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Alaska State Legislature
House of Representatives

Special Committee on Fisheries

Pouch V
Juneau, Alaska 99811
(907) 465-4924

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MEMORANDUM

TO: House Special Committee on Fisheries

FROM: Mel Monsen, Professional Assistant

DATE: January 14, 1984

SUBJECT: Prince William Sound/Southeast Hatchery Facility Trip Report

The Special Committee on Fisheries PWS/SE hatchery facility tour began on Monday, November 14th and ended on Thursday, November 17th. Only two Committee members were able to participate; Chairman Rep. Adelheid Herrmann and Rep. Jack McBride, along with myself.

The schedule had been to arrive in Cordova on Monday afternoon, attend a fishermen's reception that night and then fly by light plane to the three hatcheries in PWS on Tuesday. Unfortunately, the weather closed in during the night and by Tuesday morning we were unable to travel to the hatcheries in the Sound. Instead we spent Tuesday morning in Cordova getting as much written and verbal information as we could on area hatcheries and made plans to see the Hidden Falls hatchery on Baranof Island on Wednesday.

We left Cordova for Juneau on Tuesday afternoon. Once in Juneau we firmed up our travel arrangements for Hidden Falls. On Wednesday morning we flew to Hidden Falls and toured the hatchery facility. The charter then dropped us off in Petersburg for an afternoon fishermen's meeting. Unfortunately, due to schedule changes and a crab opening, the meeting was poorly attended and only an hour long.

The Committee departed Petersburg for Ketchikan just before dusk and arrived at approximately 5:00 pm, Wednesday night. At 7:00 pm that night the Committee had a fishermen's reception, together with Rep. Ron Wendte, at the Yacht Club. On Thursday morning we traveled to Klawock to tour the Klawock hatchery. We arrived back in Ketchikan at about 1:30 pm and were met by Rep. Ron Wendte.

Rep. Wendte drove us to the three hatcheries in Ketchikan; Whitman Lake (SSRAA), Hidden Falls, and Deer Mountain. This completed the committee's hatchery facility tour.

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What follows is a brief description of each of the Committee's hatchery stops and fishermen's meetings. I have more complete information for most of these items on file in my office if you should have any specific areas of interest or questions.

Prince William Sound Hatcheries

There are currently three major hatcheries in PWS; Cannery Creek, Main Bay, and Port San Juan. Port San Juan is operated by the PWS Aquaculture Corporation and the other two are State operated hatcheries. A fourth hatchery, Esther Lake, is in the final stages of design and construction could begin in 1984 (by PWSAC).

Main Bay Hatchery is to the southeast of Whittier and has a current capacity of about 80 million chum and pink eggs. This hatchery is just over one year old and because construction costs exceeded available funds, several structures were left out. In order to efficiently operate at capacity (100 million chum salmon) the hatchery needs the following:

- a) completion of the holding pond
- b) construction of a dock
- c) construction of a storage building and shop

It is estimated that these items, if completed, will reduce annual operating costs by \$20,000.

The other state hatchery in PWS is Cannery Creek. This facility is 45 miles west of Valdez and has a current capacity of about 54 million pink and chum eggs. Operations over several years have identified two problems which, if solved, will increase the efficiency of the operations:

- a) a need for increased returning broodstock holding capacity
- b) construction of an incinerator building in order to conform with the terms of the U.S. Forest Service lease.

It is estimated that this will reduce annual operating costs by \$16,000.

The Prince William Sound Aquaculture Association (PWSAC) operates the other major hatchery in southwest PWS, Port San Juan. This hatchery was first operated in 1975 after conversion from an abandoned cannery. Currently, the hatchery has a capacity of 195 million pink and chum green to eyed stage eggs. Final site development is scheduled for 1984 and will include:

- a) rejuvenation of the dock facility
- b) completion of the freshwater maturation facility
- c) completion of the upper pipeline
- d) completion of the road

Also, when the maximum fingerling production is reached, the facility will need another incubation building (for more information see Attachment 1).

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Esther Island is the site for PWSAC's newest hatchery. This hatchery is scheduled to be under construction in 1984 and will have a capacity of:

- 111 million chum eggs,
- 210 million pink eggs,
- 1 million coho eggs,
- and 1 million chinook eggs.

The construction is expected to cost some \$9 million initially. All permits have been obtained for the hatchery and all that remains is the final loan approval by the Dept. of Commerce & Economic Development. This is the final step in PWSAC's present hatchery plans and the hatchery will serve gill net, purse seine, and sport user groups (for more information see Attachment 2).

Southeast Hatcheries

The Committee was able to tour five hatcheries in Southeast Alaska. The State hatcheries were Hidden Falls, Klawock, Beaver Falls, and Dear Mountain. The sole private hatchery we visited was Whitman Lake, which is operated by the Southern Southeast Regional Aquaculture Association.

The Hidden Falls hatchery on the east side of Baranof Island was constructed with funds from a 1976 bond issue. The hatchery has a small hydro plant and housing for 3-5 permanent employees. The facility has a capacity of 30 million chum eggs and 230,000 king eggs, with a projected final capacity of 61 million chum eggs and 450,000 king eggs. To reach this higher capacity, some \$2 million is needed for the following:

- a) Chinook Facilities
 - 1. pipeline extension
 - 2. adult capture and egg take facility
 - 3. indoor freshwater rearing
 - 4. preventive maintenance
- b) Hatchery completion and bunkhouse
 - 1. estuarine rearing
 - 2. bunkhouse

While at the hatchery we noted an exceptionally clean water supply; there was little if any siltation in the incubators.

