

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT FILE 8672

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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 Targeted Export Assistance (TEA) program, respectively. The TEA 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: communications manager, comptroller, quality coordinator, 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 TEA program, is restricted to international marketing efforts.* In contrast, state general fund appropriations have declined in recent years. In addition, because processor contributions are based on ex-vessel values, the industry assessment will decline approximately \$600,000 in FY 92. Given the outlook for Alaska salmon

ASMI FUNDING HISTORY

(in millions of \$)

<u>FY</u>	<u>GF</u>	<u>Ind.</u>	<u>Fed.</u>	<u>Total</u>	<u>Domestic</u>	<u>International</u>
1982	2.07	--	--	2.07	2.07 (-overhead)	
1983	5.66	1.15	--	6.81	6.81 (-overhead)	
1984	2.57	1.29	.10	3.96	3.1	
1985	2.57	1.04	.34	3.95	3.3	
1986	2.6	1.0	--	3.6	3.15	
1987	1.93	1.49	.25	3.68	2.7	
1988	1.63	2.65	2.2*	6.48	3.22	2.4
1989	2.1^	3.3	5.2*	10.6	3.9	5.3
1990	2.2^	3.2	4.5*	9.9	3.8	5.1
1991	2.45^	2.7	8.78*	13.93	3.6	9.5
1992	2.1^	2.6+-	?*	??	3.0+-	??

TOTAL 27.88 20.42 21.37 64.98 38.65 22.8
 ^ This general fund total includes general fund matching dollars for the federal funds. The general fund match is used in foreign markets and is not available for domestic marketing. In FY89 and FY 90 the match was \$495,000 each year, in FY91 it was \$750,000 and in FY92 it is \$750,000.

* The federal fiscal year is different from the state fiscal year so the figures for the federal funds are not available on the same cycle as the state dollars.

Prepared by the Alaska Seafood Marketing Institute, no date.

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 have declined primarily due to price effects.

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 guarantee that Alaska salmon is superior, generic marketing may actually be helping Alaska's competitors.

LABELING OF ALASKA SALMON

A recent Consumer Reports article attacking the quality 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 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. 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's 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 include actions for product and market development, salmon quality, and marketing and a review of ASMI's role.

Long-Term Recommendations. The long-term recommendations include the development of a strategic plan to help strengthen the fishing industry and its support sector. This includes 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 is included in the Task Force's long-range recommendations as well as its recommendations for immediate action. This proposal is discussed in the following section.

The ASMI Salmon Recovery Proposal

One of the recommendations of the Salmon Strategy Task Force is ASMI's Salmon Recovery Proposal. According to an ASMI briefing paper, the *goal* of the Salmon Recovery Proposal is 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 is expected to be changed. It appears that efforts will 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. However, unless this product identification campaign is very successful and/or ASMI's generic marketing approach is modified, there is significant risk that the Salmon Recovery Program could benefit international farmed-salmon producers as much as it would the Alaska industry.

The *cost* of the proposal is \$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.

Senator Jones has introduced legislation to appropriate \$10 million to ASMI for domestic salmon marketing efforts during Fiscal Years 92 and 93.

ALTERNATIVE PROPOSALS TO INCREASE MARKETING EFFORTS

Proposed Changes to Alaska Statutes:

A number of pieces of legislation have been introduced to address the salmon marketing problem. The general intent of the legislation 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. Funding for increased marketing efforts would be provided through temporary marketing assessments.

- Representative Gene Kubina has proposed legislation to create 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.
- Representative Dave Choquette introduced legislation that would expand ASMI's statutes to allow for targeted development of Alaska salmon markets and product development.
- Representative Bill Hudson introduced legislation that would impose a temporary one percent (1%) marketing tax on the value of salmon landed and increase the ASMI Board of Directors by two positions that must be filled by commercial fishermen.
- Senator Dick Eliason introduced a bill that would establish 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.
- Representative Cliff Davidson and Senator Fred Zharoff have introduced legislation that would endow 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.

Marketing Efforts by Groups Such as PWSAC

Recognizing the need to develop markets for their very successful salmon hatchery production, PWSAC has established a product development strategy.

As part of this development strategy, in the short-run PWSAC would like to: (1) pre-sell all 1992 cost-recovery fish, (2) ensure the utilization of all cost-recovery fish, and (3) negotiate one-to-three year contracts for the sale of fish. PWSAC does not intend to tie price contracts to anticipated ex-vessel prices and would like any contractual agreements to require primary processing in Alaska. *In the long term, PWSAC would like to facilitate pink salmon product development to provide price and supply stability and continuity, and to facilitate state research on new product forms.* PWSAC would use cost-recovery fish to achieve these objectives.

The primary marketing obstacle identified by PWSAC is processing capacity---getting the fish out of the water as whole frozen fish. While there is sufficient canning processing capacity in the Sound, the decline in canned salmon markets results in

little demand for the abundant pink production by canning processors. PWSAC has identified potential buyers of frozen pink salmon, but there is insufficient freezer processor capacity to ensure product delivery. PWSAC had hoped to utilize floating processors via the coordination of the groundfish trawl season regulated by the North Pacific Fisheries Council. While this will not occur during the 1992 season, it is an option PWSAC will continue to pursue for future seasons.

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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Salmon Strategy Task Force Recommendations



**Walter J. Hickel, Governor
Commissioner Glenn A. Olds, Chair**

**State of Alaska
Department of Commerce and
Economic Development
Division of Economic Development**

JANUARY 24, 1992

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INTRODUCTION

Governor Hickel appointed the Salmon Strategy Task Force on August 15, to investigate the reasons for the 1991 salmon crisis and to review options for industry stabilization and recovery.

Alaskans should be proud of the courage of the people and companies that started this industry years ago. The people and lifestyle of the salmon industry are a fundamental part of Alaska's history, culture and way of life.

Alaska has been the world's leading supplier of salmon. The state's salmon industry now faces strong competition from many other sources and its dominant role is threatened. Traditional markets are no longer dependent on Alaska for their needs.

The entire world is producing salmon at a record rate. For many years, Alaska's salmon industry enjoyed a market strategy based on allocating scarce resources among competing customers. In less than a decade the entire system has changed. Now the competition in both traditional and developing markets is intense, and it's likely to stay that way.

In order to compete, and indeed survive in this new environment, it is essential that all participants in the industry recognize and accept the reality of these competitive changes. The industry is facing a crisis of considerable magnitude, requiring decisive short term action and long term action to prevent the crisis from recurring.

The 1991 salmon season has forced us to recognize that the Alaska salmon industry is at a crossroads. As with many other industries in America, we must recognize that traditional business practices are no longer adequate in the face of global competition. Reevaluation and action are required.

The Salmon Strategy Task Force has made several immediate and long-term recommendations which should alleviate the immediate crisis, help stabilize the industry, and plot a course to regain our leadership role in the marketplace.

The effects of the decrease in salmon prices are profound, putting at risk state loan programs, community stability, and tax revenues to all levels of government. The seafood industry is the state's largest private sector employer, with the largest resident private sector payroll. The failure of the state and the industry to take decisive action will result in continued weakness in this economic sector and put increased demands and safety net programs.

These will not necessarily be easy changes to make. It will take a substantial commitment of time, hard work, and money. We ask that the Administration, the entire salmon industry and the Legislature work together to support the implementation of these recommendations.

Charge to the Task Force

Governor Hickel's charge was to develop a strategy to generate maximum economic return to Alaska fishermen, processors, and the state as a whole, consistent with wise use and conservation of the resource. The Task Force is to make specific recommendations to the seafood industry, the Administration and the Legislature.

The group was to focus on methods to maintain existing markets, develop alternative markets and product forms, promote secondary processing, develop necessary infrastructure, coordinate production and marketing strategies, improve salmon quality control, optimize fish tax policies and improve fish harvesting and processing efficiency. The Task Force also delineated existing salmon markets and collected and distributed information to assist fishermen and processing companies in reaching agreement.

Conditions requiring study

The major factors distressing the industry are greatly increased competition, high inventory levels, low prices, and projections of continuing high production levels. The runup in prices 1986-1988 followed by declining prices since have left many fishermen with debt loads they cannot support. The declining markets have hurt processors, exporters, and end users holding product in a declining market as well. These factors led to serious price disputes and charges of price fixing in some quarters as the 1991 season developed.

