SB

482

~file 1~

SENATE COMMITTEE REPORT

FIRST COMMITTEE OF REFERRAL

Date of _____ 5-DAY NOTICE
IN ACCORDANCE WITH UNIFORM RULE 23

FURTHER: Finance

**FISCAL NOTE(S) ATTACHED _____ **
IN ACCORDANCE WITH AS 24.08.035
(see below)

2/24/88 DATE TURNED INTO OFFICE _____

Mr. President:

Resources Committee considered SB 482

farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of finfish in saltwater; efd

and recommended:

[X] replace with CS SB 482 [ ] same title [X] new title

[ ] attached amendment(s) and

[ ] do pass

[ ] do not pass

[ ] no recommendation

[ ] individual recommendations

[ ] further referral to _____

[ ] letter of intent adopted and attached

** Committee [X] attached or [ ] adopted fiscal note(s)
[ ] zero [X] fiscal impact

MEMBERS SIGNING DO PASS	OTHER RECOMMENDATIONS
Arliss Sturgulewski if amended	Steve Duncan – no Rec
Lyn Fanning if amended	Dick Eason " "
	Fred Zharoff " "
	Carl Trick No Rec

Chairman signature and recommendation DO PASS

[ ] Committee Backup Attached

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: SB 482
PUBLISH DATE: _____

FISCAL NOTE

REQUEST:

Revision Date: _____ Agency Affected: Commerce & Econ. Dev.
Title: Regarding farming of aquatic plants and animals; prohibiting farming/finfish/saltwater, e.d. BRU: Division of Business Development
Sponsor: Senator Eliason Components: _____
Requester: Senate Resources Committee

EXPENDITURES / REVENUES : (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
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:

FULLTIME	-0-	-0-	-0-	-0-	-0-	-0-
PART-TIME						
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary.)

Prepared by: Larry Merculieff, Director Phone: 465-2017
Division: Division of Business Development Date: March 9, 1988

Approved by Commissioner: J. Anthony Smith, Commissioner Date: March 9, 1988
Agency: Department of Commerce and Economic Development

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

1084D/030988a

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION CSSB 482
PUBLISH DATE: _____

FISCAL NOTE

REQUEST: _____

Revision Date: _____
Title: _____

Sponsor: _____
Requestor: _____

Agency Affected: Fish and Game
BRU: FRED

Components: FRED Division

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES		145.3	180.3	241.4	242.3	242.3
TRAVEL		13.3	14.3	17.3	24.3	27.3
CONTRACTUAL		2.4	2.4	3.4	5.4	9.4
SUPPLIES		2.6	4.6	6.6	10.6	22.6
EQUIPMENT				1.0	2.0	5.0
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING		163.6	201.6	269.7	284.6	306.6
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

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

ANALYSIS: (Attach a separate page if necessary)

Prepared by: Brian J. Allee, Director
Division: FRED
Phone: 465-4160
Date: March 9, 1988

Approved by Commissioner: _____
Agency: Department of Fish and Game
Date: March 9, 1988

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

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: SB 482
PUBLISH DATE: _____

FISCAL NOTE

REQUEST: _____

Revision Date: _____
Title: _____

Agency Affected: Fish and Game
BRU: FRED

Sponsor: _____
Requestor: _____

Components: FRED Pathology

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES	-	28.0	62.0	106.0	106.0	106.0
TRAVEL		1.0	2.0	5.0	12.0	15.0
CONTRACTUAL		1.0	1.0	2.0	4.0	8.0
SUPPLIES			2.0	4.0	8.0	20.0
EQUIPMENT				1.0	2.0	5.0
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING		30.0	67.0	118.0	132.0	154.0

CAPITAL						

REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

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

ANALYSIS: (Attach a separate page if necessary)

Adds Clerk IV in FY 89
Adds Microbiologist II in FY 90
Adds Fish Pathologist II in FY 91

Prepared by: _____ Phone: 465-4160
Division: _____ Date: _____

Approved by Commissioner: _____ Date: _____
Agency: _____

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

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: SB 482
PUBLISH DATE: _____

