ALASKA LEGISLATURE COMMITTEE FILES, 1989-1990 8672
6015 HOUSE RESOURCES

419

An Appeal for Significant Improvement in the Enforcement of Alaska's Environmental Laws

Recommended Legislative Remedies

submitted by: Sue Libenson, Executive Director
Alaska Center for the Environment

Mike Wenig, Staff Attorney
Trustees for Alaska

Introduction

In the wake of the Exxon Valdez oil spill, Alaska's greatest environmental tragedy, it is anticipated that the legislature will consider numerous approaches to improving public policy with the intent of preventing future spills. Many of these changes will focus on improvements within the Alaska Department of Environmental Conservation (DEC) which has the bulk of the State's responsibility with regards to oil spill prevention and response.

For any of the legislature's potential actions to succeed, however, they must be backed by one underlying factor - improved enforcement. While there are undoubtedly needs for change in spill prevention and response, the Commission must recognize that the current failure of existing regulatory safeguards is largely due to the inability of agencies, including DEC, to properly enforce the law and thereby create an atmosphere which encourages compliance by potential polluters.

The following outlines a package of legislative recommendations for improving the enforcement of Alaska's environmental laws and regulations. The implementation of these measures will ultimately be improved compliance, the ultimate tool in preventing future pollution catastrophes.

Recommendations

I. Authorize DEC to assess administrative penalties.

II. Strengthen criminal penalties for violations of pollution laws.

III. Authorize DEC to make reasonable inspections without first obtaining a warrant.

IV. Eliminate administrative and judicial "pre-enforcement review" of compliance orders.

V. Provide for citizen suits to enforce environmental statutes and regulations.

VI. Provide adequate funding for DEC to fulfill its regulatory

mandate.

Discussion of Recommendations

I. DEC SHOULD HAVE THE STATUTORY AUTHORITY TO ASSESS ADMINISTRATIVE PENALTIES

Among the tools that are necessary for DEC to have a credible, forceful, and efficient enforcement program is the authority to assess administrative penalties for violations of the State's environmental laws.

Penalties, generally, are an important enforcement tool because they greatly reduce the economic incentives to violate the State's environmental laws. However, DEC currently has the authority only to issue a compliance order requiring corrective action or to commence a judicial enforcement action for civil or criminal penalties.[1] Like most litigation, however, judicial enforcement actions require the State to commit substantial resources and time and, thus, are used only for the most extreme violators. By themselves, judicial enforcement actions cannot provide a sufficient enforcement threat.

A civil penalty program is thus a necessary tool for a credible enforcement arsenal. Administrative penalties could be assessed through a fair yet far less resource intensive administrative hearing procedure than court proceedings. Decisions by administrative hearing officers would be judicially reviewable on the record, rather than through a cumbersome trial

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[1] Two of these three tools, themselves, need to be strengthened, as explained below in sections IV and VI.

procedure.

Administrative penalties would greatly strengthen DEC's enforcement presence and capability by providing the agency with a relatively quick and efficient means of imposing penalties. The authority to assess administrative penalties is particularly important for the relatively numerous yet small violators, for whom DEC's commencement of lengthy judicial enforcement proceedings is simply not worthwhile. By greatly reducing the resources necessary to levy penalties, an administrative penalty program would provide an enforcement threat that is otherwise not present at all for these small violators.

Administrative penalties are an integral component of the federal environmental enforcement program.[2] Numerous state agencies also have the authority to assess penalties for violations of state environmental laws.[3] Administrative penalties should become an essential component of DEC's enforcement arsenal as well.

Of course, merely having the legal authority to assess penalties is not enough. DEC must also be given the corresponding budgetary resources to hire sufficient technical

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[2] See, e.g., section 309(g) of the Clean Water Act, 33 U.S.C. § 1319(g); section 3008(a) of the Resource Conservation and Recovery Act, 42 U.S.C. § 6928(a); section 14(a) of the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. § 1361(a); section 16(a) of the Toxic Substances Control Act, 15 U.S.C. § 2615(a); and section 109 of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9609.

[3] For example, see Washington, RCW 90.48.144.

staff and permanent hearing officers to make the administrative penalty process work.

II. CRIMINAL PENALTIES FOR VIOLATIONS OF STATE ENVIRONMENTAL LAWS SHOULD BE STRENGTHENED

Stiff criminal sanctions are another essential component of the kind of enforcement program that is necessary to achieve full compliance with the State's environmental laws. The current liability for criminal violations of Alaska's environmental laws is inadequate.

With a few exceptions, negligent and knowing violations of the State's environmental laws are currently only class B and A misdemeanors, respectively. AS 46.03.790(a), (b). Class B misdemeanors are punishable by a fine of not more than $1000 and by imprisonment for no longer than 90 days; Class A misdemeanors are punishable by a fine of not more than $5000 and by a maximum of imprisonment for one year. AS 12.55.035(b)(3), (4); 12.55.135(a), (b).

These liabilities stand in stark contrast with criminal liabilities for violations of federal environmental laws. For example, under section 309(c) of the federal Clean Water Act, negligent violations are punishable by either or both maximum fines of $25,000 per violation and/or one year imprisonment; knowing violations are punishable by either maximum fines of $50,000 per violation or by three years imprisonment. 33 U.S.C.

§ 1319(c).[4]

Alaska's criminal liabilities should be strengthened by making negligent violations Class A misdemeanors and knowing violations Class C felonies, which are punishable by a maximum fine of $50,000 per violation and five years' imprisonment. AS 12.55.035((b)(2); 12.55.125(e). In addition, the definition in AS 46.03.900(17) of "persons" who are subject to criminal sanctions should be amended to include "any responsible corporate officer." See Clean Water Act section 309(c)(6), 33 U.S.C. § 1319(c)(6).

