

# GUNNUK CREEK HATCHERY

## KAKE NON-PROFIT FISHERIES CORPORATION

### 2011 ANNUAL MANAGEMENT PLAN

#### SUMMARY

**I. Program changes or operational changes this year:**

The late large chum salmon program has been discontinued. All chum salmon production will have traditional size and release timing, with the exception of staggered releases rather than releasing all chum salmon at one time.

**II. New Permit Alterations, FTPs, or Amendments needed this year:**

No New Permit Alterations or FTPs are anticipated this year.

**III. Expected Return and Cost Recovery.** See Appendix 1.

Species, Run	Release Location	Common Property Harvest	Other <sup>1</sup>	Total Return
chum salmon, summer	Southeast Cove SHA	38,390	121,568	159,959
chum salmon, summer	Kake SHA	34,587	80,703	115,290
pink salmon	Kake SHA	149,940	224,910	374,850
coho salmon, fall	Kake SHA	1,698	1,698	3,396

<sup>1</sup> Includes cost recovery, brood stock, and escapement.

#### INTRODUCTION

The Gunnuk Creek Hatchery is a private nonprofit facility owned and operated by Kake Non Profit Fisheries Corporation (KNFC). The hatchery is located in the City of Kake, on the Northwest tip of Kupreanof Island. Gunnuk Creek (109-42-004) supplies the hatchery water via one 10-inch HDPE pipeline. Up to 5.0 cubic feet per second of water is available.

Pending Commissioner acceptance of approved permit change, the egg-take goal for 2011 will be 65 million chum salmon eggs and 20 million pink salmon eggs. Gunnuk Creek Hatchery may take an additional 30 million chum salmon eggs for transport to Port Armstrong Hatchery, if requested. Chum salmon in excess of brood stock needs will be sold for cost recovery.

The hatchery anticipates the release of **17** million BY **10** chum salmon fry this year, which is **26%** of full chum salmon production and **18 million pink salmon 90% of permitted production**. The BY **10** chum and pink salmon were **100%** thermally marked using a chiller/boiler system. All of the BY **11** chum and pink salmon will be thermal marked. Thermal marking is the first step toward evaluating adult return timing, contribution to the common property fisheries, and release strategies.

Gunnuk Creek Hatchery is also permitted to take **500,000** coho salmon eggs. The intent of this program is to provide coho salmon for common property fisheries, which include personal use and sport fishing opportunities for the community of Kake, and to provide brood stock for the continuation of the Gunnuk Creek Hatchery coho salmon program. Coho salmon in excess of brood stock needs may be sold for cost recovery.

Gunnuk Creek Hatchery expects to release **100,000** BY **09** coho salmon smolts in 2011. **Thirty percent of** smolts will be coded-wire-tagged (CWT). Tags will later be recovered from sampling programs conducted in common property commercial and sport fisheries. Gunnuk Creek Hatchery will continue the coho salmon program in 2011 with an egg-take goal of **500,000** eggs collected from Gunnuk Creek (109-42-004).

All Gunnuk Creek Hatchery Fish Transport Permits (FTP) for chum, pink, and coho salmon are current.

Cost recovery operations and weir placement are expected to occur as usual in July and August. Egg takes are expected to take place July through October.

## FISH PRODUCTION

### I. Species: Chum salmon

Run: July to August

#### A. Egg Takes

**Table 1.** Egg takes – chum salmon.

Program Name	Ancestral Stock(s)	Egg-Take Site, Stat Area	Primary or Alternate Source?	Current Year Egg Goal	Permitted Maximum <sup>1</sup>
Gunnuk Creek chum salmon	Hidden Falls	Gunnuk Creek Hatchery 109-42-004	P	65,000,000	65,000,000
		Port Armstrong Hatchery	A	10,00,000 <sup>2</sup>	50,000,000
		Hidden Falls Hatchery	A	5,000,000 <sup>2</sup>	10,000,000
Species/Run Totals				65,000,000	65,000,000

<sup>1</sup> Permitted capacity of Gunnuk Creek Hatchery is 65M pink and chum salmon eggs, with no more than 20M being pink salmon eggs. 65M chum salmon eggs may be collected if no pink salmon eggs are collected. **PAR has been approved to change wording on permit to read 65 million chum salmon and 20 million pink salmon eggs. Pending Commissioner approval.**

<sup>2</sup> Only if needed and available.

**1. Egg-Take Site: Gunnuk Creek Hatchery (109-42-004)**

Enhanced return     Mixed wild/ enhanced return     Wild return

- a) Brood stock capture method:** A check dam is in place just upstream from the mouth of the hatchery fish ladder and around July 10-12 a weir is raised on a winch system to stop fish passage. This weir prevents chum salmon from migrating upstream, while allowing non-target species, such as cutthroat trout and Dolly Varden, to pass freely through. Any non-target species too large to pass through the weir migrate into the adult holding raceway system, where they are manually passed upstream. On September 15<sup>th</sup>, the weir is lowered on a winch system to allow fish passage, and remains lowered until coho salmon return, which usually happens around October 1<sup>st</sup>. The lowered weir allows the passage of the remaining chum salmon and non-target species. There are no chum salmon in excess of brood stock needs projected to occur in the Kake Special Harvest Area (SHA 109-40). Harvesting in the Kake SHA will only occur if it is certain that egg-take goals for the hatchery and Port Armstrong will be achieved. Sex ratio monitoring of chum salmon will be conducted to ensure that there is not an excessive escapement. Communication with the ADF&G area management biologist during and after the aerial surveys of this SHA and adjacent areas will be a priority. Cost recovery harvest operations at the Southeast Cove SHA will cease or subside if it becomes apparent that escapement to the Kake SHA is insufficient to reach the facility's green egg capacity. If adults are used as brood stock from the Southeast Cove SHA (109-41), they will be collected by purse seine or by beach seine.
- b) Spawning:** Adult chum salmon diverted into the adult raceway system are held until utilized. Eggs are stripped from ripe fish, and green fish are held in a holding area until ripe. Gametes are combined in the egg-take area. Sperm activation and water hardening occur in a rinse tank in the incubation area. The eggs are sampled at the rinse tank for egg size, fecundity and fertility. Eggs are loaded into water-filled NOPAD incubators using a water slide loader.