Although built in 1977, the Klawock Hatchery has just in the past two years begun to operate with large numbers of eggs. The problem, low returns of local stocks, dramatically slowed the brood stock development process. Now that the hatchery is over the hump in brood stock development, some 15 million chum eggs and 1 million coho eggs are in the hatchery. Expansion to 37 million chum eggs can be attained with the addition of an incubator chiller unit. This unit would enable the hatchery to spread out development rates and utilize fry rearing space more efficiently. This and other small improvements are expected to cost \$320,000. (for more information see Attachment 3).

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The Beaver Falls Hatchery is located 13 miles south of Ketchikan in George Inlet. Currently the hatchery is empty, but it has the capacity for about 20 million chum eggs and has salt water rearing pens. This facility is probably the least advanced of any we went through during our tour. The facility was built with only a roof to protect operations, since then walls have been added, but the floor is still pea gravel. The Dept. is in the process of converting the facility to sockeye production.

The last state hatchery we visited was the Deer Mountain Hatchery in Ketchikan. This facility, although very successful with king salmon production, is a major tourist attraction and approximately 100,000 people go through it each year. This facility was originally built in 1954 by the Ketchikan King Salmon Committee. It is now owned by the city and operated by the state. Capacity at the hatchery is 220,000 chinook eggs, 250,000 coho eggs, and 20,000 steelhead eggs. The hatchery's water supply is provided by the city via their hydro electric plant. At times the water supply becomes critical and it is the major problem (for more information see Attachment 4).

The Whitman Lake Hatchery (SSRAA) completed its fourth year of salmon production in 1983. The facility is now operating with about 28 million eggs, most of which are chum along with chinook and coho. The hatchery is 8.5 miles south of Ketchikan and a majority of the releases are at remote sites. Juvenile salmon are transported to remote sites on a tender where they are placed in saltwater holding pens.

While at the Whitman Lake Hatchery, Committee members viewed a slide presentation covering the fish culture practices at the facility and SSRAA's newest hatchery at Neets Bay (for more information see Attachment 5).

Meetings With Fishermen

Cordova:

The meeting/reception in Cordova on Monday evening, November 14th was attended by about 30 people from the fishing industry. The major areas of discussion were directed at the state's involvement in fisheries.

Fishermen were interested in what the Fisheries Committee did and what it could do for them. Broad support for both the Alaska Seafood Marketing Institute and the hatchery program was expressed.

Some unhappiness at the administration's handling of fisheries issues was discussed. Fisheries Committee members expressed similiar views about the past year, but also presented examples of several recent improvements and expressed an optimism for the future. The Office of Commercial Fisheries Development and the Governor's Fisheries Task Force were also discussed.

The rest of the evening was spent on a one to one basis with the fishermen.

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Petersburg:

Although poorly attended because of schedule changes and an unavoidable crab season opening, the meeting provided much important information. Among the concerns expressed were:

1. the possible loss of a Southeast member on the Board of Fisheries
2. the dramatic increase in effort in Southeast crab fisheries
3. the lack of understanding of the economic impacts on fishermen by the Department of Fish & Game (and Board of Fisheries) when making management decisions
4. the increase in effort and shortness of season in the halibut fishery
5. the possible small boat (less than 55 ft.) fisheries development projects available in Southeast Alaska
6. the need for state, federal, university, and fishing industry people to work cooperatively to insure the economic viability of existing fisheries and to develop new fisheries
7. concern about the U.S./Canada Salmon Treaty

Ketchikan:

Only a few people were able to attend the reception in Ketchikan. Among the concerns raised in group and private discussions were:

1. hatchery practices and the confusion that seems to exist between the Juneau ADF&G office and the local ADF&G employees
2. the lack of someone you can go to who is ultimately responsible to make decisions at local ADF&G offices
3. logging and the impacts it has on fisheries and the local communities
4. salmon sport fish guides and the confusion over permit requirements, both state and federal
5. the U.S./Canada Salmon Treaty

ATTACHMENT 1

Prince William Sound Aquaculture Corporation

Port San Juan Hatchery Fact Sheet

I. Introduction

Port San Juan had its early beginnings in the 30's as the San Juan Packing Co. It increased in size and scope until New England Fish Co. (NEFCO) merged with San Juan Packing Co. in 1964. The plant was shut down at this time as NEFCO had a large cannery in Cordova.

In early 1975, after the formation of Prince William Sound Aquaculture Corporation (PWSAC), the decision to use the existing water development buildings etc. for a 20 million capacity pink and chum hatchery was made. PWSAC entered into a lease with NEFCO and started operation in the fall of 1975 with a 5 million egg take.

Construction work started in June 1975 with initial funds coming from an EDA federal grant, fishermen assessments, Prince William Sound processors contributions, voluntary help from fishermen and Cordova towns people.

Since this first construction and hatchery operation in 1975, PWSAC has steadily increased the production capacity of San Juan to its current status. Gradually, the old cannery and large dilapidated warehouses, shops, and herring reduction plant were removed. Other still useable buildings were remodeled and extensive rock and earth work was accomplished. San Juan will attain its final site development in 1984 with a planned major rejuvenation of the dock facility, completion of the freshwater maturation facility, as well as completion of the upper pipeline and road construction. When the decision is made to increase juvenile salmon production to the final capacity of 193 million fingerling, an additional new incubation building will be constructed.