The last legislature increased civil penalties for oil polluters (see SB 271) and considered tougher criminal sanctions in the oil pollution context. The legislature should now complete its mission and stiffen criminal sanctions for violations of all State environmental laws.

As to criminal liability for oil spills, in particular, two bills sponsored by the Governor and introduced in the last legislative session should become law. Among other things, HB 315 classifies as Class C felonies, oil spills of 10,000 barrels or more involving a failure to comply with an oil discharge contingency plan or a failure to adequately clean up a discharge of oil. HB 316 expands the penalties that can be levied against a defendant that is an organization by including fines equal to twice the damage or loss caused by the defendant.

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[4] See also, e.g., section 3008(d) of the Resource Conservation and Recovery Act, 42 U.S.C. § 6928(d); section 113(c) of the Clean Air Act, 42 U.S.C. § 7413(c).

III. DEC SHOULD HAVE THE AUTHORITY TO MAKE REASONABLE INSPECTIONS WITHOUT FIRST OBTAINING A WARRANT

The ability to make inspections to determine whether violations of the State's environmental laws are occurring is still another necessary element of a credible enforcement program. Currently, AS 46.03.860 appears to require DEC to obtain a search warrant before it can investigate possible violations. Federal environmental laws, in contrast, contain no such warrant requirement. For example, section 308(a)(B) of the Clean Water Act expressly provides the EPA with a "right of entry" and with authority "at reasonable times" to make inspections and copy relevant records. 33 U.S.C. § 1318(a)(B).[5]

Consistent with federal environmental law, AS 46.03.860 should be amended to remove the warrant requirement and thereby improve the DEC's ability to investigate potential violations of the State's environmental laws.

IV. THERE SHOULD BE NO "PRE-ENFORCEMENT REVIEW" OF DEC'S COMPLIANCE ORDERS IN EITHER AN ADMINISTRATIVE ADJUDICATORY HEARING OR JUDICIAL PROCEEDING

A sixth tool that is necessary for a sound, effective State environmental enforcement program is the ability of the enforcing agency to issue compliance orders without cumbersome procedural constraints. DEC does not presently have this ability.

Current State law (AS 46.03.850) provides DEC with the authority to issue compliance orders for known or suspected

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[5] See also, e.g., section 3007 of the Resource Conservation and Recovery Act, 42 U.S.C. § 6927; and section 114(a) of the Clean Air Act, 42 U.S.C. § 7414(a).

violations of the State's environmental laws, but the required procedures for issuing such orders are so cumbersome as to render the compliance order an infrequently used and thus ineffective enforcement tool.

State law appears to require that, before DEC can issue an order requiring a polluter to comply with an applicable State environmental law, the agency must first notify the polluter of its finding that the polluter is or may be in violation and give the polluter an opportunity to respond to the finding. AS 46.03.850(a), (b).[6]

In addition, although compliance orders become effective upon receipt (AS 46.03.850(c)), it appears that recipients can subsequently contest the order in an adjudicatory hearing that is required to include the extensive procedural steps set out in the Administrative Procedure Act. See AS 44.62. Recipients of a compliance order can also challenge an adverse ruling by a hearing officer in court. AS 44.62.560.

By requiring DEC to defend an order at administrative and, subsequently, judicial hearings, Alaska law imposes substantial resource constraints on the use of the compliance order as an enforcement tool by DEC (and its legal representatives in the Department of Law). These constraints effectively discourage DEC

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[6] AS 46.03.865 allows DEC to sidestep this pre-notification procedure, but only in the extremely narrow circumstances, where DEC has found that there is an "actual or imminent" discharge of either oil, a hazardous substance, or a low level radioactive material.

from invoking this tool, except in extremely rare circumstances.[7] As a result, the tool has not been used to fulfill its obvious role, as an efficient, relatively quick means for DEC to command compliance with the State's environmental laws and to compel the cleanup of unlawful discharges of harmful pollutants.

As with several of the other enforcement tools discussed above, State law regarding the procedures for issuing compliance orders does not compare with EPA's legal authority to issue orders to compel compliance with federal laws. Federal environmental law generally adheres to the sound policy of not allowing "pre-enforcement review" of EPA's compliance orders. This means that compliance orders which do not also require the recipient to pay an administrative penalty generally can not be challenged in any administrative or judicial proceeding, until and unless EPA commences a judicial proceeding to enforce the order and seeks penalties for violations of the order. At that time, the validity of the order can be questioned by the

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[7] In fact, the right of a recipient to challenge an order in an administrative adjudicatory hearing, by itself, appears sufficient to effectively discourage DEC from issuing compliance orders. DEC's budget does not include sufficient funds for a permanent in-house staff of hearing officers. Thus, when an adjudicatory hearing is requested, DEC must hire hearing officers on a contract basis. The substantial expense of such outside contracting, alone, strongly discourages DEC from issuing compliance orders.

recipient as a defense to EPA's enforcement suit.[8]

As the Second Circuit Court of Appeals recognized, in upholding the principle of no pre-enforcement review of compliance orders issued under the federal Clean Air Act:

> To introduce the delay of court review of administrative action taken to ameliorate a potential public health hazard would conflict with Congress' aim to 'accelerate . . . the prevention and control of pollution.' . . . In short, immediate pre-enforcement review of compliance orders . . . would 'serve neither efficiency nor enforcement' of the Clean Air Act.

Asbestec Const. Services, Inc. v. EPA, 849 F.2d 765, 769 (2d Cir. 1988).

Not until DEC's ability to issue compliance orders is as procedurally unencumbered as that of the EPA, will the compliance order become an effective tool in the State's environmental enforcement arsenal.

