H B 432

SENATE COMMITTEE REPORT

DATE: 4/19/90 FURTHER:

DATE TURNED INTO OFFICE: 5-6-90

Resources Committee considered CSHB 432 (Resources)

"An Act prohibiting finfish farming; and providing for an effective date."

and recommended:

[ ] replace with _____ CS _____ [ ] same title
[ ] or adopt _____ CS _____ [ ] new title
[ ] technical title change (HB only)

[ ] attached amendment(s)
[ ] _____ letter of intent adopted

[✓] do pass

[ ] do not pass

[ ] no recommendation

[ ] individual recommendations

[ ] further referral to _____

ATTACHES NEW FISCAL NOTE(S): Dept/Date:

[ ] fiscal note(s) _____

[ ] zero fiscal note(s) _____

[ ] appropriation-no fiscal note

APPROVES PREVIOUS: Dept/Date:

[ ] fiscal note(s) _____

[✓] zero fiscal note(s) F+G

[ ] Governor's bill w/fiscal note

SIGNING DO P[illegible]

OTHER RECOMMENDATIONS: Eliminates Unspecified Note.

Chair: Signature and Recommendation

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                                        B005-LAST PAGE
PF1  PF2   PF3   PF4   PF5   PF6   PF7   PF8   PF9   PF10  PF11  PF12
HELP       EXIT  MENU        PRINT BWD   FWD         FIRST LAST  QUIT
Bill/Resolution History       02:26 PM 05/17/90            Page 1
BILL:  HB 432
NAME:  CSHB 432(RES)
TITLE: "An Act prohibiting finfish farming; and providing
       for an effective date."

PRIME SPONSOR: GRUSSENDORF
CO-SPONSOR:    ULMER,GOLL,DAVIDSON,NAVARRE,WALLIS,HUDSON,TAYLOR,DAVIS, C.
JACKO,KUBINA.MACLEAN,SWACKHAMMER,ZAWACKI,BOUCHER,FISCHER.HALFORD,SZYMANSKI
DUNCAN,BINKLEY,RODEY,KERTTULA,JONES,ELIASON,ZHAROFF,COGHILL

CURRENT STATUS: TRANSM TO GOVERNOR      STATUS DATE: 05/14/90

Selection=>
PF1  PF2   PF3   PF4   PF5   PF6   PF7   PF8   PF9   PF10  PF11  PF12
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HB 432              Bill/Resolution Floor Action          Page 2 of 4
                  Current Status: TRANSM TO GOVERNOR
      Jrn-Date   Jrn-Page          Action
   1  01/19/90    2145    (H)   READ THE FIRST TIME - REFERRAL(S)
   2  01/19/90    2145    (H)   RESOURCES, JUDICIARY
   3  01/22/90    2160    (H)   CO-SPONSORS ADDED: TAYLOR, DAVIS,C.
   4  01/24/90    2184    (H)   CO-SPONSORS ADDED: JACKO, KUBINA
   5  02/02/90    2278    (H)   CO-SPONSOR ADDED: MACLEAN
   6  02/27/90    2577    (H)   CO-SPONSOR ADDED: SWACKHAMMER
   7  03/16/90    2807    (H)   RES RPT  CS(RES)  6DP 1DNP 1NR
   8  03/16/90    2807    (H)   -ZERO FN/ANALYSIS  (F&G) 3/16/90
   9  04/05/90    3160    (H)   JUD RPT  CS(RES)  3DP 3NR
  10  04/05/90    3160    (H)   -PREVIOUS ZERO FN/A (F&G) 3/16/90
  11  04/05/90    3171    (H)   CO-SPONSOR ADDED:  ZAWACKI
  12  04/09/90            (H)   RULES TO CALENDAR  4/9/90
  13  04/09/90    3213    (H)   READ THE SECOND TIME
  14  04/09/90    3214    (H)   RES  CS ADOPTED UNAN CONSENT
  15  04/09/90    3214    (H)   ADVANCED TO THIRD READING UNAN CONSENT
  16  04/09/90    3214    (H)   READ THE THIRD TIME  CSHB 432(RES)
  17  04/09/90    3214    (H)   PASSED Y30 N5 A5
  18  04/09/90    3215    (H)   EFFECTIVE DATE SAME AS PASSAGE
Selection=>
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                  Current Status: TRANSM TO GOVERNOR
      Jrn-Date   Jrn-Page          Action
   1  04/09/90    3215    (H)   DAVIS,M NOTICE OF RECONSIDERATION
   2  04/09/90    3220    (H)   CO-SPONSOR ADDED:  BOUCHER
   3  04/10/90    3239    (H)   RECON TAKEN UP - IN THIRD READING
   4  04/10/90    3240    (H)   PASSED ON RECONSIDERATION Y29 N8 X3
   5  04/10/90    3240    (H)   EFFECTIVE DATE SAME AS PASSAGE
   6  04/10/90    3242    (H)   TRANSMITTED TO (S)
   7  04/10/90    3336    (S)   READ THE FIRST TIME - REFERRAL(S)
   8  04/10/90    3337    (S)   L&C, THEN RESOURCES
   9  04/19/90    3458    (S)   L&C RPT  4DP 1NR
  10  04/19/90    3458    (S)   PREVIOUS H ZERO FN (F&G)
  11  05/05/90    3968    (S)   24-HOUR NOTICE WAIVED, RULE 23(D)
  12  05/06/90    4022    (S)   RES RPT 3DP 2NR
  13  05/06/90    4022    (S)   PREVIOUS H ZERO FN (F&G)
  14  05/06/90    4022    (S)   ZERO FISCAL NOTE PUBLISHED
  15  05/06/90    4022    (S)   LETTER OF INTENT WITH S RES REPORT
  16  05/06/90    4069    (S)   RULES TO SUP CAL   5/6/90
  17  05/07/90    4110    (S)   READ THE SECOND TIME
  18  05/07/90    4110    (S)   ADVANCED TO THIRD READING UNAN CONSENT
Selection=>
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BASIS  Journal Text

05/06/90                    SENATE JOURNAL                  PAGE 4022
          _HB 432_

          The Resources Committee considered _CS FOR HOUSE BILL NO. 432_
          _(Resources)_ (An Act prohibiting finfish farming; and
          providing for an effective date). Senator Fahrenkamp,
          Chair, and Senator Sturgulewski signed "no recommendation."
          Senators Eliason, Zharoff and Kerttula signed "do pass."


          Previous House zero fiscal note.


          The committee further attached the following Letter of
          Intent:

                Senate Resources Committee Letter of Intent

                                  for

Selection=>
PF1  PF2   PF3   PF4   PF5   PF6   PF7   PF8   PF9   PF10  PF11  PF12
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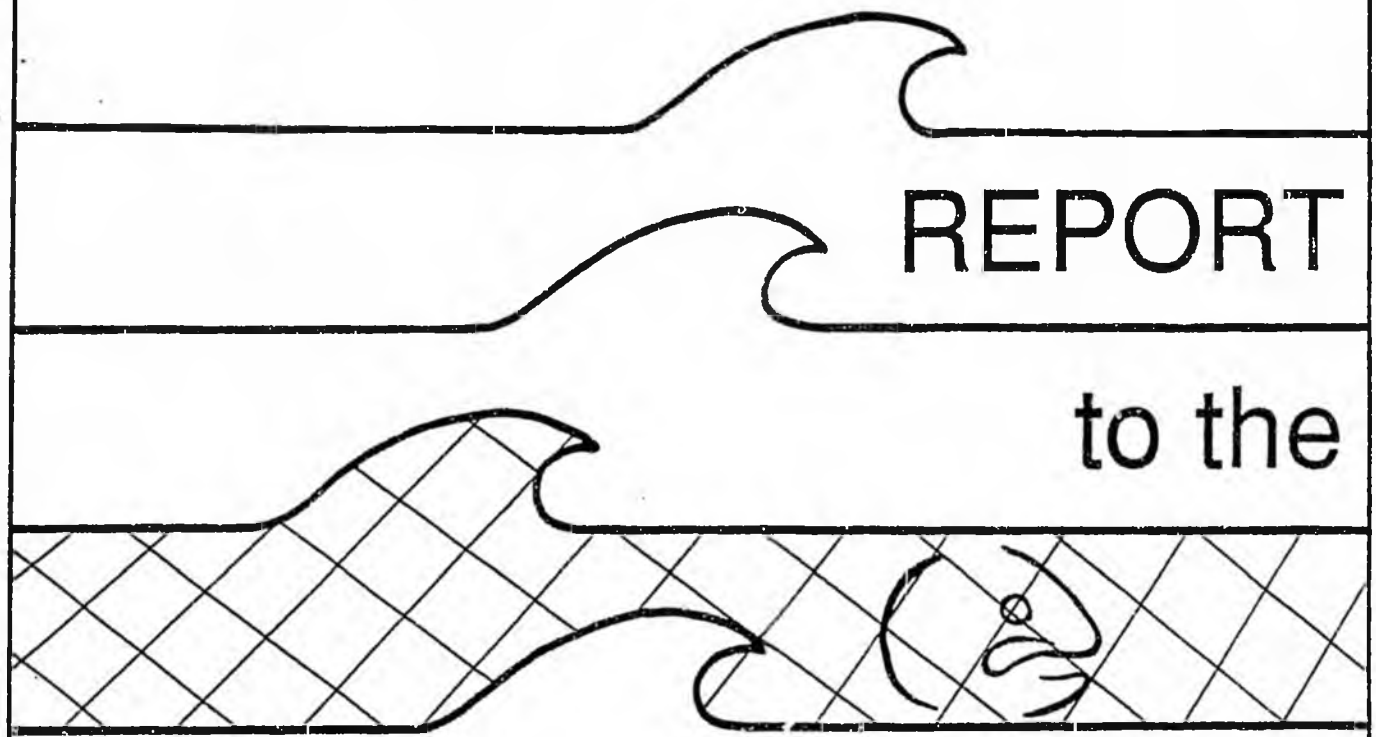
SENATE RESOURCES COMMITTEE LETTER OF INTENT TO HB 432

It is the intent of the legislature to support the concept of upland tank farming of non-salmon species. It is further the intent of the legislature that the Department of Fish and Game work with the Senate and House Resources Committees during the interim to develop environmental, siting and broodstock acquisition and ownership criteria, including identification of potential sources of broodstock, for the upland tank farming of non-salmon species for incorporation into legislation to authorize upland tank farming of non-salmon species for introduction in the 17th Legislature.

Alaska

FINFISH FARMING TASK FORCE



REPORT

to the

ALASKA

LEGISLATURE

January 15, 1990

Alaska Finfish Farming Task Force

REPORT TO THE ALASKA LEGISLATURE

January 15, 1990

Alaska Finfish Farming Task Force
P.O. Box AM
Juneau, AK 99811
907/465-3568

THE ALASKA FINFISH FARMING TASK FORCE

Members:

Ken Castner, Homer -- Representative of Commercial Fishermen
Mary Lou Cooper Elton, Juneau -- Public Member
Theodore Merrell, Juneau -- Fisheries Biologist, Chairman
Brent Paine, Anchorage -- Aquatic Farming Advocate
John Weddleton, Anchorage -- Private Economist

Staff: Jon Sherwood, Project Coordinator
Martha Fischbach, Publication Specialist

The following individuals held the part-time clerical position:

Fran Armon
Chris Clark
Martha Fischbach

Acknowledgements

Many individuals and organizations helped the task force in its efforts, and we gratefully acknowledge their efforts.

In addition, the task force would like to express its appreciation to Mike Nizich and the staff of the Office of the Governor, Division of Administrative Services for providing the task force with administrative support; to John Lucas and the staff of the Office of Management and Budget, Division of Audit and Management Services, particularly June Baker and Donna Voss, for providing office space and support for the task force staff; and Sen. Arliss Sturgulewski and her staff, for arranging conference rooms, recording equipment, and teleconferencing services for task force meetings.

Sen. Tim Kelly, President of the Alaska Senate
Rep. Sam Cotten, Speaker of the Alaska House of Representative
Pouch V
Juneau, AK 99811

Senator Kelly and Representative Cotten:

Transmitted herein is the final report of the Alaska Finfish Farming Task Force. The task force has met its charge as stated in Ch. 145 SLA 1988; the findings and recommendations included in this report reflect that mission.

These findings and recommendations have resulted from our review of prior research, inspection of finfish farms, the testimony of experts, and public comments. This report represents the consensus of the entire task force. All of our findings and recommendations were agreed upon by every task force member.

The time constraint on the task force prevented us from considering every issue in great depth. We have focused our efforts on those issues over which there is the most controversy and on the issues for which more definitive answers are available. We hope that you will find this report useful to your deliberations.

With the submission of this report, the task force will cease to exist as a formal body. However, our project coordinator has been retained to be available as needed through the legislative session to assist in the deliberations of this important issue.

Finally, on behalf of the task force, I would like to take this opportunity to thank you for creating this opportunity to participate in an important public policy issue.

Sincerely,

Theodore R. Merrell

Theodore R. Merrell, Chairman
Alaska Finfish Farming Task Force

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Chapter 1

INTRODUCTION

The viability and desirability of finfish farming in Alaska, particularly salmon, has long been a subject of controversy. The state is currently under its second finfish farming moratorium. This one expires on July 1, 1990.

The Alaska Finfish Farming Task Force was created by the Alaska Legislature in 1988 (Ch. 145 SLA 1988) to study the socioeconomic, biological, and environmental issues related to finfish farming. The task force was charged with addressing finfish farming in Alaska in freshwater, in marine environments, and in tanks or other upland structures containing marine water. In addition, the task force was to consider hatchery operations related to finfish farming.

By statute, the composition of the task force must represent a variety of perspectives. Specifically, the task force is comprised of one representative of the commercial salmon fishermen, one aquatic farming advocate, one private economist, one fisheries biologist, and one public member with no involvement in the seafood or aquatic farming industry. State employees were not eligible to serve on the task force.

Although the legislation authorizing the task force was passed in 1988, the Legislature did not fund the task force until its 1989 legislative session. In July 1989, Governor Cowper announced his appointments to the task force; the first meeting was held in late July.

This task force is not the first body in the state to consider the issue of finfish farming. During the Sheffield Administration, the Governor's Mariculture Advisory Committee was formed to look at the issue. In addition, the Alaska Legislature has considered various pieces of legislation pertaining to aquatic farming.

One of the first actions of the task force was to familiarize itself with the work that preceded it. In addition, it considered new information on social, environmental, and economic impacts that has recently become available from the operation of West Coast and foreign salmon farms. The world markets for salmon are changing dramatically; many assumptions regarding salmon farming economics and marketing that are based on historical data may not be relevant today.

In 1989, the State of Alaska implement its plant and shellfish mariculture regulations, giving state officials additional experience in the regulation of an industry that shares many of the characteristics of the proposed finfish farming industry.

To ensure that it evaluated finfish farming based upon the most current information available, the task force took testimony from experts on every major issue. In addition, the task force toured salmon farms and hatcheries in the Puget Sound area. It visited both salt water marine pen farms and fresh water smolt and pan-sized fish farms.

Due to the limited time available to the task force to perform its mandated tasks, it has focused on the specific issues set forth in Ch. 145 SLA 1988:

-- protecting the health of the existing fisheries resource;

-- siting of farms to protect the environment and minimize use conflicts;

-- the supply of finfish farming broodstock;

-- the cost of regulating finfish farming;

-- the economic benefits and costs of finfish farming; and

-- strategies for improving the marketability of Alaska salmon, particularly those species that compete with farmed salmon.

The task force has incorporated other concerns into its evaluation of these issues as appropriate.

The remainder of this report addresses the six major topics listed above. Each of these topics is divided into its component specific issues. Each issue is defined in broad terms, and a set of findings, briefly summarizing information pertaining to the issue that was collected by the task force, is provided. Where pertinent, the trade-offs associated with the different approaches to addressing each issue are discussed. Finally, the task force presents its recommendations as to the manner in which future State efforts should address each issue and some general conclusions and concerns about the role of finfish farming in Alaska.

