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Alaska State Legislature
HOUSE OF REPRESENTATIVES
COMMITTEE ON RESOURCES

POUCH V
JUNEAU, ALASKA 99811
(907) 465-3715

Proposed
House Resources Committee
Letter of Intent for House Bill 105

It is the intent of the Legislature to affirm that CFAB was established to serve and enhance the participation of Alaskans and Alaska-owned entities in the commercial fishing and agriculture industries, and it is the further intent that during periods or on occasions in which the availability to CFAB of loanable funds is limited or constrained in any way CFAB shall ensure that the financing needs of eligible and credit-worthy Alaskans and Alaskan-owned entities are fully met prior to the granting of credit for any purposes to non-Alaskan applicants.

It is the intent of the legislature that financing from CFAB should not be used to enable a shore-based processor to close its shore-based plant and move its processing operation offshore to a floating processor operation.

_____
Representative Adelheid Herrmann
Co-Chair, House Resources Committee
April 30, 1987

_____
Representative Sam Cotten
Co-Chair, House Resources Committee
April 30, 1987

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Representative Sam Cotten
Co-Chair, House Resources Committee
April 30, 1987

Introduced: 2/4/87
Referred: Resources and Finance

BY HERRMANN, CATO, HOFFMAN, HUDSON, SUND, TAYLOR, GRUSSENDORF AND FURNACE BY REQUEST

IN THE HOUSE

HOUSE BILL NO. 105

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - FIRST SESSION

A BILL

For an Act entitled: "An Act relating to financing of fish processors and agricultural and timber processors and harvesters by the Commercial Fishing and Agriculture Bank."

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

* Section 1. FINDINGS. The legislature finds that

(1) shore-based fish processing and agricultural and timber processing and harvesting facilities, regardless of ownership, are an essential part of the state economy and provide for the development of a renewable resource tax base vital to many Alaska communities;

(2) shore-based fish processing and agricultural and timber processing and harvesting facilities in the state, regardless of ownership, significantly contribute to the economic development and stability of Alaska's communities; and

(3) shore-based fish processing and agricultural and timber processing and harvesting facilities in the state, regardless of ownership, employ a significant resident work force and contribute substantially to local community economies through the demand for goods and services.

* Sec. 2. AS 44.81.210 is amended by adding a new subsection to read:

(c) Notwithstanding (a)(1) of this section, the bank may make a variable or fixed rate loan [to] a shore-based fish processor, a timber processor or harvester, or an agricultural processor or harvester that does not meet the resident ownership requirements of (a)(1) of this section for capital investment or operating capital if [(a)] the [facili y] of the processor or harvester is located in the state and the majority

interest in the processor in facility or harvester is beneficially owned by residents of the United States.

HB

108

(FILE 1)

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STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

121

REQUEST:

Bill Version : CSHB 108(L&C)
Publish Date : HOUSE 3/4/87

Revision Date: 2-4-87

Agency Affected: Natural Resources
BRU: Land and Water Management

Title : An Act Relating to Aquatic Farming

Sponsor : Ellis, Rieger, Cotten, Brown,
Requestor : etc.

Components :

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
PERSONAL SERVICES	0	84.6	171.3	171.3	210.6	210.6
TRAVEL	0	20.0	25.0	25.0	22.0	22.0
CONTRACTUAL	0	2.0	4.0	4.0	4.0	4.0
SUPPLIES	0	1.0	2.0	2.0	2.0	2.0
EQUIPMENT	0	0	0	0	0	0
LAND & STRUCTURES	0	0	0	0	0	0
GRANTS, CLAIMS	0	0	0	0	0	0
MISCELLANEOUS	0	0	0	0	0	0
TOTAL OPERATING	0	107.6	202.3	202.3	238.6	238.6
CAPITAL	0	0	0	0	0	0
REVENUE	0	15.5	23.5	32.0	36.0	40.0

FUNDING: (Thousands of Dollars)

GENERAL FUND	0	107.6	202.3	202.3	238.6	238.6
FEDERAL FUNDS	0	0	0	0	0	0
OTHER	0	0	0	0	0	0
TOTAL	0	107.6	202.3	202.3	238.6	238.6

POSITIONS:

FULL-TIME	0	2	3	3	4	4
PART-TIME	0	0	2	2	2	2
TEMPORARY	0	0	0	0	0	0

ANALYSIS : (Attach a separate page if necessary)

See Attached

Prepared by : Paula Burgess
Division : Land and Water Management

Phone : 465-3400
Date : 2/13/87

Approved by Commissioner :
Agency : Natural Resources

Date :

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

In order to assess the fiscal impact of HB 108, we estimate the number of new applications for tideland leases and permits that we expect. The actual number of applications will vary depending upon the fee structure for leasing and permitting, and the "prove up" requirements of the bill. At present our permit fees are extremely low and the cost of obtaining a lease is quite high. At this stage no "land law" accompanies the bill to alter the lease or permit structure. We recognize that certain changes are desirable to encourage growth of the industry, such as the acceptance of a paper plat rather than a full survey for a lease in remote areas. While such changes may be forthcoming in later committees, the fiscal note here reflects the existing permit structure.

We estimate the number of new applications the first year to be the following:

30 salmon
25 scallop
10 oyster
3 mussel
2 kelp

We require one adjudicator in the Southeast Region and one adjudicator in the Southcentral Region to handle the new applications. The second year we require one additional adjudicator (to be located where the need is the greatest) to handle additional new applications. By the fourth year we are assuming the need of two adjudicators in each of the two regions.

The second year we require a part time contract administrator to handle the accumulation of two years of lease contracts, and a part time surveyor to review survey plats. (The survey cost may be reduced somewhat if the bill is amended to allow paper plats rather than full surveys in remote areas.)

A goal of the state and of those seriously interested in aquatic farming is to avoid land speculation. In order to accomplish this, it will be necessary to inspect most lease and permit sites once a year. Some inspections can be combined with other field investigations, and some may be performed under cooperative agreements with other agencies. A lean inspection program will cost $10,000 for each adjudicator the first year (travel and per diem). In subsequent years the cost will decline as we establish inspection efficiencies.

Under existing statutes and regulations, the number o leases and permits estimated above would generate

approximately $15,500 in revenue the first year. As the number of operations increases each year, the revenue increases modestly. If the bill were amended to allow the Commissioner to charge a percentage of gross receipts, revenues could increase substantially once the industry began to flourish.

Position Summary

Fiscal Year '88

Two (2) - Natural Resource Officers II (Range 16)

Fiscal Years '89 and '90

Three (3) - Natural Resource Officers II (Range 16)
One (1) - Part-time Contract Administrator (Range 14)
One (1) - Part-time Surveyor (Range 20)

Fiscal Years '91 and '92

Four (4) - Natural Resource Officers II (Range 16)
One (1) - Part-time Contract Administrator (Range 14)
One (1) - Part-time Surveyor (Range 20)

No. 1

125

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

Bill Version : CSHB 108(L&C)
Publish Date : HOUSE 3/4/87

REQUEST:

Revision Date:
Title :

Agency Affected : ADF&G
BRU : FRED

Sponsor : Zharoff et al, Ellis et al.
Requestor :

Component : FRED

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
PERSONAL SERVICES		157	157	183	236	330
TRAVEL		6	6	10	17	20
CONTRACTUAL		1	1	2	4	9
SUPPLIES		2	4	6	10	22
EQUIPMENT				1	2	5
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING		166	168	202	269	385
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND		166	168	202	269	385
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME		2	2	3	3.5	9
PART-TIME		1	2	1	2	0
TEMPORARY		1	0	0	0	0

ANALYSIS : (Attach a separate page if necessary)

This analysis estimates costs of pathology services and permitting based on 100 permit applications in FY 88, ultimately resulting in 20 operational fish farms by FY 92 of economically significant size.

(see attached for additional comments)

Prepared by : Dr. Mike Kaill
Phone : 465-4160
Division : ADF&G/FRED
Date :

Approved by Commissioner :
Date : 2-2-87
Agency :

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

CONTINUATION OF FISCAL NOTE, SB106/HB108. rev 3/2/87

Estimated cost of services to be provided by ADF&G are fish pathology services, permit processing and technical oversight.

For pathology services, estimated costs are based on current workload and budget for the section at this time, to arrive at a per-unit cost (e.g. $600,000/37 hatcheries = $16,000/hatchery). An additional $12,000 is budgeted for investigations and diagnostic services in the first year. Types of services are: diagnostic, broodstock, water source analysis, shellfish certification, pre-release inspection, and human health concerns.

For permitting and technical oversight services, an assessment of work requirements was made by calling the Marine Resources Division of the B.C. provincial government. For the first three years, two full-time technicians would be required. Thereafter, manpower needs will diminish. The types of work to be undertaken will be communication with applicants, review of application materials, coordination with programs such as coastal zone consistency review, and technical biology and fish culture oversight.

It is very difficult to anticipate what will happen if a mariculture program is enabled in Alaska. We have prepared this note based on observations and consultations with managers of similar programs. We then applied this to Alaska, using the incomplete data at hand. These must be considered rough estimates of cost. As further information becomes available, the fiscal note could change. Also, as the bill becomes modified as it passes through the legislative process, there may be changes in the bill that will have corresponding changes in the fiscal note.

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

Bill Version: CSHB 108(L&C)
Publish Date: HOUSE 3/4/87

128

REQUEST

Bill/Resolution No.: HB 108
Title: "An Act relating to aquatic farming"

Sponsor: ELLIS
Requestor:
Date of Request:

FISCAL DETAIL

Agency Affected: Environmental Conservation
BRU: Environmental Health

Components: Seafood Industry, Palmer Laboratory

EXPENDITURES/REVENUES : (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
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						
FEDERAL FUNDS						
OTHER						
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

This Bill will have no fiscal impact on the Department of Environmental Conservation.

Prepared by: Douglas Donegan — Phone: 465-2609
Division: Environmental Health — Date:

Approved by Commissioner: [signature] — Date: 3/6/87
Agency: Environmental Conservation

Distribution (by Agency preparing fiscal note):
- Legislative Finance
- Legislative Sponsor
- Requestor
- Office of Management and Budget
- Impacted Agency(ies)

9/16/86

STATE OF ALASKA 1987 LEGISLATIVE SESSION
FISCAL NOTE

126

REQUEST:

Bill Version: CSHB 108(L&C)
Publish Date: HOUSE 3/4/87

Revision Date: N/A
Title: Aquatic Farming: Mariculture

Agency Affected: Commerce & Econ. Dev.
BRU: Economic Development Advocates

Sponsor: Rep. Ellis/Senator Zharoff
Requestor:

Components: Office of Commercial Fisheries Development

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
PERSONAL SERVICES	15.0	5.5	6.0	6.6	7.3	8.0
TRAVEL	10.0	5.5	6.1	6.7	7.3	8.1
CONTRACTUAL						
SUPPLIES						
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING	25.0	11.0	12.1	13.3	14.6	16.1
CAPITAL						
REVENUE	5.0	10.0	15.0	20.0	25.0	30.0

FUNDING: (Thousands of Dollars)

GENERAL FUND	25.0	11.0	12.1	13.3	14.6	16.1
FEDERAL FUNDS						
OTHER						
TOTAL	25.0	11.0	12.1	13.3	14.6	16.1

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary)

This program will become a priority mission of OCFD and shall be assigned to existing personnel. Initial permit requests are not expected to exceed 80% of one Development Specialist II available time. Travel is programmed for site visits as envisioned by the bill and contractual includes phone, photocopy and

Prepared by: W.G. Paulick
Division: Office of Commercial Fisheries Development
Phone: 465-2162
Date: 2/17/87

Approved by Commissioner: J. Anthony Smith
Agency: Department of Commerce and Economic Development
Date: 2/17/87

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

5384W21787a

1987 LEGISLATIVE SESSION
FISCAL NOTE

Analysis: (Continued)

other expenses related to permitting as required by the bill. FY 87 includes funding for public hearings, etc., to finalize new regulations. Program receipts have been estimated by using a fee of $100 per annual permit; 50 new permits per year.

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: Steve Cowper
Governor

DATE: March 13, 1987

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: Fisheries Cabinet Recommendation on Mariculture

FROM: Don W. Collinsworth DWC
Commissioner
Department of Fish and Game

Enclosed for your consideration is a recommendation from the Fisheries Cabinet for an administration position on mariculture legislation. The recommendation was arrived at after extensive review of the legislation and the issues surrounding these bills. The intent of the position is to give general guidance to the Legislature regarding the principles which any legislation must address, and yet provide flexibility to work out the details.

The agencies involved with this review include the Departments of Natural Resources, Commerce and Economic Development, Environmental Conservation, Labor, Community and Regional Affairs, Fish and Game, and the Limited Entry Commission.

Enclosure

cc: Fisheries Cabinet

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: Distribution

DATE: March 17, 1987

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: Mariculture

FROM: David Benton
Special Project Assistant
Commissioner's Office
Department of Fish and Game

The Governor has approved the mariculture position put together by the Fisheries Cabinet. I am sending you all copies of the position plus some other materials on mariculture for your files. I want to thank all of you who worked on this project for your help.

Enclosures

Distribution:

John McMullen, Governor's Office
Rod Swope, Governor's Office
Sam Stoker, Office of Management and Budget
Diane Mayer, Division of Governmental Coordination
Bill Paulick, Department of Commerce and Economic Development
Paul Peyton, Department of Commerce and Economic Development
John Williams, Department of Commerce and Economic Development
Michael Cushing, Department of Community and Regional Affairs
Doug Donegan, Department of Environmental Conservation
Mike Kaill, Department of Fish and Game
Rick Erickson, Department of Labor
Paula Burgess, Department of Natural Resources
Kurt Schelle, Commercial Fisheries Entry Commission

MARICULTURE ISSUES
POLITICAL AND ECONOMIC ANALYSIS
for
Fisheries Mini Cabinet
March 6, 1986

ECONOMIC ISSUES

Will pen rearing salmon in Alaska affect the market and/or price for wild salmon? World pen-reared salmon production is increasing at a rate that will soon make Alaska's premium quality wild salmon a minor component of world supply. There does appear to be considerable substitution going on in Europe with fresh Atlantic salmon displacing frozen Pacific troll salmon in smoker markets. The reasons seem to be that it minimizes inventory costs, allows uniform sizing and assures consistent (superior) quality.

