Basic Management Plan
Sawmill Creek Hatchery
Northern Southeast Regional Aquaculture Association

(As amended XXXX, 2016 to include permit alterations and recommended changes)

I. Introduction

Sawmill Creek Hatchery (SCH) is owned and operated by Northern Southeast Regional Aquaculture Association (NSRAA). The hatchery is located in the Gary Paxton Industrial Park (GPIP), five miles from downtown Sitka (latitude 57.04711N, longitude 135.23099W). GPIP is owned by the City of Sitka and is the former mill site of Alaska Pulp Corporation. The hatchery sits on 60,000 square feet of leased property at an elevation of 20 feet above mean high tide. Water to SCIP is supplied by Sitka's Blue Lake hydroelectric plant penstock. The hydroelectric plant uses Blue Lake, at an elevation of 425 feet, as its water source. The hatchery has a lease agreement for 10 cubic feet per second (cfs) of water.

Completed in 2003, SCH was designed as an incubation and rearing facility for coho salmon. In 2014, chum salmon production was added. The hatchery acts as a satellite facility of Medvejie Creek Hatchery (MCH) as no egg takes or releases occur at SCH. Coho salmon egg takes occur at MCH and gametes are transported to SCH for fertilization and incubation. Chum salmon egg takes occur at MCH and eyed eggs are transferred to SCH for incubation. Coho salmon incubated and reared at SCH are released in Deep Inlet; and chum salmon incubated at SCH are released at Crawfish Inlet.

This basic management plan (BMP) describes the SCH goals, objectives, facility, and operations as permitted under Private Nonprofit Hatchery Permit #44, issued March 11, 2007, and includes details regarding all subsequent permit alterations approved to date.

II. Goals

2.1 Production Goals

Sawmill Creek Hatchery was originally designed to produce 2 million coho salmon smolt annually, with the majority of smolt released at Deep Inlet for common property harvest and an adequate number of smolt for release at Bear Cove to provide a broodstock return to MCH. It was originally estimated that 4.3 million coho salmon green eggs would be needed to produce 2 million coho salmon smolt annually, due to the potential high incidence of bacterial kidney disease (BKD). The current SCH egg-take goal is 3 million eggs to produce 2.2 million smolt, 2 million for release at Deep Inlet and 200,000 for release at Bear Cove. Egg-take goals up to the maximum permitted capacity will be adjusted to meet expected release goals as the program develops.

In 2014, 30 million chum salmon green eggs were added to the permitted capacity at SCH and Crawfish Inlet was included as a chum salmon remote release site. Fall chum salmon eggs will be collected at MCH, incubated to the eyed stage and thermal marked, prior to transfer to SCH. All chum salmon smolt reared at SCH will be released at Crawfish Inlet.

Maximum permitted capacity: 4.332 million coho salmon green eggs and 30 million chum salmon green eggs.

2.2 Principal Project Goals

The 1985 US/Canada Treaty set a goal of 100,000 Chinook salmon from the Alaska enhancement program to mitigate treaty obligations, which reduced previous harvest opportunities. Due to the difficulty of producing this number of Chinook salmon in Southeast Alaska hatchery programs, the concept of 'Chinook equivalents' was subsequently introduced and is defined primarily by the other high value troll species such as coho salmon (2 ½ coho salmon are equivalent to one Chinook salmon using a weight calculation).

The SCH coho salmon program was designed to produce 200,000 adults, half of which are expected to be harvested in common property fisheries from mid-June through September.

In 2014, a chum salmon program was added for remote release at Crawfish Inlet. The chum salmon production is intended to provide additional fishing opportunity to common property fisheries, primarily to the troll and purse seine fleets. Adult returns will contribute to common property harvest in the terminal area as well as by interception in traditional fisheries.

The SCH programs will directly strengthen the local economy by creating full-time positions with benefits, along with several seasonal hourly-wage positions. Indirectly, the Sitka economy will benefit through gear, fuel, and other ancillary sales brought about by increased salmon returns and harvest activities. Processors will benefit through additional harvest sales and greater economy of scale.