The task force did not begin its work with any supposition that finfish farming is desirable or undesirable for Alaska. To address some of the issues included in the legislation authorizing the task force, however, it is necessary to presuppose the existence of a finfish farming industry. For example, one cannot determine the cost of regulating a finfish farming industry without assuming that an industry will exist. The reader should

not construe any finding or recommendation pertaining to a specific issue to be either endorsement or disapproval of finfish farming in Alaska.

For clarity, a brief explanation of a few terms used in this report and in the discussion of finfish farming is provided below.

-- **Finfish** is used as a generic term for finfish indigenous to Alaska, except where noted.

-- **Finfish farming** is the growing of fish to market size in an enclosed environment. **Aquatic farming** includes sea plants and shell fish as well as finfish.

-- **Ocean ranching** is the release of hatchery-reared fish into the public waters for eventual recapture.

-- **Aquaculture** is the cultivation of fish and plants in both fresh and salt water. However, in Alaska, the term is specific to the State's and private nonprofit hatcheries' ocean ranching programs.

-- **Mariculture** is fish cultivation in salt water. However, in Alaska, the term is used to refer to all aquatic farming activities.

To avoid confusion, we have tried to be explicit in our references to finfish farming and ocean ranching by avoiding the more general terms, mariculture and aquaculture.

Chapter 2

THE HEALTH OF THE FISHERIES

Any effort to initiate finfish farming in Alaska must provide for the maintenance of the health of the state's existing commercial, recreational, and subsistence fisheries. There is continuing public concern regarding the effects of finfish farming on disease transmission and genetic alterations in wild stocks.

Finfish farming also could affect the health of existing fisheries through its impacts on the environment. This issue is addressed as the first concern in Chapter 4.

DISEASE

Concern

Can diseases from finfish farms be transmitted to wild and hatchery finfish stocks, with substantive adverse impacts on those stocks?

Findings

a. Fish raised in farms are subject to increased stress from handling and from the high density of fish per volume of water; this increased stress makes farmed fish more susceptible to disease than are fish in the wild.

b. Diseases occurring in farmed stocks also occur in the marine environment and in wild stocks.

c. Disease transmission between captive stocks and wild stocks is a two-way problem. Captive stocks are probably more susceptible to disease because of increased stress. The potential for disease transmission between captive and wild stocks exists in both ocean ranching operations and fish farm operations.

d. The importation of nonindigenous stocks poses the risk of importing diseases that are not present in existing wild and hatchery stocks. To control the spread of disease,

the State has imposed strict regulations limiting the movement of salmon and their gametes within Alaska and prohibits the importation of live fish or gametes from outside the state.

e. Disease pathogens can travel through the water table in land-based farming operations. Upland finfish farming can result in the contamination of the water table with pathogens that infect fish.

f. The risk of disease transmission from captive to wild stocks increases in direct proportion to the degree to which captive fish and the water they use contact wild fish. Of the three alternatives for finfish farming (upland freshwater, upland marine, and marine pens), marine pens, with the certainty of fish escapement, pose the greatest risk of spreading disease.

g. Upland marine and fresh water facilities pose less risk of contamination of natural waters than do marine pens.

h. The addition of finfish farming to aquaculture activities in Alaska would increase the demand for the pathology services necessary to control disease. Providing these services to a finfish farming industry would strain existing State technical and financial resources.

i. Pathology services are available in other fish farming regions from private laboratories.

j. Pathological services can be provided by persons certified by the American Fisheries Society under State authority. This practice currently exists in the ocean-ranching program.[1]

Recommendations

1. The finfish farming industry can be accommodated without significant threat of disease to wild and hatchery stocks if the State continues to meet its responsibilities in fish disease control and if monies are provided for additional health services or private pathological services are created.

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[1] This finding is repeated in Chapter 5, as finding f.

2. Current policies prohibiting importation of live salmonids, including gametes, should be placed into statute and rigorously enforced.[2]

3. To ensure adequate control of disease in the finfish farming industry, the State will need to provide for the development of private pathology services or increase staff and funding for existing State services.

4. If the State allows private pathology services, there should be a licensing or certification process.

5. Water discharged from upland marine and fresh water facilities should be screened and the effluent treated.

GENETICS

Concern

Does escapement of farmed finfish pose a threat to the genetic integrity of wild stocks?

Findings

a. Each finfish stock has its own unique genetic characteristics. Therefore, the interbreeding of wild stocks with selectively bred farmed stocks could alter the genetic characteristics of wild stocks.

b. Fish farmers would practice selective breeding to enhance characters that are best suited for the farm environment. Over time, farmed fish stocks will diverge genetically from the donor wild stocks; the characteristics for which farmed stocks are bred diminish their suitability to life in the wild.

c. The greater the extent of fish escaping from fish farms, the greater the possibility that farmed fish will either interbreed with or compete with wild stocks.

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[2] This recommendation is repeated in Chapter 2, as recommendation 2 in the section on genetics.

d. The survival capacity of escaped farmed stocks is uncertain. While it is possible for farmed stocks to survive outside a farm environment, it is not clear what percentage would breed successfully.

e. The genetic impact on stocks of wild fish resulting from interbreeding with escaped farm fish would depend on the ratio of farmed fish to wild fish of the same species in the stream.

f. The State's genetic policy prohibits the importation of live salmonids into the state.

g. The State's genetic policy does not allow for stocks to be transported between major geographic regions of the state.

h. The State's genetic policy has been adopted to protect Alaska's diverse natural salmon and trout stocks; however, it is not always rigorously followed.

i. Several options exist for protecting the genetic integrity of wild stocks, including: restricting farming to upland marine or fresh water tanks; using triploid farm stocks (fish that have a third set of chromosomes, rendering them sterile); and establishing wild stock genetic reserves.

Recommendations

1. The existing State genetics policy is adequate to protect the genetic integrity of the state's fisheries and should be rigorously applied to fish farming.

2. Current policies prohibiting importation of live salmonids, including gametes, should be placed into statute and rigorously enforced.[3]

3. The State should not permit the siting of finfish farms within a 20 kilometer radius from the mouth of a stream that has significant production of the same species.

4. The task force concurs with the Alaska Chapter of the American Fisheries Society resolution on genetic sanctuaries:

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[3] This recommendation is repeated in Chapter 2 as recommendation 2 in the section on disease.

One recommendation for the protection of wild stocks in the Genetic Policy is the establishment of wild stock sanctuaries. These sanctuaries would be areas in which no enhancement activity is permitted except gamete removal for broodstock development. Populations of fish in these areas would represent "gene banks" of wild-type genetic variability. Sanctuary status could also be a conservative use status for the protection of particular significant or unique wild stocks.

[Editor's Note: the task force uses the term reserve, instead of sanctuary, elsewhere in this report.]

5. The State should form an ad hoc committee to determine whether the State is strictly adhering to its genetics policy.

Chapter 3

BROODSTOCK

The major broodstock issues are the sources of donor broodstock for finfish farming activities in Alaska and the creation of finfish broodstock as privately-owned resources.

OWNERSHIP OF BROODSTOCK

Concern

Should the State allow the private ownership of broodstock?

Findings

a. Finfish broodstocks are a common property resource.

b. Finfish farmers would need control over their broodstock to develop domesticated stocks most suitable for farming.

c. Private ownership of broodstock could lead to the exportation out of state of gametes or live salmonids that are now unique to Alaska.

d. Private ownership of broodstock could lead to patentable genetic alteration based on the indigenous species.

e. A system of private nonprofit hatchery regulations could be designed that would allow farmers to develop pedigreed broodstock without losing State ownership.

f. Finfish farming hatcheries would require a new statutory authorization for operation.

Recommendations

1. The State should not permit private ownership of broodstock.

2. All finfish gametes should remain in the ownership of the State by requiring that hatchery production for finfish farming be done under State permit and authority.[4]

3. All hatcheries within Alaska should be operated under nonprofit status.

4. A new permit allowing the cultivation of eggs and the sale of smolt to the finfish farming industry should be required. Existing hatcheries may be limited or precluded from participation by the conditions of their existing permits.

5. The State should create a new statutory authorization for the operation of finfish farming hatcheries.

6. There should be a statutory ban on the export of indigenous finfish stocks.

SOURCES OF BROODSTOCK

Concern

How can finfish farmers be provided secure sources of donor broodstock? How can finfish farmers be allocated broodstock to minimize the impact on the common property resource?

Findings

a. The State of Alaska owns all finfish broodstock; there are no privately-owned broodstock in Alaska.

b. Current laws, policies, and aquaculture activities do not provide for a source of broodstock for finfish farming.

c. Given current State policy on disease and genetics, the initial source of broodstock for finfish farming would have to come from State hatcheries, private nonprofit hatcheries, or wild stocks.

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[4] This recommendation is included in Chapter 3 as part of recommendation 1 in the section on sources of broodstock.

d. Existing genetic policy limits sources of donor broodstock to stocks found in the general vicinity of a net pen or upland tank farm.

e. Sources of donor broodstock for enclosed freshwater systems can be less restrictive than broodstock for marine net pen farms, both in species and in stock selection, because of the lower potential for impacts on wild stocks from enclosed freshwater systems.

f. Use of indigenous broodstock would provide finfish farms with stocks that are more resistant to naturally occurring diseases.

g. Some broodstock sources are more desirable than others because of characteristics such as fish size, color of flesh, reduced tendency toward premature sexual development, and size of the donor population.

h. Finfish farmers require a high degree of control over their selective breeding and husbandry practices in order to develop broodstock biologically and economically suited to farm operations.

i. Finfish farmers eventually would be able to develop their own broodstock with State permits and could supply new farms with smolt.

j. Current salmon management practices fully allocate returning adult salmon to either natural spawning escapements or to the sport, commercial, and subsistence fisheries.

k. Salmon egg surpluses do occur in the State and private nonprofit hatchery systems; however, current statutes would prevent these surpluses from being used as sources of donor broodstock for finfish farming.

l. Private nonprofit hatcheries harvest and sell fish to cover their costs. There is no provision in current statutes for private nonprofit hatcheries to sell eggs or smolt for cost recovery.

m. Egg surpluses occur due to overescapement up rivers and streams. Overescapement is one source of broodstock for existing hatchery programs. Current statutes prohibit the use of overescapement as a source of broodstock for finfish farming.

n. Direct sales from fishermen holding live fish transport permits would be the least desirable method of broodstock acquisition for finfish farming due to the lack of disease and genetic control.

o. A single hatchery may maintain several genetically different broodstocks as long as each is segregated from the others.

p. Sources of broodstock for finfish farming could be identified by Regional Planning Teams.

Recommendations

1. All finfish gametes should remain in the ownership of the State by requiring that hatchery production for finfish farming be done under State permit and authority. Cultivation and in-state sale of broodstock and smolt by finfish farmers should not be prohibited.[5]

2. The finfish farming industry should develop its own stocks under new State provisions for nonprofit finfish hatcheries.

3. New private nonprofit hatcheries under State authority would be required to rear broodstock for finfish farming operations.

4. The preferred initial source of broodstock is surplus hatchery eggs. Other sources include overescapement, cost recovery fish, and allocation by the Board of Fisheries.

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5 Part of this recommendation is repeated in Chapter 3 as recommendation 2 in the section on ownership of broodstock.

Chapter 4

SITING OF FINFISH FARMS

Physical characteristics of finfish farm sites affect the degree to which farms alter the local environment, and farms may interfere with other users of water and adjacent uplands. Physical characteristics of sites also affect the economic viability of finfish farms.

ENVIRONMENTAL IMPACTS

Concerns

What are the environmental impacts of finfish farms? How can they be minimized?

Will predator control measures by finfish farmers adversely affect populations of birds and mammals?

Findings

a. Proper siting of finfish farming facilities is the most important element in minimizing the transference of disease, genetic interference with wild stocks, degradation of water quality, aesthetic degradation, and predation by marine mammals, and in avoiding conflicts with existing users and designated uplands uses.

b. The primary environmental impacts of net pen farming stem from increased sedimentation, changes in the benthic infauna (bottom-dwelling organisms), and reduced water quality in the vicinity of the pens resulting from the deposition of fecal material and uneaten feed.

c. The degree of impact of net pen farming varies inversely with the degree of flushing, which depends largely on water depth and current.

d. The degree of impact of net pen farming varies directly with the surface area occupied by pens and the stocking density of the fish farms.

e. Criteria for the siting and intensity of farming activities can be used to reduce the environmental impacts of marine pen farming in an area.

f. Pre-site surveys and periodic monitoring of water quality and the benthic community beneath pens are essential to ensuring minimal environmental impacts.

g. The primary environmental impacts from fresh water and marine upland tank farming operations stem from their use and disposal of water.

Recommendations

1. The State should use existing siting guidelines to develop a set of criteria specifically applicable to finfish net pen farming in Alaska. These include the State of Washington's Recommended Interim Guidelines for the Management of Salmon Net-Pen Culture in Puget Sound and the Alaska Department of Natural Resources' Etolin Island Area Mariculture Pilot Project. Guidelines for siting should also reflect the Alaska Department of Fish and Game's disease and genetics policies.

2. The State should use the Consistency Review Process of the Alaska Coastal Management Program in permitting finfish farm sites. The Alaska Coastal Management Program provides "a framework for local and public participation in State decisions, and a mechanism for the resolution of conflicts between government agencies, individuals, and local communities." However, special provisions for public notice of finfish farming permit applications, including requirements for newspaper display ads with location maps and direct agency notification to interested parties, should be developed to encourage the greatest degree of public involvement.

3. Only nonlethal predator control measures, such as bird and mammal exclosure nets and electric fences, should be allowed for finfish farming.

USER CONFLICTS

Concerns

Will the presence of finfish farms restrict, preclude, or degrade current or potential uses of sites and adjacent areas by others for commercial, recreational, and subsistence activities?

How can the State identify potential conflicts with existing uses of uplands and coastal areas, especially where those uses do not require State permits?

Findings

a. Net pen farms may have adverse aesthetic impacts on upland land owners or other users.

b. An average finfish farm would take up one to two acres of surface area. Additional subsurface area would be required.

c. Net pen farms may interfere with navigation around the site and restrict access to uplands.

d. Finfish farms may preclude or interfere with other commercial and recreational uses of farm sites or adjacent uplands.

e. Year-round commercial activities by finfish farms may be incompatible with use of uplands set aside for wild or scenic purposes, such as State and federal parks, monuments, and wilderness areas.

f. The State does not have a complete inventory of existing uses of State waters other than those operating under a specific State permit, except for Etolin Island, Prince of Wales Island, and Prince William Sound. The use of State waters for navigation, sport and commercial fishing, water sports, or anchorage are activities for which State permits are not usually required.

g. The State's consistency review procedure for coastal permitting and its existing aquatic farm permitting procedures provide some mechanisms for identifying and resolving user conflicts.

h. The State's salmon enhancement program uses marine net pens, and they are routinely permitted under existing regulations.

Recommendations

1. Area planning represents the best method of determining consistency of uses. However, where area plans do not exist, the consistency review process must allow

for expanded public review to ensure consistency with activities that do not require State permits.

2. Fish farms and ancillary use of adjacent uplands must be compatible with zoning and designated uses of the uplands. No finfish farming should be permitted in waters adjacent to State and federal parks.

Chapter 5

COST OF REGULATION

The development of a finfish farming industry in Alaska will require the development of some new regulatory programs and the expansion of some existing ones.

Concerns

What is the cost of providing necessary regulation and oversight to a finfish farming industry? How could the finfish farming industry bear some of these costs?

Findings

a. Success of the finfish farming industry will require the support and cooperation of the government agencies charged with monitoring, permitting, and enforcement.

b. The cost of conducting site evaluation, preparing adequate site plans, and other work anticipated in the permit application process is a significant front-end cost to finfish farmers.

c. The Department of Environmental Conservation, the Department of Fish and Game, the Department of Natural Resources, and the Division of Governmental Coordination would all have regulatory responsibilities related to finfish farming.

d. The task force estimates that approximately $500,000 would be required annually by State agencies to regulate a finfish farming industry, assuming 10 to 15 permit applications per year requiring the equivalent of 5 additional full-time positions.[6]

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[6] The exact cost of regulating finfish farming will vary according to the specific provisions contained in enabling legislation and the number of permit applications that are received. Recent draft estimates provided by State agencies project a cost of $1.15 million to regulate an industry with 50 permit applications per year. The fiscal note to CSSB 106 (L&C) (1987) estimated that it would cost approximately $640,000 to regulate all forms of aquatic farming.

