus (IHNV) concerns. A disease-free water source or water depuration system will be required prior to production of sockeye salmon at KRH. It is required that all life stages of sockeye salmon be reared on a depurated water supply until release.

3.2 Facility Description

The KRH facility includes the hatchery complex, a weir across Klawock River, a fish ladder leading from Klawock River to the freshwater adult raceways and spawning area, net pen complexes for rearing in Klawock Lake and the Klawock River estuary, a dock at Klawock Lake, and several outbuildings.

The hatchery complex houses the office, storage, shop, and incubation and rearing room. The incubation room contains rows of Kitoi box, or other style, incubators where coho salmon eggs are held through hatch and swim-up. Coho salmon fry are ponded into freshwater net pens in Klawock Lake, until release or transport to saltwater net pens in the Klawock River estuary.

3.3 Fish Culture

All fish cultural procedures followed at KRH will conform to all applicable ADF&G fish health protocols and policies. Additional isolation and disinfection measures are required for sockeye culture. Hatchery staff will be familiar with the signs of common fish diseases and will continuously monitor hatchery stocks to detect disease outbreaks. Outbreaks will be reported immediately to the ADF&G Fish Pathology Section, and their recommendations will be followed.

3.3.1 Sockeye salmon

Prior to sockeye salmon culture, a detailed operational plan to address fish culture protocols, pathology concerns regarding IHNV biosecurity issues, water depuration for incoming water, and rearing of fish will be required. KRH will adhere to all biosecurity recommendations made by the ADF&G Fish Pathology staff.

3.3.2 Coho salmon

Beginning in September of each year, adult coho salmon voluntarily ascend the fish ladder and are held to ripen in broodstock holding raceways. Males and females are sorted and held in separate raceways while ripening. Coho salmon egg takes usually occur from late October to mid-November.

Coho salmon gametes are collected at the hatchery using standard procedures, including iodine disinfection. Eggs from up to three females are removed, placed into a container, and fertilized with milt from two males; or in ratios as appropriate. Once fertilized, eggs are rinsed with freshwater, placed into an incubator, and water hardened in an iodine solution. Initial green eggs estimates are based on assumed fecundity as they are seeded into the incubators. All equipment used for spawning and fertilization is disinfected with an iodine solution daily.

Eggs will be treated for fungus with formalin, as necessary. At the eyed stage of development, eggs will be shocked and picked. Live eggs will be enumerated prior to being placed into the incubators. Fry estimates may be based on egg loss on the fry screen of incubators.

At swim-up, juvenile coho salmon will be ponded and transported to freshwater net pens for initial rearing in Klawock Lake. Fry are reared in net pens in Klawock Lake until released, or placed in net pens in Klawock River estuary for short-term rearing and release. Target release size is 20-gram smolt, with release timing planned for May. While rearing in the net pens, fish will be fed a commercial fish feed diet.

IV. Fisheries Management

ADF&G will attempt to meet the following management priorities for the KRH:

1) to allow for an coho salmon escapement to the lake of 4,000–9,000 fish;
2) to achieve the broodstock requirement of approximately 3,500 coho salmon;
3) to allow for a cost-recovery harvest of hatchery coho salmon up to the value established as the hatchery's revenue goal;
4) to allow for a commercial common property harvest of any hatchery-produced fish within the KRH SHA surplus to escapement, broodstock, and cost recovery needs.

4.1 Commercial Fisheries

4.1.1 Coho salmon

Existing commercial fisheries intercept approximately 65% of the estimated total return of KRH produced coho salmon. The majority of the return is harvested in troll fisheries on the west coast of Prince of Wales Island, with the remainder intercepted in seine fisheries occurring in Districts 103 and 104. Additional harvest also occurs throughout the Southeast Alaska troll fishery. The gillnet fleet intercepts a few KRH produced coho salmon in Districts 101 and 106.

Returns of coho salmon to the Klawock River weir should be adequate to meet the escapement goal range of 4,000–9,000 fish, broodstock needs of 3,500 fish, and provide cost-recovery harvest opportunity to support operation of KRH.

4.1.2 Sockeye salmon

Sockeye salmon were released from KRH from 1990-2005. Little is known about the contribution rate of KRH sockeye salmon to commercial fisheries in the area. Contribution of SSRAA sockeye salmon will depend on the project location.

4.2 Special Harvest Areas

Cost recovery may be conducted at the Klawock weir or in the Klawock SHA as described in 5 AAC 40.051, *District 3: Klawock Inlet and River Special Harvest Area*.

