

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILE 86672  
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Lisa W. Seub  
Alaska Department of Fish & Game  
333 Raspberry Road  
Anchorage, Alaska 99518-1599  
Phone: (907) 267-2249  
FAX: (907) 344-9238

William W. Smoker  
School of Fisheries and Ocean Sciences  
University of Alaska Fairbanks  
11120 Glacier Highway  
Juneau, Alaska 99801  
Phone: (907) 789-4444  
FAX: (907) 789-4447

Gary L. Thomas  
Prince William Sound Science Center  
P.O. Box 705  
Cordova, Alaska 99574  
Phone: (907) 424-5800  
FAX: (907) 424-5820

Fred M. Utter  
National Oceanic and Atmospheric Administration  
2725 Montlake Blvd. E.  
Seattle, Washington 98112  
Phone: (206) 553-7781 or messages 553-4445  
FAX: (206) 553-4313

Percy M. Washington  
Gaia NW Inc.  
10522 Lake City Way NE Suite 201  
Seattle, Washington 98125  
Phone: (206) 367-2864  
FAX: (206) 367-2865

Mark Willette  
Alaska Department of Fish & Game  
P.O. Box 669  
Cordova, Alaska 99574  
Phone: (907) 424-3214  
FAX: (907) 424-3235

Richard L. Wilmot  
U.S. Fish & Wildlife Service  
1011 East Tudor Road  
Anchorage, Alaska 99503  
Phone: (907) 786-3312  
FAX: (907) 786-3636

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## **CHAPTER VIII.      FUNDING OF THE ALASKA SALMON                              ENHANCEMENT PROGRAM**

### **INTRODUCTION**

Sources of funds for the Alaska salmon enhancement program and projects include bond issuances, state general fund appropriations, salmon enhancement tax assessments paid by fishermen, state enhancement loans, and cost recovery sales of fish. This chapter provides information on funding of Alaska salmon enhancement program.

### **STATE HATCHERIES AND ENHANCEMENT PROJECTS**

The Alaska Department of Fish and Game, Fisheries Rehabilitation and Enhancement Division (FRED) was established by the State Legislature in 1971 to encourage the use of hatcheries and other enhancement techniques to return the state's then depressed salmon fisheries to abundance.

At its peak, the division operated 20 hatcheries. Currently, the FRED Division operates 12 (though 16 are owned by the State) hatcheries to produce salmonid fishes for commercial, sport, and subsistence fisheries. As a result of declining state revenues, state policy shifted regarding the construction and operation of state hatcheries. In general, the state will only continue to operate salmon hatcheries that primarily benefit sport and subsistence fisheries and/or are primarily research facilities. In keeping with this policy, four permits have been issued to regional aquaculture associations for the operation of state-owned hatcheries at Trail Lakes, Cannery Creek, Kitoi Bay, and Hidden Falls. Additional permits will be issued to regional aquaculture associations for operation of the Main Bay, Tutka, and Beaver Falls hatcheries in 1992. Many of the state hatcheries were constructed for research purposes and not with cost recovery and loan repayment in mind. Therefore, in order to transfer these facilities to PNPs, the state has invested funds to make the hatcheries cost effective. While these transfers may be cost effective from an amortized capital and annual operating cost analysis, questions have been raised regarding the resulting fisheries management problems. Information on state hatcheries is provided in Table 1.

In addition to hatcheries, FRED has constructed numerous fish passes (several maintained cooperatively with the U.S. Forest Service) which provide access to spawning and rearing habitat that would otherwise be unavailable to salmon stocks. Other enhancement operations include lake fertilization, habitat improvement, and fish stock introduction to provide increased freshwater survival and new salmon production opportunities.

FRED also administers the PNP Hatchery Program and coordinates the development of regional aquaculture associations, approves annual operations management plans for all salmon hatcheries, and reviews PNP hatchery applications and the permitting process (which includes hatchery and fish and egg transporting permits). FRED operates five biological laboratories--Fish Pathology, Genetics, Limnology, and Tag Recovery facilities--which provide information and support for FRED and PNP hatchery programs. FRED

also provides engineering service support to the department (including field facilities) and coordination with consultants, contractors, and landowners.<sup>1</sup>

### **STATE ENHANCEMENT PROJECT FUNDING**

Funding for the operation of the state salmon enhancement program and state project construction, operation, and maintenance has been primarily through state bonds and general fund appropriations to ADF&G, FRED Division. From FY 72 - 92 operating budget, funding for the FRED Division totalled approximately \$210.3 million, the majority of which was for salmon enhancement. Bond issues totalling \$56.17 million were authorized by the 1976 and 1978 Legislatures, and overwhelmingly endorsed by voters, to fund the construction and operation of hatchery production and other enhancement projects in each region of the state. Of the \$56.17 million in bond issues for FRED enhancement projects, \$10.3 million was spent on the construction of hatcheries, while the remainder was used for other enhancement projects. In addition to bond issues, the capital appropriations for FRED division construction of state facilities totaled approximately \$24.8 million through FY 92.

As part of the Pacific Salmon Treaty, the federal government agreed to provide \$20 million in mitigation monies to produce new salmon through enhancement as a means to mitigate losses to Alaska fishermen resulting from treaty catch quotas. These funds have all been transferred to the State, although not all have been spent.

### **PRIVATE NONPROFIT HATCHERIES**

The PNP Hatchery Program was created by the legislature to provide private sector participation in rebuilding Alaska's depleted salmon fisheries. The impetus for the program came from the desire of commercial fishermen to enhance the severely depressed salmon stocks of the early 1970s. The program represented an unprecedented partnership among fishermen, processors, legislators, and the Governor's Office.<sup>2</sup> The statutes for PNP salmon hatcheries (AS 16.10.375-620 passed in 1974) authorized the ADF&G, FRED to issue hatchery permits to qualified PNP corporations. The intent of the program was to allow private ownership of salmon hatcheries that would contribute to the state's salmon fisheries. Costs of constructing and operating these hatcheries was to be derived from the sale of a portion of the returning fish. Comprehensive salmon planning is part of the PNP program and is implemented through the regional planning teams in conjunction with the regional aquaculture associations.

Since the inception of the PNP program, 32 salmon-hatchery permits have been issued, three given up and one revoked. Thirty-nine applications have either been denied or withdrawn from the permitting process. Twenty-four of the permitted PNP hatcheries are in operation. Currently, there are two applications for PNP hatchery permits under consideration.

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<sup>1</sup>Brad Pierce, Aquaculture in Alaska, House Research Agency Report 87-B, February 1987, p.30.

<sup>2</sup>Brian J. Allee, "The Private, Non-Profit Hatchery Perspective", Alaska Fish and Game, May/June 1986, p.17 and Brad Pierce, op.

## ***Regional Aquaculture Associations***

In 1976, the legislature authorized the formation of regional aquaculture associations. Regional associations are comprised of representatives of commercial, sport, and subsistence fishermen; processors; local communities members; and other user groups in the region. Each regional association must have a board of directors consisting of at least one representative from each user group within the association. Currently, there are eight regional aquaculture associations:

Northern Southeast Regional Aquaculture Association (NSRAA)  
Southern Southeast Regional Aquaculture Association (SSRAA)  
Prince William Sound Aquaculture Association (PWSAC)  
Cook Inlet Aquaculture Association (CIAA)  
Lower Yukon/Kuskokwim Regional Aquaculture Association (LYKRAA)  
Bristol Bay Regional Aquaculture Association (BBRAA)  
Kodiak Regional Aquaculture Association (KRAA)  
Chignik Regional Aquaculture Association (CRAA)

## ***Regional Planning Teams***

Three representatives from each regional aquaculture association are appointed by their respective boards of directors to serve on a regional planning team (RPT) along with three ADF&G representatives--two from FRED and one from the Division of Commercial Fisheries. These teams are responsible for developing regional comprehensive salmon plans for both FRED and PNP hatchery production. From FY 77 to FY 86, the legislature provided funds for planning teams via grants and contracts administered through the ADF&G commissioner's office. With the exception of an initial start-up planning grant available to all regional aquaculture associations from DCED, no funds for planning have been provided to regional associations since FY 86.

## ***Private Non-Profit Hatchery Funding***

Funding for PNP hatcheries is primarily through state loans, the salmon enhancement tax, and cost recovery sales of fish. To a lesser extent, the state has provided grants to some facilities and fishing organizations; these have totalled approximately \$12.3 million.

Since 1977, a significant portion of the funding necessary for the implementation of salmon rehabilitation and enhancement activities by PNP corporations has been provided through the *Fisheries Enhancement Revolving Loan Fund* administered by the Alaska Department of Commerce and Economic Development (DCED), Division of Investments (AS 16.10.500-620). The loan program has gone through several modifications by the legislature, the most recent occurring in 1987. The maximum loan amount available for an individual project is \$10 million at approximately 9.5 percent interest, with a payback period of up to 30 years.

According to state statute (AS 16.10.525), payments and accrual of interest on these loans *must* be deferred for 6 to 10 years. Loans for non-regional aquaculture association projects have these same terms with the exception that the loan maximum is limited to \$1 million. Loans are available for the purpose of planning, construction, and operation of salmon rehabilitation and enhancement projects, primarily salmon hatcheries. These loans are secured through collateral that may include returning hatchery fish and enhancement

assessment of commercial fishermen. State regulations to implement these statutes have been revised, but many hatchery operators still feel they are not flexible enough. This topic is being addressed by a legislative audit team.

State law allows limited entry permit holders within a region where there is a qualified regional aquaculture association to establish a **Salmon Enhancement Tax** (AS 43.76.010-.015). The permit holders may establish enhancement tax rates ranging from one to three percent of the ex-vessel value of the salmon catch within the region. The Cook Inlet and Northern and Southern Southeast Regional Association assessment rates (2, 3, and 3 percent, respectively) have been in place since 1981. The Prince William Sound assessment (2 percent) began in 1985 and the Kodiak assessment became effective in 1988. Buyers of salmon are required to collect the tax and remit the revenue to the Alaska Department of Revenue. This is a pass-through program, since the legislature appropriates Salmon Enhancement Tax revenues to the regional associations from whose members the tax was collected.

Through November, 1991, \$71.0 million has been borrowed by PNP corporations. Approximately \$67.7 million (95 percent) of the \$71.0 million principal balance is currently outstanding. Including state appropriations (\$12.3 million), approximately \$83.3 million has been provided in state loans and grants to PNPs. Another \$46.2 million has been generated through enhancement tax assessments. To date, PNP operators have sold approximately \$70.9 million worth of cost recovery fish to help pay for hatchery operations. The amount and percentage of funding by category is shown below.

|                 |            |                             |
|-----------------|------------|-----------------------------|
| \$71.0 million  | 35 percent | State Loans                 |
| \$12.3 million  | 7 percent  | General Fund Grants         |
| \$46.2 million  | 23 percent | Enhancement Tax Assessments |
| \$70.9 million  | 35 percent | Cost Recovery Sales of Fish |
| \$200.4 million |            | Total                       |

As can be seen, the private sector has provided over 58 percent of the direct funding for PNP operation and construction through self-imposed taxes and cost recovery sales of fish.

#### **OPTIONS FOR POSSIBLE CONSIDERATION:**

- Requiring a more extensive public benefit-cost analysis before providing enhancement loans. This means that a project or facility expansion would not only have to be financially feasible--capable of paying back loans--but also provide net benefits to the public.
- Eliminating the statutory loan repayment deferment requirement on operating loans.
- Development of a mechanism for placing moratoriums on state enhancement loans for increased fish production. Consideration of a moratorium on loans until results of the Legislative Enhancement Program Review economic studies are complete.
- Implementing a requirement for more complete analysis of transfers of the operation of state hatchery facilities that includes factors such as fisheries management, increased need for cost recovery, and the impact on traditional common property fisheries.
- Analysis of the enhancement tax program to determine 1) whether costs are distributed in proportion to benefits, and 2) the impact of a mechanism to allow

specific gear groups to opt out of the program or pay in proportion to the enhancement benefits they receive.

- Analysis of increasing the salmon enhancement tax so fishermen who benefit from the program will pay for more of the costs.
- In light of declining state revenues and lower fish prices, development of an auditing mechanism to ensure that annual PNP operating costs, paid by loans, enhancement tax receipts and cost recovery, are "reasonable."
- Development of a requirement that funds provided in treaty agreements for enhancement be used for fish production to the maximum extent possible. In addition, a requirement for a comprehensive feasibility analysis of using enhancement as part of treaty agreements could be considered.
- Analysis of use of enhancement loan funds for operating funds versus capital investment.

***UPDATE: In June 1992, Senator Dick Eliason requested through the Legislative Budget and Audit Committee an audit of funding issues related to fisheries enhancement programs in order to respond to concerns raised during the review process. A final audit is expected in February 1993. Attachment A is the preliminary information generated by the audit team.***

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Alaska Department of Fish and Game-FRED Division  
Public Hatchery Strategic Plan

| Hatchery        | Location  | Species                                             |                    |                          |                        | FY92                          |                    | Funding Source | Operational Plan FY | Agency       | Comments                                                                                                                                                                                                                                          |
|-----------------|-----------|-----------------------------------------------------|--------------------|--------------------------|------------------------|-------------------------------|--------------------|----------------|---------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 |           |                                                     | Percent Commercial | Percent Sport            | Percent Subsistence ** | Operating Costs               |                    |                |                     |              |                                                                                                                                                                                                                                                   |
| 1 Beaver Falls  | Ketchikan | Sockeye                                             | 100%               | 0%                       | ***                    |                               |                    |                | 92                  | SSRAA        |                                                                                                                                                                                                                                                   |
| 2 Big Lake      | Big Lake  | Sockeye<br>Coho                                     | 85%<br>30%         | 0%<br>65%                | 15%<br>5%              | \$50.0<br>\$344.3             | Unfunded<br>GF     |                | 92                  | FRED         | Sockeye unfunded<br>Interim funding or contract required                                                                                                                                                                                          |
| 3 Cannery Creek | Whittier  | Pink                                                | 100%               |                          |                        |                               |                    |                | 89                  | PWSAC        |                                                                                                                                                                                                                                                   |
| 4 Clear         | Clear     | Arctic char<br>Arctic grayling<br>Lake trout        |                    | 100%<br>100%<br>100%     |                        | \$22.4<br>\$308.5<br>\$90.8   | GF<br>DJ/WB<br>F&G |                | 92                  | FRED         | Major sport fish production facility<br>Vital to US/Can chum and chinook programs                                                                                                                                                                 |
| 5 Crooked Creek | Soldotna  | Sockeye<br>Coho<br>Steelhead                        | 95%                | 0%<br>95%<br>100%        | 5%<br>5%               | \$46.0<br>\$346.2<br>\$12.0   | CIAA<br>GF<br>PgR  |                | 92                  | FRED<br>CIAA | Sockeye contracted to CIAA<br>Contributes substantially to chinook sport fish program<br>through egg takes for other facilities                                                                                                                   |
| 6 Crystal Lake  | Petersbur | Chinook CL re<br>Chinook remot<br>Coho<br>Steelhead | 56%<br>99%<br>83%  | 44%<br>1%<br>17%<br>100% | ***                    | \$618.7                       | GF                 |                | 92                  | FRED         | Large US/Can capital investment<br>US/Can involvement including Harding<br>River, Deep Cove, and Farragut River<br>Provides 5-7 million chinook eggs in addition<br>to its own needs, primary stream rehab work<br>from unique isolation modules. |
| 7 Deer Mountain | Ketchikan | Chinook<br>Coho<br>Steelhead                        | 60%<br>83%         | 40%<br>17%<br>100%       | ***<br>***             | \$144.2<br>\$144.2            | GF<br>ANAD         |                | 92                  | FRED         | Fisheries technology development results supplied to<br>other state and private programs. Prime tourist<br>facility, over 200,000 visitors annually. Major<br>role in public education.                                                           |
| 8 Elmendorf     | Anchorage | Chinook<br>Coho                                     | 9%<br>10%          | 90%<br>87%               | 1%<br>3%               | \$112.6<br>\$375.2<br>\$67.9  | F&G<br>DJ/WB<br>GF |                | 92                  | FRED         | Major sport fish production facility<br>High visibility tourist attraction                                                                                                                                                                        |
| 9 Ft Richardson | Anchorage | Chinook<br>Coho<br>Rainbow                          | 13%<br>10%         | 88%<br>90%<br>100%       |                        | \$144.2<br>\$583.5<br>\$181.6 | GF<br>DJ/WB<br>F&G |                | 92                  | FRED         | Major sport fish production facility                                                                                                                                                                                                              |

| Hatchery | Location      | Species                                                      | FY92                        |               |                     | Operating Costs                          | Funding Source                          | Operational FY | Plan Agency         | Comments                                                                                                                                                                                                                      |
|----------|---------------|--------------------------------------------------------------|-----------------------------|---------------|---------------------|------------------------------------------|-----------------------------------------|----------------|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|          |               |                                                              | Percent Commercial          | Percent Sport | Percent Subsistence |                                          |                                         |                |                     |                                                                                                                                                                                                                               |
| 10       | Gulkana       | Glennalle Sockeye Chinook                                    | 90%<br>50%                  | 2%<br>30%     | 8%<br>20%           |                                          |                                         | 92             | FRED/PWSAC          | The most cost effective sockeye facility in the world<br>35 million sockeye salmon egg take annually                                                                                                                          |
| 11       | Hidden Falls  | Sitka Pink Chum                                              | 100%<br>100%                |               |                     |                                          |                                         | 89             | NSRAA               |                                                                                                                                                                                                                               |
| 12       | Kitoi Bay     | Kodiak Pink Chum Coho Sockeye                                | 100%<br>100%<br>50%<br>100% | 50%           |                     |                                          |                                         | 92             | FRED/KRAA           |                                                                                                                                                                                                                               |
| 13       | Klawock       | Klawock Sockeye Coho Steelhead Chum                          | 93%<br>50%                  | 7%<br>100%    | 100%<br>***<br>50%  | \$446.9<br>\$18.0<br>\$100.0             | GF<br>WB<br>BIA (request)               | 92             | FRED                | BIA funds to address local projects, chum and sockeye.<br>GF used in projects to rehabilitate POW in post-logging years.                                                                                                      |
| 14       | Main Bay      | Whittier Sockeye                                             | 99%                         | 1%            |                     |                                          |                                         | 92             | PWSAC               |                                                                                                                                                                                                                               |
| 15       | Pillar Creek  | Kodiak Sockeye                                               | 100%                        |               | ***                 | \$200.1<br>38.6                          | PgR<br>GF                               | 92             | FRED/KRAA           | Unfunded<br>Interim funding or contract required                                                                                                                                                                              |
| 16       | Russell Creek | Cold Bay Chum Pink Coho                                      | 100%<br>99%<br>50%          | 1%<br>50%     |                     | \$420.1<br>\$53.0                        | GF<br>PgR                               | 99             | Reg. Assoc.         | FY92 PgR from Aleutian's East Borough<br>Fisheries developmental facility<br>to be contracted in FY98                                                                                                                         |
| 17       | Sikusuilag    | Kotzebue Chum                                                | 80%                         |               | 20%                 | \$391.4                                  | GF                                      | 99             | Reg. Assoc.         | Developmental facility, fisheries technology development<br>Great potential for subsistence harvest.<br>To be contracted in FY98                                                                                              |
| 18       | Snettisham    | Juneau Sockeye CIF Sockeye (smol Chinook (Deep Chinook (juve | 100%<br>100%<br>94%<br>66%  | 6%<br>34%     | ***<br>***          | \$775.8<br>\$167.6<br>\$108.0<br>\$190.0 | GF<br>US/Can Deep Cove<br>US/CAN<br>W/B | 92             | FRED                | Tremendous involvement in US/Can projects, \$1.35 million plus<br>5 years operational funding in Deep Cove.<br>Applied technology development for sockeye smolt.<br>Major sport fish production in Juneau recreation project. |
| 19       | Trail Lakes   | Moose Pas Coho Sockeye                                       | 100%                        | 100%          | ***                 |                                          |                                         | 89             | CIAA                |                                                                                                                                                                                                                               |
| 20       | Tutka         | Homer Pink Chum Sockeye                                      | 98%<br>100%<br>100%         | 2%            | ***<br>***          | \$429.3                                  | CIP                                     | 96             | CIAA/<br>LCI Seiner | Unfunded<br>Interim funding or contract required.                                                                                                                                                                             |

\*\* - Includes personal use

\*\*\* - Thought to contribute to subsistence but as yet unquantified



# LAWS OF ALASKA

1992

Source  
CSHB 541(RES)

Chapter No.  
93

## AN ACT

Relating to the management of mixed stock fisheries by the Board of Fisheries.