Federal and local governmental agencies would also experience some costs associated with regulating finfish farming.

e. The cost of administering regulatory requirements for hatcheries would be similar whether for ocean ranching or finfish farming.

f. Pathology services can be provided by persons certified by the American Fisheries Society under State authority. This practice currently exists in the ocean ranching program.[7]

Recommendations

1. The State should reduce its regulatory expenses by encouraging the use of private pathology services.

2. The finfish farming industry should pay economic rent for use of public resources. Forms of rent include local and State property taxes, State income taxes, sales taxes, permit fees, tideland leases, and a raw fish tax of three percent of the farm gate value.

3. Special provisions for public notice of finfish farming permit applications, including requirements for newspaper display ads with location maps and direct agency notification to interested parties, should be developed to encourage the greatest degree of public involvement. Applicants should bear the cost of these public notice provisions.

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7 This finding is repeated in Chapter 2 as finding j in the section on disease.

Chapter 6

ANALYSIS OF COSTS AND BENEFITS

Development of a finfish farming industry will provide economic benefits to finfish farmers, their suppliers and processors and, through taxation, State and local governments. At the same time, costs will accrue to State and local governments, and users of coastal marine waters, tidelands, and uplands. The costs and benefits to the state of this new industry must be weighed carefully.

In addition, it is important to look closely at the economics of finfish farming, to avoid making false assumptions about the economic viability of the industry.

COSTS AND BENEFITS ACCRUING TO ALASKA AND ITS RESIDENTS

Concerns

Do the socioeconomic, environmental, and biological costs associated with the introduction of finfish farming to Alaska outweigh its benefits?

Are the benefits associated with finfish farming likely to be concentrated among few individuals and businesses, who may or may not be Alaskan, while costs associated with finfish farming are likely to be borne by many Alaskans?

Findings

Costs:

a. The State's fishery management and limited entry programs, State and private nonprofit ocean ranching efforts, and federal management of the 200-mile economic zone have improved the economic health of the commercial salmon fisheries in Alaska.

b. Allocation of broodstock to finfish farming could result in fewer smolt available for common-property ocean ranching programs.

c. The commercial fishing industry could suffer economic loss from lower prices caused by the increase in supply of fish resulting from finfish farming. (See Appendix B for detailed estimates.)

d. The existence of a finfish farming industry in Alaska would preclude the use of a marketing strategy that equates Alaska salmon with wild salmon and emphasizes its desirability as a natural product.[8]

e. The costs associated with disease, genetic change, diminished water quality, loss of anchorages or recreational opportunities, and loss of other commercial opportunities can be mitigated through proper regulation of the finfish farming industry.

f. Non-Alaskan investment in the finfish farming industry would lead to the exportation of profits.

g. The costs associated with the finfish farming industry would not be evenly dispersed geographically.

h. An indirect impact of finfish farms could be diminished public concern for protecting the habitat of wild stocks.

Benefits:

a. The finfish farming industry would create jobs. Finfish farming might provide jobs in rural areas with otherwise limited employment opportunities.

b. There would be a year-round supply of fresh salmon from Alaska, benefiting processors and consumers.

c. Secondary industries, such as pathological services and transportation, would benefit from a finfish farming industry.

d. Existing ocean-ranching facilities seasonally use large amounts of fish feed. Land-based fish processing plants in Alaska produce by-products suitable for the meal used

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[8] This finding is repeated in Chapter 7 as finding g in the section on competition between farmed fish and Alaska commercial fisheries.

in fish feed. The addition of finfish farming could eventually bring fish feed demand to levels high enough to sustain in-state fish feed production.

e. Current waste disposal practices by fish processors may not be tolerated by regulatory agencies in the future; development of in-state fish feed production for the finfish farming industry could utilize this waste. In addition, fish processors might purchase some currently underutilized species of fish for use in fish feed.

f. Finfish farming could provide an alternative source of revenue for hatcheries, although the task force does not advocate State and private nonprofit hatcheries' moving away from their original purposes.

g. Benefits from finfish farming would not accrue immediately upon authorizing the industry. If legislation were passed in 1990 allowing finfish farming, eggs would not become available until 1992 at the earliest because of the need to allocate eggs for that purpose. Fish would enter marine pens in the spring of 1993 and would not reach market size for another eighteen months. Therefore, finfish farms would not achieve a positive cash flow until late 1994, at the earliest. (See the time line in Appendix A for a complete explanation.)

Recommendation

1. The State of Alaska should not subsidize finfish farming beyond the amount needed to regulate the industry.

ECONOMIC VIABILITY OF FINFISH FARMING IN ALASKA

Concern

Will the present economics of finfish farming constrain the ability of individuals to enter the industry?

Findings

a. Finfish farming is a high-risk industry for which there are very few insurers.

b. People with no experience in fish farming or cultivation will probably be uninsurable.

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c. Insurance for unanticipated losses will be a requirement for obtaining conventional financing for finfish farms.

d. Growth rates and food conversion rates of farmed fish are very important factors that influence the cost of growing fish to market size.[9]

e. Low water temperatures that characterize Alaska waters slow growth rates and, by extending the time needed to grow fish to market size, may increase the debt service cost associated with finfish farming.

f. There are economic incentives toward vertical integration in salmon farming to take advantage of all profit centers.

g. A few small, family-owned, fresh water farming facilities exist in Washington; they cater to specific market niches.[10]

h. Net pen farms in the Pacific Northwest are, for the most part, owned by corporations and are capital intensive.

i. For a two-acre net pen farm, it is estimated that capital of at least $1 million over a 30-month period would be needed before a cash flow from market-sized salmon would begin.

j. High capitalization and other costs required for finfish farming may limit its growth in Alaska.

k. The present poor world-wide economic climate for farmed fish will limit entry of Alaskans into the finfish farming industry and may help avoid the boom and bust cycle experienced by the finfish farming industry in British Columbia.

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9 This finding is also contained in Chapter 7, in the section on marketing opportunities for farmed Alaska salmon.

10 This finding is also contained in Chapter 7, in the section on marketing opportunities for farmed Alaska salmon.

Chapter 7

MARKETING

There have been major changes in world markets for Alaska finfish recently. In 1982, Alaska produced 59 percent of fresh and frozen salmon (includes chinook, coho, sockeye, and pen-reared) in the world; pen reared salmon accounted for 5 percent. In 1987, Alaska produced 43 percent of fresh and frozen salmon; pen reared accounted for 32 percent.

Neither the potential for finfish farming in Alaska nor its impacts on the commercial fishing industry can be properly evaluated without considering the marketing issues involved. Nor is it possible to evaluate the impact of the industry to the state without considering other alternatives for Alaska to respond to the widespread availability of farmed salmon on the world markets.

MARKET POTENTIAL FOR ALASKA FINFISH FARM PRODUCTS

Concern

What is the market potential for Alaska farmed finfish?

Findings

a. Species of finfish that have been commercially reared in net pens and are indigenous to Alaska include chinook and coho salmon, rainbow trout, steelhead, and Arctic char. Other indigenous species with the potential for farming include sablefish (black cod), grayling, sheefish, and sockeye salmon.

b. Black cod and halibut farming are still in the research and development phase, but are very promising.

c. Alaska farmed finfish will have to compete in already crowded world markets.

d. There are some market niches (for example, Arctic char) that have yet to be exploited.

e. Some finfish farmers in Washington and British Columbia have stopped raising chinook and coho salmon (species indigenous to Alaska) in favor of Atlantic salmon for economic reasons.

f. Feed composition can be used to modify color and nutritional quality of farmed salmon to increase its market value.

g. At current prices, there is an estimated surplus of 100,000 metric tons (about 14 percent of demand) of salmon on world markets, resulting in continued downward pressure on prices.

h. Prices for farmed salmon have fallen during 1989 along with the prices for wild salmon. Salmon filling specific market niches have been able to avoid dramatic price drops, e.g., pan-size coho salmon.

i. On the average, a farmed finfish will cost more per pound to produce than a wild fish.

j. Production of pen-reared salmon has recently outpaced market demands for fresh fish, and a considerable volume is now entering the frozen market. Fresh and frozen Atlantic salmon now compete with Alaska sockeye and coho in the Japanese market.

k. World production of farmed salmon in 1989 exceeded projections. Norway had projected farmed salmon production of 120,000 metric tons in 1989, up from 89,000 metric tons in 1988. Norway's actual production in 1989 is now estimated to be 150,000 metric tons.[11]

l. Projections for world-wide production of farmed salmon in 1990 are 186,000 to 220,000 metric tons.

m. Alaska is a price taker in a world dominated by pen-reared salmon.

n. There is presently room for expansion in the market for high quality, fresh finfish, especially in the Midwest.

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[11] David Aiken, World Aquaculture, "The Economics of Salmon Farming," Vol. 20(3), September 1989, p.15.

o. Downward pressure on prices will persist as a result of increased production of both wild and farmed salmon.

p. Currently, the demand for pan-sized (under 2 lbs.) salmon and salmon over 6 lbs. is good; there is little market demand for salmon between 3 and 6 lbs.

q. Growth, survival, and food conversion rates of farmed fish are very important factors that influence the cost of growing fish to market size.[12]

r. Small, family-owned, **fresh water** farming facilities exist in Washington; they cater to specific markets.[13]

s. A guaranteed year-round supply of fresh Alaska salmon (wild and farmed) could enable processors to attract and hold customers, who prefer certainty of supply from a single source.

COMPETITION BETWEEN FARMED FISH AND ALASKA COMMERCIAL FISHERIES

Concern

Will salmon farming in Alaska tend to undermine the price of wild salmon, adversely affecting Alaska's existing commercial fishing industry?

Findings

a. Markets for Atlantic and Pacific salmon raised in fish farms overlap with salmon taken in the Alaska fisheries. As production increases, competition will increase. (See Appendix B.)

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[12] This finding is repeated in Chapter 6, in the section on the costs and benefits to the finfish farming industry.

[13] This finding is repeated in Chapter 6, in the section on the economic viability of finfish farming in Alaska.

b. Some market-niche fisheries have been hit harder than others; troll-caught salmon, for example, historically have earned a premium price on fresh and quality-sensitive markets but now face stiff competition from pen-reared Atlantic salmon.

c. Alaska has lost most of its European market for salmon for smoking to farmed Atlantic salmon from Norway and Great Britain.

d. Alaska salmon has been displaced in U.S. fresh salmon markets east of the Mississippi River by farmed Atlantic salmon grown in Norway and on the coast of Maine and in Canada's Maritime Provinces.

e. Alaska salmon has been displaced in U.S. fresh salmon markets west of the Mississippi River by farmed Atlantic salmon grown in Washington, British Columbia, and Chile.

f. More pen-reared salmon is appearing in frozen salmon markets; an estimated 17,000 metric tons will be sold in the Japanese frozen market in 1989. Alaska frozen salmon sales to Japan compare at 100,000 metric tons in 1989.

g. The existence of a finfish farming industry in Alaska would preclude the use of a marketing strategy that equates Alaska salmon with wild salmon and emphasizes its desirability as a natural product.[14]

h. Competition in world markets between farmed salmon and Alaska wild salmon will continue to occur whether or not Alaska permits finfish farming.

MARKETABILITY OF ALASKA SALMON

Concern

What strategies exist for improving the marketability of Alaska salmon, especially those species that compete with farmed salmon?

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[14] This finding is repeated in Chapter 6 as finding d in the section on costs and benefits accruing to Alaska and its residents.

Findings

a. The three most important factors affecting the marketability of Alaska wild salmon are price, consistency of supply, and quality.

b. Market forces will determine the price of Alaska wild salmon.

c. No biological strategy exists for improving the consistency of supply of Alaska wild salmon throughout the year.

d. Strategies for improving the marketability of Alaska wild salmon are limited to focusing on quality.

e. Alaska does not have a mandatory quality inspection program.

f. On world markets, Alaska salmon are perceived as not being of consistently high quality.

g. Improved quality assurance and inspection programs would improve the position of Alaska salmon in world markets.

h. New markets can be developed for profitable value-added finfish products such as easy-to-prepare specialty items.

i. Negative public perceptions about chemical additives associated with farmed salmon may enhance market opportunities for Alaska wild salmon.

Recommendations

1. Alaska must develop a strategy to respond to its eroding market share for salmon sales.

2. A mandatory quality assurance and inspection program for the Alaska salmon industry that would include catcher boats, tenders, and processors should be implemented as soon as possible.

3. In conjunction with improved quality, marketing efforts should be expanded to include an aggressive, world-wide marketing program, extolling the virtues of Alaska wild salmon.

Chapter 8

GENERAL FINDINGS AND RECOMMENDATIONS

Throughout their deliberations, the foremost consideration of the members of the Alaska Finfish Farming Task Force has been to ensure that Alaska's stocks of salmon and other species of fish and their pristine environment are not jeopardized. To this end, the task force evaluated all of the major issues; it invited testimony from more than two dozen individuals who are authorities on specific aspects of finfish farming (Appendix C) and reviewed dozens of relevant documents (Appendix F). The products of these examinations are a series of factual findings and recommendations concerning specific issues based on these facts. The issues and recommendations are summarized as follows:

The environmental and biological impacts of finfish farming can be minimized through careful attention to proper siting and enforcement of the conservative regulatory policies outlined in Chapters Two and Four.

Current fisheries management techniques are designed to minimize disease and genetic problems. Risk management of disease and genetic problems found in finfish farms would be no different than for current fisheries management.

The State should retain ownership of its valuable finfish stocks. Ultimately, the goal of finfish farming broodstock development is to use farmed fish as broodstock, thus minimizing continued dependence on publicly owned broodstock. The preferred initial source of initial broodstock is surplus hatchery eggs. Other sources include overescapement, cost recovery fish from nonprofit hatcheries, and allocation by the Board of Fisheries.

The cost of providing adequate regulation of a finfish farming industry would be high, but successful development would bring employment and other benefits to Alaska. Although development of finfish farming eventually might bring in enough revenue to offset the costs to the State, costs would accrue to the State from the permitting and regulatory programs even if the industry fails. The Legislature is the appropriate body for deciding where to rank development of finfish farming in its funding priorities at a time when State revenues remain low and show signs of future declines.

Current market conditions for farmed salmon are poor. However, a developing finfish farming industry in Alaska may find some marketing opportunities.

Markets for Alaska seafood will be adversely affected by the global development of salmon farming, regardless of what happens to salmon farming in Alaska, and a long-term strategy to improve the marketability of Alaska salmon should be developed.

As directed by the enabling legislation, the task force examined various finfish farming activities. It has determined that risks differ among these farming activities. When compared to marine pens, the impacts of upland enclosed systems are greatly reduced by isolation, species limitation, and fewer potential user conflicts.

The potential genetic and socioeconomic impacts of rearing non-salmon species of finfish in marine net pens also appear to be less than those involved with salmon net pen culture, although farming of most of these species is still in the research and development phase.

The task force did not address some of the specific concerns expressed in written public comments on the draft report, because these issues are already covered by existing regulations (e.g., disposal of dead fish in hatcheries, use of antibiotics and food additives, and treatment of diseased fish).

The task force concludes that the findings, Alaska's unique position as a leading seafood producer, and the broad range of potential types of finfish farming activities do not support an unequivocal "yes" or "no" as to whether any particular type of finfish farming should be permitted. That is a political decision that will have to be made by the Legislature. Further study and debate are unlikely to change significantly the task force's findings of fact; consequently, there is no reason to extend the current moratorium beyond its expiration date of July 1990. Therefore, the task force's final recommendation is as follows:

> The Legislature should resolve the issue of finfish farming by statutory permission or prohibition before the moratorium expires.

If the Legislature decides to allow finfish farming, it is imperative that the necessary regulatory framework be in place in advance of any farming activity. If this caveat is satisfied, the task force concludes that fish farming would have little or no adverse effect on wild stocks in the environment. Most of the necessary regulations can be adapted or extended without change from those that are already in effect for the State's ocean ranching and hatchery programs, but additional funding must be provided to extend them to fish farming.

SUMMARY OF RECOMMENDATIONS

Chapter 2

Disease

1. The finfish farming industry can be accommodated without significant threat of disease to wild and hatchery stocks if the State continues to meet its responsibilities in fish disease control and if monies are provided for additional health services or private pathological services are created.