If available, green or eyed eggs will be transported to the Port Armstrong Hatchery via fixed-wing aircraft or fishing vessel. The eyed eggs will be shipped in boxes or buckets. Green eggs will be shipped with gametes in separate containers.

- c) Egg-take schedule:** Egg takes generally begin around July 10,<sup>th</sup> and last for three to four weeks, but may be extended due to run timing and recruitment to the fish ladder. The egg take should approximate the normal run curve, since brood stock are admitted into the adult raceway system proportionally during the course of the run. Two to four million eggs can be taken in a single day, depending on the number of ripe females and their fecundity. The egg-take goal for 2010 is 60 million eggs, which will require utilizing up to 45,000 females.

- d) Carcass Disposal:** Chum salmon carcasses will be given away or sold as bait. Carcasses not utilized will be ground to less than ½ square inch pieces at the City of Kake's deep water port (as required by Alaska Department of Environmental Conservation regulations) or dumped off-shore in the required depth of at least 50 fathoms.

**B. Planned releases this calendar year of previous brood years' production.**

**Table 2.** Planned releases this calendar year of previous brood years' production – chum salmon.

<b>Program Name</b>	<b>Brood Year</b>	<b>Release Date</b>	<b>Number to Release</b>	<b>Life Stage</b>	<b>Type of Mark, % Marked</b>
Kake SHA chum salmon (109-40)	2010	5/12/2010, 5/26/2010, 6/02/2010	7,000,000*	Fed Fry	Thermal Marks, 100%
Southeast Cove SHA chum salmon (109-41)	2010	5/14/2010, 5/28/2010, 6/04/2010	10,000,000*	Fed Fry	Thermal Marks, 100%

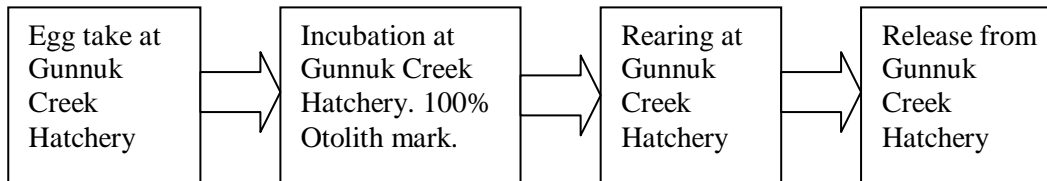
\* Estimated numbers.

**C. Program descriptions**

**1. Program Name: Gunnuk Creek Hatchery chum salmon (109-40)**

**Permitted through Gunnuk Creek Hatchery**

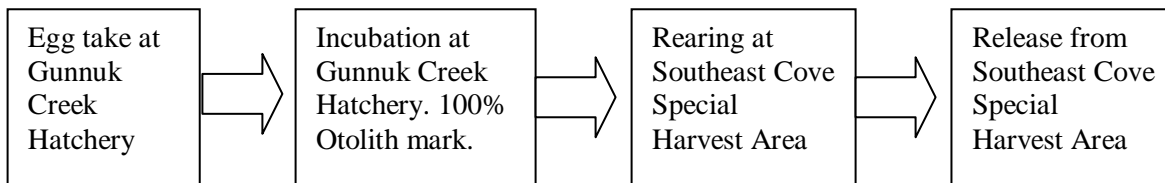
**a) Operational diagram**



**2. Program Name: Southeast Cove Chum salmon (109-41)**

**Permitted through Gunnuk Creek Hatchery**

**a) Operational diagram**



**b) Program details for Gunnuk Creek Hatchery and Southeast Cove chum salmon.**

**1) Purpose of programs** - To provide chum salmon to the common property fishery in Frederick Sound and Chatham Strait, as well as brood stock and cost recovery for Gunnuk Creek Hatchery.

**2) Narrative description** - The chum salmon program at Gunnuk Creek started in 1977. Gunnuk Creek Hatchery has two chum salmon release sites, one at the hatchery and one remote release site at Southeast Cove. All chum salmon production will have traditional size and release timing, with the exception of staggered releases rather than releasing all chum salmon at one time. A bulk release has been standard practice in an attempt to overwhelm predators. Several hatcheries in Southeast Alaska are experimenting with staggered releases, on the assumption that bulk releases are being targeted by predators, primarily whales.

ADF&G has estimated that on average, Gunnuk Creek Hatchery contributes about 30% of its total chum salmon return to the common property fisheries. Chum salmon return projections are based on 18 years of scale data from Gunnuk Creek Hatchery (Appendix 1). These data show returns are predominantly made up of four and five year olds. Evaluation of survival and contribution will become more accurate as thermally marked chum salmon return, beginning with the BY 08 chum salmon returning as three year olds in 2011. Special Harvest Area return estimates take into account the estimated 30% interception rate by the common property fisheries. The need for chum salmon brood stock is a primary concern, and conservation measures for this purpose shall be taken to the greatest extent possible.

**3) Evaluation** – Thermal marks are applied to the otoliths by a planned sequence of water temperature manipulations while eggs are in the incubators. A boiler was installed to heat hatchery water, and thermal marking began with a small trial program on the BY 05 chum salmon (16% of the Kake SHA, and 5% of the Southeast Cove SHA releases were marked). High ambient water temperatures made it difficult to mark the BY 05 fish. The ambient water temperatures during incubation of the BY 06 and BY 07 chum salmon were so high that increasing the water temperature high enough to produce a mark would have put the health of the fish at risk, so none of the BY 06 or BY 07 chum salmon were marked. The Alaska Sustainable Salmon Fund (AKSSF) money allowed for a chiller to be installed in early 2008. One hundred percent of the BY 08 chum salmon released from Gunnuk Creek Hatchery were thermally marked. A thermal mark was applied to **100%** BY **2010** chum salmon. Thermal mark data collected from returning adults will help evaluate release timing strategies, marine survival, and fishery contribution.