II. Hatchery Juvenile Production Capacity

A. Freshwater Capacity

1. Present capacity

a. Green-eyed egg capacity - 396 NOPAD incubators

Pink	-	183,500,000
Chum	-	11,630,000

b. Eyed egg-fry capacity

Pink	-	106,800,000
Chum	-	10,000,000

1. Present capacity (continued)

c. Fry rearing capacity

Chum	-	12,000,000
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2. Brood year 1983 production

a. Green-eyed egg production

Pink	-	89,473,968
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Chum	-	8,989,394
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b. Eyed egg-fry production

Pink	-	85,447,639
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Chum	-	8,539,924
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3. Final capacity

a. Green-eyed egg capacity - 660 NOPAD incubators

Pink	-	282,000,000
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Chum	-	26,666,667
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b. Eyed egg-fry capacity

Pink	-	169,200,000
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Chum	-	24,000,000
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c. Fry rearing capacity

Chum	-	24,000,000
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B. Saltwater Capacity

1. Present capacity

a. Fry-fingerling capacity

Pink	-	110,000,000
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Chum	-	10,896,000
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2. Brood year 1983 production

a. Fry-fingerling capacity

Pink	-	83,738,686
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Chum	-	3,369,126
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3. Final capacity

a. Fry-fingerling capacity

Pink	-	165,816,000
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Chum	-	23,520,000
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III. Annual Production of Adult Salmon

A. Historical Data 1975-1983 Brood Year (Table I)

B. Present Capacity

1. Pink Salmon

Number total adult return:	6,019,200
Number common property fishery catch (70%):	4,213,440
Number hatchery harvest brood & sales (30%):	1,805,760
Revenue common property fishery catch:	\$4,129,171
" hatchery harvest:	\$1,614,478

2. Chum Salmon

Number total adult return:	280,000
Number common property fishery catch (70%):	196,000
Number hatchery harvest brood and sales (30%):	84,000
Revenue common property fishery catch:	\$ 576,240
" hatchery harvest:	\$ 213,963

TOTAL Revenue Common Property Fishery Catch (72%):	\$4,705,411
" " Hatchery Harvest (28%):	\$1,828,441

C. Final Capacity

1. Pink Salmon

Number total adult return:	8,346,228
Number common property fishery catch (70%):	5,842,360
Number hatchery harvest brood and sales (30%):	2,503,868
Revenue common property fishery catch:	\$5,725,513
" hatchery harvest:	\$2,210,220

2. Chum Salmon

Number total adult return:	839,916
Number common property fishery catch (70%):	587,941
Number hatchery harvest brood and sales (30%):	251,975
Revenue common property fishery catch:	\$1,728,547
" hatchery harvest:	\$ 641,326

TOTAL Revenue Common Property Fishery Catch (72%):	\$7,454,060
" " Hatchery Harvest (28%):	\$2,852,046

IV. Adult Fish Harvest

PWSAC annually awards contracts on a competitive low bidding process using two seine boats in order to harvest adult fish in the Special Harvest Area (SHA). This SHA has been designated by ADF&G to allow for harvest of adult fish by the hatchery. The fish are sold to the highest bidder on a daily basis and these funds provide the revenue to the corporation to offset

IV. Adult Fish Harvest (continued)

the operational costs incurred annually. The proportion of fish sold relative to fish caught in the common property fishery can be seen in Table I. The percentage of fish harvested in the SHA plus broodstock in 1983 was 20% while the commercial fishermen caught 80% of the total returning pink salmon. In order to achieve our sales goal and recover our operational costs, the hatchery requires 30% of the total returning pink salmon including broodstock.

All fish sold by the hatchery are held in floating net pens and are either pumped or brailled alive aboard tenders. We have 20 net pens capable of holding 10,000 fish per pen or 200,000 fish. At the present time our harvest crew is capable of effectively harvesting 120,000 fish. These fish are silver bright and average 3.5 pounds per fish.

V. Broodstock Maturation

A. Saltwater Maturation

Broodstock are held during the early phase of sexual maturation behind a barrier seine which encloses about two acres of estuary. The salinity of the estuary is 22-30‰ and is generally from 14-16°C. Adult fish are free to move about inside the barrier seine and are initially captured outside by seine and put into the adult harvest net pens which are placed into an opening in the barrier seine. The maturation area is capable of holding 248,542 pink salmon and 33,667 chum salmon which are required for the final capacity.

The number of broodstock held in 1983 was 124,278 pink salmon and roughly 500 chum salmon. The duration of sexual maturation in the estuary is approximately 30 days.

B. Freshwater Maturation

The final phase of sexual maturation occurs in the freshwater holding facilities. This process is strictly volitional so that adult fish will leave the estuary in response to the freshwater flow coming out of the fish ladders. The fish passage system is constructed out of aluminum and consists of an Alaska steep pass and vertical slot fishway design

which transports the fish as they swim against the flow of water into a natural holding pond at the base of Larsen Creek Falls. Here they rest until the desire to swim farther upstream transports them into one of three raceways. These raceways are 8 feet wide, 64 feet long and 3 feet deep. The rate of flow of water through each raceway is 800 gpm. We have the capability of providing freshwater, saltwater, or a combination of both to each raceway to insure optimum water quantity and quality.

In 1983 the maximum number of fish held per raceway per day was approximately 4,000 fish. This represents a density of 6.8 pounds of fish per cubic foot. The entire freshwater maturation system is capable of holding approximately 30,000 fish per day. From the raceways adult fish are allowed to move upstream volitionally in response to water flow into the sorting and broodstock selection area. In this area fish are selected as to whether they are sexually immature (green) or sexually mature (ripe). All ripe fish are killed by a blow to the back of the head and sent to the spawning station.