2. Current policies prohibiting importation of live salmonids, including gametes, should be placed into statute and rigorously enforced.

3. To ensure adequate control of disease in the finfish farming industry, the State will need to provide for the development of private pathology services or increase staff and funding for existing State services.

4. If the State allows private pathology services, there should be a licensing or certification process.

5. Water discharged from upland marine and fresh water facilities should be screened and the effluent treated.

Genetics

1. The existing State genetics policy is adequate to protect the genetic integrity of the state's fisheries and should be rigorously applied to fish farming.

2. Current policies prohibiting importation of live salmonids, including gametes, should be placed into statute and rigorously enforced.

3. The State should not permit the siting of finfish farms within a 20 kilometer radius from the mouth of a stream that has significant production of the same species.

4. The task force concurs with the Alaska Chapter of the American Fisheries Society resolution on genetic sanctuaries:

One recommendation for the protection of wild stocks in the Genetic Policy is the establishment of wild stock sanctuaries. These sanctuaries would be areas in which no enhancement activity is permitted except gamete removal for broodstock development. Populations of fish in these areas would represent "gene banks" of wild-type genetic variability. Sanctuary status could also be a conservative use status for the protection of particular significant or unique wild stocks.

5. The State should form an ad hoc committee to determine whether the State is strictly adhering to its genetics policy.

Chapter 3

Ownership of Broodstock

1. The State should not permit private ownership of broodstock.

2. All finfish gametes should remain in the ownership of the State by requiring that hatchery production for finfish farming be done under State permit and authority.

3. All hatcheries within Alaska should be operated under nonprofit status.

4. A new permit allowing the cultivation of eggs and the sale of smolt to the finfish farming industry should be required. Existing hatcheries may be limited or precluded from participation by the conditions of their existing permits.

5. The State should create a new statutory authorization for the operation of finfish farming hatcheries.

6. There should be a statutory ban on the export of indigenous finfish stocks.

Sources of Broodstock

1. All finfish gametes should remain in the ownership of the State by requiring that hatchery production for finfish farming be done under State permit and authority. Cultivation and in-state sale of broodstock and smolt by finfish farmers should not be prohibited.

2. The finfish farming industry should develop its own stocks under new State provisions for nonprofit finfish hatcheries.

3. New private nonprofit hatcheries under State authority would be required to rear broodstock for finfish farming operations.

4. The preferred initial source of broodstock is surplus hatchery eggs. Other sources include overescapement, cost recovery fish, and allocation by the Board of Fisheries.

Chapter 4

Environmental Impacts

1. The State should use existing siting guidelines to develop a set of criteria specifically applicable to finfish net pen farming in Alaska. These include the State of Washington's Recommended Interim Guidelines for the Management of Salmon Net-Pen Culture in Puget Sound and the Alaska Department of Natural Resources' Etolin Island Area Mariculture Pilot Project. Guidelines for siting should also reflect the Alaska Department of Fish and Game's disease and genetics policies.

2. The State should use the Consistency Review Process of the Alaska Coastal Management Program in permitting finfish farm sites. The Alaska Coastal Management Program provides "a framework for local and public participation in State decisions, and a mechanism for the resolution of conflicts between government agencies, individuals, and local communities." However, special provisions for public notice of finfish farming permit applications, including requirements for newspaper display ads with location maps and direct agency notification to interested parties, should be developed to encourage the greatest degree of public involvement.

3. Only nonlethal predator control measures, such as bird and mammal exclosure nets and electric fences, should be allowed for finfish farming.

User Conflicts

1. Area planning represents the best method of determining consistency of uses. However, where area plans do not exist, the consistency review process must allow for expanded public review to ensure consistency with activities that do not require State permits.

2. Fish farms and ancillary use of adjacent uplands must be compatible with zoning and designated uses of the uplands. No finfish farming should be permitted in waters adjacent to State and federal parks.

Chapter 5

1. The State should reduce its regulatory expenses by encouraging the use of private pathology services.

2. The finfish farming industry should pay economic rent for use of public resources. Forms of rent include local and state property taxes, state income taxes, sales taxes, permit fees, tideland leases, and a raw fish tax of three percent of the farm gate value.

3. Special provisions for public notice of finfish farming permit applications, including requirements for newspaper display ads with location maps and direct agency notification to interested parties, should be developed to encourage the greatest degree of public involvement. Applicants should bear the cost of these public notice provisions.

Chapter 6

Costs and Benefits Accruing to Alaska and its Residents

1. The State of Alaska should not subsidize finfish farming beyond the amount needed to regulate the industry.

Chapter 7

Marketability of Alaska Salmon

1. Alaska must develop a strategy to respond to its eroding market share for salmon sales.

2. A mandatory quality assurance and inspection program for the Alaska salmon industry that would include catcher boats, tenders, and processors should be implemented as soon as possible.

3. In conjunction with improved quality, marketing efforts should be expanded to include an aggressive, world-wide marketing program, extolling the virtues of Alaska wild salmon.

Chapter 5

1. The Legislature should resolve the issue of finfish farming by statutory permission or prohibition before the moratorium expires.

APPENDIX A

PRODUCTION SCENARIO FOR A 200 METRIC TON CHINOOK SALMON FARM

Appendix A presents a scenario for the operation of a hypothetical salmon farm in Alaska if enabling legislation were passed in 1990. The scenario is composed of 1) estimated timelines for the development of a marine net pen salmon farm and a fresh water hatchery; 2) an overview of the production of salmon, including a growth/mortality model, a production schedule, and a feeding and marketing model; and 3) an economic review, including a cash flow/operating expenses model and a brief discussion of the economic returns to the state.

The scenario assumes that the most economically viable finfish farm in Alaska would be a salt water net pen salmon facility with the following characteristics:

a. The size of an individual farm site, whether a family-operated farm or a corporate farm, would be between one and two surface acres. It would produce between 200 and 400 metric tons annually (100,000 to 200,000 fish), depending on the size of the fish and production.

b. The farm could be operated by a family with some part-time labor or by a corporation with three to five full-time employees.

c. Major infrastructure for a 200 metric ton farm includes six to eight 15 x 15 meter steel or plastic net pens, nets for each pen, anchors and lines for the farm, work boat, and a storage facility for supplies and fish feed.

I. ESTIMATED TIMELINE FOR THE DEVELOPMENT OF A CHINOOK SALMON FARM IN ALASKA

Table 1 provides an approximate timeline for the major steps in the development of a salmon farm, assuming that legislation providing for finfish farming is enacted in the 1990 legislative session. It includes the time frame for the development of the marine pen facility and for the development of a fresh water hatchery to serve the farm.

Table 1. TIMELINE FOR ESTABLISHING AN ALASKA FINFISH FARM

ACTIVITY	TIME
Finfish Farming Legislation enacted into law[1]	July 1990
Finfish Mariculture Regulations Adopted[2]	January 1991
Potential Applicants Identify Farm Locations, Broodstock Sources and Permit Requirements	July 1990 - April 1991
DNR Publishes Notice of Districts Open for Applications[3]	Prior to April 1, 1991
State Agencies Accept Consolidated Finfish Farm Applications	April 1, 1991 - June 1, 1991
State Review of Applications	June 1, 1991 - Dec. 1, 1991
All Necessary Permits Issued	December 1, 1991
Secure Supplier of Smolts (State or PNP Hatchery)[4]	Winter/Spring 1992
Smolt Supplier Begins Fresh Water Growth of Eggs/Fry	Fall 1992
Net Pens Placed in Water[5]	Spring 1993
Smolts Delivered to Marine Farm Site[6]	April - June 1993
Harvest/Sales Begin[7]	November 1994

[1]Assumes legislation enacted at the beginning of new fiscal year. Could be earlier depending on effective date of enabling legislation.

[2]Assumes agencies can promulgate regulations (similar to existing Aquatic Farm Regulations) in six months.

[3]Assumes finfish farming permit process to be similar to existing Aquatic Farm permit process.

[4]Assumes smolt production to be contracted out to an existing State or PNP hatchery. Eggs could be surplus to the hatchery, from cost recovery fish, or egg take from surplus wild stock.

[5]If surplus smolts were available, pens could go into the water as early as spring 1992.

[6]Assumes one year of fresh water growth for smolt before going into salt water. Another operation is to use "zero-check" smolt (no over winter of fish in fresh water, instead fry are placed directly into salt water).

[7]Sales begin after 19th month in marine growout facility and continue into the 25th month.

TABLE 1. (CONTINUED)

ACTIVITY	TIME
Development of Fresh Water Hatchery Facility:	
Identify Source of Fresh Water and Location of Hatchery[8]	July 1990 - January 1991
Application for Fresh Water Hatchery Permits	January 1991
Permits for Finfish Farm Hatchery Issued	November 1991
Eggs Placed into Hatchery[9]	July - October 1992
Smolt from Finfish Farming Hatchery Placed into Salt Water Pens	April - June 1993
Egg Take from Captive Broodstock	July - October 1995, 1996

[8]Assumes the fish farm company will develop its own fresh water hatchery at the same time as it develops the marine growout facility.

[9]Assume sources of eggs to be from one of the following: surplus eggs from existing hatcheries, cost recovery fish from PNPs, or wild egg take.

II. PRODUCTION OVERVIEW

The production cycle includes the following:

-egg take or purchase of fertilized eggs,
-incubation of eggs and the production of fry,
-fresh water rearing of fry to smolts,
-marine growout of juvenile salmon to market size, and
-marine growout of mature salmon for broodstock.

1. EGGS AND SPAWNING

Initial sources of eggs before a farm develops its own broodstock include purchase of either surplus eggs or eggs from cost recovery fish from existing State or private nonprofit hatcheries. A farm that produces 200 metric tons annually will require 100,000 smolt. Fifty-seven female chinook salmon would be required to produce 100,000 smolt, assuming 2,500 eggs per individual salmon and a 30 percent mortality rate from egg to smolt. [100,000 smolt/(2,500 eggs/female x 70% survival rate.]

Assuming a conservative male/female ratio of 1:2, a 200 metric ton farm will require about 85 chinook salmon. Thus, for a 10,000 metric ton industry, 4,250 adult chinook salmon are needed for broodstock annually.

2. SIZES OF FISH

When fry emerge from the substrate and start feeding, they average about 0.4 grams each and are transferred into a freshwater raceway. At an average weight of twelve grams, they are transferred to the growout net pens in sea water. When they reach six to eight pounds, they are slaughtered and sold.

3. SCHEDULING THE PRODUCTION CYCLE

Scheduling is based primarily on the physiological activity of the fish in the different phases of operation and secondarily on economic considerations (e.g., when to harvest). Table 2 provides an outline of one complete production cycle. This table can be cross-referenced with Tables 3 and 4 to determine the sizes and the biomass of the production at various stages of the production cycle.

TABLE 2. PRODUCTION SCHEDULE FOR A SOUTHEAST ALASKA CHINOOK SALMON FARM

TASK	----YEAR 1 ----- JASONDJFMAMJ	----YEAR 2----- JASONDJFMAMJ	----YEAR 3----- JASONDJFMAMJ	----YEAR 4----- JASONDJFMAMJ
FRESH WATER GROWTH •EGG TAKE[1] •SPAWNING •FERTILIZATION •HATCHING[2]				
•FRY EMERGE FROM INCUBATOR[3] •TRANSFER TO PONDS •START FEEDING				
•SMOLTING •TRANSFER TO SALT WATER CAGES[4]				
SALTWATER GROWTH • FEED FISH • SEPERATE BY SIZE • MAINTAIN PROPER DENSITY • MAINTAIN FARM				
HARVEST/SALES START[5]				
BROODSTOCK • SPAWNING • FERTILIZATION • INCUBATION IN FW				

NOTES

1 Wild egg take or purchase from existing hatchery (state or PNP) until development of own broodstock
2 50 to 75 days after fertilization (900 Temp. Units)
3 100 to 150 days after fertilization
4 Smolting occurs 60 - 150 days after emerge from incubator
5 Sales begin after 19th month in marine growout facility

4. GROWTH AND MORTALITY MODELS

Growth and loss patterns are presented in Table 3 for the freshwater rearing stage and Table 4 for the salt water rearing stage. These tables can be used to aid in planning management strategies for stocking, transferring and grading farmed fish, installation of net pens, and timing sales. The tables assume a strategy of getting the largest smolts possible into saltwater as early in the year as possible to take advantage of seasonally warming ocean waters. The strategy also times sales in the winter months when wild salmon are in short supply.

The data in Tables 3 and 4 are based on the following assumptions:

a. The average size of fry is 0.4 grams when "buttoned up," during the month of November, and they are transferred to salt water as 12-gram (average) smolts.

b. The farm will experience a monthly mortality rate of one to two percent (fresh water cumulative mortality of approximately six percent and a salt water cumulative mortality of about 34 percent).

c. The average water temperature is approximately 12 degrees C for fresh water growth, and in salt water, the average temperature is 10 to 15 degrees C during summer months and above 6 degrees C in winter. (These temperatures were taken from data for mean monthly sea surface temperatures in southeast Alaska.)

d. Salt water growth rates for Chinook salmon are based on actual rates experienced in northern B.C. and at the NMFS Little Port Walter station in southeast Alaska.

e. Mortalities assume fish losses due to disease, precocity, predation, algae blooms, and unknowns. The model uses a B.C. industry-wide standard of two percent average mortality per month. Column 10 in Table 4 presents the cumulative mortality expressed in percentage of the original number of fish.

TABLE 3. GROWTH/MORTALITY MODEL FOR FRESH WATER REARING

MODEL OF A 100,000 FISH SALMON FARM

MONTH	MONTHS IN POND	NUMBER OF FISH	AVG WEIGHT FISH (g)	DAILY GROWTH RATE	% MORTALITY (Assumed)
November (start feed)	0	113000	0.4	0.000	0
December	1	110740	1.1	0.034	2
January	2	109633	2.7	0.030	1
February	3	108536	5.0	0.021	1
March	4	107451	8.0	0.016	1
April	5	106376	12.0	0.014	1

TABLE 4. GROWTH/MORTALITY MODEL FOR MARINE GROW OUT

MODEL OF A 100,000 FISH (INITIAL) PACIFIC SALMON FARM IN SOUTHEAST ALASKA

MONTH/YR	MONTHS IN GROWOUT	NUMBER OF FISH	AV. WEIGHT/ FISH (lbs.)	DAILY GROWTH RATE (%)	BIOMASS (lbs.)	MORTALITY % Assumed	NUMBER FISH LOST	BIOMASS LOST	CUMULATIVE % MORTALITY
January (Year 1)									
February									
March									
April	0	100000	0.026		2600	0	0	0	0
May	1	95000	0.051	2.246	4845	5	5000	255	5
June	2	92150	0.100	2.244	9215	3	2850	285	8
July	3	91229	0.195	2.226	17790	1	922	180	9
August	4	90316	0.381	2.233	34410	1	912	348	10
September	5	89413	0.510	0.972	45601	1	903	461	11
October	6	88519	0.601	0.547	53200	1	894	537	12
November	7	87634	0.702	0.518	61519	1	885	621	13
December	8	86757	0.801	0.440	69493	1	876	792	14
January (Year 2)	9	85022	0.900	0.388	76520	2	1735	1562	15
February	10	83322	1.001	0.355	83405	2	1700	1792	16
March	11	82489	1.201	0.607	99069	1	833	1001	17
April	12	81664	1.450	0.628	118412	1	825	1136	18
May	13	80847	1.800	0.721	145525	1	817	1470	19
June	14	80039	2.600	1.226	208100	1	808	2102	20
July	15	79238	3.604	1.088	285574	1	800	2885	21
August	16	77653	4.350	0.617	337792	2	1585	6894	22
September	17	75324	4.805	0.332	361931	3	2330	11194	25
October	18	73817	5.405	0.392	398983	2	1506	8143	26
November (Sales Begin)	19	73079	5.955	0.323	435187	1	738	4396	26
December	20	72348	6.057	0.057	438214	1	731	4426	27
January (Year 3)	21	70901	6.206	0.081	440014	2	1447	9980	28
February	22	68774	6.305	0.053	433622	3	2127	13411	31
March	23	68087	6.406	0.053	436163	1	688	4406	31
April	24	66725	7.007	0.299	467541	2	1362	9542	33
May	25	66058	7.808	0.361	515778	1	667	5210	33

5. FEEDING AND MARKETING MODEL

The feeding and marketing model presented in Table 5 projects feed consumption, weight of fish, and sales revenue over the production cycle. It can be used to plan feed purchases, storage capacity, and sales revenue.