FISCAL NOTE

REQUEST: _____

Revision Date: _____
Title: _____

Agency Affected: Fish and Game
BRU: FRED

Sponsor: _____
Requestor: _____

Components: FRED Mariculture

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES		51.6	51.6	61.4	69.6	69.6
TRAVEL		7.3	7.3	7.3	7.3	7.3
CONTRACTUAL		1.4	1.4	1.4	1.4	1.4
SUPPLIES		0.6	0.6	0.6	0.6	0.6
EQUIPMENT		0	0	0	0	0
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING		70.9	60.9	70.7	78.9	78.9
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary)

Prepared by: _____
Division: _____

Phone: 465-4160
Date: _____

Approved by Commissioner: _____
Agency: _____

Date: _____

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

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: SB 482
PUBLISH DATE: _____

FISCAL NOTE

REQUEST: _____

Revision Date: _____
Title: _____

Agency Affected: Fish and Game
BRU: FRED

Sponsor: _____
Requestor: _____

Components: PNP/FRED Permitting

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES		55.7	66.7	74.0	66.7	66.7
TRAVEL		5.0	5.0	5.0	5.0	5.0
CONTRACTUAL						
SUPPLIES		2.0	2.0	2.0	2.0	2.0
EQUIPMENT						
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING		62.7	73.7	81.0	73.7	73.7
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME						
PART-TIME						
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary)

Prepared by: _____ Phone: 465-4160
Division: _____ Date: _____

Approved by Commissioner: _____ Date: _____
Agency: _____

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

During the legislative interim, the Alaska Department of Fish and Game (ADF&G) Commissioner's Office has chaired a multi-agency work group, including the Departments of Natural Resources, Environmental Conservation, Commerce and Economic Development, and the Division of Governmental Coordination of the Governor's Office. Through work group interaction, ADF&G has more clearly defined technical and permitting responsibilities mandated by proposed mariculture legislation and in relation to those of other agencies. The ADF&G fiscal note reflects the most realistic and accurate analysis of the costs of these responsibilities that is possible at this time.

Establishing the shellfish mariculture permitting system has allowed for assessment of needs for permitting personnel. A range I6 research analyst position would perform the professional review function for permits. A Clerk V would provide system support, including computerized tracking, routine review closeout, letters of acknowledgement, accepting fees, and processing permits.

In the fiscal note for the previous mariculture legislation (87-88), the role of technical services was not clear. Lacking a clear sense of what tasks would be involved, no funding was identified. After a year of experience in dealing with farms and farmers and in studying the situation in other states and provinces, it is clear that the following are necessary:

1. A biologist/administrator in Juneau to serve as program leader. This position will deal with the public, other agencies, answer requests, and develop the program.

2. A biologist, under the program leader's direction, to assure biological and environmental suitability of proposed projects, and confirm that the potential farmer will be capable of operating the farm in a way that will realize benefit to the state while protecting natural stocks.

3. Technician time so that our local area biologists can be freed up to deal with projects out of the local offices. Area biologists will be the prime contact with real and potential farmers.

The pathology laboratory will need to add staff to handle the paperwork associated with stock transfers, disease screening of stocks involved with shellfish, plant, and freshwater fish farming, and site inspections and delivery of fish health services to the farmers. The additional staff would include a Clerk IV, a Microbiologist, and a Pathologist. These positions must be added quickly because passage of this law will precipitate additional work immediately.

	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
Previous		168	202	269	385	--
New Pathology		30	67	118	132	154
Permitting		62.7	73.7	81	73.7	73.7
Technical		70.9	60.9	70.7	78.9	78.9
TOTAL		163.6	201.6	269.7	284.6	306.6

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: CS SB 482
PUBLISH DATE: _____

FISCAL NOTE

REQUEST:

Revision Date: 4/14/88
Title: Act relating to the farming of aquatic plants and aquatic animals
Sponsor: Senate Resources
Requestor: _____

Agency Affected: Fish and Game
BRU: FRED

Components: FRED Division
Permitting and Technical Services

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES		145.3	194.3	267.4	268.3	268.3
TRAVEL		13.3	14.3	17.3	24.3	27.3
CONTRACTUAL		2.4	2.4	3.4	5.4	9.4
SUPPLIES		2.6	4.6	6.5	10.6	22.6
EQUIPMENT				1.0	2.0	5.0
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING		163.6	215.6	295.7	310.6	332.6
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND						
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME	0	3	4	5	5	5
PART-TIME		2	2	2	2	2
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary)

See attached.

