APPLICATION
PRIVATE NONPROFIT SALMON HATCHERY PERMIT

STATE OF ALASKA
DEPARTMENT OF FISH AND GAME

I. IDENTIFICATION OF APPLICANT

A. Private Nonprofit Corporation

Name: Southern Southeast Regional Aquaculture Association, Inc. (SSRAA)

Address: 14 Borch St.

Ketchikan, AK. 99901

Phone: (907) 225-9605

(Please attach a copy of Articles of Incorporation for the above nonprofit corporation organized in accordance with Alaska Statute 10.20)

See Appendix L.

B. Individual Completing This Form

Name: Jeff Lundberg

Address: PO Box 554

Craig, AK. 99921

Phone: (907) 755-2231

C. Relation to Above Nonprofit Corporation

Manager of Prince of Wales Hatchery Association (POWHA), which is being absorbed by SSRAA.

II. STATEMENT OF APPLICANT'S GOALS AND OBJECTIVES

Explain why you have decided to apply for a hatchery permit and what you generally expect to accomplish by the operation of the proposed hatchery.

Continue to produce coho salmon to benefit the common property fisheries of Southern Southeast Alaska, specifically off the west coast of Prince of Wales Island.

Sockeye rehabilitation projects **MAY** be part of the program in the future. The facility would need some modern UV equipment to depurate the influent and effluent hatchery water. New incubators, either Heath Trays or Kitoi Boxes would also be needed. There is no current FTP for sockeye and we do not intend to apply for one at this point. The bio criteria for sockeye in this permit is a starting point. If there is a need to rehabilitate sockeye in Klawock Lake in the future we will design the best possible bio criteria at that time.

III. PRODUCTION GOALS AND HATCHERY SITE INFORMATION

A. Egg Capacities by species	Millions of eggs required for hatchery at start-up	at capacity
Fall Coho	5,000,000	5,000,000
Sockeye	1,000,000	1,000,000

B. Location Description

1. Site (stream and/or lake name, ADF&G stream number, and exact geographical coordinates)

Klawock Lake/River, Prince of Wales Island; ADFG Stream #:103-60-10470
Coordinates: 55.55003N
133.04719W

2. Site Physical Description (attach topographic map and photographs of proposed site).

a. Topography

Appendix A. Map of Klawock Lake and hatchery site.

b. Geology

Existing state owned facility

c. Soils

Existing state owned facility

C. Current Land Use and Ownership Status

1. Have the land or usage rights been acquired?

Yes. ADFG has a 55 year lease with Klawock Heenya Corp. Started in 1980

2. What is (will be) the legal form of any usage rights?

Landowner is Klawock-Heenya Corporation; copy of lease is Appendix B. State of Alaska owns hatchery

3. List the additional state and federal permits needed by the applicant to build and operate the proposed hatchery. Examples may include: U.S. Army Corps of Engineers Permit; Department of Natural Resources Water Use, Land Use, and Tidelands Lease Permits; and U.S. Forest Service Land Use Permit.

Use Permits (land and water)

SOA – DNR: LAS 19522 Klawock Lake Netpens
LAS 28074: Klawock Estuary Netpens
LAS 29517 Klawock Lake Dock and Weir
SOA – Water – ADL-79921-C
USACOE – POA-2011-262: Klawock Estuary Netpens

DNR – LAS permits are currently being reviewed for transfer to SSRAA.

D. Water Supply

The water quantity, minimum and Maxim temperatures, and the amounts of silt loading will be critical factors in the evaluation of water supply adequacy. **Care should be exercised in the evaluation of these questions.**

1. Source (e.g., lake, stream, well, spring). Have the water usage rights been acquired?

Klawock Lake. Water rights through SOA. ADL # 79921-C. Appendix C

2. Water source characteristic (e.g., substrate, size of drainage area, gradient, ground water characteristics).

State has previously evaluated; information on file.

3. Water quality characteristics (in every case, cite the qualifications of the individual making the assessment and the method(s) used).

a. Recommended parameters to measure for evaluating potential hatchery water supply. Either fill out the table below or attach a copy of the water quality analysis conducted.