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BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

THE ACT FOLLOWS ON PAGE 1

Approved by the Governor: June 18, 1992  
Actual Effective Date: September 16, 1992

AN ACT

1 Relating to the management of mixed stock fisheries by the Board of Fisheries.

2 \_\_\_\_\_

3 \* ~~Section~~ 1. AS 16.05.251 is amended by adding a new subsection to read:

4 (h) The Board of Fisheries shall adopt by regulation a policy for the management of  
5 mixed stock fisheries. The policy shall provide for the management of mixed stock fisheries in  
6 a manner that is consistent with sustained yield of wild fish stocks.

# ALASKA STATE LEGISLATURE

## LEGISLATIVE BUDGET AND AUDIT COMMITTEE

Division of Legislative Audit



P. O. Box 113300  
Juneau, AK 99811-3300  
(907) 465-3830  
FAX (907) 465-2347

### MEMORANDUM

TO: Members of Legislative Budget  
and Audit Committee

FROM: Randy S. Welker *Randy*  
Legislative Auditor

DATE: November 12, 1992

RE: Excerpted Information Related to Private Non-Profit Hatchery  
Financing and Operations

In June 1992 the committee approved an audit request from Senator Eliason relating to various issues involving the financing and operations of private non-profit hatcheries. In the approved request Senator Eliason noted that *"the information derived from this audit will be used as part of the on-going Legislative Hatchery Review Project."*

We are in the process of completing audit fieldwork. We plan on presenting a preliminary report to the committee in January 1993, which most likely will not result in a final public report being available until February. This prospective timeline does not fit in with the completion schedule of the review project. Accordingly, we have contacted the lead legislative staff responsible for the review project regarding various audit information they may be interested in using. Based on this contact, we identified four major areas of information that we could develop and make available to them, with the committee's approval. This information, primarily compiled in tabular form includes the following:

1. Economic benefits compared to tax contributions - Attachment 1 consists of five tables comparing the estimated economic value of hatchery-generated fish summarized by fishing gear group, with the amount of salmon enhancement taxes (SET) paid by each gear group. This information is presented for the five major regional

aquaculture associations.<sup>1</sup> The table provides information that addresses the issue of equity that is often raised by certain gear groups. That is, in various regions of the state, certain gear groups complain that although they are assessed SET, they receive minimal, if any, economic benefit from the fish produced by the regional association.

2. Contribution to the common property fishery - Attachment 2 is a table which summarizes the contribution to the common property fishery made by various hatcheries. The table compares the contribution made by hatcheries and other enhancement projects operated or administered by regional aquaculture associations to those of non-regional independent operators. This table provides information related to the concerns that many fishers have about the benefits of independent hatcheries. Fishers are concerned that independent hatchery operators, who do not benefit from SET revenues, require a large number of their returning fish in order to generate operating revenues. In this context, fishers are concerned that independent hatchery operators become competitors for selling fish rather than benefactors.
3. Estimating SET revenues generated by independent operators - Independent, non-association hatchery operators often point out that they are indirectly subsidizing regional association operations. The fish they produced that are caught in the common property fishery generate SET revenues for the regional associations. They however, do not benefit from these revenues and accordingly may have to rely on a larger share of their production, which they have to take out of the common property fishery (see previous discussion in number 2. above). The table on Attachment 3 estimates the SET generated from the fish believed to have been produced by the non-association independent operators over the last four years.
4. Detailed schedule of recipients of Fisheries Enhancement revolving loans - Also included in the information to be provided to the legislative review project is a listing of organizations which have borrowed funds through the Fisheries Enhancement Revolving Loan fund program. The information provided on Attachment 4 includes the amounts of the original loans for each borrower organization, the current loan balance, and the number of loans that have been "restructured" due to delays in repayment. The schedule also summarizes loan activity between regional associations and non-regional operators.

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<sup>1</sup>As of the date of this memorandum six regional aquaculture associations receive SET distributions from the state. The five major associations are Southern Southeast Aquaculture Association, Northern Southeast Aquaculture Association, Cook Inlet Aquaculture Association, Prince William Sound Aquaculture Corporation, and Kodiak Regional Aquaculture Association. A sixth association, the Chignik Regional Aquaculture Association, was eligible to receive SET for the first time in 1991, and actually received its first payment in the State's FY 92 budget.

We request that the committee review the tables and notes that accompany this memorandum and authorize release to the Legislative Hatchery Review Project team. Our discussions and observations regarding the information presented follows.

Attachment 1, Tables 1 through 5 - These comparisons of SET paid by gear group to the value of hatchery fish harvested were developed from annual operating reports submitted by the various organizations. These reports are submitted to the Division of Fisheries Rehabilitation, Enhancement and Development (FRED). Weight and value of fish were determined from information maintained by the Commercial Fisheries Entry Commission. The information in the tables related to value of hatchery fish is necessarily developed from estimates and data generated by various fish tagging programs that the organizations have in place.

As reflected in Table 2, the entire production of the Kodiak Regional Aquaculture Association (KRAA) has been harvested by the region's seine fleet. The gill net fleet does not benefit from the hatchery production, however it does receive benefits from other enhancement projects administered by KRAA, which are not reflected in the table. Further the lack of any hatchery harvest in 1989 and 1990 is due to the Exxon Valdez oil spill. No commercial fishing was permitted by the Division of Commercial Fisheries on hatchery stocks. Rather, the 1989 return was harvested and used entirely for cost recovery for KRAA.

In Prince William Sound, as shown in Table 3, both the seine and gill net fleet receive more benefits than SET paid to support the regional association. In contrast, that is not consistently the case in Southeast Alaska. As shown on Table 4, gillnetters have paid more than \$ 1 million in SET since 1988 while harvesting less than \$50,000 in fish generated by the Northern Southeast Regional Aquaculture Association (NSRAA).

For the Southern Southeast Aquaculture Association (SSRAA) the situation is somewhat the opposite. As shown on Table 5, gillnetters have received from SSRAA produced fish on average more than three times the amount of SET they have paid. The seine fleet by comparison have paid more in SET than they received in three of the last four years. The troll fleet in southern southeast also receive a disproportionate share of the hatchery produced fish when compared to the SET paid by the fleet. It is interesting to note that when NSRAA and SSRAA are considered together, the benefits received by all gear groups are fairly consistent with the amount of SET each fleet has paid over the last four years.

Attachment 2, Table 6 - The information on this table reflects the contribution that has been made to the common property fisheries by both regional and non-regional independent organizations. The statutes which established the Fisheries Enhancement Revolving Loan Fund (FERLF) required that hatchery projects make a "significant" contribution to the common property fishery. The Department of Commerce and Economic Development, Division of Investments has proposed regulations to further define "significant" contribution as being at least 50%. That is, a hatchery organization would have to contribute at least 50%

of its returning fish to the common property fishery in order to remain eligible for FERLF loans.

As shown by Table 6, non-regional associations have generally contributed less to the common property fishery than regional aquaculture associations. For two of the past four years the total contribution rate for all non-regionals has fallen below 50%. It should be noted that for 1989, the contribution of the regionals was only 39.6%. This is due to the Exxon Valdez oil spill. As mentioned in previous discussions, due to the oil spill commercial fishing of returning KRAA stocks was prohibited. Rather, the entire return was harvested and used for cost recovery for KRAA. As a result, there was no common property contribution by KRAA for these stocks in 1989. If KRAA totals are excluded, the contribution rate for all associations increases to over 55%.

Attachment 3, Tables 7 through 10 - Included in Attachment 3 are four schedules estimating the amount of SET generated by independent non-profit hatchery operators. As mentioned previously, independent operators point out that while they do not benefit from SET, their common property returning fish generate SET revenues for the regional associations.

When compared with total SET revenues for the five regional associations presented in Tables 1 through 5, these SET revenues represent much less than 10% of regional association revenues. However, it should be noted that these revenues are based on estimated returns. Most non-regional operators specialize in raising and releasing pink and chum salmon. Tagging of pink and chum salmon is for the most part impractical. The absence of widespread tagging generally yield more conservative, perhaps less reliable, projections.

Attachment 4, Table 11 - This schedule lists various information for borrowers of the FERLF program. As can be seen on the table, most borrowers have multiple loans with the program. The number of loans that have been restructured reflects, in part, operational difficulties which have prevented borrowers from making repayments as required under the original terms of their loan. It should be emphasized that under the program's statutes the Division of Investments (DOI) has a great deal of discretion in setting repayment periods, interest rates, and other terms. Typically DOI has been conservative when setting loan terms. Accordingly, although many loans have necessarily been restructured, few if any, have been restructured beyond the discretionary limits provided for in statute.

The schedule is further summarized between regional aquaculture associations and non-regional independent operators. This summary addresses concerns of associations that the available loan funds have been inordinately granted to independents. As shown, historically the available funding has been divided fairly equally through the end of FY 92. Two borrowers, a independent operator and a regional association account for more than half of the fund's outstanding loan balance at June 30, 1992. Douglas Island Pink and Chum, an independent operator, accounts for over 20% of the more than \$73 million in outstanding loans while the Prince William Sound Aquaculture Corporation has more than 30% of the fund's balance.

# ATTACHMENT 1

| <b>COOK INLET AQUACULTURE ASSOCIATION</b><br><i>Schedule of Estimated SET Paid and Estimated Value of Hatchery Fish Harvested<br/>By Gear Group<br/>1988 - 1991</i> |                                  |              |              |            |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------|--------------|------------|------------|
| GEAR GROUP                                                                                                                                                          |                                  | 1988         | 1989         | 1990       | 1991       |
| SEINE                                                                                                                                                               | SET Paid                         | \$ 155,500   | \$ 52,400    | \$ 30,500  | \$ 33,400  |
|                                                                                                                                                                     | Value of Hatchery Fish Harvested | \$ -0-       | \$ -0-       | \$ -0-     | \$ 31,800  |
| GILL NET                                                                                                                                                            | SET Paid                         | \$ 2,361,300 | \$ 1,236,900 | \$ 940,600 | \$ 328,000 |
|                                                                                                                                                                     | Value of Hatchery Fish Harvested | \$ 54,100    | \$ 2,200     | \$ 179,100 | \$ 636,200 |
| TROLL                                                                                                                                                               | SET Paid                         | \$ -0-       | \$ -0-       | \$ -0-     | \$ -0-     |
|                                                                                                                                                                     | Value of Hatchery Fish Harvested | \$ -0-       | \$ -0-       | \$ -0-     | \$ -0-     |

**Table 1**

| <b>KODIAK REGIONAL AQUACULTURE ASSOCIATION</b><br><i>Schedule of Estimated SET Paid and Estimated Value of Hatchery Fish Harvested<br/>By Gear Group<br/>1988 - 1991</i> |                                  |             |            |            |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------|------------|------------|------------|
| GEAR GROUP                                                                                                                                                               |                                  | 1988        | 1989       | 1990       | 1991       |
| SEINE                                                                                                                                                                    | SET Paid                         | \$1,428,600 | \$ 1,500   | \$ 823,000 | \$ 522,800 |
|                                                                                                                                                                          | Value of Hatchery Fish Harvested | \$ 945,200  | \$ -0-     | \$ -0-     | \$ 543,800 |
| GILL NET                                                                                                                                                                 | SET Paid                         | \$ 368,800  | \$ 521,100 | \$ 250,600 | \$ 197,500 |
|                                                                                                                                                                          | Value of Hatchery Fish Harvested | \$ -0-      | \$ -0-     | \$ -0-     | \$ -0-     |
| TROLL                                                                                                                                                                    | SET Paid                         | \$ -0-      | \$ -0-     | \$ -0-     | \$ -0-     |
|                                                                                                                                                                          | Value of Hatchery Fish Harvested | \$ -0-      | \$ -0-     | \$ -0-     | \$ -0-     |

**Table 2**

# ATTACHMENT 1

| <b>PRINCE WILLIAM SOUND AQUACULTURE ASSOCIATION</b><br><i>Schedule of Estimated SET Paid and Estimated Value of Hatchery Fish Harvested<br/>By Gear Group<br/>1988 - 1991</i> |                                  |              |               |               |              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------|---------------|---------------|--------------|
| GEAR GROUP                                                                                                                                                                    |                                  | 1988         | 1989          | 1990          | 1991         |
| SEINE                                                                                                                                                                         | SET Paid                         | \$ 694,100   | \$ 490,800    | \$ 749,500    | \$ 210,700   |
|                                                                                                                                                                               | Value of Hatchery Fish Harvested | \$20,682,900 | \$ 13,429,400 | \$ 17,868,800 | \$ 6,328,200 |
| GILL NET                                                                                                                                                                      | SET Paid                         | \$ 763,600   | \$ 528,500    | \$ 526,400    | \$ 388,700   |
|                                                                                                                                                                               | Value of Hatchery Fish Harvested | \$ 8,052,600 | \$ 1,715,300  | \$ 4,222,600  | \$ 3,521,800 |
| TROLL                                                                                                                                                                         | SET Paid                         | \$ -0-       | \$ -0-        | \$ -0-        | \$ -0-       |
|                                                                                                                                                                               | Value of Hatchery Fish Harvested | \$ -0-       | \$ -0-        | \$ -0-        | \$ -0-       |

**Table 3**

| <b>NORTHERN SOUTHEAST REGIONAL AQUACULTURE ASSOCIATION</b><br><i>Schedule of Estimated SET Paid and Estimated Value of Hatchery Fish Harvested<br/>By Gear Group<br/>1988 - 1991</i> |                                  |              |            |              |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------|------------|--------------|--------------|
| GEAR GROUP                                                                                                                                                                           |                                  | 1988         | 1989       | 1990         | 1991         |
| SEINE                                                                                                                                                                                | SET Paid                         | \$ 296,500   | \$ 530,900 | \$ 266,300   | \$ 301,100   |
|                                                                                                                                                                                      | Value of Hatchery Fish Harvested | \$ 1,757,600 | \$ 188,800 | \$ 1,179,500 | \$ 1,434,900 |
| GILL NET                                                                                                                                                                             | SET Paid                         | \$ 571,000   | \$ 231,200 | \$ 313,700   | \$ 183,200   |
|                                                                                                                                                                                      | Value of Hatchery Fish Harvested | \$ 43,900    | \$ 100     | \$ 1,600     | \$ 2,000     |
| TROLL                                                                                                                                                                                | SET Paid                         | \$ 553,600   | \$ 387,200 | \$ 662,300   | \$ 470,300   |
|                                                                                                                                                                                      | Value of Hatchery Fish Harvested | \$ 155,600   | \$ 228,200 | \$ 499,000   | \$ 576,200   |

**Table 4**

## ATTACHMENT 1

| <b>SOUTHERN SOUTHEAST REGIONAL AQUACULTURE ASSOCIATION</b><br><i>Schedule of Estimated SET Paid and Estimated Value of Hatchery Fish Harvested<br/> By Gear Group<br/> 1988 - 1991</i> |                                  |              |              |              |              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--------------|--------------|--------------|--------------|
| <b>GEAR<br/>GROUP</b>                                                                                                                                                                  |                                  | <b>1988</b>  | <b>1989</b>  | <b>1990</b>  | <b>1991</b>  |
| <b>SEINE</b>                                                                                                                                                                           | SET Paid                         | \$ 1,173,200 | \$ 1,952,800 | \$ 1,307,000 | \$ 805,500   |
|                                                                                                                                                                                        | Value of Hatchery Fish Harvested | \$ 2,536,900 | \$ 1,010,600 | \$ 303,200   | \$ 297,500   |
| <b>GILL NET</b>                                                                                                                                                                        | SET Paid                         | \$ 436,500   | \$ 386,100   | \$ 329,300   | \$ 218,100   |
|                                                                                                                                                                                        | Value of Hatchery Fish Harvested | \$ 2,872,900 | \$ 961,100   | \$ 684,300   | \$ 1,047,800 |
| <b>TROLL</b>                                                                                                                                                                           | SET Paid                         | \$ 193,600   | \$ 141,300   | \$ 276,500   | \$ 203,100   |
|                                                                                                                                                                                        | Value of Hatchery Fish Harvested | \$ 713,200   | \$ 473,300   | \$ 2,040,900 | \$ 1,392,400 |

**Table 5**

## ATTACHMENT 2

| <p style="text-align: center;"><b>STATE OF ALASKA</b></p> <p style="text-align: center;"><i>Schedule of Hatchery Contribution to the Common Property Fishery<br/>By Regional and Non-Regional Organizations<br/>1988-1991</i></p> |                      |                                 |                      |                                 |                      |                                 |                      |                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------------------------------|----------------------|---------------------------------|----------------------|---------------------------------|----------------------|---------------------------------|
| Organization                                                                                                                                                                                                                      | <u>1988</u>          |                                 | <u>1989</u>          |                                 | <u>1990</u>          |                                 | <u>1991</u>          |                                 |
|                                                                                                                                                                                                                                   | Hatchery<br>Return % | Common<br>Property<br>Fishery % | Hatchery<br>Return % | Common<br>Property<br>Fishery % | Hatchery<br>Return % | Common<br>Property<br>Fishery % | Hatchery<br>Return % | Common<br>Property<br>Fishery % |
| Regional                                                                                                                                                                                                                          | 23.1%                | 76.9%                           | 60.4%                | 39.6%                           | 28.9%                | 71.1%                           | 32.9%                | 67.1%                           |
| Non-Regional                                                                                                                                                                                                                      | 68.3%                | 31.7%                           | 31.7%                | 68.3%                           | 30.2%                | 69.8%                           | 62.3%                | 37.7%                           |

**Table 6**

### ATTACHMENT 3

| <b>STATE OF ALASKA</b><br><i>Contribution to Salmon Enhancement Taxes</i><br><i>For the Five Largest Independent Non-Profit Organizations</i><br><b>1991</b> |                                      |   |                                  |   |                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---|----------------------------------|---|-------------------------------------------|
| <b>Organization</b>                                                                                                                                          | <b>Common<br/>Property<br/>Value</b> |   | <b>Regional<br/>SET<br/>Rate</b> |   | <b>Estimated<br/>SET<br/>Contribution</b> |
| AAI                                                                                                                                                          | \$181,200                            | x | 3%                               | = | \$5,400                                   |
| AKI                                                                                                                                                          | 199,800                              | x | 3%                               | = | 6,000                                     |
| DIPAC                                                                                                                                                        | 905,900                              | x | 3%                               | = | 27,200                                    |
| KAKE                                                                                                                                                         | 24,300                               | x | 3%                               | = | 700                                       |
| VALDEZ                                                                                                                                                       | 965,100                              | x | 2%                               | = | 19,300                                    |
|                                                                                                                                                              |                                      |   |                                  |   | <u>\$58,600</u>                           |

**Table 7**

| <b>STATE OF ALASKA</b><br><i>Contribution to Salmon Enhancement Taxes</i><br><i>For the Five Largest Independent Non-Profit Organizations</i><br><b>1990</b> |                                      |   |                                  |   |                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---|----------------------------------|---|-------------------------------------------|
| <b>Organization</b>                                                                                                                                          | <b>Common<br/>Property<br/>Value</b> |   | <b>Regional<br/>SET<br/>Rate</b> |   | <b>Estimated<br/>SET<br/>Contribution</b> |
| AAI                                                                                                                                                          | \$189,900                            | x | 3%                               | = | \$5,700                                   |
| AKI                                                                                                                                                          | 233,000                              | x | 3%                               | = | 7,000                                     |
| DIPAC                                                                                                                                                        | 43,000                               | x | 3%                               | = | 1,300                                     |
| KAKE                                                                                                                                                         | 55,400                               | x | 3%                               | = | 1,700                                     |
| VALDEZ                                                                                                                                                       | 9,282,600                            | x | 2%                               | = | 185,700                                   |
|                                                                                                                                                              |                                      |   |                                  |   | <u>\$201,400</u>                          |

**Table 8**

### ATTACHMENT 3

| STATE OF ALASKA<br><i>Contribution to Salmon Enhancement Taxes<br/>           For the Five Largest Independent Non-Profit Organizations</i><br>1989 |                             |   |                         |   |                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---|-------------------------|---|----------------------------------|
| Organization                                                                                                                                        | Common<br>Property<br>Value |   | Regional<br>SET<br>Rate |   | Estimated<br>SET<br>Contribution |
| AAI                                                                                                                                                 | \$840,400                   | x | 3%                      | = | \$25,200                         |
| AKI                                                                                                                                                 | 78,600                      | x | 3%                      | = | 2,400                            |
| DIPAC                                                                                                                                               | 129,200                     | x | 3%                      | = | 3,900                            |
| KAKE                                                                                                                                                | 2,500                       | x | 3%                      | = | 100                              |
| VALDEZ                                                                                                                                              | 3,825,800                   | x | 2%                      | = | 76,500                           |
|                                                                                                                                                     |                             |   |                         |   | <u>\$108,100</u>                 |

