

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILE 8672

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MEMORANDUM

TO: Representative Adelheid Herrmann
FROM: Deborah L. Greenberg, Committee Aide
DATE: December 16, 1983
SUBJECT: Analysis of the HISTORY OF HATCHERIES to Determine Support and Opposition for Hatchery Development

You asked me to look into the history of hatcheries so that we could understand the reasons why the financial and the political support hatcheries enjoyed at one time, does not seem to prevail now. I have interviewed several people involved with hatcheries issues as well as many who had first hand experience with their development. This memo also covers my review of the key sources of written information that best portray this history.

GENERAL OUTLINE OF HATCHERY HISTORY

Below I have outlined the most salient events in the history of hatcheries development, and have focused the remainder of my discussion on how that history affects current issues.

1878: Initial large scale harvest of 56,000 salmon for the year.

1878 - 1936: Steady increase in annual harvests. PEAK harvest level in 1936 of 126.4 million salmon.

Hatcheries were MANAGED BY THE FEDERAL GOVERNMENT.

Substantially greater emphasis was placed on SOCKEYES.

1936 - 1951: Most hatcheries had closed Very FEW HATCHERIES were in operation.

1960: The State gains control of fisheries management from the federal government. HATCHERIES IS NOW A STATE ISSUE.

Hatchery History
December 1983
Page two

- 1941: A steady DECLINE BEGINS of many important salmon runs.
- 1960: A FISH FOOD IS DEVELOPED that makes hatchery production significantly easier, and the interest in hatcheries is revived.
- 1960 - Now: The emphasis of hatchery production is on PINKS, not Sockeyes, due to disease control problems.
- 1941 - 1967: Annual harvest levels decline until 1967 when hitting an annual low of LESS THAN 21 MILLION SALMON. 1971: As a result State, the legislature established the FRED DIVISION.
- 1972: In a continued response to the low salmon harvest and other reasons, the Legislature passed the Limited Entry laws establishing the the Commercial Fisheries Entry Commission (CFEC).
- 1972 - 1975: The FOUR LOWEST CONSECUTIVE ANNUAL SALMON HARVESTS OCCUR.
- ? Voters pass BONDS to help finance hatcheries with strong support.
- 1974: PNP HATCHERY program was established.
- 1976: The legislature established REGIONAL AQUACULTURE ASSOCIATIONS.
- 1980 - 1982: Annual harvests for these years AVERAGE HIGHS OVER 110 MILLION salmon. This is thought to be a result of hatcheries, limited entry, and better environmental conditions.

CURRENTLY: Two controversial issues threaten the State hatchery program:

- The issue of whether hatcheries is the best mechanism for strengthening salmon runs, given the biological, economic, and environmental costs.
- The issue of whether hatcheries are better managed by the State, by Private Nonprofit, or by Private profit agencies.

HISTORY OF SUPPORT FOR HATCHERY DEVELOPMENT

As you can see from the history above, fisheries resource managers, have responded to annual declines in salmon harvest levels by using a combination of the following three mechanisms to strengthen runs:

1. Regulation of the harvest, through the Board of Fisheries, Limited Entry, etc.
2. Artificial Aquaculture techniques, such as hatcheries, and
3. Habitat management.

Of these, habitat management has been the least emphasized as a solution to the problem of strengthening salmon runs.

Supporters of hatcheries have had similar motives throughout the history of the State. The most important of these are discussed below.

Hatcheries have been strongly favored when there is a desire to increase the levels of stock dramatically for economic reasons. The initial hatchery program in the State was established by the federal government in response to the demands, and the potential, of what was then a new and developing large-scale industry. In response to the decreasing annual harvests through 1967, and low harvests, thereafter, the FRED division was established as a full scale hatchery program to restore the State's salmon resources, and ensure survival of the State's second largest industry.

As these events demonstrate, one of the most compelling arguments in favor of hatcheries, is the trend in declining salmon runs. If hatcheries are operating successfully, they can provide several advantages to the industry. The numbers of naturally occurring stocks, fluctuate dramatically and somewhat unpredictably, and hatcheries can serve to make the impacts of these fluctuations less burdensome for the fishermen. In addition, the numbers of fish available for harvest can be adjusted to meet the demands of fishermen and the market.

As other nations are rapidly developing their fisheries industries in response to the growing concerns for protein supply and resource development, competition for the resource and access to the market becomes greater. Hatcheries supporters for a long time have speculated that unless Alaska becomes more involved in developing its own fisheries resources now, that State's fishermen will quickly lose a competitive advantage over foreign interests, and even over other states on the Coast. Many other important fishing countries which have developed hatcheries include the Soviet Union, Norway, Japan, and Canada.

HISTORY OF OPPOSITION TO HATCHERIES DEVELOPMENT

Several biological, economic, and as always political concerns have been raised about the value of State support for hatcheries. I will address these questions in regards to hatcheries in general here, and reserve the discussion about the State vs. PNP or other management, for the last paragraphs.

One of the major reasons why the State no longer seems to be actively supporting hatcheries development has to do with the overall change in State policy toward fisheries development as a whole. When oil revenues were anticipated and first received by the State, there was a policy of reserving portions of these funds for the development of the State's renewable resources, especially fisheries. As the years have progressed this no longer seems to be the case. The lack of State commitment to the fisheries development as a whole has resulted in even less funding for hatchery development specifically. And of course, as State oil revenues dwindle, the competition for funding increases sharply. Programs that are not as well established in the State tend to be the first affected.

Among the most major biological questions raised about the wisdom of developing hatcheries as a management tool concerns the disease control problems and the gene pool problems of the future involved with rearing fish. Because a hatchery attempts to mass produce many fish in one location, diseases that would ordinarily only affect a segment of the fish population could threaten large numbers of stock at once, and in turn have a major impact on the industry.

I have reserved the discussion about the genetic implications of hatcheries until I can consult further with Mel.

An additional criticism of hatcheries that has been made by opponents throughout time is that fish weirs impede many important fish runs in the State. Many feel that hatcheries can adversely affect the environment by impeding natural runs, and that better habitat management would have more advantages for fisheries resources and the environment both.

Any hatchery manager is responsible for making important decisions resulting in economic impacts on the fisheries industry. This includes determining what kinds of fish are produced, and for whose benefit. Hatcheries have tended to operate most successfully in recent years, by producing pinks. In many areas of the State, however, other species such as chinooks, or sockeyes, constitute the important runs. This discrepancy raises the question about the economic value of the hatcheries to the State and to the fishermen. If, as a result of hatcheries' pink production, a whole new market for pink salmon is created, then how does this impact fishermen (and to a lesser degree processors) traditionally harvesting other species? If hatchery managers can determine what species to produce and in what quantities, these decisions could well be based on factors such as the willingness of the fishermen to fish, or on the preferences of processors to buy? There are no guarantees that these decisions won't be made solely for the benefit of one user group or one sector of the industry, rather than for the resource as whole for the maximum benefit of all users.

These concerns vary throughout the different fisheries in the State in relation to the species which comprise the critical runs, and the influence of those parties who would like to benefit from hatchery production. Support for hatcheries is often met with resentment by those who feel that State hatcheries in many regions of the State were located for political reasons rather than for sound biological or economic considerations.

THE STATE VS. PRIVATE NONPROFIT VS. OTHER MANAGEMENT OF HATCHERIES

The most current controversy about hatcheries concerns the proposed transfer of hatcheries from the State to the Private Nonprofit aquaculture associations, or other private organizations. While I do not intend to debate the merits of each proposed bill on this topic, I will address the issue in general.

The preference for hatchery transfer from the State to the Private Nonprofits (PNPs) in part stems from the lack of confidence in the State to manage the hatchery program well. Many individuals have felt that for the amount of time and money that has been sunk into FRED that there is relatively little to show in the way of returns, and that therefore it is time to let the the private sector demonstrate its capabilities. For many others there is just a belief that without the transfer, the State is functioning to impede free enterprise. There are also concerns that the State is in no position to be involved in an enterprise that might eventually involve large scale selling of fish, and that the State through hatchery production should not be allowed to have so much potential power in affecting the market.

Many groups have pointed to PNP management as an opportunity for fishermen and other concerns to exercise local control of local resources for local benefit.

The overall problem of PNP operation of hatcheries stems from the notion that fisheries resources need to be managed comprehensively for the State and that PNP control of hatcheries would threaten sensible fisheries management. This concern is particularly highlighted by those who feel that not all PNPs or aquaculture associations are equally capable of accepting the responsibilities that go along with hatchery management. For instance, the problem of disease control and the genetic implications for stocks are problems that are more difficult to handle if hatchery control is segmented and the responsibility of each hatchery to protect the State's resource is questionable and vague.

Many assert that the push for PNP ownership and management of hatcheries in some regions of the State, comes from individuals or small groups eager to exercise self-interest through hatcheries management. Again this seems to vary widely from region to region depending on the circumstances.

The economic issues connected with PNP management are also pointed to as reasons to retain State management of hatcheries. It is not clear whether managers would produce fish on the basis of what is needed in the market place, what is desired by processors or what is being fished by fishermen, or whether this would be done solely for the purposes of trying to supplement declining stocks in important runs. Others fear that if hatcheries encounter financial difficulties their production decisions will be based on economic benefits alone with little regard for the necessity to produce stocks in an effort to ensure sustained yield of resources on the decline.

Many fishermen, also fear that if management is in the hands of private nonprofit organizations that private for-profit hatcheries control would soon follow. Aside from posing economic problems similar to those posed by PNP management, there is the additional reservation that private-for-profit management would not enable the Board of fisheries, State biologists, and resource users to obtain adequate information required for evaluating a whole array of fisheries management questions.

ADDITIONAL INFORMATION

I am including for your review the best materials I have been able to find pertaining to the history of hatcheries. Each has its own slight bent but still provides valuable information. The book by Patricia Roppel on the history through 1959 is also good and we might want to order it. I also could easily compile more information on related topics if you would like. I hope you find this information useful.

1. Alaska Fisherman, "Report: Alaska Aquaculture"
September/October 1982, Vol. 9 #11.
2. Ohls, Carl, Alaska Fisherman, A four part series on Aquaculture Associations,
November 1979, Vol. 7 #3
December 1979, Vol. 7 #4
January 1980, Vol. 7 #5
February 1980, Vol. 7 #6
3. Moberly, S. A. A review of Alaska's Fisheries Rehabilitation, Enhancement and development (FRED) Program 1971-1982 # 3, FRED Reports, October 1983.
4. Roppel, Patricia Alaska's Salmon Hatcheries 1891-1959, National Marine Fisheries Service 1982, 300 pp.



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Newly hatched cohos with egg sacs mingle with embryos at an Alaska Department of Fish and game hatchery.

ADF&G photo

Private fish farmers beset by problems

Editor's note: One of the most ambitious economic programs ever attempted by the State of Alaska is its program to rebuild the state's salmon runs to support all-time high harvests of 100 million fish a year. If short-term problems can be overcome, the state's aquaculture program has the potential of eliminating the ups and downs that have plagued Alaska's salmon industry.

So far, the short-term problems have been numerous and the returns from the investment of millions of dollars of tax dollars minimal. The *Alaska Fisherman* is launching a four-part series that will take an in-depth look at where the program is now and what hurdles must be overcome.

The first article focuses on the private aquaculture associations, and subsequent articles will deal with state-run hatcheries, biological uncertainties

modern technology to efficiently harvest a resource grown by them. The evolution of fishermen into cultivators holds the promise of eliminating the hunter's age-old problem of dependence upon the vagaries of Mother Nature.

A key element in this change is giving fishermen the opportunity to farm salmon themselves through the private non-profit regional aquaculture associations. A creation of the 1974 and 1976 state legislatures, the concept is designed to minimize direct state participation and allow fishermen to control, and pay for, the rehabilitation of the fishery.

John Sund, chief aide to Speaker of the House Terry Gardiner, said aquaculture is the "second prong of limited entry. Limited entry gave fishermen an incentive to conserve fish. If you conserve today, you reap

Association (NSRAA), with its diverse number of fisheries and committees, would have a "hell of a job" trying to collect a voluntary assessment on an annual basis.

Sund discounts the Prince William Sound Aquaculture Corporation's (PWSAC) success at supporting itself with a voluntary assessment because PWSAC has had "a hand-to-mouth existence" and uses "an awful lot of volunteers."

PWSAC, in fact, is considering using some sort of mandatory assessment once the legal mess is straightened out.

Armin Koernig, PWSAC general manager and president, said, "My own feeling, as a fisherman, is I'd like it to remain voluntary. That's the best check on the support you have from fishermen. However, to build a 20 year financial commitment it may not work because bankers like to have more security." (See related story on page

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BY KAT OAK

After going through periods of over-exploitation, neglect and tight regulation, Alaska's commercial salmon fishery has entered an era of replenishment.