The Comprehensive Salmon Enhancement Plan for Southeast Alaska: Phase III called for all hatchery produced pink, chum, and sockeye salmon to be otolith marked beginning in 2004. A Southeast wide mark-recovery program has yet to be established for otolith marks. The recovery program will most likely need to incorporate port sampling at the major processing locations such as Sitka, Petersburg, Excursion Inlet, and Ketchikan. In addition, sampling on minor sites, such as floating processors, may be necessary to properly sample production by smaller hatchery associations. A cooperative effort between Gunnuk Creek Hatchery, other hatchery associations, and ADF&G would provide a cost-effective opportunity to recover otolith marked fish. Gunnuk Creek Hatchery will collect otoliths during cost recovery harvest.

#### 4) Performance standards for the program

- Release fed chum salmon fry from the 65 million egg-take goal at an average minimum release weight of 1.00 grams.
- Significantly contribute to the Frederick Sound and Chatham Strait common property fisheries.
- Annually harvest between 500,000 and 1,500,000 chum salmon to meet cost recovery requirements (price dependent).
- Thermally mark all fry released from the facility to evaluate return timing and contributions to common property fisheries. Use accessory thermal marks to determine best release strategy.

#### b) FTPs

**Table 3.** FTPs chum salmon.

FTP#	E.t., trans, or rel?	Trans. from→ To	Maximal #, Life Stage	Expires
91J-1010	ET and release	Gunnuk Hatchery to Southeast Cove SHA	60 million chum salmon eggs	6/15/2011
02J-1009	ET and release	Gunnuk Hatchery to Kake SHA	10 million chum salmon eggs	6/1/2012
07J-1025	transport	Port Armstrong to Gunnuk Hatchery	50 million chum salmon eggs	10/30/2012
07J-1023	transport	Hidden Falls to Gunnuk Hatchery	10 million chum salmon eggs	10/30/2012

**I. Species: Pink salmon**

**Run: August to September**

**A. Egg takes**

**Table 4.** Egg takes – pink salmon.

<b>Program Name</b>	<b>Ancestral Stock(s)</b>	<b>Egg-Take Site, Stat Area</b>	<b>Primary or Alternate Source?</b>	<b>Current Year Egg Goal</b>	<b>Permitted Maximum<sup>1</sup></b>
Gunnuk Creek pink salmon	Gunnuk Cr.	Gunnuk Creek Hatchery 109-42-004	P	<b>20,000,000</b>	20 million
Species/Run Totals				<b>20,000,000</b>	20 million

<sup>1</sup> Permitted capacity of Gunnuk Creek Hatchery is 65 million pink and chum salmon eggs, with no more than 20 million being pink salmon eggs. Up to 20 million pink salmon eggs may be collected, if 45 million (or less) chum salmon eggs are collected. **PAR has been approved to change wording on permit to read 65 million chum salmon and 20 million pink salmon eggs. Pending Commissioner approval..**

**1. Egg-Take Site: Gunnuk Creek Hatchery (109-42-004)**

Enhanced return     Mixed wild/ enhanced return     Wild return

**a) Brood stock capture method:** A check dam is in place just upstream from the mouth of the hatchery fish ladder and around July 10-12, a weir is raised on a winch system to stop fish passage. This weir prevents the pink salmon from migrating upstream, while allowing non-target species such as cutthroat trout and Dolly Varden to pass freely through. Any non-target species too large to pass through the weir migrate into the adult holding raceway system, where they are manually passed upstream. The weir is lowered to allow fish passage on September 15<sup>th</sup> and remains lowered until coho salmon return, which usually happens around the October 1<sup>st</sup>. The lowered weir allows the passage of the remaining pink salmon and non-target species.

**b) Spawning:** Adult pink salmon diverted into the adult raceway system are held until utilized. Eggs are then stripped from ripe fish. Green fish are put in a green holding area until ripe. Gametes are combined in the egg-take area. Sperm activation and water hardening occur in a rinse tank in the incubation area. The eggs are sampled at the rinse tank for egg size, fecundity, and fertility, prior to loading into water-filled NOPAD incubators using a water slide.

**c) Egg-take schedule:** Egg takes generally begin around August 15<sup>th</sup> and last for 10 days. Run timing and recruitment to the fish ladder can extend this period. Egg take should approximate the normal run curve since brood stock are admitted into the adult raceway system proportionally during the course of the run. Approximately 250,000 to 500,000 eggs can be taken in a single day, depending on the number of ripe females available and their fecundity. The 2010 egg-take goal for pink salmon is five million eggs, which will require utilizing up to 2,500 females. Gunnuk Creek Hatchery may not take more than 20 million pink salmon eggs annually, which would require utilizing up to 10,000 females.

d) **Carcass Disposal:** Pink salmon carcasses will be given away, or sold as bait. Carcasses not utilized will be ground to less than ½ square inch pieces at the City of Kake’s deep water port (as required by Alaska Department of Environmental Conservation regulations) or dumped off-shore in the required depth of at least 50 fathoms.

**B. Planned releases this calendar year of previous brood years’ production.**

**Table 5.** Planned releases this calendar year of previous brood years’ production – pink salmon.

Program Name	Brood Year	Release Date	Number to Release	Life Stage	Type of Mark, % Marked
Kake SHA Pink salmon (109-40)	2009	6/02/2010	18,000,000*	Fed Fry	100%**
Southeast Cove SHA Pink salmon (109-42)	2009		0	Fed Fry	

\* Estimated number.