**Table 9**

| STATE OF ALASKA<br><i>Contribution to Salmon Enhancement Taxes<br/>           For the Five Largest Independent Non-Profit Organizations</i><br>1988 |                             |   |                         |   |                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---|-------------------------|---|----------------------------------|
| Organization                                                                                                                                        | Common<br>Property<br>Value |   | Regional<br>SET<br>Rate |   | Estimated<br>SET<br>Contribution |
| AAI                                                                                                                                                 | \$67,700                    | x | 3%                      | = | \$2,000                          |
| AKI                                                                                                                                                 | 12,600                      | x | 3%                      | = | 400                              |
| DIPAC                                                                                                                                               | 315,200                     | x | 3%                      | = | 9,500                            |
| KAKE                                                                                                                                                | 4,800                       | x | 3%                      | = | 100                              |
| VALDEZ                                                                                                                                              | 1,320,700                   | x | 2%                      | = | 26,400                           |
|                                                                                                                                                     |                             |   |                         |   | <u>\$38,400</u>                  |

**Table 10**

# ATTACHMENT 4

| STATE OF ALASKA<br><i>Fisheries Enhancement Revolving Loan Fund</i><br><i>Schedule of Borrowers, Loans, Current Balances, and Status</i><br>June 30, 1992 |                            |                                         |                                             |                                       |                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------------------------|---------------------------------------------|---------------------------------------|---------------------------------------------|
| Organization                                                                                                                                              | Original<br>Loan<br>Amount | # of Loans<br>Outstanding<br>at 6/30/92 | # of Loans<br>Restructured<br>as of 6/30/92 | Current Loan<br>Balance at<br>6/30/92 | % of<br>Total Loan<br>Receivable<br>Balance |
| <b>Regional</b>                                                                                                                                           |                            |                                         |                                             |                                       |                                             |
| PWSAC                                                                                                                                                     | \$24,560,900               | 21                                      | 3                                           | \$23,149,800                          | 31.4                                        |
| SSRAA                                                                                                                                                     | 11,941,900                 | 13                                      | 13                                          | 12,201,000                            | 16.6                                        |
| NSRAA                                                                                                                                                     | 2,840,700                  | 7                                       | 0                                           | 2,557,000                             | 3.5                                         |
| CIAA                                                                                                                                                      | 328,600                    | 2                                       | 0                                           | 328,600                               | .4                                          |
| Total Regional Organizations                                                                                                                              | \$39,672,100               | 43                                      | 16                                          | \$38,236,400                          | 51.9                                        |
| <b>Non-Regional</b>                                                                                                                                       |                            |                                         |                                             |                                       |                                             |
| DIPAC                                                                                                                                                     | \$15,579,500               | 41                                      | 0                                           | \$15,289,100                          | 20.7                                        |
| VFDA                                                                                                                                                      | 6,444,400                  | 17                                      | 12                                          | 6,491,500                             | 8.8                                         |
| AKI                                                                                                                                                       | 4,845,100                  | 20                                      | 2                                           | 4,702,400                             | 6.4                                         |
| AAI                                                                                                                                                       | 4,571,800                  | 30                                      | 14                                          | 4,705,900                             | 6.4                                         |
| KNPFC                                                                                                                                                     | 3,534,600                  | 17                                      | 6                                           | 3,713,100                             | 5.0                                         |
| SJ                                                                                                                                                        | 362,300                    | 2                                       | 1                                           | 346,700                               | .5                                          |
| BCF                                                                                                                                                       | 275,000                    | 4                                       | 2                                           | 244,600                               | .3                                          |
| Total Non-Regional Organizations                                                                                                                          | \$35,612,700               | 131                                     | 37                                          | \$35,493,300                          | 48.1                                        |
| Total                                                                                                                                                     | \$75,284,800               | 174                                     | 53                                          | \$73,729,700                          | 100.0                                       |

**Table 11**

## ATTACHMENT 5

## STATE OF ALASKA

**Fisheries Enhancement Revolving Loan Fund  
Schedule of Borrowers, Loans, Operating, and Capital**

**June 30, 1992**

| <i>Organization</i>                         | <i># of<br/>Loans<br/>Outstanding<br/>at 6/30/92</i> | <i>Current<br/>Loan<br/>Balance at<br/>6/30/92</i> | <i># of<br/>Operating<br/>Loans at<br/>6/30/92</i> | <i>Operating<br/>Loan<br/>Balance at<br/>6/30/92</i> | <i># of<br/>Capital<br/>Loans at<br/>6/30/92</i> | <i>Capital<br/>Loan<br/>Balance at<br/>6/30/92</i> |
|---------------------------------------------|------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|
| <b>Regional</b>                             |                                                      |                                                    |                                                    |                                                      |                                                  |                                                    |
| PWSAC                                       | 21                                                   | \$23,149,800                                       | 2                                                  | \$ 981,900                                           | 19                                               | \$22,167,900                                       |
| SSRAA                                       | 13                                                   | 12,201,000                                         | 7                                                  | 2,778,700                                            | 6                                                | 9,422,300                                          |
| NSRAA                                       | 7                                                    | 2,557,000                                          | 4                                                  | 926,100                                              | 3                                                | 1,630,900                                          |
| CIAA                                        | 2                                                    | 328,600                                            | 1                                                  | 238,600                                              | 1                                                | 90,000                                             |
| <b>Total Regional<br/>Organizations</b>     | <b>43</b>                                            | <b>\$38,236,400</b>                                | <b>14</b>                                          | <b>\$4,925,300</b>                                   | <b>29</b>                                        | <b>\$33,311,100</b>                                |
| <b>Non-Regional</b>                         |                                                      |                                                    |                                                    |                                                      |                                                  |                                                    |
| DIPAC                                       | 41                                                   | \$15,289,100                                       | 26                                                 | \$7,126,900                                          | 15                                               | \$ 8,162,200                                       |
| VFDA                                        | 17                                                   | 6,491,500                                          | 9                                                  | 3,294,000                                            | 8                                                | 3,197,500                                          |
| AKI                                         | 20                                                   | 4,702,400                                          | 11                                                 | 2,173,800                                            | 9                                                | 2,528,600                                          |
| AAI                                         | 30                                                   | 4,705,900                                          | 18                                                 | 3,300,400                                            | 12                                               | 1,405,500                                          |
| KNIPFC                                      | 17                                                   | 3,713,100                                          | 11                                                 | 2,132,500                                            | 6                                                | 1,580,600                                          |
| SJ                                          | 2                                                    | 346,700                                            | 0                                                  | 0                                                    | 2                                                | 346,700                                            |
| BCF                                         | 4                                                    | 244,600                                            | 2                                                  | 123,700                                              | 2                                                | 120,900                                            |
| <b>Total Non-Regional<br/>Organizations</b> | <b>131</b>                                           | <b>\$35,493,300</b>                                | <b>77</b>                                          | <b>\$18,151,300</b>                                  | <b>54</b>                                        | <b>\$17,342,000</b>                                |
| <b>Total</b>                                | <b>174</b>                                           | <b>\$73,729,700</b>                                | <b>91</b>                                          | <b>\$23,076,600</b>                                  | <b>83</b>                                        | <b>\$50,653,100</b>                                |

## CHAPTER IX. ECONOMICS

The Legislative review of the salmon enhancement program included a benefit-cost analysis of the program. This analysis was completed under contract to the University of Alaska, Fairbanks. *Given recent low Alaska salmon prices and relatively dismal international salmon markets, the economic analysis was conducted to address questions such as whether Alaska enhanced salmon stocks are over-produced given current international salmon markets, the impact on Alaska regional salmon prices of additional enhanced production, the optimal species production mix, and the appropriate level of continued state fiscal support.*

The study consisted of four parts. First, a biological model (Collie, 1992) was used to estimate the returns of adult fish available for harvest under a variety of scenarios. Second, given the return of fish, an international demand model was estimated to predict the prices fishermen would receive at the ex-vessel level (Herrmann and Greenberg, 1992). Third, a fishing cost model was estimated to predict the producer's surplus in each fishery given the ex-vessel prices and returns of fish from the biological model (Boyce, 1992). Fourth, a survey of the hatcheries provided the costs of producing various levels of hatchery fish. The combined results of these four studies comprise the benefit-cost analysis of the salmon enhancement program. (Boyce, Herrmann, Bischak and Greenberg, 1992)

While the contractors have completed their work on the research, the public has not had the opportunity to review and comment on the results of the study. Therefore, the draft economics chapter, with options for possible consideration, and the final benefit-cost report have been printed separately. That document, entitled "Legislative Review of the Alaska Salmon Enhancement Program, Draft Chapter IX, Economics", is available in the Legislative Library in Juneau.

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## **CHAPTER X.**

## **MARKETING**

Following the precipitous decline in Alaska salmon prices in 1991, Governor Hickel formed a Salmon Strategy Task Force. The purpose of the group was to identify the problems facing Alaska's salmon fishing industry and recommend state actions to address these problems. A primary focus of the task force was salmon marketing. The task force recently finalized its recommendations. To avoid duplication with the task force's efforts, it was decided that the Legislative review of the Alaska salmon enhancement program would analyze the economic costs and benefits of the enhancement program and review past state salmon marketing efforts. In addition, as part of the legislative review, the Salmon Strategy Task Force's final recommendations are summarized (a copy of the Task Force's report is included in the Appendices).

### **INTRODUCTION**

The Alaska Seafood Marketing Institute (ASMI) was established in 1981 as a quasi-state corporation in the Alaska Department of Commerce and Economic Development (DCED). The institute's statutory responsibilities include:

- To conduct educational, research, advertising, and sales promotional programs to increase awareness of all species of seafood and their by-products that are harvested in Alaska.
- To develop quality specifications to enhance the high quality image of Alaska seafood worldwide, and to adopt recommendations for the handling of seafood from the moment it is caught until it is shipped to the marketplace.
- To prepare market research and product development plans for all species of seafood and their by-products harvested in Alaska.

State statutes prohibit ASMI from favoring any region, product, or processor. For that reason, ASMI uses "generic" marketing campaigns aimed at enhancing the sales of particular "species" of fish or broad product categories (such as canned or frozen) rather than specific products. Also, because it is likely to favor individual processors, ASMI does not promote new products.

### **ORGANIZATION**

#### **Board of Directors**

*To accomplish its statutory mission, the ASMI organization consists of a board of directors, numerous committees, and a relatively small number of staff. Policy and program direction is set by the 18-member board of directors.* The board membership consists of 12 fish processors, 5 commercial fishermen, and 1 public citizen. Of the 12 processors, 8 are to be appointed from "large processors" (annual Alaska payroll of \$1 million or more) and 4 are to be appointed from "small processors" (annual Alaska payroll between \$50,000 and \$1 million). Although not required by statute, the board has three non-voting ex-officio members: the DCED commissioner, and a legislator appointed from each chamber.

## Committees

*The ASMI committee system is extensive, with the largest portion being a system of marketing committees.* The primary marketing committee plans the generic Alaska seafood marketing program for the domestic market. Committee members include the chairs from the five individual species committees (halibut, shellfish, canned seafood, whitefish, and salmon), plus the chairs of the export and quality committees, and two board members. The philosophy of the primary marketing committee is to promote Alaska seafood through the development of long-term marketing goals and strategies.

Under the marketing committee are the five individual species committees. These committees generically address marketing concerns related to their particular species group. The philosophy of the individual marketing committees is to promote the species with short-term marketing goals and strategies that are consistent with the long-term goals and strategies of the marketing committee.

The quality and export committees develop industry guidelines for the care and handling of seafood and oversee the federal Market Promotions Program (MPP) program, respectively. The MPP program was developed to increase U.S. exports.

Most of the members of the marketing committees are marketing specialists employed by the fish processors represented on the ASMI board. Other committee members are representatives from fishery organizations that are knowledgeable about the fishing industry.

## Staff

The ASMI executive director is selected by the board of directors and permitted to hire additional staff upon approval of the board. The central staff members include: comptroller, quality manager, special projects coordinator, and office manager. In the past year, ASMI was authorized to hire four additional marketing specialists who had previously worked with ASMI as contractors.

## ASMI FUNDING SOURCES

A portion of ASMI's funding is derived from a self-imposed seafood marketing assessment. All fish processors who purchase annually \$50,000 or more (ex-vessel value) of seafood pay an assessment of 0.03 percent of their total purchases. These assessments are collected in the state's general fund and are appropriated annually to ASMI. The balance of ASMI's funding is derived from state general fund and federal appropriations. Table 1 shows funding sources and levels since FY 82.

According to an ASMI briefing paper, ASMI has spent nearly \$35 million in the domestic market since 1981 in their "generic" seafood marketing program. Since FY 88, an additional \$24 million was spent in foreign markets, using federal funds and small state general fund matching appropriations. *Federal funding, which has increased as a result of the MPP program, is restricted to international marketing efforts.* In contrast, state general fund appropriations have declined in recent years. Given the outlook for Alaska salmon prices, industry contributions can be expected to remain below historic levels. *State general fund appropriations and industry contributions are used primarily to fund domestic marketing efforts. As a result, ASMI will have fewer resources for domestic marketing at a time when the domestic market has been identified by analysts as having the greatest potential for increasing sales of Alaska salmon.*

## **EFFECTIVENESS OF ASMI'S MARKETING PROGRAM**

When ASMI was established, the Alaska salmon industry provided most of the U.S. production and about half of the world production from wild and ocean-ranched salmon stocks. As a major supplier, the generic marketing of Alaska salmon was relatively effective. A recent Legislative Audit report evaluated whether there has been an increase in awareness of Alaska seafood since ASMI's inception. The audit report analyzed ASMI effectiveness based on the following criteria:

- \*Perception that Alaska is the best region for seafood.
- \*Awareness of Alaska as a seafood-producing region.
- \*Positive beliefs/attitudes toward Alaska seafood.
- \*Awareness of Alaska seafood advertising.
- \*Association of seafood species with Alaska.
- \*Awareness of seafood species.

*The Legislative Audit review of market research provided by ASMI concluded that increases had occurred in consumers' perception of Alaska seafood. In addition, consumers are more aware of Alaska as a seafood-producing region.*

*Despite these overall improvements in consumer perceptions and increased consumption of seafood, Alaska has lost a significant share of both the domestic and international salmon markets as a result of the tremendous growth in world farmed-salmon production.* The dramatic rise in production and growing acceptance of farmed salmon as a source of fresh salmon represents the single greatest threat to the Alaska salmon market. The consistent year-round availability and quality of fresh, farmed salmon has made wild (and ocean ranched) Alaska salmon, with its short fresh season and quality and supply inconsistencies, a secondary choice for a large number of buyers. United States and foreign markets generally prefer fresh over frozen salmon.

According to ASMI board chair, Bob Waldrop, the large farmed-salmon producer nation of Norway spends about five cents per pound marketing salmon, while only one cent per pound is spent marketing Alaska salmon. *The new producers of salmon are out-competing Alaska producers in product preference, quality, availability, and marketing.*

*Another problem is the fact that canned salmon production represents 59 percent of all retail salmon volume. U.S. per capita consumption of canned salmon declined 60 percent from 1980 to 1989, at the same time that harvests of pink salmon--the majority of which is canned--increased approximately 50 percent.* Canned salmon suffers from an "old-fashioned" image with most younger consumers. The bones and skin also result in the perception that it is inconvenient and unappealing. In foreign markets, canned salmon markets fluctuate around pricing and supply conditions.

Analysts who are critical of ASMI's marketing programs maintain that the "generic" approach promotes all salmon, regardless of origin, because Alaska products are not clearly identified in the market. They argue that without brand identification and a quality assurance program to assure that Alaska salmon is superior, generic marketing may actually be helping Alaska's competitors.

## **LABELING OF ALASKA SALMON**

A 1992 *Consumer Reports* article attacking the wholesomeness and safety of seafood sold in the United States has caused considerable concern within the Alaska fishing industry. The industry already faces difficult marketing challenges in a changing competitive environment. Despite its flawed methodology and lack of specificity, the report's long-term potential impact on Alaska must be taken seriously.

*The Consumer Reports article also illustrates the problem of insufficient labeling of seafood products when sold in retail markets.* The salmon samples tested in the report could not be identified by species, origin, or whether it was wild or pen reared. The Alaska Seafood Marketing Institute has recently developed a new U.S. promotion of Alaska salmon in order to meet increasing market challenges. This promotion is to emphasize the freshness and purity of Alaska's wild salmon. However, without specific labeling of salmon products as to species, state of origin, and identification as to whether wild or pen reared, the effectiveness of such marketing will be reduced.

To address the labeling problem, the Alaska State Legislature sent a letter to the Alaska Congressional delegation requesting that they introduce federal legislation requiring the labeling of seafood products as to their source and type, and whether the product is wild or farmed. Proper labeling will ensure that consumers can identify and select Alaska salmon, and provide better information and clearer choices in the market place. It would also reward those states that maintain strict quality control programs, such as Alaska, and ensure that the benefits of promotional efforts accrue to Alaska.

It should be noted that Alaska does have a statute that requires that any farmed salmon sold in the state must be labeled that it is farmed and is from outside Alaska.

## **THE SALMON STRATEGY TASK FORCE RECOMMENDATIONS**

The Salmon Strategy Task Force finalized its recommendations on January 24, 1992. The Task Force provided immediate, mid-range, and long-range recommendations which are summarized below.

**Recommendations for Immediate Action.** (1) ASMI should develop a budget and strategy for selling the existing inventory surplus of Alaska salmon; (2) processors and fishermen should initiate price negotiations early; (3) The University of Alaska, DCED, and ADF&G should provide the best possible information to fishermen regarding world salmon markets; (4) DCED should review Prince William Sound processing capacity; (5) DCED and the Alaska Commercial Fishing and Agriculture Bank (CFAB) should provide loan extensions as needed.

**Mid-Range Recommendations.** The mid-range recommendations included actions for product and market development, salmon quality, and marketing and a review of ASMI's role.

**Long-Term Recommendations.** The long-term recommendations included the development of a strategic plan to help strengthen the fishing industry and its support sector. This included an integrated marketing and production strategy, a review of loan and limited entry permit policies, a review of ASMI, a review of fish tax policy, and the reduction of regulatory burdens to lower costs. ASMI's Salmon Recovery proposal was included in the Task Force's long-range recommendations as well as its recommendations for immediate action. This proposal, which did not receive support from the Hickel Administration, is discussed in the following section.

## ***The ASMI Salmon Recovery Proposal***

One of the recommendations of the Salmon Strategy Task Force was ASMI's Salmon Recovery Proposal. According to an ASMI briefing paper, the *goal* of the Salmon Recovery Proposal was to increase annual per capita U.S. salmon consumption from 1 to 1.5 pounds. This increase would absorb an additional 119 million pounds of salmon each year or about 15 percent of Alaska's annual production. Of the expansion, 60 percent would be frozen and 40 percent would be canned salmon.

The *strategy* of the program would be a combination of consumer and trade education and advertising, direct trade contacts, and other promotional methods used by ASMI over the last decade. Instead of patchwork, crisis-response marketing, this would be an integrative approach tying all marketing elements together. The basis for the marketing effort comes from a number of core issues identified by ASMI. These include:

- \*trade and consumer preference for fresh salmon,
- \*decreased consumer consumption of canned salmon,
- \*low consumer knowledge and awareness of Alaska salmon products,
- \*negative consumer perception of quality of frozen and canned salmon,
- \*limited regional and seasonal purchases of Alaska salmon,
- \*limited food-service use of Alaska salmon, especially canned,
- \*fluctuating supply and prices of Alaska salmon, and
- \*increased competition.

It is unclear from ASMI's information how consumer and trade preference for fresh over frozen and canned salmon was expected to be changed. It appears that efforts would be made to increase overall salmon consumption while convincing purchasers that Alaska frozen and canned salmon are also high quality products. To avoid merely expanding the farmed-salmon market, central to ASMI's recovery program is an Alaska salmon product identification promotion using a logo or seal of origin. This is similar to the "Alaska Made" program.

ASMI does have a record of success. As a result of direct marketing, Alaska canned salmon exports to the United Kingdom increased from 370,000 cases to 946,500 cases between 1989 and 1991.

The *cost* of the proposal was estimated at \$10 million annually for five years, totalling \$50 million. A lower annual amount would be needed after the first five years to sustain the marketing effort. ASMI has identified some potential sources of funds as follows:

- 1) state general fund appropriations,
- 2) a raw fish tax credit,
- 3) an endowment from the *Exxon Valdez* settlement as part of the restoration agreement,

4) a redirection of salmon enhancement taxes paid by fishermen to regional aquaculture associations, and

5) a combination of the above sources.

In reality, a raw fish tax credit amounts to an indirect state appropriation because a small amount (0.03 percent) of the foregone general fund fish tax revenues would then be paid in the form of industry processor contributions. Unless the legislature deems that a well specified and directed raw fish tax credit is desirable public policy in and of itself, a direct state general fund appropriation to ASMI is a superior method for funding the proposal.

Regarding a redirection of the enhancement tax, ASMI states that Alaska does not have a salmon production problem but a salmon marketing problem. While this may be true, the pass-through salmon enhancement taxes pay for the operation and/or repayment of state loans for salmon enhancement projects. As a result, this funding source is also an indirect state appropriation---the funding the aquaculture associations would forego would reduce payments on state loans and/or require additional operating loans. In general, if the legislature supports the salmon recovery proposal, a direct appropriation would be the best fiscal approach for funding the program.