The market outlook for the 1992 season may improve somewhat for sockeye, but extremely high inventory levels remain for pinks. These species represent the vast majority of Alaska production value and volume. The early, very tentative prognosis from Fish and Game is for another big production year.

Inventory of issues

An initial questionnaire went out to 350 recipients of the Alaska Fish and Game weekly catch reports in mid July. This was followed by a second mailing of 125 in late July that added all Alaskan salmon fishing organizations, processors and legislators. The mailing solicited opinion on the issues the Task Force should address. Some 70 responses (a 15% response rate) were received. Staff collated the responses and summarized them. These responses were then categorized under nine headings for presentation to the Task Force.

Selection of Task Force

The Governor announced the membership of the Task Force on August 15. It includes broad representation from the salmon industry, appropriate state agencies, and the general public. The group provides a good cross section of the industry and policy makers in state government, while main-

taining reasonable geographic balance and a practical size. The members are:

Honorable Richard Eliason of Sitka,
President of the Alaska Senate,
and a Southeast Alaska fisher;
Honorable Fred Zharoff of Kodiak,
Chairman of the Alaska Senate Rules
Committee and a Bristol Bay fisher;
Honorable Eugene Kubina* of Valdez,
Chairman of the House State Affairs
Committee;
Commissioner Glenn Olds,
Alaska Department of Commerce and
Economic Development;
Commissioner Carl Rosier*,
Alaska Department of Fish and Game;
Mr. Ed Crane*,
President of the Alaska Commercial
Fishing and Agriculture Bank;
Dr. Jerome Komisar,
President, University of Alaska;
Mr. Richard Lauber,
Vice President, Pacific Seafood
Processors Association;
Ms. Hazel Nelson*,
President, Becharof Corporation,
and Bristol Bay fisher;
Mr. Greg Seider*,
Executive Director, United Fishermen of
Alaska;
Ms. Sandra Tavanis*,
Co-owner, Sea Hawk Seafoods, Valdez;
Mr. Bob Van Brocklin,
Prince William Sound Aquaculture
Corporation; and
Mr. Robert Waldrop,
President of the Board, Alaska Seafood
Marketing Institute, and Vice President,
Silver Lining Seafoods, Ketchikan.

* Editorial Committee

Calendar of work

The Task Force met four times, August 29, October 7, November 1, and November 22. Agendas and summaries of the meeting minutes are contained in appendices to the full report.

At the first meeting, the Task Force selected which of the issues raised in the extensive mail-out solicitation to pursue. Five of the original nine survived; product and market development, reducing costs of production, getting reliable information, improving quality, and marketing salmon and ASMI's role. It also became clear there were several myths at work clouding the issues. Staff reworked the five issues passed by the Task Force in the first meeting into problem statements before the second meeting.

The second meeting started with presentations on various myths, including "everyone's making money but me," "it's all just a Japanese conspiracy," and "we should stick to business as usual, the customer just thinks they want something different.". The Japanese market, salmon prices, margins and costs at various points in the industry, and ASMI's mission were discussed. The Task Force made changes to the problem statements and staff followed up the second meeting with extensive interviews of Task Force members and other experts to lay out the facts and options available to address the problems. A sixth problem was isolated and addressed in this process, the need for strategic planning. The persons interviewed, the questions asked and the options identified are in the full report appendix.

The third meeting started with presentations of the interview results and options gathered. The interview results form the main body of the full report. The Task Force then ranked the options available at that time. Some options were dropped. Staff reworked the options into general, specific, and detailed lists, and prepared a draft outline for the report.

The fourth meeting consisted of preparing some new recommendations for immediate action, and reworking the options that passed muster at the third meeting into the recommendations that follow. Some items were dropped. An editorial committee was appointed to oversee production of the report (see footnote above), and a schedule established for completion of the report.

Recommendations

The Task Force recommendations take into account budget cycles and priorities. In many cases requiring state agency action, existing budgets are not adequate to perform the recommendations. Additional funding will be required, not reprogramming of existing budgets. The Task Force expects the relevant agencies to prepare the necessary budget information, and respectfully requests full and favorable consideration by the Administration and Legislature.

RECOMMENDATIONS FOR DEALING WITH THE IMMEDIATE CRISIS

1. The Alaska Seafood Marketing Institute (ASMI) should develop a budget for immediate funding to deal with the existing inventory surplus before the 1992 season and projected 1992 production. This must be implemented as soon as possible¹.
2. Processors and fishermen should initiate market discussions early. The Task Force recognizes that the market situation will be uncertain at that time, and that the risk involved will lead to low price suggestions from processors, but recommends early discussions to provide maximum information sharing and opportunity to reach agreement. The Department of Labor (DOL) should be prepared to bring in knowledgeable mediators if necessary.
3. The University of Alaska (U of A), Commerce and Economic Development (DCED), and Fish and Game (ADF&G), should initiate and/or support efforts to expose the broadest possible range of Alaska fishermen to credible and detailed information about recent and ongoing changes, including problems and opportunities, in the world markets for salmon.³
4. The DCED Division of Economic Development should review the processing capacity situation in Prince William Sound, taking into account the outcome of the 1991 season, and make preliminary findings available to the Governor (and the industry) as early as is practicable. The Task Force recognizes that the capacity problems that developed in Prince William Sound were the result of the fishery being late and very concentrated, and the fish being relatively dark and small.⁴
5. The DCED Division of Investments and Alaska Commercial Fishing and Agriculture Bank (CFAB) recognize the crisis caused by low prices and the effect this has on loan payments. The Task Force encourages them to actively seek out fishermen having problems and work with them on loan extensions and other measures to minimize foreclosures.⁵

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1. The immediate ASMI program should be geared to long-term domestic market growth. The Governor could include this amount in his budget request, including a request for exemption from procurement codes for this emergency funding. The Legislature could pass this supplemental funding out as soon as possible in the session. ASMI could reprogram funds to initiate the campaign as soon as possible, prior to release of the funds, consistent with prudent financial management.
 3. Provide reasonably detailed but clearly written information on prices and markets for salmon for wide-spread distribution in the spring of 1992 and thereafter. The information could be updated in season. A goal should be to establish a clearer understanding of the effects of market conditions and dynamics on prices.
 4. DCED could prepare a supplemental budget to cover the costs of doing the necessary surveys for the PWS capacity determination.
 5. Reinstatement of state funding for the ABDC (Alaska Business Development Centers) program of outreach and business assistance in rural areas has been identified as an important component in dealing with financial hardship. This organization provides one-on-one assistance with loan workouts and dealing with the IRS that is not available elsewhere.

MID-RANGE RECOMMENDATIONS

General

1. The DCED, ADF&G, and Department of Labor (DOL) should consider promoting a closer and more trusting relationship among the interests involved in the issues concerning Alaska's salmon industry. This effort should be closely coordinated with other ongoing educational and consensus building efforts.¹

Product and Market Development

2. The Alaska Science and Technology Foundation (in fisheries area), and the U of A's Fisheries Industrial Technology Center, and Marine Advisory Program should be encouraged to expand their efforts in salmon product and market development and to coordinate their efforts in providing technical assistance and research and development in salmon products through the Alaska Fisheries Development Foundation (AFDF).²
3. The DCED's ability to provide international marketing information and sales assistance should be expanded. The Department's Division of Economic Development and Office of International Trade should work closely with ASMI and the Alaska Center for International Business (ACIB) to reduce risk and costs to the private sector.³
4. The DCED, ASMI and the Marine Advisory Program's ability to assist domestic marketing should be expanded. The Department's Division of Economic Development work closely with ASMI to reduce risk and costs to the private sector.⁴

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1. In the consensus building efforts, the agencies could organize forums and/or participate in existing trade shows and conferences. The issues examined by the Salmon Strategy Task Force could be presented and discussed with the objective of developing a consensus about the direction the state should take in the future regarding the harvesting, management, promotion and marketing of Alaska's salmon.
 2. AFDF has in place a proven industry board and ability to perform, but will require administrative funding to continue operations. Salmon industry representation on their board should be expanded.
 3. Specific projects could include:
 - Work to reduce tariff barriers for Alaska seafood products overseas.
 - Encouragement to foreign reproducers to purchase or joint venture value-added production in Alaska.
 - Continuing investigation of new markets for salmon overseas where disposable income is high enough, and seafood is commonly eaten.
 4. These entities could reduce risk and costs to the private sector of expanding domestic markets through:
 - Working with food service entities in Alaska and other states to promote sales and distribution of Alaska salmon products.
 - Providing start-up technical assistance to new ventures.