VI. Spawning

Eggs are stripped from the females (spawned), checked for quality and collected in buckets whereupon sperm from males is added. Sperm from at least five males is used per bucket of 15 females' egg complement. Buckets of eggs and sperm are transported from the spawning area via a cable tramway in the incubation area of the hatchery. All buckets are weighed to accurately determine the number of eggs per bucket. Water is added to activate the sperm and allow for fertilization and the eggs are placed into incubators.

The maximum number of pink salmon eggs spawned per day was 16 million. This took place in September of 1982. A more typical average is 8-10 million per day. Spawning occurs over a period of 15 days in late August and early September.

VII. Water Supply

The freshwater for the hatchery is extracted from a 26 acre lake which is 315 feet above sea level. The water is conveyed from the lake via an

VII. Water Supply (continued)

insulated 12 inch plastic pipeline. The maximum flow from the pipeline is 2,700 gpm.

Incoming water from the lake is disinfected using ultraviolet purification units and then processed through packed columns to reduce the risk of gas supersaturation. During normal operation the water is used only once then discharged from the hatchery.

Cold winter conditions create little or no intrusion of water into the lake water source so that the lake level drops significantly. In this instance it becomes necessary to recirculate or re-use the water rather than discharge it after only one use. This will allow us to only use 25% of the water required under the single pass or one use mode.

Since eggs and fry produce metabolic byproducts, principally ammonia, it is necessary to filter and extract the ammonia before returning the water to the incubators. Therefore, the hatchery has state of the art ion exchange ammonia filtration units made of clinoptilolite, as well as rapid sand filters. Once the water is sand filtered and passes through the ammonia filters, it is disinfected by ultraviolet purification units and pumped back to the incubators.

VIII. Support Facilities

A. Electrical Power Generation

1. 2 - 75kw generators 208-3 phase/480 volts
2. 2 - 125kw Caterpillar generators 480 volts
3. 1 - Pelton wheel hydro 75kw generator, non-functional, to be replaced by 85kw impulse turbine

B. Dock Facility

1. Large vessel docking capability - Alaska state ferry M/V Tustumena services area in summer
2. Small boat and float plane float
3. Helipad

C. Warehouse Facility

1. 2 - large storage warehouses - fully equipped carpentry, metal, steel, aluminum fabrication and maintenance shops

VIII. Support Facilities (continued)

D. Fire Protection

1. Fire hydrant (4") on dock
2. Numerous fire hose stations
3. Complete sprinkler system for all dorms, kitchen, hatchery and residences

E. Staff Housing

1. Permanent staff

- a. 1 - single unit home, 2 bedrooms
- b. 2 - 2 story apartments, 4 bedrooms
- c. 1 - apartment, 3 bedrooms

All residences are fully furnished with utilities and laundry facilities.

2. Temporary staff & visitor facilities - 3 dormatory locations, 58 beds

- a. within hatchery complex: 7 rooms with 13 beds
- b. small bunkhouse with 10 beds
- c. dormatory on dock: 13 rooms with 35 beds

Bullcook provided to change sheets and linens and clean facility.

F. Kitchen and Dining Room Facility

20 person seating capacity.

Camp cook provided for preparation of all meals.

G. Communications System

1. 2 - 150 watt single sideband radios with radio telephone capability
2. 1 - VHF radio
3. 1 - marine VHF aircraft radio
4. 1 - CB radio
5. 1 - intercommunication system

H. Vessel and Small Boat Capability

1. 2 - 40' commercial seine boats
2. 4 - wooden skiffs
3. 8 - outboard motors

VIII. Support Facilities (continued)

I. Laundry Facilities

1. Permanent staff
 - a. 4 washers and dryers
2. Temporary staff
 - a. 3 washers and dryers
3. General public
 - a. 4 washers and dryers
 - b. 2 commercial 30 pound steam dryers

IX. Financial Status

A. Total Capital Cost to Present Capacity:	\$8,162,026
1. Annual operational cost: (excluding depreciation and debt service)	\$ 600,000
2. Administrative support (Cordova):	\$ 150,000
B. Total Capital Cost to Final Capacity:	\$9,662,026
1. Annual Operational cost: (excluding depreciation and debt service)	\$ 600,000
2. Administrative support (Cordova):	\$ 150,000

Table 1

Prince William Sound Aquaculture Corporation
 Port San Juan Hatchery
Production & Catch Distribution of Pink Salm

Brood Year	No. Green Eggs Taken (millions)	Fry Released at PSJ		Adult Returns			By Commercial Se		
		Number of Fry	Year	Total Pink Return (brood yr. plus 2 yrs)	% Total Marine Surv.	Return/Harvest Year	No./Fish Taken By Intercep.	% Intercep. Rate	No./I in S.H.
1975	6,254,460	1,000,000	1976	44,000	4.4	1977	4,000	10	-
1976	14,733,530	11,010,577	1977	154,620	1.4	1978	-	-	-
1977	23,424,000	16,950,784	1978	552,955	3.3	1979	275,000	50	-
1978	28,645,626	22,774,739	1979	1,493,489	6.6	1980	1,038,700	70	-
1979	28,401,415	21,500,000	1980	2,264,845	10.5	1981	1,358,907	60	-
1980*	94,689,000	69,787,000	1981	5,134,363	7.4	1982	3,183,305	62	431,7
1981*	143,500,000	70,118,000	1982	3,722,502	5.3	1983	2,990,225	80	-
1982*	129,615,000	87,384,000	1983	4,900,000	5.6	1984	3,430,000	70	-
1983	92,842,737	81,701,603	1984	4,902,097	6.0	1985	3,431,467	70	-

*1980 7.2 million eyed eggs transferred to state hatchery (Cannery Creek/Hobo Cr.)