Water Qualities	Standards	Levels for the hatchery water source
Alkalinity	at least 20 mg/L as $caCO_3$	
Ammonia (unionized)	<0.0125 mg/L	
Arsenic	<0.05 mg/L	
Barium	<5.0 mg/L)	
Cadmium	<0.0005 mg/L (< 100 mg/L alkalinity <0.005 mg/L (≥ 100 mg/L alkalinity)	
Carbon dioxide	<1.0 mg/L	
Chloride	<4.0 mg/L	
Copper	<0.006 mg/L (< 100 mg/L alkalinity) <0.03 mg/L (≥ 100 mg/L alkalinity)	
Dissolved oxygen	>8.0 mg/L	
Hydrogen sulfide	<0.003 mg/L	
Iron	<0.1 mg/L	
Lead	<0.02 mg/L	
Magnesium	<15 mg/L	
Mercury	<0.0002 mg/L	
Nickel	<0.01 mg/L	
Nitrate (NO_3)	<1.0 mg/L	
Nitrate (NO_2)	<0.1 mg/L	
Nitrogen (N_2)	<110% total gas pressure (<103% nitrogen gas)	
Petroleum (oil)	<0.001 mg/L	
pH	6.5 - 8.0	
Potassium	<5.0 mg/L	
Salinity	<5.0 ppt	
Selenium	<0.01 mg/L	
Silver	<0.003 mg/L (fresh water) <0.003 mg/L (salt water)	
Sodium	<75.0) mg/L	
Sulfate SO_4^{-2}	<50.0 mg/L	
Total dissolved solids	<400.0 mg/L	
Total settleable solids	<80.0 mg/L (25 JTU)	
Zinc	<0.005 mg/L	

Hatchery has been operational since 1977. All water qualities in Klawock Lake are within acceptable parameters. No catastrophic mortality has occurred due to poor water qualities. There are natural runs of chum, sockeye, pink and steelhead in system.

Note: Synergistic and antagonistic chemical reactions must be considered when evaluating a water source against these criteria.

b. Attach a temperature profile (minimum of one year of data) of the hatchery water source. Also, provide vertical profiles if a lake water source is proposed.

See attached Appendix D

c. List monthly levels of dissolved oxygen in the hatchery water source. If a lake source, provide seasonal oxygen profiles.

See attached Appendix E

d. If a lake source, provide information on surface area, depth, and water storage capacity.

Klawock Lake has a surface area of 11.9 km^2, an elevation of 9.1 m, a mean depth of 17.7 m, a maximum depth of 49.0 m and a volume of 209 x 10^6 m^3

e. Describe the silt load (include consideration of possible seasonal high water).

Silt load has been minimal since inception of hatchery (1978).

4. <u>Water Flow Data</u>.

This information should be based on the equivalent of long-term USGS stream gauge data (10 years or more data) or the U.S. Forest Service Water Resources Atlas synthetic hydrograph model.

a. Attach a seasonal profile, including yearly minimum and maximum flows.

See attached Appendix F

b. List a historical range of water flow conditions, if available.

See attached Appendix F

5. <u>Water Distribution System</u>

Describe the water distribution system in at least the following dimensions:

a. Type, size, elevation and locations of water intake, screening, and water use/reuse system.

See attached drawing by Kramer, Chin, and Mayo, Inc. Drawing C-2

b. Size, length, and type of pipe, insulation, and distribution system. Include elevations of water surfaces at each point in the system from intake through incubation and rearing to fishladder or other discharge.

Pipeline is 650' of 30" SDR 32.5 High Density Polyethylene (HDPE). The majority of it is buried, approximately 100 feet is not buried. Water surface elevation at lake (intake) is 44.75'. Elevation at top of headbox is 42.5'. Elevation at bottom of headbox is 39.5'. See Appendix G

c. If a hydroelectric generation system will be used, will effluent from this system be used in the hatchery? If so, describe plans to address possible problems with gas supersaturation.

No hydroelectric generation.

d. Describe provisions for an emergency water system in the event of primary water system failure.

6 inch trash pump which delivers 1,600 GPM.

6. Water Treatment System

Describe any water treatment facilities that you will employ to meet minimal water quality standards (influent or effluent).

None currently. Depurate with UV in future for any sockeye program.

7. Annual Water Budget

Attach a graph showing seasonal variation in flow required for eyeing, incubation, freshwater rearing, freshwater lens in saltwater pens, adult holding, and fishladder operations.