## **ALTERNATIVE PROPOSALS TO INCREASE MARKETING EFFORTS**

### **Proposed Changes to Alaska Statutes:**

A number of pieces of legislation have been introduced recently to address the salmon marketing problem. The general intent of the proposals is to provide funding for the immediate increased promotion of Alaska salmon and to increase the voice of fishermen in those marketing efforts either through changes to ASMI or creation of a new salmon marketing association. No action was taken on any of these proposals in 1992.

- Creation of six regional salmon marketing committees and the Alaska State Salmon Marketing Association. Two fishermen from each committee would sit on the association. Funding for marketing efforts would be provided through a 1 percent marketing tax on value of salmon landed.
- Expansion of ASMI's statutes to allow for targeted development of Alaska salmon markets and product development.
- Imposition of a temporary one percent (1%) marketing tax on the value of salmon landed and increasing the ASMI Board of Directors by two positions that must be filled by commercial fishermen.
- Establishment of a temporary one percent (1%) salmon marketing tax and a committee within ASMI to provide fishermen with control over how the funds would be expended.
- Endowing the Alaska Fisheries Development Foundation to fund fisheries development research projects.

### **Development of a Salmon Marketing Council**

Under the federal Seafood Promotion Act of 1986, after rigorous fisherman and processor review and approval, a salmon marketing council could be developed to increase the U.S. marketing

efforts of salmon. If properly organized and chartered, a "National Salmon Council" would have the power to assess industry participants for funds to be used for salmon promotion and marketing, product research, and consumer education. The council would also be able to develop and offer salmon quality standards for U.S. Department of Commerce approval.

#### **OPTIONS FOR POSSIBLE CONSIDERATION:**

- Review of the state's role in the marketing of Alaska seafood, and salmon in particular, including a review of the ASMI program.
- Given that ASMI's generic approach to marketing was statutorily established prior to the significant increase in world farmed-salmon production, expansion of ASMI's statutes to reflect changes in world salmon markets. In particular, ASMI's marketing efforts could be expanded to include new product and market development, including targeting and distribution of salmon products at the wholesale and retail levels.
- Providing funding for ASMI's Salmon Recovery Proposal.
- Supporting the Salmon Strategy Task Force's recommendation that ADF&G review the impact of fisheries management practices on fish quality, especially related to the quality of cost-recovery fish harvested in terminal areas.
- Conducting a comprehensive analysis of ASMI privatization including whether 1) privatization would provide greater flexibility and possibly more effective marketing and 2) privatization would result in the loss of control over marketing activities to the detriment of Alaska and Alaska fishermen.
- Encouragement of the development of a national salmon marketing council.

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## **CHAPTER XI.            OTHER ISSUES**

### **A.    USE OF ENHANCEMENT AS ENVIRONMENTAL MITIGATION**

*Hatcheries are sometimes built with the goal of mitigating environmental damage caused by such things as construction of dams and other projects, and water pollution.* The goal of environmental mitigation has been a driving force in salmon hatchery development in the Pacific Northwest, particularly in association with dams on the Columbia River.

In contrast, Alaska's hatchery system has been developed for fisheries enhancement, mitigation of the effects of over-fishing, and the offsetting of reductions in fishing quotas for Alaskan fishermen negotiated as part of the U.S./Canada Salmon Treaty. However, Alaska law does contain several provisions regarding use of fisheries enhancement projects as a means of mitigating environmental damage. The primary one is the "Fishways Act."

Alaska Statutes 16.05.840 through 860, referred to as the "*Fishways Act*," gives the Commissioner of Fish and Game the authority to require the builder of a dam or other obstruction across a stream containing fish to provide and maintain a fishway or other device for fish passage. Where a fishway is not practical because of cost, the builder of the obstruction can choose among several other mitigation options with the approval of the commissioner. The options include:

1.     Paying a lump sum to the state Fish and Game Fund;
2.     Conveying land and funding the building, maintenance and operation of a fish hatchery, rearing ponds, buildings and other facilities; or
3.     Agreeing to provide money (both initially and in annual payments) to expand, maintain, and operate additional facilities at existing hatcheries within a reasonable distance of the dam or obstruction.

The Fishways Act was passed in 1959. Since that time, other environmental protection laws and regulations have been enacted setting water quality standards and regulating the types, locations, designs, and allowability of development projects. The *Anadromous Fish Act* (AS 16.05.870) is especially important as it spells out requirements for pre-approval of any projects which could potentially impact fish or fish habitat. This Act and other environmental protection requirements work in conjunction with the mitigation requirements in the Fishways Act.

According to the Department of Fish and Game, the requirement to provide a fishway, either as a permanent structure or as a temporary one during construction, logging, or other work, is used frequently. The State often requires construction of spawning channels in streams that are being disturbed by such things as highway projects. *Although the other provisions of the Fishways Act which require construction of hatcheries or monetary compensation are rarely imposed, state officials believe their existence in statute encourages modifications in project plans that will avoid the actual stream obstruction and serious risk to fish that would activate these very expensive mitigation measures.*

Obviously, preventing damage to fish and fish habitat in the first place is the simplest and most practical means of ensuring the health and ongoing availability of fish. State and

Federal officials are charged with making every effort to ensure that the siting, planning and construction of any development project is done in a way that avoids or minimizes potential damage. *Realistically, however, development will occur which will damage fish and fish habitat. In those cases where environmental protection methods, even fishways, cannot prevent that damage, mitigation of some sort is usually required by law.* In other states and countries, hatchery production has indeed provided enough fish to keep some commercial and sport fisheries alive, at least for a time, that would otherwise have been curtailed due to a lack of fish. This is particularly true in areas where major dam projects or pollution have completely changed or destroyed salmon habitat and spawning patterns. To fishermen in an affected area, hatcheries seem better, at least initially, than no mitigation at all.

*While salmon and steelhead hatcheries do produce fish to offset declines in natural runs, there is increasing concern among some scientists in the Pacific Northwest that under some circumstances hatcheries may actually cause the further depletion of already suffering natural stocks, even to the point of extinction.* These concerns are further addressed in Chapter VII of this report, regarding biological and genetic issues.

*It is important to note how the federal Endangered Species Act (ESA) relates to the matter of using hatcheries as a means of mitigating environmental damage. In the state of Washington, where hatcheries have been used extensively with mitigation as a goal, scientists and fishermen are concerned that regardless of how productive hatcheries might be, they cannot prevent the federal government from invoking the provisions of the ESA if particular stocks are declared endangered.* Indeed, the National Marine Fisheries Service (NMFS), which has jurisdiction over endangered species, proposed in 1991 that one stock of Snake River sockeye be listed as endangered under the ESA, and that two stocks of Snake River chinooks be listed as threatened. Decisions on two more salmon stocks (in the Snake and Columbia Rivers) are expected soon.

The Washington Legislature is considering legislation to address issues which have arisen from the application of the ESA to Washington's salmon. These issues include salmon habitat, wild stock protection, tagging of hatchery stocks, and how to define "species" or "stocks" of fish.

*Declaration of a salmon stock as "endangered" can have enormous impacts on fisheries and local and state economies. Since salmon are migratory, any restrictions placed on fisheries to protect a particular stock could affect fishing hundreds or even thousands of miles from the spawning area of that stock.*

The Endangered Species Act in effect sets the parameters within which hatcheries can be used to mitigate environmental damage. The Act does not recognize the creation of strong runs of one stock of salmon, through hatcheries or other enhancement efforts, as adequate compensation for the destruction of another stock. If a natural stock is at risk of becoming "endangered," the ESA will not allow for hatcheries to serve as a substitute for damaged habitat. The end result is that efforts to mitigate damage through hatcheries can backfire, closing down fisheries rather than enhancing them, if the hatcheries contribute to the further depletion of a stock. *Thus, to avoid the impacts of the strict protective measures which can be imposed under the ESA, primary concern must be focused on preservation of wild stocks.*

It should be noted however, that in some instances, such as where dams have irreparably destroyed the ancestral habitat of a particular salmon stock, a carefully designed hatchery or other enhancement project may represent the only hope for survival of that stock. For the purposes of ESA, federal law defines "conservation" as including "propagation" if it is necessary to help an endangered or threatened species recover. *Thus, while the ESA serves as a warning against hatchery development that could deplete natural stocks, it also recognizes the potential usefulness of hatcheries in the ultimate survival of an endangered stock.*

Judgement about how effective hatcheries can be for "mitigating environmental damage" must be made on a case by case basis and with a recognition that mitigation is just that, a means of minimizing or offsetting some of the change or damage. Hatcheries can produce new harvestable salmon, but they do not generally repair or duplicate a damaged resource. Hatchery production of fish is an expensive ongoing commitment. *The use of hatcheries to mitigate damage must be employed with the understanding that salmon which have been provided "free" and perpetually by nature, are being replaced by salmon that will initially and continuously cost money to produce.* This cost, along with the possibility that hatcheries may harm remaining natural stocks, must be realistically considered and weighed in each case, against what is to be gained through the project that will cause the damage and set the mitigation effort into motion.

#### **OPTIONS FOR POSSIBLE CONSIDERATION:**

- Re-evaluation of the state Fishways Act and Anadromous Fish Act in light of the provisions of the federal Endangered Species Act.
- Evaluation of whether specific consideration of potential consequences of the ESA should be required before the commissioner can pre-approve a project (under the Anadromous Fish Act) or approve of mitigation measures (under the Fishways Act).
- Tracking the current and upcoming debate and actions occurring in other areas, particularly the state of Washington, regarding environmental mitigation of damage to fish habitat. Determine the relevance of findings to Alaska.

#### **B. ROLE OF ENHANCEMENT IN INTERNATIONAL TREATIES**

##### **U.S./Canada Pacific Salmon Treaty**

After many years of negotiation, the United States and Canada signed a treaty in 1985 regarding the interception of Pacific Salmon. *The primary goals of the treaty were to protect and rebuild depleted salmon stocks, assure the long-term viability of salmon stocks within the jurisdiction of the treaty, and bring equity by providing that each country receive benefits from the fisheries which are roughly commensurate with their respective production of salmon in the treaty area.* Fisheries management guidelines for the region covered by the treaty (Oregon, Idaho, Washington, Southeast Alaska and British Columbia, Canada) are provided in a series of annexes to the treaty which are renegotiated on a regular basis. The annexes establish baseline-harvest numbers for many areas but the authority over allocation

of fish between user groups within specific areas is maintained by the respective states, provinces, and tribes.

In 1983, a tentative treaty agreement was reached, but Alaska fishing groups found the provisions to be unacceptable and the treaty was not signed. Concerns centered on the concessions to be made by Alaska in the treaty. The reduction in the level of chinook salmon that Alaska trollers would be allowed to harvest was especially controversial. Key to the eventual acceptance of the treaty by Alaska was an offer by the U. S. federal government to give Alaska approximately \$20 million for salmon enhancement to help offset impacts of the treaty. *This mitigation money was not part of the negotiated multi-party treaty. It was a separate agreement between Alaska and the U.S. federal government, offered fundamentally as an incentive to Alaska to agree to the treaty.*

Under the terms of the treaty, Alaska hatchery fish caught after 1985 were not to be counted as part of the negotiated quota of allowable catch, and could be taken in addition to that quota. *While everyone involved seemed to understand that the federal mitigation money was intended to replace what the Southeast Alaska fisheries groups had lost in the treaty settlement, the specific purpose of the money was not clearly spelled out at the time of the agreement. This lack of clarity and documentation has caused considerable confusion and controversy over the years.* Initially many fishermen and the Alaska Department of Fish and Game believed that the money was to go towards an annual production goal of 100,000 chinook for the trollers, 1,000,000 chum for the seiners, and 20,000 to 40,000 sockeye for the gillnetters. Although the state appears to have honored the general purpose of salmon enhancement with the mitigation funds, it has not spent the funds in accordance with the most widely-held understanding of the intent for those funds.

The governments of Washington and Oregon have not allocated any funds specifically for enhancement projects related to this treaty. British Columbia instigated a treaty-related enhancement project on the Fraser River, but has since run out of funds to continue it.

A computer model was developed to calculate the allowable catch of each of the parties to the treaty, and to update that quota annually. Information about hatchery-bred fish indicates the health and numbers of the natural stocks for the computer model.

*Alaska fishermen agreed to the Pacific Salmon Treaty, despite the sacrifices it required in their allowable catch levels, because of guarantees that increased hatchery efforts and production would result in increases in these allowable catches.* For reasons which may have included misunderstandings of original intentions, a lack of clear binding language in the treaty, or ineffectual negotiating at annual sessions to update agreements and re-negotiate treaty annexes, many fishermen are dissatisfied with what the treaty has accomplished. Hatchery efforts funded with mitigation funds have indeed produced salmon, but fishermen, particularly trollers, do not believe they have received the benefits they were promised from that production.

While fishermen may not have seen the specific benefits they had hoped for in the form of increased allowable catches, the state hatchery program has received more funding than it would have had without mitigation funds, and the Alaska Department of Fish and Game has been able to use mitigation money to supplement their budget for projects and personnel which are related directly or indirectly to the goals of the treaty.

## **Yukon River Treaty**

Salmon restoration and enhancement have been discussed as part of the United States/Canada Yukon River salmon negotiations since 1985. The goal of the United States in these talks has been to ensure the long-term health of salmon stocks and assure consistency in harvest for both countries of the Yukon River system.

The U.S. proposal, agreed to by the Alaska Department of Fish and Game, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the Yukon River Drainage Fisheries Association, includes:

- Restoration projects to increase production of transboundary stocks that do not respond to harvest management.
- Fisheries enhancement projects where appropriate, consistent with state genetics and disease policies.
- Planning strategies to allocate and manage restored stocks before the program starts.
- Operational plans for enhancement projects, with protection of wild stock genetic diversity as the paramount concern.

The FRED Division has developed a Yukon Fisheries Enhancement Initiative with its key components being overall design and planning work, expansion of the Clear Hatchery near Nenana, Alaska, and rehabilitation of natural salmon production. The cost of this initiative is estimated to be more than \$13 million.

*Fishermen along the Yukon are primarily interested in bringing natural stocks back to historic levels. Rehabilitation projects and protection of wild stocks are their top priorities.*

Some biologists believe that supplemental hatchery production on the Yukon River will only further complicate mixed stock fisheries management, and risk the reduction or elimination of small wild stocks. They are also concerned about the risks of genetic dilution of natural stocks, reduced stock fitness, and disease.

## **OPTIONS FOR POSSIBLE CONSIDERATION:**

- Evaluation of the effectiveness of enhancement as an international treaty component.
- Requirement of a comprehensive feasibility and benefit-cost analysis of enhancement in treaty proposals prior to treaty agreements. Because state agency budgets tend to "benefit" from enhancement agreements, consider contracting these reviews to disinterested third parties.
- Development of an auditing mechanism to determine if enhancement benefits are realized by fishermen impacted by treaty agreements.

### **C. ENVIRONMENTAL REGULATIONS RELATED TO ENHANCEMENT**

There are a number of environmental considerations involved in the siting, construction, and operation of hatcheries. In addition to the biological and genetics matters associated with the fish and eggs themselves, other environmental protection issues include the siting of hatcheries, their water usage requirements, the effluent they produce, and the disposal of fish carcasses (of broodstock or fish which are excess or diseased).

*While Alaska law does not contain many environmental statutes and regulations which are specific to hatcheries, it does have a number of general provisions regarding protection of the environment which come into play during the planning, development, and operation of hatcheries.* These include the Anadromous Fish Act which controls and requires approval for any construction projects or other action which might affect "rivers, lakes or streams or parts of them that are important for the spawning, rearing or migration of anadromous fish"; the Fishways Act which requires the construction of a fishway or hatchery construction if a dam or other obstruction will impact the passage of fish (see section on environmental mitigation); plus many laws and regulations about water quality and pollution, protection of genetic purity of fish stocks (see chapter on biology and genetics), fish health inspections (AS 16.05.868), and siting of hatcheries.

*A significant environmental protection issue associated with hatcheries is the discharge of waste into public waters.* The procedures and permits required of hatchery operators in this regard have been confusing and in a state of flux for several years, but now seem to be headed for some resolution and streamlining. Part of the confusion stems from the fact that both the Federal Environmental Protection Agency (EPA) and the Alaska Department of Environmental Conservation (DEC) have some jurisdiction in this matter.

It appears that both EPA and DEC have been fairly lenient about requiring the various waste disposal permits that have technically been required. Even so, there have been very few complaints or problems regarding hatchery impacts on water. Hatcheries do discharge effluent which may contain organic fish waste, as well as some disinfectants or other chemicals used to prevent or control disease, but generally they discharge only very small amounts of pollutants. *However, recent developments necessitating the disposal of large numbers of fish carcasses have raised the subject of waste disposal monitoring.* These developments include 1) a joint decision by the Federal Food and Drug Administration and the Alaska DEC in 1990 that the carcasses of hatchery broodstock (mature fish used for the taking of eggs and milt) should no longer be sold for canning for human consumption, and 2) the recent huge returns of fish, particularly in Prince William Sound, which have resulted in the inability of hatcheries to sell large numbers of their "cost-recovery fish." Both of these developments demonstrated the need to establish procedures for hatcheries to dispose of large numbers of fish carcasses.

The federal Clean Water Act prohibits the point source discharge of pollutants by any person into the waters of the United States, except in compliance with the terms and conditions of a National Pollutant Discharge Elimination System (NPDES) permit issued by EPA. *Under federal regulations, discharges of concentrated aquatic animal production facilities require NPDES permits.* The regulations identify the annual level of production and feeding of a facility to require an NPDES permit, but also leaves to the EPA the discretion to require the permit of any facility it deems to be a significant contributor of pollutants.

In a January 1991 letter to all hatchery operators in Alaska, the EPA explained these requirements and noted that even if the regular operations of a hatchery did not fall under the NPDES permit guidelines, a permit would be required if the operator planned to dispose of fish carcasses in the water. It further explained that fish processors who dispose of greater than 1000 pounds of waste per day may be covered by the "Authorization to Discharge Under the National Pollutant Discharge Elimination System for Alaska Seafood Processors" general permit (the GP), and that for the purposes of carcass disposal, the EPA was willing to cover hatcheries under the same GP. The letter explained that this "greatly simplifies the administrative process and reduces the time frame in which a NPDES permit is obtained." The letter ended by asking that hatchery operators notify the EPA of their plans for fish waste disposal prior to the 1991 season.

In April 1991, the Anchorage EPA office sent another letter to all hatchery operators stating that many of the responses they had received to the January letter had raised a number of issues to be considered. Since resolving these issues is likely to take some time, the EPA established an interim policy to allow the hatcheries to operate and to provide for environmental protection in the interim period. The letter goes on to lay out three conditions under which the disposal of whole fish carcasses would be permissible. The criteria include 1) the depth of water where discharge may occur, 2) a requirement of pre-approval of the discharge site by EPA, and 3) a requirement that the skipper of the discharge vessel maintain records of each discharge occurrence, its location, and the date.

Alaska is currently operating under the interim criteria spelled out in the EPA's April 1991 letter. Many hatcheries, particularly state-run hatcheries, have submitted their applications for the NPDES permits to EPA. However, the EPA considers these state hatcheries to be minor dischargers and has agreed to turn over to the state the authority for permitting and monitoring of their waste discharge. EPA has forwarded copies to DEC of all the NPDES permit applications they have received from hatchery operators, and has asked that the state implement a hatchery waste permitting process.

*Under current state law, hatchery effluent is covered under the DEC waste disposal permit statute (AS 46.03.100).* DEC reports that few hatcheries apply for this permit but DEC has been comfortable with the situation, and has made permitting hatcheries a low priority, since hatcheries generally handle effluent in a manner that maintains acceptable water quality standards.

DEC has drafted a "General Waste Disposal Permit for Fish Hatchery Discharges," to be issued to hatcheries to fulfill the state waste permit requirement. Once the state has officially adopted this permit, hatchery operators will obtain waste permits only from DEC under the operating agreement between DEC and EPA. This state permit would in effect fulfill both state and federal waste permit requirements. This centralization and consolidation should simplify the permitting and reporting processes for hatchery operators, ensure more compliance, and improve uniformity in the monitoring and information available.

The state's draft permit contains a provision stating that the permit is effective until a specified date, "unless superseded before that time by a state certified EPA permit." This statement is included in order to provide for any potential situation in which EPA might require an NPDES permit, which would then supersede the state permit. The draft permit contains specific language regarding discharges, carcass disposal, drugs, chemicals and medications, operational, monitoring and reporting requirements, and so on. It lacks specific language to address disposal of diseased fish or eggs but other general provisions

in the permit, or language in the hatchery operational permits from ADF&G may sufficiently provide for that circumstance.