This new phase could foreshadow a change in the traditional roles of fishermen as hunters to farmers using

this problem when in 1971 it created the Division of Fisheries Rehabilitation, Enhancement and Development (FRED) in the Alaska Department of Fish and Game. One of FRED's responsibilities is running a statewide hatchery program.

In 1974, legislation passed to open up the hatchery business to qualified private nonprofit corporations. In 1976, the law was rewritten to give fishermen direct responsibility for rebuilding salmon stocks through the vehicle of regional nonprofit corporations.

Still in their formative stages, the corporations have been beset with problems. As a new concept, the corporations don't have much experience to fall back on and have felt their way through all sorts of novel situations.

The main problems seem to be old rivalries between gear groups, a shortage of brood stock, lingering doubts that science is capable of duplicating the quantity and quality of the natural runs, personalities, and questions over how to raise money. The funding problem currently is the biggest roadblock.

Most of the corporations are in a holding pattern right now because of the uncertainty over financing. The mechanism the legislature created for fund-raising — a mandatory assessment on the catches of all fishermen in the region — has been declared unconstitutional by a Superior Court Judge. (See related story on page 12)

The general consensus among corporation managers and political leaders is that a voluntary assessment won't work.

Sund, who helped write the contested assessment law, said the Northern Southeast Regional Aquaculture

Alaska's five private, nonprofit regional aquaculture corporations are in varying stages of development, all are laboring under problems unique to their regions, and all have taken different approaches to running their programs.

The Southern Southeast Regional Aquaculture Association (SSRAA) and its Panhandle counter-part, NSRAA, have much more in common than most in that they share a lot of the same problems. Both are trying to weld together gear groups — gillnetters, seiners and trollers — that have little use for each other because of long, bitter battles over access to the salmon resource.

The gear groups disagree over what kind of facilities to build and what kind of species of salmon to concentrate on. Seinners, in general, are critical of the private nonprofit aquaculture program in Southeast Alaska because of communication problems, a feeling the projects have nothing to offer them, and conflicts over special harvest permits.

A case in point is SSRAA's chum egg take at Disappearance Creek on Prince of Wales Island. Michele Zerbetz, executive director of the Southeast Alaska Seine Boat Owners & Operators, sent a letter to the state Board of Fisheries charging the egg take represented a turn-about from biological management to political management.

The escapement goal was raised to provide for hatchery brood stock creating a conflict with seinners who wanted to fish the area. Board members Jim Beaton said the special harvest permit was granted because, "We felt the board was under

(Continued on next page)

Shelton said. "There's a willingness to see if development is appropriate under some circumstances. The legislative mandate to guarantee the

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legislative mandate to guarantee the egg take."

Zerbetz addressed the issue in her letter. "Now that an organization like SSRAA has borrowed millions of dollars from the state and has built a hatchery," she wrote, "the state is in a position of having to insure that their money is returned. Therefore, decisions are being made that result in a political management for our fisheries resources."

The long-range problem Zerbetz sees is a trend will develop to give hatchery stocks priority treatment resulting in the dominance of artificial salmon over natural runs.

The whole question of special harvest permits becomes a thorny one when thrown into the lap of the Board of Fisheries, which has the power to sort out the conflicts and approve the permits.

Beaton said only a couple of permits have come before the board and each involved an insignificant number of fish. But the permits do cause "a lot of emotional problems and headaches for us because a lot of people are against it, as you well know, and they show up at the meetings" to complain.

So far the permits have been granted because the board felt it was in the "broad public interest to allow this to come about," Beaton said the permits have not caused the disruption of any major fishery but that "could be a problem down the road."

SSRAA used the Disappearance Creek brood stock in its new hatchery, the Whitman Lake central incubation facility (CIF) on the Ketchikan road system.

With the CIF, SSRAA is attempting to meet the needs of all the gear groups. "The design is very flexible," said executive director Ron Wendt. "We have the capacity to incubate and rear 26 million eggs. Our plans call for three separate runs, — coho, summer chum and fall chum."

Shelton said. "There's a willingness to see if development is appropriate under some circumstances."

The Salmon Creek/Twin Lakes hatchery will rear cohos, summer chums and pinks, and will feature a visitor's interpretation center. The facility is a joint effort between NSRAA and the Juneau City Borough.

Because of the NSRAA financial situation, Poon said the association stresses projects with "very extensive multiple-agency cooperation."

In the works are an evaluation of over 30 lakes for a lake stocking program, a survey of the Chilkat River for a cooperative habitat improvement project, a sockeye lake fertilization program, and the development of portable hatcheries.

Poon said the projects were put together from a survey sent to all fishermen in the region and from public hearings.

The Cook Inlet Aquaculture Association (CIAA) also is in something of a holding pattern. Though not a party to the lawsuit, CIAA is having all the money collected from its two percent mandatory assessment held in escrow pending the Supreme Court resolution of the case.

In the meantime, a number of projects are underway, according to the executive director Floyd Heimbuch.

A test incubator has been set up at the Eklutna Lake Power Plant near

Anchorage to see how chum eggs behave in different test situations in glacier water. CIAA envisions building a 65 million chum and pink egg capacity facility there.

CIAA is also planning to fertilize the sockeye population in Crescent Lake on the Kenai Peninsula, improve the spawning grounds at Tustumena Lake, and provide engineering data for a fish pass on the Paint River.

The Imarpik (Yupik Eskimo word for "big bay") Regional Aquaculture Corporation in Bristol Bay has not yet fully defined its goals, except to note that, because of strong natural runs and high bush construction costs, hatcheries have a low priority.

Projects Imarpik is looking at include building waterfull by-passes, opening up beaver dams, predator control, stream clearance, lake fertilization, and more research into the region's fishery.

The corporation's informational brochure indicated Imarpik, though still in the organizational stage, also is interested in being an advocate for Bristol Bay fishermen on political issues like resources protection, the area's share of ADF&G's research budget, coastal zone management, D-2 legislation, and outer continental shelf oil development.

Amidst all of the controversy, no one argues with the goals of the

aquaculture program, just over the best method to achieve them. Most of the political and administrative battles fought over the salmon fishery stem from the fact that there just aren't enough fish to go around.

Despite the relative health of the natural salmon stocks right now, there's no assurance they will remain healthy.

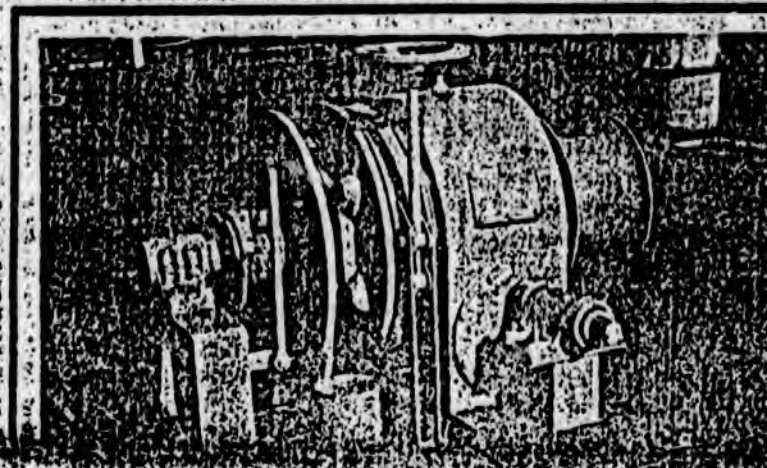
Speaker of the House Terry Gardiner, a Ketchikan fisherman, bristles when asked if expensive rehabilitation programs are really necessary. "Why don't you ask the Cook Inlet gillnetters that question?" he said. "Mother Nature is kinda fickle." Measured against what the runs once were, "the fish have not come back." He added, "They're nowhere near their historic levels."

Even as outspoken a critic of the aquaculture corporations as fisherman Wayne Alex believes in hatchery programs. "You definitely gotta have them," he added.

Alex filed the lawsuit that got mandatory assessments thrown out as unconstitutional.

"What pisses me off is we've wasted so much time," he said, and built resentment against the hatchery programs. The lawsuit "didn't change my attitude toward the hatcheries. We need them now more than we ever did."

(Continued on page 25)



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incubate the eggs at the facility, and deposit the eggs at sites where more fish are needed. "Unlike most hatcheries, it's not tied to a specific site," he said. Theoretically, the corporation has the flexibility to respond to a number of different situations. But biological uncertainties still exist with this approach.

Besides getting the CIR on line, Wendt said other SSRAA priorities on its "bare bones budget" include lak fertilization and the compilation of a complete data file on every single stream system in southern Southeast.

NSRAA incorporated a couple years after SSRAA and tried to learn from some of the SSRAA difficulties.

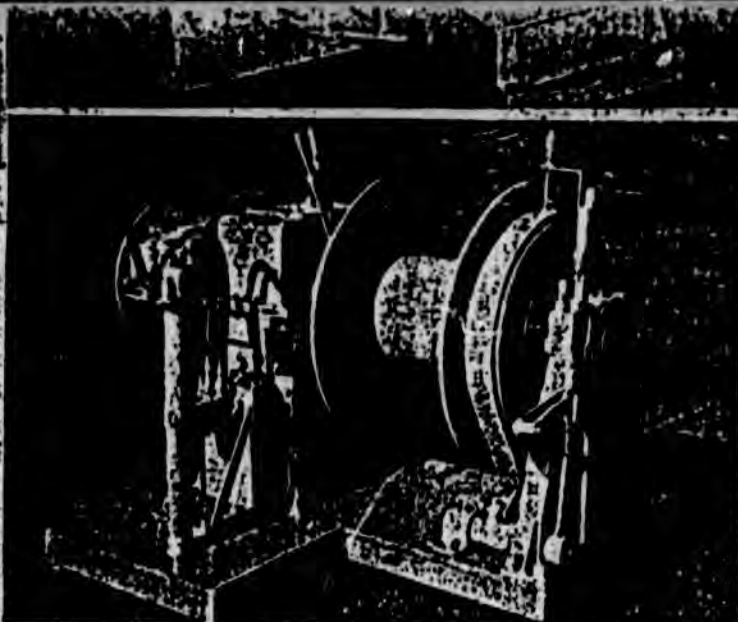
Jev Shelton, a member of the NSRAA board of directors, said two things the northern group appeared to do differently were to see that a "lot of time and care was taken" to make the board as "representative of the region as it could be" and to "not go in with any predetermined idea on how to spend money in order to generate fish. No one started with the idea of definitely building a large-scale hatchery."

How successful the northern Southeast has been at this is a matter of debate among fishermen. Like southern Southeast, the gear groups and communities are split over the worth of the aquaculture corporations.

NSRAA general manager Dr. Derek Poon, for example, is careful not to use the word "hatchery" in his public statements.

In an interview, Shelton and United Southeast Alaska Gillnetter President Geron Bruce said "hatcheries" have bad connotations in the minds of many fishermen because of the cost, biological problems and special harvest privileges.

Despite this general feeling, NSRAA is going ahead with plans for the "Salmon Creek facility" in Juneau. "The point needs to be made that there's not a blanket rejection of hatcheries,"



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aquaculture

(Continued from page 9)

Alex's lawsuit attacked the aquaculture program on the narrow legal point that the mandatory assessment was an illegal tax. Still, Alex does have strong objections to the whole private non-profit regional corporation concept.

"This approach set back fisheries rehabilitation 10 years. Everything about it is wrong. Even if I hadn't filed suit, it would have floundered around."

Alex said the way the corporations are set up, they are not accountable to anyone. He believes people that don't know what they're doing could end up running them.

Alex sees other problems with the structure. "If you gave the logging industry this much power over their resources, the fishermen would scream." Alex said fishermen could be drawn into a conflict with the general public over an issue like the use of fresh water resources.

"This thing should be run by the state. Then all people would have a sayso, not just the harvesters."

The whole question of what role the state and the corporations should play in the overall rehabilitation program still is being defined.

Bob Roys, FRED division director, said he would like to see the state "spend the bucks to work all the bugs out" of the aquaculture program. Let it "rationally develop, then bring the regional associations in."

The fishermen and the politicians, though, are impatient to get started.

"There's probably more than one group that can work the bugs out," said Jev Shelton. "We have access to all the experience in the world. We have lots of contact with academic programs. We have access to people that can solve practical, technical on-site programs."

the department was pretty close. That's just the way the community is laid out." While avoiding specifics, he noted there have been conflicts with other corporations.

The ingredients for a successful hatchery program include pathology (fish disease prevention and control), genetics, engineering, biology and fish culture, Roys said. It takes time and knowledge and experience to determine whether something's successful.

Roys said some corporations have discovered aquaculture is "not quite as simple as they thought. In certain cases they have not recognized the complexity of projects. Every site has its own vagaries."