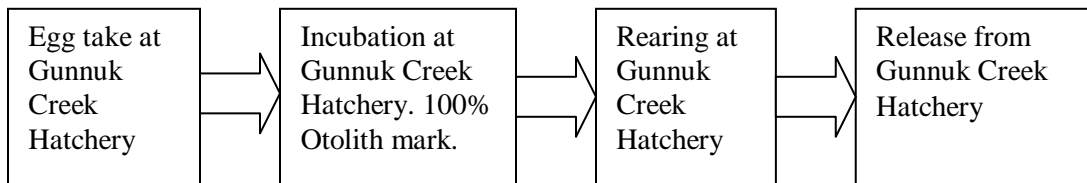
\*\* Eggs were marked but trouble with boiler may have affected mark quality.

**C. Program descriptions**

**1. Program Name: Gunnuk Creek Hatchery Pink salmon (109-40)**

Permitted through Gunnuk Creek Hatchery

**a) Operational diagram**



**b) Program details for Gunnuk Creek Hatchery Pink salmon**

1) **Purpose of programs** - To provide pink salmon to the common property fishery in Frederick Sound and Chatham Strait, as well as brood stock and cost recovery for Gunnuk Creek Hatchery.

2) **Narrative description** - The pink salmon program at Gunnuk Creek was started in 1976. It was suspended in 1994 to concentrate on the more profitable chum salmon. With new markets and higher prices for pink salmon, production has been reinstated to diversify cost recovery options. Gunnuk Creek Hatchery is the only release site for the pink salmon program. Estimated average contribution to the common property fisheries has been about 15% of the total Gunnuk Creek Hatchery return. The fish were not marked in the previous pink salmon program, so contribution and survival is a rough estimation.

3) **Evaluation** – 100% of BY 11 eggs will be thermally marked. Otoliths will be collected during cost recovery harvest for evaluating release strategies. The Comprehensive Salmon Enhancement Plan for Southeast Alaska: Phase III called for all hatchery-produced pink, chum,

and sockeye salmon to be otolith marked beginning in 2004. A Southeast wide mark-recovery program has yet to be established for otolith marks. The recovery program will most likely need to incorporate port sampling at the major processing locations such as Sitka, Petersburg, Excursion Inlet, and Ketchikan. In addition, sampling on minor sites such as floating processors may be necessary to properly sample production by smaller hatchery associations. A cooperative effort between Gunnuk Creek Hatchery, other hatchery associations, and ADF&G would provide a cost-effective opportunity to recover otolith marked fish.

**4) Performance standards for the program**

- Release fed pink salmon fry from the **20** million egg-take goal at an average minimum release weight of **1.00** grams.
- Significantly contribute to the Frederick Sound and Chatham Strait common property fisheries.
- Annually harvest a minimum of 75,000 - **500,000**,000 pink salmon to meet cost recovery requirements.
- Thermally mark all fry released from the facility to evaluate contributions and timing of returns to common property fisheries. Accessory thermal marks will be used to determine best release strategy.

**c) FTPs**

**Table 6.** FTPs - pink salmon.

<b>FTP#</b>	<b>E.t., Trans, or Rel.?</b>	<b>Trans. From→To</b>	<b>Maximal #, Life Stage</b>	<b>Expires</b>
07J-1024	ET and release	Gunnuk Hatchery to Southeast Cove SHA	Up to 20 million pink salmon eggs and fry	6/15/2017
10J-1022	ET and Release	Gunnuk Creek Hatchery to Kake SHA/ Gunnuk Creek	Up to 20 million pink salmon eggs and fry	6/15/2017

**II. Species: Coho salmon**

**Run: Late Fall**

**A. Egg takes**

**Table 7.** Egg takes - coho salmon.

<b>Program Name</b>	<b>Ancestral Stock(s)</b>	<b>Egg-Take Site, Stat Area</b>	<b>Primary (P) or Alternative (A) source?</b>	<b>Current Year Egg Goal</b>	<b>Permitted Maximum</b>
Gunnuk Creek coho salmon	Gunnuk Creek	Gunnuk Creek Hatchery 109-42-004	P	500,000	500,000*
Species/Run Totals				500,000	500,000

**\* PAR has been approved to increase permitted capacity to 500,000. Pending Commissioner approval.**

**1. Egg Take Site: Gunnuk Creek Hatchery**

Enhanced return     Mixed wild/ enhanced return     Wild return

- **Brood stock capture method:** A check dam is in place just upstream from the mouth of the hatchery fish ladder and a weir is raised on a winch system to stop fish passage between October 1 - 10. This weir prevents coho salmon from migrating upstream, while allowing non-target species such as cutthroat trout and Dolly Varden to move freely through. Any non-target species too large to pass through the weir migrate into the adult holding raceway system, where they are manually passed upstream. The weir is lowered on a winch system by November 10 to allow passage of remaining coho salmon and other non-target species. In 2010, there are no coho salmon in excess of brood stock needs projected to occur in the Kake Special Harvest Area. Communication with the ADF&G area management biologist during egg take will be a priority.

**Spawning:** Adult coho salmon diverted into our adult raceway system are held until utilized. Eggs are then stripped from ripe fish. Green fish are put in a green holding area until ripe. Gametes are combined in the egg-take area. Sperm activation and water hardening occur in a rinse tank in the incubation area. The eggs are sampled at the rinse tank for egg size, fecundity, and fertility. Heath Tray incubators are marked for individual family tracking, prior to being loaded with eggs.

**a) Egg-take schedule** – Egg takes usually occur between late October and early November, over a one to two week period, as sufficient numbers of females ripen. Eggs will be taken in lots of approximately 10,000, until the maximum goal of 250,000 eggs has been collected. The 2011 coho salmon egg-take goal of 500,000 eggs will utilize approximately 160 females.