Prepared by: Brian J. Allee, Director Phone: 465-4160
Division: FRED Date: April 27, 1988

Approved by Commissioner: _____ Date: April 27, 1988
Agency: Department of Fish and Game

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

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2. A biologist, under the program leader's direction, to assure biological and environmental suitability of proposed projects, and confirm that the potential farmer will be capable of operating the farm in a way that will realize benefit to the state while protecting natural stocks.

3. Technician time so that our local area biologists can be freed up to deal with projects out of the local offices. Area biologists will be the prime contact with real and potential farmers.

The pathology laboratory will need to add staff to handle the paperwork associated with stock transfers, disease screening of stocks involved with shellfish, plant, and freshwater fish farming, and site inspections and delivery of fish health services to the farmers. The additional staff would include a Clerk IV, a Microbiologist, and a Pathologist. These positions must be added quickly because passage of this bill will precipitate additional work immediately.

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: SB 482 (Resources)
PUBLISH DATE: _____

FISCAL NOTE

REQUEST:

Revision Date: _____
Title: Aquatic Farming

Sponsor: Resource Committee
Requestor: Senator Eliason

Agency Affected: Natural Resources
BRU: Land and Water Management
Parks and Outdoor Recreation
Components: _____

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES	-	144.0	270.0	385.0	385.0	429.0
TRAVEL	-	8.0	10.0	12.0	12.0	13.0
CONTRACTUAL	-	8.0	10.0	12.0	12.0	13.0
SUPPLIES	-	1.0	2.0	3.0	3.0	4.0
EQUIPMENT	-	-	-	-	-	-
LAND & STRUCTURES	-	-	-	-	-	-
GRANTS, CLAIMS	-	-	-	-	-	-
MISCELLANEOUS	-	-	-	-	-	-
TOTAL OPERATING	-	161.0	292.0	412.0	412.0	459.0
CAPITAL	-	-	-	-	-	-
REVENUE	-	45.0	110.0	165.0	185.0	175.0

FUNDING: (Thousands of Dollars)

GENERAL FUND	-	161.0	292.0	412.0	412.0	459.0
FEDERAL FUNDS	-	-	-	-	-	-
OTHER	-	-	-	-	-	-
TOTAL	-	161.0	292.0	412.0	412.0	459.0

POSITIONS:

FULL-TIME	-	2	3	6	6	7
PART-TIME	-	2	5	4	4	4
TEMPORARY	-	-	-	-	-	-

ANALYSIS: (Attach a separate page if necessary)

Prepared by: Paula Burgess/ Phone: 465-3400
Division: Land and Water Management Date: 3/7/88

Approved by Commissioner: _____ Date: 3/9/88
Agency: Natural Resources

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

Position Title	No. of Positions	Range/Step	Barg. Unit
.Natural Resource Officer II	1	16	GGU

Time Status	Staff Months	Location	Election District
Fulltime	12	Juneau	

Type of Expenditure		Amount
1	2	3
Salary	33.0	
Benefits	11.0	
Premium Pay		
Other		
Total Personal Services		44.0
Travel		2.0
Contractual		2.0
Commodities		1.0
Equipment		
Other		
Total Cost		49.0

Funding Source for Total Cost	
Federal Receipts 1002	
G. F. Match 1003	
General Fund 1004	49.0
GF Program Receipts 1005	
Other	

Justification

The adjudicator would process all permit and lease applications that were received by the Southeast Regional Office in Juneau. We estimate some 25 to 30 applications may be received the first year. In order to complete site inspections and compliance reports, monies are included under Travel and Contractual. This source of funds would also be used to hold the public hearing. The Southeast Regional Office is responsible for the entire panhandle.