Sawmill Creek Hatchery is primarily designed to be a production salmon hatchery, but due to its prime location on a road system, may also function as a tourist and educational facility. Summer

visitors will be exposed to hatchery operations and educated in the many facets of Alaskan fisheries. During the school year, the facility will support hands-on learning for the public school system from K-12 including Pacific High and Mount Edgecombe High Schools. An existing collaborative effort with the Sheldon Jackson Hatchery program will be expanded and developed to provide practical training for aquaculture students.

2.3 Annual Fish Culture Objectives

1. Develop adult broodstock capture and holding protocols to maximize adult survival to spawn.

2. Minimize BKD in hatchery-produced coho salmon by creating ideal holding facilities and handling protocols; family tracking, destruction of >0.2 ELISA titers BKD eggs, and release of only BKD negative parent crosses at Bear Cove (broodstock site); and maintain strict fish handling protocol to minimize cross contamination of rearing tanks.

3. Maximize egg to smolt survival to attain 70% or better over the life of the program.

4. Produce quality coho salmon smolt with a goal of 20 to 25 grams for release at optimum ocean conditions in late May each year and thereby maximizing marine survival.

5. Produce quality chum salmon smolt with a goal of 2 to 4 grams for release at optimum ocean conditions in April each year and thereby maximizing marine survival.

6. Maximize facility efficiency and benefit to cost ratio.

7. Maximize contribution to common property fisheries.

8. 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

Blue Lake, at an elevation of 425 feet and the geographical coordinates of lat 57.06314N, long 135.20006W, serves as SCH's water supply. Blue Lake has a maximum water depth of 168 meters and a mean depth of 80 meters. The watershed is 37 square miles and receives nearly 100 inches of rain annually. In the late 1950's, a dam was constructed at the outlet of Blue Lake to increase water storage for a hydroelectric power plant. Water is collected in a submerged intake, at an elevation of 320 feet, and delivered to the hydroelectric plant via a pipeline. The pipeline has a capacity of 800 cfs at the base of the dam for discharge into Sawmill Creek. The Federal Energy Regulatory Commission (FERC) permit requires 50 cfs be discharged at the base of the dam to maintain fish habitat in Sawmill Creek for rearing and spawning salmonids – rainbow trout/steelhead; pink, chum, and coho salmon; as well as Dolly Varden char. Blue Lake has a small population of non-

anadromous rainbow trout that are known to go through the hydropower plant and emigrate over the spillway. The dam spillway has a capacity of 14,000 cfs.

A bulk water line, owned by the City of Sitka, provides untreated water to SCIP. A tap off the bulk water line provides 10 cfs of water for hatchery use, at a pressure of 40 to 55 pounds per square inch. The water is then run through pressure reducing valves to maintain a consistent low head pressure for hatchery incubation and rearing. Hatchery water is then run through a degassing tower before moving on to incubation or rearing tanks. Incubation and rearing tanks will be set up with the capability to recirculate water for a maximum of 100% reuse, similar to MCH where up to 100% of the water can be recirculated without filtering. CO_2 is stripped by sending through a degassing tower. Recirculation is used for thermal manipulation and as an emergency response option if there is a loss of the primary water supply.

Incubation and rearing tank effluent water will pass into an effluent pipeline that terminates in Silver Bay at a minimum depth of 100 feet of seawater. This will disperse effluent water into the deep tidal currents and minimize potential attractant that may draw returning salmon to Sawmill Creek. All domestic effluent is run through the City of Sitka's GPIP wastewater treatment plant.

A secondary/backup industrial water supply was developed by the City of Sitka and NSRAA with an infiltration gallery constructed in the tailrace of the Blue Lake hydropower plant. The City of Sitka has water rights (ADL 43826) for the project. The pumped supply line will tie into the primary water supply line and be used when the main penstock is shut down for up to a ten-day inspection every five to six years. This water is then routed through the hatchery's centralized water distribution system. Testing has determined that this will only supply 90% of the maximum flow of 10cfs.