**b) Carcass Disposal:** Coho salmon carcasses will be given away, or sold as bait. Carcasses not utilized will be ground to less than ½ square inch pieces at the City of Kake’s deep water port (as required by Alaska Department of Environmental Conservation regulations) or dumped off-shore in the required depth of at least 50 fathoms.

**B. Planned releases this calendar year of previous brood years' production**

**Table 8.** Planned releases this calendar year of previous brood years' production – coho salmon.

Program Name	Brood Year	Release Date	Number to Release	Life Stage	Type of Mark, % Marked
Gunnuk Creek coho salmon	2009	4/5/2011	100,000*	smolt	31k CWT-AD

\*Estimated number

**C. Previous brood years that will remain in culture during the entire calendar year.**

**Table 9.** Previous brood years that will remain in culture during the entire calendar year.

Program Name	Brood Year	Number Live (Jan. 1)	Life Stage	Type of Mark, % to Mark	Number to Release, Date
Gunnuk Creek coho salmon	2010	250,000*	Eyed eggs	N/A	Spring 2012
None					

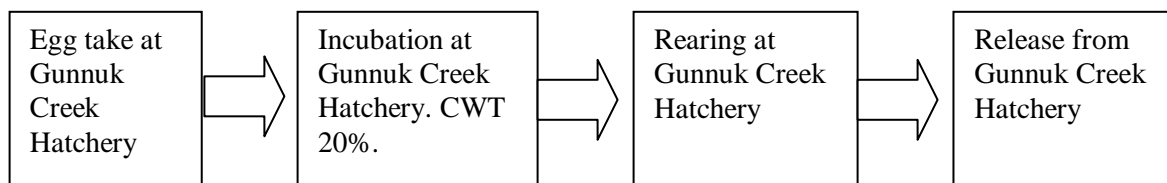
\*Estimated number.

**D. Program descriptions**

**1. Program Name: Gunnuk Creek coho salmon**

**Permitted through: Gunnuk Creek coho salmon**

**a) Operational diagram**



## b) Program details

1) **Purpose of program** - To provide coho salmon to the common property troll fishery in Frederick Sound and Chatham Strait. Provide coho salmon to the sport and personal use fisheries around the City of Kake, as well as brood stock and cost recovery for Gunnuk Creek Hatchery.

2) **Narrative description** - Gunnuk Creek Hatchery began its coho salmon program in 1994, with brood stock taken from Portage Bay. In 1998, brood stock was taken from Duncan Creek. Both of these egg takes were for U.S. Forest Service enhancement projects, and none of the fry or smolts were released at Gunnuk Creek. The permitted capacity of the Gunnuk Creek Hatchery coho salmon program is 500,000 eggs.

Gunnuk Creek Hatchery coho salmon will be reared and released in the traditional method. Traditional freshwater rearing occurs in circular fiberglass tanks and linear concrete raceways. Fish may overwinter in saltwater net pens. The goal for the coho salmon smolts is to reach a target weight of **15** - 24 grams, with a very high condition factor.

In 201**10**, return and contribution data will be gathered as CWT BY **087** coho salmon return. **All coho release groups** will have unique coded wire tags. This will allow the collection of survival and return data to judge the overall success of **the** program. Portage Bay, Duncan Creek runs **and current Gunnuk Creek run show an** overall marine survival of approximately 10%. Marine survival estimates are derived from commercial interception expansion rates of coded wire tag recovery data. Commercial interception was speculated to be 50% of the overall marine survival. Improved fish culture techniques, improvements in the hatchery water system, and the ability to regulate incubation and rearing temperatures will lead to an increased production of quality smolts.

3) **Evaluation**– **31,000** of the BY **1009** coho salmon smolts **were** coded-wire-tagged.. These tags will be recovered by ADF&G during port sampling of the troll and sport fishery. Brood stock will also be sampled for coded wire tags. **Gunnuk Creek Hatchery staff will perform creel surveys in the Kake area, looking for adipose clipped fish. This will help ascertain if any straying has occurred as well as determine local sport and subsistence usage.**

### 4) Performance standards for the program

- Annually release coho salmon smolts produced from the permitted egg-take capacity of **500,000** green eggs at a size of **15** to 24 grams.
- Strive to maintain a green egg to smolt survival over 85%.
- Coded wire tag **15%** of coho salmon.
- Maintain rearing and release strategies that have marine survival comparable to those experienced by Hidden Falls and Deer Lake/Mist Cove (e.g., ~10% or greater). These facilities and programs are located along the eastern shore of Baranof Island.
- Maintain a coho salmon common property contribution rate as high as possible given current environmental and market factors (historically around 50%).
- Produce enough excess adults to provide for both brood stock needs and common property

harvest, including substantial personal use and sport fisheries harvest in the Kake area.

**FTPs**

**Table 10.** FTPs - coho salmon.

FTP#	E.t., trans., or rel.?	Trans. from→To	Maximal #, Life Stage	Expires
07A-1027	ET and rearing	Gunnuk Creek Hatchery to Kake SHA	250,000 green eggs	11/30/2017
07A-1028	Release	Kake SHA	250,000 smolts	11/30/2017

**HARVEST MANAGEMENT**

**I. Release Location:** Southeast Cove    \_\_\_THA    XSHA

Described in 5 AAC 40.073 DISTRICT 9: SOUTHEAST COVE SPECIAL HARVEST AREA. (109-41)

The Southeast Cove Special Harvest Area (SHA) is defined in the Basic Management Plan as all waters of Keku Strait bounded by a line from rocky point on the east side of Southeast Cove at 56° 52.95’ N. Lat., 134° 01.33’ W. Long. to the northwest corner of Hound Island at 56° 53.12’ N. Lat., 133° 56.77’ W. Long. Then northwest, connecting points along the northern shore of Keku Islands at 56° 53.98’ N Lat., 133° 57.58’ W. Long. to 56° 54.90’ N. Lat., 133° 59.53’ W. Long. to 56° 55.93’ N. Lat., 134° 00.97’ W. Long. to 56° 55.95’ N. Lat., 134° 02.15’ W. Long. to 56° 55.22’ N. Lat., 134° 02.53’ W. Long. to 56° 56.37’ N. Lat., 134° 06.62’ W. Long. then to the northwestern corner of Payne Island at 56° 57.45’ N. Lat., 134° 08.75’ W. Long. then south to a point on Kuiu Island at 56° 55.08’ N. Lat., 134° 09.25’ W. Long. This area will be closed to commercial fishing and opened for cost recovery harvest by Gunnuk Creek Hatchery by emergency order when hatchery returns begin to appear.