As for the popular political notion that whatever the state can do, private corporations could do better and cheaper, Roys said, "I can dig up information to show you the opposite. For the regional corporations' cost of running one hatchery, the state can run four or five for the same amount." The only problem, he added, is the program is too new to tell if the data had much validity.

Many different ideas and concepts about aquaculture are floating around and being tried out with varying degrees of success. "I think all the issues have to get in a pot and boil a bit," he said. "Then we see what flows out." Next Month: A look at FRED.

Alaska Fishermen, November 1981

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olving some of the confusion is the regional planning process. Each regional corporation was given \$100,000 by the last legislature to develop a comprehensive salmon plan for its region. Regional planning teams, made up of three corporation representatives and three ADP&G staff members, were formed to handle the job.

A draft report from each region is expected to be released when the legislature convenes.

Roy said the report will look at "strategies, needs and aspirations. What it takes to satisfy an area's specific needs." He calls the process "the best thing to ever happen to fish in the whole state."

In talking about how FRED gets along with the corporations, Roy said the relationship between PWSAC "and

limited entry

(Continued from previous page)

earlier campaigns haven't died. A seminar on limited entry at Fish Expo in Seattle provides a case in point.

Many salmon fishermen complained the panel selected by organizers of Fish Expo was stacked heavily against limited entry, and the stinging rhetoric against limited entry delivered by most of the panel members showed the accusation had a ring of truth.

The strongest denunciation was delivered by Jeff Stephan, manager of the United Fishermen's Marketing Association of Kodiak which has been a leading opponent of limited entry. Stephan said fish are a "common property to all citizens. I challenge any proponent (of limited entry) to explain why the right to harvest the common resource should be limited to a few."

Interestingly, when New England lobsterman Jim O'Malley asked the audience of roughly 500 fishermen for a show of how many had been hurt by the limiting of Alaska's salmon fisheries, only a handful raised their hands.

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aquaculture

(Continued from page 9)

Alex's lawsuit attacked the aquaculture program on the narrow legal point that the mandatory assessment was an illegal tax. Still, Alex does have strong objections to the whole private non-profit regional corporation concept.

"This approach set back fisheries rehabilitation 10 years. Everything about it is wrong. Even if I hadn't filed suit, it would have floundered around."

Alex said the way the corporations are set up, they are not accountable to anyone. He believes people that don't know what they're doing could end up running them.

Alex sees other problems with the structure. "If you gave the logging industry this much power over their resources, the fishermen would scream." Alex said fishermen could be drawn into a conflict with the general public over an issue like the use of fresh water resources.

"This thing should be run by the state. Then all people would have a sayso, not just the harvesters."

The whole question of what role the state and the corporations should play in the overall rehabilitation program still is being defined.

Bob Roy, FRED division director, said he would like to see the state "spend the bucks to work all the bugs out" of the aquaculture program. Let it "rationally develop, then bring the regional associations in."

The fishermen and the politicians, though, are impatient to get started.

"There's probably more than one group that can work the bugs out," said Jev Shelton. "We have access to all the experience in the world. We have lots of contact with academic programs. We have access to people that can solve practical, technical on-site programs."

He added that the technical side of

the department was pretty close. That's just the way the community is laid out. While avoiding specifics, he noted there have been conflicts with other corporations.

The ingredients for a successful hatchery program include pathology (fish disease prevention and control), genetics, engineering, biology and fish culture, Roys said. It takes time and knowledge and experience to determine whether something's successful.

Roys said some corporations have discovered aquaculture is "not quite as simple as they thought. In certain cases they have not recognized the complexity of projects. Every site has its own vagaries."

As for the popular political notion that whatever the state can do, private corporations could do better and cheaper, Roys said, "I can dig up information to show you the opposite. For the regional corporations' cost of running one hatchery, the state can run four or five for the same amount." The only problem, he added, is the program is too new to tell if the data had much validity.

Many different ideas and concepts about aquaculture are floating around and being tried out with varying degrees of success. "I think all the issues have to get in a pot and boil a bit," he said. "Then we see what flows out." Next Month: A look at FRED.

Shirley Fisherman, November 1979, page twenty-five

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solving some of the confusion is the regional planning process. Each regional corporation was given \$100,000 by the last legislature to develop a comprehensive salmon plan for its region. Regional planning teams, made up of three corporation representatives and three ADF&G staff members, were formed to handle the job.

A draft report from each region is expected to be released when the legislature convenes.

Roy said the report will look at strategies, needs and priorities. What it takes to satisfy an area's specific needs. He calls the process "the best thing to ever happen to fish in the whole state."

In talking about how FRED gets along with the corporations, Roy said the relationship between PWSAC and

limited entry

(Continued from previous page)

earlier campaigns haven't died. A seminar on limited entry at Fish Expo in Seattle provides a case in point.

Many salmon fishermen complained the panel selected by organizers of Fish Expo was stacked heavily against limited entry, and the stinging rhetoric against limited entry delivered by most of the panel members showed the accusation had a ring of truth.

The strongest denunciation was delivered by Jeff Stephan, manager of the United Fishermen's Marketing Association of Kodiak which has been a leading opponent of limited entry. Stephan said fish are a "common property to all citizens. I challenge any proponent (of limited entry) to explain why the right to harvest the common resource should be limited to a few."

Interestingly, when New England lobsterman Jim O'Malley asked the audience of roughly 500 fishermen for a show of how many had been hurt by the limiting of Alaska's salmon fisheries, only a handful raised their hands.

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December 1979



Volume Seven
Number Four

Alaska Fisherman

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Rags or riches?

Informational gap plagues efforts to
research fishermen's incomes

by Rodger Painter

Rich Alaska fishermen: Myth or reality?

Using available information, it's extremely difficult, if not impossible, to answer the question that has become a key issue in the debate over limited entry.

Mounting opposition to limited entry has prompted the state legislature to consider massive changes in the restrictive fishing program. In a nutshell, the opposition stems from the widely held impression that an exclusive group of fishermen is getting rich off resources belonging to all citizens of the state.

This attitude can be traced to news stories about Bristol Bay fishermen who took home huge checks for a month's work, herring fishermen who made \$100,000 without leaving the docks and the seiner who netted 47,000 pinks in one set.

this scarcity of data are numerous... but the principal cause appears to be insufficient funding for this purpose to the agencies responsible for fisheries economic research.

"The end result of this lack of current information is that some of the data series presented in (a preliminary report to the limited entry study group), particularly in regard to fishing costs and net earnings, have had to be estimated from outdated or generalized sources."

The report by the two economists carried statistics showing gear operators in many of the state's major commercial salmon fisheries actually lost money when operating costs and crew shares were deducted for the 1969-77 seasons. (See page 3.)

The primary cause of the informational gap is the lag in processing fish tickets. Gross incomes are figured by the Commercial Fisheries Entry Com-



Most Alaska fishermen fell below the poverty guidelines.

These are isolated examples of fishermen who struck it big, but they leave the reader feeling that most fishermen must fly to the fishing grounds in Lear jets.

The latest estimate of gross incomes of Alaska's salmon fishermen is for 1977. More current figures can be obtained by laboriously sifting through piles of state documents and independent research. The most meaningful figures — net incomes — simply aren't available, except for three drift gill net fisheries in 1976.

The only statewide net income survey of salmon fishermen was conducted in 1973, and only 520 fishermen, or seven percent of the active skippers, were questioned.

Two economists researching fishing incomes for the legislature's "Limited Entry Study Group" had this to say about the information they had to work with:

Considering the importance of Alaska's fishing industry to the state's economy and its residents, very little concrete economic information is available in this area. The reasons for

2).

Spurred by inquiries from the *Alaska Fisherman*, the University of Alaska's Sea Grant Program is conducting a mail survey of Alaska's commercial salmon fishermen in an attempt to compile net income statistics for 1979. The survey, co-sponsored by the United Fishermen of Alaska, was developed with the cooperation of the Commercial Fisheries Entry Commission and the Limited Entry Study Group.

Sea Grant hopes to have the survey results compiled by February or March.

Meanwhile, available information suggests salmon fishermen are not getting rich through the state's exclusive fishing program.

The most reliable information on incomes of salmon fishermen is "gross income estimates by the entry commission. The commission's figures show the average annual gross earnings from 1969 to 1975 were \$20,382 for a purse seiner, \$3,524 for a beach seiner, \$7,520 for a drift gillnetter and \$2,280 for a set gillnetter. Trollers averaged \$1,568 each in annual gross earnings from 1969 to 1974; power trollers averaged \$6,136 a year in 1975-76 and hand trollers \$599.50 annually in the same period.

Gross incomes shot up dramatically during the 1977 in nearly all salmon fisheries: purse seiners \$58,295; beach seiners \$11,623; drift gillnetters \$18,914; set gillnetters \$7,384; hand trollers \$1,787; and power trollers \$14,113.

Gross earnings estimates, however, can be very misleading, as they fail to take into account overhead expenses and crew shares. Comparing gross incomes of set gillnetters and purse seiners is akin to mixing apples and oranges.

Unfortunately, information on net incomes is much more sketchy and outdated than gross income data.



Karl Olin photo/Alaska Fisherman

Aquaculture in transition: Part II

Fish culturist Dedra Holm takes scale samples from female cohos for the Division of Fisheries Rehabilitation, Enhancement and Development (FRED) at the Deer Mountain Hatchery in Ketchikan. The second installment of our series on aquaculture—an in-depth look at FRED's troubled history—begins on page 8. For a profile of Ketchikan's low-budget hatcheries see page 10.

The only major effort to examine the economic health of the salmon fisheries was a statewide survey of fishermen by the entry commission in 1973, the last year of unrestricted access to the commercial salmon fisheries.

"Data was gathered from interviews with 520 active commercial fishermen from all over the West Coast and Alaska," said a 1974 report issued by the commission. "Extensive use was also made of records held on the computerized files of the Alaska Department of Fish and Game."

"Completed interviews represented approximately 7% of the fishermen in the fisheries studied. While generally valid, the results reflect the randomness of the sample picked for each fishery and the percentage and accuracy of completed responses."

The commission made some rather startling conclusions about the real earnings of salmon fishermen during 1973:

"A nonfarm family of four living in Alaska on an adjusted gross income of less than \$5,250 per year falls below Federal Poverty Guidelines. Without supplementing his income from other sources, the average gear operator in 15 of 18 salmon fisheries examined made less than this amount. In seven

fisheries, gear operators actually showed a net loss."

The health of the salmon fisheries has improved dramatically since 1973, but quantifying the gains in fishermen's incomes is impossible without directly surveying fishermen or getting the state's confidentiality laws changed.

Alaska law prevents researchers from having direct access to individual tax returns, even if the information is to be compiled in statistical form that wouldn't compromise individual privacy.

The Alaska Department of Revenue does not compile tax return information in computer banks in a form that could be translated into statistical averages, so department auditors have to perform any computations by hand. Entry commission spokesmen say such an effort would be more expensive and time consuming than directly contacting fishermen.

The last net income survey of salmon fishermen by the commission was conducted by mail and personal interviews in 1977. Four hundred thirty-eight drift gillnetters who fish in Prince William Sound, Cook Inlet and Bristol Bay were surveyed in the effort.

The surveys, the most complete analysis of net returns to salmon

(Continued on page 4)

inside

Since switching to a new computer system designed to speed up the processing of catch information, Fish and Game has fallen two and one-half years behind. See page 2.

The Coast Guard said it learned a lot about dealing with oil spills in the Bering Sea when a 324-foot Japanese factory ship went aground in the Pribilof Islands. See page 16.

Everyone at Petersburg High School learns about the fisheries. See page 18.

Two fishermen aren't about to let the state forget about financing the conversion of their surplus military freighter into a floating processor. See page 21.

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developing a bottomfish industry in Western Alaska, as many
of the prime fishing grounds are located beyond the reach of

Hand troll limits again delayed

The Commercial Fisheries Entry Commission has delayed imposition of limited entry on Southeast Alaska's burgeoning hand troll fleet.

The Nov. 29 decision to postpone adoption of regulations bringing the fishery under limited entry means the commission will not be able to issue hand troll permits until after the 1980 fishing season, according to acting commission chairman Robert Simon.

The delay also will allow fishermen who started hand trolling in 1979 to qualify for a permit, if the fishery eventually is limited.

The action was not expected to please the Board of Fisheries which was scheduled to consider regulations for troll fleet on Dec. 6. The growing hand troll effort has created allocation problems for the fisheries managers and heavy regulations have been slapped on the last of the open salmon fisheries.

incomes

(Continued from page 1)

fishermen, demonstrates how deceptive gross income averages can be as an indication of the health of the salmon fisheries. Following are the results of the surveys:

- Bristol Bay drift gillnet permit holders grossed an average of \$15,143, had \$10,971 worth of expenses and netted \$4,172 each.