(a) The Klawock Inlet and River Special Harvest Area consists of the waters of Klawock Inlet and Harbor south of the latitude of Cemetery Point and north of 55°32′N lat., and any of the hatchery raceways and holding ponds contiguous with the hatchery access ladder from Klawock River for broodstock and cost recovery of coho salmon.
(b) A hatchery permit holder harvesting salmon within the special harvest area is exempt from the provisions of 5 AAC 33.310. The open fishing season within the Klawock Inlet and River Special Harvest Area for the hatchery permit holder is from July 1 through November 30. Additional fishing periods may be established by emergency order.
(c) Notwithstanding 5 AAC 33.330, legal gear types for the hatchery permit holder in the special harvest area are purse seine, beach seine, dip net, gillnet, and troll gear.

Maps of the Klawock Inlet and River Special Harvest Area the Port Asumcion Special Harvest Area can be found in Figures 1 and 2.

4.3 Sport Fishery

Sport fisheries will be managed in accordance with regulations as provided in 5 AAC 47 – 5 AAC 75. Emergency orders may be issued to liberalize or restrict sport fisheries based on achievement of broodstock goals.

4.3.1 Saltwater Sport Fisheries

Returning coho salmon of KRH origin are captured by sport fisheries in the marine waters near Prince of Wales Island and in the Klawock River. Contributions of coho salmon to the marine boat sport fishery are estimated through the recovery of coded wire tags (CWT) placed in KRH coho salmon. The recent ten-year (2005-2014) average harvest of coho salmon in the Prince of Wales area marine sport fishery is 66,757 annually (Romberg et. al. *In prep*). The recent ten-year average contribution of KRH coho salmon to the marine sport fishery harvest is 7% annually.

Currently, the marine sport fishery for coho salmon is managed under the regionwide limit of 6 fish per day and 12 in possession year-round. The department may use emergency order (EO) authority to address issues inseason.

4.3.2 Freshwater Sport Fisheries

Sport harvest of coho salmon in Klawock River is significant, and occurs from late July through September each year. CWT information is not collected from the freshwater sport fishery, however analysis of marked otoliths recovered at the hatchery indicate that 99 percent in 2013 and 92 percent in 2014 of the coho salmon escapement were KRH returns (2015 KRH Annual Management Plan). The recent ten-year (2005-2014) average harvest of coho salmon in the Klawock River sport fishery is 1,926 fish annually (Romberg et. al. *In prep*).

The entire Klawock River watershed is open to sport fishing for coho salmon and is managed under the regionwide limit of 6 fish per day and 12 in possession. By regulation, fishing is closed within 300 feet of the installed weir. By regulation, bait is allowed in the Klawock River downstream of the weir from September 15 to October 15. The department may use EO authority to address issues inseason.

4.4 Subsistence Fishery

4.4.1 State Subsistence Fisheries

The Alaska Board of Fisheries (BOF) established a state subsistence fishery whereby Alaskan residents are allowed harvest opportunity under provisions of a subsistence permit obtained from the department. The department has established harvest limits of 20 coho salmon per day, with a 40 coho salmon annual limit, in the customary and traditional use area in the Klawock River

estuary and lake. Allowable fishing gear in state waters includes dip nets, hand beach seines, hand purse seines, spears, and cast nets throughout the July 1–October 31 fishing season. Use of rod and reel is not an allowable gear type in this fishery.

4.4.2 Federal Subsistence Fisheries

A federal subsistence fishery on Klawock River is authorized under federal regulations by permit for residents of Prince of Wales Island. The fishery allows for a harvest of 20 coho salmon per day with no annual limit. Permitted gear includes rod and reel with bait (bait is only allowed from September 15–November 15), dip net, hand snagging lines, and spears. Local U.S. Forest Service representatives are available for information regarding the federal subsistence fishery on the Klawock River.

V. Special Operational Requirements

5.1 Coded Wire Tagging

In order to estimate contribution rates of KRH coho salmon to common property fisheries the coho salmon released from KRH will be finclipped and coded wire tagged at a rate to be determined by the department and detailed in the Annual Management Plan (AMP. All groups of released fish will be reported to the ADF&G Mark, Tag, and Age Laboratory (MTA Lab).

Tag recoveries in commercial fisheries (port sampling program), sport fisheries (creel census program), and the contribution estimates generated by ADF&G will be used in all marine survival calculations. Heads from coho salmon missing adipose fins will be recovered in the escapement in conjunction with cost recovery, terminal harvest, and egg take operations; all heads will be sent to the MTA Lab for processing. Escapement and survival data will be reported to ADF&G in an annual report.