**A. Projected return this year.**

**Table 11.** Projected return this year – chum salmon.

Species	Program	Projected Common Property Harvest	Other <sup>1</sup>	Total Projected Return, Current Year
Chum salmon	Southeast Cove SHA	15,814	50,078	65,892
Chum salmon	Kake SHA	11,559	38,531	26,972

<sup>1</sup> Includes cost recovery, brood stock, and escapement.

## **B. Common property fisheries management:**

### **1. Commercial fisheries**

#### **Chum Salmon**

Gunnuk Creek Hatchery is expecting adult chum salmon to return and will harvest any chum salmon returning to the Gunnuk Creek Hatchery SHAs, in excess of brood stock requirements, for cost recovery. No common property openings targeting Gunnuk Creek Hatchery chum salmon are anticipated in the Kake/Southeast Cove SHAs. In the event that Gunnuk Creek Hatchery fails to make necessary arrangements for marketing surplus fish or if pre-season harvesting and marketing arrangements fail, common property openings may be necessary to harvest surplus fish in the Southeast Cove and Kake Special Harvest Areas. Such openings may be needed to prevent waste of salmon and to prevent unwanted straying of Gunnuk Creek Hatchery production to neighboring wild stock streams. Gunnuk Creek Hatchery will maintain close contact with the Petersburg Area Management staff throughout the return so the department can respond to unharvested surplus in a timely manner should the need arise. It is the goal of Gunnuk Creek Hatchery to have sufficient return numbers of chum salmon to Southeast Cove to warrant a common property fishery by 2015.

### **2. Sport Fisheries**

Increased subsistence, personal use, and sport fishing effort may occur on returning Gunnuk Creek Hatchery chum salmon.

## **C. Cost recovery harvest management: (Appendix 2)**

Gunnuk Creek Hatchery anticipates minimal cost recovery effort on chum salmon in 2011, as there is only a small margin of fish estimated to return above brood stock needs. It is anticipated that all chum salmon returning to the Gunnuk Creek Hatchery SHAs will be needed for brood stock purposes. No escapement or brood stock goals have been established for Southeast Cove SHA. An employee may be stationed at this site in order to establish the location and timing of hatchery fish moving into this area and to provide security so that potential illegal fishing can be avoided.

In the event that brood stock goals are met and surplus chum salmon are available, a harvest crew will be contracted to harvest the fish for cost recovery. The focus of cost recovery harvest will be the fish returning to the Southeast Cove Special Harvest Area. Chum salmon run timing is monitored via daily sex ratio sampling during harvest activities. The early portion of the chum salmon return has a high percentage of males, so cost recovery efforts are managed to provide the highest quality flesh condition. As the run progresses, females account for a larger share of the return, so management emphasis may turn to harvest strategies that maximizing roe value,

with flesh quality being secondary. As a general practice, Gunnuk Creek Hatchery and its contracted harvesters will strive to keep the outer portion of the SHA fully harvested each day in order to minimize any potential straying.

The pink salmon escapement objective for Gunnuk Creek is 500 spawners. The pink salmon brood stock goal will be **20,000** fish (**10,000** females), to achieve the **2011** pre-season egg-take goal of **twenty** million pink salmon eggs. salmon in surplus of brood stock needs are available for cost recovery.

The focus of cost recovery harvest of pink salmon will be fish returning to the Kake SHA. Pink salmon run timing is monitored via daily sex ratio sampling during the harvest activities. The early portion of the pink salmon return has a high percentage of males, so cost recovery efforts are managed to provide the highest quality flesh condition. As the run progresses, females account for a larger share of the return, so management emphasis may turn to harvest strategies that maximize roe value, with flesh quality being secondary. As a general practice, Gunnuk Creek Hatchery and its contracted harvesters will strive to keep the outer portion of the SHA fully harvested each day in order to minimize any potential straying.

|

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The 2011 Annual Management Plan for Gunnuk Creek Hatchery is hereby approved:

\_\_\_\_\_  
Deputy Commissioner, ADF&G

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**Appendix 1– 2010 Projected Hatchery Return.**

<b>Broodyear</b>	<b># of fed fry released</b>	<b>Estimated Average Survival<sup>1</sup></b>	<b>Estimated return by age class<sup>2</sup></b>	<b>Total # of Returning Adults</b>	<b>Estimated Comm Prop Catch<sup>3</sup></b>	<b>Estimated Return to Hatchery</b>
2005	8,025,947	0.5%	1%	401	120	281
2006	8,876,863	0.5%	43%	19,085	5,726	13,360
2007	8,500,748	2.0%	54%	91,808	27,542	64,266
2008	6,658,667	2.0%	3%	3,995	1,199	2,797
<b>Totals</b>				<b>115,290</b>	<b>34,587</b>	<b>80,703</b>

<sup>1</sup> Average survival based on historical return data.

<sup>2</sup> Estimated return by age class based on prior year age class data.

<sup>3</sup> Common property catch estimated to be 30% of total hatchery return to Kake SHA.