Quality

5. The Department of Fish and Game should reexamine management practices with the goal of obtaining the highest quality pack possible without harming the stocks.⁵
6. The Department of Fish and Game should conduct a comprehensive study in Southeast Alaska and Prince William Sound, with the cooperation of fishermen and processors, to determine the degree of risk managers should take in managing for economic efficiency and fish quality. The goal would be to identify the optimum locations for harvest.⁶
7. Industry and the Department of Fish and Game should cooperate on a program to educate fisheries managers, fishermen and industry operators on the physiological changes that occur in salmon (and hence its marketability) to encourage management that provides for the optimum use of the resource.⁷
8. Hatcheries should conduct research to determine the cause for variations in sexual maturity and other quality factors for stocks returning to hatcheries. Based on the research, hatcheries should modify their stocks and practices to optimize quality.

Marketing and ASMI's Role

9. ASMI, the FITC and the Marine Advisory Program (U of A) should expand educational programs on fish handling, cleaning, chilling, and processing for virtually all parts of the industry. Such efforts should focus on providing hands-on training from the fishing boat to the market, and on meeting the needs of the consumer for quality seafood. The effects of quality handling on the ability to market the end product should be emphasized.

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5. The reexamination of management practices could include changes in the length of openings and the timing of fisheries to optimize salmon quality. The Task Force recognizes that Fish and Game may need statutory and regulatory changes to incorporate such considerations in management decisions.
 6. A controlled set of experiments to determine the optimum points of harvest for top quality could include:
 - a. testing the condition of fish to determine rates of deterioration in terminal harvest and outer areas, throughout the duration of the run; and
 - b. identifying the optimum location which will provide the highest quality of salmon with an acceptable risk to the wild stocks.
 7. A study to examine the effects of sexual maturity on finished product quality could include the following:
 - a. samples in each of the categories in ASMI's Color Guide and hatchery broodstock would be collected;
 - b. portions of each category would be processed at least as headed and gutted, filleted and canned products; and
 - c. the end products would then be used in a workshop setting to educate managers on the various aspects of salmon quality.

The Task Force recognizes that a similar program budgeted at \$25,000 was considered and set aside by the ASMI board, and that it may be possible to achieve the same ends using commercially-processed products. ADF&G should prepare a budget item if necessary.

10. The Department of Commerce and Economic Development should initiate and/or encourage efforts to expose all salmon fishermen to organized, accurate and credible data concerning the salmon industry and markets in sufficient form and detail to permit fishermen's consideration of a national salmon marketing council chartered by the U. S. Secretary of Commerce under the Federal Fish and Seafood Promotion Act of 1986.¹⁰

LONG-TERM RECOMMENDATIONS

GENERAL GOAL

The state needs to develop a strategic plan for long term development of the salmon (seafood) resource, using recommendations of this task force as a starting point. This should focus on strengthening the support structure and sustainability of the industry. The goal would be a more rational and efficient system which is less vulnerable to market, production, and financial fluctuations. This would ensure an integrated and uniform state approach to the fishing industry.

OBJECTIVES:

- review and evaluate the institutions and relationships developed in the industry with an eye toward improving competitiveness and economic return to Alaska residents.
- bring together agencies and functions to affect a rational, consistent and sustainable program linking production, harvesting, processing, marketing and financing.
- determine the proper roles for the public and private components of the industry, integrating regulatory and developmental activities.

ACTION ITEMS

General

1. The Department of Commerce and Economic Development, in cooperation with other state agencies and the salmon industry, should organize a group with broad experience and understanding, in aggregate, of food and commodities industries, to:

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10. The Federal Fish and Seafood Promotion Act of 1986 provides that species-specific councils (roughly parallel to the National Beef Council, etc.) may be formed only after a rigorous referendum process which must include all salmon harvesters and all primary processors or harvest purchasers and may include other industry participants. If properly organized and chartered, a "National Salmon Council" would have the power to assess the industry participants for funds to be used for salmon promotion and marketing, product research, consumer education, etc. It would also have the power to develop and offer, for Department of Commerce and Economic Development approval, salmon quality standards.

- a. review the functional and procedural workings of the Alaska seafood industry;
- b. identify areas of inefficiency, counter-productivity and resource waste.
- c. review and evaluate research and development capabilities.
- d. recommend what state resources, including statutes, regulations, prestige, etc., can and should be applied to address those areas.

Fish Production

- 2. DCED, ADF&G, and ASMI should develop an integrated production and marketing strategy, which would:
 - a. recognize marketability of the fish as an important management goal.
 - b. recognize that price will be set by overall supply and demand, including the production of farmed salmon.
 - c. coordinate production with wider economic goals, including processing, product development, and markets, based on dependable information and planning.
 - d. better coordinate wild and hatchery production, regionally and by species and market.

Harvesting/Processing

- 3. The Commercial Fisheries Entry Commission, DCED, and DF&G, should develop fishery management and regulatory measures aimed at reducing operating costs, more efficiently utilizing present investments, and promoting a rational sustainable industry. Investigate ways to retain permits in Alaska and rural areas in particular, provide greater stability and enhanced revenues to resident fishermen, and increased shoreside investment consistent with sound financial standards, through:
 - a. reexamination of loan policies and permit use limitations.
 - b. reexamination of Alaska's limited entry system.
- 4. To widen options for Alaskan fishermen, DCED, in cooperation with other state agencies and the industry should consider promoting Alaskan controlled joint venture processing developments linking present investors and industry participants with new technologies and capital, and Pacific Rim and lower 48 markets. Give special attention to rural communities dependent on the salmon resource, smaller plants, local consumption and market needs, infrastructure needs, and current economic development plans.

Marketing

5. DCED should contract a major marketing research firm with proven credentials in food marketing to develop and analyze the "facts" related to salmon market trends, opportunities and weaknesses in major and potential markets. The group should also evaluate the state and industry's marketing efforts, including consideration of changes in the ASMI statute or operations, to permit, if possible, a more effective approach to marketing Alaska seafood.⁵
6. The Governor and Legislature should consider funding ASMI's \$10 million per year proposal for an intensive 5 year domestic marketing campaign. The goal is to raise domestic consumption of salmon from 1 to 1.5 pounds per person annually.
7. DCED, in cooperation with ASMI and DEC, should conduct a study to find the most cost effective ways to improve consumer confidence in Alaska seafood products. The Task Force recognizes that the entire seafood industry must improve the inherent quality of the salmon it processes, the freshness and workmanship of the product, and the consistency of grading to remain competitive, particularly when competing with farmed salmon.⁷

Finance/Other

8. DCED, in cooperation with other agencies and the industry, should readdress the issue of infrastructure including but not limited to improving quality, providing cold storage capacity, and promoting value added production.
9. OMB, in cooperation with state agencies and the industry, should reexamine the policy and implementation of fisheries taxes, including the corporate income and marine fuels taxes. The State must first decide what it wishes to accomplish by taxation. While this is nominally raising revenues, any tax distorts the market in some way, and a review of the current tax structure and various proposed alternatives is in order. Of particular interest is whether targeted tax credits for research and development expenditures is feasible.

Reducing Costs and Regulatory Burdens

1. The Departments of Fish and Game and Revenue should consider combining the appropriate processor annual report forms to simplify reporting requirements for the industry. This should be done at an agency level with the agencies sharing information from each form or integrating them, and may require statutory changes.
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5. The efforts should take into account what's already been done (Salmon 2000) and focus on those areas outside ASMI's assigned and traditional role, including new product and market development. The results must be produced in a form which will permit evaluation and initiation of strategies to further enhance and stabilize markets.
 7. A great deal of the input the Task Force received identified the lack of consistency in Alaska salmon products as a major marketing problem. Some Alaska product has been described as "low quality" compared to the competition. As Alaska's products become better identified in the marketplace, the Task Force recognizes that "Alaska brand" seafood must be of "good" quality, and meet the customers' expectations if customer satisfaction is to be achieved and advertising dollars well spent. Exactly how to determine those inherent quality standards, and how to ensure that the customer consistently gets the product they have purchased and expect could not be reconciled. The industry is divided on how large a role the state should play in determining quality, ranging from mandatory grading standards to no standards beyond wholesomeness.