5.2 Otolith Marking

Coho salmon eggs incubated at KRH may be otolith marked at a rate of 100%. Though the department does not currently have a broad program to sample common property harvests for marked otoliths to determine contribution rates, otolith marking will allow for assessment of contribution in other organizations' mark recovery programs and of straying rates of hatchery returns in local streams.

5.3 Escapement Monitoring

A weir across Klawock River disrupts natural migration of salmon and trout in and out of Klawock Lake. The weir will be operated as described in the AMP to allow for escapement and capture of coho salmon for cost-recovery and broodstock needs. The sustainable escapement goal (SEG) for Klawock River is a range of 4,000 to 9,000 coho salmon, counted as they are passed upstream of the KRH weir. A weekly coho salmon escapement schedule, provided in the AMP, is followed to pass coho salmon upstream, proportionate to historical run timing, to meet the midrange goal of 6,500 coho salmon into the lake. Other weir operation requirements

detailed in the AMP include installation and removal dates, and instructions on data and reporting requirements.

VI. Approval

The Basic Management Plan for the Klawock River Hatchery is hereby approved.

_____ _____

Scott Kelley Date
Alaska Department of Fish and Game
Director, Division of Commercial Fisheries

_____ _____

Tom Brookover Date
Alaska Department of Fish and Game
Director, Division of Sport Fish

VII. Appendices

7.1 Maps

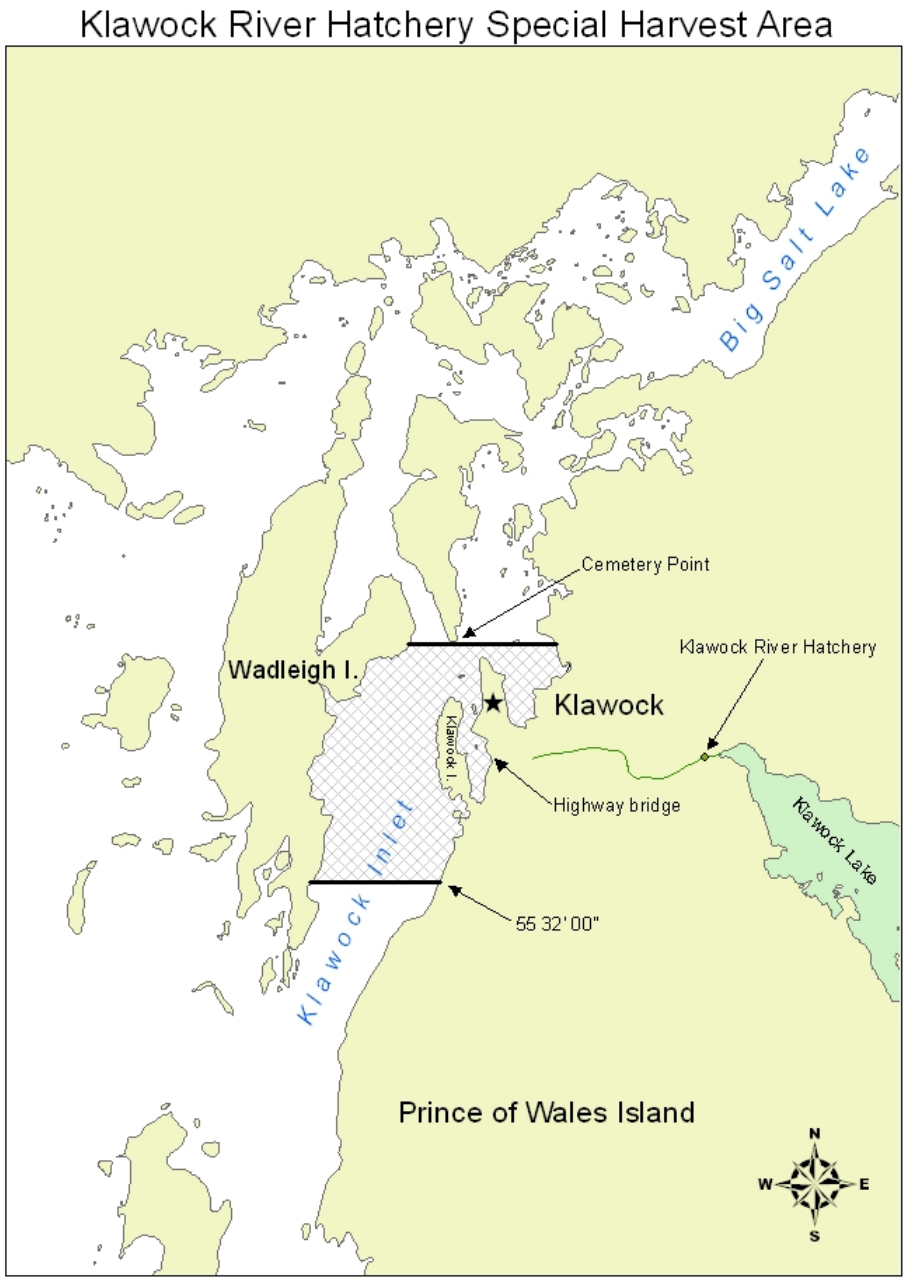

Figure 1. – Klawock Inlet and River Special Harvest Area.