**S.E. Cove SHA**

<b>Broodyear</b>	<b># of fed fry released</b>	<b>Estimated Average Survival<sup>1</sup></b>	<b>Estimated return by age class<sup>2</sup></b>	<b>Total # of Returning Adults</b>	<b>Estimated Comm Prop Catch<sup>3</sup></b>	<b>Estimated Return to Hatchery</b>
2005	0	0.5%	1%	0	0	0
2006	24,830,000	0.5%	43%	53,385	12,812	40,572
2007	9,867,963	2.0%	54%	106,574	25,578	80,996
2008	0	2.0%	3%	0	0	0
<b>Totals</b>				<b>159,959</b>	<b>38,390</b>	<b>121,568</b>

<sup>1</sup> Average survival based on historical return data.

<sup>2</sup> Estimated return by age class based on prior year age class data.

<sup>3</sup> Common property catch estimated to be 24% of total hatchery return to S.E. Cove SHA.

<b>Total Projected Return to Terminal Areas-</b>	202,271
<b>Number Needed for Broodstock-</b>	60,000
<b>Projected Surplus Available for Cost recovery-</b>	<b>142,271</b>

**Appendix 1 (continued)– 2010 Projected Hatchery Return.**

Broodyear	# of fed fry released	Estimated Average Survival <sup>1</sup>	<u>Pink Salmon</u>		Estimated Comm Prop Catch <sup>3</sup>	Estimated Return to Hatchery
			Estimated return by age class <sup>2</sup>	Total # of Returning Adults		
2009	9,000,000	5.0%	83.30%	374,850	149,940	224,910
<b>Total Projected Return to Terminal Area-</b>				224,910		
<b>Number Need for Broodstock-</b>				20,000		
<b>Projected Surplus to Terminal Area-</b>				<b>204,910</b>		

<sup>1</sup> Average survival based on historical return data.

<sup>2</sup> Estimated return by age class based on prior year age class data.

<sup>3</sup> Common property catch estimated to be 41% of the total hatchery return.

Broodyear	# of fed fry released	Estimated Average Survival <sup>1</sup>	<u>Coho Salmon</u>		Estimated Comm Prop Catch <sup>3</sup>	Estimated Return to Hatchery
			Estimated return by age class <sup>2</sup>	Total # of Returning Adults		
2008	39,583	10.0%	85.80%	3,396	1,698	1,698
<b>Total Projected Return to Terminal Area-</b>				1,698		
<b>Number Need for Broodstock-</b>				160		
<b>Projected Surplus to Terminal Area-</b>				<b>1,538</b>		

<sup>1</sup> Average survival based on historical return data.

<sup>2</sup> Estimated return by age class based on prior year age class data.

<sup>3</sup> Common property catch estimated to be 50% of the total hatchery return.

**Appendix 2**– Projected Hatchery Revenue for 2010 Harvest.

<b>Species</b>	<b>Proj. Surplus to SHA's # Fish</b>	<b>Pounds of Fish<sup>1</sup></b>	<b>Projected Price/Lb.</b>	<b>Potential Revenues</b>	<b>Anticipated Budget<sup>2</sup></b>	<b>Surplus or Deficit</b>
Chum Salmon	142,271	1,209,304	\$0.55	\$665,117		
PinkSalmon	204,910	614,730	\$0.36	\$221,303		
Coho Salmon	1,538	13,842	\$1.50	\$20,763		
				<u>\$907,183</u>	<u>\$1,151,642</u>	<u>(\$244,459)</u>

## Appendix 3– Production Tables.

### Gunnuk Creek Hatchery Production Tables

chum salmon production				Returns					
BY	Eggs Collected	Releases		Return Year	Cost Recovery		Common Property		Hatchery return
		Southeast Cove SHA	Kake SHA		Kake SHA	Southeast Cove	Kake SHA	Southeast Cove	
1978	10,000		3,000						
1979	16,000		1,000						
1980	129,000		0						
1981	0		0						
1982	831,000		608,000						
1983	1,070,000		55,000						
1984	2,000,000		1,982,000		2,851		900		5,322
1985	8,400,000		8,110,000		19,638		2,518		46,721
1986	10,930,000		10,825,000		29,033		912		49,270
1987	10,856,000		10,752,000		37,111		1,536		58,825
1988	10,216,000		9,880,000		41,245		18,233		95,395
1989	12,008,000		5,644,000		9,755		18,337		48,012
1990	14,305,000		7,054,000		10,467		14,610		72,471
1991	14,256,000		13,119,000		30,031		2,085		65,619
1992	16,495,000		15,073,000		291,041		40,203		557,828
1993	16,292,000		13,981,000		241,768		43,056		365,983
1994	21,046,000	8,198,485	6,260,447		98,407		73,858		369,637
1995	43,932,000	28,914,600	6,744,470		251,153		128,194		512,968
1996	51,742,000	36,244,635	6,177,285		519,795		168,737		835,524
1997	66,739,700	47,528,221	6,360,760		323,395		41,390		364,839
1998	54,237,000	36,156,200	6,522,900		203,449		0		203,449
1999	70,614,000	54,526,806	6,395,219	1999	70,538	229,210	10,581	34,382	344,711
2000	71,560,000	36,941,430	6,476,062	2000	186,544	429,053	62,675	122,650	800,922
2001	54,250,920	34,951,864	6,476,062	2001	84,383	228,615	9,896	25,956	348,850
2002	44,655,000	31,841,655	6,556,146	2002	58,948	243,830	25,600	104,323	432,701
2003	75,783,000	45,234,731	6,562,396	2003	105,414	1,219,839	11,813	135,538	1,472,604
2004	36,208,000	23,469,265	6,710,670	2004	54,708	596,561	21,883	197,861	871,013
2005	24,814,468	0	5,086,391	2005	42,283	79,025	16,952	0	138,260
2006	45,884,872	26,802,293	8,876,563	2006	76,895	145,375	32,332	62,556	317,158
2007	24,740,082	9,717,483	8,651,228	2007	31,364	25,523	13,161	10,769	80,817
2008	7,607,960	1,000,000	6,112,117	2008	6,942	2,579	1,041	387	10,949
2009	55,000,000	46,395,837	8,000,000	2009	8,492	2,092	3,385	837	14,806
2010	17,309,590	9,000,000	6,000,000	2010	3,000	200	19,479	22,000	44,679
2011				2011	76,864	99,832	37,846	49,171	263,687

1999- present production numbers from web page. Web page reports returns by return year and does not break down to brood year.