The model assumes an average conversion rate (pounds of feed required to produce one pound of salmon flesh) of 1.7, with a range of 1.3 to 1.9. This rate is based on actual data from the NMFS Little Port Walter research.

The model utilizes feed cost assumptions for extruded feed from Moore-Clark in LaConner, Washington. Extruded feed is more expensive than dry feed ($.46/lb. versus $.32/lb. FOB Sitka, Alaska).

The model assumes sales occur after the fish reach a six pound average to obtain maximum value for the crop. Thus, sales begin in November (the 19th month) of the second year in salt water and continue at a rate of 15 percent of the biomass through May (25th month).

III. ECONOMIC CONSIDERATIONS AND BUDGET ANALYSIS

Cash flow requirements for a 200 metric ton southeast Alaska Chinook salmon farm are presented in Table 6. Growth, mortality, and feed conversion rates and sales are from Tables 2, 3, and 5.

CAPITAL EXPENSES

Pens. The analysis assumes the use of premanufactured steel net pens, assembled and installed by the supplier. Two 15 x 15 meter net pens, necessary for initial smolt growth and required for the first year, cost $19,000 each. A total of four of these pens are required by the start of the second year. Two large 33 x 33 meter pens valued at $38,000 each are needed during the second year. Cost data are from Viking Pacific Seacage Systems (Oppdrett Service Canada LTD) in North Vancouver, B.C. The cost includes the cost of anchoring the cages. Also included in the model are two 15 x 15 meter wooden net pens in the second year to be used as mobile enclosures to transfer fish from one pen to another and for grading fish.

Nets. Nets for smaller pens are assumed to cost $3,000 each; the larger pens require nets assumed to cost $10,000 each. A space net is planned for each size. The cost also includes the price of a predator net. Nets have a life expectancy of five years. Replacement costs are included.

Power Plant. The model includes the purchase of a 20 kilowatt generator. Cost of maintaining and rebuilding it are included.

Boat. The model assumes a work boat is needed at a cost of $14,000 for boat and motor. Another $5,000 is needed every two years for motor replacement. A replacement boat is planned for year six.

TABLE 5. FEEDING/MARKETING MODEL

MODEL OF A 100,000 FISH (INITIAL) PACIFIC SALMON FARM IN SOUTHEAST ALASKA

MONTH/YR	MONTHS IN GROWOUT	BIOMASS (lbs.)	CONVERSION RATE	FEED CONSUMPTION (lbs./month)	CUMULATIVE FEED CONSUMPTION	FEED COST/ MONTH ($0.46/lb)	CUMULATIVE FEED COST	NUMBER OF FISH SOLD	AV. WEIGHT/ FISH (lbs.)	PRICE ($/lb)	GROSS SALES REVENUES
January (Year 1)											
February											
March											
April	0	2,600	0	0	0	0	$0	0	0.03	$0.00	$0
May	1	4,845	1.3	2,919	2,919	1,343	1,343	0	0.05	0.00	0
June	2	9,215	1.5	6,555	9,474	3,015	4,358	0	0.10	0.00	0
July	3	17,790	1.5	12,862	22,335	5,916	10,274	0	0.20	0.00	0
August	4	34,410	1.5	24,931	47,267	11,468	21,743	0	0.38	0.00	0
September	5	45,601	1.6	17,904	65,171	8,236	29,979	0	0.51	0.00	0
October	6	53,200	1.6	12,159	77,330	5,593	35,572	0	0.60	0.00	0
November	7	61,519	1.6	13,310	90,640	6,123	41,694	0	0.70	0.00	0
December	8	69,493	1.7	13,555	104,196	6,236	47,930	0	0.80	0.00	0
January (Year 2)	9	76,520	1.7	11,946	116,142	5,495	53,425	0	0.90	0.00	0
February	10	83,405	1.7	11,705	127,847	5,384	58,810	0	1.00	0.00	0
March	11	99,069	1.7	26,628	154,475	12,249	71,059	0	1.20	0.00	0
April	12	118,412	1.7	32,884	187,359	15,127	86,185	0	1.45	0.00	0
May	13	145,525	1.8	48,802	236,161	22,449	108,634	0	1.80	0.00	0
June	14	208,100	1.8	112,636	348,797	51,813	160,447	0	2.60	0.00	0
July	15	285,574	1.8	139,453	488,251	64,149	224,595	0	3.60	0.00	0
August	16	337,792	1.8	93,992	582,243	43,236	267,832	0	4.35	0.00	0
September	17	361,931	1.8	43,449	625,693	19,987	287,819	0	4.81	0.00	0
October	18	398,983	1.8	66,693	692,386	30,679	318,498	0	5.41	0.00	0
November (Sales Begin)	19	375,637	1.9	83,980	776,366	38,631	357,128	10,000	5.96	$2.06	$122,673
December	20	317,680	1.9	58,492	834,858	26,906	384,035	10,000	6.06	2.41	145974
January (Year 3)	21	256,925	1.9	8,291	843,149	3,814	387,849	10,000	6.21	2.77	171906
February	22	190,143	1.9	8,780	851,929	4,039	391,887	10,000	6.31	2.77	174649
March	23	127,197	1.9	3,825	855,753	1,759	393,647	10,000	6.41	2.77	177446
April	24	66,277	1.9	2,001	857,755	921	394,567	10,000	7.01	2.77	194094
May	25	0	1.9	0	857,755	0	394,567	9,459	7.81	2.77	216282
TOTAL				857755		$394,567		69,459			1203023

Note: Sales are assumed to begin in November of the second year (19th month) and continue at a rate of 10,000 fish/month through May of year 3 (25th month).
Sale prices are for round fish sold to processors.
This model is intended to represent the complete grow-out cycle of one year class of smolt

TABLE 6 . CAPITAL AND OPERATING COSTS AND YEARLY CASH FLOW PROJECTIONS FOR 200 METRIC TON ANNUAL PRODUCTION

(Thousands of U.S. Dollars)

CAPITAL COSTS:	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year	TOTAL
Pens	76	86	0	0	0	0	162
Nets	15	32	0	0	0	15	62
Anchoring	5	5	0	0	0	1	11
Automatic feeders	1	1	0	0	0	1	3
Power plant	10	0	2	0	0	10	22
Equipment	8	8	5	10	10	10	51
Accomodations	100	0	0	0	0	0	100
Boat	14	0	5	0	5	9	33
Miscellaneous	20	16	8	8	8	8	68
Depreciation	19	29	29	29	29	29	164
TOTAL CAPITAL EXPENSES	268	177	49	47	52	83	676
OPERATING EXPENSES:							
Smolts ($0.50 each)	50	50	50	50	50	50	300
Feed	48	340	395	395	395	395	1968
Labor	104	104	104	104	104	104	624
Management	50	50	50	50	50	50	300
Insurance	6	52	93	93	93	93	430
Medicine/Vet.	8	8	8	8	8	8	48
Maintainance & Fuel	16	16	16	16	16	16	96
Contingency	24	24	24	24	24	24	144
TOTAL OPERATING EXPENSES	306	644	740	740	740	740	3910
TOTAL EXPENSES	574	821	789	787	792	82?	4586
SALES REVENUE	0	441	1203	1203	1203	1203	5253
NET REQUIREMENT	($574)	($380)	$414	$416	$411	$380	$667
CUMULATIVE NET REQUIREMENT	($574)	($954)	($540)	($124)	$287	$667	

Return on investment = net req./total investment

Equipment. This category covers everything from diving gear and hydraulic winches to water testing equipment and rain gear.

Accommodations. The model assumes the farm will conduct support activities from a barge attached to the net-pen structure. The facilities include living quarters, storage shed for feed, work shop, lab, and office. It is budgeted to cost $100,000.

Depreciation. Net pens, accommodations, power plant, and boat are depreciated at 10 percent per year for a ten-year useful life.

OPERATING EXPENSES

Smolts. The model assumes the farm will initially purchase smolts until its own broodstock mature. The cost per smolt is assumed to be $.50.

Feed Costs. Costs are based on quotes from Moore-Clark's Washington plant for container shipments from Seattle, with freight rates for delivery in Sitka provided by Lynden Transfer.

Labor. The cost of a farm manager is budgeted at $50,000.The salaries of five production employees (production supervisor, two culturists, and two laborers) are budgeted at $104,000 per year. The culturist and laborer positions are budgeted at $8 per hour. For both the laborer and culturist positions, one eight-hour shift per day is required during the six months of reduced daylight, and two eight-hour shifts per day are required for the other six months. Supervisor wages are budgeted at $10 per hour and the position is full-time year round.

Insurance. Insurance coverage for fish stocks is calculated at four percent of the market value of the fish held in net pens, which is the B.C. industry standard.

Medicine/Veterinarian. This $8,000 is based upon the expenses of a B.C. farm for vaccinations and pathology services performed by private veterinarians and pathologists.

Sales revenue. The model assumes a farm site price of $2.77 per pound round weight.

ECONOMIC RETURN TO THE STATE OF ALASKA

The state will receive economic rent from the finfish farming industry in the following ways:

Aquatic farm product tax for finfish. This revenue is estimated to be three percent of the farmgate value (gross sales). This tax is similar to the raw fish tax. For a farm that produces 200 metric tons annually, the estimated annual gross sales revenue is $1,203,000 (from Table 6, assuming the farm is operating at capacity). Thus, the aquatic farm product tax for a 200 metric ton farm would be $36,090 annually. For a 10,000 metric ton industry (fifty 200 metric ton farms), the total annual farm product tax is estimated at $1,804,500. Note that the revenue from this tax is split evenly between the local municipality or borough and the State.

Tideland lease from the State. Currently, there are no tideland leases from the State for shellfish farms; as a result, no estimates are available. However, the revenue to the State from the tideland lease is based on the appraised fair market value. An average farm of two surface acres would lease the amount of tideland utilized, which includes the area up to location of the anchors. Thus, depending on depth, current, and location, the area of the lease would range from approximately 10 to 20 acres per farm.

Permit fees. Current fees include a $50 filing fee, $100 annual permit fee, and a $50 per acre fee if utilizing a permit rather than a lease for tideland use.

Corporate income tax. Estimated at $4,500 up to the first $90,000 of net income, plus 9.4 percent of all net income over $90,000.

Local property tax. Varies depending on the municipality or borough in which the farm is located.

Local sales tax or raw fish tax. This revenue varies depending on whether the local taxing authority has a sales or raw fish tax, and whether the farm is located inside a local taxing authority (municipality or borough).

APPENDIX B

IMPACT OF FARMED SALMON PRODUCTION ON SALMON PRICES

Increased worldwide production of farmed salmon has put downward pressure on the price of Alaska wild salmon. Alaska's salmon fishermen are concerned that production of Alaska farmed salmon will further this price erosion. With available data, we can estimate a range for the lost revenue to Alaska commercial fishermen resulting from an increase in the production of farmed salmon.

In Appendix A, the operation of a 200 metric ton salmon farm is described. The task force has envisioned that over a period of 5 to 15 years from the date finfish farming may be permitted, the industry will grow slowly from 10 to 100 fully productive farms of about 200 metric tons each.

Recent estimates of the elasticity of demand for pacific salmon can be used for a rough estimate of the effect that a farmed salmon industry in Alaska could have on the price of Alaska wild salmon.

It is difficult to provide an accurate estimate of the elasticity for salmon since demand for salmon is increasing and the composition of production is changing with more farmed salmon on the market. Also, the elasticity of demand for salmon depends on the markets in which it is sold. The results provided here should be considered ballpark estimates.

From elasticities provided in Anderson (1988), assuming our maximum estimate of 100 farms each producing 200 metric tons, and assuming a world production of 568,000 metric tons with an exvessel price of $3.00 per pound, we get a range of loss to the Alaska commercial fishing industry due to a decline in price of $15-51 million (See Table 1).

The lower end of this range would occur if wild and farmed salmon competed mostly in the Japanese market, a likely scenario. The high end assumes competition only in the expensive seafood restaurant market, less likely since this market could not absorb more than a small fraction of the total production of wild salmon.

These estimates are based on mostly negative assumptions. It is unlikely that the Alaska salmon farming industry would produce 20,000 metric tons for many years to come. Also, most farmed salmon fills market niches that do not compete with wild salmon. Also, the markets that would be targeted by Alaska farmed salmon producers would likely be filled by another producer if Alaska does not permit finfish farming.

The contribution of salmon farms to the economy may be larger than the negative effects. Refer to Appendix A for information on the economic benefits of salmon farming.

TABLE 1
IMPACT OF ALASKA FARMED SALMON ON ALASKA PRICES

	ELASTICITY	CURRENT PRICE PER LB.	WORLD PACIFIC SALMON (MT)	ALASKA CATCH (MT)	HYPOTHETICAL ALASKA FARM OUTPUT (MT)	RESULTING PRICE CHANGE PER LB.	LOSS TO AK COM. FISHING
N.E. SUPERMARKETS	-1.69	$3.00	568,000	200,000	200	(0.00)	($275,023)
N.E. FISH STORES	-2.19	$3.00	568,000	200,000	200	(0.00)	($212,232)
EXPENSIVE SEAFOOD	-0.9	$3.00	568,000	200,000	200	(0.00)	($516,432)
JAPANESE TRADERS	-3.1	$3.00	568,000	200,000	200	(0.00)	($149,932)
N.E. SUPERMARKETS	-1.69	$3.00	568,000	200,000	1,000	(0.00)	($1,375,115)
N.E. FISH STORES	-2.19	$3.00	568,000	200,000	1,000	(0.00)	($1,061,161)
EXPENSIVE SEAFOOD	-0.9	$3.00	568,000	200,000	1,000	(0.01)	($2,582,160)
JAPANESE TRADERS	-3.1	$3.00	568,000	200,000	1,000	(0.00)	($749,659)
N.E. SUPERMARKETS	-1.69	$3.00	568,000	200,000	10,000	(0.03)	($13,751,146)
N.E. FISH STORES	-2.19	$3.00	568,000	200,000	10,000	(0.02)	($10,611,615)
EXPENSIVE SEAFOOD	-0.9	$3.00	568,000	200,000	10,000	(0.06)	($25,821,596)
JAPANESE TRADERS	-3.1	$3.00	568,000	200,000	10,000	(0.02)	($7,496,592)
N.E. SUPERMARKETS	-1.69	$3.00	568,000	200,000	20,000	(0.06)	($27,502,292)
N.E. FISH STORES	-2.19	$3.00	568,000	200,000	20,000	(0.05)	($21,223,230)
EXPENSIVE SEAFOOD	-0.9	$3.00	568,000	200,000	20,000	(0.12)	($51,643,192)
JAPANESE TRADERS	-3.1	$3.00	568,000	200,000	20,000	(0.03)	($14,993,185)

(1) FROM "WORLD MARKETS FOR SALMON: PEN REARED SALMON IMPACTS"

ELASTICITIES ARE FROM P.189.
PACIFIC SALMON PRODUCTION IS FOR 1987 P.73.

THESE IMPACTS ASSUME ALASKA FARMED SALMON COMPETES ONLY WITH PACIFIC SALMON AND DOES NOT ACCOUNT FOR INCREASING DEMAND FOR SALMON.

TO THE EXTENT THAT ALASKA FARMED SALMON COMPETES WITH ATLANTIC SALMON AND AS DEMAND INCREASES, THE IMPACT ON ALASKA COMMERCIAL FISHING INDUSTRY DIMINISHES.

APPENDIX C

SUMMARY OF TASK FORCE ACTIVITIES

CREATION OF THE TASK FORCE

The Alaska Finfish Farming Task Force was created by the Alaska Legislature under Chapter 145, SLA 1988; the effective date of the act was June 9, 1988.