See attached Appendix H

IV. HATCHERY DESIGN AND CONSTRUCTION INFORMATION

A. Biocriteria for Design and Construction

Describe the critical operational assumptions and objectives which determine the design size and capacity of the proposed hatchery. Specific reference should be made to the following (for reference, a table of CFMD assumptions for salmon survival is provided, Table I):

BROOD STOCK – SPECIES: Fall Coho

1. Eggs per female spawner: 2,800
2. Brood stock requirements at 1:1 sex ratio: 3,600
3. Green egg requirements: 5,000,000
4. Estimated holding mortality: 360, 10%

HATCHERY FACILITY

5. Eyed eggs (3% loss from green egg stage) 4,850,000
6. Eyed egg density per incubation unit: 100,000
7. Total number of incubation units: 48
8. Number of cabinets per unit: N/A
9. Water requirements at 23L/min/unit=1,104L/min
10 Water requirements with _ loss= __L/min

FRESHWATER REARING UNITS: NETPENS not RACEWAYS: Freshwater Release

11 Number of emerging fry (1% loss from eyed stage) 3,600,000
12 Initial fry weight at 0.0003/kg= 1,080kg
13 Final Fry weight at 0.02/kg= 72,000 kg
14 Initial freshwater fry rearing space required at 0.2 kg/m^3 8,700 m^3 (12 netpens)
15 Final freshwater fry rearing space required at 20 kg/m^3 17,400 m^3 (24 netpens)
16 Maximum number of rearing units (12 m by 12 m by 6 m= 17,400 m^3, (24 netpens)
17 Maximum water requirements at _____kg/L/min and 10% loss_____L/min
18 Number of exchanges per hour (R-value) per raceway_____

MARINE REARING UNITS Saltwater Release

19. Number of fry/fingerling/or smolts 1,200,000
20. Initial weight at 0.015/kg = 18,000kg
21. Final weight at 0.020/kg = 24,000kg
22. Initial rearing space required at 20 kg/m^3 = 4,300 m^3 (6 netpens)
23. Final rearing space required at 20 kg/m^3 4,300 m^3 (6 netpens)
24. Maximum number of rearing units (12 m by 12 m by 6 m= 4,300 m^3), 6

PROJECTED RETURN Freshwater +Saltwater Releases

25. Number of returning fish at 5% ocean survival = 240,000

A. Biocriteria for Design and Construction (continued)

BROOD STOCK – SPECIES: Sockeye

1. Eggs per female spawner: 3,000
2. Brood stock requirements at 1:1 sex ratio: 670
3. Green egg requirements: 1,000,000
4. Estimated holding mortality: 200, 30%

HATCHERY FACILITY

5. Eyed eggs (10% loss from green egg stage): 900,000
6. Eyed egg density per incubation unit: 3,000/tray
7. Total number of incubation units: 300
8. Number of cabinets per unit:
9. Water requirements at 23L/min/unit= 1,150L/min
10 Water requirements with _% loss= __L/min

FRESHWATER REARING UNITS Netpens Not Raceway

11 Number of emerging fry (10%loss from eyed stage) 810,000

12 Initial fry weight at 0.0003/kg= 243kg

13 Final Fry weight at 0.001kg= 800kg

14 Initial freshwater fry rearing space required at 0.2 kg/m^3 1,450= m^3 (2 netpens)

15 Final freshwater fry rearing space required at 0.6kg/m^3 = 1,450m^3 (2 netpens)

16 Maximum number of rearing units (12m x12 m x6 m) = 1,450 m^3

17 Maximum water requirements at _____kg/L/min and 10% loss_____L/min

18 Number of exchanges per hour (R-value) per raceway:

MARINE REARING UNITS N/A, will be freshwater release

19. Number of fry/fingerling/or smolts:
20. Initial weight at ___/kg= __kg
21. Final weight at ___/kg= ___kg
22. Initial rearing space required at __kg/m^3 = ___ m^3
23. Final rearing space required at __kg/m^3 = ___ m^3
24. Maximum number of rearing units (_____m by_____m by_____m=_____ m^3)

PROJECTED RETURN

25. Number of returning fish at 6% ocean survival = 48,000

B. GENERAL DESCRIPTION

Attach a written description of the proposed facility. This description should represent a solid concept of the proposed hatchery design. Also include preliminary sketches and drawings of at least the following in an appendix.

1. Incubation and rearing site plan.
2. Hatchery floor plan.
3. Water supply system.
4. Incubation/operation building.
5. Facility layout.