*Despite the lack of clear regulations and enforcement, and the confusion over federal and state requirements, there have been very few problems reported regarding such things as hatchery waste disposal in Alaska.* Even during the situation in Prince William Sound during the 1991 season when processors would not buy many of the hatchery fish that later had to be dumped, both DEC and EPA report that their agencies worked very closely with the hatcheries to devise and carry out plans for large-scale carcass disposals, and things went quite smoothly. The Alaska Departments of Fish and Game and Environmental Conservation, and the federal Environmental Protection Agency, generally believe that for this aspect of environmental protection, current laws are adequate.

Other environmental issues related to hatcheries are covered in this report in the chapters on Biology and Genetics, Planning and Permitting, and Environmental Mitigation. The topics covered in those chapters appear to raise more serious and complex environmental concerns and questions, and need more extensive review, than the more direct environmental protection regulations discussed here.

#### **OPTIONS FOR POSSIBLE CONSIDERATION:**

- Encouraging DEC and EPA to coordinate waste disposal permitting requirements to the extent possible.
- Ensuring that adequate direction is provided in regulation regarding the disposal of any diseased hatchery fish.

#### **D. USE OF ENHANCEMENT AS TOOL FOR ECONOMIC DEVELOPMENT**

The state's financial support of hatchery production and other enhancement efforts has focussed primarily on Southeast Alaska, Prince William Sound, Cook Inlet, and Kodiak. However, fisheries enhancement is increasingly being viewed in other rural areas of the state as a tool for local economic development. Potential benefits from enhancement activities include the increased number of jobs, the potential for attracting processors or other value-added businesses to the region, as well as increased harvest for fishermen.

In some cases, the regions interested in enhancement for economic development have small, localized commercial fisheries based on local stocks of fish which in many cases are depleted, and which local residents would like to see replenished. In other areas of the state, residents are interested in the potential of creating entirely new fisheries. For many rural areas of the state, fisheries development represents the most viable - and in many cases, perhaps the only - opportunity for economic development.

Some of the projects being discussed and planned include:

- Sikusuilag Springs Hatchery.* Residents of Kotzebue Sound are meeting with a planning core group that includes ADF&G, the National Park Service, and the Northwest Arctic Borough to develop increased production proposals as part of a basic management plan for this small state hatchery located on the Noatak River.

A regional aquaculture association will probably be established in 1992, and a comprehensive salmon plan for the region should be completed in 1993.

- Yukon Enhancement Initiative.** Residents of the Yukon River area are organizing an aquaculture association and seeking legislative funding so that regional enhancement planning can be reactivated and expanded. A draft comprehensive salmon plan could be completed by early 1994. Enhancement efforts are also being considered as part of the U.S./Canada Yukon River treaty negotiations.

- Western Alaska.** Feasibility studies are underway for potential fisheries enhancement projects in the Nelson Island/Chevak area. Local villages and the Bering Sea Fishermen's Association are contributing to the effort, with additional funding requested from the Bureau of Indian Affairs and the National Coastal Resources Research and Development Institute. Although there are no natural runs currently, fishermen in this region are interested in developing salmon returns in streams that are ice-free year round.

- Norton Sound Economic Development Initiative.** Under this proposal, developed in February 1991, FRED Division is providing technical support in developing a fisheries enhancement program at Elim, including stream rehabilitation and a possible hatchery.

- Port Graham Salmon Development Project.** The goal of this pink salmon development project is to create a local village economy based on high quality value-added salmon products. The goal of the hatchery is to produce fish for the processing plant.

- Kake Nonprofit Fisheries Corporation.** This southeast Alaska community proposes to expand its Gunnuk Creek Hatchery with the express goal of contributing to the economic development of the village. Kake has historically been a fishing village, but in recent years saw logging replace fishing as the major form of employment in the community. Logging is now on the decline, and the village wishes to expand its fishing industry.

It should be noted that these enhancement proposals are subject to the same concerns and conflicts generated by enhancement projects elsewhere in the state. The continued interest in enhancement and in hatcheries however, should be a prime reason for addressing the issues highlighted in other chapters.

#### **OPTIONS FOR POSSIBLE CONSIDERATION:**

- Evaluation of how much weight to give the need for local economic development when considering a new hatchery permit application.

#### **E. IMPORTANCE OF ENHANCEMENT TO SPORT FISHERIES**

While the Senate Special Committee on Domestic and International Commercial Fisheries initiated the Legislative Review of Alaska's Fisheries Enhancement Program to evaluate the contribution of the program to commercial salmon fisheries, the role of the program in

sport fisheries warrants attention. This section summarizes information provided by a FRED Division report attached to this chapter.

Many projects in the statewide enhancement program produce fish, primarily chinook, coho, pink, sockeye, and chum salmon, steelhead, rainbow trout, grayling, and Arctic char, that are highly valued by sports fishermen. Fish targeted for sport fisheries are released in over 350 locations around the state. Many of the projects operated by the FRED Division are entirely dedicated to improving recreational fishing opportunities.

Sport fishing has been growing in Alaska as evidenced by the increase in the number of licensed anglers from 1977 (200,000 total license sales) to 1990 (425,000 total license sales). This dramatic increase in sport fishing participation can be attributed to many factors, including changes in population, real per capita income of residents and non-resident visitors, and the opportunities for quality sport fishing experiences. A major component of a high quality fishing experience, especially for resident anglers, is the probability of catching a fish during the fishing experience (called the harvest per angler day). According to ADF&G, the economic value of fishing experiences are directly related to higher harvests per angler day. The statewide enhancement program has been a key factor in maintaining and augmenting these harvests despite increasing fishing effort.

*The statewide salmon enhancement program has grown to the point of supporting a significant portion of total sport and commercial fishing harvests.* For example, total 1990 recreational harvests of salmon, trout, grayling, Arctic char, and steelhead was approximately 1.3 million fish. The enhancement program is estimated to have contributed 28 percent of the harvest. State facilities provided 73 percent of the enhancement harvest while PNPs provided 27 percent.

According to recent studies completed by the ADF&G, sport fishing provides significant economic benefits in Alaska. A draft study prepared by ADF&G is attached.

#### **OPTIONS FOR POSSIBLE CONSIDERATION:**

- If the Legislature initiates an on-going enhancement program review similar to Canada's, include sport as well as commercial fishing aspects of the program in order to achieve a more comprehensive performance report.
- Increasing the sport fish license fees or changing priorities of sport fish funds to pay for a larger portion of the enhancement projects that benefit recreational fisheries.
- Encouraging Congress to increase Dingle-Johnson funds provided to Alaska to support increasing sport fishery enhancement and rehabilitation efforts.

#### **F. CONTRIBUTION TO SUBSISTENCE FISHERIES**

In addition to commercial and sport fisheries, there is increasing demand for the state's enhancement program to provide fish for subsistence and personal use fisheries.

Sikusilaq Hatchery on the Noatak River provides a substantial number of chum salmon for subsistence gillnets in Kotzebue Sound and on the Noatak. Subsistence users in southern Southeast harvested 5,000 sockeye salmon produced from the McDonald Lake

fertilization project. Production from the Klawock Hatchery, located on Prince of Wales Island, is extensively used by subsistence fishermen.

**OPTIONS FOR POSSIBLE CONSIDERATION:**

- If the Legislature initiates an on-going enhancement program review similar to Canada's, include subsistence and personal use as well as commercial and sport fishing aspects of the program in order to achieve a more comprehensive performance report.

**G. ENHANCEMENT OF OTHER SPECIES**

In addition to its work on such sport fish species as grayling, rainbow trout, and arctic char, FRED Division is also exploring king crab rehabilitation in a cooperative effort with Kodiak fishermen and the Kodiak Island Borough. Additional funding is being requested from the Alaska Science and Technology Foundation in order to examine shellfish rehabilitation projects in other countries and states.

Currently, research and production of non-salmon species is done almost entirely by the FRED Division. If private entities became interested in taking on such efforts, statutory changes would be required since the entire PNP program is based on salmon production.

**OPTIONS FOR POSSIBLE CONSIDERATION:**

- Amending statutes to allow the private sector to enhance non-salmon species.
- Taking action to encourage the production of non-salmon species.

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Draft

**The Scope, Importance and Economic Value of the Fishery  
Enhancement Program to the Recreational Fishery in  
Alaska**

Edited by  
Jeff Hartman

Alaska Department of Fish and Game  
Division of Fisheries Rehabilitation,  
Enhancement and Development

Carl L. Rosier  
Commissioner

J. P. Koenings, Ph.D.  
Director

P.O. Box 25526  
Juneau, Alaska 99802-5526

February, 1992

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# **The Scope, Importance and Economic Value of the Fishery Enhancement Program to the Recreational Fishery in Alaska**

## **Introduction.**

### The importance of enhancement program to the recreational fishery.

Many projects in the statewide enhancement program produce fish that are highly valued by sports fishermen, primarily chinook, coho, pink, sockeye, and chum salmon, steelhead, rainbow trout, grayling, and arctic char. Fish targeted for sport fisheries are released in over 350 locations around the state. Many of the projects in the state operated portion of the program (FRED Division) are entirely dedicated to improving recreational fishing opportunities.

This chapter summarizes the size and distribution of enhanced harvests, type of economic effects that result from the harvests, other non-market values associated with tourism, and to the extent possible, magnitude of these effects on Alaska's economy. Additionally, a discussion of some of the issues and conflicts relevant to the enhancement of recreational fisheries are presented.

Sport fishing has been growing in Alaska since Statehood. This is evidenced by the increase in the growth in the number of licensed anglers fishing in Alaska from 1977 (200,000 total license sales) to 1990 (425,000 total license sales) (Mills 1991).

The explosive growth in sport fishing participation in Alaska can be attributed to many factors, including changes in Alaskan population, real per capita income of resident and non-resident visitors, and the opportunity to have a good quality fishing experience. A major component of a high quality fishing experience, particularly for resident anglers is the probability of catching a fish during an angling experience (called the harvest per angler day) (Jones and Stokes 1991). The economic value of fishing experiences are directly related to higher harvests per angler day. The statewide enhancement program has been a key factor in maintaining and augmenting these catches in the presence of increasing fishing effort.

### Magnitude of recreational fishing from the Enhancement Program.

The statewide salmon enhancement program has grown in recent years to the point of supporting a significant portion of the total Alaska fin fish harvest. Total finfish harvests in 1990 in the Alaska Recreational fishery were 1,995,360 (Mills 1991)<sup>1</sup>. Total finfish harvest of trout, salmon, grayling, and arctic char and steelhead was 1,341,741. The enhancement program contributed over 28 percent of the harvest of salmon, trout, grayling, arctic char, and steelhead (Table 1.)(Fig. 1)(McKean 1991 and Mills 1991).

The state operated enhancement program produced 270,983 salmon, trout, grayling, char and steelhead in 1990, while PNP operators contributed 98,910 salmon to the recreational harvests for a Total of 369,893 fish (Table 1) (Fig. 2). The total recreational harvest from enhancement in 1991 is estimated to be 357,370 (Holland and McKean 1992).

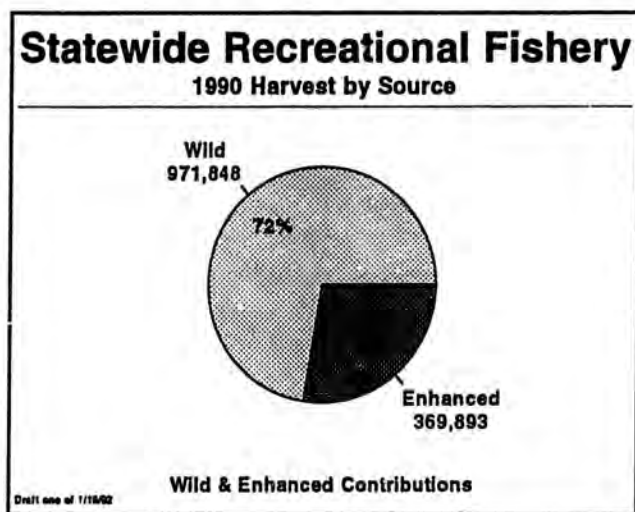


**Figure 1**

Table 1. Number and Percent of Enhanced Salmon, Trout, and other enhanced species harvested in 1990 in comparison with total harvest in the recreational fishery.

| Species          | king    | searun<br>coho | sockeye | pink    | chum   | landlocked<br>coho/chin | rainbow | other   | total     |
|------------------|---------|----------------|---------|---------|--------|-------------------------|---------|---------|-----------|
| FRED harvest     | 16,100  | 33,447         | 3,550   | 3,900   | 0      | 37,831                  | 170,283 | 5,872   | 270,983   |
| PNP harvest      | 1,517   | 34,754         | 0       | 54,867  | 7,772  | 0                       | 0       | 0       | 98,910    |
| Enhance total    | 17,617  | 68,201         | 3,550   | 58,767  | 7,772  | 37,831                  | 170,283 | 5,872   | 369,893   |
| Wild totals      | 106,291 | 257,735        | 235,568 | 146,835 | 6,753  | 0                       | 21,526  | 197,140 | 971,848   |
| Grand Total      | 123,908 | 325,936        | 239,118 | 205,602 | 14,525 | 37,831                  | 191,809 | 203,012 | 1,341,741 |
| % harvest enhanc | 14.22%  | 20.92%         | 1.48%   | 28.58%  | 53.51% | 100.00%                 | 88.78%  | 2.89%   | 27.57%    |

<sup>1</sup> Over 1 million razor clams were also harvested in 1990 in non-finish fisheries.

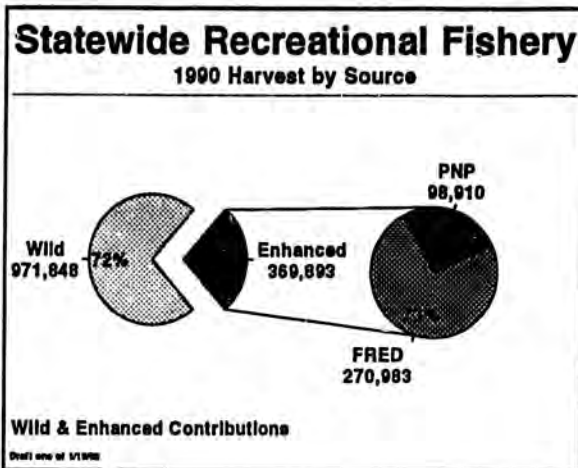


**Figure 2**

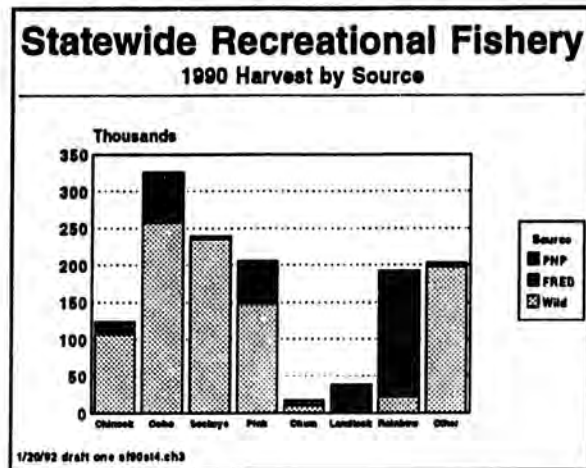


**Figure 3**

List of selected enhancement projects that have dramatically increased recreational catches.

- o Eighty nine percent of the 192,000 rainbow trout harvested by sport fishermen in Alaska in 1990 originated from state operated hatcheries (Fig. 3)(McKean 1991, and Mills 1991)<sup>2</sup>.
- o Of 37,831 coho and chinook landlocked sport harvests, 100% were produced by state hatcheries in 1990 (McKean 1991, and Mills 1991).
- o Between 1987 and 1990, 47% of the coho salmon harvested in the popular Resurrection Bay sport fishery originated from enhancement projects at Elmendorf Hatchery, Trail Lakes Hatchery, and Bear Lake rearing Facility. The average sport harvest of enhanced fish was 9,910 (McKean 1991).
- o Harvests of coho salmon from enhancement projects in the Juneau area increased by 21 fold (2,166%) between 1990 and 1991 from 1,174 to 21,664 fish (McKean 1991). Most of the increased harvests in 1991 were estimated to originate from Gastineau Hatchery operated by Douglas Island Pink and Chum (Holland and McKean 1992).
- o In 1991 the Homer Spit recreational fishery produced 10,000 coho salmon, 3,500 chinook salmon, and 500 pink salmon entirely from enhancement releases from Crooked Creek Hatchery.

<sup>2</sup> While enhanced harvest statistics are available for recreational fisheries in 1991, statewide harvest statistics for wild and enhanced fish are produced on a one year lag, so 1990 is the most recent year that total and enhanced harvests may be contrasted.

- o Southeast chinook salmon production in 1991 totaled almost 38 thousand adult fish returning with another 5 thousand pan-sized fish harvested in stocked lake fisheries. Over six thousand adults and 5 thousand sub-adults were harvested in marine and freshwater sport fisheries.
- o The Elmendorf and Crooked Creek Hatchery increased the harvests of king salmon by 4,800 and coho salmon by 1,655 in the 1990 Kasilof River Recreational Fishery.

#### Contribution of enhancement program to community fishing derbies.

Dozens of fishing derbies are conducted each year in Alaska. Fishing interest groups and vendors, and municipalities are the major organizers of these events. Approximately one dozen of these derbies produce large harvests of fish into the recreational fishery (Table 2). The major reason that communities hold derbies is to increase the amount of economic activity in an area or to collect revenue for charity.

Retail businesses in some communities depend upon the angler related spending that occurs during a derby to sustain a large portion of their annual gross receipts. The ability of a derby to attract the angling public depends largely on the ability of the fishery to supply a good fishing experience with acceptable catch levels.<sup>3</sup> The enhancement program augments catch opportunities and in some cases is the primary source of fish harvested during the derby. In Alaska some derbies would not be able to exist without fishery enhancement (i.e. Valdez coho derby pers. comm. Paul McCollum) others would not attract nearly as many participants without the acceptable catch rates offered by fishery enhancement. Approximately 82% of the salmon harvested in Alaska's major fishing derbies have originated from the statewide enhancement program (Fig. 4).

#### List of major fishing derbies in Alaska, augmented by enhancement

1. Juneau sport fish Derby
2. Ketchikan sport fish Derby
3. Wrangell/Petersburg
4. Sitka Derby
5. Seward Coho derby.
6. Valdez Derby
7. Big Lake Derby
8. Seldovia
9. Community of Houston
10. Assorted Kodiak derbies

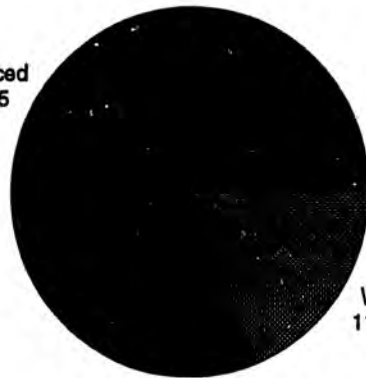
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<sup>3</sup> Weather conditions, income, and substitute recreational activities, and the opportunity to compete for prizes, are also known to affect participation in fishing derbies.

## Statewide Recreational Fishery Fishing Derby Harvest

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Enhanced  
50135



Wild  
11655

Wild & Enhanced Contributions

Figure 4

Table 2. Fishing Derby Harvests, including numbers of enhanced fish by species, percent of enhanced fish by species for 1991 and other selected years.

| Derby Name                      | Species | Location   | Enhanced Harvest | Wild Harvest | % Enhanced |
|---------------------------------|---------|------------|------------------|--------------|------------|
| Golden North(1991) <sup>a</sup> | Chinook | Juneau     | 136              | 522          | 26.0%      |
|                                 | Coho    | Juneau     | 173              | 2,567        | 15.8%      |
| Petersburg(1991) <sup>a</sup>   | Chinook | Petersburg | 228              | 422          | 35.1%      |
| Wrangell(1991) <sup>a</sup>     | Chinook | Wrangell   | 48               | 173          | 21.7%      |
| Sitka(1991) <sup>a</sup>        | Chinook | Sitka      | 270              | 980          | 21.6%      |
| Seward(1989) <sup>c</sup>       | Coho    | Seward     | 9,280            | 5,581        | 62.4%      |
| Valdez(1991) <sup>d</sup>       | Coho    | Valdez     | 10,000           | 500          | 95.2%      |
| Valdez(1991) <sup>d</sup>       | Pink    | Valdez     | 30,000           | 500          | 98.4%      |
| Total                           |         |            | 50,135           | 11,655       | 81.7%      |

<sup>a</sup> Memo from Paul Suchanek to Fred Gaffney 12/05/91

<sup>b</sup> Karen Crandall, Pers Comm. 1-15-91

<sup>c</sup> Doug Vincent-Lang Sport Fish Division Anchorage, pers comm. 1-91

<sup>d</sup> Paul McCollum, Valdez Fisheries Development Corporation, pers comm 1-91

#### Valuation and economic impacts of the recreational fishing that result from the statewide enhancement.

##### How are recreational benefits measured, and how does it differ from an expenditure and an economic impact?

The salmon, steelhead, trout, grayling, and Dolly Varden resource in Alaska provides at least two distinct forms of recreation. It provides an extensive saltwater and freshwater sport fishery, as well as non-consumptive recreation such as watching a run of salmon migrate and spawn. The same basic economic principles apply to determining the value of both forms of recreation in terms of how benefits are generated. However, the data bases differ for each kind of recreation and the methodologies developed for the sport fish evaluations will not be suitable for evaluating the non-consumptive forms of recreation.