V. PRIVATE CITIZENS SHOULD HAVE THE AUTHORITY TO ENFORCE THE STATE'S ENVIRONMENTAL LAWS

The final, necessary, and, perhaps, most critical component of a viable, credible State enforcement program is the ability of citizens to act as "private attorneys general" by bringing suits to enforce the State's environmental laws. This ability is nonexistent under current law.

AS 46.03.760 and 46.03.765 provide State courts with authority to compel the payment of civil penalties and to grant

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[8] For example, section 113(h) of CERCLA, 42 U.S.C. § 9613(h) expressly prohibits federal courts from reviewing challenges to compliance orders, except under limited circumstances, including a suit brought by EPA to seek penalties for a violation of the order.

injunctive relief for violations of the State's environmental laws. But AS 46.03.870 provides that the bases for the enforcement actions listed above "inure solely to and are for the benefit of the state. . . ." Similarly, AS 46.03.890 provides that only State officials are authorized to enforce the State's environmental laws.

The ability of private citizens to enforce environmental laws is a critical supplement to government enforcement because resource constraints inevitably prevent governments from taking all the enforcement measures that would otherwise be warranted. Given the DEC's severely limited enforcement resources (even if a separate enforcement unit like the one recommended above were available), citizen suits are necessary to present to the regulated community a forceful and credible message that violations of the State's environmental laws will not be tolerated.

Congress has wisely recognized the value of citizen suits as supplements to governmental enforcement and thus provided citizens with ample authority to enforce the federal environmental laws.[9] The record of citizens suits to enforce these laws is a strong one. Citizens enforcement actions have proven not to be unreasonable avenues for harassment of industry

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[9] See, e.g., section 505 of the Clean Water Act, 33 U.S.C. § 1365; section 7002 of the Resource Conservation and Recovery Act, 42 U.S.C. § 6972, section 304 of the Clean Air Act, 42 U.S.C. § 7604; and section 310 of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9659.

or the EPA, but to be valuable means for stopping major violators whom the EPA had not been able to reach.

Full enforcement and, in turn, compliance with the State's environmental laws will simply not be achieved without the ability of citizens as well as the government to enforce those laws.

VI. THE LEGISLATURE SHOULD PROVIDE ADEQUATE FUNDING FOR DEC TO FULFILL ITS LEGAL MANDATE OF PROTECTING THE ENVIRONMENT

A State such as Alaska which relies on a healthy environment for many of its economic mainstays such as tourism and fisheries and yet persistently scrimps on environmental protection will continue to run the risk of environmental and associated economic degradation. Current funding levels for DEC not only preclude effective enforcement, they also result in delayed and inadequately researched permits as well as narrow interpretation of regulations intended to protect the environment. Future funding should provide for sufficient personnel, including attorneys, to provide DEC the ability to more effectively enforce Alaska's environmental laws. A commitment to increased funding would more realistically reflect the immense mandate of environmental protection assumed by DEC and the importance of DEC's success in assuring that there will be a viable environment for Alaska's long term needs. We will be working shortly towards providing the legislature with some recommendations for DEC budget needs.

HOUSE COMMITTEE REPORT

(9)
Date Referred: January 18, 1990 FURTHER REFERRALS:

Date of Committee Action: 2/6/90

The RESOURCES Committee considered: HB 424

HOUSE BILL NO. 424 ANCHOR RIVER & FRITZ CREEK MGT. PLAN

"An Act relating to the Anchor River and Fritz Creek Critical Habitat Area management plan; and providing for an effective date."

RECOMMENDATIONS:
[ ] be replaced with _____ [ ] the same title [ ] a new title
[ ] have attached amendment(s)
[X] do pass
[ ] do not pass
[ ] no recommendation
[ ] individual recommendations
[ ] additional referral to the _____ Committee

ADOPTS: _____ letter of intent

ATTACHES NEW FISCAL NOTE(s): (Dept)
[ ] fiscal impact_____
[ ] zero fiscal note_____
[ ] zero with analysis_____

APPROVES PREVIOUS: (Date/Dept)
[ ] fiscal note(s) _____
[X] zero fiscal note(s) ADF+G 2/5/90
[ ] zero fn/analysis _____

SIGNING DO PASS:

SIGNING: (Check approp. column)

	Do Not Pass	No Rec	Amend

Chairman's Signature

STATE OF ALASKA
1990 LEGISLATIVE SESSION

BILL VERSION: HB424
PUBLISH DATE: _____

FISCAL NOTE

REQUEST:

Revision Date: _____
Title: Anchor River/Fritz Creek Critical Habitat Area Mgmt. Plan.
Sponsor: _____
Requestor: Governor

Agency Affected: Dept. of Fish and Game
BRU: Habitat Division
_____
Components: _____
_____

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96
PERSONAL SERVICES	0					
TRAVEL	0					
CONTRACTUAL	0					
SUPPLIES	0					
EQUIPMENT	0					
LAND & STRUCTURES	0					
GRANTS, CLAIMS	0					
MISCELLANEOUS	0					
TOTAL OPERATING	0					
CAPITAL	0					
REVENUE	0					

FUNDING: (Thousands of Dollars)

GENERAL FUND	0					
FEDERAL FUNDS	0					
OTHER	0					
TOTAL	0					

POSITIONS:

FULL-TIME	0					
PART-TIME	0					
TEMPORARY	0					

ANALYSIS: (Attach a separate page if necessary)