2. The Department of Commerce and Economic Development, in cooperation with other affected agencies and the industry, should investigate ways to assist small operators in meeting the myriad regulatory requirements of various agencies. This might range from exempting processors under a specified size from filing certain forms to providing a central clearinghouse for permitting and filing information, technical advisory services and special loans for equipment such as computers and computer software.
3. The relevant state agencies should, in consultation with the Limited Entry Commission, collect child support payments from permit holders at the time of yearly permit renewal. Permit holders will be motivated to pay this fee and it will not unfairly burden processors.
4. The Departments of Revenue and Labor respectively, should relieve the burden of prepayment of the Fishery Business Tax and provision of Labor bond for companies with proven payment records and sufficient assets.

CHAPTER XI. OTHER ISSUES

A. USE OF HATCHERIES 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. (See Attached information).

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 HATCHERIES 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. The Alaska Chapter of the American Fisheries Society is currently considering a resolution to support setting aside the Yukon River drainage as a Wild Stock Management Zone (hatchery-free).

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 HATCHERIES

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:

- **Sikusuilaq 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 the fall of 1992. 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 HATCHERIES TO SPORT FISH

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 enhanced harvest while PNPs provided 27 percent.

According to recent studies completed by the ADF&G, sport fishing provides significant economic benefits in Alaska.

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 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 FISH

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.

Sikusuilag 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.

BACKGROUND: DECLINING SALMONIDS IN WASHINGTON

Columbia River Salmon and the Endangered Species Act (ESA)

In April and June of 1990 petitions were filed by the Shoshone-Bannock tribe in Idaho, Oregon Trout and five other organizations, under the federal Endangered Species Act (ESA) to list five wild stocks of Columbia River salmon as threatened or endangered. These stocks were: Snake River sockeye, Snake River spring, summer, and fall chinook, and lower Columbia River coho. The National Marine Fisheries Service (NMFS) is the federal agency with jurisdiction over endangered fish species. In April and June of 1991, NMFS proposed that three of the five stocks of salmon be listed under the Endangered Species Act. These stocks are the Snake River sockeye salmon (proposed as endangered), the Snake River fall chinook (proposed as threatened) and the Snake River spring/summer chinook (proposed as threatened). On November 14, 1991, NMFS officially listed the Snake River sockeye as endangered. Decisions on the other two stocks are expected shortly.

Wild Stocks Under the Endangered Species Act

An important part of the NMFS decision was their determination of what the definition of stock would be that would constitute a "species" for purposes of the ESA. The agency determined that an "ecologically significant unit", or ESU, would constitute a species for the purposes of the ESA. Another key point in application of the ESA to fish is that the wild stocks were recognized and being genetically and biologically important and merit protection, or stocks that have not been intermixed with hatchery stocks and that still spawn naturally, are considered.

Salmon in the Columbia River System and Reasons for Decline

Approximately one-third of the Columbia River drainage that historically supported salmon populations is not currently accessible to these fish because of dam construction without fish passage facilities. Alterations in river flow and velocity, adjacent habitat changes, irrigation diversions, commercial and recreational harvest, and hatchery practices have resulted in fewer "returns" of spawning adults from the ocean than historically. In the mid-19th century, anadromous fish runs in the Columbia River basin numbered up to 16 million adult fish. Anadromous fish include salmon, steelhead, and sea-run cutthroat trout. Juveniles migrate from freshwater to the ocean, where they take between one and five years to mature. They return as adults to their streams of origin to spawn. Salmon and steelhead numbers on the Columbia have been reduced to about 15 percent of historic run sizes.

Dams: The U.S. Army Corps of Engineers, the U.S. Bureau of Reclamation, and the state's public utility districts operate water projects in the Columbia and the lower Snake Rivers. The Bonneville Power Administration, part of the U.S. Department of Energy, markets the power generated by these hydroelectric facilities. There are hindrances to both upstream and downstream fish migration that can occur because of dams. The impoundments that are associated with dams alter natural water flow, sometimes preventing downstream migration of juvenile fish. Power turbines without adequate screening can cause fish mortality when fish do attempt to migrate downstream. Five of eight Army Corps of Engineers projects have juvenile fish bypass systems. Facilities at the Lower Monumental, Ice Harbor, and the Dalles dams are not yet in place. For successful upriver migration of adult salmon, dams are equipped with fish

ladders. There are no ladders at the Chief Joseph or Grand Coulee Dams, blocking upstream spawning in the Columbia River at Bridgeport.

Habitat Alteration Out of River: Activities such as timber harvest, mining, agricultural drainage, livestock grazing and point source pollution can alter fish habitat conditions. Increased sediment, increased water temperatures, loss of riparian (adjacent to the watercourse) habitat, and reduced oxygen can negatively affect fish.

Harvest: Both recreational and commercial salmon fishing occur on the Columbia River. Salmon fishing in Washington and Oregon state waters is regulated by the Washington Department of Fisheries and by the Oregon Department of Fish and Wildlife, respectively. The two states coordinate their commercial fishing regulation development through the Columbia River Compact. Recreational fishing is regulated by the Washington Department of Wildlife (steelhead trout and resident game fish), Washington Department of Fisheries (salmon and marine fish), and the Oregon Department of Fish and Wildlife (all species of fish).

Fish Production: 80-90% of salmon returning to the Columbia River from the ocean are produced in hatcheries. There is an ongoing debate over the role of hatchery practices in preservation of wild stocks of fish. Deterioration of wild stocks of salmon and steelhead can occur through poor hatchery management practices. Hatchery practices have begun to explore the use of wild stock in breeding programs, to avoid deterioration of hatchery stocks.

Water Use: There are several large users of water in Washington, including municipal, industrial, irrigation, hydroelectric generation, and instream. Municipal water use includes water supplied by public water systems for domestic, commercial, and fire protection. Industrial use includes process and cooling water. Irrigation accounts for the majority of water use in Washington. Water is diverted from water sources. Diversions must be screened to prevent fish from entering the irrigation system, unless the area of the diversion is under the management authority of the Department of Wildlife and the diversion existed prior to 1947. Water storage for irrigation, power production or flood control affects timing of peak flows that under natural conditions coincide with juvenile anadromous fish migration downstream.

The American Fisheries Society Endangered Species Committee Report

According to a report by the Endangered Species Committee of the American Fisheries Society, entitled *Pacific Salmon at the Crossroads*, 214 stocks of wild salmon, steelhead, and cutthroat trout are in decline in the Pacific Northwest. 52 of these are in the Columbia River basin. In the coastal and Puget Sound areas of Washington, outside of the Columbia River basin, 41 stocks are in jeopardy. There are currently no mandated recovery efforts for these stocks, other than for the Snake River sockeye salmon.

Other Efforts to Recover the Columbia River Salmon

Columbia River Salmon Flow Measures

The Army Corps of Engineers, Bureau of Reclamation, and the Bonneville Power Administration are conducting an Environmental Impact Statement (EIS) to examine water management actions to help both juvenile and adult salmon. These actions will be taken in 1992, for a one year period, on an experimental basis. The alternatives include various combinations of reservoir drawdown and flow augmentation to assist juvenile salmon migration.

The final EIS is expected to be released in March of 1992.

The Salmon Summit

The Salmon Summit was convened at the urging of Senator Mark Hatfield by agencies and organizations in the Pacific Northwest to develop a management and recovery program for the Columbia and Snake River salmon. This effort concluded in March 1991 and the participants failed to reach a consensus on major recovery methods. However, the task of continuing these efforts was subsequently undertaken by the Northwest Power Planning Council (NWPPC).