Domestically, there is a major new market developing for fresh salmon year round. Further, the only study comparing Pacific salmon (frozen) with Atlantic salmon (fresh) found that most domestic distributors surveyed did not consider them substitutes - ie, there was no direct competition. The reason is that Pacific salmon is not generally available fresh and that the sizing of Atlantic salmon is controllable. The magnitude of Norwegian imports and relative stability of troll prices appears to support this finding.

However, what will happen in the future? Substantial increases in production are expected from Norway, New Zealand, Chile, Scotland, Ireland, and British Columbia. The technical limit of European Atlantic production is projected to be between 250,000 and 300,000 MT; 200,000 MT of that from Norway.[4]

By comparison, the total U.S. and Canadian production of kings and cohos (all gear groups) has averaged 70-80,000 MT over the last ten years.[2] Thus the Alaskan increment of production, which is not likely to exceed 10,000 MT, would be adding a relatively small increment to the overall supply.[3]

The industry will likely go through the same type of over-production and share fight seen in most markets with high margins. At some point the saturation level for the high priced fresh market will be reached, and the surplus fish will likely go into fillet and frozen markets. Prices will be pushed down to the level of the lowest cost producers, with a shakeout of the less experienced and higher cost producers. Alaska will likely be one of the higher cost areas.

Some feel Alaska shouldn't get involved in an industry where the market will peak before Alaskan products hit the market while others say Alaska must act quickly to get in before the window of opportunity is closed. Determining the saturation point and when it will be reached is highly speculative at this point. One study done in Norway uses a 130,000 MT market figure, a production figure likely to be surpassed by 1990.[4] Norway expects Atlantic production to be 153,000 MT by that year.[4,5] The resulting 23,000 ton surplus is creating considerable controversy among Atlantic farmers. No other study known at this time makes a projection.

There will be major changes in the market for Alaskan salmon whether Alaska gets into pen-rearing or not. These changes will likely occur before the first Alaskan pen-reared fish could reach market. It would appear that the only way Alaska's production could have a significant impact on the price would be if that increment coincided with the topping out of the market. As supply surpasses demand, and the growth rate in consumption drops, a market share fight seems inevitable. To further complicate the equation, recent projections indicate US and Canadian releases under the recent salmon treaty will provide additional product. The juxtaposition of this projected increase with that of European Atlantic production could lead to more severe fluctuations in the price of salmon products. The long term indication is for declining salmon prices, with fresh prices capping the frozen salmon price.

Politically, some fishermen hold the view that stopping pen-rearing in Alaska will either stop the competition or make a significant dent in the competition they face from pen-reared fish. When pressed, the answer appears to be that they will accept no chance of increased competition now or in the future. This attitude is not likely to change, but may be mitigated by providing opportunities for those fishermen who want to participate. There are regional differences in attitude as well, with most of the opposition coming from the Southeast, particularly the trollers.

Another point raised is that resources will be diverted from management and enhancement of wild and hatchery stocks to pen-rearing. This is based on the propensity of the legislature to not fund fiscal notes, and is a valid concern. A fee structure adequate to cover costs needs to be considered.

Environmental pollution problems appear to be manageable through siting selection, though this needs to be monitored closely. More problematic is site selection itself, given the potential for conflict between commercial fishing areas, anchorages, recreational areas, log transfer sites and mariculture sites. The best anchorages will likely offer the most protected sites, and the areas nearest transportation centers will be the most economic, leading to inevitable tidelands use conflicts with recreation boaters and commercial fishermen. A gold rush approach to tidelands leases cannot be allowed if this situation is to be resolved satisfactorily.

1. NMFS, world farmed salmon production projections.
2. NMFS, 3/87; Alaska Trollers Assn. 3/87; INPFC-Statistical Data.
3. Projected 50 farms @ 200 MT each. ADCED/OCFD.
4. Fish Farming Int'l: 12/86.
5. Norway=100 MT, Scotland=25 MT, Ireland=10 MT, all others=18 MT.

PROJECTED COSTS/BENEFITS
SALMON FARMING IN ALASKA

The economics of salmon farming in Alaska are not well known at present. A breakdown of the investment and operating costs of a family-sized (50 MT) operation and a corporate-scale (200 MT) Atlantic salmon farm in the Seattle/Vancouver area are presented in table 1. Production cost/revenue projections for the same two farms are presented in Table 2.

Table 1
Investment and Operating Costs[1].

50 MT Salmon Farm		200 MT Salmon Farm	
Investment Costs:			
Pens and Nets	$ 30,000	Pens (15)	$125,000
Anchoring	2,000	Anchoring	8,000
Automatic Feeders	1,000	Automatic Feeders	2,000
Storage Facilities	4,000	Simple House/Storage	6,000
Slaughterhouse & Equipment	15,000	Slaughterhouse	22,000
Dock	3,000	Equipment	22,000
Transport Equipment	5,000	Boat and Motor	6,000
	$ 60,000	Dock	11,000
		Truck	20,000
			$222,000
Operating Costs:			
Smolts (1$ ea.)	$ 26,000	Smolts	$103,000
Freight for Smolts	2,000	Freight for Smolts	10,000
Vaccination	500	Vaccination	1,000
Feed ($600/ton)	60,000	Feed	240,000
Labor (2 full-time + Extra)	70,000	Labor (1 Mgr, 8 Emp)	202,000
Energy Costs	1,000	Energy Costs	10,000
Miscellaneous	2,000	Miscellaneous	20,000
Maintenance	2,000	Maintenance	10,000
Insurance (facilities)	3,000	Insurance (Facilities)	10,000
Insurance (fish)	3,500	Insurance (fish)	13,000
Containers ($5.50 ea)	13,000	Containers	55,000
Total	$183,000		$674,000
Gross Sales:			
91,300 lbs @ $3.50/lb	$320,000	365,143 lbs	$1,278,000

Table 2
Production Costs/Returns[1].

50 MT Atlantic Salmon Farm

Year	1	2	3	4	5	6-11
Operating	76	159	183	183	183	183
Financing (15%/10)	0	97	171	71	12	29
Subtotal	76	256	354	254	195	192
Transportation	0	9	22	22	22	22
Subtotal	76	265	376	276	217	214
Sales	0	117	320	320	320	320
Gross Profit	(76)	(148)	(56)	44	103	106
Gross Profit Margin				13.7%	32%	33%

200 MT Atlantic Salmon Farm

Year	1	2	3	4	5	6-11
Operating	277	584	674	674	674	674
Financing	0	353	553	144	45	34
Subtotal	277	937	1,237	818	719	708
Transportation	0	35	88	88	88	88
Total	277	972	1,315	906	807	796
Sales	0	506	1,278	1,278	1,278	1,278
Gross Profit	(277)	(466)	(88)	372	471	482
Gross Profit Margin				29.7%	36.9%	37.7%

A 1985 Sealaska Corporation Study estimated employment and income effects from a Norwegian-style 20,000 MT Alaska-based industry to include 2,640 additional jobs and a payroll of $67.8 Million on gross sales (3$/lb) of $132 Million. In a more recent study compiled by Brad Pierce of HRA, it was suggested that certain assumptions including income multipliers and availability of smolt rearing facilities were not valid for Alaska. Adjusting those factors for Alaska yields a total employment effect of about 1,920 jobs and a payroll of $48.8 Million.

[1]. Brad Pierce, Aquaculture in Alaska, Feb., 1987

M A R I C U L T U R E I N A L A S K A

An Examination of Government Programs
by the Alaska Mariculture Technical Work Group
December 1986

STATE OF ALASKA / STEVE COWPER, GOVERNOR

December 16, 1986

Mr. Rodger Painter
Alaska Mariculture Association
P.O. Box 020704
Juneau, AK 99802-0704

Dear Mr. Painter:

As chairmen of our respective technical subcommittees, we are pleased to present the enclosed documents representing the product of our committee's deliberation on a variety of topics relating to development of a mariculture industry in Alaska.

Our purpose is to provide, to the extent possible, an unbiased and accurate analysis of issues relating to a potential mariculture industry in Alaska. We recognize that final decisions must be made by the people of Alaska working through the public process. Because of the complexity and uncertainty of these often new issues, decision makers should find the enclosed documents very useful.

On behalf of the entire technical committee, we would like to thank you for your role in this important effort. We expect that the educational process will continue as Alaska moves forward into this new area of resource development. Hopefully, the information provided here will be of continuing use.

In the interest of public education, we would appreciate the widest possible dissemination of this information.

Michael Kaill, Ph.D.
Alaska Department of Fish & Game
Co-Chair, Siting and
Operations Subcommittee

William G. Paulick
Alaska Department of Commerce
and Economic Development
Co-Chair, Development and
Research Subcommittee

MK/WGP/wfs4926W
121686a
Enclosure

Susan Braley, A.D.E.C., Co-Chair
Amy Kruse, A.D.E.C.
Dick Stokes, A.D.E.C.
Dave Gibbons, USFS
Diane Mayer, DGC
Bob Clasby, ADF&G
Paula Burgess, ADNR
Bill Smoker, UAJ

Ole Mathisen, UAJ, Co-Chair
Bill Heard, NMFS
Dolly Garza, M.A.P.
Kellus Sewell, Consultant
Bill Woolf, ASMI
Ted Meyers, ADF&G
Bob Palmer, ADNR

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Reference Materials

Alaska Mariculture Technical Work Group
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(These discussion papers are available through the Alaska Mariculture Association, P.O. Box 020704, Juneau, AK 99802-0704.)

The Environmental Effects of Floating Mariculture in Puget Sound
Donald P. Weston, School of Oceanography, University of Washington
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A Philosophy for Aquaculture Development in Alaska
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INTRODUCTION

Mariculture--or sea farming--is the for-profit captive culture of shellfish, finfish and sea vegetables in the marine environment. This is distinct from Alaska's existing salmon ranching program which involves the release of juvenile fish into the ocean to intermingle with wild stocks. The latter also is non-profit and returning fish are a common property resource.

Food products from sea culturing operations are becoming increasingly important throughout the world as seafood consumption climbs and wild fisheries landings remain relatively static. The world aquaculture production (fresh water and marine culture) was estimated at 22 billion pounds in 1983, and is expected to reach 48 billion pounds by the turn of the century.

The productive, unpolluted waters of Alaska's many sheltered bays and fjords are considered ideal for mariculture operations.

The first mariculture operations in Alaska involved the experimental culturing of oysters near Ketchikan in the early 1900s. Several oyster and mussel farms are now in operation and other farms are underway or are under consideration in Southeast, Southcentral and Southwest Alaska.

The State of Alaska recently began a joint project with Japan to test the feasibility of growing scallops in Kodiak and giant kelp (Macrocystis) in Sitka. The National Marine Fisheries Service also is cooperating with the state in an experimental research station in Southeast dealing with problems related to salmon farming.

A general need for policy and issue clarification was recognized by state and federal agencies, potential fish farmers and industry. The Alaska Mariculture Technical Work Group was formed at the invitation of the Alaska Mariculture Association. This cooperative effort represented here could assist in meeting the need for an information base to be used by policy makers.

EXECUTIVE SUMMARY

Legal Status--The legal status of mariculture in Alaska is unclear. While there is recognition of sea farming in statutes, clear regulatory processes are not available to guide individuals wishing to engage in many mariculture activities.

The Department of Law has said that technically the only species for which an applicant can presently receive a fish farming permit is oysters, a non-indigeneous shellfish. However, there are mechanisms that allow individuals to harvest some undersized species and hold the animals in a farming environment until they reach salable size.

Specific regulations must be passed by the Board of Fisheries and Department of Fish and Game before sea farmers can obtain permits to collect and hold most native species of shellfish and finfish. Current statutes do not allow state or nonprofit salmon hatcheries to sell or transfer surplus eggs to private farmers.

Siting--The environmental impacts of mariculture operations are site- and species-specific. When siting mariculture facilities, it is important to consider the water circulation in the area and flushing action in the immediate vicinity. Concerns that water quality would be degraded beyond the immediate vicinity of mariculture operations are generally unwarranted. Such conditions would exist only in areas of extremely limited flushing or if culture density was very great.

Mariculture is one of many potential uses of Alaska's tidelands and adjacent uplands. The current decision-making process for these land use decisions involves weighing mariculture against a host of other potential uses.

Permitting--Mariculture is likely to become a significant use of Alaska's tidelands and adjacent uplands. This has prompted the Department of Natural Resources to work on a new tideland permitting process for shellfish operations that would require permittees to meet certain benchmarks to ensure project viability. The new permitting process also provides the mariculture developer greater security than the present system.

Disease and Genetics--Alaska's existing disease and genetics policies appear to provide adequate safeguards for the protection of native and cultured stocks. Endemic disease agents are ubiquitous in wild stocks and the marine environment. Many are opportunistic, causing disease in fish primarily when they are crowded or stressed. Although it is possible for such disease to be transmitted from cultured to wild stocks, catastophic mortalities from indigeneous pathogens would not be expected because of the lack of stress factors in the receiving populations and the wide environmental dispersion of host animals. Mariculture would produce no further risk to wild stocks than the current salmon ranching program provided state disease and genetic policies are followed.

Public Health--Growth of a mariculture industry presents no special public health concerns as existing state regulatory programs governing sanitary practices and seafood product wholesomeness appear to be adequate to provide proper protections.

Brood Stocks--The availability of brood and seed sources will be a major factor in shaping the initial growth of a mariculture industry in Alaska. Orderly development of mariculture would be enhanced by a policy of allowing access to necessary seed and brood sources from wild stocks, but sea farmers should develop captive brood sources for many species over a period of time. Acquisition of brood stocks for salmon and some other fully allocated species may require changes in statutes and regulations. Proper protection of Alaska's wild fisheries resources will require the cautious development of mariculture brood sources. Brood stock programs for captive culture populations should follow appropriate policy guidelines for disease, genetic and exotic species issues.

Research and Development--The success of mariculture throughout the world is largely due to government research in disease prevention and control, broodstock development, and nutritional requirements, including use of local fish meals. The industry is likely to look at government to continue fulfilling these functions.

Training and Education--One of the best methods for the State of Alaska to encourage a strong resident involvement in mariculture is through training, education and extension service programs. Particularly important to local involvement in mariculture operations is the availability of these programs to residents of rural areas. Education and training programs should (1) provide a novice with enough knowledge to allow him or her to start a mariculture business with a reasonable chance of success and (2) train Alaskans to work as technicians at sea farms or hatchery operations.

Taxes--The Department of Revenue was seeking at the time of this report legal clarification of the applicability of the Fisheries Business Tax on cultured seafood. This issue also is important to municipalities, however, since half of the tax is shared with local governments.