The site plan should include a plan view of all facilities at a scale of 1:100 or larger, a USGS 1:63360 scale topographical map showing the entire watershed and all facility locations, and a NOAA marine chart of the largest scale available showing all tidewater-based facilities and local data.

See Attached Appendix I. Location of netpens in Klawock Lake and harbor are shown in Appendix A

C. PROPOSED CONSTRUCTION TIMETABLE

Prepare a timetable for the construction period which indicates the critical milestones for the project.

See attached Appendix: HATCHERY ALREADY CONSTRUCTED

V. BROOD STOCK

A. Initial Donor Stock

1. Identification of source.

Indicate stream name, ADF&G number or geographic coordinates, and salmon species for each proposed donor stock.

a. Species: Fall Coho

Stream name: Klawock River

ADF&G number or geographic coordinates: 103-60-10470

b. Species: Sockeye

Stream name: Klawock River

ADF&G number or geographic coordinates: 103-60-10470

2. **Capture techniques and holding facilities at the donor stream.** **Sockeye Only**

   a. **Capture techniques**

   Describe in detail the capture techniques you will use to harvest adults and take eggs. Please provide a map identifying the exact location of the holding facilities.

Sockeye will be captured off mouth of ½ mile Creek and 3 mile Creek using beach seines and held for ripening in netpens anchored off streams.

   b. **Holding facilities**

   Describe the holding facilities to be used for donor stock spawners (include schematics). List the loading rate [kg fish/ (L/min)] and density (kg fish/mg^3).

Adult sockeye will be held in 40'x40'x20' netpens, 3/8" mesh. 300 fish per pen. .002kg/m^3

3. **Transportation**

Discuss method planned for transporting live fish and/or eggs

Sockeye are spawned on shore at holding pen site. Eggs transported in 1-gallon zip lock bags on burlap covered ice in coolers by boat to hatchery service road then driven short distance to hatchery. Males spawned into whirl-pacs with oxygen added to milt. Also placed on ice.

4. **Spawning and fertilization**

   Discuss the spawning, fertilization, and disinfection procedures and the procedure for estimating percent fertilization.

Standard FRED sockeye spawning protocols used. Individual gametes are fertilized in plastic bowls (2 males to 1 female). IHN virus free freshwater used for rinsing and activation. Water harden in 1:100 Argentyne for an hour. Refresh Argentyne if dilution occurs during water hardening. Standard disinfection between each fish and disinfection of zip lock bags and whirl-pacs. Fertilization estimated using Stockard's solution to clear 50 eggs at 4 cell stage.

B. Brood Stock Returning to Hatchery - COHO

1. Capture techniques and holding facilities at the hatchery.

a. Capture Techniques

Describe in detail the techniques you will use to capture and ripen adults and take eggs.

See Appendix J.

b. Holding facilities

Describe the holding facilities to be used for hatchery brood stock spawners (include schematics) and give the loading rate [kg fish/ (L/min)] and density (kg fish/mg^3).

Density: 4kg/m³ Loading rate: 2700kg/2300 lpm

2. Transportation

Discuss method planned for transporting live fish and/or eggs (if different from those described in Part A).

3. Spawning and fertilization

Discuss the spawning and fertilization procedures (if different from those described in Part A).

Three females are fertilized with two males in two gallon buckets. Eggs are rinsed in clean, flowing freshwater and water hardened in Argentyne at 1:100 for one hour. Fertilization rates are checked using Stockard's solution to clear 50 random eggs from each lot at 4 cell stage. (See Appendix J).

VI <u>INCUBATION AND REARING PLAN</u>

A. Incubators and Rearing Units

Describe the type of incubators and rearing facilities to be used.

Green eggs are loaded into 18 Kitoi Boxes (~277,000/Kitoi) through picking and thermal mark. After thermal mark eyed eggs are seeded into 50 Kitois (100,000 per) for hatching and swim up. Initial ponding of fry into 12 1/8" mesh netpens (400,000/per) until 4-5g then split into 24 3/8" mesh netpens until release (200,000/per).

B. Egg Handling

Describe the method by which you plan to handle the eggs from the spawning process through planting them in incubators.

Eggs will be carried to incubation room and gently placed in incubator containing 1:100 strength Argentyne for a one hour water hardening after which fresh water will be delivered

C Chemical Treatment

What chemicals and concentrations will be used for controlling fungus on eggs until the eyed stage?