Request For New Position

Agency: Natural Resources

BRU: Land and Water Management

Component: Land and Water Public Use

Revised Date

FY 89

Position Title	Natural Resource Officer II	No. of Positions	1	Range/Step	16	Barg. Unit	GGU
Time Status	Staff Months	Location		Election District			
Fulltime	12	Anchorage					

Type of Expenditure		Amount
1	2	3
Salary	33.0	
Benefits	11.0	
Premium Pay		
Other		
Total Personal Services		44.0
Travel		2.0
Contractual		2.0
Commodities		1.0
Equipment		
Other		
Total Cost		49.0

Funding Source for Total Cost		
Federal Receipts	1002	
G. F. Match	1003	
General Fund	1004	49.0
GF Program Receipts	1005	
Other		

Justification

The adjudicator would process all permit and lease applications that were received by the Southcentral Regional Office in Anchorage. We estimate some 25 to 30 applications may be received the first year. In order to complete site inspections and compliance reports, monies are included under Travel and Contractual. This Regional Office includes all of Prince William Sound, the Kodiak Island area, and the Aleutian Chain, Applications might be expected in any of these areas. This individual and this source of funds would also be used to hold public hearings.

Request For New Position

Agency: Natural Resources

BRU: Land and Water Management

Component: Land and Water Public Use

FY 89

Position Title	Appraiser	No. of Positions	1	Range/Step	18	Barg. Unit	GGU
Time Status	Staff Months	Location		Election District			
Halftime	6	Juneau					

Type of Expenditure		Amount
1	2	3
Salary	20.0	
Benefits	8.0	
Premium Pay		
Other		
Total Personal Services		28.0
Travel		2.0
Contractual		2.0
Commodities		
Equipment		
Other		
Total Cost		32.0

Funding Source for Total Cost		
Federal Receipts	1002	
G. F. Match	1003	
General Fund	1004	32.0
GF Program Receipts	1005	
Other		

Justification

SB 482 requires appraisal of all sites to be permitted (leases already require appraisal). State certified appraisers are, at a minimum, Range 18 employees. All application sites would require site inspection as well as inspection of comparables in order to complete the appraisal report. This half-time individual in the Southeast Regional Office would complete all appraisals for the 25 to 30 estimated applications that are expected.

Request For New Position

Agency: Natural Resources

BRU: Land and Water Management

Component: Land and Water Public Use

Revised Date 3/8/88

FY 89

ANALYSIS
SB 482

The fiscal note for SB 482 is based on an estimate of the number of new applications for tideland leases and permits that we might expect to receive over the next five years. All state agencies have used the same base estimates for their fiscal notes. SB 482 does not allow farming of finfish, so we assume zero finfish applications. The estimates are an extrapolation of existing trends in shellfish applications, assuming continued progress in those industries, an assumption that progress will be made in the farming of scallops, and that some experimentation may begin in the farming of sea vegetables. The total number of new applications of all types we estimate to be:

1989	1990	1991	1992	1993
50	75	100	75	75

In addition to the processing of new applications, we must budget for monitoring the permits and leases that are granted. For this purpose, we are assuming an approximate 25 percent success rate of the new applications after the first two years. (For the first two years we assume that all of the applications require some form of monitoring.) Under these assumptions, we would expect to see some 55 "successful" mariculture farms at the end of five years. ("Success" is defined here as a farm that is actually growing something in the water. No assumption is made about marketing of the product.)

In order to process and monitor the permits and leases, the Division of Land and Water Management (DLWM) will need one adjudicator in the Southeast Region, and one adjudicator in the Southcentral Region in the first year. In the second year, DLWM will need one additional adjudicator to be located where the need is the greatest (depending upon which region receives most of the new applications). By the third year DLWM will need two adjudicators in each of the two regions. By the fifth year DLWM will need one additional adjudicator, again to be located where the need is the greatest. (For the purpose of preparing the fiscal note, one of the additional positions is assumed to be in the Southeast Region, and one in the Southcentral Region.)

SB 482 requires appraisal of all permit and lease sites (in order to charge fair market value for the sites), and a reappraisal of all sites every five years. In order to complete the appraisals, DLWM will need a half-time appraiser in each of the two regional offices in the first year. By 1991 DLWM will need a full-time appraiser for each office.

By the second year DLWM will need one half-time contract administrator to handle the accumulation of two years of lease contracts, and one half-time surveyor in each region to review survey plats. We do not anticipate the need for contract administrators and surveyors to increase beyond these levels during the five year period covered by the fiscal note.