Investment Incentives--There appears to be a number of strategies available to the State of Alaska to encourage mariculture development or to influence the composition of the industry. A clear state policy supportive of mariculture is perceived to be a vital factor, while incentives such as credits on the Fisheries Business Tax may influence growth. Resident participation in mariculture could be encouraged through state loans and other non-conventional financing.

Market Development--Although overall consumer demand for high quality seafood is strong and growing, a critical factor to development of a strong mariculture industry is establishment of specific market channels. Early development could help farmers avoid holding products for which there are no markets. It would be helpful to gather market information in an easily accessible format.

Policy and Administration--Selection of a lead state agency has been recommended by a leading mariculture expert, but much more important is development of a strong and clearly articulated state policy regarding mariculture.

I. SITING

A. Species Requirement Criteria

Each species of cultured plant or animal has a unique and specific set of environmental needs. Consideration of the environmental requirements of the species targeted for a sea farm will help assure that the site will be suitable for the proposed operation. Conditions, such as salinity, temperature, flushing action, depth of water at the site and other factors may vary from species to species. For example, oysters are tolerant of salinity changes and exposure to air, while scallops are quite sensitive to those factors.

This procedure could allow for evaluation of permit applications to assure that the site is suitable for the proposed farming operation.

B. Requirements for Aquatic Environmental Protection

Mariculture facilities have several possible environmental impacts on areas adjacent to their location. These effects include changes in water current circulation, an increase in sedimentation and various changes in water quality. These environmental impacts are species- and site-specific, depending on the size of the operation.

When siting mariculture facilities, it is important to consider the water circulation in the area and flushing ability in the immediate vicinity. The placement of mariculture facilities in the water (either rafts with suspended mesh bags or trays for shellfish, or net pens for finfish) will alter the water-current patterns. These structures will decrease water movement which may in turn result in an increase in sedimentation from food particles, feces, and shell debris. The concentration of ammonia-related compounds generated from decomposing organic material may increase, and the amount of dissolved oxygen may decrease. All of these factors may combine to effect the quality of the seafood product being cultured.

Generally, floating facilities have less problems with sedimentation than bottom-culture operations. One way to alleviate a water circulation problem is to place multiple net pens or rafts in a line parallel to the direction of water flow. Proper spacing between nets or rafts should be maintained to allow adequate water circulation. Choosing a site with adequate flushing capabilities will eliminate much of the sedimentation problem. The culture structure should be far enough off of the bottom to allow normal water flow beneath it.

the Prince William Sound area plan. These plans attempt to balance many disparate and sometimes competing interests. If the potential mariculture sites were included in such a plan, site decisions would be straightforward and timely. While these area plans would be developing mariculture policies within the planning areas, statewide mariculture policies could result from these efforts. Another option is the development of a new plan similar to the ones generated by the Private Nonprofit Hatchery Program, which are presently working quite well. The development of a new plan does not seem currently possible because of the time and resources needed to develop such a plan. The inclusion of potential sites into state plans also seems unlikely due to the present lack of state funding for future plans. Thus, it seems that the present and future basis for the site decision making will be made on a case-by-case basis by all state and federal agencies involved with either permitting or resource review. These decisions will involve, for example, on federal public lands, wilderness capability analyses using the Alaska National Interest Lands Conservation Act (ANILCA) Sections 507(a) and 1315(b and d), and subsistence evaluations using ANILCA Section 810. Subsistence, as defined by ANILCA, provides for the customary and traditional consumptive uses of fish, wildlife, and other wild renewable resources by rural Alaska residents on federal public lands. It does not preclude the use of other resources but requires that an evaluation of effects be made. In Section 804, the nonwasteful subsistence uses of fish and wildlife shall be accorded a priority over the taking of fish and wildlife on public lands for other purposes. Another determination, which may be and probably will be required, is a cumulative effects analysis. This determination will probably be the result of legal actions and the expected large number of mariculture sites. These two determinations, and especially the case-by-case determinations, will necessitate more work by all the agencies involved as well as time delays for the applicants.

II. PERMITTING

A. Statutory/Regulatory Status

The legal status of mariculture in Alaska is unclear. While there is legal recognition of sea farming in statute, clear regulatory processes are not available for applicants to engage in many mariculture activities. Unclear are issues such as the ability of individuals to gather brood stock in limited fisheries, use of gear not authorized in the commercial fishery, and the harvesting of juveniles for culturing in fisheries with size limitations.

CORRECTION

THIS DOCUMENT
HAS BEEN REPHOTOGRAPHED
TO ASSURE LEGIBILITY

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The effects of finfish culture and shellfish culture on water quality of surrounding areas are quite different. Shellfish cultures feed on indigenous phytoplankton and so do not introduce any 'new' nutrients into the area. As much as 40% of the total nutrients can be removed from the water column by these shellfish. Shellfish excrete relatively small amounts of ammonia and related compounds. Finfish cultures may increase the concentrations of ammonia, organic and total nitrogen, phosphate, and total phosphorous and Biological Oxygen Demand (BOD) in the surrounding area. Surrounding concentrations of dissolved oxygen may decrease. Generally, this phenomena is not a problem in culture areas with good water circulation because the metabolic wastes are diluted over a short distance.

The culture of finfish and shellfish results in the release of nutrients and the consumption of dissolved oxygen. A net increase in environmental nutrient levels may be expected in salmonid culture because of nutrient input in the form of feed. Culturing molluscs requires no addition of feed, so no input of "new" nutrients to the marine ecosystem results. However, molluscs do enhance the recycling of nutrients in the water column as they ingest phytoplankton and return a portion of the nutrients to the water column and sediments, making those nutrients available to primary producers again. The filter-feeding activities of the molluscs also serve to concentrate nutrients from a wide area into the area of the sea farm.

Concerns that water quality would be degraded beyond the immediate vicinity of mariculture operations are generally unwarranted. Such conditions would be anticipated only in areas of extremely limited flushing or if culture density was very great. In the few cases where measurable water-quality changes have been noted, the effects have been largely confined within the culture structure.

C. Site-Use Determination

Mariculture is one potential use among many of Alaska's tidelands and the uplands. The current decision-making process for these land-use decisions involve weighing mariculture against a host of other potential uses, including recreation, subsistence, personal use, log transfer sites, commercial fishing, and wilderness, as well as social, political, and economic factors associated with these uses. The most logical procedure to determine site usage is to have potential mariculture locations identified (using a set of predetermined, proven site criteria) and then included in the State Land Use Plans, such as the Prince of Wales Island area and

the Prince William Sound area plan. These plans attempt to balance many disparate and sometimes competing interests. If the potential mariculture sites were included in such a plan, site decisions would be straightforward and timely. While these area plans would be developing mariculture policies within the planning areas, statewide mariculture policies could result from these efforts. Another option is the development of a new plan similar to the ones generated by the Private Nonprofit Hatchery Program, which are presently working quite well. The development of a new plan does not seem currently possible because of the time and resources needed to develop such a plan. The inclusion of potential sites into state plans also seems unlikely due to the present lack of state funding for future plans. Thus, it seems that the present and future basis for the site decision making will be made on a case-by-case basis by all state and federal agencies involved with either permitting or resource review. These decisions will involve, for example, on federal public lands, wilderness capability analyses using the Alaska National Interest Lands Conservation Act (ANILCA) Sections 507(a) and 1315(b and d), and subsistence evaluations using ANILCA Section 810. Subsistence, as defined by ANILCA, provides for the customary and traditional consumptive uses of fish, wildlife, and other wild renewable resources by rural Alaska residents on federal public lands. It does not preclude the use of other resources but requires that an evaluation of effects be made. In Section 804, the nonwasteful subsistence uses of fish and wildlife shall be accorded a priority over the taking of fish and wildlife on public lands for other purposes. Another determination, which may be and probably will be required, is a cumulative effects analysis. This determination will probably be the result of legal actions and the expected large number of mariculture sites. These two determinations, and especially the case-by-case determinations, will necessitate more work by all the agencies involved as well as time delays for the applicants.

II. PERMITTING

A. Statutory/Regulatory Status

The legal status of mariculture in Alaska is unclear. While there is legal recognition of sea farming in statute, clear regulatory processes are not available for applicants to engage in many mariculture activities. Unclear are issues such as the ability of individuals to gather brood stock in limited fisheries, use of gear not authorized in the commercial fishery, and the harvesting of juveniles for culturing in fisheries with size limitations.

The Department of Law has determined that private, for-profit mariculture is covered by existing statutes. However, the department said, the Board of Fisheries and ADF&G must enact specific regulations before sea farmers can obtain permits to hold live fish or shellfish. To date the board has approved the farming of a non-indigenous species--oysters. Current statutes do not allow state or private nonprofit hatcheries to sell surplus salmon eggs to private salmon farmers.

There is no clear regulatory structure supportive of the development of a mariculture industry, although there are mechanisms to allow some activities. For instance, it is legally possible to obtain a permit to commercially harvest some undersized species and to hold the animals in a farming environment until they reach salable size. This method would appear to be most suitable in fisheries where there are no size and sex restrictions and little competition for the resource, such as mussels. There also is provision in law (AS 16.05.050 (11)) under which the Commissioner of ADF&G can authorize interim-use permit holders to engage in the experimental taking of fisheries resources. This statute may be a vehicle to allow the collection of brood stock for farming purposes in some fisheries.

ADF&G and the Department of Commerce and Economic Development are conducting a joint project with Japan to test the feasibility of culturing scallops in Kodiak. Local "cooperators" participating in the experiment have been issued scientific/educational permits for the collection of spat, and will be allowed to hold scallops for experimental purposes. However, the cooperators are not allowed to engage in "commercial" activities such as the sale of spat, juvenile or adult scallops.

B. Agency Coordination

Oyster farmers follow the established permitting path for use of state tidelands, and production and sale of shellfish products. The most critical permitting process is physical aquatic siting. This generally involves the Departments of Natural Resources, Fish and Game, and Environmental Conservation, the Army Corps of Engineers, and the Environmental Protection Agency. Permits for uplands usage at individual sites may require the additional involvement of the U.S. Forest Service, U.S. Fish and Wildlife Service, Bureau of Land Management, National Park Service, or other federal agencies.

Coordination of state and federal agency responses to the physical siting process is handled by the Division of Governmental Coordination (DGC) in the Office of Management and Budget. The DGC's review process is designed to

coordinate federal, state, and local review of projects in the coastal areas of the state. It is oriented to address any land management or resource regulatory issue related to physical siting and design of proposed projects. A key component of the process is review of the "consistency" of the proposed project with the standards of the Alaska Coastal Management Plan. Mariculture projects will be reviewed for their consistency with recreation, subsistence, habitat, and with air, land, and water quality standards. Applications for mariculture projects are reviewed on a 50-day schedule, which means the DGC will complete its review within 50 days unless non-consistency or other problems are raised.

New permitting systems required for mariculture development should fit within the existing DGC review process and timetable.

C. Project Development

Based on the growing interest in sea farming, mariculture is likely to become a significant use of Alaska's tidelands and adjacent uplands. As such, land managers and upland owners are interested in ensuring that sites are utilized for permitted activities and do not result in speculation. At the same time, these land managers have interest in developing a system that responds to the needs of the individual grower and results in a strong, diverse mariculture industry. ADNR currently is working on a new tidelands permitting process for shellfish operations that would require permittees to meet certain benchmarks to ensure project viability, while providing greater security for the mariculture developer than the present permitting system.

The characteristics and the scope of a mariculture project will be determined during the permit process. The applicant's development plan will become a part of the permits and they will describe: (1) what species will be raised; (2) size and location of the project; (3) type of structures used for growing; (4) whether upland support facilities will be allowed; (5) environmental safeguards that will be implemented; and (6) a timetable that will be used to monitor the progress during construction and development.

During the early stages of development, ADNR will be using these permits and develop a plan to monitor the progress of a project. ADNR will be emphasizing the need to use the land for its intended purpose within a specified period of time. The intent of this monitoring is to ensure the land speculation is not occurring and that approved sites are available to create a land base large enough to support a self-sustaining industry.

As the project gets into the production phase, the monitoring by ADNR will become less important and the roles of ADF&G and ADEC will become more important in regulating water quality, protecting public health, and certifying brood sources.

To ensure mariculture develops into a self-sustaining industry, ADNR is considering modification of land-use permits and leases to meet the need of a grower. At the present time, there is no guarantee for the grower that starts out with a land-use permit and then requests a lease with a term of more than ten years. The site will be put up for bid at a public auction and the grower may lose the site if he is outbid. A lease term of less than ten years may be negotiated if the director finds it in the best interest of the state.

III. FIN/SHELLFISH HEALTH AND GENETICS

A. Fin/Shellfish Health

1. Importation of exotic diseases

Current regulations (5AAC 41.070) prohibit importation of exotic finfish or shellfish species into Alaska except Pacific Northwest-cultured, Japanese oysters and ornamental fish for non-release only. Oysters can be imported only after disease certification by the ADF&G, Division of Fisheries Rehabilitation, Enhancement and Development's Fish Pathology Section and only after the importing party obtains a Fish Transport Permit (5AAC 41.005), which must also be evaluated by the Fish Pathology Section. Adequate control to prevent importation of exotic diseases is in effect.

2. Potential dissemination of indigenous aquatic animal diseases within the State of Alaska by movement of mariculture species

Possession or transport of any live fish or gametes thereof requires a Fish Transport Permit, as above, the application of which is evaluated regarding various concerns, including finfish or shellfish disease within the stock or brood source on which the permit is approved or denied (5AAC 41.020; 41.030). The definition of a fish includes all invertebrates and amphibians (AS 16.05.940). In addition, disease control is required at hatchery or rearing facilities (5AAC 41.080) through disinfection procedures and yearly hatchery inspections by a qualified fish pathologist. Disease outbreaks must be reported to the Fish Pathology Section which is governed by these

regulations in recommending to the Commissioner the disposition of said diseased fish. Current regulations appear adequate to control movement of finfish and shellfish diseases affecting mariculture practices.

3. Transmission of diseases from cultured finfish or shellfish species to wild stocks

   Future mariculture practices would produce no further risk to wild stocks than practices currently employed. Certain disease agents are already ubiquitous in the environment and opportunistic, infecting fish only when they are crowded or stressed artificially by aquaculture practices. Other disease agents which are obligate pathogens could possibly transmit from cultured finfish/shellfish to wild stocks. Although this would be undesirable, most generally clinical disease or catastrophic mortalities do not result in the receiving wild populations due to the lack of stress factors and wide environmental dispersion of host animals.