An additional emergency water loss port was installed in the industrial water supply line to allow a temporary intake directly upstream of the trestle bridge. This port will allow placement of up to an 8" diesel powered water pump to increase pumped supply to the full 10cfs in combination with the afterbay pumps. This location would also be used in an emergency if there is an unanticipated penstock shutdown, failure, or possible saltwater inundation of the afterbay during extreme high tide events.

3.2 Facility Description

The facility layout consists of the following components:

- Centralized water distribution/treatment room
- Hatchery building, including incubation, office, and warehouse space
- Freshwater rearing area
- Effluent line to 100 feet of seawater in Sawmill Cove

3.2.1 Hatchery Floor Plan

There is an office area that is approximately 15’ x 25’. Adjacent to the office is the centralized water distribution area, primarily located on the second level, which feeds the incubation/rearing rooms and freshwater rearing area. Below is a small maintenance shop and equipment storage area.

The hatchery facility houses the coho incubation room that is approximately 25’ x 25’ and contains rows of stacked Heath-style incubators to incubate up to 4.3 million green coho salmon eggs. Double doors leading outside allow easy access for moving equipment in and out of the room. Adjacent to the coho incubation room is the larger chum incubation/rearing room, approximately 40’ x 35’. Stacks of NOPAD-style incubators are used for hatching and fry development of chum salmon. Both incubation rooms are windowless to provide a dark environment suitable for salmon incubation. After chum salmon fry are transferred to Crawfish Inlet, the chum incubation room is converted to the coho rearing room by utilizing available start tanks. Through-wall fans provide ventilation to the building. Wash down hoses for cleanup operations are located throughout both incubation rooms and in the equipment storage area.

3.2.2 Incubation Room

Coho

Hatchery water is passed through a degassing tower in the centralized water distribution head tank before it is passed to a header pipe in the incubation room. Return troughs located underneath each stack will route effluent to a central sump area located underneath the head tank. From the sump, water can either be allowed to pass down an effluent line to leave the building or be pumped up to a small packed column where it feeds an isolated recirculation head box and separate distribution line for thermal manipulation. Each stack of incubators will have two valves to control water flow from either the primary heard tank supply or the recirculated supply.

Chum

Hatchery water is passed through a degassing tower in the centralized water distribution head tank before it is passed to a header pipe in the incubation room. Each stack of incubators will have its own valve to control water flow. Return troughs located underneath each stack will route effluent to a central sump. From the sump, water can either be allowed to pass down an effluent line to leave the building or be pumped back into the incubation header troughs if there is a water loss emergency at the facility. The recirculation system is not used for thermal manipulation and is independent from the coho incubation room.

3.3 Fish Culture

3.3.1 Coho Salmon

Coho salmon egg takes are performed in late October and early November at MCH. The spawning ratio is one male to one female. Broodstock are disinfected with iodine then stripped of eggs or

massaged for milt into a disinfected container. When required for BKD ELISA analysis, each spawned female/male pair is designated a number and kidney samples from the female are sent to the state pathology lab. Family tracking will occur for all Bear Cove broodstock production; family tracking may occur for SCH and remote release site production. The SCH portion of the egg take will be collected as separate gametes and transferred to SCH. Following fertilization, eggs are rinsed in running water and water hardened in a 1:100 iodine solution for one hour. Fertilized eggs are incubated in Heath-style incubators. Egg numbers are rough estimates until more accurate estimates can be made at the eyed egg stage, such as weight estimates or electronic counts during egg picking operations.

The freshwater rearing area will rear juvenile coho salmon from first ponding to their presmolt life stage. Upon emergence, coho salmon fry will be moved to grow out indoor raceway tanks. Each of these tanks will contain approximately 400,000 fry at 0.25 grams. At approximately 1 gram, the fry will be transferred to larger outdoor raceways and/or 16' round ponds. As densities increase, the juveniles will be split into additional round ponds. At peak rearing biomass, all of the raceways and round ponds will be utilized.