Under Ch. 145, SLA 1988, the task force was charged with providing an interim report, due by January 30, 1989, and a final report, due by January 30, 1990, to the Legislature addressing "finfish farming in fresh water, in marine environments, and in tanks or other enclosed structures that contain marine water and that are located on land." The task force was also to consider related hatchery operations.

The legislation directed the task force to examine:

(1) whether the farming of finfish can be conducted in a manner that protects the health of the state's fishery resources;

(2) criteria for the siting of finfish farms to minimize land use conflicts and to protect the environment;

(3) net economic costs and benefits of finfish farming in the state to state residents, including jobs created or lost for state residents, tax revenue (assuming an appropriate tax rate), cost of State regulation and monitoring, and effects on markets for salmon caught by the state's commercial fishing fleets;

(4) the cost of providing adequate regulation of finfish farming to protect wild stocks, the environment, public health, and existing beneficial uses of the state's coastal water and land, and the role of the private sector in providing pathological and other services;

(5) identification and analysis of appropriate sources of supply of stock for finfish farms, including but not limited to private nonprofit hatcheries, private for-profit hatcheries, and wild stocks, and their likely effect on existing state policy; and

(6) strategies for improving the marketability of Alaska salmon, particularly those high-value species competing with farmed salmon for domestic and export sales.

No funds were appropriated for task force operations until the 1989 legislative session. As a result, the original deadline for the interim report passed before the task force was established.

Following the 1989 legislative session, the Office of the Governor began organizing the task force. For administrative purposes, the task force was located in the Office of the Governor, Division of Administrative Services. A project coordinator was hired in late June.

TASK FORCE MEMBERS

In late July 1989, Governor Cowper appointed the following task force members: Ken Castner, representative of commercial salmon fishermen; Mary Lou Cooper, public member; Gordon Harrison, private economist; Theodore Merrell, fisheries biologist; and Brent Paine, aquatic farming advocate. Mary Lou Cooper was designated chairman.

In August 1989, Gordon Harrison resigned from the task force to take a job as director of the Legislative Research Agency. Under Ch. 145, SLA 1988, State employees were not permitted to serve as task force members. John Weddleton was appointed as Mr. Harrison's replacement in September 1989.

On October 16, 1989, Mary Lou Cooper resigned as chairman while continuing to serve on the task force. Theodore Merrell was elected chairman by unanimous consent of the task force.

FUNDING

During the 1989 session, the Legislature appropriated $50,000 to the task force. Of this, $16,600 was appropriated for FY 89 and $33,400 was appropriated for FY 90. Because task force activity did not commence until after July 1, 1989, the appropriation for FY 89 lapsed.

In September 1989, the task force received $10,000 from the Department of Commerce and Economic Development through a reciprocal service agreement (RSA). In early November 1989, the Legislative Council awarded $10,000 to the task force. In total, the task force had $53,400 to spend on its efforts.

TASK FORCE MEETINGS

The task force held a series of meetings for the purpose of collecting information and developing its report to the Legislature.

The meetings are briefly described below. A list of persons testifying at each meeting is provided. For additional information, see the minutes of the meetings in Appendix D.

July 31, 1989, Juneau

Topics: Review enabling legislation and budget; develop goals and objectives; plan future activities.

Individual Testifying:

Deborah Greenberg, Special Assistant, Alaska Department of Fish and Game

September 6 & 7, 1989, Anchorage

Topics: Disease, genetics, and broodstocks; report format.

Note: While in Anchorage, task force members also attended various sessions of the American Fisheries Society Convention concerning aquatic farming and related issues.

Individuals Testifying:

Conrad Mahnken, National Marine Fisheries Service, Northwest and Alaska Fisheries Center
Dr. Lee Harrell, National Marine Fisheries Service, Northwest and Alaska Fisheries Center
Dr. Brian Allee, Director of Fisheries Rehabilitation, Enhancement and Development, Alaska Department of Fish and Game
Alex Wertheimer, National Marine Fisheries Service, Auke Bay Laboratory

September 27 & 28, 1989, Juneau

Topics: Siting and marketing; presentation from Tim Kennedy, Cordova fisherman and part owner of fish farms in Washington and British Columbia; presentation from Bill Heard, with the National Marine Fisheries Service, Auke Bay Laboratory.

Individuals Testifying:

Laura Dameron, Southeast Alaska Conservation Council
Rodger Painter, Alaska Mariculture Association
Diane Mayer, Office of the Governor, Division of Governmental Coordination
Janet Burleson, Department of Natural Resources, Division of Land and Water Management
Brian Allee, Department of Fish and Game, FRED Division
Sonja Corazza, United Fishermen of Alaska
Tim Kennedy, commercial fisherman and salmon farm owner
Paul Peyton, Department of Commerce and Economic Development, Division of Business Development
Bill Atkinson, Private Consultant on Japanese markets for seafood (by teleconference)
Bill Heard, National Marine Fisheries Service, Auke Bay Laboratory

October 16 & 17, 1989, Juneau

Topics: Review of previous findings; broodstock ownership, siting, disease, genetics; and commercial fisheries economics, regulation, and management.

Individuals Testifying:

Dr. Anthony Gharrett, University of Alaska and National Marine Fisheries Service
Gale Good, Alaska Trollers' Association
Sonja Corazza, United Fishermen of Alaska (by teleconference)
Ken Parker, Director, Alaska Department of Fish and Game, Division of Commercial Fisheries
Rodger Painter, Alaska Mariculture Association

November 5 & 6, 1989, Juneau

Topics: Regulating finfish farming; costs and benefits of a finfish farming industry; marketing issues; findings and recommendations.

Individuals Testifying:

Chip Toma, private citizen
Rick Harris, Sealaska Corporation

December 5, 1989, Work Session by Teleconference

Topic: Review of draft report and public comments received.

December 18, 19 & 20, 1989

Topic: Finalize report to Legislature.

ADDITIONAL ACTIVITIES

September 24 - 26, 1989, Tour of Puget Sound Fish Farms

On September 24, 25, and 26, task force members Ken Castner, Mary Lou Cooper, Theodore Merrell, and Brent Paine toured finfish farms in the Puget Sound area. Also present on the tour were Rick Harris, Sealaska, Tom Moyer, Legislative Aide to Sen. Bettye Farhenkamp, and Jon Sherwood, project coordinator for the task force.

On the afternoon of September 24, the task force visited the Squaxin Island marine pen fish farm and ocean ranching facility and viewed the proposed site of Swecker Farms marine pen fish farm, both in south Puget Sound.

On the morning of September 25, the task force visited Swecker Farms' processing facility in Olympia and its fresh water tank farm and hatchery facility in Rochester. That afternoon, the task force visited the Sea Farms Washington marine pen fish farm at Port Angeles. In addition, the task force conducted an aerial inspection of several marine pen operations in north Puget Sound.

On the evening of September 25, the task force met with representatives of the Marine Environmental Coalition, a group opposed to most aquatic farming in Puget Sound.

On the morning of September 26, the task force met with several members of the University of Washington faculty, addressing to them questions on disease, genetics, broodstock development, environmental impacts and research activities.

The faculty members were Dr. Ken Chew, Dr. Marsha Landolt, Dr. Bill Hershberger, Dr. Bob Stickney, and Dr. Donald Weston.

The trip to Puget Sound was hosted by Sealaska Corporation. The task force paid for its airfare to and from Seattle and for its food and accommodations. Sealaska Corporation paid for transportation within Washington and for the rental of a meeting room at the University of Washington campus for the morning of September 26. (An ethics report is on file with the Department of Law.)

November 17, 1989, Draft Report Released

On November 17, the task force released its interim report, including the draft version of its final report, to the Alaska Legislature. By November 20, copies of the report were mailed to the 130 people on the task force's mailing list, as well as all of the Legislative Information Offices.

A press release announcing the release of the report was also sent out. The task force received additional requests for the report. Eventually, a total of approximately 300 copies of the report were distributed to interested parties.

The task force received over seventy separate written comments on the draft report.

Throughout its existence, the task force gathered relevant information on finfish farming. Individual task force members collected data on various related topics, and information sent the task force from any source was distributed to the task force or (in the case of a few lengthy documents) summarized for the task force by the project

coordinator or a task force member. (See Appendix F, Bibliography, for a complete listing of sources.)

The task force developed a mailing list numbering approximately 150, including legislators, state and federal officials, various advocacy groups, and interested members of the press and public. Anyone who asked was put on this mailing list. After each meeting, the task force sent out letters summarizing the meeting and setting forth upcoming task force activities.

APPENDIX D

MINUTES OF MEETINGS

ALASKA FINFISH FARMING TASK FORCE
July 31, 1989

MINUTES

The meeting was called to order at 9:00 by Mary Lou Cooper, Chairperson of the Task Force. Task Force members present were: Mary Lou Cooper, Ken Castner, Gordon Harrison, Ted Merrell, and Brent Paine. No members were absent.

Mary Lou Cooper introduced the members of the task force and staff to the audience. Members of the audience identified themselves.

Mary Lou Cooper reviewed the rules and methods of operation of the Task Force.

Jon Sherwood, project coordinator for the Task Force, provided a brief overview of the legislation authorizing the Task Force. He explained that the Task Force is to produce an interim report by December 1, 1989 and a final report by January 15, 1990. He also reviewed the Task Force's budget. The Task Force is funded for $33,000.

Task Force members then engaged in a discussion of their goals and how they would like to achieve them. Ted Merrell stated that the American Fisheries Society was holding its annual meeting in Anchorage in September and there would be a symposium on pen rearing salmon at the meeting. The Task Force decided to meet in Anchorage during the AFS meeting to take advantage of the expertise that would be available there.

Deborah Greenberg, Special Assistant with the Department of Fish and Game, addressed the Task Force on the legislative history of aquatic farming in Alaska. She then explained the Cowper administration position on mariculture. She also summarized the issue papers on finfish farming prepared by the interagency working group on mariculture. The issues included land use, water quality, disease, brood stock, habitat protection and product wholesomeness.

Ted Merrell asked whether minutes of the meetings would be provided. The Task Force decided that minutes indicating who spoke, the general topics, any formal decisions, and a list of observers should be kept.

The Task Force held a discussion of the topics for consideration included in its authorizing legislation. Members asked questions and exchanged information on finfish farming. Much of this discussion focused on the issue of minimizing land use conflicts. The task force identified a number of people to contact for additional information on this issue.

At 12 p.m., the Task Force adjourned for lunch.

The meeting was reconvened at 1:20 p.m. The task force members continued their discussion of the issues contained in the authorizing legislation. As each issue was discussed, contact persons were identified.

The issue of broodstock was addressed briefly. The task force then returned to their discussion of land use conflicts and siting.

Mary Lou Cooper raised the cost-benefit issue. Gordon Harrison stated that it would be a major task and depend on the assumptions made by the task force. Task force members discussed loss of jobs in the fishing industry, market niches, reasons for farming finfish, the cost of regulation, taxation of finfish farming, and the need to look at the three possible types of farming operations: freshwater, upland tanks, and marine pens.

Jon Sherwood handed out travel authorization forms for reimbursement of travel and per diem costs. He also passed out an article on salmon farming provided to the task force by Frank Homan, of Senator Sturgulewski's staff.

The task force discussed the cost of regulation issue contained in the authorizing legislation. Ken Castner said that this issue duplicated parts of the cost-benefit issue, except that it addressed the role of private sector in regulation. He stated that this role is a policy question. A brief discussion was held on this issue.

Mary Lou Cooper raised the issue of broodstock sources. Ken Castner suggested that the task force should review the debate before the Board of Fisheries in December of 1988. Brent Paine stated that he had put together papers on broodstock supplies while working for the Legislature. The task force discussed the practical and policy issues associated with supply of broodstock.

The task force discussed the issue of improving the marketability of Alaska salmon. Ken Castner suggested calling the producers of the Seafood Report radio program in Kodiak for the name of a good marketing person. Mary Lou Cooper mentioned ASMI as a possible resource. Ted Merrell suggested contacting the Alaska Trollers Association.

Ken Castner commented on how the task force members should conduct themselves in public. He said he did not want to see the task force members be perceived as public experts, and suggested that task force members keep their comments private. He stated that he did not want to do anything to poison or damage the quality of the task force's report.

Following the discussion of the issues, it was decided to divide the topics for consideration into five subjects: siting, cost-

benefit analysis, the amount and cost of regulation, broodstock-genetics-disease.

The task force discussed how to proceed. It was decided that each member would take one topic and work with Jon Sherwood to prepare a presentation for one of the meetings.

Ken Castner stated that he would like to teleconference with the other task force members for an hour or so before the next meeting. The task force agreed to do so, acknowledging that Gordon Harrison, and possibly Ted Merrell, would be unavailable to participate.

Mary Lou Cooper offered to take the marketability issue, Brent Paine the broodstock-genetics-disease issue, Gordon Harrison the cost-benefit analysis, Ted Merrell the siting issue, and Ken Castner the cost of regulations.

The task force briefly discussed the structure and intent of the marketability issue.

The task force decided to address the regulation and broodstock-genetics-disease issues at the next meeting. It was decided that the siting and marketing issues would be addressed at a meeting in the last week in September, and the cost-benefit issue would be addressed in an October meeting.

Ken Castner stated that he would like to have Jon Sherwood begin working on early drafts of the report soon. He said that the task force should devote 25 percent of its time to discuss writing.

The task force members updated their addresses and phone numbers for one another. The meeting was adjourned at approximately 5:30 p.m.

List of persons in attendance

Greg Erickson
Deborah Greenberg
Rick Harris
Sheila Helgath
Frank Homan
Eric King
Karl Ohls
Sandy Perry

APPROVED 9/7/89

ALASKA FINFISH FARMING TASK FORCE

September 28 & 29, 1989

MINUTES

The meeting was called to order at 8:35 a.m. on Thursday, September 28, by Mary Lou Cooper, Chairman. All task force members were present: Mary Lou Cooper, Ken Castner, John Weddleton, Ted Merrell, and Brent Paine.

Members of the task force introduced themselves to the new task force member, John Weddleton. Jon Sherwood introduced Fran Armon, who assists Jon in the office, providing administrative support for the task force.

Ken Castner reviewed the task force's past activities for John Weddleton. He listed the five catagories of issues under consideration: broodstock, genetics, and disease; siting; cost of regulation; markets/marketing; and benefits and costs. Brent Paine reviewed the minutes from the last meeting for John Weddleton to provide a general idea of what the task force has accomplished to date.

The task force discussed siting issues, including local control, conflict minimization, environmental concerns, and the Washington interim guidelines for siting.

The task force members identified questions for Bill Atkinson, a fish marketing consultant, to be faxed to Atkinson so he would be prepared to answer them during the conference call on Friday.

Laura Dameron, with SEACC, spoke with the task force stating her concerns: impacts of the coastal environment and socio-economics and lifestyle impacts. SEACC opposes all fish farming because of upland impacts, pollution, water demands, and the potential loss of desire for habitat protection.

Rodger Painter, with the Alaska Mariculture Association, spoke with the task force on the need for rational policy guidelines for siting of finfish farms. He pointed out that state regulations for shellfish farming provide for local control and that the Washington interim siting guidelines address important siting criteria. He also offered his thoughts concerning the economic viability of finfish farming and how state regulation might affect it.

The task force adjourned for lunch and reconvened at 1:30 p.m.

Diane Mayer, with the Division of Governmental Coordination, discussed the state's Project Consistency Review procedures for use of coastal waters.

Janet Burleson, with the Division of Land and Water Management, discussed how the state's permitting process works for aquatic farms.

The task force addressed several questions to Brian Allee, Director of the FRED Division, Department of Fish and Game.

Sonja Corazza, with United Fishermen of Alaska, discussed negative impacts of finfish farming. Her concerns were that pens change the habitat of wild fish, that fish escape in large numbers, and that marketing farmed salmon on Alaska wild salmon quality is wrong. She also addressed siting issues, stating that area planning is very important. She suggested requesting mapping positions with the Department of Natural Resources and the Department of Fish and Game to consolidate habitat and use charts for public use.

The meeting was adjourned at 5:15 p.m.

The meeting was reconvened Friday at 8:30 a.m. by Ken Castner. Due to illness, Mary Lou Cooper was not present; all other members were present.

The task force approved the minutes of the last meeting with amendments. They then discussed the draft of the report's introduction and health of the fisheries section and suggested changes to be incorporated by the project coordinator.