   Although some risk is present now and will be present in future mariculture endeavors, there are adequate, current regulations cited previously for monitoring cultured fish/shellfish stocks for disease, and control of such diseases to protect both wild and other cultured stocks.

4. Environmental contamination by therapeutic drugs or chemicals used in mariculture practices

   There are no data on which to evaluate this possibility. However, certain premises suggest that this is an unlikely concern: (1) The great magnitude of dilution of such drugs in the water column would make the final exposure concentration so far below efficacious levels that natural fauna and flora should be unaffected; (2) the infrequency of use would prevent chronic exposure of natural flora; (3) in most instances, a systemic chemotherapeutant is the only practical method to treat a disease affecting thousands of captive fish. Consequently, the drug is administered in the diet and metabolized with very little of the medicated feed left to allow leaching of the drug into ambient water.

   Circumstantial information suggests that drugs used in mariculture operations present a negligible risk to the environment.

5. The increasing demand on state pathology laboratories to conduct disease surveillance for private enterprise

will incur additional costs that must be borne by the state in order to maintain control of disease occurrence within cultured and wild stocks of finfish and shellfish.

B. Genetics

ADF&G has a detailed policy statement developed dealing with the issue of genetics, including transportation of stocks and importation of non-indigenous species. Exceptions to this genetics policy will be made on a case-by-case basis. While it appears that there is considerable opportunity for genetic engineering as part of mariculture activities, that field is largely unknown.

IV. PUBLIC HEALTH

The Alaska Department of Environmental Conservation (ADEC) is responsible for ensuring sanitary control and product wholesomeness of all phases of the seafood industry. This responsibility is addressed in 18 AAC 34, the Fish Inspection Regulations.

With regard to the shellfish industry, ADEC certifies all shellfish waters for harvesting on the basis of sanitary quality and public health safety, regulates the harvesting of shellfish, makes laboratory examinations of shellfish and shellfish waters, and restricts the harvesting of shellfish from particular areas in public health emergencies.

Processing of other mariculture products also would be dealt with through existing ADEC regulations to protect the sanitary quality and public health safety of the particular mariculture product.

A. Water Quality

Water quality of a shellfish growing area must meet minimum standards established by the federal Food and Drug Administration, "National Shellfish Sanitation Program (NSSP)." Prior to harvesting a shellfish growing area, ADEC conducts a sanitary and biological survey of the area before approving it to allow shellfish harvesting for sale for human consumption.

The examination is verified by laboratory findings when needed to indicate that pathogenic microorganisms, radionuclides, pesticide chemicals, harmful industrial wastes, and sewage wastes do not reach the area in dangerous concentrations and do not pollute the shellfish in the area.

Laboratory water samples from the sanitary survey are analyzed by the ADEC Palmer Laboratory to ensure that the samples do not exceed standards established by the NSSP.

Factors which may affect water quality are location of nearby pollutant sources, other users of the growing site, vessel traffic, freshwater streams, float houses, human habitation, and point source pollution.

The use of nets treated with tri-n-butyl tin (TBT) has been extensive in Norway and other countries involved in sea farming. This compound is used as an antifoulant to reduce labor costs associated with cleaning nets. Public health concerns have been raised over the use of TBT, a heavy metal.

However, the use of TBT in connection with mariculture in Alaska is not likely to be a problem since the ADEC presently is not approving permit applications for aquaculture operations using TBT-treated nets.

For information on requirements of the "National Shellfish Sanitation Program", refer to the program's Manual of Operations, Part 1. Sanitation of Shellfish Growing Areas, U.S. Department of Health and Human Services, Food and Drug Administration, 1986 Revision.

B. Food Quality of Mariculture Products

ADEC is responsible for ensuring that all seafood products intended for human consumption are wholesome and uncontaminated.

Shellfish (clams, mussels, and oysters) possess the ability to filter and concentrate pathogenic microorganisms and toxic substances from the water. Furthermore, shellfish are packed whole and alive and are often consumed raw or lightly cooked. For these reasons, the public health significance of consuming shellfish for food is very important.

Other mariculture products intended for sale for human consumption would need to be evaluated and protected from potential contamination or adulteration that could result from pathogenic microorganisms and toxic substances.

1. Paralytic shellfish poisoning

Paralytic shellfish poisoning, or "PSP", is a very serious illness caused by poisons concentrated in some varieties of dinoflagellates, a kind of microorganism. Since shellfish feed on these organisms, they can absorb and store the PSP toxin. The presence of PSP in Alaska has been well documented, and shellfish intended for commercial markets must be quarantined and tested for the toxin before being released for sale for human consumption.

Currently, testing for PSP is done through the ADEC laboratory in Palmer. The only test currently certified by the Food and Drug Administration is a mouse bioassay. Research is ongoing at several universities to establish other testing methods for PSP, but none have been certified to date.

2. Coliform testing

The National Shellfish Sanitation Program has minimum coliform standards for shellfish meat that must be met before shellfish can be commercially marketed. The need for actual coliform testing of the meat is determined by an ADEC review of the sanitary survey to see if actual or potential pollution may be present.

3. Sanitation

Harvesting and processing areas must meet state and federal regulations currently in existence to guarantee proper sanitation and product wholesomeness. This includes, for example, separation of raw and finished product, transporting under refrigeration, and holding shellfish during PSP and/or bacterial testing.

V. BROOD STOCKS

Development of dependable, high quality brood stock sources in sufficient quantity to meet initial and long-term needs will be a critical step in providing a strong foundation for mariculture. During the initial phases of growth, general availibility of brood and seed sources will likely be a major factor in deciding which species are developed and where development occurs.

Proper protection of Alaska's wild fisheries resources will require the cautious development of mariculture brood sources. Brood stock programs for captive culture for profit populations should follow specific policy guidelines for disease, genetic, indigenous and non-indigenous species issues.

Orderly development of mariculture would be enhanced by adoption of a policy by the State of Alaska to assist in initial access to necessary seed and brood sources from appropriate wild stocks. Over the long term, however, sea farmers should develop captive brood sources for many species. This will be particularly important in brood sources secured from fully allocated common property resources.

Acquisition of brood stocks and seeds also may require changes in statutes and regulations. For instance, the sale of surplus eggs from existing hatcheries to private farmers appears to be prohibited by state law. Legal issues also are raised by the capture of under-sized juveniles, use of gear not authorized in the commercial fishery, captures when the commercial fishery is closed and ability to capture wild brood sources in limited fisheries.

A. Salmon

Most interest in salmon farming in Alaska revolves around chinook and coho stocks. Alaska now has well developed public and private hatchery programs releasing large numbers of smolts of these species. Many of these programs achieve large enough returns to satisfy brood needs, provide catches to common property fisheries and allow terminal area cost recovery harvests. Present performance and estimates of survival rates and other factors suggest that these hatchery programs could provide large enough surpluses of chinook and coho eggs to satisfy the initial needs of a salmon farming industry in Alaska.

The food quality of returning hatchery salmon deteriorates rapidly, and many fish harvested in terminal areas for cost recovery would be more valuable as egg sources for salmon farming. A higher value for cost recovery catches could mean more fish are made available to the common property fisheries. It is estimated that 10 to 20 million surplus chinook and coho eggs per year could be made available for farming purposes under a strategy of allowing cost recovery

egg sales. Statutes would have to be amended to allow surplus egg sales from private or public hatcheries for salmon farming.

B. Trout, Char, Steelhead

There are no current brood stock surpluses in Alaska's hatchery programs for these species. Farming brood stock development for these species probably would be modeled after the conservative, carefully controlled egg take schedules from wild stocks taken already for our existing salmon ranching programs. These salmon egg takes are conducted on the healthiest wild stocks on varied schedules to ensure protection to the donor populations.

C. Non-indigenous Salmonids

Atlantic salmon is the most intensely farmed salmonid in the world. Some British Columbia and Washington State farms are now growing Atlantic salmon, partially because of limited sources of Pacific salmon brood stocks. The State of Alaska's disease and genetics policies and regulations currently prohibit the importation of live salmon or eggs.

D. Black Cod

Present interest in black cod (sablefish) farming is based upon the concept of capturing early life-stage juveniles from wild populations, and growing the fish to marketable size. Farming of black cod is being conducted on an experimental basis in British Columbia. High market prices have created strong competition for Alaska's black cod, and the state's only in-shore fishery already has been limited. Knowledge of this species is somewhat limited, suggesting that black cod farming should proceed cautiously.

E. Oysters

Several oyster farms are presently operating in Southeast with seed spat being imported primarily from Washington. Logistical problems in importing this spat have resulted in significant losses to many operators and remain a primary concern of existing farmers. While it may be necessary to develop an oyster seed hatchery in Alaska to ensure continuous dependable supplies, present sources of spat appear adequate to meet foreseeable demand.

F. Mussels

Mussel farming is based upon the collection of wild spat. In this case, Alaska has an abundant, widely distributed and unutilized resource, and there does not appear to be any biological need for constraints upon collection of wild spat.

G. Scallops

Interest in scallop farming has grown rapidly, particularly in the Kodiak area where a feasibility study is being conducted on collection of weathervane scallop spat using Japanese techniques. The distribution of natural populations is limited, but scallops produce enormous quantities of gametes and continuous collection of wild spat for farming probably won't pose biological or allocation problems.

H. Abalone

Abalone farming in Alaska probably would follow the development of culturing programs in Japan and California where hatcheries are used to produce spat for brood purposes. Competition is strong for Alaska's relatively small abalone resource open to commercial harvest.

VI. RESEARCH AND DEVELOPMENT

The success of mariculture is largely due to progress in three areas: (1) controlled breeding of domesticated broodstock; (2) understanding of the nutritional requirements of cultured organisms; and (3) control and prevention of disease. All three elements are involved in development of any mariculture operation, including shellfish, finfish and sea vegetables. Even if mariculture development is industry-driven in Alaska, there's a major role for government to play in research and development.

A. Broodstock Development

The biggest initial problem facing shellfish farmers in Alaska is location of dependable sources of spat. Indeed, the collection of spat is a major concern of established shellfish farming industries throughout the world. For the short term, the farming of indigeneous shellfish probably will rely upon the capture of wild spat or juvenile animals. Hatchery production of shellfish spat is an option for development of dependable sources for farming operations, but technical obstacles must first be overcome for some species.

The Norwegian success in salmon farming can be partially linked to the establishment of an experimental government genetics laboratory. A variety of salmon stocks were tested for growth characteristics, food conversion, fecundity, disease resistance, maturity schedules and other desired characteristics. The few stocks selected form the basis of an ongoing selection program. The University of British Columbia is undertaking a similar broodstock development program for Canadian farmers using coho hatchery stocks.

Development of salmon farming in Alaska would pose similar needs involving chinook and coho. Broodstock development using hatchery stocks would help guide farmers to the most suitable brood stock sources. Selection of the right broodstock could be critical to the success of fish farming.

B. Fish Nutrition and Dietary Requirements

Since about 60 percent of the production cost of farmed fish is procurement of food and feeding, a successful fish farming industry creates a demand for local production of food. An important research need is experimental work to develop the proper diet for Alaska conditions using ingredients that can be procured locally. While there is substantial agreement to the ratio of fish meal, dry ingredients and the fresh fish components of a diet, it is desirable to utilize stocks of local fish which aren't currently harvested in a commercial fishery. This would create new fishing opportunities and provide raw product to feed mills at low cost. Some waste products from processing plants also can be utilized in fish food.

C. Experimental Facility

A variety of fisheries research programs exist in Alaska, but no single agency has the resources to undertake the research outlined in this document. One potential solution is a coordinated approach to mariculture research involving a number of state and federal programs, resulting in a pooling of talent and financial resources under a single program. An important potential source of operating funds for such an experimental facility could be proprietary research for individuals and companies.

D. Database

Orderly development of a mariculture industry will be assisted by the gathering and organization of solid statistical data on the growth and performance of the industry. This database will be particularly helpful in market development and the growth of in-state support industries. The state could incorporate reporting requirements for quantities of brood or seed, production and product on hand into licensing programs.

VII. TRAINING AND EDUCATION

One of the best methods available to the State of Alaska to encourage a strong resident involvement in mariculture is through education, training and extension service programs. A special effort should be undertaken to make these programs available to residents of coastal communities to ensure local involvement.

Education and training programs should focus on two separate objectives: (1) provide a novice with enough knowledge to allow him or her to embark upon a mariculture business with a reasonable chance of success; and (2) train Alaskans to work as technicians at sea farms or hatchery operations.

A. Components of a Comprehensive Program

The most effective program would provide education and training at all levels: high school, post-secondary, vocational and extension services. High school technical training will serve to inform young Alaskans about jobs and career opportunities in mariculture. Post-secondary mariculture education helps ensure a resident pool of expertise, while vocational-technical courses provide focused education aimed at providing local residents with operational job skills needed by the industry. Extension services are particularly important to residents desiring to develop small scale mariculture operations and support services.

B. Coordination

Components of this comprehensive program are likely to be located throughout Alaska's diverse educational system, including local school districts, University of Alaska, Marine Advisory Program, community colleges, private institutions (Sheldon Jackson College), vocational education programs, and services offered by various governmental agencies (Office of Commercial Fisheries Development, FRED Division). Coordination of these programs could help avoid duplications and identify gaps in programs.

C. Training Areas

Education and training should cover the spectrum of planning, operational and regulatory concerns, including but not limited to physical operations, biological operations, economics, regulatory programs and technology.

1. Physical operations--site selection, physical plant design, equipment, utilities, support services, chemicals, transportation, processing, product quality

2. Biological operations--brood stock acquisition and development, disease management, nutrition, environmental quality

3. Economics--business management, operational costs, supply and demand, marketing, cash flow, financing, short- and long-term financial and operational planning

4. Regulatory--explanation of the regulatory process involving training and applicant manuals, helpful agencies and nonprofit organizations

5. Technology--dispersal of information regarding technological advances in equipment, nutrition, disease and other operational concerns

VIII. TAXES

Development of a clear and stable taxing policy is an important ingredient of governmental response to a developing industry such as mariculture. While municipal taxing authority over locally raised mariculture products appears clear, the applicability of existing seafood taxes levied by the state is uncertain. Clarification of this issue will be important to the state, local governments and prospective farmers alike.