Each spring, coho salmon will be transferred to a boat for transport to Deep Inlet net pens, located near the head of the bay. Saltwater rearing allows the fish to acclimate to a saltwater environment while imprinting on the rearing location, and adds additional growth.

3.3.2 Chum Salmon

Chum salmon egg takes start at MCH in late August and are usually completed by the end of September. Fertilization, water hardening, and egg surface disinfection will occur at MCH. Chum salmon eggs will be eyed in R-48-style incubators. Eyed and otolith marked eggs are transferred to SCH and placed in NOPAD-style incubators. Fungal growth in incubators will be controlled by hatching screens, egg sorting, and saltwater and/or chemical treatments.

When buttoned fry are ready for transfer, they will be loaded into an exterior holding raceway and allowed to "swim-up". The acclimated fry will be loaded onto a transport boat and then be transported to saltwater net pens at Crawfish Inlet for saltwater rearing and release.

3.3 Biological Considerations

No coho salmon smolt or chum salmon fry will be released directly from SCH. All salmon reared at the hatchery will be transported to their remote release location and held in net pens for saltwater imprinting prior to release. Coho salmon smolt and chum salmon fry intended for broodstock returns are reared and released in Bear Cove, at MCH, 3 miles southeast of SCH.

The SCH salmon programs are designed to maximize homing fidelity to the release site, which helps reduce the risk of straying. Elements implemented to attain a high level of return fidelity and increase the potential for efficient harvest of returns to reduce the chance of straying include:

1. No smolt or fry released at Sawmill Creek or Sawmill Cove, which reduces the risk of adult returns straying into Sawmill Creek.

2. Separation of the broodstock program (conducted at MCH) from the contribution programs (Deep Inlet and Crawfish Inlet). This strategy puts the majority of the releases at locations where the returning adults can be aggressively harvested in the common property fisheries.

3. Smolt released at MCH (broodstock) spend their entire freshwater life stages on site, and then imprint during saltwater rearing in front of the hatchery. Incubation and rearing of salmon at MCH produces a scent that helps attract returning adults to the hatchery location.

4. The SCH effluent pipe terminates in approximately 100 feet of seawater to help disperse effluent, which eliminates an attractant that could draw fish to Sawmill Creek.

5. Adult salmon returning to Deep Inlet THA and Crawfish Inlet THA do not mill around or build at the release site due to aggressive harvest. Allowing returning salmon extended time at the release site increases the chance the fish will migrate elsewhere in search of suitable spawning grounds. Each release site (Bear Cove, Deep Inlet and Crawfish Inlet) will also have a special harvest area (SHA) to allow cost recovery harvest if a significant number of fish remain after common property fisheries have ceased.

IV. Sawmill Creek Hatchery Coho Salmon

In 1988, NSRAA began a coho salmon program at MCH. Indian River stock coho salmon, from Sheldon Jackson Hatchery, was chosen for the broodstock, in part because the return timing was several weeks later than Salmon Lake, which helped mitigate concerns of increasing exploitation on local fall coho salmon stocks such as Salmon Lake.

In 2002, MCH began using Plotnikof Lake coho salmon stock (Anadromous Waters Catalog number 113-22-10280-0010) for release at Bear Cove and Deep Inlet. Changing broodstock to summer run Plotnikof Lake coho salmon was initially thought to further separate the return timing from local fall coho salmon stocks. In 2007, the MCH Plotnikof Lake stock coho salmon broodstock was approved for SCH when the initial PNP hatchery permit was issued. However, it was determined that the Plotnikof Lake stock had more overlap in return timing with local fall coho salmon stocks than anticipated, lower marine survivals than expected, and high prevalence of BKD. The last release of Plotnikof stock coho salmon occurred in 2009 (BY07) in Deep Inlet.