- Cook Inlet drift gillnetters grossed an average of \$17,969, and expenses averaged \$13,618, leaving \$4,351 as net income to the permit holder.

- Prince William Sound drift gillnetters averaged \$21,151 as gross income, had \$9,445 worth of expenses and individual net incomes of \$11,706.

Simon attributed the delay to the need to compile more information on the hand troll fleet and confer with the board at its December meeting.

The board is managing the fishery with the intent of maintaining the historical allocation of catch between the hand troll and power troll fleets," Simon said in a news release. "They've (the board) told us that they want to see us significantly reduce the size of the hand troll fleet so it can be managed in conjunction with the power trollers. We don't believe that's possible if the historical use pattern is to be maintained."

"What we would like to do is keep the hand troll fishery similar to what it has been in the past, meaning a relatively low cost, low income fishery. The message we received from testimony is that the public wants it managed as an entry level fishery."

The only fresher information on net incomes the *Fisherman* was able to locate was estimates by the Bristol Bay Native Association of the 1978 earnings of Bristol Bay drift gill net fishermen.

Noting the difficulty of coming up with "cold, hard facts for the average fisherman," Association Deputy Director Kay Larson said, "it is safe to say that the average crew made between \$10,000 and \$20,000. This of course, had to be split between captain and boat puller(s)."

While available information on fishing incomes seems to dispell contentions that salmon fishermen are getting rich off limited entry, the myth is not likely to be dispelled until current net income data is developed.

SUZIE

Biological risks remain for salmon aquaculturists

Third in a series.

by Karl Ohls

Although a lot of unknowns still exist with the biological aspects of aquaculture, biologists and fisheries managers are confident they know enough to proceed with their goal of enhancing Alaska's salmon resource. But because of the unknowns, they hasten to point out the protection of natural runs is their highest priority.

The state follows a tight set of policies regarding aquaculture and natural runs. The abundant wild salmon are considered one of Alaska's greatest resources and no one talks about replacing them with a race of artificially bred super salmon.

"We have a lot of wild fish left here," said Dr. Roger Grischkowsky, principal pathologist for ADF&G's Division of Fisheries Rehabilitation, Enhancement and Development (FRED). "No one wants Alaska to end up like other states that have no wild stocks."

Biological risks certainly do exist. If sound scientific practices are not followed, potential problems include:

- Wild salmon catching diseases from hatchery fish.
- The intermingling of hatchery and wild salmon that could mix up the gene pools and potentially alter the fish's all-important homing instinct.
- Wild stocks being decimated in the mixed stock fishery. Hatchery-produced salmon can stand up to 95 percent exploitation, but how can a fisherman sort natural salmon from the artificial ones?

Aquaculture biology is divided into genetics and pathology. The two sciences work closely with each other at their best.

The research laboratory was set up in 1974. Its space currently is being expanded.

Grischkowsky said that as far as research into biological problems goes, Alaska is "essentially on par with the lower 48 states. We're not behind. And if they don't watch out, we're going to be ahead."

He said the laboratory does combined research into pathology and genetics problems and finfish and shellfish diseases. An active information exchange program is maintained with federal and academic researchers.

There are 21 diseases that afflict or could potentially afflict Alaska's salmon stocks. The "potentially" means they could easily exist in Alaska's environment, but have not yet been detected.

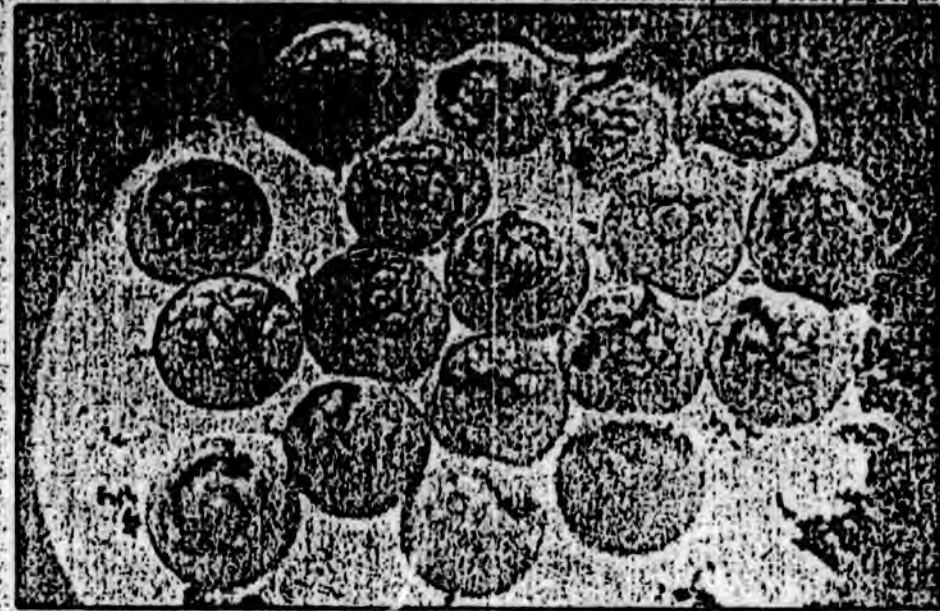
The afflictions include nine different bacterial, three viral, six parasitic and three environmental diseases.

The most common diseases in Alaska appear to be bacterial kidney disease (BKD) and infectious hematopoietic necrosis (IHN) virus.

IHN is particularly prevalent among sockeyes.

An outbreak at FRED's Big Lake hatchery, north of Anchorage, resulted in the destruction of all the sockeye juveniles there last summer. By May, nearly half the 10 million sockeye had died of IHN or related maladies. Following FRED policy, the remainder were destroyed to prevent them from becoming carriers.

The hatchery was in its third year of production. Grischkowsky said the facility has been thoroughly disinfected and con-



Mark Kissel photo/ADF&G

Healthy sockeye eggs sit in a fish culturist tray, the beginnings of salmon clearly visible inside them. Alaska sockeyes, both wild and artificial, have a demonstrated susceptibility to the IHN virus.

sockeyes.

Grischkowsky said the IHN virus has been here during his six field seasons in Alaska and he believes it caused "mortality before that."

Research into the disease has uncovered a useful diagnostic technique that works in less than two weeks and a means of using hormones to speed maturation of adult sockeye, possibly controlling IHN by reducing pre-spawning mortalities. A vaccine also is being tested for potency.

The studies of the virus may be helpful in working with wild stocks, as well. "Preliminary indications are that there's a relationship between the size of returns to the prevalence of IHN virus in parent year stocks," Grischkowsky said. The information may be helpful in predicting the size

can aggravate pathogens already present in the stocks.

Also, the population density of hatchery fish and a shared water supply, makes it easy for a disease to infect a facility once it gets in there. "It's like 30 people in a fallout shelter for three months," Grischkowsky said. There's a "derivative situation" in regard to health.

FRED's solution is to stress preventive measures.

Brood stocks should be certified free of diseases.

The water source should heavily weigh in the decision about where to locate a hatchery. Well water is preferred since it is much purer than water from lakes, creeks and rivers. The water still should be cleaned up before it's run through the in-

quarters at FRED's Anchorage office, where they have broad responsibility for monitoring the state's aquaculture program.

Grischkowsky has been with the section since it started in 1973. He first operated as a one-man consulting service offering advice on hatchery design, fish nutrition, genetics and other problem areas.

cleaner.

IHN pathogens are present in most wild sockeye stocks. The only recorded outbreaks in Alaska, however, have been in hatchery stocks. IHN outbreaks also have occurred in hatchery chinooks in California and in hatchery rainbow trouts in Oregon. The only documented case in wild stocks was with British Columbia

of sockeye runs. Data suggests IHN has a "cyclical nature."

FRED division director Robert Roys said wild stocks are a "reservoir of diseases." But when a disease wipes out a wild stock, no one necessarily knows about it.

There's nothing inherently unhealthy about a hatchery-produced fish. The main problem is that conditions in a hatchery

incubators, either by ultraviolet light, ozone generation or chemical treatment.

Grischkowsky theorizes disease can break out if the fish are put under too much stress. Stress can be caused by overcrowding and too much handling.

Fish are very sensitive to change," he said. Another thing to avoid is an inadequate diet.

Besides dealing with what nature throws its way, the pathology section must cope with man-made problems like pollution.

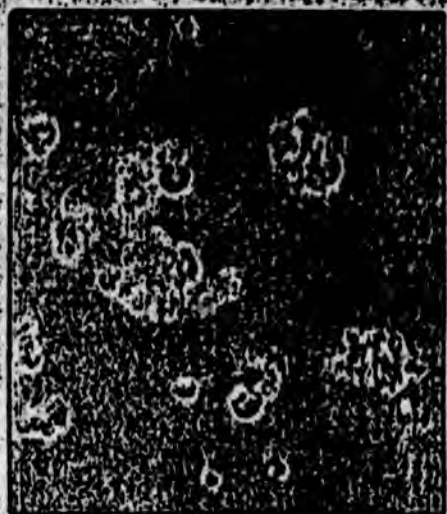
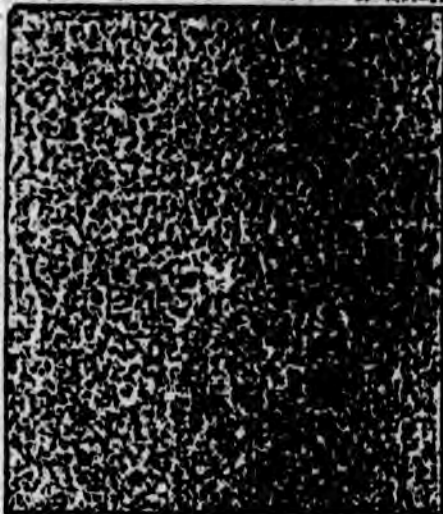
Grischkowsky said pollution exists at the Fort Richardson hatchery in Anchorage. Oil still is present in the ground and leaking into the water supply from a now closed disposal site. He said the pollution and an outbreak of furunculosis—which takes the form of skin blisters—might be related.

"The petroleum residue reduces the fish's ability to cope with the furunculosis agent," he speculates. "Pollution in general reduces the ability of the fish to resist pathogens."

The pathology section is working on vaccines for the various diseases. Salmon are vaccinated by dipping a net full of them in the chemical solution.

Grischkowsky said another project is to research the genetics of disease resistance.

FRED's genetics section develops genetic profiles of stocks through the examination of samples in the laboratory.



Roger Grischkowsky photos/FRED

This sequence, taken through a microscope, shows the progress of the IHN virus. At left is a healthy cell. The second picture shows the cell after the virus has been introduced. The third shows the cell in an advanced state of deterioration.

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The profiles show the stocks' variation in gene pools. A low variation indicates a reduced fitness for survival. Geneticist Bob Davis said it raises problems similar to those of inbreeding in humans.

As the pathology section screens potential hatchery brood stocks for disease, the genetics section looks at them for their genetic content. The section is charged with protecting the gene pool of wild salmon and maintaining the viability of hatchery brood stocks.

From a genetic standpoint, Davis doesn't see many problems with eliminating the natural selection process that wild salmon go through. "A lot of the mortality (in natural stocks) is not due to genetic differences," he said. Much of the credit for survival has to do with "luck" rather than genetic superiority.

Little is known about the salmon's homing instinct. Davis said a genetic component may be involved with the homing instinct, but it may be small. The olfactory sense is believed to play the largest role in homing. "Data suggests second generation stocks" may fare better after movement to another system, he said.

One aquaculture concept that has fallen into disfavor in recent years involves the central incubation facility (CIF). One idea behind the CIF is to take eggs from an area where stocks are abundant, incubate them at a hatchery located elsewhere and release them at various sites where stocks are depleted.

This practice now, however, is strictly regulated.

Davis said, "I don't much like the idea" as it eliminates the natural selection process in the receiving streams.

Grishkowsky said he had problems with "the movement of fish to different water systems."

FRED takes the position that the transfer of fish and eggs to distant watersheds will be strongly discouraged, while the use of native or resident stocks in all enhancement projects will be strongly encouraged. Problems have cropped up in Alaska when alien stocks with their own peculiarities were brought into a watershed where the fish

Harris said the current catch level of chums is so low, SSRAA would have to wait 12 years to get enough stock to meet its goals.

Under the "honest thief" method, "You take some number of fish from a stream, probably more than the stream can really afford to give up, Harris said. "You bring them to a hatchery" where the egg survival rate would be 80 to 90 percent. "In a stream you have 10 to 15 percent survival. Then you return a certain portion of the fry to the stream. You return at least as much as you take."

Harris recognizes the biological risks, but asks how else does one achieve the goal of producing fish for fishermen to catch?