*1981 35.2 million eyed eggs transferred to state hatchery (Cannery Creek/Main Bay)

*1982 31.4 million eyed eggs transferred to state hatchery (Main Bay)

ATTACHMENT 2

Proposed Esther Lake Hatchery

PWSAC

I. PROGRAM OUTLINE

HATCHERY CONCEPT

The Prince William Sound Aquaculture Corporation (PWSAC) will commence operating a multispecies hatchery complex in the fall of 1985 at the southern outlet of Esther Lake in the Coghill District of Prince William Sound. This hatchery complex will consist of two separate spatially isolated fish culture facilities. One hatchery will produce pink, coho, and chinook salmon while the other will produce sockeye salmon.

The design capacity of the hatchery complex is:

- 211 million green pink eggs,
- 111 million green chum eggs,
- 1 million green coho eggs,
- 10 million green sockeye eggs.
- 1 million green chinook eggs.

This multispecies hatchery will provide facilities for:

- Freshwater broodstock maturation,
- eggtaking, incubation
- short and long term freshwater rearing,
- short term saltwater rearing.

HATCHERY OBJECTIVES

The central thrust of the pink and chum salmon program is to create an adult return of chum from June to September and an adult return of pinks from mid-July to the end of August which would contribute to both the drift gillnet and purse seine fishery. In order to accomplish this program, it is necessary to select four donor stocks for chum and two or three for pinks based upon time of adult return, early through late. Donor stocks are also selected on the basis of adult product quality, brightness, flesh color, and oil content.

The majority of the coho and chinook salmon will be planted into selected lakes as fry while a small number of smolts will be produced. These smolts will be reared in the hatchery, transported, imprinted, short-term reared in saltwater pens and released in Quillan Bay. Sockeye fry will be stocked in selected lakes. The development of the sockeye hatchery conceptual design and permit will be postponed and will be discussed in a separate document at a later date.

The production objectives are to achieve an average, annual adult production of 10,000,000 pink salmon by 1989, 2,000,000 chum salmon by 1992, 20,000 coho salmon by 1990, 7,000 chinook salmon by 1992, and 500,000 sockeye salmon by 1993, through lake stocking.

OPERATIONAL PLAN

Maturation. All returning pink and chum salmon adults will enter the fish ladder and migrate into holding ponds where they will be held until sexually mature. At the point of maturation, they will be allowed to migrate in response to velocity upstream and into a false weir whereupon they will pass through an electrokilling device and terminate as freshly killed carcasses at the sorting table within the egg take area.

Due to the broad return time of adult pink and chum salmon, only 38% of the maximum number of broodstock required will be held at any one point in time. The capability to fine tune maturation timing will be achieved by water temperature control using the dual piping system of deep and shallow intake water.

Incubation. All four species will be incubated in NOPAD shallow substrate trays which will be stacked six high. Eggs will be fertilized and incubated from July until early September from pink and chum salmon adults, and, as such, early eggs will need to be retarded in development or exposed to coldest water available while late eggs will need to be accelerated in development and exposed to warmer water. Thus, each incubation stack will need influent water pipes from the deep and the shallow intakes. Pink and chum salmon will be incubated in one common area in separate incubators while coho and chinook salmon will be incubated in a separate area.

Rearing. Pink salmon will require no freshwater rearing, but will volitionally emigrate to saltwater pens. Freshwater residence time for chum salmon has been programmed for one week due to osmoregulatory constraints. Due to the short freshwater turnover time of chum salmon and the extended spawning time, only 25% of the total number of fry will be in rearing ponds at any one time. Fry will be distributed into outdoor rearing ponds as soon as snow and ice conditions allow. Coho and chinook fry will be provided with indoor rearing space as the prior brood year presmolts are transferred to outside rearing ponds. These fry will reside in the indoor raceways during the winter.

Saltwater rearing of pink and chum salmon will occur in Lake Bay from April to June in nylon net pen enclosures. Timing of the fry release will occur when zooplankton abundance in the estuary reaches its maximum. Coho and chinook smolts will be short-term reared in saltwater pens located in adjacent Quillian Bay and released in June.

Harvest. Harvest of the hatchery escapement in the Special Harvest Area will begin in June and end in August. All fish will be purse seined and transferred into adult holding pens. Adult fish will be sold daily and transferred aboard tenders by pump or brail in Lake Bay.

Broodstock collection will be occurring concurrently with the hatchery harvest. Broodstock will pass through an adult type trapping structure within a barrier seine which functions to fence off or separate broodstock from adult fish for harvest. The barrier seine will run across Lake Bay close to the mouth of the lake outfall and will provide an enclosed area for broodstock maturation.