In 2009, SCH switched broodstock from Plotnikof Lake coho salmon stock to Salmon Lake coho salmon stock. Gametes were collected from Salmon Lake coho salmon 2009 through 2011. In 2011, the first releases of Salmon Lake stock coho salmon occurred at Bear Cove and Deep Inlet. Since the first returns in 2012, MCH has been the primary broodstock collection site. Using Salmon Lake coho salmon for broodstock mitigates some of the genetic concerns of hatchery-produced coho salmon spawning with wild coho salmon in Salmon Lake. In addition, due to the migration pattern of wild coho salmon returning to Salmon Lake, some wild fish enter into the hatchery broodstock collected at MCH, contributing to the genetic diversity. However, the use of Salmon Lake coho salmon as broodstock means there will no longer be temporal separation in the return timing between local wild stocks and hatchery stocks, which raises the concern of reduced escapement of wild fall coho salmon stocks such as Salmon Lake.

4.1 Broodstock Source

Salmon Lake (Anadromous Waters Catalog number 113-41-10320-0010) coho salmon was used to develop broodstock for SCH and will continue to be a backup brood source when necessary to supplement hatchery production. A sliding egg take schedule will be included with each year's Annual Management Plan (AMP) and will take into consideration protection of a minimal necessary escapement of wild coho salmon to Salmon Lake. Broodstock collection at Salmon Lake will be limited to 260 salmon with no more than half of those (130) being female.

4.2 Broodstock Development

The hatchery broodstock development schedule was designed to allow timely development, which included adequate genetic diversity for hatchery stock, without long-term impacts on the wild Salmon Lake stock. Egg incubation, freshwater rearing, and broodstock releases occur at MCH. Since 2012, MCH returns have been the primary source for SCH's Salmon Lake coho salmon broodstock.

4.3 Release numbers and locations

For brood years 2009 through 2011, the egg-take goal was 250,000, with progeny of 200,000 eggs destined for release in Deep Inlet and progeny of 50,000 eggs for release in Bear Cove (Table 1). Starting in 2012, the egg-take goal was allowed to increase incrementally. Since 2014, the egg-take goal has been 3 million eggs, with planned releases of 2 million smolt at Deep Inlet and 200,000 smolt at Bear Cove. Adult returns to Bear Cove should provide sufficient broodstock to meet egg-take goals. Adult returns to Deep Inlet should contribute to common property fisheries, and act as a back-up broodstock location. Additional adjustments to the release numbers can be addressed in the annual management plans (AMP) and fish transport permit (FTP) review process.

4.4 Hatchery Return Management

Coho salmon returns to Deep Inlet and Bear Cove will contribute to common property fisheries in Northern Southeast Alaska. Deep Inlet THA will serve primarily as the commercial harvest area for SCH coho salmon, but may include cost recovery harvest and broodstock collection. Bear Cove will be managed primarily to provide coho salmon broodstock to MCH. Adults returning to Bear Cove are expected to be harvested in the Silver Bay sport fishery, captured by NSRAA for broodstock, and possibly harvested for cost recovery.

4.4.1 Commercial Fisheries

Commercial trollers will likely harvest returning SCH coho salmon in outside waters prior to entering Sitka Sound. Commercial trollers may also harvest some SCH coho salmon in Eastern Channel and Silver Bay during August and September. Commercial gillnet and seine fisheries are expected to harvest SCH coho salmon in the Deep Inlet THA.

4.4.2 Terminal Fisheries

The Deep Inlet THA Salmon Management Plan is defined in regulation (**5 AAC 33.376 District 13: Deep Inlet Terminal Harvest Area Salmon Management Plan**). Rotational fisheries are managed to distribute the harvest of hatchery-produced salmon in the THA between the purse seine, drift gillnet, and troll fleets.

The Silver Bay Salmon Management Plan is described in regulation (**5 AAC 33.375 District 13: Silver Bay (Medvejie Creek Hatchery) Salmon Management Plan**). Openings will allow for common property fisheries to harvest excess salmon. Closures will occur to ensure chum salmon broodstock escapement to MCH is achieved. As described, the waters of Bear Cove are closed to commercial salmon troll gear.