No FY 90 impact

Prepared by: Frank Rue, Director
Division: Habitat
Phone: 465-4105
Date: 2/5/90

Approved by Commissioner: _____
Agency: Department of Fish and Game
Date: 2/5/90

Distribution (by preparer):
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)

page ____ of ____

STATE OF ALASKA
1990 LEGISLATIVE SESSION

BILL VERSION: HB 424 No. 2
PUBLISH DATE: HOUSE 1/18/90

FISCAL NOTE

REQUEST:

Revision Date: _____
Title: An act relating to the Anchor River Fritz Creek CHA
Sponsor: Rules Committee
Requestor: Governor

Agency Affected: Dept. Natural Resources
BRU: Division of Land & Water Mgmt.
Components: Land & Water Management

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96
PERSONAL SERVICES	0	0	0	0	0	0
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL	0	0	0	0	0	0
REVENUE	0	0	0	0	0	0

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL	0	0	0	0	0	0

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS : (Attach a separate page if necessary)

Prepared by: Lawrence Ostrovsky Phone: 465-2400
Division: Commissioner's Office Date: 10/23/89

Approved by Commissioner: Jennie Johnson Date: 10/27/89
Agency: DNR

Distribution (by preparer):
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

STEVE COWPER, GOVERNOR

400 WILLOUGHBY AVE.
JUNEAU, ALASKA 99801-1796
PHONE: (907) 465-2400

February 6, 1990

The Honorable Curt Menard
and Cliff Davidson, Co-Chairs
House Resource Committee
State House of Representatives
P.O. Box V
Juneau, Alaska 99811

Dear Representatives Menard and Davidson:

Subject: HB 424, Relates to the Anchor River and Fritz Creek Critical Habitat Area Management Plan. It provides that the plan, adopted by the Department of Fish and Game, dated June 1989, is approved.

Position: The department does not oppose this bill.

Background: The department participated in the planning process in preparation of the area management plan. We support both the planning process and the plan.

The Management Plan requires an instream flow reservation for streams in the Anchor River drainage and requires a mineral closing order. It also conveys management rights for private inholdings which the Department of Fish and Game desires to acquire. We assume that Fish and Game will participate in the above activities by doing the necessary research, mapping and providing legal descriptions. We also assume Fish and Game will fund the required public notice ad orders and other direct costs associated with these activities. Therefore, we attached a $0.0 fiscal note for this bill.

Thank you for the opportunity to comment. As always, my staff and I are available to answer questions.

Sincerely,

Lennie Gorsuch
Commissioner

10-J9LH

cc: Bill Sponsor
Committee Members
Bob Evans, Legislative Liaison
Office of the Governor
Denby Lloyd, Special Staff Assistant
Office of the Governor

STATE OF ALASKA

OFFICE OF THE GOVERNOR

BILL ANALYSIS

DEPARTMENT	DIVISION	BILL NUMBER	SPONSOR
Fish and Game	Habitat	HB424	House Rules at Regest of Governor

SHORT TITLE OF BILL

Anchor River and Fritz Creek Critical Habitat Area Management Plan

DEPARTMENT POSITION

Support

PREPARED BY	DATE	COMMISSIONER'S SIGNATURE	DATE
Frank Rue, Director	2/5/90		2/6/90

SUMMARY

OTHER AGENCIES AFFECTED BY BILL	CONSTITUENT GROUP(S) AFFECTED BY BILL
Department of Natural Resources	Homer area residents
ORGANIZATIONAL SUPPORT FOR BILL	**ORGANIZATIONAL OPPOSITION TO BILL**
	None

FISCAL IMPACT: ☐ NONE ☒ FISCAL NOTE ATTACHED

BACKGROUND/LEGISLATIVE INTENT

The purpose of the bill is to implement the Anchor River and Fritz Creek Critical Habitat Area Management Plan developed through a public planning process conducted by the Department of Fish and Game as directed in AS 16.20.605(d).

ANALYSIS OF BILL/PROGRAM EFFECTS

The bill will implement the Anchor River and Fritz Creek Critical Habitat Area Management Plan and allow future plan updates and amendments to be implemented through the Administrative Procedure Act.

AMENDMENTS PROPOSED

PLEASE ATTACH A SEPARATE SHEET FOR ADDITIONAL COMMENTS OR ANALYSIS.

01-003 (Rev. 3-88)

Anchor River Fritz Creek Critical Habitat Area Management Plan

° On the initiative of local citizens and a grass roots effort, the Anchor River Fritz Creek Critical Habitat Area was established in 1985 to protect and preserve habitat and fish and wildlife populations, especially moose.

° The statute creating the critical habitat area directed that a management plan be prepared. The purpose of the plan is to provide consistent, long range direction in managing the critical habitat area.

° The planning process began with a public meeting held in December, 1987 to identify the issues that should be addressed in the plan.

° Department staff prepared a resource inventory of fish and wildlife and their habitats; public access; land use; and land ownership.

° The planning team composed of state, federal and local agency representatives with authority on critical habitat area lands developed the draft management plan based on the issued identified at the public meeting, critical habitat area resource values, the purpose for which the critical habitat area was established and other guidance provided in law.

° The draft management plan was sent out for public review and a public hearing was held to solicit comments.

° The final plan was prepared based on comments received during the public review period.

° The plan does not address harvest regulations, which are the authority of the Boards of Fish and Game.

° The plan applies only to state lands within the critical habitat area. (There are several private inholdings).

° The management plan is now awaiting implementation by Act of the legislature, as specified in statute.

MEMORANDUM

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

TO: The Honorable Don Collinsworth
Commissioner
Department of Fish and Game

DATE: August 15, 1989

FILE NO:

TELEPHONE: 465-2400

FROM: Lennie Gorsuch
Commissioner

SUBJECT: Anchor River/Fritz Creek
Critical Habitat Area

In an August 2 memorandum, you requested my full endorsement of the Anchor River/Fritz Creek Critical Habitat Area Management Plan.