In order to avoid land speculation, it would be desirable to inspect permit and lease sites once a year. Some inspections can be combined with other field investigations or with the appraisers' site visit, and some may be performed under cooperative agreements with other agencies. SB 482 also states that the Commissioner may hold a public hearing to take oral testimony. Given the controversial nature of many mariculture proposals, we can expect frequent requests for public hearings in nearby communities. A lean inspection program, plus the holding of public hearings, will cost the department $8,000 for each adjudicator the first year (travel, contractual, and per diem). Each half-time appraiser will require an additional $8,000 the first year to determine fair market value of the sites. (The cost of the appraiser could be reduced if evaluation statement were accepted in place of a full appraisal.)

The Division of Parks and Outdoor Recreation (DPOR) is responsible for adjudicating mariculture applications within park boundaries. DPOR anticipates receiving additional applications for mussel farming in Kachemak Bay over the next few years (11 permits have already been granted within the park on an experimental basis). By 1991 DPOR will need a seasonal position to process mariculture applications and to complete field inspections, as well as incidental marine supplies to operate the field equipment that currently exists.

Assuming the department receives fair market value for the number of permits and leases estimated above, some $45,000 in revenue might be generated the first year. As the industries begin to flourish, and sites are reappraised, the return to the state would be expected to increase.

POSITION SUMMARY

Fiscal Year '89

Two (2) - Natural Resource Officers II (Range 16)
Two (2) - Half-time Appraisers (Range 18)

Fiscal Year '90

Three (3) - Natural Resource Officers II (Range 16)
Two (2) - Half-time Appraisers (Range 18)
One (1) - Half-time Contract Administrator (Range 14)
Two (2) - Half-time Surveyors (Range 20)

Fiscal Year '91

Four (4) - Natural Resource Officers II (Range 16)
Two (2) - Appraisers (Range 18)
One (1) - Half-time Contract Administrator (Range 14)
Two (2) - Half-time Surveyors (Range 20)
One (a) - Seasonal Park Ranger (Range 16)

Fiscal Year '92

Four (4) - Natural Resource Officers II (Range 16)
Two (2) - Appraisers (Range 18)
One (1) - Half-time Contract Administrator (Range 14)
Two (2) - Half-time Surveyors (Range 20)
One (a) - Seasonal Park Ranger (Range 16)

Fiscal Year '93

Five (5) - Natural Resource Officers II (Range 16)
Two (2) - Appraisers (Range 18)
One (1) - Half-time Contract Administrator (Range 14)
Two (2) - Half-time Surveyors (Range 20)
One (a) - Seasonal Park Ranger (Range 16)

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: CCSB 482 (Resources)
PUBLISH DATE: _____

FISCAL NOTE

REQUEST:

Revision Date: 4/22/88
Title: Aquatic Farming

Sponsor: Resource Committee
Requestor: Senator Ellason

Agency Affected: Natural Resources
BRU: Land and Water Management
Parks and Outdoor Recreation
Components: _____

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES	-	88.0	214.0	273.0	273.0	317.0
TRAVEL	-	5.0	7.0	9.0	9.0	10.0
CONTRACTUAL	-	5.0	7.0	9.0	9.0	10.0
SUPPLIES	-	1.0	2.0	3.0	3.0	4.0
EQUIPMENT	-	-	-	-	-	-
LAND & STRUCTURES	-	-	-	-	-	-
GRANTS, CLAIMS	-	-	-	-	-	-
MISCELLANEOUS	-	-	-	-	-	-
TOTAL OPERATING	-	99.0	230.0	294.0	273.0	341.0
CAPITAL	-	-	-	-	-	-
REVENUE	-	27.5	40.0	59.5	57.0	70.0

FUNDING: (Thousands of Dollars)

GENERAL FUND	-	99.0	230.0	294.0	294.0	341.0
FEDERAL FUNDS	-	-	-	-	-	-
OTHER	-	-	-	-	-	-
TOTAL	-	99.0	230.0	294.0	294.0	341.0

POSITIONS:

FULL-TIME	-	2	3	4	4	5
PART-TIME	-	-	3	4	4	4
TEMPORARY	-	-	-	-	-	-

ANALYSIS: (Attach a separate page if necessary)