The risks are unacceptable, though, to Paul Novak, the project leader for FRED's Ketchikan office. Novak said wise management dictates you keep something in the stream for future use. If a catastrophe were to hit the hatchery, nothing would be left.

Ketchikan also is the location of some of the most vocal opposition to hatcheries. The seiners have directed most of their protest, though, toward SSRAA activities rather than the creation of artificial salmon.

In a letter to the Alaska Board of Fisheries, Michele Zerbetz, executive director of the Southeast Alaska Seine Boat Owners and Operators, expressed concern over trend developing to give hatchery stocks priority treatment over

natural stocks. "The decisions being made by the state today are going to have far reaching effects on just what kind of fish stock will be fished twenty years from now...natural or unnatural runs," she wrote.

Zerbetz said the seiners are concerned about unnatural runs because they don't want to be forced into terminal fisheries.

Fishermen find they have a better product if they can catch fish in the outside waters. "By the time the fish gets that far inside (for a terminal harvest), it's pretty far gone," she said.

Alaska fisherman, January 1980, page nine. In conclusion, one might note that a lot is left to be discovered in the fields of salmon pathology and salmon genetics.

Bob Davis said that if pathology is in its infancy, than "genetics is in the gestation stage."

Roger Grishkowsky notes, "fish pathology is a very young science...not a definitive science, not an exact science."

He added, "It's hard to come to any cut and dry conclusions as far as hatchery and natural stocks go."

Next month: A look at the economics of aquaculture.

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Because of this, the public and private hatcheries follow a policy of not importing stocks from outside Alaska.

FRED has a review procedure set up for people in the hatchery business to make sure they're following good aquaculture practices. FRED certification, however, is not mandatory, Grischkowsky said. "But people involved in hatcheries, both public and private, have for the most part realized that if they work with the fisheries pathology section they get better results."

As Robert Roys said, "No Goddamn eggs move in this state without review by the pathologist and geneticist."

FRED has written proposed legislation, now in the governor's office, that would make its disease control procedures mandatory for all public and private hatcheries.

The other concept behind a CIF—that eggs are taken from a site, incubated, and put back at the site—meets with more acceptance.

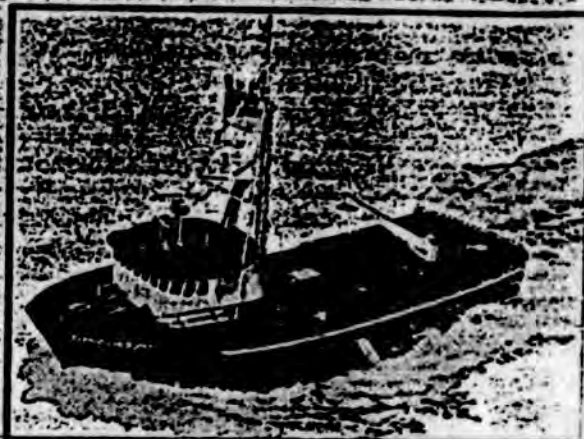
Grischkowsky, though, is concerned about the actual movement of the fish. "There's an inherent risk in moving fish," he said. "We're aware of only a portion of the potential problems." He worries the movement of extreme densities could cause stress in the population and possibly trigger the pathogens.

Working around problems like this is one of the things the Southern Southeast Regional Aquaculture Association (SSRAA) has to contend with in discussions with FRED about how it can use its CIF at Whitman Lake near Ketchikan. Many of the problems should be solved by regional planning process, where FRED personnel and people from the regional associations draw up a regional salmon plan.

SSRAA, for instance, would like to release some cohos at Whitman Lake so it can have brood stock return directly to the hatchery, according to field operations manager Rick Harris. The cohos, however, would pass through the mixed stock fishery and there would be no way to manage the returns to prevent the wild stocks from being overexploited. Fish and Game prefers releases in terminal areas.

Another plan SSRAA is exploring is the "honest thief" method of procuring brood stock. SSRAA raises chums at its CIF.

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Too early to judge economics of hatcheries

Editor's note: The final article in our four-part series on aquaculture looks at the economics of salmon hatcheries. In previous articles, we explored the state-run aquaculture program, private, non-profit hatchery associations, and the biological risks of artificially bred salmon.

by Karl Ohls

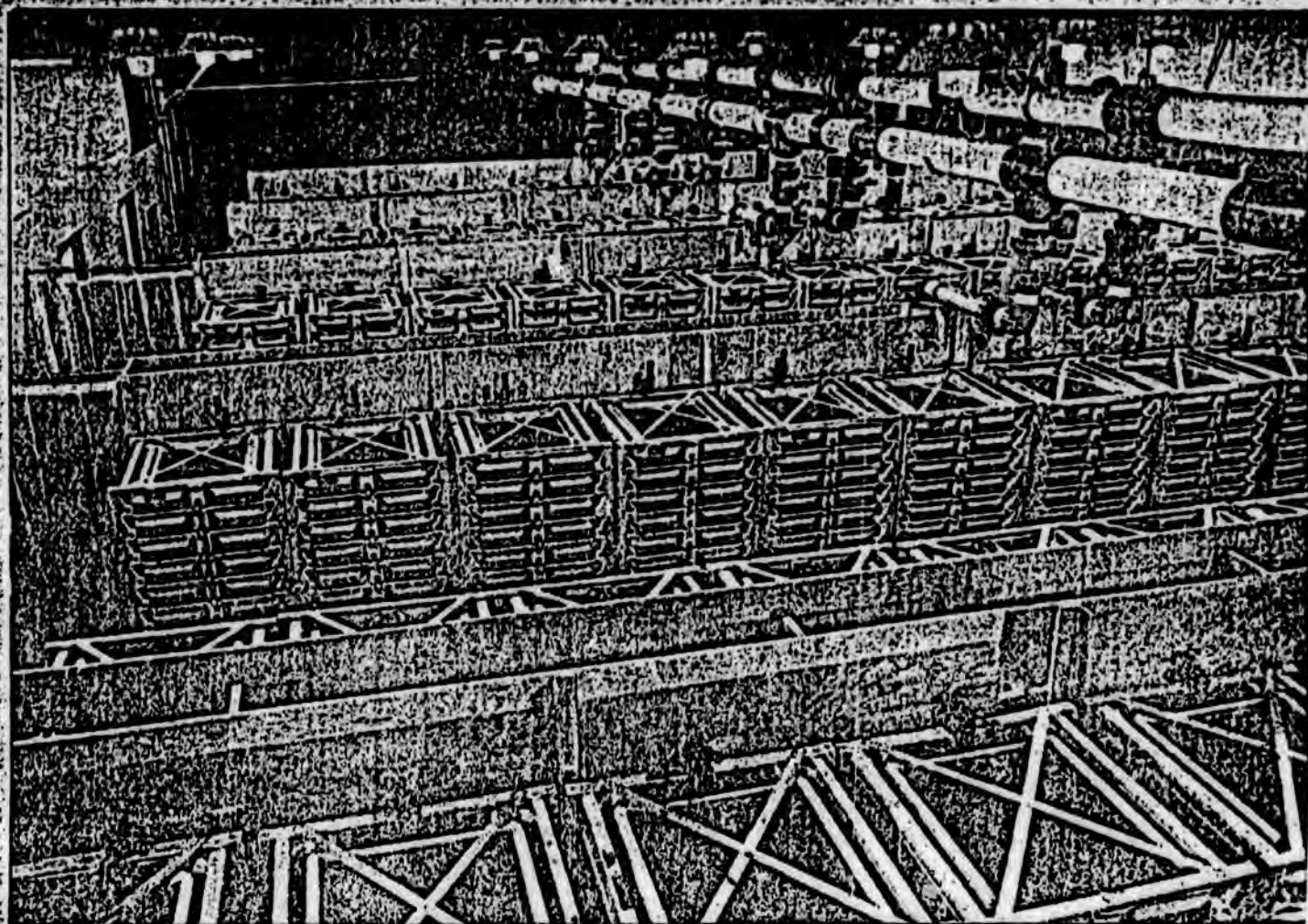
On paper it looks good.

The plan calls for network of public and private hatcheries across the state to produce enough fish to level out the downs in the cycle of natural salmon runs. Once the wildly fluctuating supplies of Alaska salmon to the world marketplace evened out, a lot of the perennial problems plaguing one of Alaska's most important industries will be solved.

Since the State of Alaska started working toward that goal in 1971, there have been pretty encouraging results. About 400,000 adult pink salmon returned in 1979 from releases by the state-run hatchery at Tutka Lagoon, and up to one-fourth of the 1980 commercial pink harvest in Cook Inlet is expected to be from Tutka stocks. After only five years of operation, the Prince William Sound Aquaculture Association hatchery at San Juan is in the black and expecting more than a half million pinks to return in 1980.

But there also have been many problems with Alaska's fledgling hatchery programs. For the most part, the private nonprofit aquaculture associations have been stalled in the initial stages by legal challenges to their primary source of funding. Despite an investment of some \$70 million in hatcheries, the state program still is waiting for the big returns to materialize.

Many questions need to be answered about public and private hatcheries. The



Karl Ohls photo/Alaska Fisherman
Stacks of incubation trays in Southern Southeast Regional Aquaculture Association's 26 million egg capacity hatchery. The central incubation facility has encountered many problems in obtaining brood stocks, and the project is lagging behind schedule. SSRAA director Ron Wendt says the association could use an extension in its state loan repayment schedule.

aquaculture managers have been basing all their calculations on assumptions. These guesses are no basis for credible long-range financial planning, according to Armin Koernig, president of the Prince William Sound Aquaculture Corporation.

Even when the data does finally come in, the question of cost effectiveness has to be addressed from a philosophical viewpoint. Making a contribution to the common property fishery is one way to judge economic returns, but having to sell enough fish to cover hatchery expenses is quite a different measure of cost-benefit.

In general, when aquaculture supporters are asked if the state can afford to have a large-scale hatchery system, they reply the state can't afford not to.

"I think it's important, for people to understand this, to go back to the early Seventies when all the species were at rock bottom. And they still are in a lot of areas," said Bob Roys, Director of the ADF&G Division of Fisheries Rehabilitation, Enhancement and Development (FRED).

overexploitation — had made state involvement in fisheries rehabilitation a major priority of every politician from the governor on down.

Now, however, the health of the natural runs—up to an 87 million harvest in 1979—has made many lawmakers question the wisdom of a large state investment in aquaculture.

Roys notes that by the time FRED was at a point to be able to counteract the low runs, the problem had passed. "To plan ahead for the bad years, we would have had to initiate action in the 1960's." But he adds, "The bad years will come again."

Roys wants to be ready for them with a solid, fish-producing system.

FRED has a capital investment of \$69,775,000 in facilities that, when they reach full capacity, should produce 9.5 million adult fish annually.

Roys said that will be a significant impact on the fishery. "Say we had nine and a half million adults in 1971. You don't think 9.5 million in a 20 million catch statewide wouldn't be significant impact?"

an annual harvest of 115 million. Researchers calculated that was the number of fish needed to level out the bottoms, based on what the estuarine environment could handle.

Looking at the long-range goal, Roys said, "If we're going to capture a major portion of the world's salmon market, we're not going to do it with wildly fluctuating natural stocks." He points to the Japanese success with chum hatcheries in Hokkaido. "They blew the market all to hell."

Roys said huge artificial runs in Alaska will not overpower the natural runs if the hatchery sites are carefully selected. He notes, "They didn't do it that way in Washington and Oregon."

Roys hopes to have all his facilities up to full production within 10 years.

On paper, every hatchery now operating in the state or in the planning stages works out to be cost-effective. The value of the projected fish production equals or exceeds the construction and operational costs.

This equation, however, doesn't take into consideration very significant external

Brood stock procurement is a continuing statewide problem since egg takes are managed on the basis of first assuring enough escapement to protect a stream's natural production. The egg takes are regulated by the state Board of Fisheries, which has had to weigh approval a couple times between the needs of a hatchery and the interests of fishermen that want to harvest those extra salmon.

The hatchery program's cost-effectiveness can be figured either on what economists call "micro" or "macro" scales.

A micro scale includes whether a hatchery can pay for itself and its direct dollar contribution to a fishery. Other factors can be figured in such as the overall value of a hatchery to a community both in terms of the extra money generated by the additional fish and the wages of the hatchery personnel.

The macro scale looks at the collective economic value to the state of all hatchery projects. A consultant's report to the legislature's Aquaculture Study Policy Group, however, said, "Based upon the current lack of reasonably accurate macro-

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economic information, the State of Alaska is not in a position to evaluate its investment opportunity in the fisheries. Moreover, the current lack of this information effectively precludes the state from explicitly formulating an economically sound fisheries development policy.

FRED uses a simplified micro scale to evaluate its hatcheries. The total development cost plus the anticipated annual operational costs are measured against the prices the fishermen will get for the fish over an arbitrary 20 year period.