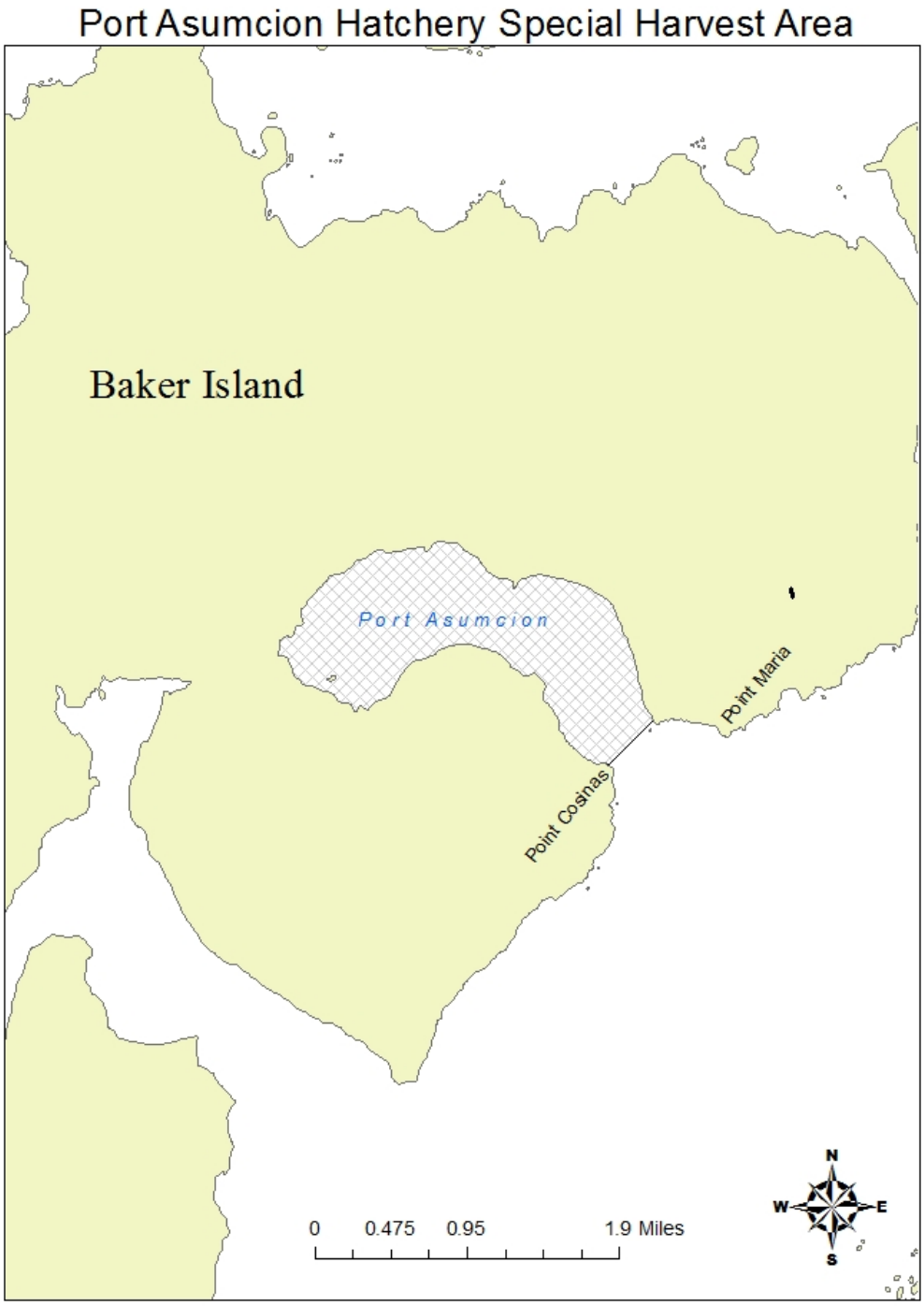

Figure 2: Port Asumcion Special Harvest Area.