The Northwest Power Planning Council Amendments

In 1980, Congress passed the Northwest Power Act. The Act created the NWPPC and directed it to determine how much energy the region would require over the next twenty years and to develop an electric power plan to meet those needs; and to develop a program to protect, mitigate, and enhance fish and wildlife and related habitat in the Columbia River basin. The NWPPC develop a Fish and Wildlife Program (FWP) to accomplish this. In response to the declining salmon on the Columbia and Snake Rivers, the NWPPC is amending its FWP. The amendments are in four phases. Phase I identified immediate measures to assist in salmon recovery. Phase II, completed on December 12, 1991, recommends the following actions, as well as many others not listed below:

- mainstem passage improvements on the Snake and Columbia by increasing flows for juvenile salmon migrating downstream and by improving screens so that juveniles don't experience as much mortality in dam turbines;
- reductions in commercial harvest;
- implementation of a temporary commercial salmon license leaseback program;
- adoption of water conservation measures including the placement of instantaneous flow meters on all diversions from anadromous fish streams tributary to the Snake and Columbia;
- improvement of hatchery management practices;
- development of habitat management standards for salmon protection.

NMFS will use this Phase II Amendment as the basis for their recovery plan for the endangered sockeye salmon. Phase III and IV are watershed level planning, and resident fish and wildlife protection, respectively. The NWPPC has just begun to develop these phases.

HOUSE BILL ANALYSIS

HB 2626

AN ACT RELATING TO WILD STOCKS OF SALMONIDS

Brief Description: Conserving and enhancing wild stocks of salmonids.

Committee: Fisheries & Wildlife

Sponsor(s): Representatives R. King, May, Orr, Rust, Belcher, Fraser, Hochstatter, Horn, Morris, R. Meyers, Basich, Jones, Sheldon, Leonard, Franklin, Zellinsky, Valle, Pruitt, O'Brien, Nelson, Bowman, Brough, Jacobsen, Haugen, Rasmussen and J. Kohl

Background:

Recovery Planning

The Northwest Power Planning Council, in their Phase II Amendment process, developed a management plan for salmon on the Columbia and Snake Rivers, which will be used by the National Marine Fisheries Service as a basis for their recovery plan for sockeye salmon. The Snake River sockeye salmon was listed as endangered under the Endangered Species Act in November of 1991.

There is currently no mandatory or ongoing recovery effort for wild stocks of salmon, steelhead and cutthroat trout that have not been petitioned for listing under the Endangered Species Act. There are many other wild salmon, steelhead, and sea-run cutthroat trout stocks that have been identified as declining by the American Fisheries Society. Forty-one of these are in Washington, outside of the Columbia River Basin.

Management Techniques for Increasing Wild Fish Runs

The Department of Wildlife regulates the recreational harvest of resident fish including steelhead trout and sea-run cutthroat trout. The Department of Fisheries regulates the harvest of the commercial and recreational salmon fisheries for non-treaty fishers. Both agencies coordinate with the tribes in developing commercial harvest regulations. Regulations are designed to provide harvest opportunities and sustain fish runs.

The Northwest Power Planning Council, in their Phase II Amendment, proposed a reduction in harvest of fall chinook in the Columbia river. Part of the mechanism for accomplishing this will be by providing for a commercial license leaseback program. The federal government will assist in paying to temporarily lease back commercial fishing licenses. Current Washington law requires that a commercial fisher, in order to renew a salmon license, catch one fish. The director of the Department of Fisheries has the authority to waive this requirement if the fisher has not had the opportunity to catch fish, such as would occur if a fisher participated in the leaseback program.

Marking and Catch and Release

Where a distinction between wild and hatchery stocks needs to be made for the purpose of allowing wild fish, if caught, to be released, the hatchery fish may be marked by clipping the adipose fin, using a coded wire tag, or using a newer ocular marking technique. The Department of Wildlife has marked most of its hatchery raised steelhead and sea-run cutthroat trout and is therefore able to implement catch and release regulations for recreational fishers. For almost all of the steelhead and sea-run cutthroat stocks identified by the American Fisheries Society as stocks of concern, these regulations are already in place. The Department of Fisheries has not marked all hatchery fish. Even if all were marked, the utility in returning wild fish caught commercially with current techniques is low, since these fish, caught in nets are usually dead shortly after the nets are hauled in. The recreational fishery could be managed for catch and release if all hatchery raised salmon were marked.

Hatcheries

The Department of Fisheries operates 39 major hatcheries and 19 satellite facilities. The Department of Wildlife operates 32 hatcheries. The tribes and the U.S. Fish and Wildlife Services also operate hatcheries, and there are hundreds of cooperative production facilities operated by volunteers and coordinated by the state Departments of Fisheries and Wildlife.

Captive Broodstock and Wild Stock Supplementation:

Wild salmonids spawn in river gravel. Their progeny reside in freshwater until ready to go to the ocean, where they mature. As adults, they return to their natal streams to spawn. Fish produced in hatcheries are artificially spawned by removing eggs from the female and raising the young fish and releasing them to travel downstream as smolts. New technologies are being developed to use artificial production means to supplement wild populations of salmonids with fish that are genetically of the same wild stock. One technique, called captive broodstock rearing, raises the fish from egg to mature adult, rearing in saltwater if necessary by using saltwater net pens. That adult is spawned artificially. Wild stock supplementation is the process of using eggs from the wild stock that one wants to supplement, by taking the fish out of the wild, rearing the progeny, and releasing the progeny back into the natal stream from which the parents originated. The Department of Wildlife has sea-run cutthroat captive broodstock programs in Shelton and Aberdeen, which have been implemented in the last five years. Many stocks of sea-run cutthroat on coastal streams have been identified by the American Fisheries Society as being stocks of concern.

Summary of Bill:

The Departments of Fisheries and Wildlife are directed to establish a review and recovery team to recommend recovery methods for salmonid stocks outside of the Columbia River Basin. The review and recovery team is to develop a definition of the term "stock", determine the status of all wild salmonid stocks in Washington, set escapement objectives for these wild stocks, and where escapement objectives are not currently being met, develop a recovery plan for each subbasin containing the wild stock. Priorities for recovery are to be, in descending order, natural production, supplementation using hatcheries, and captive broodstock technology. The team shall evaluate the role of existing hatcheries in recovery, and shall evaluate methods of

harvest that have less impacts on wild stocks. The recovery plan shall be submitted to the appropriate legislative committees by June 30, 1993.

By January 1, 1993, the Department of Wildlife is directed to implement an experimental captive broodstock program on a coastal river to be selected by the Department for wild sea-run cutthroat trout.

The Department of Fisheries, by December 31, 1992, is to determine the cost of marking all hatchery fish at all Department operated hatchery facilities.

The director of the Department of Fisheries is directed to use authority granted under existing law to waive requirements for commercial fishing license renewal, in order to accomplish the goals of the license leaseback program of the Northwest Power Planning Council, described in the Council's Phase II Amendment.

*Prepared by Keithlyn Watson, Research Analyst (786-7310)
House Fisheries and Wildlife Committee
Office of Program Research
January 23, 1992*

SECTION BY SECTION SUMMARY: H-2626
Conserving and enhancing wild stocks of salmonids

Section 1. Legislative findings.

Section 2. The Departments of Fisheries and Wildlife are directed to establish a review and recovery team to recommend recovery methods for salmonid stocks outside of the Columbia River Basin. The review and recovery team is to develop a definition of the term "stock", determine the status of all wild salmonid stocks in Washington, set escapement objectives for these wild stocks, and where escapement objectives are not currently being met, develop a recovery plan for each subbasin containing the wild stock. Priorities for recovery are to be, in descending order, natural production, supplementation using hatcheries, and captive broodstock technology. The team shall evaluate the role of existing hatcheries in recovery, and shall evaluate methods of harvest that have less impacts on wild stocks. The recovery plan shall be submitted to the appropriate legislative committees by June 30, 1993.

Section 3. By January 1, 1993, the Department of Wildlife is directed to implement an experimental captive broodstock program on a coastal river to be selected by the Department for wild sea-run cutthroat trout, using existing facilities where possible.

Section 4. The Department of Fisheries, by December 31, 1992, is to determine the cost of marking all hatchery fish at all Department operated hatchery facilities.

Section 5. Amends existing law to require the director of the Department of Fisheries to use authority granted under existing law to waive requirements for commercial fishing license renewal, in order to accomplish the goals of the license leaseback program of the Northwest Power Planning Council, described in the Council's Phase II Amendment.