A. Fisheries Business Tax

The Fisheries Business Tax currently imposed on commercially processed or exported seafoods ranges from one to six per cent of the product value at its first point of sale or export. Except for limited circumstances, the tax is based upon the amount paid a harvester by a processing company or broker. If mariculture products were to be taxed under the current structure, most mariculture farmers would be taxed at three per cent of the export product value. In-state sales of fresh product probably would not be taxed.

After studying the statutes and regulations, the Department of Revenue decided it should seek a legal advice from the Department of Law concerning the applicability of the Fisheries Business Tax on mariculture products. The Department is uncertain whether the tax was designed as a severance or product tax. Since state law provides municipalities with 50 percent of the collections of the Fisheries Business Tax within their jurisdiction, the issue is important to local governments.

B. Local Taxing Authority

Recent revisions to Title 29 broadened the taxing authority of local governments. All municipalities appear to have the authority to impose local sales taxes on seafood products purchased or sold with their taxing jurisdictions. Several local governments currently levy such taxes ranging from one to three percent of the initial purchase value.

C. Seafood Marketing Assessment

The Alaska Seafood Marketing Institute is partially funded through the Seafood Marketing Assessment which is a tax applied to processing operations and round fish exports or in limited cases to seafood brokers or distributors. This tax currently is fixed at .2 percent of the initial purchase

or export value. It appears to be applicable to mariculture products.

IX. INVESTMENT INCENTIVES

There appear to be a number of strategies available to the State of Alaska to encourage mariculture investments or influence the composition of the industry. In crafting these strategies, social and economic objectives should be carefully weighed. For instance, local employment and resident ownership may be achieved through divergent policies, and economic stability may come through involvement of a blend of corporate and family farming operations.

Large corporations or companies desiring to develop mariculture operations generally have access to venture capital through existing collateral bases or established relationships with financial institutions. These investors also can afford to hire experienced professionals to craft a financial prospectus,deal with difficult regulatory processes or manage a farm. Individual Alaskans interested in small to moderate farms generally lack the collateral base, trust of financial institutions and operational experience. These competitive disadvantages can be partially offset through non-conventional financing and other incentives designed to encourage resident investment.

Important to note is that other countries with developed mariculture industries have used combinations of incentives and regulatory devices to achieve socio-economic goals. Examples can be found in Norway where the government has restricted production size of salmon farms and extended licensing preference to local residents to encourage small operations in rural locations. These policies are directed at reversing population migrations to urban areas. The Japanese government has actively encouraged the development of cooperative farms involving local residents of coastal communities who often combine fishing and farming activties.

A. Regulatory/Political Climate

A clear policy supporting and encouraging mariculture development throughout the state's regulatory structure is perceived to be extremely vital to the growth of sea farming. A strong governmental policy supporting salmon farming has been critical to the rapid development of pen-rearing operations in British Columbia. This also has been true in Hawaii, Japan and Norway. Conversely, the growth of salmon farming in Washington State has been hampered by confusing and conflicting policies between various state agencies and county governments.

B. Taxes

A major attraction to venture capital in the British Columbia salmon farming industry has been a government program allowing tax-free profits up to $500,000 (Canadian currency) from qualified farming investments. This policy helped attract millions of dollars in investment capital. This avenue would be open to the State of Alaska through amendments to its corporate tax laws.

If the Fisheries Business Tax is applied to mariculture products, another potential incentive available to the state would be tax credits or a temporary moratorium on Fisheries Business Taxes on new facilities. A model for a tax credit program could be found in legislation approved by the 1986 Legislature. The legislation (House Bill 58) was designed to encourage the building of new shore-based processing facilities, expansion of existing plants, diversification of product lines, and improvement of product quality. This incentive also could be accomplished by a moritorium on the Fisheries Business Tax during the first years of production of a new farming operation.

C. Non-conventional Financing

The state could encourage resident involvement in mariculture through establishment of a state loan program or loan guarantee fund. These non-conventional financing arrangements could be geared toward small to medium sized projects to qualified Alaskans. This program could potentially be targeted to assist residents of economically depressed rural communities. Non-conventional financing could be particularly important to family-sized mariculture operations.

Another option could be to focus on amendments to national agricultural loan funds to include financing for small-scale mariculture projects.

D. Non-cash Incentives

Another method to intice investment capital is through long term tideland leases, water rights and lease or grants of state-owned uplands for staging facilities. These non-cash incentives and tax advantages could be offered to firms which meet certain state objectives, such as employment of residents from areas of high unemployment or with commercial fishing backgrounds, or providing equity participation by Alaskans.

X. MARKET DEVELOPMENT

Although overall consumer demand for high quality seafood is

strong and growing, a critical factor to development of a strong, diversified mariculture industry is establishment of specific market channels. This market development ideally occurs before farms reach the production stage, so farmers don't end up with products at the marketing stage that cannot be sold. Failure rates in mariculture can be affected by the early establishment of market development programs.

A. Market Information

A large body of knowledge exists concerning seafood quality and marketing of Alaska products. While most is directed at products of wild origin, much of the information also will be applicable to cultured seafood. The information has not been gathered in an easily accessible format that could benefit prospective sellers of cultured--or wild--seafood products. Consequently, each interested individual must invest significant amounts of time and energy into essentially duplicative research.

B. Market Research

A good market research program would focus on development of specifc market-related information on target species prior to commercial production. Critical market problems and opportunities should be identified for each species on a priority basis.

C. Alternative Markets

Cultured seafood products may not follow existing marketing channels, forcing farmers to focus on development of specialty or select markets. In analogous situations this need has led to the creation of private marketing entities conducting common promotion and assuming direct involvement in the sales process.

D. Quality

A primary benefit of cultured seafood is the relative ease of providing consistently high quality products. The early development of minimum and target quality standards for each product would benefit pioneering farmers and prevent problems as the industry grows and operational patterns are developed.

E. Transportation

The cost of moving product to market will play a significant role in siting of farms and market price of the finished product. Concentration of Alaska's mariculture activities or development of innovative transportation systems will help allow economies of scale in shipping and make Alaska cultured seafood price competitive.

F. Generic Promotion

The Alaska Seafood Marketing Institute's programs are designed to promote the benefits of all Alaska seafood products and do not make such distinctions as "troll-caught" or "net-caught," and "wild" or "cultured." However, some differentiations are possible under ASMI's enabling statutes but must not create competitive advantages for specific companies or regions of the state. ASMI promotions are determined by its industry board of directors which generally allocates the promotional budget in proportion to the value of Alaska's seafood production sold in U.S. markets. These amounts are adjusted to reflect market conditions and other factors.

XI. POLICY AND ADMINISTRATION

As outlined in this document, government will play a major role in the development of an Alaska mariculture industry. The specific roles of state agencies in that process will be determined through policy direction from the governor and legislature. One critical policy decision will be the determination of how the various agencies involved should interact, and whether a lead agency for mariculture should be designated. In determining the appropriate governmental structure, it might be useful to view the primary functions of agencies in terms of development advocacy and regulatory functions.

A. Lead Agency

A leading U.S. aquaculture law specialist brought to Alaska in early 1986 to discuss mariculture development strongly recommended the designation of a lead agency. The lead agency should be a development advocate with the ability to pull together state, local, federal and private resources to ensure success. The goal for this lead agency would be to streamline the permitting process and strengthen advocacy programs, while the objective would be to put Alaskans to work and create new wealth with the sale of a finished product.

While this concept is sound, the present structure of state agencies do not easily facilitate a lead agency with both advocacy and regulatory functions. The Department of Commerce and Economic Development has a strong advocacy program, but lacks regulatory jurisdiction and staffing. This also is the case with the Department of Community and Regional Affairs. At the same time, the resource agencies (DNR, ADEC and ADF&G) and the Division of Governmental Coordination in the Office of Management and Budget have strong regulatory and permitting functions but lack economic development staffs.

The present structure of state government might be more easily adapted to a cooperative approach with lead advocacy and permitting agencies. This concept would have prospective farmers making initial contacts at the lead advocacy agency which would in turn provide permitting road maps directing applicants to the proper lead permitting agency.

B. Policy Development

Regardless of which agency is considered lead, the parade should be led by a strong, clearly articulated state policy regarding mariculture development. This policy should give clear guidance to the agencies for making such value judgments as:

(1) The balance between creation of jobs and the maximum amount of industrial capital.

(2) Balance of environmental protection and economic development.

(3) The importance of mariculture as a use of state tidelands and uplands.

(4) Role of mariculture in efforts to diversify Alaska's economy.

(5) Weight of specific social objectives (local employment, Alaska equity, tax revenues, etc.).

(6) Recovery of private wealth created from common property resources.

-DRAFT-

Mariculture
Issues Discussion Paper
March 4, 1987

1. Issue: Can the state legally give Alaskans either exclusive or preferential access to mariculture permits? Can legislation have provisions to give priority to Alaskan residents or Alaska-owned businesses or corporations?

   Option: a) Have the Department of Law analyze our options, including:

   1) Restricting mariculture leases to Alaskan residents or corporations.

   2) Give priority for aquatic farm and broodstock permits to Alaska residents or businesses.

2. Issue: Should the state recover all or part of the administrative and other state costs associated with managing a mariculture program and get fair return for use of state resources (i.e. tidelands)?

   Options: a) User fees charged as part of the permitting process to cover administrative costs, the cost of inspections, etc.

   b) Fees or "rents" for use of state tidelands and water resources to ensure fair return to the state.

3. Issue: There needs to be a vehicle to focus the permitting process for mariculture operations. There will be a wide variety of mariculture ventures. Most will require multiple permits and multi-agency review. We need to prevent a piecemeal approach to the approval process, and promote efficient review of each operation. In addition, we need a way to guage the commitment the applicant is willing to make to seriously develop the project.

Option: Require the applicant to submit a mariculture plan of operations and prospectus. This plan would be prepared by the applicant and used by the agencies in the permit process. It would be the document used to make an initial fit, willing, and able determination to screen out speculators. The plan would describe the measures used to ensure compliance with water quality standards, disease control measures, etc. Specific elements in the plan could include the location, type of operation, species involved, size and scale of the operation, a financial plan, and a project development schedule to provide milestones to measure the project's progress as part of any "prove-up" requirements.

4. Issue: There is concern that there needs to be an initial screening of applicants to prevent rampant speculation and to encourage serious mariculture operations. At the same time there is a concern that this "test" not present an insurmountable barrier to small-scale, mom and pop ventures.

Options: a) Perform a "Fit, Willing, and Able" test. This would be an initial determination that the operator is "fit, willing, and able" to successfully conduct operations as described in the mariculture plan of operations and prospects. By tying the fit, willing, and able determination to the operations described in the plan, there should be latitude to allow for "mom and pop' operations as well as larger corporate ventures. The Department of Commerce and Economic Development would make the determination in consultation with other state agencies, and specific criteria would be developed through regulation. General standards should, however, be in the legislation. Such standards could include consideration of financial resources; level of expertise, presence or absence of full-time personnel, etc.

b) Require a bond from the applicant for the purposes of covering any site clean-up or other costs should the operation fail. Posting an bond could be viewed as a signal of the applicant's commitment.

5. Issue: As part of the attempt to discourage speculation and encourage serious mariculture ventures, there needs to be on-going review of these projects. Once they receive the initial permit the state needs to ensure that they are actually making a serious effort to develop their project.

Options: a) Have a "prove-up" requirement which would entail a periodic review of the project. The project development schedule could provide milestones to guage the progress the operator has made. The "prove-up" determination could then be used to ensure that a serious effort was being made to follow the plan and develop a successful mariculture facility.

b) Divide the permit/lease into a two stage process. Grant an initial permit/tidelands lease for a period of 5 years for development purposes. At the end of that time review the status of the project. If it is a viable operation then grant a 25-year operational permit/lease.

6. Issue: Tidelands leases could be locked up by individuals or businesses which are not actively operating their facilities.

Options: a) Ensure that tidelands leases are non-transferable from one company or individual to another.

b) Ensure that there are provisions for revocation of the permit and tidelands lease in the event an operator is not making a serious attempt to develop the project.

7. Issue: There needs to be criteria for resolving space-use conflicts. Many excellent sites for mariculture facilities are also highly prized for other uses including log storage, commercial fishing, anchorages, subsistence, and recreation.

Options: a) Use coastal zone management program to resolve conflicts. Unfortunately, ACMP standards do not address the issue of resolving conflicts between competing water-dependent uses, and there are no local CZM plans for most of the areas where mariculture might occur.

b) Use DNR tidelands planning process to resolve space-use conflicts. Land-use plans could

address many of these issues, but DNR budgets may need to be adjusted accordingly.

c) Develop standards in the legislation which would provide general guidance to the agencies when reviewing these projects. These criteria would include provisions so that mariculture facilities will be sited to minimize land use conflicts; provide environmental safeguards; maintain navigation and access channels; and reduce visual and aesthetic impacts.

8. Issue: Considerable speculation is already occurring. Individuals are presently "staking" potential mariculture sites in order to get the jump on the market.

Option: Place a retroactive moratorium on mariculture site applications until the regulatory mechanisms have been established. Already-existing operations would have to be grandfathered in.

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: John McMullen
Fisheries Policy Coordinator
Office of the Governor

DATE: March 11, 1987

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: Reply to your March 5 Memo

FROM: David Benton
Special Project Assistant
Commissioner's Office
Department of Fish and Game

Thanks for sending me your notes on the staff workgroup meeting we had on mariculture. I was pleased to see that your list of the tasks which remain to be completed coincide with mine. I appreciate you taking the time to write them up and get them to me.

You may have missed the discussion we had early in the meeting about whether or not to support the current legislation. I opened the discussion by suggesting that, for the purposes of that particular meeting, we should discuss the technical issues which remained to be addressed. I specifically did not want to get into the larger policy questions at that time. Many of the staff present were on short schedules and we had a lot of ground to cover without getting bogged down in a debate about the merits of salmon farming.

The test you propose is interesting and contains many of the questions which need to be addressed. Undoubtedly, you know that the Legislature is planning extensive hearings on these issues and they should provide much useful information. I personally believe that the best approach for the Administration to take at the present time is to allow these issues to be fully debated in the legislative arena. The Administration can adopt the position that it supports the mariculture industry in concept but that specific legislation must meet certain principles. This is the approach we are pursuing in the Fisheries Cabinet.

Once again, thank you for your notes. I will keep you informed about our progress on this issue.