Prepared by: Paula Burgess
Division: Land and Water Management
Phone: 465-3400
Date: 4/22/88

Approved by Commissioner: Judith M. Brady
Agency: Natural Resources
Date: 4/25/88

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

Position Title	No. of Positions	Range/Step	Barg. Unit
Natural Resource Officer II	1	16	GGU

Time Status	Staff Months	Location	Election District
Fulltime	12	Juneau	

Type of Expenditure		Amount
1	2	3
Salary	33.0	
Benefits	11.0	
Premium Pay		
Other		
Total Personal Services		44.0
Travel		3.0
Contractual		2.0
Commodities		
Equipment		
Other		
Total Cost		49.0

Funding Source for Total Cost		
Federal Receipts	1002	
G. F. Match	1003	
General Fund	1004	49.0
GF Program Receipts	1005	
Other		

Justification

The adjudicator would process all permit and lease applications that were received by the Southeast Regional Office in Juneau. We estimate some 25 to 30 applications may be received the first year. In order to complete site inspections and compliance reports, monies are included under Travel and Contractual. This source of funds would also be used to hold the public hearing. The Southeast Regional Office is responsible for the entire panhandle.

Request For New Position

Agency Natural Resources

BRU Land and Water Management

Component Land and Water Public Use

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Natural Resource Officer II	1	16	GGU

Time Status	Staff Months	Location	Election District
Fulltime	12	Anchorage	

Type of Expenditure		Amount
1	2	3
Salary	33.0	
Benefits	11.0	
Premium Pay		
Other		
Total Personal Services		44.0
Travel		2.0
Contractual		3.0
Commodities		1.0
Equipment		
Other		
Total Cost		50.0

Funding Source for Total Cost	
Federal Receipts 1002	
G. F. Match 1003	
General Fund 1004	50.0
GF Program Receipts 1005	
Other	

Justification

The adjudicator would process all permit and lease applications that were received by the Southcentral Regional Office in Anchorage. We estimate some 25 to 30 applications may be received the first year. In order to complete site inspections and compliance reports, monies are included under Travel and Contractual. This Regional Office includes all of Prince William Sound, the Kodiak Island area, and the Aleutian Chain. Applications might be expected in any of these areas. This individual and this source of funds would also be used to hold public hearings.

Request For New Position

Agency: Natural Resources
BRU: Land and Water Management
Component: Land and Water Public Use

FY 89

ANALYSIS
CSSB 482

The fiscal note for CSSB 482 is based on an estimate of the number of new applications for tideland leases and permits that we might expect to receive over the next five years. All state agencies have used the same base estimates for their fiscal notes for shellfish and sea vegetables. The estimates are an extrapolation of existing trends in shellfish applications, assuming continued progress in those industries, an assumption that progress will be made in the farming of scallops, and that some experimentation may begin in the farming of sea vegetables. CSSB 482 does allow the farming of some types of finfish, so DNR has increased these estimates by five applications each year. The total number of new applications of all types we estimate to be:

1989	1990	1991	1992	1993
55	80	105	80	80

In addition to the processing of new applications, we must budget for monitoring the permits and leases that are granted. For this purpose, we are assuming an approximate 25 percent success rate of the new applications after the first two years. (For the first two years we assume that all of the applications require some form of monitoring.) Under these assumptions, we would expect to see some 60 "successful" mariculture farms at the end of five years. ("Success" is defined here as a farm that is actually growing something in the water. No assumption is made about marketing of the product.)

In order to process and monitor the permits and leases, the Division of Land and Water Management (DLWM) will need one adjudicator in the Southeast Region, and one adjudicator in the Southcentral Region in the first year. In the second year, DLWM will need one additional adjudicator to be located where the need is the greatest (depending upon which region receives most of the new applications). By the third year DLWM will need two adjudicators in each of the two regions. By the fifth year DLWM will need one additional adjudicator, again to be located where the need is the greatest. (For the purpose of preparing the fiscal note, one of the additional positions is assumed to be in the Southeast Region, and one in the Southcentral Region.)