15 minute formalin drip 3x/week per incubator @ 1:6000

D. Enumerations

Describe the method(s) to be used in estimating numbers of green eggs, eyed eggs, and fry.

Green eggs estimate based on historical average of 2,800 fecundity. Eyed eggs are enumerated by weight after obtaining single egg weight. Fry estimates are based on egg loss on fry screen in incubator.

E. Rearing Plans

Describe any plans to rear the salmon including type of food.

Fry are initially reared in 12 40'x40'x20' 1/8" mesh netpens until 6g. Fish are then split into 24 40'x40'x20' 3/8" mesh netpens until release. Historically fish have been fed EWOS feed from mash to 2mm pellet.

F. Disease Control

Describe plans for preventing or controlling disease during rearing.

Nets are routinely cleaned to promote good water flow. Containers containing disinfectant are available for disinfection of equipment. Minimizing stress and good fish culture practices are implemented to avoid disease. Any suspected disease issue is confirmed with ADFG Pathology lab and a prescribed treatment is followed if necessary.

VII RELEASE PLAN

A. Release Site(s)

1. Give exact location and description of proposed release site(s), including maps.

Klawock Lake and Klawock Estuary. Appendix A.

Port Asumcion. Appendix A2.

2. List proposed number and age of each species to be released at each site.

1.2 million smolt (1 check) are released each year into Klawock Lake on May 15 (FTP 07J-1003. The remaining production (up to 3.6 million) 1 check smolt will be released in the Klawock estuary after short term rearing (FTP 10J-1020). FTP's on file with ADFG.

Up to 250,000 smolt may be released at Port Asumcion, based on the current POWHA KRH permit. Fish transport permits have not been applied for or approved for Port Asumcion release.

B. Transportation

Discuss the methods planned for transporting live fish from the hatchery to the release site(s).

Smolts are transported with a fish transport trailer which has three 600 gallon tanks. Fish are transported at 180kg/m per tank. Oxygen is provided by bottle at a rate necessary to maintain a dissolved oxygen level of 12-14 ppm. Trip to estuary is short, 10 minutes, and fish are not in tanker longer than an hour from start of loading to finish.

VIII STAFFING

A. Technical Advisors

Attach information about each technical advisor to the nonprofit corporation, indicating that person's name, address, role and responsibilities, and a brief statement of technical qualifications.

HATCHERY HAS BEEN CONSTRUCTED.

B. Design and Construction

Attach a list of the names and qualifications of persons or corporations responsible for final design and construction of proposed facilities.

See attached Appendix: HATCHERY HAS BEEN CONSTRUCTED

C. Administrative Personnel

List the administrative personnel who will support this facility when operational.

Personnel Assigned (Titles)	Percentage of Time
1. David Landis, General Manager	10
2. Bill Gass, Production Manager	20
3. Bret Hiatt, Operations Manager	10

D. Operating Personnel

List the operating personnel who will be assigned to this facility when operational.

Personnel Assigned (Titles)	Percentage of Time
1. Jeff Lundberg, Hatchery Manager	100
2. Troy Liske, Assistant Hatchery Manager	100
3. Rick Medlin, Maintenance Supervisor	100
4. Paul Young, Fish Culturist	100
5. Sheldon Sammons, Fish Culturist	100
6. Casey Gagne, Seasonal Fish Technician	100
7. Wiley Heppe, Seasonal Fish Technician	100
8_____	_____
9._____	_____
10._____	_____

IX FINANCIAL PLAN

An estimate of hatchery construction and operating costs should be detailed here. These estimates would provide an indication of the cost recovery requirements of the proposed facility on an annual basis. Acceptance of this application by the Department of Fish and Game in no way implies agreement by the Department of Commerce and Economic Development to commit state loan funds for this project.

See attached Appendix K.

X. Basic Management Plan

The preparation of a draft Basic Management Plan will be completed prior to the public hearing. The applicant will be expected to work closely with ADF&G staff in developing the Basic Management Plan (see 5 AAC 40.820).

XI DECLARATION AND SIGNATURE

I declare that the information given in this application is, to my knowledge, true, correct, and complete.

JEFFREY H. LUNDBERG
Name of Applicant

1/28/16
Date Signed

Jeffrey H. Lundberg
Signature of Applicant

1/28/16