HOUSE BILL 2626

State of Washington 52nd Legislature 1992 Regular Session

By Representatives R. King, May, Orr, Rust, Belcher, Fraser, Hochstatter, Horn, Morris, R. Meyers, Basich, Jones, Sheldon, Leonard, Franklin, Zellinsky, Valle, Pruitt, O'Brien, Nelson, Bowman, Brough, Jacobsen, Haugen, Rasmussen and J. Kohl

Read first time 01/22/92. Referred to Committee on Fisheries & Wildlife.

1 AN ACT Relating to wild stocks of salmonids; amending RCW
2 75.30.120; and creating new sections.

3 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

4 NEW SECTION. Sec. 1. The legislature finds that wild stocks
5 of salmonids in the state of Washington are in a state of decline.
6 Stocks of salmon on the Columbia river are proposed for listing as
7 threatened and endangered, the Snake river sockeye has been officially
8 listed as endangered, and the American fisheries society has indicated
9 that there are two hundred fourteen other stocks of salmonids in the
10 Pacific Northwest that are in decline or possibly extinct. Many of
11 these are within Puget Sound or the coast, and therefore are not within
12 the jurisdiction of the Northwest power planning council. The
13 legislature recognizes that to lose these wild stocks would be
14 detrimental to the genetic integrity of the fisheries resource and the

1 econo d will represent the loss of a vital component of
2 Washington's aquatic ecosystems. The legislature further finds that
3 to postpone the recovery of stocks that are on the decline but that are
4 not yet listed as threatened or endangered is short-sighted, and that
5 it will be less costly to act now to save this important resource.

6 NEW SECTION. Sec. 2. (1) The departments of fisheries and
7 wildlife shall establish a wild salmonid review and recovery team
8 consisting of fisheries biologists and geneticists. The purpose of the
9 team shall be to review and recommend recovery methods for salmonid
10 stocks outside of the Columbia river basin. The departments shall
11 invite representatives of the Northwest Indian fisheries commission and
12 the national marine fisheries service to participate on the team.

13 (2) By June 30, 1993, the review and recovery team shall:

14 (a) Develop a meaningful definition of stock. The definition shall
15 be formulated to allow preservation of genetic integrity of the wild
16 fish resource and to avoid future federal listings under the endangered
17 species act. The team shall consider the national marine fisheries
18 service's species definition as well as the American fisheries society
19 definition of stock;

20 (b) Determine the status of all wild salmonid stocks in Washington;

21 (c) Set escapement objectives for all wild salmonid stocks in
22 Washington; and

23 (d) Where escapement objectives are not currently being met,
24 develop a recovery plan for each subbasin containing the wild stock,
25 attempting to achieve escapement objectives within two generations.
26 The recovery plan shall identify baseline conditions as well as
27 recommend actions. Priorities for recovery shall be, in descending
28 order, natural production, supplementation using hatcheries, and
29 captive broodstock technology. The recovery plan shall include an

1 evaluation of the role of existing hatcheries in wild salmonid
2 recovery, as well as of methods of harvest that have less impact on
3 wild stocks.

4 (3) By June 30, 1993, the review and recovery team shall provide
5 a recovery plan to the appropriate legislative committees. The plan
6 shall include:

7 (a) A definition of stock;

8 (b) A state-wide list of wild stocks, with status of and escapement
9 objectives for each;

10 (c) A summary of data management needs; and

11 (d) A range of recovery alternatives for wild stocks outside of the
12 Columbia river basin, with accompanying time frames for implementation,
13 time frames for expected recovery, costs, and risk assessments.
14 Alternatives shall consider actions in the areas of water quality and
15 quantity, flow management, hatchery management, captive broodstock
16 programs, harvest, and land management. Costs shall be developed in
17 consultation with an advisory committee of appropriate membership to
18 be appointed by the departments.

19 (4) This section shall expire January 1, 1994.

20 NEW SECTION. Sec. 3. By January 1, 1993, the department of
21 wildlife shall implement experimental captive broodstock programs on
22 a coastal river to be selected by the department, for wild sea-run
23 cutthroat trout. Existing facilities shall be used where possible.

24 NEW SECTION. Sec. 4. By December 31, 1992, the department of
25 fisheries shall determine the cost of marking all hatchery fish at all
26 department of fisheries operated hatchery facilities.

1 Sec. 5. RCW 75.30.120 and 1983 1st ex.s. c 46 s 146 are each
2 amended to read as follows:

3 (1) A commercial salmon fishing license issued under RCW 75.28.110
4 or salmon delivery permit issued under RCW 75.28.113 may be issued only
5 to a vessel:

6 (a) Which held a state commercial salmon fishing license or salmon
7 delivery permit during the previous year or had transferred to the
8 vessel such a license, and has not subsequently transferred the license
9 or permit to another vessel; and

10 (b) From which food fish were caught and landed in this state or
11 in another state during the previous year as documented by a valid fish
12 receiving document.

13 Where the failure to obtain the license or permit during the
14 previous year was the result of a license or permit suspension, the
15 vessel may qualify for a license or permit by establishing that the
16 vessel held such a license or permit during the last year in which the
17 license or permit was not suspended.

18 (2) The director may waive the landing requirement of subsection
19 (1)(b) of this section if:

20 (a) The vessel to which an otherwise valid license is transferred
21 has not had the opportunity to have caught and landed salmon; and

22 (b) The intent of the commercial salmon vessel limitation program
23 established under this section is not violated.

24 (3) The director shall exercise his or her authority under
25 subsection (2) of this section to accomplish the goals of the Northwest
26 power planning council's phase two amendment to its fish and wildlife
27 program, dated December 11, 1991, concerning a temporary commercial
28 salmon fishing license leasing program. The director may adopt rules
29 to accomplish the goals of the leasing program.

- 1 (4) Commercial salmon fishing licenses and salmon delivery permits
- 2 are transferable.

Draft

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

Edited by
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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)¹. 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).

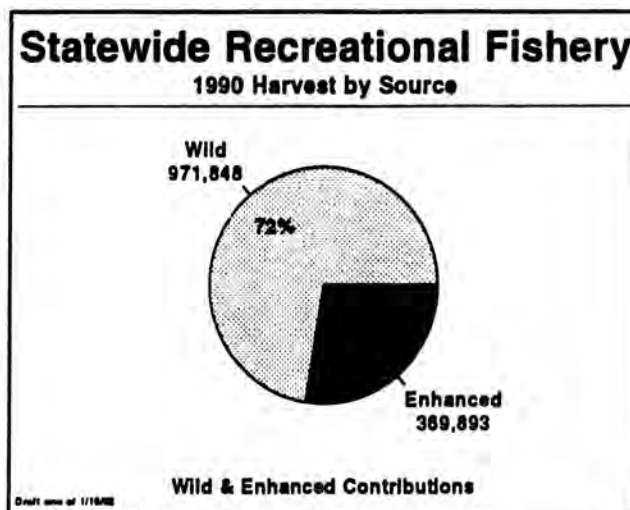


Figure 1

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 cobo	sockeye	pink	chum	landlocked cobo/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%

¹ Over 1 million razor clams were also harvested in 1990 in non-finish fisheries.

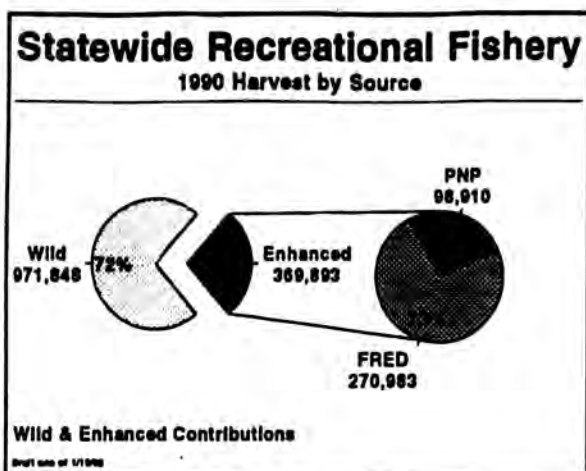


Figure 2

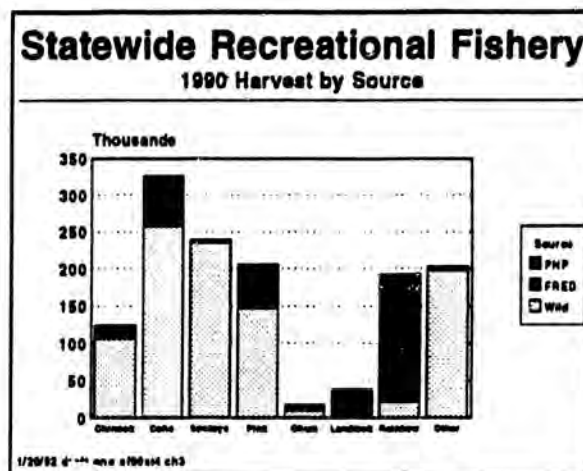


Figure 3

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)².
- 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.