Tim Kennedy, commercial fisherman and salmon farm owner, spoke with the task force. He stated that Alaska finfish farming would not be economically viable without raising Atlantic salmon, and noted that he would not start a fish farm up here.

Paul Peyton, with the Division of Business Development, discussed the economics of fish food production and addressed the outlook for salmon in world markets.

The meeting was adjourned for lunch at 11:25 a.m. and reconvened at 12:45 p.m.

The task force reviewed the siting issues discussed the previous day.

Bill Atkinson, expert on Japanese markets for seafood, was contacted via a conference call. Atkinson addressed several questions on Japanese markets for seafood and the impacts of farmed salmon on these markets.

Bill Heard, with the National Marine Fisheries Service at Auke Bay Laboratories, addressed research in raising salmon at Osprey Bay. He stated that indigenous species could be raised successfully, although he could not speak about the economic viability.

The meeting was adjourned at 5:00 p.m.

Minutes approved October 17, 1989

List of persons in attendance:

Brian Allee, Department of Fish and Game
Susan Bradley, Coastal Zone Management
Janet Burleson, Division of Land and Water/Department of Natural Resourses
Sonja Corazza, United Fishermen of Alaska
Laura Dameron, Southeast Alaska Conservation Council
Bill Heard, National Marine Fisheries, Auke Bay Laboratories
Sheila F. Helgath, Legislative Research
Frank Homan, Senator Sturgulewski's staff
Bill Janes, Environmental Conservation
Tim Kennedy, Fish Farm Owner
Amy Kruse, Environmental Conservation
Diane Mayer, Division of Governmental Coordination/Office of the Governor
Robert Mikol, Northern Deep Sea Fisheries, Inc.
Rodger Painter, Alaska Mariculture Association
Sheila Peterson, Senator Eliason's staff
Paul Peyton, Commercial Fisheries Development/Department of Commerce and Economic Development
Rick Reed, Habitat Division/ Department of Fish and Game
Lana Shea, Habitat Division/ Department of Fish and Game
John S. Thiede, Department of National Resources

ALASKA FINFISH FARMING TASK FORCE
September 6 & 7, 1989

MINUTES

The meeting was called to order at approximately 1:30 p.m. on September 6 by Mary Lou Cooper, Chairperson. Task force members present were Mary Lou Cooper, Ken Castner, Ted Merrell, and Brent Paine. No members were absent.

Mary Lou Cooper noted that Gordon Harrison had resigned his position on the task force to take a job with the Legislative Research Agency. She stated that the Governor's Office had not found a replacement for Mr. Harrison at that time.

The task force discussed the questions it wanted to resolve at the meeting, a proposal from Sealaska Corporation to tour operating farms in the Puget Sound area, and correspondence received from Sen. Fahrenkamp regarding the task force.

Conrad Mahnken, with the National Marine Fisheries Service, Northwest and Alaska Fisheries Center (NWAFC), joined the task force in a discussion of the genetic and broodstock issues. Both Atlantic and Pacific salmon were discussed..

Dr. Lee Harrell, fish pathologist with NWAFC, discussed the incidence of disease in pen-reared salmon and the potential for spreading disease to the wild stock.

At approximately 5 p.m., the task force adjourned for the afternoon.

The task force reconvened at 9 a.m. on September 7. Dr. Brian Allee, director of the Alaska Department of Fish and Game FRED Division, discussed disease, genetics, and broodstock issues with the task force.

Dr. Allee spoke to the state's existing hatchery programs, efforts to cultivate indigenous species of finfish, and the concept of creating areas free of salmon farming near critical salmon streams.

After breaking for lunch, the task force continued their discussion of Sealaska's invitation to take the task force on a tour of finfish farming operations in Puget Sound. The task force decided to accept the invitation.

The task force discussed the report with project coordinator, Jon Sherwood, who outlined some of the options for structuring the report. The task force directed the project coordinator to begin writing the report using an issue-by-issue format.

Alex Wertheimer, with the National Marines Fisheries Service, Auke Bay Laboratories, spoke to the task force regarding protection of the wild salmon stocks from disease.

The task force approved the minutes of the last meeting. Ken Castner requested that the word "produces" on p. 2 be corrected to "producers." The task force concurred.

The task force discussed developing its preliminary recommendations on the disease, genetics, and broodstock issues.

The task force then enacted its preliminary recommendations as follows:

-- Only indigenous broodstocks should be used in finfish farming in Alaska. No stocks should be imported from out of state.

-- The State will need to allow the use of private pathology services for the finfish farming industry to grow.

-- Current state policies on disease control should be applicable to finfish farming.

The meeting was adjourned at approximately 5 p.m.

ALASKA FINFISH FARMING TASK FORCE
October 16 & 17, 1989

MINUTES

The meeting was called to order in Juneau at 8:34 a.m. on October 16 by Mary Lou Cooper, Chairman. Task force members present included Ken Castner, Mary Lou Cooper, Ted Merrell, Brent Paine, and John Weddleton.

Ms. Cooper announced her resignation as chairman and asked for the selection of a new chairman. By unanimous consent, the members approved Ted Merrell as the new chairman of the task force. Brent Paine took over as chairman of this day's meeting.

Jon Sherwood, project coordinator of the task force, apprised the members that state ethics requirements compel the members to report the services they received from Sealaska Corporation during the September meeting. Although the services do not constitute a conflict of interest, each member must report receipt of those services. Jon Sherwood will submit the required report on behalf of task force members.

Mr. Castner presented an Alaska Native Brotherhood resolution opposing finfish farming and a 1987 study on how commercial fishing affects Homer.

After reading various materials, the members discussed the format of the task force report. They reviewed a series of questions to ask Dr. Anthony Gharrett, a biologist with the University of Alaska Southeast Auke Bay Laboratory and the National Marine Fisheries Service. Mr. Gharrett made comments concerning the destrction of discrete genetic pools in the Pacific Northwest and encouraged the task force to prevent that occurence in Alaska.

Mr. Merrell recounted his interviews with state officials regarding the relationship among state resource agencies, the permitting process, siting issues, and the establishment of sanctuaries. The members talked about these issues, the role of infrastructure for the economic survival of mariculture, and the question of public versus private ownership of broodstock.

The task force then discussed siting. Mr. Castner stressed the importance of this issue by stating that "siting is everything in this game" and that any legislation authorizing finfish farming should contain a fiscal note that reflects the costs of siting. Mr. Paine agreed and said that conflict and confrontation can be diffused if siting is set up properly.

Members concurred that the proper siting of finfish farms should address the transference of disease, genetic interference with wild stocks, environmental degradation, aesthetic degradation, conflicts with existing users, avoidance of marine mammals, avoidance of water-borne organisms lethal to the farmed stock, and avoidance of conflict with designated uplands or neighborhood uses.

Members also wanted to include mention of the state of Washington's interim guidelines for siting and of the Alaska Coastal Zone Management Plan's permitting process for resolving siting issues.

Mr. Paine suggested that siting and the permitting process should be addressed as two separate issues. Mr. Merrell suggested that the Alaska Coastal Zone Management Plan's permitting process be used as a model for the finfish farming permitting process. He then asked for clarification on the structure of the task force report. Mr. Sherwood outlined the distinctions between conclusions and findings. Conclusions, he explained, should be statements of public policy. Findings should be points of agreement among the task force members on matters of fact.

Members then discussed the permitting process. Ms. Cooper and Mr. Merrell supported the inclusion of maps in the public notification process. Questions then arose about the adequacy of the state's inventory of sites.

At 10:30 a.m., Dr. Anthony Gharrett discussed disease and genetics among salmon, the homing habits of various salmon species, siting, how the Alaska Department of Fish and Game enforces its genetics guidelines, the genetic differences that exist among lakes within the same area, patentable gamete production, and the aquaculture research by Japan and the Soviet Union. He distributed a proposal calling for the Alaska Department of Fish and Game to implement its genetic policy by establishing, on a regional basis, sanctuaries for wild fish populations. Mr. Gharrett entertained questions from the members until 11:35. Discussion then returned to siting and permitting.

After lunch, the task force members heard testimony from Gale Good, member of the Alaska Trollers' Association. Mr. Good described his industry and voiced his opposition to finfish farming.

The members spent the rest of the day discussing findings and conclusions relating to siting. Specific issues addressed were: water quality; effluents; water circulation; the use of uplands; predation; disease; aesthetics;

pollution; user conflicts; having finfish farmers produce annual performance reports to governmental agencies; the distinctions among marine pens, marine upland tank facilities, and freshwater upland facilities; distances between farms and wild anadromous streams; distances between farms; and, the incremental implementation of finfish farming.

The meeting was adjourned at 5:14 p.m.

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The task force reconvened at 8:45 a.m. on October 17. John Weddleton presided over the day's meeting. Task force members present included Ken Castner, Ted Merrell, Brent Paine, and John Weddleton. Due to illness, Mary Lou Cooper was absent.

The members adopted, with corrections, the minutes from the September 28 and 29 task force meeting and briefly discussed broodstock issues.

At 9:00 a.m., the task force members listened to United Fishermen of Alaska's Sonja Corazza's testimony on the history of the Alaska fishing industry, the limited entry program, the ocean ranching program, and the implementation of the 200-mile limit. She pointed out that in Anchorage alone, 3900 fishermen contributed $126 million to the economy. Because of the underfunding of the Alaska Department of Fish and Game, she claimed that errors in fisheries management have incurred losses to fishermen. She ended her testimony by voicing her opposition to finfish farming.

After listening to Ms. Corazza's testimony, the members resumed their discussion on broodstock selection for enclosed freshwater systems, the importation of eggs, the use of Atlantic salmon in the Pacific Northwest, the selling of smolt, and other broodstock issues.

At 10:10 a.m., the members heard testimony from Ken Parker, Director of the Division of Commercial Fisheries, Alaska Department of Fish and Game. Mr. Parker presented a fiscal history of his division and described its duties. He provided information about the catches and ex-vessel values among various fisheries; the number of fisheries permits, licenses, and processors and buyers. He showed the relationship between receipts and expenditures for commercial fisheries management before entertaining questions from the members.

Mr. Parker's testimony ended at 11:15 a.m. The members continued their discussion on broodstock issues.

At 11:35 a.m., Rodger Painter, President of the Alaska Mariculture Association addressed the task force, urging support for the development of finfish farming in Alaska. In addition to handing out the latest edition of the "Alaska Mariculture Report" (Volume 3, No. 6), he distributed a paper responding to concerns relating to the permitting process, the ability of regulatory agencies to deal with finfish farming issues, the impacts on wild stocks, disease control, support of adequate funding for regulatory programs, the demands on Alaska's environment by every industry -- from tourism to logging, public use issues, Alaska's declining market share of salmon, and the obtaining of salmon eggs for mariculture. He also addressed the role of private non-profit groups in the cultivation of broodstock. Citing his past experience at the Alaska Seafood Marketing Institute, he noted how the state still has a poor quality assurance program.

After the lunch break, the task force members discussed their agenda, the testimony they had received, developing strategies for retrieving Alaska's 1988 market share of salmon, and issues relating to quality, allocation, habitat, broodstock, costs/benefits, recapitalizing the fishing fleet, permit costs, and marketing.

After a brief break at 3:00, the members established the following meeting dates and deadlines:

November 5 & 6.....Task Force Meeting in Juneau
November 17.....Release of Draft Report
December 5.....Work Session on Draft Report
December 13.....Deadline for Public Comments
December 17 & 18.....Task Force Meeting in Juneau

Citing previous testimony, the members summarized their findings on marketing issues.

The meeting was adjourned at 5:35 p.m.

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The following people attended the task force meetings:

Sonja Corazza, United Fishermen of Alaska*
Laura Dameron, Southeast Alaska Conservation Council

Dr. Anthony Gharrett, Biologist, University of Alaska Southeast Auke Bay Laboratory and the National Marine Fisheries Service
Gale Good, Alaska Trollers' Association
Deborah Greenberg, Special Assistant, Alaska Department of Fish and Game
Sheila Helgath, Legislative Research Agency, Alaska State Legislature
Frank Homan, Aide, Senator Arliss Sturgulewski
Michael Kaill, Biologist, Fisheries Rehabilitation, Enhancement, and Development Division, Alaska Department of Fish and Game
Dale Kelly, Alaska Trollers' Association
Eric King, Alaska Trollers' Association
Richard Lauber, Pacific Seafood Processors' Association
Lynn Morley, Teleconference Moderator, Legislative Affairs Agency, Alaska State Legislature
Dave Moses, Aide, Senator Paul Fischer*
Karl Ohls, Aide, Senator Fred Zharoff
Rodger Painter, President, Alaska Mariculture Association
Ken Parker, Director, Division of Commercial Fisheries, Alaska Department of Fish and Game
Sheila Peterson, Aide, Senator Dick Eliason
Chip Thoma, Observer

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* Participated via teleconference

Minutes were approved 12/19/89.

ALASKA FINFISH FARMING TASK FORCE
November 5 & 6, 1989

MINUTES

The meeting was called to order in Juneau at 9:45 a.m. on Sunday, November 5, 1989 by Ted Merrell, Chairman. Task force members present included Ken Castner, Ted Merrell, Brent Paine, and John Weddleton. Mary Lou Cooper was absent.

Jon Sherwood, project coordinator of the task force, distributed copies of a required "ethics" report on task force activities and the draft report of findings and recommendations dated October 29, 1989. He discussed the maintenance of task force records and announced that on Friday, November 3, the Alaska State Legislature's Legislative Council approved $10,000 additional funding for the task force.

The members discussed task force staffing and agreed to have Mr. Sherwood on contract to testify on behalf of the task force before committees during the upcoming legislative session. They also discussed how to distribute the draft report, the press release that would accompany the report, and what an interim report should contain.

Mr. Merrell announced that Mary Lou Cooper spoke to him about the possibility of her resigning from the task force and that he had requested that she not do so. Members concurred with having her remain on the task force.

At 10:20 a.m., Chip Thoma addressed the task force. He voiced his strong opposition to allowing finfish farming in Alaska. He stated that finfish farming would undermine the marketing of Alaska salmon as a "pure, fresh, cold" commodity that would benefit from the "increasing trend in consumer buying and eating habits [by] stay[ing] away from raised or harvested foods that are linked with pesticides, toxins, or additives..."

The task force then discussed the costs of regulation caused by the introduction of finfish farming to Alaska. Mr. Paine cited fiscal notes from earlier legislation authorizing finfish farming. The members discussed this, the fiscal demands of siting requirements, the number of possible permits to administer, the fiscal impact on other resource programs with the introduction of finfish farming, and the spin-offs of those new demands to other regulatory agencies such as the Board of Fish.

Discussion then resumed on the draft report the task force planned to release on November 17. Several members voiced their concern about the public misconstruing the document as

Dr. Anthony Gharrett, Biologist, University of Alaska Southeast Auke Bay Laboratory and the National Marine Fisheries Service
Gale Good, Alaska Trollers' Association
Deborah Greenberg, Special Assistant, Alaska Department of Fish and Game
Sheila Helgath, Legislative Research Agency, Alaska State Legislature
Frank Homan, Aide, Senator Arliss Sturgulewski
Michael Kaill, Biologist, Fisheries Rehabilitation, Enhancement, and Development Division, Alaska Department of Fish and Game
Dale Kelly, Alaska Trollers' Association
Eric King, Alaska Trollers' Association
Richard Lauber, Pacific Seafood Processors' Association
Lynn Morley, Teleconference Moderator, Legislative Affairs Agency, Alaska State Legislature
Dave Moses, Aide, Senator Paul Fischer*
Karl Ohls, Aide, Senator Fred Zharoff
Rodger Painter, President, Alaska Mariculture Association
Ken Parker, Director, Division of Commercial Fisheries, Alaska Department of Fish and Game
Sheila Peterson, Aide, Senator Dick Eliason
Chip Thoma, Observer

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* Participated via teleconference

Minutes were approved 12/19/89.

being conclusive or as representing each individual member's position.

Mr. Sherwood suggested having a cover letter accompany the draft report, in which the task force could solicit public comment while emphasizing that the document is only a draft.