DB/rlc

STEVE COWPER
GOVERNOR

STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

MEMORANDUM

TO: David Benton
Special Assistant
Department of Fish and Game

DATE: March 5, 1987

PHONE: 465-3652

FROM: John McMullen
Fisheries Policy Coordinator
Office of the Governor

SUBJECT: Aquatic Farming Bill (HB 108)

Agency representatives attending the February 26, 1987, staff meeting to begin developing the Administration's position on aquatic farming generally agreed that it is reasonable and should be pursued in Alaska if workable policy and administration procedures can be established.

The work group's discussion revealed the need to develop a number of procedures to accommodate an aquatic farming program, but I believe the working group might have considered a test that could be applied as a means of developing the Administration's position on HB 108. In this instance the test might be:

- Does aquatic farming represent new economic opportunity?
- Will that opportunity principally benefit Alaskans?
- Is the cost to the state affordable?
- Can the program be managed to provide for competitiveness between farms?
- Can the program be managed so as not to interrupt existing commercial fisheries?
- Can the program be managed to ensure a reasonable level of success?

The Bill and the program pass the test if the answers are in the affirmative, at which time the Administration should support it.

Meanwhile, back at the staff meeting, the group believed there is need for staff work on the followirg subjects.

- Determine criteria that must be met to qualify for a site permit.

- Define "fit, willing, and able" as applies to the determination of qualified applicants.
- Define "proving up."
- Determine if "resident preference" is obtainable for Alaskan applicants.
- Determine if resident hire bill now before the Legislature is applicable to resident preference.
- Determine the site acquisition process.
- Define the sites available for selection.
- Determine the stipulations of competitive leases.
- Determine the involvement (if any) of the Board of Fisheries in the stock acquisition process.
- Make the same determination for the Limited Entry Commission.
- Determine what regulations would need to be written to implement the program following passage of the legislation.

The above determinations should be completed as soon as possible, but the large questions to be answered are still, how does the state control who gets the permits and what will regulate the size of the individual production units? That's important, for I can imagine that companies with lots of money would secure the better sites close to transportation centers and that the lesser funded outfits would end up at the more remote, least cost effective locations.

Thanks.

cc: Rod Swope, Special Staff Assistant
Office of the Governor

Commissioner Don W. Collinsworth
Department of Fish and Game

MEMORANDUM

State of Alaska
DEPARTMENT OF FISH AND GAME

TO: Grace Schaible
Attorney General
Department of Law

DATE: March 26, 1987

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: Pen-Reared Salmon Farming

FROM: Don W. Collinsworth
Commissioner
Department of Fish and Game

Thank you for the work you have been doing to research and clarify the authorities presently available to the department to permit mariculture activities in Alaska. The recent hearings in House Resources highlight the interest in this issue. The March 10 memorandum from Sarah McCracken to Commissioner Collinsworth (enclosed) indicated that there may need to be clarification from the Board of Fisheries regarding the use of the Fish Transport Permit to govern the possession and transportation of live fish for farming purposes.

In your opinion, can the department under the current regulation issue permits for these fish farming purposes without action by the Board of Fisheries?

cc: Larri Spengler

Enclosure

DWC/DB/rlc

MEMORANDUM State of Alaska

Michael J. Frank
DNR Section Chief
Assistant Attorney General

DATE March 11, 1987

FILE NO

TELEPHONE NO

SUBJECT CS HB 108(L&C)
Aquatic Farming

SEM

Sarah E. McCracken
Assistant Attorney General

The major legal problem I see with this bill is the provision that the Commissioner of Fish and Game must issue an acquisition permit unless the Commissioner finds that the proposed harvest "will substantially impair sustained yield of the species." The Alaska Constitution article VIII, requires management on a "sustained yield" basis, and the "substantially impair" standard in the bill might not be consistent.

Also, the provision that in order to qualify for a tidelands lease for aquatic farming the applicant must be a resident or corporation authorized to do business in Alaska might present some problems, in terms of restricting a non-resident person's ability to engage in a vocation (fish farming) in the state.

In addition, the provision that a fish farm may only sell or transfer stock to another fish farm that has an AS 08.06 permit may create commerce clause problems, especially where a farm in Alaska seeks to sell to one out of state.

There are other policy considerations that should be noted.

First, this bill transfers some authority over aquatic farming from the Commissioner of Fish and Game to the Commissioner of Commerce. Under existing law, the Commissioner of Fish and Game already has the statutory tools to allow fish farming (see my recent MOA on this). Second, the bill also eliminates a potential (albeit small) revenue source -- the $200 fish farming permit fee.

These are just a few quick comments. If you want something in more detail, please let me know.

SEM:jem

cc: Larri Spengler
Bob Clasby

MEMORANDUM

State of Alaska

TO: Hon. Don W. Collinsworth
Commissioner
Department of Fish & Game

DATE: March 10, 1987

FILE NO: 661-87-0360

TELEPHONE NO:

THRU:

SUBJECT: State authority to permit and manage fish farming

Grace Berg Schaible
Attorney General

FROM: Sarah E. McCracken
Assistant Attorney General
Natural Resources-Anchorage

Your memorandum of February 6, 1987, sets out various statutory and regulatory provisions relating to fish farming and requests our legal advice regarding whether your department may authorize and regulate fish farming in the manner outlined in your memorandum.

Our summary response is that under existing law the Department of Fish and Game ("department") does have authority to allow fish farming essentially as set out in your memorandum. As you know, however, there is pending legislation (SB 106 and HB 108) that would significantly alter the existing responsibilities and authorities of the department. Our analysis follows.

As noted in 1985 Inf. Op. Att'y Gen. (Jan. 31; 663-84-0187), fish farming is an activity that is expressly contemplated by the legislature. AS 16.05.340(a)(14) and AS 16.05.360 provide for issuance of a $200 fish farming license, and AS 16.05.940(14) defines "fish farming" as:

> the business of propagating, breeding, raising, or producing fish ... in captivity for the purpose of marketing the fish ... or their products, and "captivity" means having the fish ... under positive control, as in a pen, pond, or an area of land or water which is completely enclosed by a generally escape-proof barrier; 1/

1/ Similar provisions for fish farming were included in the first Alaska fish and game code. See sec. 2(u), art. I, ch. 94, SLA 1959 (definition of "fish farming"); sec. 2 (15), art. II, ch. 94, SLA 1959 (fish farming license fee).

In addition, AS 16.05.930 specifies that AS 16.05.920 (which generally prohibits possession and sale of fish or game unless authorized by state law) does not prohibit "the rearing and sale of fish from private ponds ... under regulations adopted by the appropriate board." 2/

Fish farming is to be distinguished from the activity of operating a salmon hatchery, which latter activity is separately provided for by statute, AS 16.10.375--AS 16.10.475. The primary difference between fish farming and operating a salmon hatchery is that in the former fish are not released into the wild, but are kept in captivity under "positive control." AS 16.05.940(14). See generally 1985 Inf. Op. Att'y Gen. (Jan. 31; 663-84-0187).

Reading the above statutory provisions together as a whole, it is clear that the activity of fish farming is one that the legislature intended to allow. 3/ As you noted in your memorandum, however, the question then arises of how a potential fish farmer may acquire fish for the farming project. Obviously there are two sources of fish: imported or in-state.

Turning first to the availability of fish within the state, one must look at three possibilities: fish from the wild, hatchery fish, and fish from other fish farms. With respect first to fish from the wild, as you noted in your memorandum the Commissioner of Fish and Game ("Commissioner") has authority to issue permits for collecting fish "for scientific, propagative, or educational purposes." AS 16.05.340(b). This authority is also reflected in AS 16.05.930(a), which specifies that AS 16.05:

> does not prevent the collection or exportation of fish ... or a part of fish ... for scientific or educational purposes, or for propagation or exhibition purposes under a permit which the

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2/ This section is virtually identical to that in the first Alaska fish and game code, sec. 28, art. I, ch. 94, SLA 1959.

3/ Although the business of fish farming is an as yet basically undeveloped industry, it has existed for a long time. See, e.g., 2 Alaska Compiled Laws §39-2-7 (1949), allowing lease of water bottoms for oyster cultivation.

department may issue and prescribe the terms thereof. 4/

You noted in your memorandum that it is a long-standing department policy that fish collected under a department collecting permit cannot be sold, bartered, or used for human consumption. This "policy" is consistent with legal advice given to you previously indicating that commercial uses are not included within the purposes for AS 16.05.340(b) collecting permits. See 1986 Inf. Op. Att'y Gen. (Nov. 14; 661-87-0149) at 6; see also 1985 Inf. Op. Att'y Gen. (Jan. 31; 663-84-0187) at 3. 5/ Thus, a person desiring to establish a commercial fish farm could not, absent legislative amendment, acquire fish under an AS 16.05.340(b) collecting permit. Similarly, a potential fish farmer could not obtain fish from an existing private fish hatchery because under AS 16.10.420(3) and (7), hatchery fry and eggs may only be sold

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4/ As we noted in 1986 Inf. Op. Att'y Gen. (Nov. 14; 661-87-0149) at 4 n.2, AS 16.05.340(b) does not list the additional permit purpose of "exhibition" that is specified in AS 16.05.930(a); however, we view exhibition purposes as being included within scientific, propagative, or educational purposes and thus find the two statutory provisions compatible.

5/ We note here that AS 16.05.340(b) and AS 16.05.930(a) are susceptible to a broader reading that would allow commercial use of fish or game taken under a collecting permit. The term "propagating" in AS 16.05.340(b) is not restrictively defined and could be viewed as including breeding for commercial sale. This interpretation may be strengthened by the fact that AS 16.05.340(b) also directs the Commissioner to issue a permit to collect wild fur animals for improving genetic stock on commercial fur farms. (Although we note that there is no parallel provision requiring issuance of a permit for collecting fish for fish farms). We believe, however, that the stronger argument is that the terms "scientific," "propagative," and "educational" in AS 16.05.340(b) should be read as addressing similar purposes, and that "propagative," in the context of "scientific" or "educational" purposes, does not include commercial uses. See generally, 2A J. Singer, Sutherland Statutory Construction §47.16 at 161 (1984) (principle or noscitur a sociis, that associated words are to be construed similarly).

to another hatchery or to the department - - not to a fish farmer. This provision does not, however, apply to sale of fish from a fish farm. Thus, if there were an existing permitted fish farm in the state, that fish farmer could sell brood stock to another fish farmer.

As you correctly note in your memorandum, the one available source for fish within the state is from a commercial season. AS 16.05.930(c) expressly allows the board of fisheries to authorize the rearing and sale of fish from private ponds, and AS 16.05.251(a)(2) allows the board to regulate seasons and areas for the taking of fish. Also, AS 16.05.251(a)(7) allows the board to govern "use, disposal, propagation and stocking of fish." Under these broad powers, the board of fisheries could authorize and regulate the taking of fish for establishment of fish farms, so long as the board's regulations were consistent with constitutional provisions such as managing fish on the sustained yield basis (article VIII, section 4 of the Alaska Constitution). 6/ The board could set a special fishery for collection of fish for fish farms, or, as you noted in your memorandum, fish could be taken during a normal commercial fishery (assuming the commercial fishery timing and lawful gear made this practical). 7/

6/ As already articulated in 1985 Inf. Op. Att'y Gen. (Jan 31; 663-84-0187), fish farming does not violate article VIII, section 15 of the Alaska Constitution, prohibiting exclusive rights or special privileges of fishing.

7/ Because a person taking fish for fish farming would be possessing and transporting live fish, the person would presumably be required, under 5 AAC 41.005, to have a fish transport license. 5 AAC 41.005 requires any person who transports, possesses, exports, or releases a fish into state waters to have a fish transport permit. 5 AAC 41.001, however, provides that the fish transport license requirement applies only to the "transportation, possession, or release of live fish transplanted for or cultivated for human consumption or sport fishing purposes, or as part of an aquaculture program for scientific, educational, or propagative purposes." That section further provides that the fish transport license does not apply to transportation, possession, or release of fish taken for commercial, sport, or subsistence purposes. We believe the term

You state in your memorandum that "since fish farming and the sale of fish to farms as brood stock are commercial operations, the taking of those fish cannot be done under sport, subsistence, or personal use fishing regulations." We agree. Unless authorized by statute or regulation, fish may not be sold (AS 16.05.920(a)), and the only sale of fish (other than ornamental fish) that is authorized by law is sale of commercial fish (AS 16.10.265--AS 16.10.296). The definitions of "personal use" (5 AAC 77.001(f) and AS 16.05.940(23)), "sport fishing" (AS 16.05.940(27)), and "subsistence uses" (AS 16.05.940(30)), do not encompass taking fish for commercial fish farming.

The second possible source for brood stock for fish farms is imported fish. Fish may be imported only as allowed by statute or regulation. AS 16.05.920(a). Under present regulations, only ornamental fish and certain oysters may be imported into Alaska. 5 AAC 41.070. 8/ This regulation could, however, be amended by the board of fisheries to allow importation of fish for fish farming brood stock if the board found that there could be adequate controls to protect indigenous species from fish disease.

"cultivated for human consumption" probably is broad enough to encompass fish transported and held for fish farming purposes, and that the exemption for fish taken for commercial, sport, or subsistence purposes probably does not apply to fish held at fish farms. To the extent that there may be any ambiguity regarding the applicability of the fish transport permit requirement, this can easily be clarified by the board of fisheries.

8/ We note here that any prohibition on importation of fish used in commercial enterprises must be based on a factually supportable legitimate state concern for the health and welfare of the state's resources or its people - - it cannot be based on protectionist economic reasons, and the prohibition against importation must be the least discriminatory option available. See Maine v. Taylor, 106 S. Ct. 2440 (1986) (upholding Maine ban on importing baitfish based on need to protect native species from disease). C.f. Hughes v. Oklahoma, 441 U.S. 322 (1979) (striking down Oklahoma ban on export of minnows, finding ban to discriminate impermissibly against interstate commerce.)

In summary, fish farming could be accommodated under existing statutory authorities. The Department of Revenue could issue a fish farming permit under AS 16.05.340(a)(14), and your department could allow a fish farmer to obtain and keep brood stock by issuing a permit under 5 AAC 41 (to possess live fish) and by allowing the fish farmer to collect fish either during a normal commercial fishery or in a new fishery to be established by the board under AS 16.05.251(a). 9/

Alternatively, fish farming could be accommodated through legislative action, such as amending AS 16.05.340(b) and AS 16.05.930(a) to authorize the Commissioner to issue collecting permits for fish farming. 10/

If you have additional questions, or would like assistance in developing appropriate regulatory changes or in addressing the specific provisions in SB 106 and HB 108 relating to fish farming, please let us know.