The Alaska Department of Natural Resources has assisted the Alaska Department of Fish and Game in preparing the Anchor River/Fritz Creek Critical Habitat Area Management Plan and does endorse its recommendations. This plan establishes policies that will guide land uses that the Department of Natural Resources must either permit or review. The Department of Natural Resources will use this plan as guidance in implementing its authorities under Title 38 of Alaska Statutes.

We appreciate the cooperation and assistance by your staff in working with us on this matter.

cc: Tom Hawkins, Assistant Commissioner
Gary Gustafson, Director
Division of Land and Water Management
Frank Rue, Director
Division of Habitat
Department of Fish and Game

KENAI PENINSULA BOROUGH
144 N. BINKLEY • SOLDOTNA, ALASKA 99669
PHONE (907) 262-4441

DON GILMAN
MAYOR

January 4, 1990

Debra Clausen
Department of Fish & Game
Habitat Division
333 Raspberry Road
Anchorage, Alaska 99518-1599

Dear Ms. Clausen,

I have reviewed the final draft of the Anchor River/ Fritz Creek Critical Habitat Area Plan and support adoption of this plan by the legislature.
The plan is consistent with the Borough's Concept Approved Coastal Management Program, and includes a good balance between environmental protection and human use and enjoyment of the area.

The Borough has requested relinquishment of the municipal selections in T5S, R13W as recommended in the plan.

Thank you for the opportunity to comment.

Sincerely,

Sylvia Spearow

Sylvia Spearow

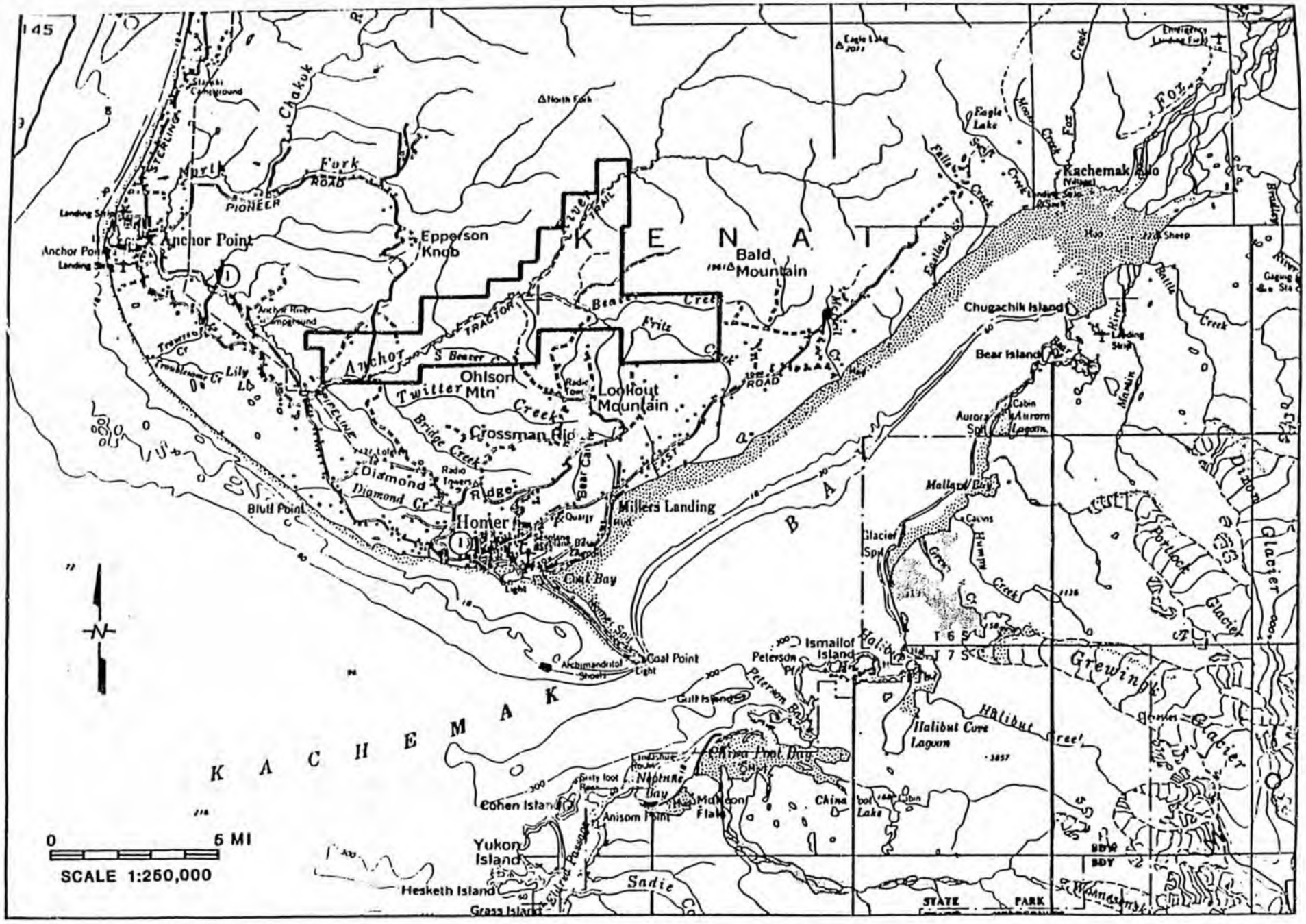
ANCHOR RIVER/FRITZ CREEK
CRITICAL HABITAT AREA
MANAGEMENT PLAN

JUNE 1989

Prepared by the
Divisions of Habitat and Wildlife Conservation

Alaska Department of Fish and Game
333 Raspberry Road
Anchorage, Alaska 99518

Don W. Collinsworth, Commissioner



ANCHOR RIVER FRITZ CREEK CRITICAL HABITAT AREA

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ACKNOWLEDGEMENTS

The Anchor River/Fritz Creek Critical Habitat Area was first proposed by the Kenai Peninsula Critical Habitat Task Force, a group of citizens concerned about the protection of this important area. It is largely through their support and the support of the citizens of Homer that the Anchor River/Fritz Creek Critical Habitat Area was established in 1985.