4.4.3 Special Harvest Area Management

NSRAA Special Harvest Areas (SHAs) and management are described in regulation (5 AAC 40.042 Northern Southeast Regional Aquaculture Association Special Harvest Areas). For Bear Cove and Deep Inlet, the SHA areas and allowable time and gear for harvest are described as:

Bear Cove, for king and coho salmon: the waters of Bear Cove and Silver Bay east of a line from 57° 00.63′ N. lat., 135° 09.80′ W. long., to 57° 00.75′ N. lat., 135° 10.58′ W. long., to 57° 01.07′ N. lat., 135° 09.93′ W. long. will be open for the hatchery permit holder from 12:01 a.m. May 10 until 11:59 p.m. October 31 (or as otherwise described in regulation);

Deep Inlet for king, chum, and coho salmon: the waters of Deep Inlet, Aleutkina Bay, and contiguous waters south of a line from a point on the westernmost end of Cape Burunoff at 56° 59.04′ N. lat., 135° 23.23′ W. long., to a point west of Cape Burunoff at 56° 59.11′ N. lat., 135° 23.59′ W. long., to a point one-half mile west of the westernmost tip of Long Island at 57° 00.17′ N. lat., 135° 22.69′ W. long., to the westernmost tip of Long Island, to the easternmost tip of Long Island, to the westernmost tip of Emgeten Island, to the westernmost tip of Error Island, to the westernmost tip of Berry Island, to the southernmost tip of Berry Island, to the westernmost tip of the southernmost island in the Kutchuma Island group, to the easternmost tip of the southernmost island in the Kutchuma Island group, to the westernmost tip of an unnamed island at 57° 00.30′ N. lat., 135° 17.67′ W. long., to a point on the southern side of the unnamed island at 57° 00.08′ N. lat., 135° 16.78′ W. long., and then to a point on the Baranof Island shore at 56° 59.93′ N. lat., 135° 16.53′ W. long. will be open for harvest by the hatchery permit holder from 12:01 a.m. June 15 until 11:59 p.m. September 15, except Sandy Cove is closed south of 56° 59.05′ N. lat. (or as otherwise described in regulation).

A hatchery permit holder harvesting salmon within a special harvest area is exempt from the provisions of 5 AAC 33.310. Notwithstanding 5 AAC 33.330, legal gear for the hatchery permit holder in a special harvest area are as follows: Bear Cove: purse seine, hand purse seine, beach seine, and dip net, drift gillnet with six inch or larger mesh, and troll gear; Silver Bay and Deep Inlet: purse seine, hand purse seine, beach seine, dip net, and troll gear.

4.4.4 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.

A sport fishery is expected to develop in Sitka Sound on coho salmon returning to Deep Inlet and Bear Cove. The Sitka sport charter fishery is expected to intercept a portion of the return as the coho salmon pass through Eastern Channel, Deep Inlet, and Silver Bay.

No special sport fish management is expected other than in the Bear Cove SHA where the sport fishery may be curtailed to meet broodstock goals. Similarly, the sport fishery at the terminal end of the Deep Inlet THA may be curtailed to achieve broodstock goals should there be inadequate returns to Bear Cove.

4.5 Special Operational Requirements

Special operational requirements include marking, tagging, and monitoring. Additional details regarding special operational requirements may be included, as necessary, in annual management plans or further described in fish transport permits. Operational requirements are intended to be tools for monitoring and evaluation of hatchery-produced returns including contributions to the fisheries and to assess interactions with wild stock returns.

4.5.1 Marking Requirements

Hatchery produced salmon are coded wire tagged and/or thermally marked to estimate marine survivals and contributions to common property fisheries. Due to concerns with hatchery-produced coho salmon interacting with wild coho salmon during the development of the SCH coho salmon program, comprehensive tagging requirements were necessary to gain a clearer understanding of the extent of this interaction.