After lunch, the task force discussed costs/benefits issues, including: the volatility of salmon prices; market niches for farmed and wild salmon; the history and purpose of the limited entry program and its conservational and economic repercussions; marketing strategies; the threat finfish farming poses to the livelihood of fishermen; the effects on the market of price, quality, and consistency of supplies; the possible losses to wild salmon stocks from using gametes to start farming operations; finfish farming as an allocation issue; having hatcheries profiting from the sale of smolts; the possible benefits of sharing facilities between finfish farmers and ocean ranchers; incremental start-up of finfish farming; establishing genetic reserves; and, the production of fish meal.

At 4:25 p.m., Rick Harris, of Sealaska Corporation, spoke in support of allowing finfish farming in Alaska and its possible benefit to coastal areas. He argued that finfish farming can help market Alaska salmon as a commodity that is available year-round. Mr. Harris suggested that one form of economic rent would be the servicing of a remote site net pen for common property benefit. The fish would be provided by the state or non-profit hatcher. The finfish farmer would beed the fish until their release and provide and faintain the pen facility.

After a brief break, the task force members resumed their discussion of costs/benefits.

The meeting was adjourned at 6:10 p.m.

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The task force reconvened on Monday, November 6, 1989, and was called to order at 8.43 a.m. by Chairman Ted Merrell. Task force members present were Ken Castner, Ted Merrell, Brent Paine and John Weddleton. Mary Lou Cooper was absent.

The task force began discussing the profile of finfish farmers and the role they would play in the various aspects of the fishing industry. Mr. Castner was concerned that they might not defend the issues that affected the commercial fishing industry, but rather look after only their personal interests. Mr. Paine disagreed, stating that good

The task force adopted the November 2, 1989 draft labeled "Draft with Ted's Changes" for purposes of discussion.

It was decided that costs and benefits needed to be broken into two categories: 1) State of Alaska; and 2) the industry. It was determined that a time line to show the development of a fish farm to market stage was needed for inclusion in the report.

Mr. Castner requested that duplicate references under a heading be footnoted, for purposes of cross-referencing.

The task force decided that the costs associated with the beginning of the industry (insurance, markets, etc.) needed to be included in the report. Time frame estimates were predicated on a 1991 allocation, leaving site approval for 1991, with smolt and fish availability in 1992.

After a brief break, the task force discussed marketing. Findings were clarified and regrouped. The task force decided that separate findings were required for fresh and frozen markets.

The task force discussed: competition between farmed and wild salmon; improved marketing of wild salmon through quality assurance programs; and marketing wild salmon as natural, chemical-free salmon.

The task force recessed for lunch at 12:18 p.m. and reconvened at 1:30 p.m.

The task force briefly returned to its discussion of quality assurance.

Mr. Castner recommended that the report introduction contain a section on the make-up of the task force. He also thought definitions were needed on mariculture, aquaculture and finfish farming.

Several findings in the draft report were amended to provide clarifying language.

Having completed its review of the draft report, the task force verified the November 17, 1989 release of the draft report.

The meeting was adjourned at 5:22 p.m.

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The following people attended the task force meetings:

Laura Dameron, Southeast Alaska Conservation Council
Deborah Greenberg, Special Assistant, Alaska Department of Fish and Game
Rick Harris, Sealaska Corporation
Frank Homan, Aide, Senator Arliss Sturgulewski
Tom Moyer, Aide, Senator Bettye Fahrenkamp
Sheila Peterson, Aide, Senator Dick Eliason
Kate Tesar, Aide, Representative Fran Ulmer
Chip Thoma, Observer

Minutes were approved 12/19/89.

ALASKA FINFISH FARMING TASK FORCE
December 5, 1989
WORK SESSION

MINUTES

The work session teleconference was called to order at 2:30 p.m. on Tuesday, December 5, 1989, by Ted Merrell, Chairman. Task force members present were Ted Merrell, Mary Lou Cooper, Ken Castner, Brent Paine and John Weddleton.

Opportunities for public comment and participation were discussed. A request by Chuck Piedra, of Elfin Cove, to expand the public comment period and testimony methods, was noted. It was decided to continue the same comment procedures as in previous meetings of the task force. No written comments relative to substantive changes in factual findings in the draft report had been directed to the task force as of the December 5 meeting. The task force reiterated that written comments on the draft report should be received by December 13, 1989, to ensure consideration.

The task force reviewed and edited the final chapters of the draft report. Jon Sherwood, project coordinator, discussed the format and content of the final chapter of the report.

The work session was adjourned at 4:42 p.m.

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The following people observed the task force meeting:

In Juneau--

Chip Thoma, Observer
Mary McDowell, Aide to Senator Dick Eliason
Frank Homan, Aide to Senator Arliss Sturgulewski
Gordy Williams, Angoon
Karl Ohls, Aide to Senator Fred Zharoff

In Anchorage--

Valerie Brown, Alaska Wildlife Alliance
Jay Nelson, Aide to Representative Cliff Davidson
Bryce Edgemon, Aide to Representative George Jacko
Charles McKee, Observer

Minutes were approved 12/19/89.

ALASKA FINFISH FARMING TASK FORCE
December 18-20, 1989

MINUTES

The Alaska Finfish Farming Task Force meeting was called to order on December 18, 1989, in Juneau, at 1:19 p.m., by Ted Merrell, Chairman. Members present were Ted Merrell, Mary Lou Cooper-Elton and John Weddleton. Brent Paine and Ken Castner were absent due to weather and eruption of Redoubt Volcano causing flight cancellations.

Format and appendices of the final report were discussed. Mr. Merrell noted patterns to the public comment received. Members felt that comments from the public sector about the draft report indicated a need for clarification of numerous points, but no significant changes in format or content. Minutes of October 16-17, November 5-6, and December 5, 1989 meetings were reviewed and corrected. Final approval was postponed pending Mr. Castner's approval.

Brent Paine arrived at 2:28 p.m. The task force recessed at 2:30 p.m., returned at 3:29, and adjourned at 3:30 p.m.

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Ted Merrell called the task force to order on December 19, 1989 at 8:53 a.m. Members present were Ted Merrell, John Weddleton, Mary Lou Cooper-Elton and Brent Paine. Ken Castner was absent but arrived later at 9:34 a.m.

Members began reviewing the revised draft on an item by item basis, starting with the Cost of Regulation (Ch. 5). The consensus was that the actual costs will depend on the legislation that is passed.

Discussion of regulatory costs continued, including taxation and public notice costs. A recommendation limiting predator control to non-lethal methods was adopted. The task force addressed the compatibility of wilderness areas and national monuments (Ch. 4) with finfish farming, and modified the recommendation on that subject.

The task force recessed for lunch at 12:30 p.m. and reconvened at 1:45 p.m.

Minutes of October 16-17, November 5-6 and December 5, 1989 meetings were approved as corrected.

The task force continued its review of public comments on the draft report and adopted many changes in wording to clarify the findings and recommendations.

Brent Paine's Production Model draft and timeline of a typical finfish farm was discussed. The task force agreed that a clear

description of a finfish farm should be included in the production model section.

The Health of Fisheries (Ch. 2) was taken up next. Disease transmission, genetics and risks were clarified. A consensus was reached on content and format of the final chapter of the report: All recommendations in the body of the report should be repeated; the facts do not support an unequivocal "yes" or "no" to finfish farming in Alaska; the legislature should not extend the current moratorium; and finfish farming could be done without harming fishery resources if strictly regulated. Ted Merrell agreed to prepare a draft of the chapter for review by the task force next morning.

The task force was adjourned at 6:45 p.m.

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Ted Merrell reconvened the task force at 8:15 a.m. on December 20, 1989. Members present were Ted Merrell, John Weddleton, Ken Castner, Brent Paine and Mary Lou Cooper-Elton.

The task force completed Chapter 8, General Findings and Recommendations. Costs and Benefits (Ch. 6) were considered and clarified. Marketing (Ch. 7) was discussed and it was decided that it needed to be revised and expanded to reflect numerous comments by the public. John Weddleton agreed to rewrite this section and return a revised draft to Jon Sherwood as soon as possible.

Jon Sherwood will prepare a final draft of the task force's report, incorporating all the changes that were adopted and the additional sections from Brent Paine and John Weddleton. This draft will be sent to task force members for approval by the first week of January, 1990.

No further meetings of the task force will be necessary, but a final teleconference to approve any changes in the report to the legislature, may be required.

The meeting was adjourned by Chairman Ted Merrell at 1:05 p.m.

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The following people attended the task force meeting:

Rodger Painter, Alaska Mariculture Association
Mary McDowell, Aide to Senator Dick Eliason
Frank Homan, Aide to Senator Arliss Sturgulewski
Sheila Helgath, Legislative Research Agency
Kate Tesar, Aide to Representative Fran Ulmer
Barnaby Dow, Aide to Representative Mike Davis
Chip Thoma, Observer
Gordon Williams, Selt/Alaska Trollers/Angoon F&G Adv. Committee

APPENDIX E

LIST OF PERSONS SUBMITTING COMMENTS ON DRAFT REPORT

ALASKA FINFISH FARMING TASK FORCE

PUBLIC COMMENT TO DRAFT REPORT

#	Name	Organization	Address
1.	James Kallander		PO Box 2272, Cordova, AK 99574
2.	Joe Craig		Box 941, Douglas, AK 99824
3.	Lonnie Haughton	F/V China Cove, Inc.	PO Box 3006, Ketchikan, AK 99901
4.	News articles	Seattle P.I. &	Alaska Fisheries Journal
5.	William Royce	AFS	10012 Lake Shore Blvd NE,SEA,WA 98125
6.	Paul Zimmerman	Keener Packing Co.	PO Box 890, Kenai, AK 99611
7.	Sen. Zharoff	State Legislature	PO Box 405, Kodiak, AK 99615
8.	Barry Griffin	Nor'Eastern Trawl	7910 NE Day Rd W, Bainbridge Is, WA
9.	William Wilson	AIFRB	13611 Capstan Dr., Anc., AK 99516
10.	Rep. Jacko	State Legislature	PO Box 47001, Pedro Bay, AK 99647
11.	James Mackovjak	Pt. Adolphus Seafoods	PO Box 63, Gustavus, AK 99826
12.	Concerned citizens	Elfin Cove	Elfin Cove
13.	Charles Piercy	F/V Tuckahoe	PO Box 1025, Ward Cove, AK 99928
14.	Charles Piedra		Box 4, Elfin Cove, AK 99825
15.	Jeff Hetrick		PO Box 7, Moose Pass, AK 99631
16.	Joseph Mehrkens	SE AK Nat Res Center	PO Box 20212, Juneau, AK 99802
17.	Kathryn Troll	SE AK Seiners Asso.	PO Box 9579, Ketchikan, AK 99901
18.	Brian Paust-see#60	Coop Ext Svc-Sea Grant	PO Box 1329, Petersburg, AK 99833
19a.	Ralph Mackie	Craig Fishery Adv Com	(see #28 below-dupl.)
19b.	Julie Hursey	F/V Thunder	Box 213, Petersburg, AK 99833
19c.	Debra Lyons		Box 296, Petersburg, AK 99833
20.	Chris Nerison	Cordova Dist Fshrmn Un	PO Box 939, Cordova, AK 99574
21.	Charles Piedra		Box 4, Elfin Cove, AK 99825
22.	Shirley Piedra		Box 4, Elfin Cove, AK 99825
23.	Denby Lloyd	Office of Governor	Box A, Juneau, AK 99811
24.	Rosemary Enderle		PO Box 10, Elfin Cove, AK 99825
25.	David Bedford		PO Box 1211, Petersburg, AK 99833
26.	Ralph Guthrie		Box 595, Petersburg, AK 99833
27.	Chris Sharpsteen		Box 1255, Petersburg, AK 99833
28.	Ralph Mackie	Craig Fishery Adv Com	PO Box 252, Craig, AK 99921
29.	Sid Cox	United Cook Inlet Drft	Box 4649, Kenai, AK 99611
30.	Jerry Wickstrom		3605 Arctic #745, Anc, AK 99503
31.	Pete Granger	Seafood Producers Coop	2875 Roeder Ave, Bellingham, WA 98225
32.	Mardi Hutchens		11340 Borealis, Eagle River, AK 99572
33.	Chip Thoma		
34.	Nick Yurko	Gast Channel F&G Adv C.	9412 Longrun Dr., Juneau, AK 99801
35.		United Fishermen of AK	211 4th St. Ste 106, Juneau, AK 99801
36.	Cheryl Sutton	Kenai Pen Fshmns Asso	Box 546, Soldotna, AK 99669
37.	Wolf Benson	Benson Sea Farms	PO Box 1541, Petersburg, AK 99833
38.	Laura Dameron	SE AK Conservatn Cil	PO Box 21692, Juneau, AK 99802
39.	Roger Painter	AK Mariculture Asso	130 Seward St., Ste 201, Juneau, AK
40.	Cathy Conner	Juneau Audubon Society	PO Box 21725, Juneau, AK 99802
41.	David Rogers	Sea Culture of AK Inc	130 Seward St., Ste 504, Juneau, AK
42.	Paul Barnes	AK Fish Trade	Box 211121, Auke Bay, AK 99821
43.	Rebecca Knight		PO Box 1331, Petersburg, AK 99833
44.	Robert Martin	T&H Reg Electrical Aut	PO Box 210149, Auke Bay, AK 99821
45.	Wallace Fields	Kodiak Reg Aquaculture	Box 1691, Kodiak, AK 99615
46a.	Sen. Fahrenkamp	Sen. Resources Com	PO Box V, Juneau, AK 99811
46b.	Sheila Helgath	Leg. Research Agency	PO Box Y, Juneau, AK 99811-3100

#	Name	Organization	Address
47.	Sen. Jones	State Legislature	352 Front St., Ketchikan, AK 99901
48.	Scott Swanson		3800 Valley Ave, Juneau, AK 99801
49.	Valerie Brown	AK Wildlife Alliance	PO Box 202022, Anchorage, AK 99520
50.	Paul Peyton		1647 Harbor Way, Juneau, AK 99801
51.	David McFadden	F/V Sand Dab	PO Box 668, Petersburg, AK 99833
52.	Geron Bruce	Unit SE AK Gillnetters	PO Box 021186, Juneau, AK 99802
53.	Oliver Holm	Kodiak Reg Aquaculture	Box 3407, Kodiak, AK 99615
54.	John Nielsen	AK Shellfish Grower's	Box 220029, Anchorage, AK 99522
55.	William Heard	(replcemnt) NMFS-AukeB	PO Box 210155, Auke Bay, AK 99821
56.	Sen. Eliason	State Legislature	PO Box V, Juneau, AK 99811
57.	Rep. Ulmer	State Legislature	PO Box V, Juneau, AK 99811
58.	Bruce Smith		PO Box 45, Gustavus, AK 99826
59.	Steve Pennoyer	NOAA, Marine Fish.	PO Box 21668, Juneau, AK 99802-1668
60.	Brian Paust's art.	Coop. Ext. Svc.	(see #18)
61.	Rep. Davidson	House Resources Com.	PO Box V, Juneau, AK 99811
62.	Richard Harris	SEALASKA Corp.	One Sealaska Plaza, Juneau, AK 99801
63.	Neil Kinney		(Homer?)
64.	Brad Pierce		
65.	Dennis Watson	City of Craig	PO Box 23, Craig, AK 99921
66.	Rebecca Knight		PO Box 1331, Petersburg, AK 99833
67.	Dan Hull		310 N 46th #402, Seattle, WA 98103
68.	Nick Barlett		Box 4032, Homer, AK 99603
69.	Jim Green		1033 Millar St., Ketchikan, AK 99901
70.	Dan Berkshire		13010 Sher Circle, Anc, AK 99516
71.	Nevin Holmberg	US F&W Svc	PO Box 021287, Juneau, AK 99802-1287
72.	Doris Howe	(From Sen. Eliason)	Box 67, Gustavus, AK 99826
73.	Brian Allee	ADF&G, FRED Div.	PO Box 3-2000, Juneau, AK 99802-2000
74.	Chip Toma	(articles from indiv.)	
75.	Dale Kelley	AK Trollers Asso.	130 Seward St.,#213, Jnu, AK 99801
76.	Concerned citizens		Juneau, Douglas, Auke Bay, Hoonah,Tok

APPENDIX F

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