The Anchor River/Fritz Creek Critical Habitat Area Management Plan was prepared by a multi-agency planning team lead by the Department of Fish and Game (ADF&G). Planning team representatives are as follows:

Debra Clausen	ADF&G, Habitat Division
John Matthews	ADF&G, Wildlife Conservation Division
Dave Holdermann	ADF&G, Wildlife Conservation Division
Dave Watsjold	ADF&G, Sport Fish Division
Sandra Cosentino	Department of Natural Resources
Tim Rumfelt	Department of Environmental Conservation
Hank Hosking	U.S. Fish and Wildlife Service
Kevin Fenner	Kenai Peninsula Borough
Susan Regan	City of Homer
Tom Arminski	Alaska Power Authority

Other ADF&G staff have contributed significant time and expertise in developing this plan including Lance Trasky and Steve Albert of Habitat Division, Tom Schroeder of Commercial Fisheries Division, and John Westlund of Wildlife Conservation Division. Department of Natural Resources staff Helen Nienhueser, Division of Land and Water Management; Wade Wahrenbrock, Division of Forestry; Mitch Henning, Division of Mining; Bonnie Friedman, Division of Agriculture; and Leila Weiss, Division of Oil and Gas also deserve recognition for their contributions in the development of this plan.

INTRODUCTION

Anchor River/Fritz Creek Critical Habitat Area, located in the southern Kenai Peninsula north of Homer, includes 19,000 acres of river bottoms, muskegs, upland spruce forests and subalpine meadows in the upper portions of the South Fork Anchor River and Fritz Creek drainages. The critical habitat area was established by the Alaska Legislature in 1985 for the purpose of protecting natural habitat critical to the perpetuation of fish and wildlife, especially moose. The critical habitat area contains portions of two of the most important moose ranges on the southern Kenai Peninsula.

The purpose of the Anchor River/Fritz Creek Critical Habitat Area Management Plan is to provide consistent long-range guidance to the Department of Fish and Game in managing the critical habitat area.

A variety of commercial and recreational activities have occurred in or been proposed for the critical habitat area. In order to evaluate the compatibility of these activities with the protection of fish and wildlife, their habitats, and public use of the critical habitat area, the Department of Fish and Game has undertaken this comprehensive critical habitat area management planning process.

The plan presents management goals for the critical habitat area and its resources and identifies policies to be used in determining whether proposed activities are compatible with the protection of fish and wildlife, their habitats, and public use of the area. The plan will guide management of the critical habitat area for the next ten years and will be reviewed after five years for necessary updates or amendments. The plan affects state lands only. Private lands within the boundaries of the area are not subject to critical habitat area authority. Harvest regulations for fish and wildlife populations are not addressed by this plan.

This document is the result of a public planning process led by the Department of Fish and Game. It was developed by a planning team represented by the following state, federal, and municipal agencies: the Alaska Departments of Fish and Game, Natural Resources, and Environmental Conservation; the Alaska Power Authority; Kenai Peninsula Borough; City of Homer; and the United States Fish and Wildlife Service. At the outset a public meeting was held in Homer to explain the planning process and solicit citizens' issues, interests, and concerns for the critical habitat area. Public input from this meeting was used by the planning team to formulate a list of issues to be addressed in the plan. At the same time resource information on the critical habitat area's fish and wildlife populations and their habitats, other natural resources, existing land use and land ownership was being collected and synthesized. This

information, presented in both map and narrative form comprises the plan's Resource Inventory.

Management goals and policies for the critical habitat area were developed by the planning team to address the identified issues. All policies were developed with consideration of their ability to meet the formulated management goals. In some cases alternative policies were developed. Each alternative policy was analyzed according to its ability to meet the management goals.

The draft plan went out for public review. Based on comments received during the public review process, the final plan was prepared. The plan is now being sent to the legislature for approval as directed in AS 16.20.605(d). Finally, the Commissioner of Fish and Game will adopt the plan for use by the department in managing the critical habitat area. At that point, the plan can be implemented by the Department of Fish and Game.

Future land use activities within the critical habitat area, including those proposed by the state, will be approved, conditioned, or denied on the basis of their consistency with the goals and policies provided in this plan as well as state laws and regulations. A Special Areas Permit is required for any habitat altering work, including any construction activity, in a designated Critical Habitat Area (5 AAC 95). A Special Areas Permit application form can be obtained from any Department of Fish and Game office and should be submitted to the Habitat Division Regional Office in Anchorage.

Future management activities of the Department of Fish and Game in the critical habitat area will also be directed by this plan. Research programs, public use facilities and other department projects will be consistent with the goals and policies presented in this plan.

Other state, federal, and local agencies have management responsibilities on critical habitat area lands as well.

Any use, lease or disposal of resources on state land in the critical habitat area requires Department of Natural Resources authorization. Activities affecting air or water quality require authorization from the Department of Environmental Conservation. The U.S. Army Corps of Engineers evaluates applications of the Department of the Army (DA) permits for discharging dredged and fill material in waters of the United States including wetlands. Various federal and state agencies, along with local governments, review proposals for DA permits, pursuant to the Fish and Wildlife Coordination Act (16 USC 661-666R). The Kenai

Peninsula Borough reviews and comments on all permit proposals within the coastal zone, including the Anchor River/Fritz Creek Critical Habitat Area.