For brood years 2009 through 2016, all SCH coho salmon released at Bear Cove were marked with adipose finclips and coded wire tags (CWTs) at a rate of 100%. Deep Inlet releases were marked with adipose finclips and CWTs at a rate of 15% of the release number.

In order to estimate contribution rates of SCH coho salmon to common property fisheries, SCH coho salmon will be adipose finclipped and coded wire tagged at a rate to be determined by the department and detailed in the AMP. Tags will be recovered in the department’s port sampling and creel survey programs.

Otolith marking all coho salmon will further enhance the ability to evaluate the SCH program.

4.5.2 Salmon Lake Monitoring

Salmon Lake Wild Stock Coho Salmon

State of Alaska wild stock fisheries are managed using the sustained yield principle. Salmon Lake is located at the head of Silver Bay and wild stock runs must pass through fisheries targeting the hatchery runs. Previous stock assessment work (Schmidt 1996; Tydingco et al. 2006, 2008), conducted when NSRAA was using Indian River and Plotnikov Lake coho salmon broodstocks, identified high exploitation rates of coho salmon returning to Salmon Lake. Using Salmon Lake stock coho salmon at SCH means there is no temporal separation in the run timing between wild Salmon Lake stock and the hatchery stock, which increases the concern for meeting escapement requirements of wild stock Salmon Lake coho salmon. The department is required to manage fisheries so populations of wild salmon, including Salmon Lake coho, can be sustained.

There are many ways to measure the production of a lake system. The use of a weir, in combination with an inlake mark-recapture effort, to estimate escapement generally will result in the highest degree of confidence in an escapement estimate. However, there are other cost effective ways to determine escapement.

The department will require monitoring Salmon Lake escapement during development of the SCH coho salmon program. This requirement includes evaluating three consecutive years of wild stock Salmon Lake coho salmon returns during full hatchery production (as described in section 2.1) before considering any increases in either hatchery production or a reduction in this monitoring requirement. Drops in Salmon Lake escapement below escapement requirements may result in fishery restrictions or possible changes in hatchery production or a combination thereof.

Salmon Lake Escapement Monitoring

From 2007 through 2015, NSRAA operated the Salmon Lake weir. During that time, the main objective was to count adult wild coho salmon through the weir, place a primary mark on every fish for subsequent mark/recapture sampling in the lake to estimate escapement, and identify hatchery-produced coho salmon trying to enter the system. A beach seining recapture effort was conducted in the lake to estimate coho salmon not observed at the weir in order to estimate escapement and as a secondary observation for hatchery-produced fish. Salmon Lake escapement monitoring will be described in annual management plans and detailed in the required fish resource permits.

4.5.3 Sawmill Creek Monitoring

Since 2012, coho salmon have been reared at SCH. Blue Lake supplies water to both SCH and Sawmill Creek, which may increase the likelihood of hatchery-produced coho salmon entering Sawmill Creek. The primary objective of monitoring Sawmill Creek is to determine the number of hatchery-produced fish entering the system. When data on the number of hatchery-produced fish trying to enter the system needs to be gathered, detailed operations will be described in annual management plans and fish resource permits.

V. Chum Salmon

In 2014, the SCH permit was amended to allow 30 million fall chum salmon eggs to be collected at MCH; transferred as eyed eggs to SCH for additional rearing and hatch; and then transferred to Crawfish Inlet for saltwater rearing and release.

5.1 Broodstock Source

Medvejie Creek Hatchery stock chum salmon will be used for fry releases at Crawfish Inlet.

5.2 Development

Chum salmon returns to MCH are broodstock for SCH. Chum salmon releases at MCH began in the early 1980's. The MCH chum salmon returns were created using fall chum salmon broodstock from Medvejie Creek, Nakwasina River, and Salmon Lake Creek.

5.3 Release Numbers and Locations

Resulting progeny from up to 30 million chum salmon green eggs may be released at Crawfish Inlet.