² 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.

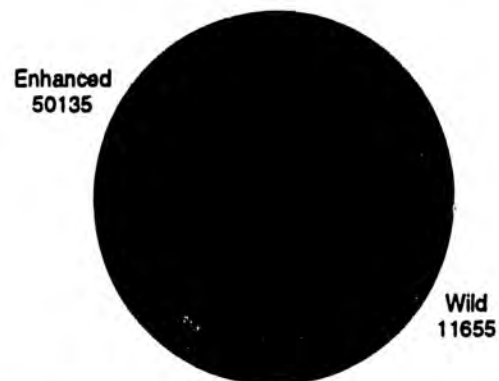
Retail businesses in some communities depend upon the angler related spending that occurs during a derby to sustain a large portion of their annual gross receipts. The ability of a derby to attract the angling public depends largely on the ability of the fishery to supply a good fishing experience with acceptable catch levels.³ 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

³ 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



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) ^a	Chinook	Juneau	136	522	26.0%
	Coho	Juneau	173	2,567	15.8%
Petersburg(1991) ^a	Chinook	Petersburg	228	422	35.1%
Wrangell(1991) ^a	Chinook	Wrangell	48	173	21.7%
Sitka(1991) ^a	Chinook	Sitka	270	980	21.6%
Seward(1989) ^c	Coho	Seward	9,280	5,581	62.4%
Valdez(1991) ^d	Coho	Valdez	10,000	500	95.2%
Valdez(1991) ^d	Pink	Valdez	30,000	500	98.4%
Total			50,135	11,655	81.7%

^a Memo from Paul Suchanek to Fred Gaffney 12/05/91

^b Karen Crandall, Pers Comm. 1-15-91

^c Doug Vincent-Lang Sport Fish Division Anchorage, pers comm. 1-91

^d 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" ⁴ 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).

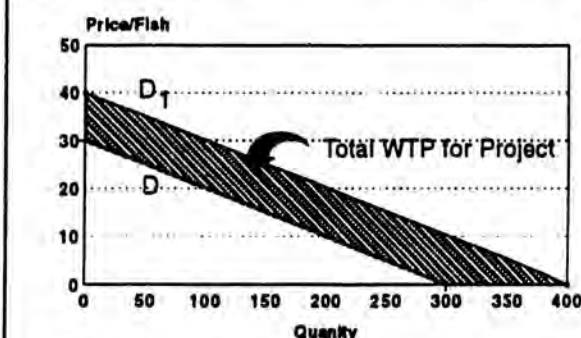
⁴ Also, they are referred to as secondary effects, secondary impacts, and regional economic impacts.

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

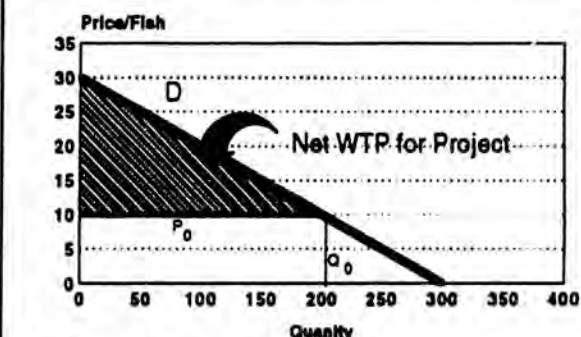
Total Willingness To Pay (WTP) For An Enhancement Project



Draft of 1/22/92 SF901n1.ch3

Figure 5

Net Willingness To Pay (WTP) For An Enhancement Project



Draft of 1/22/92 SF901n2.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 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 example⁵, 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

⁵a. 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
Total	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 million⁶. The full time employment that would result from this

⁶ 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 Statewide Impacts	South east	Prince Willia Sound	Cook Inlet Mat/Su	Kodiak AK. Pen.	Interior
Personal Income (\$ 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

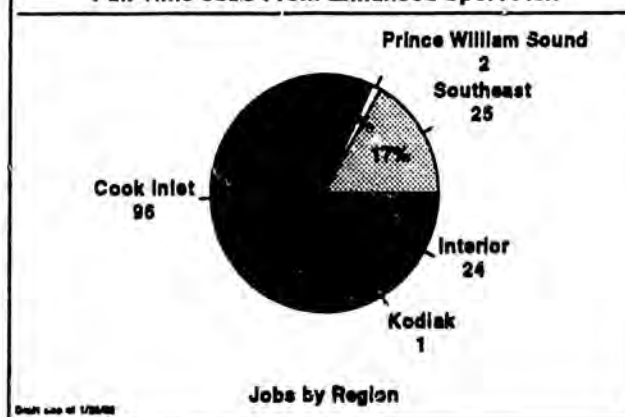


Figure 7

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.⁷ 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.

⁷ 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.

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Alaska State Legislature

Official Business

SENATE SPECIAL COMMITTEE ON DOMESTIC AND INTERNATIONAL FISHERIES

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

February 10, 1992

Dear Reviewer:

Attached is the Executive Summary of the Draft Report of the Legislative Review of the Alaska Salmon Enhancement Program which is being released today for public comment by the Senate Special Committee on Domestic and International Fisheries.

Many issues and concerns relating to the state's salmon enhancement programs have been brought to the Legislature's attention over the last few years. Last spring it became apparent that it was time the Legislature, as the state policy-setting body, step back and take a broad look at these programs. The Committee decided to undertake this review with the participation of all interested Alaskans.

I must strongly emphasize that this report is only a DRAFT. It is the result of an effort to identify and research various issues, concerns and conflicts associated with the state's salmon enhancement program, and to begin laying out some possible options (not recommendations at this point) to consider for improving the program.

This draft report has been prepared by legislative staff with the assistance of the Legislative Research Agency and the input of state agencies and others. It is a starting point. Now it is time to enlist the help, and incorporate the suggestions, of other legislators, hatchery operators, fishermen, scientists, processors and others who care about the state's enhancement programs.

It should be noted that one important segment of the review is missing. That is the economic analysis that was contracted to professional researchers at the University of Alaska. This analysis will not be complete and available for several months. Therefore, this draft report contains information gathered on other aspects of the program, with specific options presented at the end of each chapter. Until the economic studies are incorporated into the entire review, we cannot presume to be looking at the "whole picture." When that last major piece of the puzzle is in place, we will begin the process of formulating some overall conclusions.

Our goal now is to fine-tune the chapters contained in this draft report, see what conclusions can be reached with the information before us, and develop those options which we can act on right away. We are counting on your comments on the contents of this

draft report, especially regarding your thoughts about the lists of options: which ideas you like or dislike; which ones should be addressed immediately, and how; what additional options should be added to the list for consideration. Please let us know of any errors, omissions, or misinterpretations you see in this draft.

We urge you to participate in a teleconferenced hearing on this report scheduled for Monday, February 24, from 1:30 to 5:00 p.m. This will be the first of several hearings on the various aspects of the enhancement program and any legislative action that may be proposed. In addition to your testimony at the teleconference, it would be helpful to have your comments in writing as soon as possible. (To: Sen. Eliason, Senate Fisheries Committee, State Capitol, Juneau, AK 99801-1182, or to FAX #907-465-4928). Public input is vital to the success of this review!

Please note that what we are sending out is the executive summary of the draft report which includes the lists of possible options for consideration at the end of each chapter, and a table of contents for the full report. The complete draft report is several inches thick. If you would like to receive a copy of any particular chapter(s), please call my office at 465-4916, or check with your local Legislative Information Office as we will be sending a complete draft report to most LIOs to have available to the public.