Bob Lium, a hatchery developer in FRED's Juneau headquarters, said that with this method one can determine a reasonable benefit and get consistent results. "After trying several different techniques, I decided this was the most logical one and it was very easy to get my hands on the figures."

Benefits also can be calculated from how many tax dollars went into the general fund from the catch of hatchery-produced fish, the gross income to fish wholesalers and hatchery-related income to fishing communities. The consultant's report to the Aquaculture Policy Study Group recommends the first level wholesale price for processed salmon be used to determine benefits as represents the best average of all the different figures.

Lium said the cost-benefit analysis is a good tool for comparing hatcheries, but there are so many different ways of determining benefits and arriving at costs that you can't say it's the best way of determining absolute value.

He said anyone trying to sell a project on the basis of its cost-benefit ratio would be "better off trying to sell it on its merits."

Roy said the cost-benefit analysis "does weigh in quite a bit" in deciding whether to build a hatchery. FRED makes sure that it will get at least a slightly better return on every dollar it spends on a facility. "If it comes in below one, we get very edgy."

Based on FRED's still limited experience, Lium said chums and cohos appear to be the best species to raise. Chums are easy and have a good value. Cohos are

more expensive to take care of, but have a very good rate of return.

Sockeyes also make good economic sense, Lium said. "If we could overcome the difficulties raising them, they'd be a great fish. But because of the difficulties, we're just trying to cool it." Sockeyes are extremely susceptible to the fatal infectious hematopoietic necrosis (IHN) virus.

So far, the only hatcheries that have become or are close to becoming financial successes are those that raise pinks. Pinks are a two year fish and the returns come back fast. Other species still are in the build up phase.

In 1979, the Tutka Lagoon hatchery got back 369,000 pinks. The Kitoi Bay hatchery on Afognak Island logged returns of 235,000 pinks.

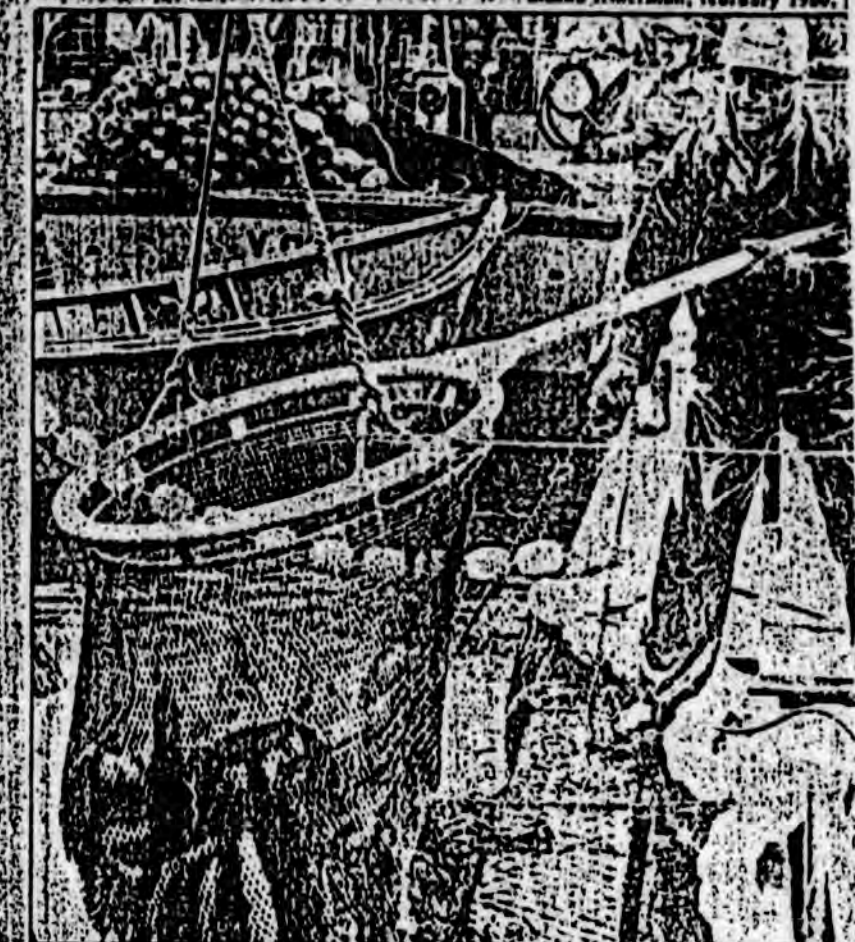
Pinks also are cornerstone of the Prince William Sound Aquaculture Corporation (PWSAC). Approximately 550,000 were accounted for in 1979. Around half of them were caught by purse seiners, adding at least \$350,000 to the fishermen's gross incomes. PWSAC harvested another 215,000 itself to help offset the costs of the hatchery.

For the first time in its five year existence, PWSAC balanced its revenues and expenditures. More than one million dollars was received both in income from fish sales and assessments from fishermen and processors.

The 1980 return is projected at 557,000 salmon. This return should be particularly significant since the wild stock forecast is not good—five million as compared to 1979's 18.4 million. If PWSAC's pinks come in at the expected 10 percent of the total run, Alaska will see a demonstration of a hatchery contributing a significant amount to stabilizing a fishery's low cycle.

Prince William Sound is used as an example of one of the regions in Alaska that can't afford not to have an aquaculture program. Wallace Noerenberg, a co-founder and now a consultant to PWSAC, wrote in a paper delivered to a 1976 aquaculture conference that "all the good management in the world" would never stabilize the Sound's stocks.

"We were quite encouraged through the 1960's in the rising trend of produc-



Alaska Department of Fish and Game photo. A commercial fisherman hauls pinks from his seine during an emergency commercial opening at Tutka Lagoon last summer. So many pinks returned to FRED's at Tutka Lagoon hatchery that commercial fishermen had to be called in to take care of the surplus. In Alaska's still limited experience with hatcheries, the greatest economic success has been recorded with pinks because big returns result within a short amount of time.

tion; but it is now clear that environmental factors, specifically adverse winter conditions in the streams which devastate eggs and alevins in the stream gravel, at times of certain weather sequences will continue to cancel much of this improved management," he said. "This occurred in the early 1970's and led to very depressed conditions after a lot of hopeful periods in the 1960's. I think the crashing of these stocks in the 1970's has had more to do

with the formation of our corporation than anything else."

Other regional aquaculture corporations have not been as prosperous and as successful as PWSAC.

The Inarpi Regional Aquaculture Corporation in Bristol Bay was formed in 1976. The Cook Inlet Aquaculture Association is in a holding pattern because

aquaculture

(Continued from page 9)

legal confusion over funding, but has a few small projects underway. Executive Director Floyd Heimbuch said hatcheries can be economical "as long as you don't put eggs ahead of biology."

The two Southeast corporations, Northern Southeast Regional Aquaculture Association (NSRAA) and Southern Southeast Regional Aquaculture Association (SSRAA), have had the most problems. Personality clashes, long-time ear conflicts and the physical and social separation of the region's communities have combined to hamper operations. The two were especially hard-hit by a Superior Court decision throwing out their main source of funding — a mandatory assessment on the catches of all fishermen in a region.

NSRAA was barely off the ground when got hit with the lawsuit.

SSRAA already was well-established, its activities to date have generated a lot of controversy.

A debate still is raging among fishermen and fisheries managers over RAA's wisdom in building a \$2.8 million central incubation facility (CIF) just outside of Ketchikan. Problems include a severe shortage of brood stock and restrictions imposed by FRED on what SSRAA can do with it.

FRED tends to look with suspicion on the CIF concept — which involves taking eggs from a stream, incubating them at a hatchery and taking them back to a stream, though not necessarily the one they came from — because of biological problems associated with introducing fish in stocks in a watershed and physical movement of the fish.

SSRAA's Whiteman Lake facility has a 26 million egg capacity, but now holds 4.3 million summer chums, 1.3 million fall runs and 500,000 cohos. Executive Director Ron Wendte said SSRAA's board of directors probably "recognized that it was not easy to develop brood stock, but could SSRAA feel the regulations and application to brood stock develop-

Some state officials contend state hatcheries should pay their own operating costs. The idea is to relieve Alaska's taxpayers of the burden of supporting a program that primarily benefits one group — the commercial fishermen.

The concept has wide support among lawmakers.

FRED is formulating some options. An alternative to having every state hatchery raise money through its own terminal harvest is to designate one hatchery in a region — or even the state — as the revenue producer for all the others.

"This would make up for the places where you can't alter the fishery to make it pay for itself," said Stan Moberly, FRED's Southeast regional supervisor.

The value of the nine million adult salmon FRED eventually hopes to add to statewide runs would amount to an estimated \$52.4 million a year. This year's 87 million catch was valued at approximately \$350 million.

Bob Roys said the state just now is starting to get returns. He expects FRED's costs to level off while the "returns keep increasing until we get 9.5 million fish."

For getting those runs, Roys puts his faith in hatcheries rather than lower cost rehabilitation projects like stream clearance and portable incubation boxes. He said they are the "most reliable over time" in meeting fish production objectives.

Hatcheries also are good for overcoming bad environmental conditions, he added. "One of the major working hypothesis that we're working under is that the biggest mortality occurs within 60 days after the fish leaves the freshwater environment."

Alaska fisherman, February 1980, page thirty-one
We can time the release so it coincides with better conditions and we can release them at a larger size."

Roys doubts Alaska can base its escalating subsistence, sport and commercial needs of salmon on natural runs.



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their application to brood stock development have been overly restrictive, both for our facility and the FRED facilities."

Wendte said the board was aware of a CIF's difficulties but went ahead because of its flexibility. "We'll be able to enhance various fisheries in a wide range of areas," he said.

Many Ketchikan fishermen accuse SSRAA of turning itself into a bureaucracy and building a useless concrete monument. Wendte said that when the board decided on a facility, they wanted it to have a "significant and positive impact on the fishery," and that involved a minimum feasible size. "They initially looked at a much larger facility" with a 40 to 50 million egg capacity, but because of cost, scaled it down to 25 to 30 million.

Much of the bad feeling about SSRAA stems from reports it wasted a lot of money in its early years of operation. Seiners, as a whole, were particularly critical. Michele Zerbetz, executive director of the Southeast Alaska Seine Boat Owners and Operators, said that was because of personalities, conflicts over brood stock and the rumors of overspending.

Now, however, "we don't have that worry," she said. "All the money's been spent. SSRAA is operating on a shoestring."

Wendte notes that SSRAA might have trouble paying for the Whitman Lake CIF. It was financed by a 25-year note from the state Department of Commerce and Economic Development. SSRAA won't have to start paying it off until 1985.

"The theory being that in a six-year period we will be able to develop sufficient returns to cover the cost of retiring the debt service and to cover the operating costs," he said. However, the six-year period is "based on the assumption that in the first year we'll have a full hatchery operation. Evidently, that's not possible. That's why we're considering changing it to a more realistic 10 years."

The change is being readied for introduction in the legislature.

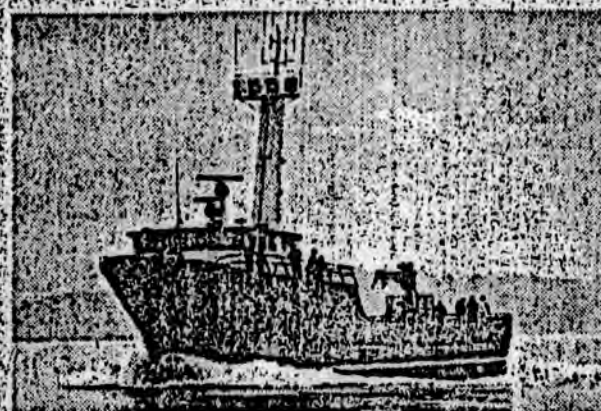
Bob Lium recommends the private non-profit hatcheries stay away from the cost-benefit analysis and work on a profit-loss basis. That way they'll know on a

Doubts in the Pacific Fishing Fleet Today."

— Capt. Mark O'Brien



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ALASKA'S SALMON HATCHERIES

1891- 1959



By
Patricia Roppel

"When all is said and done, and all criticisms on early hatchery procedures and techniques are made, it is true part of these were well founded, but in the main, we made those mistakes due to lack of experience. We were groping in the dark and it simply took time. They didn't send a man to the moon without tremendous research. In the same vein, given the knowledge we have now, scientific and practical, salmon hatcheries, particularly in Alaska where the natural environment hasn't been tampered with, should be highly successful."

Alphonse Kemmerich

Alaska Historical Commission Studies in History No. 20.