ATTACHMENT 3

STATE OF ALASKA

Bill Sheffield, Governor

DEPARTMENT OF FISH AND GAME
DIVISION OF FISHERIES REHABILITATION
ENHANCEMENT AND DEVELOPMENT
P.O. Box 101
Klawock, Alaska 99925

February 23, 1983

Greetings:

I am writing to appraise you of this past season's operations and accomplishments here at the hatchery. As you are aware, at the beginning of last year's operations (1982), fiscal year funding allocation for our operation was, at best, uncertain. Knowing this, Community Leaders, as well as our Fisheries Advisory Committees, Native Corporations, Coastal Zone Management Teams, Processing Representatives, A.N.B. Camp #9, and other concerned citizens from Klawock, Craig, Hydaburg, and other areas of the island, voiced a strong support for continued funding for this facility. This support came in the form of written letters, telephone calls, and participation in a statewide telephone conference with the House of Representatives' finance committee. This support was voiced at the executive and legislative levels of government and was in no small part, I'm sure, responsible for last year's budget allocation.

It is ironic with last year's uncertain beginning that we logged our, as of yet, most successful operational year at the facility. This was due, in the most part, to what I feel are three main factors. One, 4 years of hard work here at the facility by what I feel is a dedicated staff. Two, policy changes allowing for off-site chum donor stocks. Three, the support for the facility as shown by the local communities and organizations previously mentioned.

Chum Salmon

This past year's operation culminated in the taking of approximately 13,800,000 chum eggs: 6,200,000 from Klawock stocks and 7,600,00 from off-site stocks. This was the largest number of chum eggs in the facility yet, with the previous high being 5,600,000. Over the previous 4 years we had always been plagued with insufficient numbers of returning adult chum for our brood-stock development program. This last year saw a policy change that allowed us to go off-site to supplement our chum egg-take program. This change of policy now allows us the opportunity to achieve yearly egg-take goals for our brood-stock development and will, in fact, accelerate this program.

We anticipate releasing approximately 10,850,000 chum fry this spring from last fall's egg takes. We project from this year's release alone, that we will have returns of 168,584 adults over a 3 year period of time, starting in 1985. These adults returning over this same period of time will provide an availability of 42,150,000 eggs at the hatchery and an estimated 630,000 returning adults available in the fishery.

Research conducted at the facility over the past 4 years is directed to helping improve the percent survival from fingerlings release to adult return. One such undertaking has been to take advantage of the relatively warm waters available at this site and release a larger size fingerling (than normally attainable at the other sites). It is hoped by releasing a larger than "normal" chum fingerling, that we will be able to attain greater marine survivals. Tagged adult returns, starting this year, should help to answer this question and others.

Coho Salmon

This past year was also very successful for our coho program. This resulted from 4 years of work developing coho returns to the hatchery site and research done at the facility comparing ocean survivals of winter-released coho smolts and spring-released smolts. Tagged adults returning this past fall have shown our winter release to be successful. Prompted by these findings and the availability of hatchery returns, we were successful in gaining approval to expand our coho program and actual previous high egg take by tenfold. At the same time, we are making more efficient use of the facility by avoiding the normal competition for rearing space between chum and coho salmon. This has all resulted in the taking of 1,200,000 coho eggs this past fall, all from adults returning to the hatchery. We hope to release approximately 1,000,000 smolts from this egg take in the winter of 1983-84. We project 60,000 to 100,000 adults returning from this release in the summer and fall of 1985. A return of this size would represent approximately 17% to 29% of the total 1981 coho catch (by all gear types) for the combined Districts 103 and 104, or 59% to 95% of the total 1981 coho catch (by all gear types) for District 103.

Steelhead Trout

A small steelhead enhancement program was initiated at the facility in the fall of 1978. This program has been maintained on a space available basis. It was developed to attempt to "spread out" the steelhead fishing season with initial eggs taken from adults returning in the fall. The first adults are now returning from our first releases made in the spring of 1980. Thus far, eight tagged adults have been represented in the local fishery. We have just initiated a reward program for the largest tagged adult checked in at the facility in an effort to encourage reporting of tagged returns. This program has remained steady over the last few years with goals of around 30,000 eggs per year. Research conducted in this program should help to answer questions on the effects of culture techniques, size at release, and time of release, etc. We hope to be able to apply practical findings to this and other programs.

February 23, 1983

In closing, all the staff at the hatchery are "fired up" over our past year's successful season. We've spent 4 years of hard work getting this program going. Our biggest problems in the past were availability of brood-stock. We've finally been successful in securing approval for off-site chum stocks. This coupled with returns beginning to show up from previous releases will allow us to achieve present year's and the next 2 years' goals. At this time, Klawock adult returns should bring the facility to capacity. Coho returns to the hatchery and approval for an expanded program have resulted in a very successful year for this program. Coho returns now exceed the numbers required for our egg-take needs. We are very excited about this program and the importance it will play in our West Coast fisheries. The steelhead program has remained steady with the first adults returning now. This program is interesting in that it is maintained on a space-available basis and has been accomplished in normally empty ponds and/or incubators with existing staff. Techniques, "lessons learned" along the way, and research findings now coming in have all lead to a more efficient and successful program. As an example, this last year's successes have all been accomplished on a budget 10% below the previous years, even before counting losses to inflation.

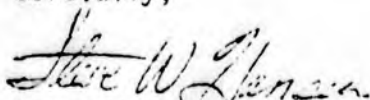
We would all like to thank you for the support you've shown us in this past year. I can honestly say that it has been a great motivational factor for the crew here at the hatchery. We all feel we are here to serve, "especially" the needs of West Coast citizens and resources. Your support has reinforced the fact that we are all working toward the same goal.

We are optimistic about our future capabilities at the facility and with your continued support, as demonstrated last year, we feel our mutual objectives will be realized.