Thank you for your interest in this review project, and for any ideas and input you can contribute. We look forward to working with you.

Sincerely,

A handwritten signature in dark ink, appearing to read "Dick Eliason", written in a cursive style.

Senator Dick Eliason, Chairman
Senate Special Committee on
Domestic and International Fisheries

**LEGISLATIVE REVIEW OF ALASKA'S FISHERIES
ENHANCEMENT PROGRAM
February 10, 1992**

Executive Summary & Options to Consider

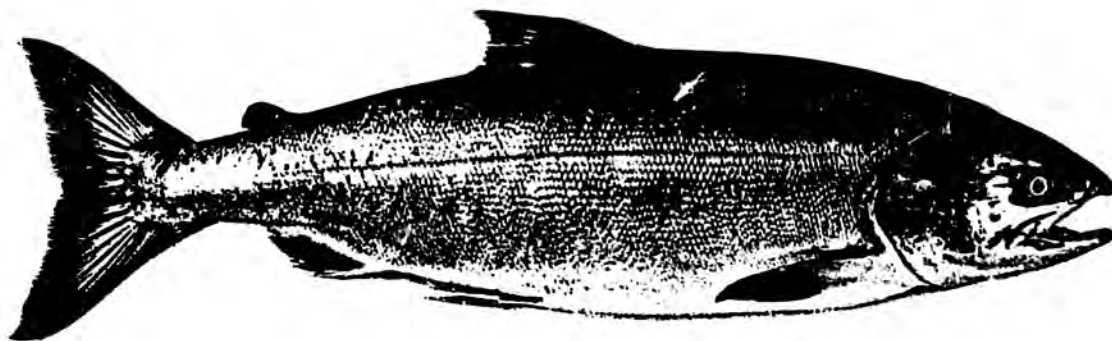
- I. Introduction
- II. History & Development of Hatcheries in Alaska
- III. Production Policies and Trends in Alaska and Worldwide
- IV. Fisheries Management Issues
 - A. Mixed-Stock Fishery Management
 - B. Quality
 - C. Tagging Needs
- V. Legal Issues Raised by Board of Fisheries
- VI. Planning and Permitting Process
- VII. Biological Issues
- VIII. Enhancement Funding
- IX. Economics
- X. Marketing
- XI. Other Issues
 - A. Use of Hatcheries as Environmental Mitigation
 - B. Role of Hatcheries in International Treaties
 - C. Environmental Regulations
 - D. Use of Hatcheries as Tool for Economic Development
 - E. Importance of Hatcheries to Sport Fish
 - F. Contribution to Subsistence Fish
 - G. Enhancement of Other Species

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**LEGISLATIVE REVIEW
OF THE ALASKA SALMON ENHANCEMENT
PROGRAM**

EXECUTIVE SUMMARY



**Senate Special Committee on
Domestic & International Commercial Fisheries**

February 10, 1992

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Chapter I

INTRODUCTION

In the late spring of 1991, the Alaska Senate's Special Committee on Domestic and International Commercial Fisheries initiated a review of salmon fisheries enhancement in Alaska. The committee recognized that while hatchery and other enhancement projects in Alaska have been highly successful, they have not been comprehensively reviewed since the program's inception nearly 20 years ago. Since the program was initiated by the Alaska Legislature, and setting policy for state programs is a legislative responsibility, it is appropriate that the Legislature be the entity to conduct this review.

The committee began its work with no pre-conceived notions regarding its eventual findings and conclusions. Rather, legislative staff were directed first to compile relevant information, question interest groups, and develop a series of recommendations or options for action that could be taken to improve the state's program. This review is to serve as a starting point for a process of scrutiny and fine-tuning that may become an established part of the enhancement program itself.

It should be noted that an important segment of the review is not included in this draft report. The economic analyses, contracted to professional researchers, will not be complete and available for several months. Therefore, this draft contains information on the other topics of the review, with options presented at the end of each chapter regarding that specific chapter. Overall conclusions regarding Alaska's salmon enhancement program will be developed after the economic studies have been completed and analyzed in relationship to the information contained in this draft report.

Chapter II

HISTORY AND DEVELOPMENT OF HATCHERIES 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. Recent trends indicate a slight reduction in farmed salmon production. 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

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 at recent meetings 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.*

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.

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 traveled 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 Ellason. 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 16.05.44C(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.

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.

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 v. 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.

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.

There is also the concern that the non-Fish and Game members of the RPT may not be sufficiently capable of evaluating and making decisions on issues that are increasingly technical in nature.

5. Allocation issues.

The RPT does not have allocation authority; that responsibility is delegated by state statutes to the Board of Fisheries. *Without the ability to consider allocation issues as part of the permit review process, ADF&G may approve a hatchery permit that could create future allocation problems.* By the time the Board of Fisheries begins to consider allocation problems resulting from hatchery production, millions of dollars may have been invested through state loans. In addition, allocation conflicts over hatchery-produced fish may eventually require tagging programs as part of their resolution. The question of tagging--and who should pay for it--is one that is more easily addressed early in the planning and permitting process.

Recent developments seem to indicate a change for the future. *In 1988, the Board of Fisheries charged the Prince William Sound Aquaculture Corporation (PWSAC) with development of an allocation plan for enhanced stocks in Prince William Sound.* After an intense planning effort and several drafts, PWSAC was able to come up with an allocation scheme that all user groups and the department could support. The allocation plan was approved by the Board of Fisheries in 1991 and was in effect this past fishing season. Using the success of PWSAC as a model, the Board of Fisheries has also directed the two Southeast regional aquaculture associations (NSRAA and SSRAA) to develop an allocation plan for hatchery stocks by 1993.

6. Management issues.

Another complaint is that regional comprehensive salmon plans often focus exclusively on production goals for a hatchery, but provide little specific information on fishery management. FRED now requires an initial Management Feasibility Analysis (MFA) be completed before a final application is submitted. The MFA covers the basics of siting, species, timing, and magnitude of production, and is developed by the Commercial Fisheries and Sport Fisheries Divisions to avoid potential management problems. FRED planners believe that they have never permitted a hatchery or enhancement project that fisheries managers did not initially approve.

7. Uniform review.

State hatcheries and projects are not subject to the same permitting requirements as PNPs. Some fishermen believe that state projects cause the most allocation, management, and potential biological problems because of the lack of this additional layer of scrutiny. They would like to see permits required for state hatcheries and projects, as well as for PNP projects. FRED Division believes adding this requirement is unnecessary because of the many other layers of review these projects receive.

8. Criteria to show public benefit.

Four criteria must be considered by the RPT to determine if a permit application is in compliance with the regional comprehensive salmon plan:

- the contribution the proposed hatchery would make to the common property fishery,
- the provisions for protecting wild stocks from any adverse effects which may originate from the proposed hatchery,
- the compatibility of the proposed hatchery with the goals and objectives of the comprehensive salmon plan for the region, and
- whether the proposed hatchery would make the best use of the site's potential to benefit the common property fishery.

Critics say these criteria should be expanded to consider other public benefits and costs.

9. Operation performance reviews and permit revocation.

State managers and RPT gear group representatives are also concerned about ADF&G's authority over hatcheries that are out of compliance with state laws, regulations, and permit requirements. *With the potential risk of impacts on the state's common property fisheries, managers and some RPT members believe a mechanism to allow for the timely revocation of a permit is necessary.*

10. Hatchery Siting Privileges

If a region has an organized aquaculture association, that association, under state statutes, has the preference rights to all potential hatchery sites in that region. Non-association PNPs (Mom and Pops) have expressed concern that giving priority use of potential to future sites to an association is not good public policy. The Mom and Pop operators believe that any unused hatchery sites should be available to both associations and non-association PNPs.

11. Canadian evaluation model.

The Canadian government is considered to have a model evaluation program of its national salmon enhancement program. The first evaluation project began in 1985 and concluded that there was not enough production and biological data available to carry out a proper program evaluation. The program audit branch then designed the optimum evaluation framework and determined what kind of data would be needed. These data included biological and production information, as well as an analysis of economic costs and benefits. With that data in hand, program auditors are now preparing to spend a year reviewing the entire program, with a final report due in March 1993. Federal funds are being used for this project, although university staff and consulting firms are conducting the actual evaluation.