SEM/jmo

cc: Steven Pennoyer
Normal Cohen
Ken Parker
Stan Moberly
Bob Clasby
Tom Kron
Larri I. Spengler

9/ Fish farmers would of course still have to comply with other applicable licensing and permitting requirements, such as AS 14.43 and Department of Environmentional Conservation provisions, 18 AAC 34.

10/ Legislation presently pending in the Alaska legislature, SB 106 and HB 108, would make significant changes in the statutory framework discussed in this memorandum. In particular, the bills would shift major authority and responsibility over fish farming from your department to the Department of Commerce & Economic Development.

MEMORANDUM

State of Alaska

DEPARTMENT OF FISH AND GAME

TO: Larri Spengler
Assistant Attorney General
Department of Law

DATE: February 6, 1987

FILE NO.:

TELEPHONE NO.: 465-4100

SUBJECT: Fish Farming

FROM: Don W. Collinsworth DWC
Commissioner
Department of Fish and Game

In recent months there have been an increasing number of questions as to what is legal and not legal in conducting fish farming operations. I would appreciate your assistance in analyzing existing law on the subject. There is an immediate need to clarify what can and cannot be legally done now and begin discussions on how best to clarify any ambiguous matters.

The staff has reviewed existing Title 16 statutes and regulations dealing with fish farming, commercial fisheries, salmon hatcheries, research, and fish importation, transplantation, and holding. That review indicates that some fish farming activities are legal, although the route one must follow through the law to reach that conclusion is complex. Other matters are not so clear. Set out below are the results of the review.

I would very much appreciate your timely comments on our conclusions, as well as any suggestions for needed changes. All indications are that fish farming legislation will be introduced early this session; therefore, both departments need to be prepared to deal with the legal issues involved under existing law and any proposed in legislation.

Collecting Permits

The department has issued what are commonly referred to as "collecting permits" [AS 16.05.340 (b)] to initiate cooperative efforts with other public agencies and the private sector involved in mariculture projects. While such permits are appropriate for conducting mariculture research projects, they are not appropriate for initiating commercial ventures. The statute indicates that the permit is to be limited to scientific, propagative, and educational purposes. It has been a long standing policy that fish taken under these permits may not be sold, bartered, or used for human consumption.

We prefer to stop issuing collecting permits to private individuals involved in scallop mariculture research. Many of these people believe that by receiving these permits they are grandfathering themselves into a fishery. Such is not the case. Additionally, we feel that there are other legal

avenues that can be used to establish commercial ventures associated with farming of scallops, as well as some other species.

Fish Farming License

The Department of Revenue, under AS 16.05.340 (a)(14) may issue a fish farming license. Fish farming, by definition [AS 16.05.940 (12)] is a commercial activity, thus allowing one to sell the products of the operation. The farming operation must conform to the statutory definition, e.g. the fish must be held in positive control and enclosed in an escape-proof barrier. By informal agreement, the Department of Revenue does not issue fish farming licenses without approval from the Department of Fish and Game. This policy is predicated on the fact that we are the agency that administers the laws that govern the taking or importation of the fish species that would be farmed. This policy ensures that fish farming activities are biologically and legally sound. With the growth of mariculture, the existing policy should be formalized.

Stocking Fish Farms

Since it appears that fish farming, in general, is a legal activity, we must then look at the legal means of obtaining the fish to be farmed. Those fish can be imported or obtained instate. Most of our experience has been with imported species, so I will cover those first.

The importation, transportation, and possession of live fish are covered by the regulations found in 5 AAC 41. 5 AAC 41.001 and 5 AAC 41.070 limit importation to ornamental fish. No other species of fish may be imported for use in fish farming. – no. oysters

A question that many find perplexing is how does one obtain, other than by importation, fish for placement in a farm? It seems clear to us that, at the present time, one must do this through commercial fishing laws. Since fish farming and the sale of fish to farms as brood stock are commercial operations, the taking of those fish cannot be done under sport, subsistence, or personal use fishing regulations. If one has all the proper permits and licenses, the season is open, and legal gear is used, the fish may be harvested and subsequently farmed. For the most part, this is clearly the case for shellfish. The case is not so clear for finfish. 5 AAC 37.900 prohibits the transplantation of aquatic plants for the purpose of farming of the plant.

Procedures Under Current Law

The following lays out how we might handle requests for fish farms and associated operations under current laws. We would ask the individuals to discuss their operation with the local area management biologist, as well as FRED Division staff. They would review the request and route their recommendations up through channels. The farmer or fisherman would then, if he so desires, start the process of obtaining the needed permits and licenses. The processes, licenses, and permits will differ depending on species involved and whether the operation is to gather brood for sale to farms or the farming of purchased brood. Those who obtain their own brood stock will need to follow a combined process.

One who only takes fish to sell as brood stock would follow, with some possible exceptions, the process followed by typical commercial fishermen. The brood stock supplier would obtain an interim-use or entry permit from Commercial Fisheries Entry Commission (CFEC) for the species and gear types needed. He could then harvest those species during the normal open season provided by regulation. This will work fine for some species; particularly those without size limits, those for which the season is open during a period when individuals of the desired age are available, and those for which appropriate gear can be used. In some instances, seasons could be adjusted to allow the taking of juveniles or larva. Under AS 16.05.050 (10), the commissioner could approve the issuance of a CFEC permit for a new gear type, such as scallop spat collecting bags, which could be used to capture larvae or juveniles. Additional controls could be placed on brood stock fisheries through permitting processes. For most invertebrates and some bottom fish, this could be done through existing regulations such as 5 AAC 38.062. For other species, seasons for taking under the conditions of a permit issued by the department could be opened by emergency order. We have used this approach in the past to initiate experimental-type fisheries.

Once a brood stock is available, the Department of Revenue (DOR) licensing and DF&G permitting process for the fish farmer are relatively simple. The farmer would apply to DF&G, under 5 AAC 41, for a permit to transport and hold live fish. We would review the proposed operation for compliance with AS 16 and 5 AAC. Upon issuance of the permit, we would then recommend that DOR issue a fish farming license.

As I indicated earlier, the above processes can currently be used to handle most fish farming and brood stock requests. The process is not easily deduced by the public, and for that matter some staff, and is rather complex in

implementing. If you agree that the processes as outlined are legal, we could then develop a document that explains those processes in a logical clear manner. Additionally, your analysis and comments on the process will be invaluable in assisting the legislature in development of clear fish farming policy and statutes.

cc: Steven Pennoyer
Ken Parker
Tom Kron

MEMORANDUM State of Alaska

TO: Hon. Don Collinsworth
Commissioner
Dept. of Fish and Game

Norman C. Gorsuch
Attorney General

FROM By: Larri I. Spengler
Assistant Attorney General
Department of Law

DATE: January 31, 1985

FILE NO: 366-187-84

TELEPHONE NO: 465-3600

SUBJECT: Marine net pen salmon rearing

You have asked whether marine net pen salmon rearing is authorized under current fish and game statutes and regulations, and if it is not, what steps would be needed to do so. As discussed below, it appears that fish farming would not pose any constitutional problems, but that it is not now statutorily authorized.

As explained by your department, marine net pen salmon rearing differs from the private nonprofit hatchery program authorized and governed by AS 16.10.375 -- 16.10.475 in that the salmon are not released into the open ocean where they are subject to the common property fishery. Additionally, the salmon are not hatched from eggs as part of the operation, but rather smolts are reared in enclosures that either float or are grounded on the ocean bottom under state or federal leases. The salmon in the enclosures are placed there by the operator of the fish farm.

Fish farming is clearly contemplated by existing statutes. It is defined in AS 16.05.940(12) as

> the business of propagating, breeding, raising, or producing fish ... in captivity for the purpose of marketing the fish ... or their products, and "captivity" means having the fish ... under positive control, as in a pen, pond, or an area of land or water which is completely enclosed by a generally escape-proof barrier.

A fish farming license costs $100 and is to be obtained from the Department of Revenue. AS 16.05.340(a)(14); AS 16.05.360.

Just after statehood, the attorney general's office determined that salmon farming as defined now in AS 16.05.940(12) would not violate the Alaska Constitution. 1959 Inf. Op. Att'y Gen. (June 10; Gregg). The question arose because article VIII, section 15, of the Alaska Constitution provides in part:

> No exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the State.

However, there is no mechanism under current fish and game statutes for smolts to be legally reduced to possession to transfer to rearing pens. Currently, no person may possess live fish without a permit from the Commissioner of Fish and Game. Permits may be used for transportation, possession, and release of live fish for "human consumption or sport fishing purposes" or for "scientific, educational or propagative purposes." AS 16.-05.340(b); 5 AAC 41.001 and 5 AAC 41.005. Raising salmon for sale -- commercial purposes -- is not encompassed. The salmon to be reared in marine fish farms in state waters may not be imported from outside Alaska. 5 AAC 41.070(a); compare with 5 AAC 39.-975(13) and 5 AAC 75.995(31) (defining "waters of Alaska"). Further, they could not be purchased from hatcheries within the state, for AS 16.10.420 prohibits sale or transfer of eggs or fry from hatcheries to anyone other than the department or other hatcheries.

Because of the existing statutory framework, there is no legal basis for regulations that would authorize the acquisition from hatcheries within the state of smolts for rearing and eventual commercial sale. In order to accomplish such a result, a mechanism for obtaining the smolts would need to be enacted, such as an amendment to AS 16.10.420 regarding possible sale of hatchery fry. Alternatively, the Board of Fisheries under AS 16.65.251(9) could amend 5 AAC 41.070 to allow importation of smolts. Further, in either case, the board would need to amend 5 AAC 41 under AS 16.05.251 to authorize release and possession of the smolts in the marine pens, for rearing and eventual sale.

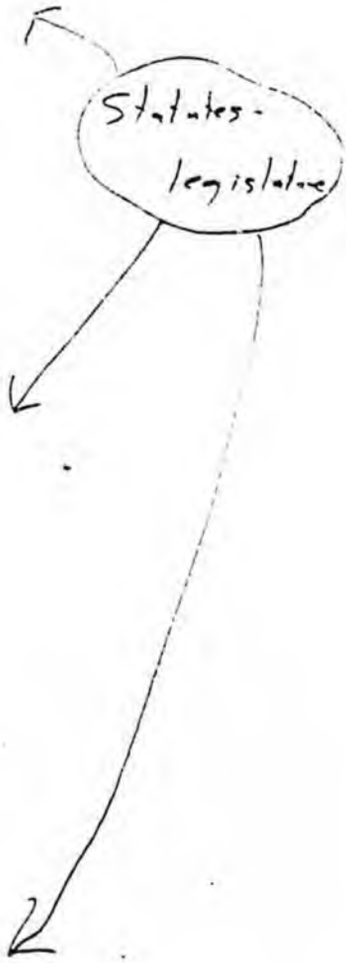
In summary, marine net pen salmon rearing would not constitute an exclusive right or special privilege of fishery, but is not currently authorized by fish and game statutes and regulations.

LIS:dlm

cc: Steve Penncyer
Norman Cohen
Stan Moberly
Kevin Duffy

§ 16.05.940

(12) "fish or game farming" means the business of propagating, breeding, raising, or producing fish or game in captivity for the purpose of marketing the fish or game or their products, and "captivity" means having the fish or game under positive control, as in a pen, pond, or an area of land or water which is completely enclosed by a generally escape-proof barrier;



§ 16.05.340

(14) Fish or game farming license 100

Sec. 16.05.920. Certain acts made unlawful. (a) Unless permitted by this chapter or by regulation adopted under this chapter, a person may not take, possess, transport, sell, offer to sell, purchase, or offer to purchase fish, game or marine aquatic plants, or any part of fish, game or aquatic plants, or a nest or egg of fish or game.

§ 15.05.340

(b) The commissioner of fish and game may issue without cost a permit to collect fish and game, including fur animals, subject to limitations and provisions that are appropriate, for a scientific, propagative, or educational purpose. In addition, the commissioner shall issue a permit for the collecting of wild fur animals for improving the genetic stock of fur farm animals. Permits issued under this subsection shall be in accordance with current sustained yield management practices for the species of wild game for which the permit is requested. The annual permit fee for an Alaska resident to collect wild fur animals for fur farming purposes is the same as the fee for resident trappers.

Statutes - legislature

16.05.940 (9) "fish" includes eggs ("any stage of its life cycle")

Sec. 16.40.010. Disposition of surplus buffalo and musk oxen. Whenever it is determined by the Department of Fish and Game that a surplus exists in the herds of buffalo and musk oxen under its control, the department may, under regulations adopted by it, grant the surplus or portions of it to persons, groups, associations, partnerships, or corporations for the purpose of raising and breeding the animals as domestic stock for commercial purposes, or for scientific and educational purposes. A person, group, association, partnership, or corporation may receive animals only after proving to the satisfaction of the Department of Fish and Game

(1) intent to raise and breed the animals; and

(2) possession of facilities for maintaining the animals under positive control. (§ 1 ch 15 SLA 1962)

AS 16.05.251

(a) The Board of Fisheries may adopt regulations it considers advisable in accordance with the Administrative Procedure Act (AS 44.-

(2) for

(9) prohibiting and regulating the live capture, possession, transport, or release of native or exotic fish or their eggs;

statute - legislature

5 AAC 41.001. APPLICATION OF THIS CHAPTER. The provisions of this chapter govern the transportation, possession, or release of live fish transplanted for or cultivated for human consumption or sport fishing purposes, or as part of an aquaculture program for scientific, educational or propagative purposes. Unless specifically provided, the provisions of this chapter do not apply to the transportation, possession, or release of fish taken for commercial, sport, or subsistence purposes.

5 AAC 41.005. PERMIT REQUIRED. (a) No person may transport, possess, export from the state, or release into the waters of the state, any live fish unless the person holds a fish transport permit issued by the commissioner or his authorized designee, and the person is in compliance with all conditions of the permit and the provisions of this chapter. A fish transport permit will be issued for a fixed term subject to the provisions of (c) of this section.

regulations - board

5 AAC 41.070. PROHIBITIONS ON IMPORTS AND RELEASE OF LIVE FISH. (a) Except as provided in (b) and (c) of this section, no person may import any live fish into the state for purposes of stocking or rearing in the water of the state.

(b) Live oysters originating from locations other than Korea, the Gulf of Mexico, and the Atlantic Coast of North America, may be imported for aquaculture purposes and may be released into the waters of the state only pursuant to a permit required by this chapter. Live oysters native to and originating from Korea, the Gulf of Mexico, or the Atlantic Coast of North America may be imported for aquaculture purposes pursuant to a permit required by this chapter and released into the waters of the state only if:

(1) the brood stock is derived from oysters commercially cultured on the Pacific Coast of North America through three or more generations; and

(2) the disease history or an inspection indicates no incidence of disease that is not indigenous to Alaska.