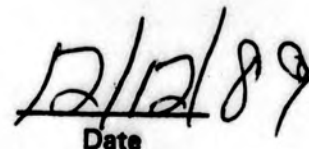


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HOUSE SPECIAL COMMITTEE ON FISHERIES

Final Interim Report

January 15, 1984

The following report is a weekly breakdown of Fisheries Committee activities from November 16, 1983 to January 6, 1984. When combined with the other interim reports, from September 15, 1983 and November 15, 1983, a complete accounting of interim Committee activities is presented.

Weekly Activity Report

November 16, 1983 - January 6, 1984

- Nov. 16 - 18 The Fisheries Committee's Hatchery Facility tour through Prince William Sound and Southeast Alaska took place during this week. Stops were made in Cordova, Hidden Falls, Petersburg, Klawock, Ketchikan, and Juneau. A full report of this tour can be found in attachment 1.
- Nov. 21 -23 Staff responded to a constituent request out of Representative Cowdery's office about a fisheries problem in Bristol Bay. The constituents name is Robert Butt(344-3132) and he is concerned about the recent use of airplanes in Bristol Bay for fish spotting. This past summer some gill netters in the Bay began using spotter planes for the first time. This has raised a lot of controversy, especially from the established fishermen. They feel that these spotter planes are being used to spot fish in boats or nets, not in the waters. In other words the planes enable fishermen with little or no experience to take advantage of fishermen with many years of experience. Staff told Robert about the Alaska Independent Fishermen's Marketing Association(AIFMA) proposal to stop this use of spotter planes. Although this proposal did not make it on the the Board of Fisheries agenda for February 1984, AIFMA is still pursuing the issue. Because of this staff gave him Mitch Kink's(general manager of AIFMA) phone number so he could work with them in their efforts. Robert was also put in touch with Dan O'hara of the Naknek/Kvichak fisheries advisory committee. Staff put together and submitted Representative Herrmann's expenses from the just completed hatchery facilities tour. Staff prepared a schedule for Rep. Herrmann covering fisheries activities for late Nov. and Dec. 1983. Arrangements were made for George Jacko for housing and training in Juneau for the upcoming session. George will be a new staff person for the Committee. Staff talked with Brian Everett, a representative of the Alaska Small Boat Fishermen's Cooperative out of Whittier and Seward.

Fisheries Committee
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Brian was concerned with the poor amount of research on Prince William Sound Spot Shrimp and the confiscation of some shrimp pots belonging to a vessel in his organization. After checking with the Alaska Department of Fish and Game office in Anchorage it was found that the pots would most probably be returned without any prosecution from the Dept. of Fish and Game. The fishing vessel had been severely damaged (all cabin windows busted out and all electrical equipment ruined) by a large wave in the Gulf and was unable to pick-up its pots in time for the shrimp closure. A Fish and Game vessel picked up the gear and took it into Cordova. A meeting was set up with Brian and the local biologist in charge of the Cordova office. The meeting was to discuss the status of spot shrimp research and the possibility of the fishermen's cooperative receiving Dept. support and assistance for a proposal to begin some baseline research on spot shrimp in Prince William Sound. Staff produced letters to; Chuck Bundrant on joint ventures in state waters and Commissioner Dick Lyon on limited entry permit valuations for loans and the increasing costs of vessels in relation to state limits on loan amounts. Chuck Bundrant, owner of Trident Seafoods, was concerned that the state was not taking a supportive position towards domestic processors when it was making decisions on whether or not foreign processors could come into state waters and buy fish from domestic fishermen. Through efforts of the Committee and interested parties the administration has begun to analyze the impacts of their joint venture decisions on domestic processors. This information was stressed in the letter. The concerns raised to the Commissioner were a result of the Committee's hearings during the two trips this interim. Several fishermen expressed concern that the present permit appraisal method lagged to far behind the market and the limit on loan amount determined from it was unduely low. Also, the \$100,000 limit on vessel loans was set when vessels were much less expensive; now with 32 foot boats costing upwards of \$160,000 perhaps adjustments need to be made.

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Nov. 28 - Staff toured the Fort Richardson Hatchery
Dec. 2 (Anchorage) with the FRED Division and other Anchorage legislative staff. The Division's presentation concentrated on the sport fish needs of the Anchorage area and how the Department was attempting to meet the needs. Programs in rainbow trout, steelhead, chinook, and coho are primarily carried out at the facility. Reconstruction was just being completed at the hatchery and most of the brood stock and production was not yet in place. Staff met with Norm Statem, a local member of the Alaska Fishermen's Independent Fishermen's Marketing Association, about the Gov.'s fisheries task force summary report and the HB 381 preliminary report. Both of these reports had been produced by the Office of Commercial Fisheries Development within the Dept. of Commerce and Economic Development and comments on them were due. Staff also met with Brian Everett to go over his research proposal and attempt to improve it before the appointment with Fish and Game. Went to the BBCMP presentation to the Alaska Land Use Council Advisory Committee. This meeting covered the changes in the plan since the draft was put out. The major changes are: reducing the number of streams closed to placer mining from 225 to 66, closing the 3 mile coastal area off the North side of the Peninsula to leasing for 10 years, opening the Caribou calving area on the Peninsula to leasing, and changing the land disposal program so that a majority of the 14000 acres in the program is around Dillingham. This revised plan has the support of the Dept. of Natural Resources, the Dept. Fish & Game, the Aleutians East Coastal Resources Service Area Board, and BBCRSA; but there is still some token opposition from oil representatives about the 10 year closure on the north side of the Peninsula and Jim Repine (sport fish representative) is mad about the reduction in the number of streams closed to mining. Staff met with Chuck Meachem of Fish and Game and Brian Everett about research on the PWS spot shrimp. The Dept. agrees that more research needs to be done and they will support Brian's efforts to obtain funding for his proposal after he sits down with their Cordova shellfish biologist to design the study.

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They are going to bring Al Kimker in from Cordova in mid-December to work on it. Staff went to the Fishery Industrial Technology Center two day meeting. Main topics covered at the meeting were ongoing research programs and the proposed budget for the upcoming session. Staff went to the Alaska Fisheries Development Foundation board meeting. They selected a processor for their pollock demonstration project and covered the status of the Trident project in Akutan. It appears that the Trident plant will be operating some time in 1984.

Dec. 5 - 9

Staff discussed the possibilities of fish legislation for the upcoming session with Karl Ohls of the Fishermen's Journal for an upcoming article. A letter was written to George Kudrin concerning Atka's fishery development plans. Discussions with the Office of Commercial Fisheries Development were promised. Atka is attempting to build a commercial fishing industry so that the community will have some sort of long-term economic basis and they are looking for some funding to get off the ground. Staff wrote a letter to Gov. Sheffield concerning the Bristol Bay Cooperative Management Plan. Support was expressed for the revised draft. A vote was taken at the Alaska Land Use Council in support of the plan, even though the vote was not expected to take place until the spring of 1984. Staff checked on the cost of a loan book that Specialized Professional Services of Auke Bay produces(it is \$135/year). The loan book covers all the state's loan programs and updates sections that change each year. Staff set up fishermen's a meeting in Sand Point for Rep. Herrmann and Sen. Mulcahy for Dec. 13th. This meeting was to make up for the cancellation of an meeting scheduled during the September Committee trip to the area. Staff produced Nov. 15th Fish Committee report for Representative Barnes' office. Staff attended the North Pacific Fishery Management Council meeting which covered Bering sea(high seas) herring research, tanner crab exclusive registration areas, black cod fishing restrictions, and the halibut moratorium. For an update on halibut moratorium activities of the Fishery Management Council see attachment 2. Staff also attended the Dept. of Revenue workshop on processor permitting and requirements of the state and federal government.

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- Dec. 12 - 16 Staff drafted a briefing memo covering the main fisheries concerns of the Sand Point area fishermen for Rep. Herrmann. Staff wrote a letter to Mitch Kink of AIFMA concerning a petition set netters are circulating in Bristol Bay. This petition would increase fishing time for set netters to make up for their lower than usual catches in recent years. Staff drafted a letter to Josephine Fagan in answer to her concerns about the Pribilof Crab opening this fall. As a crab fishermen she, and many others, were seriously impacted by a regulation to remove pots in a very limited time period. Staff wrote a letter to Greg Baker and Com. Collinsworth concerning Josephine's problems. Staff also wrote to Paul Hansen of King Salmon about the allocation of herring between gill netters and purse seiners in the Togiak fishery. Paul was concerned that the Board of Fisheries should do something about this at their February meeting and the letter confirmed that the Board had indeed decided that the issue would be on their schedule. For more information on the revised Board of Fisheries February meeting schedule see attachment 3. Staff requested a legal opinion on HB419 which concerns residency and access to shore fisheries leases. Staff met with Rep. Jack McBride while he was in Anchorage for a railroad meeting to discuss fisheries legislation and priorities. Staff talked with Brian Everett about PWS shrimp and how his meeting with Fish and Game went. It seems that the Dept. gave him a signed letter of support for his project. Staff ordered minutes of Fish Board hearings held in Sand Point and Dillingham. Staff also ordered copies of any set netters petitions from Bristol Bay over the last few seasons from the King Salmon Fish & Game office.
- Dec. 19 - 23 Staff contacted Jim Allen of DEC about setting up a meeting to cover the problems raised by fishermen of Bristol Bay with regards to fish waste dumping by processors. Discussions centered on setting up a meeting in Juneau in late January and on who should be invited. At the meeting an attempt will be made to clarify who has which responsibilities for enforcement and to reach a cooperative agreement that will lead to a solution.

Fisheries Committee
Final Interim Report
January 15, 1984
Page Seven

Staff contacted Janielle King of LAA about an extension for Nels Anderson's fisheries committee contract due to a prolonged illness. See attachment 4 for a copy of the original contract with the contract amendment and attachment 5 for a report on Nels' activities. Staff discussed the possibilities of financing small boat building operations with Ivan Ivanoff of Anchorage. He has built a 46 foot fiberglass boat mold and has run out of money to produce vessels from the mold. A meeting was set up with Rep. Szymansky for him. Staff attended a meeting of Anchorage fisheries people put together by Stan Hajenga of the Office of Commercial Fisheries Development. Groups at the meeting discussed their projects and coordination was discussed between the groups. Staff discussed with Dr. Brian Allee of PWSAC the percentage return determination for their hatcheries and their methods of determining it. This percentage is very critical when used for determining whether or not a private non-profit hatchery facility will be able to meet its operation and capital state loan obligations. Staff discussed with AFDF their pollock program now that they had agreed on a processor for the production of surimi. Staff read OMB's fish loan program audit.

Dec. 26 - 30 Staff packed up the Anchorage office. Boxes were shipped air-freight to Juneau. Staff answered resumes for fisheries committee positions with a generic merged response letter. Staff read the fisheries task force summary report prepared by OCFD. Staff wrote a letter to Greg Baker of OCFD about the task force report which was generally supportive of the administrations new activity in the fishing industry. Staff drafted a letter to Paul Arnoldt about obtaining information on fish loans made in the Bristol Bay area. This information will be used to in a upcoming report to analyze the loan programs impact in the Bristol Bay area.

Jan. 2 - 6 Staff traveled to Juneau, unpacked office supplies and files from Anchorage. All petty cash accounts and submitted TR books were closed and turned in. Staff sent out more resume responses. Organized committee interim files. Staff wrote a letter to Brian Paust of the Marine Advisory Program thanking him for the information he sent as a result of the S.E. hatchery facilities trip.

ATTACHMENT 1



Alaska State Legislature
House of Representatives

Special Committee on Fisheries

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

CHAIRMAN
ADELHEID HERRMANN
VICE-CHAIRMAN
JACK FULLER
MEMBERS
CHARLIE BUSSELL
BEN GRUSENDORF
PETER GOLL
JACK MCBRIDE
FRED ZHAROFF

MEMORANDUM

TO: House Special Committee on Fisheries
FROM: Mel *Wendte*, 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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Special Committee on Fisheries
January 14, 1984

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).

MEMORANDUM - PAGE THREE
Special Committee on Fisheries
January 14, 1984

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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Special Committee on Fisheries
January 14, 1984

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 similar 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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Special Committee on Fisheries
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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
------	---	------------

Chum	-	8,989,394
------	---	-----------

b. Eyed egg-fry production

Pink	-	85,447,639
------	---	------------

Chum	-	8,539,924
------	---	-----------

3. Final capacity

a. Green-eyed egg capacity - 660 NOPAD incubators

Pink	-	282,000,000
------	---	-------------

Chum	-	26,666,667
------	---	------------

b. Eyed egg-fry capacity

Pink	-	169,200,000
------	---	-------------

Chum	-	24,000,000
------	---	------------

c. Fry rearing capacity

Chum	-	24,000,000
------	---	------------

B. Saltwater Capacity

1. Present capacity

a. Fry-fingerling capacity

Pink	-	110,000,000
------	---	-------------

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

a. Fry-fingerling capacity

Pink	-	83,738,686
------	---	------------

Chum	-	8,369,126
------	---	-----------

3. Final capacity

a. Fry-fingerling capacity

Pink	-	165,816,000
------	---	-------------

Chum	-	23,520,000
------	---	------------

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:	\$ 641,826
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 brailed 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 dormitory locations, 58 beds

- a. within hatchery complex: 7 rooms with 13 beds
- b. small bunkhouse with 10 beds
- c. dormitory 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 Salmon

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./1 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 7,600,000 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.