Consumptive values from harvests and catches of fish could be likened to property values, in that they vary from location to location. Also, they vary in quality, just as a piece of property with a beautiful view or superior amenities may have a higher market value than an equal sized piece of property with a view of a city dump, and poor amenities.

In the context of a salmon or trout fishery, enhancement changes these consumptive values by increasing the abundance of fish available to anglers. This results in a larger catch which increases the harvest expectations of both current and prospective anglers. This will either cause a greater number of fishermen to go fishing, the current number of fishermen to spend more time fishing, or cause fishermen to receive a higher valued experience for the current amount of fishing effort. Since these angler decisions can occur simultaneously, economic models that estimate the value of these experiences may be quite complex. This chapter includes a short discussion of the methods used for valuing sport fishing benefits from enhancement projects and some analytical results of economic studies on enhancement.

When anglers expend more effort catching fish from an enhancement project they may spend a greater portion of their income in harvesting. For policy makers and fishing interest groups, expenditure data reported by anglers is frequently mistaken for the "value" of recreational fishing. The net economic value of a recreational fishing experience is what fisher's are willing to pay over and above their costs. These expenditures, however, are a "cost" to the consumer and must be subtracted from the total consumer surplus. While these expenditures are an unambiguous cost, they do produce economic activity in communities. This economic activity is referred to as "indirect effects" <sup>4</sup> in economics, and is further discussed in the impact section of this chapter.

#### Consumptive Values and economists use of the term "value".

Given the virtual free and open access to fisheries that are augmented by enhanced fish, the largest part of the incremental recreational benefits generated by FRED Division and the PNP program will accrue directly to recreationists in the form of consumer surplus. **Consumer surplus is a measure of the satisfaction people enjoy from their consumption of a commodity.** It is defined by what they would be willing to pay for it.

If charges could be levied for the rights to harvest enhanced fish, each individual would be willing to pay some maximum fee for the opportunity to participate in any particular type of fishing or other recreational opportunity. Further, the angler would choose to buy a certain number of units of that recreation at each unit price below that maximum. Of course recreationists do not buy angler days or days of salmon viewing as they do other commodities. None-the-less, this price quantity relationship does exist for each individual and forms his or her demand curve for fishing, viewing etc. The sum of all the individual demand curves forms the aggregate demand curve over all those willing to pay to participate in the recreation (Fig. 5).

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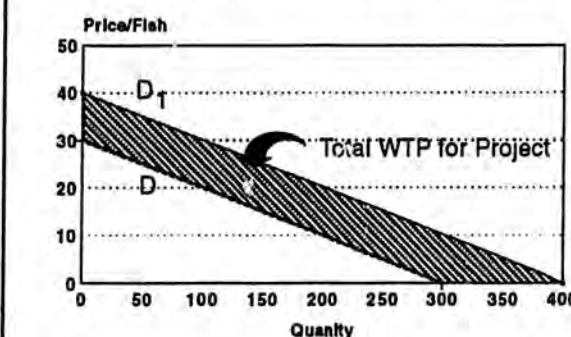
<sup>4</sup> Also, they are referred to as secondary effects, secondary impacts, and regional economic impacts.

In Fig. 5, the line D represents the aggregate demand curve for some particular recreational activity associated with the salmon, trout or other resource. The area under the curve is the total willingness to pay of all recreationists. It is a measure of the total satisfaction gained from consumption of the recreation if it is offered at no charge. This demand curve is influenced by many factors such as the price of complementary goods, by incomes and by the expectations and perceptions of those who participate. The availability of more fish as a result of the enhancement program causes the quality of the product to change, thus, shifting the demand for salmon and steelhead recreation from D to D1. The expectations of fishermen are raised over the prospect of improved catch success and this, in turn, improves what they are willing to pay for the experience. This increase in willingness to pay results in the consumption of more fish at each price. The shaded area between D and D1 is the increase in consumer surplus that results from an enhancement project.

The total willingness to pay differs from the net willingness to pay in that net WTP considers the additional cost of catching fish. In (Fig. 6), the net willingness to pay for a recreational experience is demonstrated by the difference between the total willingness to pay and the cost of fishing at a given price per fish. The consumer surplus is the shaded area above the price line and below the demand curve. This graph represents the net willingness to pay for a project that creates a new fishery, and does not represent an increment in catch for an existing fishery.

In addition to generating consumer surplus by increasing the abundance of fish in existing fisheries, the statewide enhancement program can generate consumer surplus by opening new sport fisheries. Enhancement projects which rehabilitate a diminished stock have been credited with re-opening sport fishing areas, and with expanding bag limits in a recreational fishery. The reopening of a sport

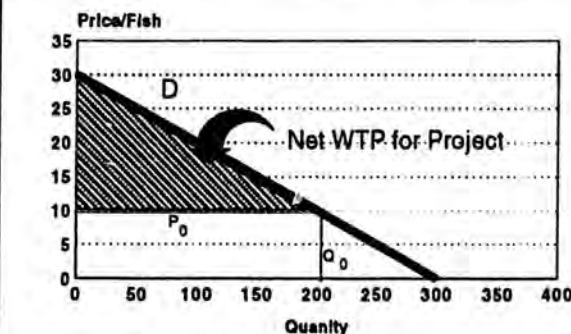
### Total Willingness To Pay (WTP) For An Enhancement Project



Draft of 1/22/92 SF90ln1.ch3

Figure 5

### Net Willingness To Pay (WTP) For An Enhancement Project



Draft of 1/22/92 SF90ln2.ch3

Figure 6

fishing statistical area, or relaxing of bag limits will often produce greater consumer surplus values than simply increasing catch rates during an existing opening.

Finally, there may be non-consumptive and nonuse values associated with the fishery. These values include existence, option or bequest values. People may gain satisfaction from the fishery not because they make use of it, but for other reasons. Viewing and education associated with fishery enhancement projects motivate tens of thousands of visits to state and PNP facilities each year. A discussion of some of the tourist visitation statistics are included in this chapter. Persons who never fish may still place a value on the continued existence of the fishery. Fishery rehabilitation projects have been applied to several streams with salmon populations that would be otherwise too small to sustain themselves in the future. Although nonuse values associated with fisheries in Alaska may be significant, they are not treated here.

### Valuation Statistics on Enhancement of Recreational Fisheries

The State of Alaska is fortunate to have some of the finest economic models in the North America for valuation of recreational fishing. Three studies by the consulting firm of Jones and Stokes, have been carried out since 1986 (Jones and Stokes 1987, 1989, and 1991). The work, which clearly represent the state of the art in recreational demand modeling cover the regions of South Central Alaska, Juneau, and Southeast Alaska. Areas not covered by the analysis include the Arctic, Yukon, Kuskokwim regions, Alaska Peninsula, Kodiak, and Bristol Bay. The State of Alaska has expended over \$600,000 in the development of the current models. The two valuation techniques applied in these studies are (1) a modified travel cost model approach and (2) contingent valuation procedures. While the methods for these two techniques cannot be described in detail here, some of the major findings of the studies, as well as difficulties with the models are summarized.

While enough cannot be said about the analytical quality of the three Jones and Stokes studies, several obstacles exist in actually applying some of the models to policy questions related to the Statewide fishery Enhancement Program.

1. The report for the South Central studies, and Juneau area studies do not include an analysis of current enhancement projects. Some net willingness to pay values are cited in the reports that are unfortunately, not relevant to evaluation of enhancement projects. The economic models created for the studies must actually be operated on a computer program to precisely estimate sport fishing values for policy analysis (unless a relevant policy analysis simulation was carried out under the contract). In fact, the estimates of average value for a day of fishing effort will be overestimates of the marginal value of an enhanced fish by a few percent to more than an order of magnitude. This is demonstrated in the Southeast economic study where average angler willingness to pay per king salmon harvested of \$616 was nearly three times the marginal angler willingness to pay

per fish of \$210 from a king salmon enhancement project (Jones and Stokes 1991). Thus, use of the average willingness to pay figures from the reports, could produce grossly distorted and spurious results when applied to policy questions requiring marginal or incremental values.

2. The South Central Economic Study (Jones and Stokes 1987) is extremely complex, and the models created in this study required initial calibration on a Cray super computer, during their formulation. The cost of carrying out simulations on the mainframe computer is prohibitive for day to day policy analysis. Furthermore, only the staff at Jones and Stokes and a few other economists in the U.S. are capable of operating the South Central Region discrete choice models.

3. Even if the computer simulation models were operated in their current state, many of the site/species statistical areas, that are sampled in the studies are not the sites in which enhanced fish are produced. Enhanced sites must be matched with similar site/species combinations in the surveys to approximate the value of a project. This would require some ADF&G Sport Fish Division staff time to carry out the site/species matches.

4. Applied cost benefit analysis with the Jones and Stokes models require the projection of some fairly detailed catch and effort information from the Department of Fish and Game. The logit Travel Cost models and Contingent Valuation models require detailed information on probable harvests and fishing effort (angler days) for each proposed project. This information must be projected by specific statistical area and by week of harvest.

5. The Jones and Stokes models produce valuation estimates for years between 1986 and 1988. To run simulations on present day policy questions requires some updating of the models. These updates would require some ADF&G staff time and some contractual resources for economic analysis.

For the proceeding reasons (1-5), a comprehensive study of the net benefits of the statewide fishery enhancement program to the recreational fishery has not been carried out. Such a study would be of critical importance for investment and allocation purposes and would complement the economic modeling that the Legislature is now undertaking on the value of enhancement to the commercial fishery. The costs of creating the necessary software to evaluate all projects in South Central region, would require approximately \$20,000. Additional running of simulations would require approximately 1 full year of work in a cooperative effort with FRED Division and the Division of Sport Fish. The simulation of the net benefits for projects in Southeast Alaska could be undertaken with fewer resources, since the computer software was produced as part of the contract. Both the South Central and Southeast Region fishery enhancement could be evaluated with an additional \$30,000 in contractual services, and with the better part of

a year of staff time from the FRED Division economist and 1/3 year of staff time from the Biometrics section of the Division of Sport Fish.

Selected statistics for the enhancement produced Southeast Alaska king salmon fishery.

The Southeast Alaska Sport Fishing Economic Study (Jones and Stokes, 1991) does produce some analytical results that are applicable to estimating the value of proposed king salmon enhancement actions.

- They are:
- (1) An estimate of the net willingness to pay estimates for a proposed increase in hatchery operations for king salmon enhancement of 20%, and
  - (2) A policy analysis question involving the estimation of an increasing in the opening for the Juneau Statistical Area for Chinook salmon fishing.

In brief, the first analysis applies direct survey questions about what amount anglers would be willing to pay for a fishing stamp to charge for improved chinook salmon fishing from the hatcheries in Southeast Alaska. The survey relates these proposed access fees to a 20 increase in production costs from the enhancement facilities. This in turn, was estimated to yield approximately a 30% increase in the average sport harvest of Chinook salmon in Southeast Alaska. While the production costs are not exact estimates, a special simulation of the models revealed that the increase of 8,900 harvests would result in an annual net willingness to pay of approximately 1.9 million dollars annually (1988 dollars) (Table 3). The average value for a chinook salmon in this scenario is approximately \$210 per harvested adult.

Table (3) Total Annual Willingness to Pay of Resident Angler Households in Southeast Alaska for a 20% increase in the King Salmon Harvest from Hatcheries

| Harvest Area                     | Hatchery<br>Operations |
|----------------------------------|------------------------|
| Ketchikan                        | \$380,688              |
| Prince of Wales                  | 340,958                |
| Kake/Petersburg/Wrangell/Stikine | 352,287                |
| Sitka                            | 362,983                |
| Juneau-Haines/Skagway            | <u>439,104</u>         |
| Total                            | \$1,876,020            |

The second economic statistic results from a proposed opening of the Juneau statistical area for King salmon fishing during the months of April, May, and June. This policy question focuses on a recent decision to open a portion of the Juneau Statistical area to early season king salmon fishing (from April 24 to June 18). During a previous opening of this statistical area over 1,130 king salmon were harvested, and a large increase in the number of days of effort were recorded. Angler net willingness to pay for this alteration was estimated using the travel cost, and contingent valuation methodologies. The change in the willingness to pay for the increased catch for this management action was between \$303,500 (from the results of the logit model) and \$398,000 (from results of the CV model) annually and from \$268 to \$352 per harvested fish respectively.

This simulation is similar to the approach that would be applied to computing the value of a Chinook enhancement project that increased the abundance of fish sufficiently to extend the length of the opening in a prime fishing area. For several reasons, the net willingness to pay for an identical increment in chinook harvests from a typical enhanced chinook fishery may be less than the WTP amounts cited in this example<sup>5</sup>, but they are probably within a similar magnitude.

While these valuation results must be offered with a note of caution, they probably provide an upper bracket for the marginal value of a Chinook salmon, produced by enhancement, and caught by recreational fishers in Southeast Alaska. The lack of updated computer software, designed to apply the Jones and Stokes models, is the major restraint to a comprehensive economic assessment of recreational net benefits for the statewide enhancement program.

#### Visitation Statistics for Hatcheries.

In aggregate, State and PNP hatcheries generate **nearly one half million visitor days from resident and non residents per year**. Visitation statistics have been compiled for the following hatcheries.

Table (4) Public and PNP facilities with visitor facilities and visitation records.

|                | Visits  |
|----------------|---------|
| Deer Mountain  | 150,000 |
| Elmendorf      | 65,000  |
| Ft. Richardson | 1,200   |

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<sup>5</sup>a. Most enhancement projects increase the catch per unit of effort in an established fishery opening, but do not result in outright extensions of area/time openings.

b. Harvests in this example consist of both enhanced and non-enhanced salmon. The Jones and Stokes models have demonstrated a small WTP premium for wild fish in the Southeast marine chinook salmon fishery.

|                                   |                           |
|-----------------------------------|---------------------------|
| Gastineau Hatchery (DIPAC)        | 100,000                   |
| Trail Lakes Hatchery (CIAA)       | 25,000 (20,000 to 30,000) |
| Bear Lake Rearing Facility (CIAA) | 12,500 (10,000 to 15,000) |
| Crooked Creek Hatchery            | 80,000                    |
| Valdez Hatchery (VFDA)            | 8,541                     |
| <hr/> Total                       | <hr/> 442,241             |

The tourism generated by hatchery visitation is one example of a non-consumptive value that is created by the statewide enhancement program. Non-consumptive recreational benefits generated by the enhancement program are in many ways more difficult to estimate than the benefits of sport fishing itself. Baseline information on the demand for such forms of recreation is scarce, but visitation itself is an indicator that people derive consumer surplus from these experiences. The value of a visit to a salmon enhancement facility can be compared with the value of visits to attractions such as Aquaria or a private zoo. The willingness to pay for entrance to the facility is a proxy for the minimum consumer surplus derived.

The visits vary in quality and time from facility to facility. Some facilities have extensive visitor amenities and visitation may consist of an hour or more in length. Other facilities have minimal visitor amenities and visitation may consist of a few minutes of viewing of migrating and rearing of salmon. The states largest and most extensive hatchery visitor center is at Gastineau Hatchery, in Juneau. In 1991 the facility charged \$2.25/visit (walk in fee) and recorded nearly 100,000 visits.

While a total value cannot be computed from the existing visitor information available from these facilities, total visitation suggests that benefits to Alaska are on the order of hundreds of thousands of dollars annually.

Indirect economic effects of the statewide enhancement program (employment and income effects from tourism and resident expenditures)

As previously explained, an enhancement project that increases non-market benefits of a fishery will often compel anglers to spend additional fishing effort and make additional expenditures to compete for improved fishing. Thus, fishery enhancement can compel anglers to pay more for boats, moorage, lodging, transportation, food and beverages, guiding, and other fishing related items. It is these out of pocket expenditures that lead to "economic impacts" and result in increased employment and income in the Alaska economy. Businesses that provide goods and services to anglers hire and pay employees and buy inventory from other businesses, which in turn hire and pay employees and buy from still other businesses. Multiplier effects turn these expenditures into gross business revenues in Alaska. The magnitude of these revenues can be projected with economic impact models.

Two economic impact models exist in Alaska that are suitable for computing changes in changes in expenditures and employment resulting from fishery enhancement of recreation. One is an input-output model developed for Jones and Stokes 1987, 1989, and 1991). The second is a model called SALMOD, developed by the Institute of Social and Economic Research. In the Jones and Stokes, I-O models angling expenditures are computed for anticipated change in fishing effort (angler days), and in turn, the direct, indirect, and induced economic impact for a fishery may be estimated. A major advantage of this model is that short run expenditures for a given project are empirically estimated in the behavioral models. Thus, the expenditure estimates conform more closely to the amount of additional spending resulting from a management, or enhancement action. Many impact models must use average expenditure data which can produce greatly overstated estimates of marginal expenditures.

As in the case of the Jones and Stokes non-market models, economic impacts for the statewide enhancement program could not be estimated without the creation of practical computer software, and additional fishery effort projections for enhanced sites (for South Central Alaska). Impact assessments would be possible for enhancement projects in Southeast Alaska with the soon to be completed computer software, and with additional ADF&G staff projections on fishing effort estimates for all enhancement projects. An example of an employment and personal income estimate is provided in Jones and Stokes (1991) for an expansion of recreational fishing opportunities for chinook salmon fishing in the Juneau area. An additional catch of 1,130 harvested adults is estimated to produce approximately \$13,000 in personal income and less than 1 full time job (Jones and Stokes 1991).

#### Results of Economic impact Assessment of Statewide Enhancement program with ISER Model.

Estimates of employment in the Alaska economy can also be made with SALMOD, an economic impact model created by the Institute of Social and Economic Research (ISER). This model was created specifically for the evaluation of the state wide enhancement program. Several revisions of the economic base model have been completed between 1986 and 1990. The model produces estimates of the expenditures of recreational fishing created by the enhancement program. Employment is expressed in full and part time jobs. The documentation for this model is in progress through a contract with Scott Goldsmith of ISER (pers comm Jeff Hartman FRED Division 1991).

The preliminary results of the FRED recreational impacts, from SALMOD, project personal income to Alaska residents of \$2.0 million to \$7.0 million annually, with a point estimate of \$4.3 million<sup>6</sup>. The full time employment that would result from this

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<sup>6</sup> Income and employment impacts vary greatly depending on what assumptions are used in this model for the expenditures that would occur in the absence of the recreational fishing

increased personal income is approximately 150 jobs. The PNP hatchery personal income impacts from recreational fishing are estimated to be approximately \$400,000. These impacts result from the eggs taken in broodyear 1988, that were projected to return between the years 1990 and 1997 (Hartman, 1988) Memo of July, 20, 1988, to Distribution. These employment and income impacts occur primarily in the Cook Inlet region, Southeast, and Kodiak regions (Table 5) (Fig. 7).

Table 5 Personal Income and Employment Impacts from 1988 simulation of SALMOD impact model for FRED Division enhancement projects by region of impact.

|                                 | Total<br>Statewide<br>Impacts | South<br>east | Prince<br>Willia<br>Sound | Cook<br>Inlet<br>Mat/Su | Kodiak<br>AK. | Pen. Interior |
|---------------------------------|-------------------------------|---------------|---------------------------|-------------------------|---------------|---------------|
| Personal Income<br>(\$ 1,000'S) | \$4,309                       | \$731         | \$59                      | \$2,786                 | \$37          | \$696         |
| Employment                      | 148                           | 25            | 2                         | 96                      | 1             | 24            |

#### Issues and Conflicts relating to Enhancement of Salmon, Trout, and other species.

##### 1. Allocation between competing users.

Intense competition between users exists for most of the salmon fishery in Alaska as is the case in most of the salmon fisheries in North America. This competition is observed by the Alaska Board of Fisheries, and ADF&G fisheries managers who are under constant pressure to deliver more fish to each of the various interest groups in the state. Within the commercial fishery, sport fishery, personal use and subsistence fisheries of Alaska, there are a multitude of insistent claims to enhanced fish, all asserting equal validity but in total, exceeding the available supply.