(c) Ornamental fish not raised for human consumption or sport fishing purposes may be imported into the state, but may not be reared in or released into the waters of the state. Fish wastes and waste water from ornamental fish may not be released directly into the waters of the state.

Sec. 16.05.930. Exempted activities. (a) This chapter does not prevent the collection or exportation of fish and game, a part of fish or game or a nest or egg of a bird for scientific or educational purposes, or for propagation or exhibition purposes under a permit which the department may issue and prescribe the terms thereof.

dept.

statute - legislature

(b) This chapter does not prohibit a person from taking fish or game during the closed season, in case of dire emergency, as defined by regulation adopted by the appropriate board.

(c) AS 16.05.920 does not prohibit rearing and sale of fish from private ponds, the raising of wild animals in captivity for food or the raising of game birds for the purpose of recreational hunting; in [OR] game hunting preserves, under regulations adopted by the appropriate board. In this subsection, "animals" includes all animal life, including insects and bugs.

board

(d) Nondomestic animals of any species may not be transferred or transported from the state under (a) of this section unless approved by the Board of Game in regular or special meeting. Animals transferred or transported under (a) of this section shall be animals that are certified by the department to be surplus and unnecessary to the sustained yield management of the resource. Each application for a permit under (a) of this section shall be accompanied by a statement prepared by the Department of Fish and Game examining the probable environmental impact of the action.

(e) This chapter does not prevent the traditional barter of fish and game taken by subsistence hunting or fishing, except that the commissioner may prohibit the barter of subsistence-taken fish and game by regulation, emergency or otherwise, if a determination on the record is made that the barter is resulting in a waste of the resource, damage to fish stocks or game populations, or circumvention of fish or game management programs.

(f) A permit may not be required for possessing, importing or exporting mink and fox for fur farming purposes. (§ 28 art I ch 94 SLA 1959; am § 1 ch 7 SLA 1972; am § 2 ch 104 SLA 1972; am § 4 ch 82 SLA 1974; am §§ 16, 17 ch 206 SLA 1975; am § 1 ch 20 SLA 1976; am § 13 ch 151 SLA 1978; am § 4 ch 23 SLA 1983)

(4)

Statute - legislature

Sec. 16.10.420. CONDITIONS OF A PERMIT. The department shall require, in a permit issued to a hatchery operator, that:

(1) salmon eggs procured by the hatchery must be from the department or a source approved by the department;

(2) no salmon eggs or resulting fry be placed in waters of the state other than those specifically designated in the permit;

(3) no salmon eggs or resulting fry, sold to a permit holder by the state or by another party approved by the department, may be resold or otherwise transferred to another person;

(4) no salmon be released by the hatchery before department approval, and, for purposes of pathological examination and approval, the department shall be notified of the proposed release of salmon at least 15 days before the date of their proposed release by the hatchery;

(5) diseased salmon be destroyed in a specific manner and place designated by the department;

(6) adult salmon be harvested by hatchery operators only at specific locations as designated by the department;

(7) surplus eggs from salmon returning to the hatchery be made available for sale first to the department and then, after inspection and approval by the department, to operators of other hatcheries authorized by permit to operate under §§ 400 - 470 of this chapter;

(8) if surplus salmon eggs are sold by a permit holder to another permit holder, a copy of the sales transaction be provided to the department;

(9) Repealed by § 5 ch 110 SLA 1980.

(10) a hatchery be located in an area where a reasonable segregation from natural stocks occurs, but when feasible, in an area where returning hatchery fish will pass through traditional salmon fisheries.
(§ 2 ch 111 SLA 1974)

WHAT IS MARICULTURE?

Mariculture is the farming for profit of shellfish, finfish and sea vegetables in the marine environment. The organisms to be cultured are produced in hatcheries or gathered from the wild. The growing takes place in net pens, from rafts, longlines, and on the ocean floor or intertidal area. In some cases sea water is pumped to shore-based enclosures. Some of the more common mariculture products are scallops, shrimp, salmon, mussels, nori and kelp.

This captive culture is distinct from Alaska's existing **ocean ranching** program which involves raising salmon to the juvenile stage for release to intermingle with wild stocks. Ocean ranching in Alaska is conducted on a private non-profit basis or by public agencies. The returning salmon must contribute to the common property fisheries (commercial, sport, subsistence and personal use).

A more encompassing term is **aquaculture** which includes mariculture, ocean ranching, and farming in fresh water with such species as catfish, shrimp, trout and crayfish.

GLOBAL MARICULTURE TRENDS

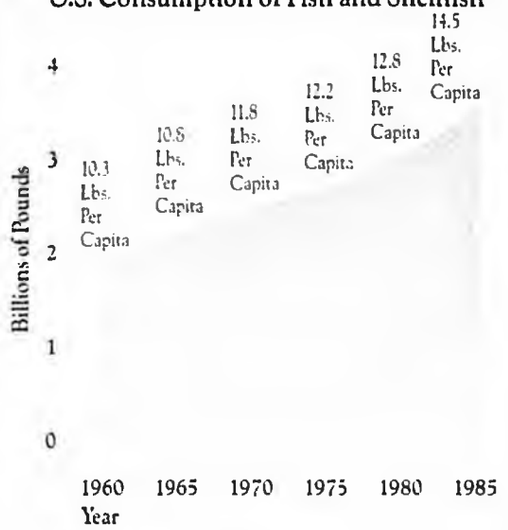
Although fish farming originated in China many centuries ago, relatively recent advances in controlling diseases, understanding nutritional requirements and breeding domesticated stock have led to an aquaculture explosion throughout the world.

Global aquaculture production of fish and shellfish was estimated at 22 billion pounds in 1983 and is expected to reach 48 billion pounds by the turn of the century. Aquaculture produced 12.2 percent of the world's total supply of edible fish and shellfish in 1983.

Meanwhile, production curves of commercial fisheries landings have flattened out. While aquaculture production is expected to rise by 5.5 percent annually over the next 25 years, the annual increase for wild fisheries is expected to be .5 percent.

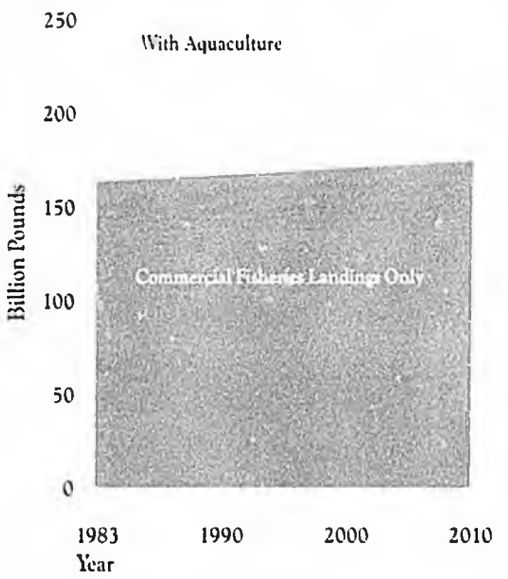
The increases in production of cultured fish and shellfish correspond with a steady growth in seafood consumption throughout the world. These trends are readily apparent in the United States where consumption of fish and shellfish climbed by 609 million pounds or 21.5 percent between 1982-1985.

U.S. Consumption of Fish and Shellfish



National Marine Fisheries Service

Actual and Projected Annual World Fish and Shellfish Production



International Aquaculture Foundation

HOW TO OBTAIN ADDITIONAL INFORMATION ON MARICULTURE

Department of Commerce and Economic Development
Bill Paulick
Office of Commercial Fisheries Development
Department of Commerce and Economic Development
P.O. Box D
Juneau, Alaska 99811
(907) 465-2162

Department of Fish and Game
Mike Kaill
Fisheries Rehabilitation, Enhancement and Development
Department of Fish and Game
P.O. Box 3-2000
Juneau, Alaska 99802-2000
(907) 465-4160

Department of Commerce and Economic Development
Office of Commercial Fisheries Development

Steve Cowper, Governor
State of Alaska

MARICULTURE IN ALASKA

A DISCUSSION OF THE ISSUES INVOLVED IN SEA FARMING DEVELOPMENT IN COASTAL ALASKA

MARICULTURE IN ALASKA

The unpolluted, productive waters of Alaska's many protected bays and fjords are considered ideal for many forms of mariculture. Alaska also has healthy populations of many species of shellfish, finfish and aquatic plants that could contribute broodstocks for sea farms.

Alaska's first experience with mariculture in[illegible]l the experimental culture of oysters near Ketchikan in the early 1900s. There now are a handful of active oyster farms in Southeast and Prince William Sound.

Blue mussels also have been successfully cultured at Halibut Lagoon in Kachemak Bay. Juvenile mussels are collected from the wild and grown on longlines or from rafts.

The State of Alaska recently entered into an agreement with the Japanese Overseas Fishery Cooperation Foundation to test the feasibility of collecting and farming weathervane scallop on Kodiak Island, and the growing of giant kelp (*Macrocystis*) at Sitka. The scallop project involves several private "cooperators" who will conduct operations at various locations around the island.

The state also is cooperating in a National Marine Fisheries Service experimental project to examine the biological feasibility of farming salmon on Baranof Island in Southeast. Growth performance during the experiments suggests that six to nine pound (market range of most farmed salmon) chinook salmon can be produced in three seasons.

Interest in mariculture has been growing in Alaska over the past few years. When a diverse group of Alaskans examined issues related to mariculture for the state in early 1986 it supported immediate development of farming operations for shellfish and aquatic plants. Voicing concern about the potential socio-economic impacts upon Alaska's important fishing industry, the group suggested that market impacts of farmed salmon be more closely examined before allowing the pen-rearing of finfish.

POLICY ISSUES RELATED TO MARICULTURE DEVELOPMENT

Legal/Regulatory Status—The legal status of mariculture in Alaska is uncertain. While it is now possible to obtain a fish farming license, changes in state law or passage of new regulations would be necessary before individuals could engage in most mariculture activities. The only clear existing permitting process currently available is for the farming of oysters. However, it is possible to obtain permits to commercially harvest some juvenile native species and to grow them to a commercial size. State law prohibits state and private non-profit salmon hatcheries from selling surplus eggs to fish farmers.

Disease and Genetics—Some concern has been expressed that mariculture could result in the spread of disease to wild stocks. However, a 1986 study prepared for the University of Washington said there is no evidence to indicate this has ever occurred. "While fish held in culture are likely to show more frequent appearance of disease than wild fish," the study said, "disease does not appear to be transmitted to wild populations." Similarly, the study said, there is no evidence to support concerns that escapes of cultured organisms will lead to interbreeding with wild stocks and cause genetic problems.

The State of Alaska has taken a cautious approach on disease and genetic issues in development of Alaska's ocean ranching program, and this is likely to continue with mariculture. Sea farming activities will fall under the state's disease and genetic policies.

Environmental Effects—Mariculture operations appear to have a small effect on water quality beyond the immediate vicinity of the culturing facilities. Potential problems would be posed only in areas of extremely limited flushing action (tides or currents) or if culture density was very great.

Concerns also have been voiced about sedimentation under floating mariculture facilities. Shellfish culture generates relatively small amounts of solid waste, while salmon farming can produce fairly large quantities of unutilized feed and feces which settle to the bottom. This sedimentation can result in major changes to the ocean floor. However, the materials are deposited in the immediate vicinity of the culturing facility and the effects are localized.

Sedimentation and water quality issues can be addressed with the use of siting criteria to ensure proper flushing action. Mariculture operations will be monitored by state water quality enforcement programs and must comply with provisions of the federal Clean Water Act.

Use of Tidelands—Mariculture is one of many potential uses of Alaska's tidelands and adjacent uplands. A major factor in the tidelands permitting process in determining whether a site will be approved for sea farming is compatibility with existing uses. Siting of sea farms generally involves obtaining approval from at least the Departments

Leif Larson displays a shipment of oyster spat (an early life stage) at a farm near Wrangell.

of Natural Resources, Fish and Game and Environmental Conservation, Environmental Protection Agency and Army Corps of Engineers.

Brood Stocks—The initial growth of a mariculture industry will be shaped by availability of marine organisms in early life stages. In most mature mariculture industries, sea farmers purchase marine organisms in early life stages from hatcheries producing fish or shellfish with genetic characteristics adapted to farming conditions. However, some species, such as scallops and mussels, may depend upon continual access to wild stocks.

Acquisition of brood stocks for salmon farming would require changes in existing law. Access to wild stocks which support other important commercial fisheries also may require statutory or regulatory changes.

Capital Investments—As a general rule, the farming of shellfish requires a smaller front-end investment than the pen-rearing of salmon or other finfish. Many shellfish operations can be family-sized businesses, while most salmon farms have 3-10 employees. The economy of scale of mariculture operations in Alaska is unknown at this time. Japanese shellfish farmers achieve economy of scale through the use of cooperatives for processing, transportation and marketing.

Paralytic Shellfish Poisoning—Paralytic shellfish poisoning (PSP) is a serious health concern in many wild and farmed shellfish. The state requires that many species of shellfish be certified before sale. Farmed shellfish must be pulled out of the water and quarantined while samples are flown to a laboratory in Palmer for analysis prior to sale.

Tidelands Leasing—The state's current tidelands permitting process allows shellfish farmers to obtain one-year use permits. Long-term leases also may be obtained, but the surveying and appraisal process required is expensive and time consuming. The one-year permits do not provide farmers with the assurance that they will obtain the site in subsequent years and may not be used as security for loans.

Economic Impacts on Commercial Fisheries—Many commercial fishermen and processors are concerned about the impact of salmon farming on the world market price for salmon. A 1986 study by the University of Alaska's Marine Advisory Program concluded that salmon farming worldwide "may immediately impact only a small portion of the Alaskan salmon industry." However, the study went on to say, the growth of salmon farming throughout the world suggests these trends should be watched closely.

The Alaska Department of Commerce and Economic Develoment is gathering comments on mariculture development from various coastal communities for consideration by the 1987 legislature. During these "town hall" meetings, the department will present information outlining potential effects in Alaska from a range of mariculture development scenarios. Included in the report to the legislature will be an analysis of the potential impacts on existing salmon markets from additional Alaska supplies (wild and farmed sources) of chinook and coho salmon.