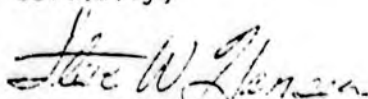
We would all like to thank you for the support you've shown us in this past year. I can honestly say that it has been a great motivational factor for the crew here at the hatchery. We all feel we are here to serve, "especially" the needs of West Coast citizens and resources. Your support has reinforced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

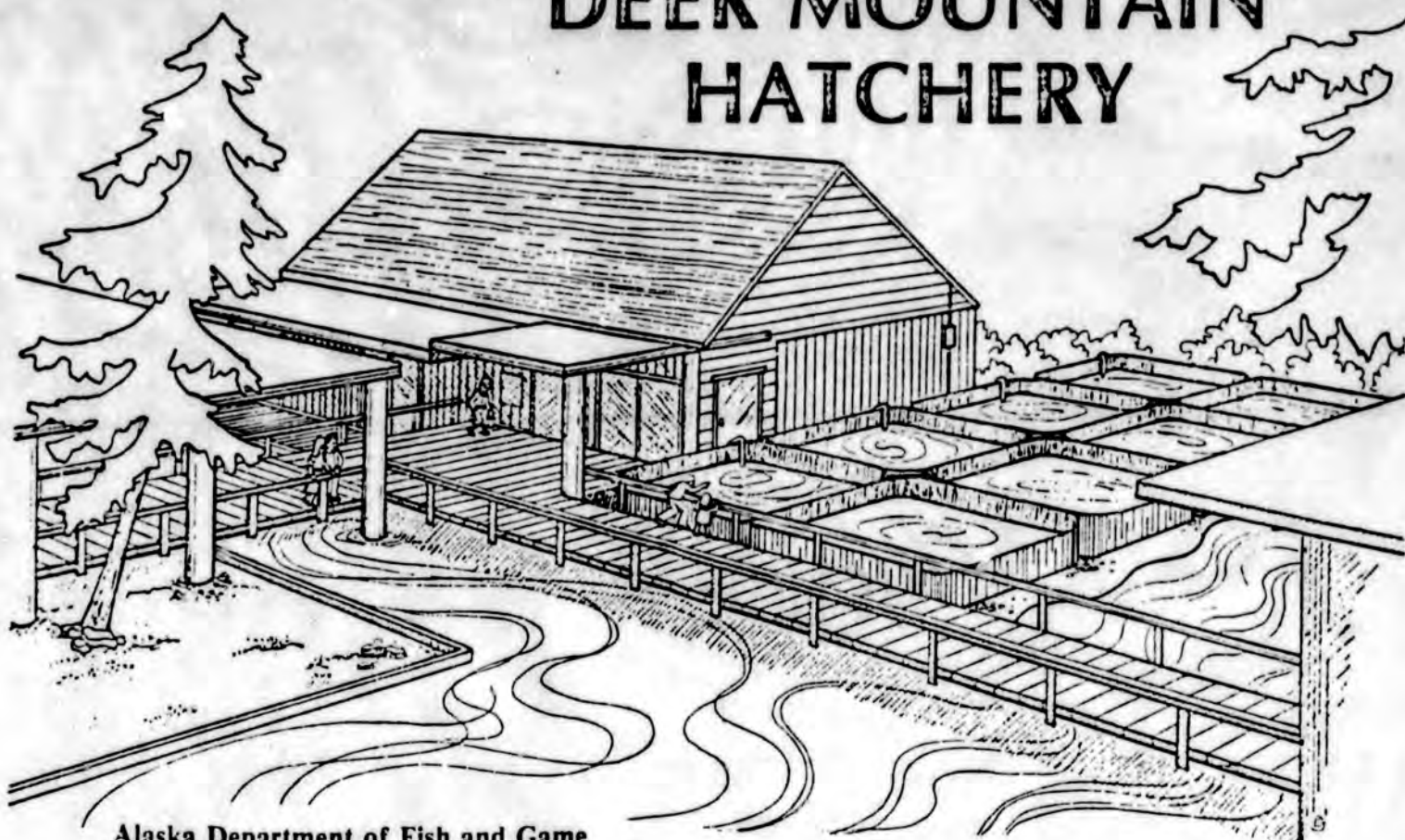
Again, thank you for the support!

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.

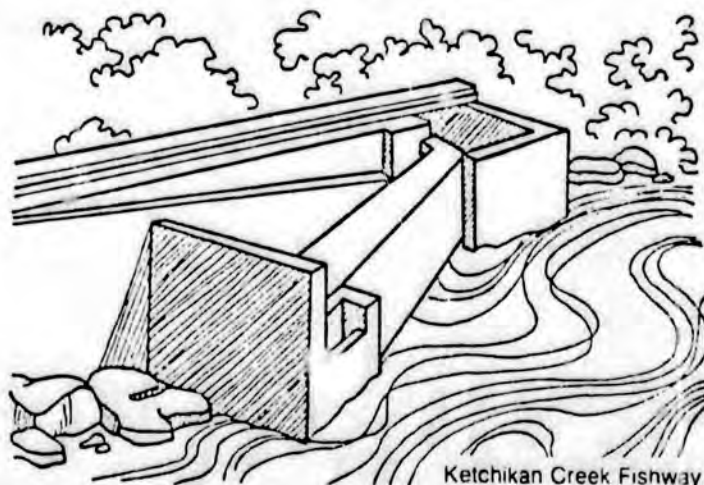
Rainfall in Ketchikan averages 154 inches annually, and that's fine with the hatchery workers. Operation of the hatchery requires approximately 2.8 million gallons of water daily all year round. This is about 32 gallons per second, or 1 billion 22 million gallons a year! The hatchery's water comes from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

ATTACHMENT 2



Alaska State Legislature
House of Representatives

Special Committee on Fisheries

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

CHAIRMAN
ADELHEID HERNMANN
VICE-CHAIRMAN
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CHARLIE BUSSELL
BEN GRUENDORF
PETER GOLL
JACK MCBRIDE
FRED ZHAROFF

MEMORANDUM

TO: House Special Committee on Fisheries
FROM: Mel *Mensen* Professional Assistant
SUBJECT: Update on North Pacific Fishery Management
Council Halibut Actions
DATE: January 10, 1984

In my October 17th report on the status of the Council's actions towards a moratorium in the halibut fisheries I promised to get you an update at the beginning of the session on the latest action. Fortunately, the Council has made this a short, simple report.

At their December 7-9th meeting the Council voted 8 to 2 to discontinue efforts to impose a moratorium on the Alaska halibut fishery. They also stated they would be looking at other management alternatives for the fishery in cooperation with the International Pacific Halibut Commission.

The Council also listed their objectives for halibut management:

1. Insure survival of the North Pacific halibut resource.
2. Distribute the halibut fishery in time and place to insure the harvest of the available surplus of all components of the halibut population over all areas of the North Pacific Ocean including the Bering Sea.
3. Continue to limit the harvesting of halibut to hook and line as the best means of utilizing and maintaining the resource at its highest sustained level of abundance.
4. Retain the International Pacific Halibut Commission as the primary management authority over the coast-wide range of the halibut population.

Final Halibut Memo
January 10, 1984
Page Two

5. Provide high quality fresh, frozen or preserved halibut to the consumer throughout the year.
6. Strive to reduce incidental halibut mortality by gear that is not legal for a directed halibut fishery.

The report on halibut limited entry done by Northwest Resources Analysis for the Council is available from the Council or you can borrow my copy here in Juneau. The report is titled, Limited Entry in the Pacific Halibut Fishery: The Individual Quota Option (Council Document 20), and is 168 pages long. The Council's mailing address is P.O. Box 103136, Anchorage, Alaska 99510, and their phone number is 274-4563.

ATTACHMENT 3

MEMORANDUM:

TO: Representative Adelheid Herrmann &
The House Special Committee on Fisheries.

FROM: Deborah L. Greenberg, Committee Aide

DATE: November 18, 1983

SUBJECT: Board of Fisheries October Agenda Setting Session

I met with Beth Stewart, the Executive Director of the Boards of Fisheries and Game, to discuss the BOARD OF FISHERIES SESSION held in October for the purposes of REVISING THE AGENDA FOR THEIR NEXT MEETING IN FEBRUARY. Beth can be contacted at 465-4110 in Juneau.

The October session was intended to focus only on what proposals should be added to the agenda and was not intended to be a regulatory meeting. The Board did, however, clarify their intent on previously taken action concerning the Brown Crab fishery in Southeast, but I have covered this topic in a separate memorandum. Substantive discussion of each proposal was to be deferred until the proposals are taken up by the Board of Fisheries in their regulatory meetings. The seven members tried to add to the agenda those proposals in most urgent need of review. To evaluate each proposal in this light, the Board used the following criteria or questions:

1. IS THERE A CONSERVATION PROBLEM?
2. IS IT A SOCIO-ECONOMIC ALLOCATION PROBLEM?
 - A. Will one user group be so adversely impacted by the present regulations that their economic survival may be in jeopardy?
 - B. Will one user group be so adversely impacted by present regulations that they may have no opportunity to harvest?
 - C. Do existing regulations aggravate enforcement?
 - D. Are the current regulations so out of date that the department has difficulty managing the fishery?

Although the Board tried to apply these criteria to their decisions, they were not required to do so, and therefore the additions to the agenda should not necessarily be viewed as the most urgent proposals submitted by the Advisory Committees, the Regional Councils or the general public.

Because the Board has so many new members and two members remain to be confirmed by the legislature, there will be no December meeting. The next scheduled meeting is February 1-15.

Below, I have outlined by region some of the topics added to the agenda:

BRISTOL BAY:

How far off can you set a net at Nushagak
Loran lines at Egègik and Ugashik (expected to be long topics).
48 hour registration, or district transfer.

SOUTHEAST:

Chilkat River subsistence salmon fishery.
Most of the Southeast topics concern shellfish and these aren't covered until later anyway.

PRINCE WILLIAM SOUND:

As a result of several advisory committee meetings in Anchorage, the Board decided to take up at the February meeting, the Copper River Dip-net issue.
A proposal was also added on herring gill net areas, and one that would allow a salmon sport fishery on the Robe River.

COOK INLET:

Only non-salmon sport fish topics are to be covered in February.
Kenai River King Salmon topics will be covered in March.

STATEWIDE:

The Board added a proposal which would prohibit fishing more than one type of herring gear at a time.
They will also review a definition to describe when a seine has ceased fishing.

No additional topics were added concerning the lower Yukon, Kodiak, or the Southeast troll or gillnet fisheries.

For your convenience, I have provided the following ATTACHMENTS:

- A LIST OF PROPOSALS BY REGION that will be taken up at the February Board meeting, showing both those on the original agenda, and those just added.
- A LIST FROM WHICH THE BOARD SELECTED PROPOSALS TO ADD TO THE AGENDA,
- A TENTATIVE AGENDA for the February Board of Fisheries Meeting.

I also discussed with Beth the role she anticipates for Regional Coordinators, and her intents for a public information campaign to clarify the role of the Board meetings, the Regional Councils and the Advisory Committee. I will try to cover these in another memorandum in the next few weeks. Please contact me if you have any questions.

* On original agenda

February AgendaSoutheastern-Yakutat

- * 1. King Salmon O.Y. + Season.
- * 2. Seine - Gillnet salmon Allocation.
- * 3. Yakutat Surf Fishery.
- 4. Chilkat River subsistence salmon Fishery.

Prince William Sound

- * 1. Koyuk Island salmon interception.
- 2. Herring gill net Fishery.
- 3. Copper River subsistence Fishery.
- 4. Rohe River sport salmon Fishery.

Cook Inlet

- 1. Single hook only areas for steelhead.
- 2. Arctic char + Dolly Varden limits.
- 3. Housekeeping - enforcement, nonsubstantive ^{staff} proposals sport Fish.

Bristol Bay

- 1. Seine - gill net herring Allocation.
- 2. 48 hr. district transfer.
- 3. LOIZAN boundary lines.
- * 4. Bag + possession limits for rainbow trout.
- 5 - Set net thing

Westward

- * 1. Unimak Island and Shumagin Islands June Fishery.

Statewide

1. Prohibit the Fishing of more than one type of gear in the herring Fishery.
2. Define when seines have stopped Fishing.