Two items for future consideration are: 1) It has been passed down through the grapevine that the Department is considering king salmon enhancement programs for Southeast. I would like to hear your comments on Klawock being considered for this program. Hopefully, if this proves popular, your support could be instrumental in a decision on where these programs will be implemented. 2) It appears that there may again be budget allocation problems for continuation of our program as well as others in this year's budgeting process. Your opinions or support in this matter will also be appreciated. As I receive any more information on this subject, I will pass it along.

Again, thank you for the support!

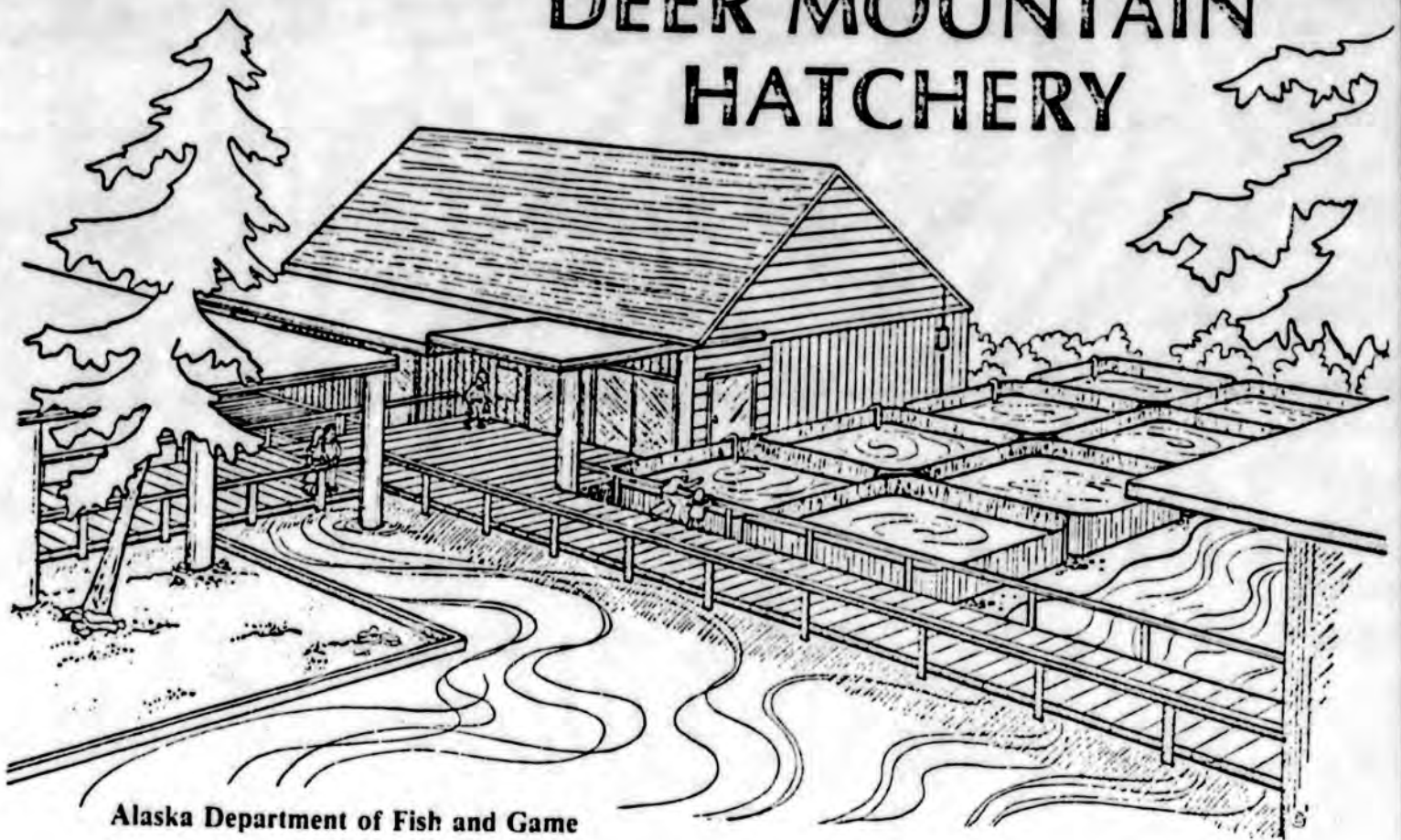
Cordially,



Steve W. Hansen
Hatchery Manager

ATTACHMENT 4

DEER MOUNTAIN HATCHERY



Alaska Department of Fish and Game

THE DEER MOUNTAIN HATCHERY

The hatchery at Deer Mountain was built in 1954 by the Ketchikan King Salmon Derby Committee. It is now owned by the city and operated by the Division of Fisheries Rehabilitation, Enhancement and Development (FRED) of the Alaska Department of Fish and Game.