This plan will be formally reviewed and, if appropriate, updated every ten years. Public participation will be solicited during the update process.

HOUSE COMMITTEE REPORT

(9)
Date Referred: January 19, 1990 FURTHER REFERRALS:

JUDICIARY

Date of Committee Action: 3/14/90

The RESOURCES Committee considered: HB 432

HOUSE BILL NO. 432 PROHIBITION OF FINFISH FARMING

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

RECOMMENDATIONS:
[X] be replaced with CS HB 432 (RES) [ ] the same title [ ] a new title
[ ] have attached amendment(s)
[X] do pass
[ ] do not pass
[ ] no recommendation
[ ] individual recommendations
[ ] additional referral to the _____ Committee

ADOPTS: _____ letter of intent

ATTACHES NEW FISCAL NOTE(s): (Dept) APPROVES PREVIOUS: (Date/Dept)

[ ] fiscal impact_____ [ ] fiscal note(s) _____
[ ] zero fiscal note_____ [ ] zero fiscal note(s)_____
[ ] zero with analysis_____ [ ] zero fn/analysis _____

SIGNING DO PASS:

Cliff Davidson
Mike Navarre
Bill Hawk
Mike Reeves

SIGNING: (Check approp. column)

	Do Not Pass	No Rec	Amend
	X		
		✓	

Cliff Davidson
Chairman's Signature

STATE OF ALASKA

OFFICE OF THE GOVERNOR

BILL ANALYSIS

DEPARTMENT	DIVISION	BILL NUMBER	SPONSOR
Fish and Game	FRED	SB 397/HB432	Eliason, et. al., Grussendorf, et. al.

SHORT TITLE OF BILL

Prohibition of finfish farming

DEPARTMENT POSITION

Neutral

PREPARED BY	DATE	COMMISSIONER'S SIGNATURE	DATE
Brian J. Allee, Ph. D.	2/1/90	Dan A. Weber	2/8/90

SUMMARY

OTHER AGENCIES AFFECTED BY BILL	CONSTITUENT GROUP(S) AFFECTED BY BILL
Dept. of Environmental Conservation, Dept. of Natural Resources, Dept. of Commerce and Economic Development, OMB, Div. of Governmental Coor.	Commercial fishermen, sport fishermen, PNP hatchery operators, Regional Aquaculture Associations, Recreational Interests, Upland owners and Managers.
ORGANIZATIONAL SUPPORT FOR BILL	**ORGANIZATIONAL OPPOSITION TO BILL**
UFA, various commercial fishing groups and environmental groups	Potential private for profit fish farmers

FISCAL IMPACT. ☒ NONE ☐ FISCAL NOTE ATTACHED

BACKGROUND/LEGISLATIVE INTENT

SEE ATTACHED

ANALYSIS OF BILL/PROGRAM EFFECTS

SEE ATTACHED

AMENDMENTS PROPOSED

SEE ATTACHED

PLEASE ATTACH A SEPARATE SHEET FOR ADDITIONAL COMMENTS OR ANALYSIS

01-009 (Rev. 3-88)

STATE OF ALASKA
9 90 LEGISLATIVE SESSION

BILL VERSION : [illegible]
PUBLISH DATE : 1/19/90

FISCAL NOTE

REQUEST:

Revision Date: _____
Title : Prohibition of finfish farming

Agency Affected : Fish and Game
BRU : FRED

Sponsor : Ellason et. al., Croussenoff, et. al
Requestor : Steve Cowper

Components : _____

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 91	FY92	FY 93	FY 94	FY 95	FY 96
PERSONAL SERVICES						
TRAVEL						
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	0	0	0	0	0	0
CAPITAL	0	0	0	0	0	0
REVENUE	0	0	0	0	0	0

FUNDING: (Thousands of Dollars)

GENERAL FUND	0	0	0	0	0	0
FEDERAL FUNDS	0	0	0	0	0	0
OTHER	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0

POSITIONS:

FULL-TIME	0	0	0	0	0	0
PART-TIME	0	0	0	0	0	0
TEMPORARY	0	0	0	0	0	0

ANALYSIS : (Attach a separate page if necessary)

FY 90
See attachments.

Prepared by : _____ Phone : 465-4160
Division : ADF&G, FRED Division Date : 1/30/90

Approved by Commissioner : _____ Date : Feb 8 1990
Agency : ADF&G

Distribution (by preparer):
Legislative Finance
Legislative Sponsor
Requestor
Office of Management and Budget
Impacted Agency(ies)

Bill Analysis SB 397/HB432

Background/Legislative Intent

In 1987, the Alaska State Legislature passed SB 297 placing a one year moratorium on finfish farming. The following year HCS SSSB 514 was passed, authorizing the farming of shellfish and aquatic plants, extending the moratorium on finfish farming until July 1, 1990, and establishing the five-member Alaska Finfish Farming Task Force. The shellfish farming program is currently being implemented. HCSSSSB 514 also contained a provision for inland farms in closed waters. The Board of Fisheries however, denied a proposal to make surplus coho eggs available to an interior-based applicant proposing to operate a recycle hatchery. In doing so, the Board of Fisheries asserted that public policy questions pertaining to brood stock acquisition and the privatization of a public resource were questions that should be addressed by the legislature, rather than set by precedent by the Board.