#### **Statewide Recreational Fishery**

Full Time Jobs From Enhanced Sport Fish

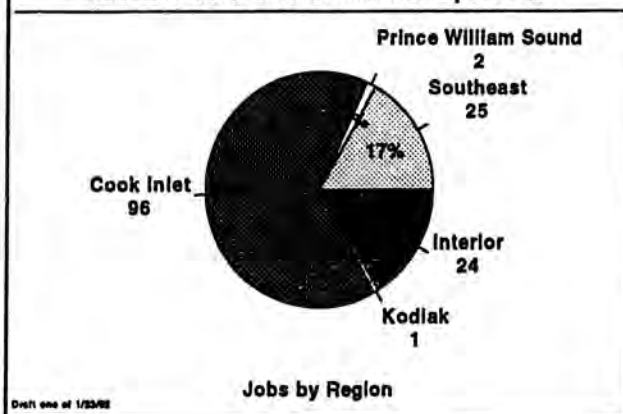


Figure 7

opportunity. Net expenditures in this simulation are equal to 1/2 of the average expenditures for an angler day, as approximated from Jones and Stokes (1987) and Mike Mills pers comm 1988.

The source of the conflict and divisiveness over allocation of enhanced fish is often misunderstood. The primary reason for the competition for these resources lies in the large economic value of the salmon resource that has been created in Alaska. If the resource created by enhancement were of little economic value, fishers would not spend so much of their time trying to seek out larger shares of the available harvest.

Since enhanced fish are often harvested along with wild stocks, allocation conflicts involving recreational fish are complex and intertwined. In Southeast Alaska, the allocation conflicts are additionally complicated by U.S./Canada treaty constraints. This treaty sets strict limits on harvests of non-enhanced chinook salmon in the region. Reduced quota's for chinook salmon, along with increased harvests in the recreational fishery, have generated a recent Board of Fish decision to hold special hearings that consider a range of restraints on the sport harvest of chinook salmon.

Examples of the types of fishing restraints that managers have applied in recreational fisheries include, bag limits, reduced area/time closures, gear restraints, increased user fees, and limited access for charter fishing operations. Most of these techniques reduce fishing effort, and may also reduce the quality of a recreational fishing experience, which in turn can actually decrease the economic value of fishing. The economic costs of some types of restraints to the recreational fishery can be greater than the economic costs of producing additional chinook salmon to targeted commercial or recreational fisheries through enhancement. While there is no substitute for careful management of salmon stocks, the fishery enhancement program may be a tool to help reduce conflict in these types of allocation disputes.

## 2. Funding of enhancement for recreational fisheries.

While anglers in Alaska have clearly become dependent on the statewide fishery enhancement program for sustaining a valuable fishing experience, the prognosis for sustained financing of fishery enhancement in the state is much less certain.

The existing funding for statewide fishery enhancement program is highly dependent on the continuation of Federal funding through an excise tax and distribution program called Wallop-Breaux. This amendment in the federal Register, represents somewhat of a windfall for Alaska. Alaska fisher's contribute a trivial amount the tax receipts to the total fund in comparison with other states. The current funding formula provides an amount to the State of Alaska which is not commensurate with population or the number of licensed fishermen in Alaska. Should the funding formula for distributing tax receipts to Alaska change, most of the states enhancement production would be affected.

Additionally, in the FY 93 Governor's Budget, two state owned hatcheries that produce important recreational fisheries, are not funded. They are Deer Mountain Hatchery in Ketchikan, and Big Lake Hatchery in Wasilla. Deer Mountain Hatchery produces several hundred chinook salmon harvests in the recreational fishery, and over 1,000 chinook harvests annually in the commercial fishery. It also produces a significant harvest of coho salmon in the recreational fishery. Big

Lake Hatchery plants coho salmon into lakes and streams in the Sustina drainage that are harvested in the sport fishery. While the economic value of the permanent loss of the production from these hatcheries has not been computed, it would be possible to produce an estimate by creating a simulation from the newly completed Southeast Economic Study.

### 3. Management Implications and Issues related to Enhancement of Recreational Fisheries

It is a statutory obligation of ADF&G to manage fisheries populations in order to maintain a "sustained yield" in the common property fisheries.<sup>7</sup> Other references to wild stock protection and maintenance of healthy wild stocks are also important parts of the title 16 statutes. There is, however, no specific formula in the statutes for determining the exact population size for a stock of wild fish that is "sustainable". Fisheries managers determine escapement goals for stocks and populations of fish and corresponding catch levels that can be sustained, with a variety of techniques. These sustainable catch levels may vary from year to year based on the expectation of run strength prior to and during the fishing season. Often, there is a great deal of uncertainty over the escapement level that must be maintained to sustain a healthy population of salmon.

What a sustainable wild stock is, and what population size it corresponds to, is of importance for the State and PNP enhancement program. Enhancement projects targeted to commercial, recreational, or subsistence fisheries may increase or decrease populations of wild fish.

In so called "mixed stock" fisheries, an enhancement project may increase the probability of harvesting wild stocks. The probability of wild stock interception increases where information on the temporal and spacial mixing of the enhanced and wild population of salmonids is poor. This potential is generally thought to be of greater concern in commercial salmon fisheries where a great deal of intense fishing power may occur during an opening. Most recreational fisheries, in Alaska represent a small portion of the total salmon harvest, and as such do not contribute as acutely to unwanted interceptions. Possible exceptions to this general rule in anadromous fisheries include (1) Kenai River chinook salmon, where a conservative approach to enhancement has been applied, and (2) Southeast region recreational chinook fisheries where the resident and charter fishing fleet is catching an increasing portion of the allowable chinook harvest. There is no empirical evidence that larger catches of enhanced fish in the recreational fisheries would reduce escapements of wild stocks even in these fisheries.

Enhancement projects may also decrease the probability of over-harvesting wild stocks by drawing fishing pressure to an opening which is composed entirely of enhanced fish. Some evidence exists that demonstrates the ability of an enhancement project to reduce pressure on wild stocks in fresh and salt water fisheries.

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<sup>7</sup> Maintenance of a sustained yield for fish and wildlife resources also has a basis in the Alaska Constitution.

An example of this approach has occurred on the Kenai River, where fishery managers have occasionally restrained sport fisheries in an effort to control excess fishing pressure on chinook salmon. These actions have been taken to reduce the probability of over-harvesting a unique stock of large chinook salmon, that are highly valued by anglers (Jones and Stokes 1987). This stock of salmon, however, is also subjected to fishing pressure in commercial fisheries, which incidentally harvest the large fish while seeking sockeye salmon in Cook Inlet. In 1991, an adjacent chinook salmon enhancement project, in the Kasilof River provided an alternative fishing opportunity that removed fishing pressure from the Kenai (Harrington, 1991, Homer News, July 25, 1991, "Enhancement is favored way to protect sport fisheries"). Catches of enhanced chinook salmon from this project have dramatically increased in recent years (Holland and McKean 1992).

A second example of stock protection through enhancement exists in the urban rainbow trout fishery that is maintained by FRED Division in the Anchorage and Matnauska and Susitna areas. In 1990 89% of the rainbow trout harvests resulted from enhancement projects in road access fisheries. Many of these projects, which produce high catches per angler day, occur in close proximity to wild populations of trout, which are not able to sustain heavy fishing pressure. The opportunity for a higher catch per angler day of effort, undoubtedly draws fishing pressure away from alternative wild fish stocks.

# **LIST OF APPENDICES**

## **Chapter V. Legal Issues Raised by Board of Fisheries**

1. August 1, 1990 memorandum from Alaska Assistant Attorney General Stephen White to Alaska Department of Fish and Game Commissioner Don Collinsworth regarding "ADF&G Authority to Manage Fisheries for Hatchery Broodstock and Cost Recovery".
2. February 28, 1991 memorandum from Attorney Michael A. D. Stanley to Kate Troll, Executive Director of Southeast Alaska Seiners, regarding "Department of Law Opinion, Re: Management of Fisheries for Hatchery Broodstock and Cost Recovery".
3. April 8, 1991 memorandum from George Utermohle, Legislative Counsel, to Senator Dick Eliason regarding "Sustained Yield Management of Salmon Produced by Private Nonprofit Hatcheries".
4. October 17, 1991 memorandum from Attorney A. William Saupe to John McMullen, President of Prince William Sound Aquaculture Corporation, regarding "Proposed Hatchery Regulations".

## **Chapter VII. Biological/Genetic Issues**

1. September 11, 1991 report with attachments by Glen Gray, Legislative Research Agency, "Effect of Hatchery Salmon on Wild Salmon".

## **Chapter X. Marketing**

1. January 24, 1992 report by the Alaska Department of Commerce and Economic Development, "Salmon Strategy Task Force Recommendations".

## **Chapter XI. Other Issues**

1. Background paper prepared by Office of Program Research, Washington State House of Representatives, "Declining Salmonids in Washington".

## **Record of Public Comment**

1. February 24, 1992 Committee Minutes of the Teleconferenced Hearing for Public Comment.
2. Written Public Testimony Submitted.

*(Appendices may be obtained from the Legislative Library, State Capitol, Juneau, AK 99801-1182, Phone (907) 465-3808.)*

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# Alaska State Legislature

## SENATE

Official Business

P.O. Box V  
State Capitol  
Juneau, Alaska 99811

December 1992

The Senate Special Committee on Domestic and International Commercial Fisheries has been conducting a review of the Alaska salmon enhancement program since May of 1991. The work of this particular committee concludes with the publication of both this final report and an additional chapter in draft form which contains an economic analysis of the enhancement program. It is the Committee's hope that these two reports will be used during the next few years as "working documents," providing a focus as the Legislature and all those interested in Alaska's fisheries enhancement efforts work together to make sound policy decisions regarding this important state program.

A number of people and agencies have worked hard on this review project. The Committee would especially like to thank legislative staff members Molly McCammon, Mary McDowell, Ginny Fay, Jo-Eve Benedict and Doug Rickey, the Alaska Department of Fish and Game, the Commercial Fisheries Entry Commission, the Legislative Research Agency, and the faculty members of the University of Alaska who have contributed to the project.

Many individuals and organizations from throughout the state have also put considerable amounts of time, thought and effort into following the progress of this review, testifying before the Committee, submitting written comments, and providing information for use in the economic analysis. I want to thank everyone for your willingness to be involved and work constructively towards the goal of improving the state's enhancement program.

A handwritten signature in cursive script, appearing to read "Dick Eliason".

Senator Dick Eliason, Chairman

Senate Special Committee on  
Domestic and International  
Commercial Fisheries

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## **Chapter I**

### **INTRODUCTION**

In May 1991, the Alaska Senate's Special Committee on Domestic and International Commercial Fisheries initiated a review of fisheries enhancement in Alaska. While the Committee recognized the success of the salmon enhancement program, its statutes, regulations, and role in Alaska's fisheries had not been thoroughly reviewed since the program's inception nearly 20 years ago.

***During the last 20 years, Alaska's Salmon Enhancement Program and fishing industry have undergone enormous changes.*** New variables are influencing Alaska's fisheries which had not been anticipated when the enhancement laws were enacted: the implementation of limited entry, the advent of fish farming, oil spills, a worldwide glut of salmon markets, the rising and crashing of various fish and shellfish stocks, enactment of the federal Endangered Species Act, impacts of trawling and highseas driftnets, annual state revenues that grew dramatically for some years and are now declining, and the possibility of enhancement and pen-rearing of fish and shellfish species not thought to be feasible in the past.

The Committee did not initiate its review of the enhancement program with any preconceived notion of conclusions, recommendations, or actions. Rather, it began with the recognition of the Legislature's responsibility to review the history and evolution of the program and establish future policy direction. ***The goal was to assemble and analyze information about the program and the global context in which it operates. The review was to serve as the first step in ensuring that current and future enhancement efforts will be economically and biologically sound, while fulfilling the goals for which the program was established.***

Legislative staff members were assigned to conduct most of the research, with the assistance of the Legislative Research Agency and private contractors. Staff were directed to compile a report listing possible options for consideration, rather than specific recommendations, after each chapter. The aim was to create a "working document" which would provide policymakers with information and a full range of approaches to consider. The University of Alaska, Fairbanks was placed under contract to provide an economic benefit-cost analysis.

In February 1992 the Committee released the draft of its report entitled, "Legislative Review of the Alaska Salmon Enhancement Program." Copies of the draft report and its executive summary were distributed statewide. Since the University's economic study was just getting underway at that time, the economics chapter included only an outline of the economic research to be conducted.

On February 24, 1992, the Committee held a statewide teleconference to hear public comment on the draft report. The hearing was well attended and resulted in several hours of testimony and discussion. Many individuals and groups also submitted written comments to the Committee. ***Most public comments spoke to agreement or disagreement with the options presented. A few also suggested minor changes or corrections in the report content.*** The public comments have been made available to the Legislature, and are included in the appendices to the final report, which are available from the legislative library in Juneau.

***The issue raised most frequently in public comments was the status of wild fish stocks and enhanced stocks, especially in the context of fisheries***

*management and allocation. That very issue, raised by the Alaska Board of Fisheries, was one of the primary reasons that the Committee undertook the review of the enhancement program. There appeared to be near-unanimous consent among fishermen, hatchery operators, fisheries managers, members of the general public, and legislators that a successful enhancement program necessitates that the sustained yield of Alaska's wild stocks be specified, in law, as the highest management priority.*

After considering public comment, the Committee decided to take immediate action on a "wild-stock priority" bill. Senate Bill 457, sponsored by the Committee, passed the Legislature in May 1992 and became the first legislative action to result from this review of the enhancement program. (A copy of SB 457 is included in Chapter V of the final report.)

*The University of Alaska's work on the economic studies took more time than originally anticipated. The benefit-cost analysis was not completed until the end of December. Because the Committee is a temporary, special committee established only for the duration of the 17th Legislature, it was not possible for the Committee to hold public hearings on the economic portion of the review project. Since the economics chapter has not yet undergone scientific peer review or the same public review that the rest of the chapters have received, the Committee decided to publish it separately in "draft" and make it available to the public at the same time as this final report containing the remaining chapters.*

This final report is largely the same as the draft report that was distributed in February 1992. Minor revisions have been made to update information and to incorporate several suggestions made in public comments.

*Both the final report and the draft chapter on economics are being submitted to the incoming 18th Alaska Legislature. A letter accompanying the two documents requests that public hearings be held on the draft chapter, that consideration be given to the information and suggested options in the full report, and that legislative committees carry on with the work begun in this review.*

## **Chapter II**

### **HISTORY AND DEVELOPMENT OF SALMON ENHANCEMENT IN ALASKA**

The development of Alaska's hatchery program was an evolutionary process. Beginning as early as the late 1800s, attempts at hatchery production of salmon were undertaken by the federal government and private industry. As harvests of salmon declined, interest in efforts to mitigate the economic impacts through enhancement and hatchery production increased. However, enhancement efforts were minimal until a dramatic drop in salmon harvests in the 1960s and 1970s prompted state action.

*The expressed goal of the state hatchery program was to produce additional fish to supplement the existing wild salmon stocks. The Legislature acknowledged concern about the potential for detrimental biological impacts of large-scale hatchery development on wild stocks, particularly from the interaction between wild and hatchery fish. However, program development was primarily driven by concern about the economic decline of the fishing industry.*

In 1969 the state began receiving large sums of revenue from oil and gas leases on the North Slope. The Legislature decided to channel some of the future public income from such nonrenewable resources into development of renewable resources for long-term economic stability. The salmon resource was an obvious candidate for this type of investment.

Throughout the 1970s, laws were enacted to facilitate development of a major fisheries enhancement program in Alaska. Program components included:

- creation of the Division of Fisheries Rehabilitation, Enhancement and Development (FRED) within the Alaska Department of Fish and Game,
- passage of a number of bond issues authorizing tens of millions of dollars for capital improvements for state hatchery facilities,
- authorization of private nonprofit (PNP) corporation hatcheries, and
- creation of regional aquaculture associations (as PNP) responsible for the regional planning and coordination of salmon enhancement activities.

After the initial start, it became increasingly apparent that a successful hatchery program was going to be more expensive than originally anticipated. New methods of financing were sought. The Legislature made funds available to PNP hatcheries through the Renewable Resources Development Fund, and by expanding the commercial fisheries loan program to include hatcheries. A separate fisheries enhancement loan program was later established. Statutes were also amended to allow proceeds from PNP sales of salmon or eggs to be applied to debt retirement, as well as operating costs.

A salmon enhancement tax was enacted that allows commercial fishermen in a region to vote to pay an assessment of 1 to 3 percent of the ex-vessel value of the landed salmon catch. The proceeds of this assessment are appropriated by the state to regional aquaculture associations. State law also provided for the establishment of other PNP operations run by private nonprofit corporations which are independent of regional associations, sometimes called "Mom and Pop" hatcheries. Both regional associations and "mom and pop" hatcheries are "PNPs" under state law. In this report, any reference to PNPs refers to both types unless otherwise indicated.

Legislation was passed creating a Fisheries Enhancement Revolving Loan Fund within the Department of Commerce and Economic Development. Over the years, a variety of other provisions were passed to assist in the construction and operation of hatcheries. These include such things as property tax exemptions, the granting of special harvest area entry permits to PNP hatchery operators for harvesting of their own broodstock and cost-recovery fish, exempting these broodstock and cost recovery fish from salmon enhancement taxes, and allowing the state to contract the operation of state hatcheries to regional associations.

Currently the state operates 12 hatcheries throughout the state, and PNPs operate 25 hatcheries, of which 4 are state-owned facilities. Hatchery fish represented 24 percent of Alaska's commercial salmon harvest in 1990. The FRED Division maintains two pathology labs, one genetics lab, one limnology lab, and a coded-wire tag processing lab. The Division also provides technical and management assistance to the PNP hatcheries. While PNPs tend to focus on production for the commercial fishery, FRED hatcheries emphasize research, some production of sport fish species, and experimental farming of shellfish and aquatic plants.

*A review of legislative history reveals that many facets of the hatchery program which have evolved over the past two decades, such as financing, related fisheries management issues, and biological concerns, were not foreseen or were only briefly acknowledged or discussed by the Legislature during the initial stages of development of the program. The record does reveal legislative intent in some broad areas, but it appears that many current questions and concerns regarding the role and future of hatcheries will have to be addressed without benefit of clear statutory or historical direction.*

### **Chapter III**

## **PRODUCTION POLICIES AND TRENDS IN ALASKA AND WORLDWIDE**

*In 1980, Alaska salmon harvests accounted for 41 percent of world salmon supply. By the end of 1990, wild and enhanced Alaska salmon accounted for just 31 percent of the world supply. This occurred, despite the 50 percent increase in Alaska's production during the same period, as a result of the dramatic increase in farmed-salmon production. Farmed-salmon production nearly doubled between 1988 and 1990, increasing from about 310 million pounds to over 600 million pounds. In 1990, farmed salmon composed about 30 percent of world salmon production, up from a mere one percent in 1980. The increased supply of salmon on the world market has lowered prices. Lower salmon prices and rising operating costs have brought economic hardship to salmon farming operations worldwide, although many farms remain competitive. Lower prices have also adversely impacted commercial salmon-fishing operations worldwide.*

One interesting development in the salmon farming industry is that the glut of salmon on the world market has forced many salmon farmers to freeze their product for later resale. This trend could increase the competitiveness of Alaska frozen fish since it eliminates the perceived "fresh versus frozen" advantage of farmed fish.

The countries and regions which commercially harvest the largest quantities of *wild and hatchery* salmon are the United States (Oregon, Washington and Alaska), Canada (British Columbia), Japan and the U.S.S.R. Other areas have experimented with salmon ranching, but as yet produce few fish. Major salmon-farming industries are located in Norway, Scotland, Chile, U.S. and Japan. Iceland, the Faroe Islands, Ireland, Australia, New Zealand and France also farm salmon but are not considered major producers.

### **CHAPTER IV**

## **FISHERIES MANAGEMENT ISSUES**

The success of the state's enhancement program has made managing Alaska's salmon fisheries more complicated. Much of this research project was initiated by a request from the Board of Fisheries to provide clearer legal and policy direction on the issues of managing fisheries for a wild stock priority, providing for broodstock, and providing for cost-recovery fisheries. These three issues encompass a number of legal questions and are addressed in Chapter V, Legal Issues. In this chapter a variety of other management issues are discussed.

## **MIXED-STOCK FISHERIES**

*A fundamental issue facing fisheries managers is how to control fishing effort in mixed-stock fisheries composed of both hatchery and wild stocks. The predominant management concern is that the weakest stocks will be overfished. In cases in which hatchery productivity is significantly greater than natural stock productivity, wild stocks face the risk of being depleted. In cases where hatchery stocks are smaller, these stocks run the risk of being lost among the wild stocks. Smaller stocks are more likely to be in danger of depletion in mixed-stock fisheries because there is a tendency to optimally harvest the larger stocks before quality declines in terminal fisheries.*

*With large scale hatchery enhancement, ADF&G's Division of Commercial Fisheries is concerned that the additional costs of managing mixed stock commercial fisheries composed of wild and hatchery stocks are not always accounted for in the planning and operation of hatchery facilities, and fisheries managers are often not given adequate funds to properly manage what can become a very complicated fishery.*

## **QUALITY**

*State law requires that fish returning to hatcheries and sold for public consumption be of comparable quality to fish harvested by commercial fishermen in the area. Prince William Sound is the major focal point for the issue of managing hatchery and wild stocks to optimize quality and marketability.*

During the planning process for the Prince William Sound hatcheries, the Basic Management Plans that addressed the harvest of hatchery fish were developed cooperatively by the department and hatchery operators. *Returning adults were to be primarily harvested in terminal areas, thereby minimizing harvest conflicts with wild stocks.* Additional harvest management costs were not considered under this strategy. Initially, fish quality was not an issue as terminally caught fish were of high quality. However, as the program grew, processing capacities became fully utilized, sometimes forcing delays in harvesting terminal fish. Such delays resulted in poorer quality fish, and thus, the demand to harvest fish farther away from terminal areas. This issue was highlighted last season in Prince William Sound.