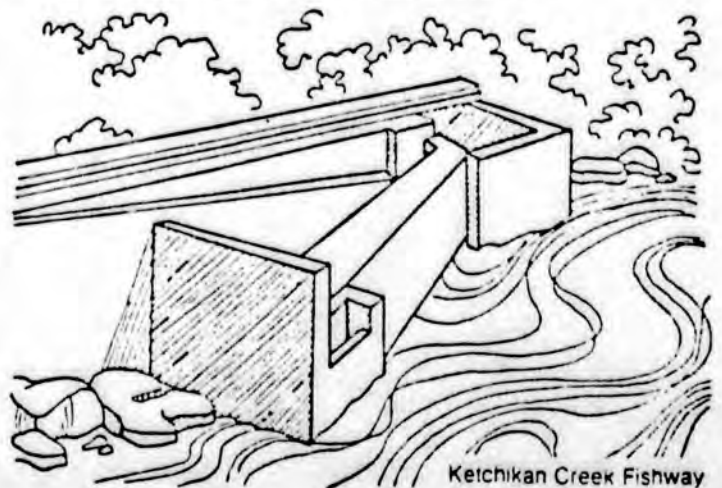
Rainfall in Ketchikan averages 154 inches annually, and that's fine with the hatchery workers. Operation of the hatchery requires approximately 2.8 million gallons of water daily all year round. This is about 32 gallons per second, or 1 billion 22 million gallons a year! The hatchery's water comes from Lower Ketchikan Lake via the city's hydroelectric plant.

Deer Mountain can produce 300,000 salmon smolts and 10,000 steelhead trout smolts yearly. The fish are kept at the hatchery for about 2 years, so the fish population there at any one time is more than 600,000, far more than the human population of all Alaska.

When the fish are released and swim to sea, their life becomes hazardous. Only about 3% of the chinook salmon and 10% of the coho salmon and steelhead trout will return as adults, but they are of considerable value to commercial and sport fishermen.

The fish that return to the creek carry in them the seeds of a new generation. Some spawn naturally in the creek gravel; most swim upstream into the hatchery's holding pens, attracted by the scent of their original home. These fish are used as breeding stock for the hatchery.

A fishway on Ketchikan Creek allows salmon to pass a series of rapids that would normally block their ascent to the hatchery. Many wild salmon, especially pink salmon, use the fishway to reach upstream spawning areas. As a result, the wild fish population has increased. The fishway reduces water velocity with a series of baffles in a wooden chute.



Ketchikan Creek Fishway

ATTACHMENT 5

Capacity of 68 Million Eggs

SSRAA to Seek Permit for Hatchery at Neets Bay

ADF&G commissioner Don Collingsworth has approved a preliminary permit for a hatchery at Neets Bay and SSRAA staff and consulting engineers are busy preparing design, cost estimates and application for a final permit. Plans call for construction of the hatchery to begin this summer with completion in September, in time to be used for returning coho and chum salmon adults, said Walt Larrick, SSRAA operations director.

Last summer, as part of an expansion of Whitman Lake hatchery's capacity, construction began on Phase I, adult holding space for returning salmon. Work consisted of constructing a primary water system, including a dam, plus raceways for rearing juvenile salmon and holding adult salmon until egg-takes. Construction also included a residence for crews. The construction ended for the season in December with near completion of the dam and installation of a small residence.

SSRAA has been releasing coho and chum salmon into Neets Bay since 1980 and has had returns of coho and chum salmon for two years. The transition to make this a self-contained hatchery, not an extension of Whitman Lake, was considered during the planning of Phase I.

"This year, we will be in a position to take advantage of our own broodstock, which we've developed over the last four years. The new hatchery will help us to significantly increase our production," he added.

The proposed hatchery will have the space to incubate 60 million chum eggs, 5 million coho eggs and 3 million chinook eggs, he added. Chum and coho stocks would come from existing, returning SSRAA fish, while potential donor stocks of chinook could be from Cripple Creek (origin) chinook returning to the Whitman Lake hatchery.

At full production, this hatchery should produce 600,000 to 1,200,000 returning chum, 400,000 coho and 240,000 chinook. SSRAA staff estimates that commercial fishermen should land 75 percent of these returning fish.

"Construction of the new hatchery is consistent with the Comprehensive Salmon Plan for southeast Alaska, and through sound enhancement practices,

should increase benefits not only to commercial fishermen but to other fishery users," Larrick noted.

"We have developed a broodstock and have a dependable water source, two of the primary components of a hatchery," he said. With egg-take and release operations in Neets Bay, SSRAA crews have been working there steadily since last summer.

SSRAA crews are rearing overwinter a group of coho salmon in saltwater net pens in preparation for their release to sea this spring. Normally, these fish rear in freshwater until just prior to sea releases, Larrick said. SSRAA also plans to release 1.4 million summer chum there this spring, along with about 15 million fall chum and 1.0 million coho.

He noted that former field supervisor George Carnes has been named Neets Bay Hatchery Manager and is part of the hatchery design team composed of Larrick, Ward Griffioen, Rheel Finnegan and R.W. Beck and Associates.

Larrick said that the aquaculture association will have to seek a change in its special-use permit from the U.S. Forest Service and a hatchery permit from ADF&G to allow for the self-contained hatchery at Neets Bay. Presently, SSRAA staff is working on final designs and permit procedures.

ADF&G officials are concerned, he said, about large releases of chum salmon and their impact on the available food supply. ADF&G is also concerned about predation of wild pink and chum salmon by hatchery-released coho and chinook. SSRAA, in developing the final permit, will address these concerns, he added.

Larrick said that Neets Bay was initially selected as a release site because it is separated from the Behm Canal areas where a majority of native stocks occur. Past recovery of tags from SSRAA fish have shown there is little or no significant straying from sites where SSRAA fish have been imprinted prior to release.

He also said that the special harvest area, instituted in Neets Bay, helps pay for debt service on a portion of hatchery expenses. The size of Neets Bay will accommodate virtually all the various fishing methods in the region. SSRAA has held special harvests in Neets Bay on returning coho during 1981 and 1982.