Although the task force was authorized in 1988, it was not funded until last spring. The members were appointed by Governor Cowper and began work last July. The task force recently issued its report and recommended that prior to the end of the moratorium on July 1, 1990, the legislature take statutory action to expressly allow or prohibit finfish farming. SB 397 would prohibit finfish farming by not allowing a person "to grow or cultivate finfish in captivity or under positive control for commercial purposes." As drafted, the state and PNP hatcheries would remain unaffected.

Amendments Proposed

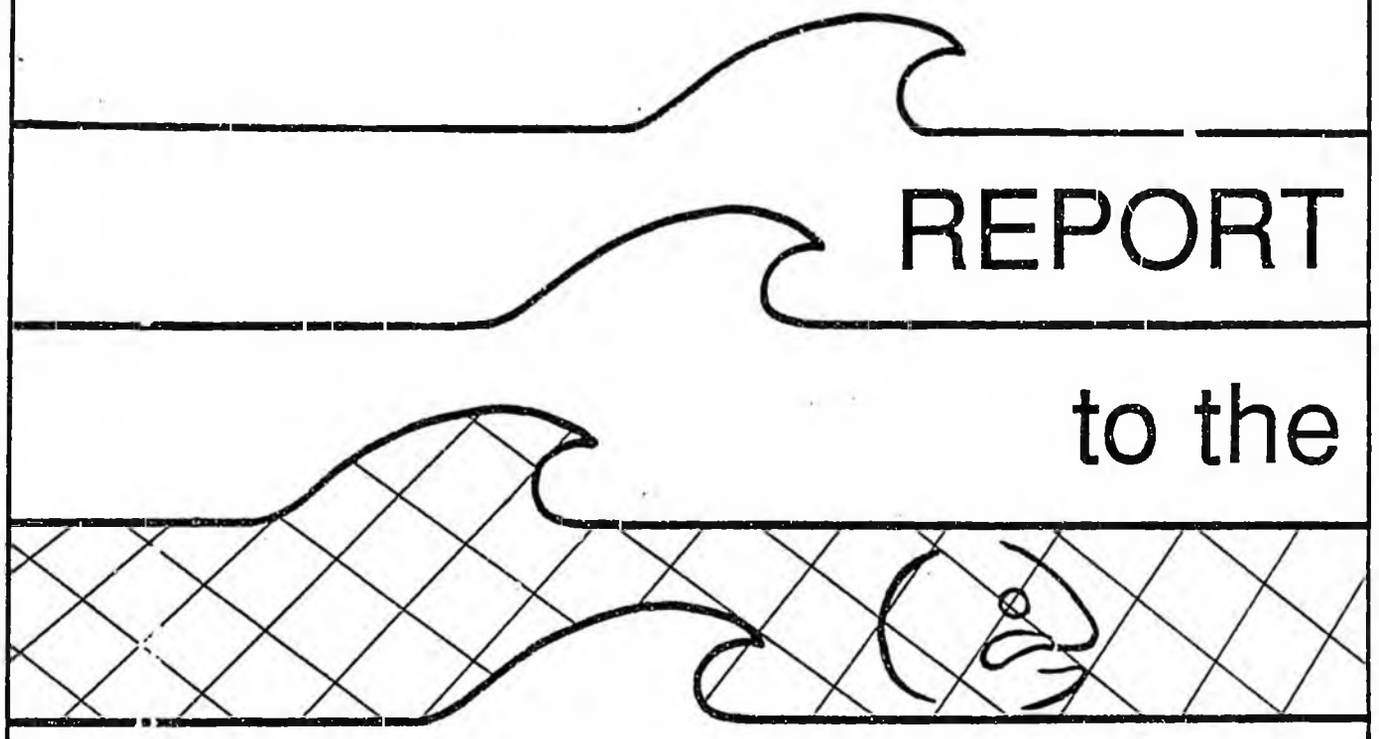
On Page 2, lines 1-5, the third finding asserts that serious disease and genetic risks are posed to wild stocks. As the FRED Division has stated on the record, in legislative hearings and to the task force, if a properly managed, regulated, and funded pathology and genetics program were in place, similar to that run by the FRED division for current public and private non profit hatcheries, then commercial farming of finfish would not pose a serious risk to the health and genetic integrity of wild stocks.

Sale of finfish under a scientific or educational permit is not allowed currently. Accordingly on Page 3, Section 2, the department recommends deleting item 3.

With regard to Section 2, item 4, the department recommends extending the sentence. After the word "ponds", insert: "provided these fish are not reared or released into waters of the state."

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

TABLE OF CONTENTS

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.

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 8

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.

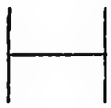
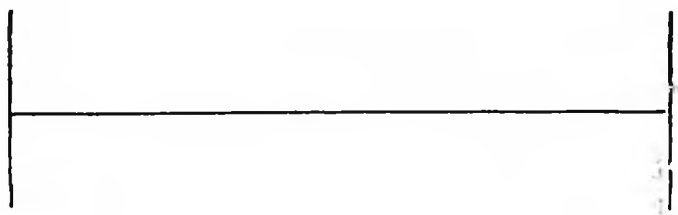
2. SIZES OF FISH

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	CUMULATIV % MORTALI
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	130	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	702	13
January (Year 2)	9	85022	0.900	0.388	76520	2	1735	1562	15
February	10	83322	1.001	0.355	83405	2	1700	1702	16
March	11	82489	1.201	0.607	99069	1	833	1001	17
April	12	81664	1.450	0.628	118412	1	825	196	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	0.627	337792	2	1585	6894	22
September	17	75324	4.805	0.332	361931	3	2330	11194	13
October	18	73817	5.405	0.392	398983	2	1506	8143	25
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	8980	29
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	174[illegible]
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 [illegible] of smolts

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	3	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	823	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.