During discussions in 1991 of Governor Hickel's Salmon Strategy Task Force, it became apparent that there is no definitive information on how close to their spawning areas salmon can be harvested without sacrificing quality. ADF&G has suggested a research project be funded to analyze salmon quality at various distances from their spawning areas in an effort to determine how best to manage fishing effort to produce a top-quality and marketable product.

## **TAGGING NEEDS**

Since hatchery-produced fish often complicate fisheries management, a way to simplify management is to determine the mix of hatchery and wild stocks in a mixed-stock fishery. For most mixed-stock fisheries composed of hatchery fish, an adequate program of tagging, recovery and analysis is required.

*The tagging method most commonly used now is the coded-wire-tag (CWT). However, otolith marking is seen as the most viable mass marking technique on*

the horizon. The benefit of otolith marking is that virtually *all* hatchery fish can be marked at the same time. FRED Division is also actively pursuing genetic stock identification (GSI) research and applications using both protein electrophoresis and deoxyribonucleic acid (DNA) analysis. ADF&G has obtained funds for a new GSI lab and is now seeking funds for a new tag lab.

*The extent of any particular tagging program is determined by funding.* The general assumption is that the people who tag the fish pay for the tagging. In the case of hatchery operators, that usually means the state or the PNP operator. However, the greater expense lies with the recovery and analysis of tags by the state, and the issue of who pays for that portion has never been resolved. Commercial fisheries managers would like to see more tagging to enable increased management precision. The Board of Fisheries would also like to see additional tagging in order to provide information for allocation disputes.

*FRED Division is informing hatchery operators that new increments of hatchery production will be permitted with a requirement that the operator pay for tagging and analysis.* Whether or not to require that of existing production is being debated. Some people, including some members of the Board of Fisheries, advocate for a requirement that all hatchery production be categorically tagged and analyzed. However, existing operations have permits that do not require tagging. These operations were planned, permitted and funded without accounting for tagging in their costs. It is likely that imposing a tagging requirement on permitted facilities would be subject to legal challenge.

*Another issue, however, is whether an all encompassing tagging requirement is necessary.* In some cases, a multi-year tagging study to show migration patterns and run timing would be sufficient. In other cases, where tagging is intended for in-season management, a large tagging program would need to be maintained. Not all hatchery production results in complicated, mixed-stock fisheries that would necessitate extensive tagging.

The question has also been raised concerning the extent of tagging or marking of natural stocks, and whether the current level is sufficient to provide the necessary information in mixed-stock fisheries composed both of hatchery and wild stocks.

#### **OPTIONS FOR POSSIBLE CONSIDERATION:**

- Development of a state policy on managing mixed-stock fisheries composed of hatchery and wild stocks.
- Requiring hatchery production to have tagging, recovery and analysis programs. This could range from a blanket requirement for all production to site-specific requirements.
- Development of a policy regarding funding for tagging, recovery, processing and analysis.
- Funding a study to analyze salmon quality at various distances from terminal streams to determine the effect of fishery management effort on product quality and marketability.
- Direction to the Board of Fisheries on how to factor managing for quality into fisheries management plans.

- Funding research and development of new tagging and marking techniques suitable for mass marking.
- Clarifying the roles and uses of tagging---for biological information, allocation, or management purposes.
- Expanding tagging and stock identification studies of wild fish stocks for the purpose of comparing wild and hatchery stocks.

**UPDATE:** *In May 1992, the Alaska Legislature passed legislation (HB 541) requiring the Board of Fisheries to develop a mixed stock fisheries policy. Development of such a policy is currently underway.*

## **Chapter V**

### **LEGAL ISSUES RAISED BY BOARD OF FISHERIES**

The Board of Fisheries ("board") has expressed to the legislature its concern over perceived ambiguities in the Alaska statutes relating to wild stock and hatchery fish management. *One problem is that there is no clear statutory policy for the board to follow when it must make decisions that would favor wild stocks over hatchery fish or vice-versa. An additional problem is that the statutes are unclear about the state's duty to provide for hatchery broodstock and cost recovery, and about the hatcheries' obligation to contribute to the common property fisheries.*

The Alaska Statutes contain only two direct references to wild stock protection from hatchery-related dangers: AS 16.10.400(g), which requires the commissioner, during the development of a comprehensive regional plan and before a hatchery permit is issued, to determine that such an action would not jeopardize wild stocks; and AS 16.10.420(g), which directs the department to require, as condition of a permit, that the hatchery be located in an area where "reasonable segregation" from wild stocks occurs.

The board is concerned that these statutes protect wild stocks only prior to the start of a hatchery operation. This raises the inference that, once a regional plan is completed and/or a hatchery permit is issued, wild stocks no longer enjoy a statutory protection from hatchery operations.

Article VIII, sec. 4 of the Alaska Constitution ("Sustained Yield") states:

Fish, forests, wildlife, grasslands, and all other replenishable resources belonging to the State shall be utilized, developed, and maintained on the sustained yield principle, subject to preferences among beneficial uses.

The board was created "for purposes of the conservation and development of the fishery resources of the state." AS 16.05.221. The Alaska Supreme Court has stated that, "'conserving' implies controlled utilization of a resource to prevent its exploitation, destruction or neglect" and that "'development' connotes management of a resource to make it available for use." Kenai Peninsula Fishermen's Coop. Assn. v. State, 628 P.2d 897, 903 (1981).

## **ATTORNEY GENERAL OPINION**

*In an August 1990 opinion letter to the commissioner of the Department of Fish & Game, assistant attorney general Stephen White concluded that the board had the authority, and was in fact directed by law, to manage for hatchery broodstock. He further concluded that the board had the power to manage for cost recovery, but that it was not required to do so. He based these conclusions in part on the unstated assumption that the constitutional "sustained yield" requirement applied to hatchery fish. This assumption, coupled with the board's statutory charge to "conserve" the fishery resource, formed the basis for White's conclusion that the board was required to manage for broodstock.*

White's conclusion that the board has the authority to manage for cost recovery was based on the board's statutory authority to "develop" the resource and to allocate among various user groups. Although hatchery operators are not specified on the list of user groups for which the board may allocate, AS 16.05.251(d), White concluded that the board had the power to make such an allocation by treating hatchery operators as a "subgroup" of commercial users. He noted that the Alaska Supreme Court, in Meier v. State, 739 P.2d 172, 174 (1987), has upheld a board allocation between two subgroups of commercial users.

## **OPINION RESPONSES**

The White opinion generated two critical responses. The first was from *Juneau attorney Michael A.D. Stanley, in a February 1991 letter to the Southeast Alaska Seiners. Stanley argued that the "sustained yield" clause may not apply to hatchery fish for a number of reasons.* First, because humans play such a significant role in the development of hatchery fish, there is some question whether the framers of the constitution would have considered them "natural" resources "belonging to the state" as those terms are used in article VIII. Stanley then points to AS 16.10.440(a), which provides that hatchery fish are to be treated "in the same way as fish occurring in their natural state until they return for harvest by the hatchery operator." He argues that the "in the same way" language indicates the legislature did not view hatchery fish as already subject to article VIII.

Stanley also takes issue with White's conclusion that hatchery operators could receive a cost recovery allocation as a subgroup of commercial users. He asserts that the definition of "commercial fishing," AS 16.05.940(5), would have to be "strained" to include hatchery operators, and that such a broad reading would allow other inappropriate users (such as salmon derby operators) to be considered as a subgroup. He also notes that the definition of "commercial fisherman," AS 16.10.940(4), contemplates a "natural person," not a nonprofit corporation.

Finally, Stanley asserts that only the department, not the board, can make an allocation of fish for hatchery operators. He argues that AS 16.10.440(a), quoted above, allows for harvest only at an area designated by the department, and only after the hatchery fish have travelled through the common property fisheries. Stanley argues that for the board to decide otherwise would be a circumvention of the existing statute.

*The second opinion that questioned assistant attorney general White's conclusions was from Legislative Counsel George Utermohle, in an April 8, 1991 letter to Senator Dick Eliason. He argues that, if the legislature had intended for hatchery fish to be managed on a sustained yield basis, it would have used the phrase "belonging to the state" when it wrote AS 16.10.440(a), quoted above. Utermohle reasons that the legislature intended hatchery fish to be treated as if they were a part of the common property resource, but only until they return to the designated harvest location; at that point, the hatchery operator may harvest the fish. Utermohle asserts that this language "suggests some form of lingering private property interest in hatchery fish by the hatchery operator," and indicates that the fish do not "belong" to the state for purposes of sustained yield.*

*Utermohle also argues that if hatchery fish belong to the state, it does not mean they necessarily must be managed for sustained yield. He points out that the sustained yield principle is always "subject to preferences among beneficial uses." Citing commentary and minutes from the Alaska Constitutional Convention, Utermohle asserts that the delegates understood this qualification to mean that the state "could make reasoned decisions to prefer certain renewable resources over other renewable resources to achieve a more beneficial public purpose." He concludes that this "may permit the state to harvest hatchery fish without providing for sustained yield;" and points to AS 16.10.430(b), which allows the termination of a hatchery operation "in the best interest of the public, if the adverse effects of the operation are irreversible and cannot be mitigated."*

*The Stanley and Utermohle opinions generated a vigorous and lengthy response from Anchorage attorney A. William Saupe, contained in an October 17, 1991 opinion letter to the president of the Prince William Sound Aquaculture Corporation (PWSAC). Saupe concluded that any regulation significantly restricting PWSAC's broodstock and cost recovery practices would be inconsistent with existing statutes and with the Alaska Constitution. He further concluded that legislative history suggests the board was never intended to have the power to limit hatchery production.*

Saupe points to the legislative history compiled by Linda J. Snow of the Legislative Research Agency as evidence that the legislature intended to assert state ownership of hatchery fish, and relies on statements made by several legislators and lobbyists to that effect. He also cites commentary from the framers of the constitution which states that the sustained yield principle is applicable to "plant and animal life subject to the immediate control of the state." Saupe argues that hatchery fish are so subject and therefore must be managed for sustained yield.

He answers the "beneficial use" argument by asserting that article VII, sec. 15, which speaks to the "efficient development of aquaculture in the state," indicates the importance and value of hatchery operations to the state; he also argues that hatcheries, specifically PWSAC's, would be seriously harmed if broodstock harvest was curtailed.

Saupe also points to "an extensive web of statutory provisions that evidence an unwavering legislative intent to sustain and expand hatchery operations through hatchery harvest," as evidence of the legislature's belief that harvests are necessary and beneficial. Among these provisions: AS 16.10.443, which requires the department to assist permit holders in the operation of their hatcheries; AS 16.10.450(a), which contains certain expenditure requirements for hatcheries that sell salmon or salmon eggs after harvest; AS 16.43.420, which allows for the sale of fish caught under the authority of a special harvest area entry permit; and AS 16.10.430(b), which allows sale, but not release, of fish during the period

of time that a hatchery operation is being terminated; AS 16.05 020, which requires the commissioner to "improve and extend" the fisheries of the state. Saupe concludes that the cited statutes, and legislative history, demonstrate the legislature's intention that cost-recovery harvests be the primary method of funding private nonprofit hatchery operations.

Saupe also takes issue with Michael Stanley's questioning of the board's authority to allocate for cost recovery. Saupe argues that the language of AS 16.05.440(a), quoted above, applies only to the time and location of a special harvest and not to allocation. To support his conclusion, he points also to legislative history indicating approval of board authority to regulate hatchery harvests, as well as to provisions of the Limited Entry Act that subject entry permit holders to board regulations.

On the question of board restrictions on local hatchery production, Saupe is less certain. He cites evidence to the effect that the legislature did not consider such restrictions during the time the private nonprofit hatchery system was put in place; and he takes the position that AS 16.10.440(b), which allows the board to amend hatchery permit terms relating to source and numbers of salmon eggs, was intended by the legislature to relate only to harvests and not to limiting hatchery production. On the related question of the board's ability to limit hatchery production on a regional basis, Saupe acknowledges that the answer is unclear, but he asserts that such a policy would conflict with many statutes already cited, and with the constitutional provisions relating to sustained yield and promotion of aquaculture.

## **CONCLUSIONS**

1. There is no specific statutory mandate directing the board to give wild stocks preferential management treatment relative to hatchery raised fish.

2. The Alaska Constitution may require that hatchery fish be managed to allow for broodstock and cost recovery by the hatcheries, but that requirement may be invalidated by a determination that the sustained yield of hatchery fish is not as "beneficial" a "use" of the fishery resource as that of protecting the health of the wild stocks.

3. Existing statutes appear to allow the board to allocate fish to hatcheries for broodstock, but are less clear as to the authority for cost recovery.

4. Existing statutes are not clear on the board's authority to restrict hatchery production on a local or regional basis.

## **OPTIONS FOR POSSIBLE CONSIDERATION:**

- Placing a wild stock priority into state statutes; or alternatively, making the status of wild and hatchery stocks of equal priority, or leaving the statutes ambiguous.
- Clarifying in state statutes whether or not the Board of Fisheries is required to provide for hatchery broodstock or for cost-recovery fisheries.
- Clarifying the Board of Fisheries' authority to restrict hatchery production.

**UPDATE:** In May 1992 the Alaska Legislature responded to the concerns described in this chapter by passing SB 457, establishing a wild fish stock priority.

## **Chapter VI**

### **PLANNING AND PERMITTING PROCESS**

A major element of the statewide salmon enhancement program is the planning and permitting process.

#### **CURRENT PLANNING AND PERMITTING PROCESS**

*The Department of Fish and Game (ADF&G) is responsible for planning enhanced salmon production which is conducted on a regional basis throughout the state.* Regional aquaculture associations have been formed in some regions to plan and implement enhancement projects. *Regional Planning Teams (RPTs)*, composed of department personnel from the fisheries divisions and representatives from the regional aquaculture associations (or local fishermen if there is no association), are charged with developing long-term comprehensive salmon production plans. The state also involved the private sector in the enhancement effort through private nonprofit (PNP) corporations which can plan and build hatcheries. Those PNPs that are not part of a regional aquaculture association are referred to as "Mom and Pop" operations.

The RPTs not only develop the comprehensive salmon plans, but also review and comment on all hatchery permit applications, annual hatchery management plans, and annual reports. Each hatchery enhancement project is reviewed, based on some relatively consistent criteria:

- Will the hatchery make a significant contribution to the common property fishery?
- Does the proposed project allow for continued protection of natural stocks?
- Is the proposed project compatible with the comprehensive plan?
- Does the proposed project make the most appropriate use of the site's potential?

*The PNP permit application process is rigorous and includes substantial review*, as well as a public hearing and full review by state and federal agencies through the coastal zone review process. Even in a best-case scenario, the review and approval process of a permit application takes at least six months.

*Fish released by hatchery operators are available for common use as natural stocks, until they return to the location established by the department for hatchery harvest.* The Board of Fisheries may, after a permit has been issued, amend by regulation the terms of the permit relating to the source and number of eggs, the harvest by hatchery operators, and the locations of hatchery special harvest areas. This is the basis for the board-regulated Fish Transport Permit process (see Biological Issues chapter), establishment of hatchery special harvest areas, and board-approved terminal harvest area plans. The statutes also appear to give the Board the authority to limit or control production at individual hatcheries based on egg-take for broodstock. This authority has never been used, and there is a strong difference in opinion as to whether or not the Legislature

actually intended the Board of Fisheries to regulate hatchery production, or instead, to regulate the taking of eggs from wild stocks for hatchery production.

A *Basic Management Plan* (BMP) is developed as part of the actual permit. Marking programs for hatchery-produced fish can be required in the hatchery permit and BMP. Tagging is usually considered optional, unless during the permit or permit alteration process fisheries managers specify the need for special in-season management capability. When a permit is approved and operational, an *Annual Management Plan* (AMP) is developed for each year of operation.

## **FISH TRANSPORT PERMITS**

The possession, transportation or release of live fish and their reproductive products (eggs) into the waters of the state requires a *Fish Transport Permit* (FTP) from ADF&G. The FTP permit application covers only one specific operation and is quite detailed. The application is intensively reviewed by the regional supervisors of the FRED, Commercial Fish and Sport Fish Divisions, the FRED pathologist and principal geneticist, as well as the FRED chief of technology and development and the FRED director. A signature page is attached to the actual permit which includes recommendations and comments. The permit is then approved or disapproved by the commissioner of ADF&G. The potential for disease and genetic impacts are the primary considerations in the FTP review process.

## **FISH RESOURCE PERMITS**

ADF&G is currently developing a policy on *Fish Resource Permits* (FRP). The FRP was previously called a scientific/educational (sci/ed) permit. This policy is being developed as a result of a lack of standards for the scientific and educational projects allowed. Under the proposed policy, Fish Resource Permits will be issued with the stipulations of no commercial activities, no human consumption, and no sale of the species. These permits are classified into collecting permits for scientific or educational purposes, holding permits for either exhibition or scientific research, and limited propagation permits for various scientific or educational purposes, including mariculture site suitability.

## **PROBLEMS AND ISSUES**

### **1. Lack of statewide goals and objectives for enhancement program.**

The original goal of the enhancement program was to rehabilitate the state's depressed salmon fisheries. This goal has essentially been met, with the numbers of Alaska's wild and hatchery fish at an all time high. Other than the problems of marketing and price, most of the state's salmon fisheries are no longer depressed. *The state does not have a clearly defined policy for future management and development goals for hatcheries and other enhancement efforts that goes beyond increased production.*

### **2. Regional or Statewide Planning.**

State law directs salmon production planning to be done on a regional basis. Little comprehensive statewide planning is done, with only minimal interaction between regions of the state. At the time these provisions were enacted, it was not envisioned that hatchery-produced fish would become such a large proportion of the statewide harvest. *Fisheries managers argue that the state needs a statewide planning policy that will take into account the potential impacts of the production of one region on*

*another, as well as closely scrutinizing potential management problems and marketing feasibility. Others involved in the industry argue that regional differences are so unique and contentious, that such a statewide process would be futile.*

The Board of Directors of the United Fishermen of Alaska (UFA) in January 1992, requested the FRED Division to involve all RPTs in a statewide review process of hatchery production. No action has been taken on that request.

### **3. Funding and support for planning.**

Fishermen, hatchery operators, and state fisheries managers agree that the RPT planning process provides an important forum for discussing and resolving difficult issues on an ongoing basis.

However, *state support for planning has declined since the early 1980s* when FRED had a budget of over \$500,000 for grants to aquaculture associations. Despite the need for more rigorous planning due to increased enhanced production, FRED planning staff has declined from two to one and a half positions. These positions coordinate all enhancement efforts statewide, including state facilities, provide technical assistance to the PNPs, and plan new ventures. *Budget reductions have forced state planners to shift priorities from plan development and implementation to plan maintenance.* Those involved in planning say the current funding level is inadequate for FRED to properly oversee the functions of the 37 hatcheries in operation in Alaska. As a result, they believe many more conflicts and issues will develop that should have been resolved early in the process.

RPT members also complain that the cutback in funds for planning has limited their contribution to a cursory discussion and approval of permit changes. If a hatchery requests a change in a permit, they often have to wait six months or longer to be considered because funds are not available for some RPTs to meet more than twice a year.

### **4. Composition of Regional Planning Teams**

*Although many people believe the regional planning team (RPT) process is a good one if adequately staffed and funded, there are others who believe that the entire structure of the RPT should be changed.* A frequent complaint is that the composition of the RPT is heavily weighted towards the commercial sector of the fishing industry, without sufficient representation of subsistence and sport fishing users, community and regional governments, environmentalists, and the general public. These critics argue that in order to have a truly *balanced* decision, all the varied interests of the region need to be adequately represented. Some RPTs have tried to address this complaint by broadening the composition of the team to include all interested groups.

Another, more fundamental concern is that ADF&G managers are usually out-numbered on the RPTs. As a result, the group can pressure department managers into approving projects that should probably be denied. Department personnel who raise future management concerns are under considerable pressure to be a *positive* presence in the RPT process, which in some cases, translates into withdrawing or modifying their objections without these concerns being adequately addressed. On the other hand, concern has also been expressed that department managers sometimes have a strong, anti-hatchery bias that can influence their management recommendations.