1978-1998 numbers from 2004 AMP, some return data missing thru 1988.

eggs destroyed in 1980 due to septicemia brought on by ammonia toxicity

1981 -hatchery built

1976-1979 operated on Scientific and Educational permit with Kake School District. Few eggs and few records kept

1984-1987, 2001, 2009, 2010 received some eyed eggs from Hidden falls hatchery and or Port Armstrong hatchery

2000- old dam failure

2001-2006 Hatchery on temporary pipeline intake

2006-2007 New Gunnuk Dam Construction  
 2008- Hatchery online in new dam  
 2010- very hot drought conditions affected return (creek very dry)  
 2011- projected return numbers (does not take into account Brood stock needs)

### Appendix 3 (continued)– Production tables.

#### pink salmon production Gunnuk Creek Hatchery (KNFC)

BY	Eggs Collected	Releases	Returns		Total BY Returns	% OS
		Kake SHA	Estimated CP	Cost Recovery		
1976 <sup>a</sup>	0	0				
1977	30,000	5,000				
1978	0	0				
1979	0	0				
1980 <sup>b</sup>	16,000	0				
1981	0	0				
1982	1,018,000	270,000				
1983	1,044,000	103,000			1,000	1.0%
1984	0	0				0.0%
1985	3,300,000	3,066,000	6,000	17,830	56,000	1.8%
1986	3,076,000	2,874,000	10,000	28,235	43,330	1.5%
1987	4,498,000	4,160,000	6,000	33,293	58,041	1.4%
1988	4,486,000	4,193,000	45,000	68,400	194,655	4.6%
1989	5,992,000	3,883,000	64,900	52,654	155,090	4.0%
1990	7,170,000	6,422,000	91,840	32,169	150,855	2.3%
1991	5,981,000	5,597,000	14,000	4,900	40,310	0.7%
1992	6,029,000	5,486,000	139,415	65,590	268,825	4.9%
1993	2,267,000	1,996,000	16,900	940	33,800	1.7%
1994 <sup>c</sup>	Program discontinued until ?					
1999						
2000						
2001						
2002						
2003						
2004						
2005						
2006						
2007 <sup>d</sup>	5,000,000	341,245	2,158	625	60,059	17.6%
2008	1,819,738	1,637,764	62,417	38,069	163,776	10.0%
2009	10,000,000	9,000,000	270,000	155,000	450,000	5.0%
2010	20,000,000	18,000,000	360,000	515,000	900,000	5.0%

**2011**

a 1976-1999 operated as Science and Educational facility with the Kake School District. Few eggs collected and few records kept.

b All alevins were destroyed on demand of ADFG due to bacterial septicemia brought on by ammonia toxicity.

c All data from 1976-1994 came from 2004 AMP

d bulk of fished released in the Southeast Cove SHA

**Appendix 3 (continued)– Production tables.  
coho salmon production**

BY	Eggs Collected	Releases in Kake SHA		Returns		Total BY Returns	%OS
		Traditional Rearing	Zero-Check	Estimated CP	Cost Recovery		
1994	50,000	35,000	0	482		964	2.75%
1995	40,000	35,000	0	653		1,306	3.73%
1996	0	0	0	0		0	0.00%
1997	0	0	0	0		0	0.00%
1998	15,000	13,000	0	170		340	2.62%
1999	47,000	33,000	0	420		840	2.55%
2000	0	0	0	0		0	0.00%
2001	72,920	0	59,573	745		745	1.25%
2002	0	0	0	0		0	0.00%
2003	0	0	0	0		0	0.00%
2004	0	0	0	0		0	0.00%
2005	25,000	4,143	8,000	304	303	833	6.86%
2006	28,759	1,025	18,232	638	638	1,276	6.63%
2007	25,000	8,803	9,180	1,997	1,600	3,597	20.00%
2008	50,000	35,978	0	1,619	1,979	3,598	10.00%
2009	100,000	90,000	0	4,050	4,950	9,000	10.00%
2010	260,665	250,000	0	11,250	13,750	25,000	10.00%
2011							11.16%

94-00 data from 2004 AMP

94-2004 all releases were fry releases for USFS projects @ Portage Bay Creek and Duncan Creek

2005 -current have been traditional smolt releases at GCH into Gunnuk Creek

All red numbers are projected, fish have not returned or have been released yet

**Appendix 4– Timeline.**

**PRODUCTION SUMMARY**

Organization or Hatchery: Gunnuk Creek Hatchery

	Current Year																									
	2010					2011					2012															
	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J		
Coho salmon																										
11 BY Coho A																		E								
																		500k								
10 BY Coho A						E											T 35k						R			
						250k eggs taken																				
09 BY Coho A											T 31k						R									
																100k										
																release 100k Gunnuk Creek										
10 BY Chum	E	T 100% otolith mark										R	E	T 100% otolith mark										R		
	17.5M											7	10	65M eggtake goal										8M		
											7M release Kake SHA										8M release Kake SHA					
											10M release Southeast Cove										55M release SE Cove					
10 BY Pink	E											R	E													
	20M											18	20M													
											18M release Kake SHA										19M release Kake SHA					

**Codes:**

Egg take  
Tagging  
Release  
transfers

E Egg-take goal at Gunnuk Creek Hatchery  
T Rate or number tagged  
R Release numbers  
trans Eggs taken from adults returning to Gunnuk Creek Hatchery and transferred to another facility

A Traditional Rearing  
B Zero-check Rearing

**Figure 1– Location of Gunnuk Creek Hatchery and Southeast Cove Special Harvest Area (SHA), in Southeast Alaska.**