SCH chum salmon broodstock program egg incubation, rearing, and release occur at MCH. Adult returns to Bear Cove should provide sufficient broodstock to meet egg-take goals.

5.4 Hatchery Return Management

Crawfish Inlet will be the primary commercial harvest area for SCH chum salmon, and may include cost recovery if necessary.

Bear Cove will be managed primarily to provide chum salmon broodstock to MCH. Adults returning to Bear Cove are expected to be harvested in the Silver Bay sport fishery, captured by NSRAA for broodstock, and possibly harvested for cost recovery.

5.5 Commercial Fisheries

Commercial troll and seine fisheries are expected to harvest SCH chum salmon in Crawfish Inlet THA. Harvest rates of SCH chum salmon may be monitored using otolith recovery data.

5.6 Terminal Harvest Area/Special Harvest Area Management

The Crawfish Inlet SHA is designated as all waters within Crawfish Inlet east of long 135°0'0"W. 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. NSRAA may be required to remove unharvested chum salmon remaining in the terminal harvest area should a significant number remain after common property fisheries have ceased.

The Silver Bay Salmon Management Plan is described in regulation (**5 AAC 33.375 District 13: Silver Bay (Medvejie Creek Hatchery) Salmon Management Plan**). Openings will allow for common property fisheries to harvest excess salmon. Closures will occur to ensure chum salmon broodstock escapement to MCH is achieved. As described, the waters of Bear Cove are closed to commercial salmon troll gear.

5.7 Sport Fishery

Sport fisheries will be managed in accordance with regulations as provided in 5 AAC 47–5 AAC 75.

5.8 Special Operational Requirements

The SCH permit allows collection of 30 million chum salmon eggs at MCH for transfer to SCH and later release in Crawfish Inlet. Conditions of approval include differential otolith marking of the chum salmon produced for release at Crawfish Inlet, in order to enable evaluation of adult returns as described in annual management plans. Initially, straying would be monitored through an ongoing department straying study collecting chum salmon otoliths from streams in West Crawfish Inlet.

VI. Approval

The revised Basic Management Plan for the Sawmill Creek Hatchery is hereby approved.

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Sam Cotten Date
Commissioner
Alaska Department of Fish and Game

Table 1. – Salmon Lake stock coho salmon broodstock development for brood years 2009–2016.

Brood Year	Egg Take Goal	Egg take[1]	Release Year	Deep Inlet/Medvejie Release Goals	Deep Inlet Release	Medvejie Release	Marine Survival[3]	Return Year	Deep Inlet Return	Medvejie Return	Total Return
2009[1]	250,000	242,000	2011	200,000/50,000	163,000	55,000	3%	2012	5,000	1,300	6,300
2010[1]	250,000	175,000	2012	200,000/50,000	116,000	50,000	11%	2013	13,000	6,000	19,000
2011[1]	250,000	222,000	2013	200,000/50,000	159,000	53,000	8%	2014	13,000	5,000	18,000
2012[2]	765,000	471,000	2014	500,000/75,000	296,000	72,000	4%	2015	11,000	4,000	15,000
2013	1,500,000	1,583,000	2015	1,000,000/75,000	950,000	78,000	8%	2016	80,000	6,000	86,000
2014	3,000,000	942,000	2016	2,000,000/200,000	700,000	200,000	8%	2017	57,000	5,000	72,000
2015	3,000,000	1,175,000	2017	2,000,000/200,000			8%	2018	160,000	16,000	176,000
2016	3,000,000		2018	2,000,000/200,000			8%	2019	160,000	16,000	176,000

Note: Highlighted cells show egg takes, releases, and returns as they have already occurred. Estimated production not highlighted.

[1] Salmon Lake wild stock coho salmon used for brood years 2009–2011

[2] Approximately 65,000 eggs from Salmon Lake remote egg take combined with hatchery egg take.

[3] Combined release site estimated marine survival.