By the second year DLWM will need one half-time contract administrator to handle the accumulation of two years of lease contracts, and one half-time surveyor in each region to review survey plats. We do not anticipate the need for contract administrators and surveyors to increase beyond these levels during the five year period covered by the fiscal note.

In order to avoid land speculation, it would be desirable to inspect permit and lease sites once a year. Some inspections can be combined with other field investigations, and some may be performed under cooperative agreements with other agencies. CSSB 482 also states that the Commissioner may hold a public hearing to take oral testimony. Given the controversial nature of many mariculture proposals, we can expect frequent requests for public hearings in nearby communities. A lean inspection program, plus the holding of public hearings, will cost the department $5,000 for each adjudicator the first year (travel, contractual, and per diem).

The Division of Parks and Outdoor Recreation (DPOR) is responsible for adjudicating mariculture applications within park boundaries. DPOR anticipates receiving additional applications for mussel farming in Kachemak Bay over the next few years (11 permits have already been granted within the park on an experimental basis). By 1991 DPOR will need a seasonal position to process mariculture applications and to complete field inspections, as well as incidental marine supplies to operate the field equipment that currently exists.

Assuming a resonable flat rate fee is set for the new permit, such as $250 per acre per year (with a $250 minimum), and assuming an average farm size of two acres, some $27,500 in revenue might be generated the first year.

POSITION SUMMARY

Fiscal Year '89

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

Fiscal Year '90

Three (3) - Natural Resource Officers II (Range 16)
One (1) - Half-time Contract Administrator (Range 14)
Two (2) - Half-time Surveyors (Range 20)

Fiscal Year '91

Four (4) - Natural Resource Officers II (Range 16)
One (1) - Half-time Contract Administrator (Range 14)
Two (2) - Half-time Surveyors (Range 20)
One (a) - Seasonal Park Ranger (Range 16)

Fiscal Year '92

Four (4) - Natural Resource Officers II (Range 16)
One (1) - Half-time Contract Administrator (Range 14)
Two (2) - Half-time Surveyors (Range 20)
One (a) - Seasonal Park Ranger (Range 16)

Fiscal Year '93

Five (5) - Natural Resource Officers II (Range 16)
One (1) - Half-time Contract Administrator (Range 14)
Two (2) - Half-time Surveyors (Range 20)
One (a) - Seasonal Park Ranger (Range 16)

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: SB 482
PUBLISH DATE: 2/24/88

FISCAL NOTE

REQUEST:

Revision Date: ---
Title: An Act relating to the farming of aquatic plants & aquatic animals:*
Sponsor: Resources Committee
Requestor: Resources Committee

Agency Affected: Environmental Conservation
BRU: Environmental Health
Components: Seafood Industry
Palmer Laboratory

prohibiting the aquatic farming of finfish in saltwater; and providing for an effective date.

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES	-0-	67.2	88.1	88.1	88.1	88.1
TRAVEL	-0-	15.0	15.0	15.0	15.0	15.0
CONTRACTUAL	-0-	7.0	8.5	8.5	8.5	8.5
SUPPLIES	-0-	3.0	13.0	13.0	13.0	13.0
EQUIPMENT	-0-	18.0	-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-	110.2	124.6	124.6	124.6	124.6
CAPITAL	-0-	-0-	-0-	-0-	-0-	-0-
REVENUE	-0-	-0-	-0-	-0-	-0-	-0-

FUNDING: (Thousands of Dollars)

GENERAL FUND	-0-	110.2	124.6	124.6	124.6	124.6
FEDERAL FUNDS	-0-	-0-	-0-	-0-	-0-	-0-
OTHER	-0-	-0-	-0-	-0-	-0-	-0-
TOTAL	-0-	110.2	124.6	124.6	124.6	124.6

POSITIONS:

FULL-TIME	-0-	1.0	2.0	2.0	2.0	2.0
PART-TIME	-0-	1.0	1.0	1.0	1.0	1.0
TEMPORARY	-0-	-0-	-0-	-0-	-0-	-0-

ANALYSIS: (Attach a separate page if necessary)

See Attachment.

Prepared by: Douglas C. Donegan, Director
Division: Environmental Health
Phone: 465-2609
Date: 3/11/88

Approved by Commissioner: Dennis D. Kelso ADK
Agency: Environmental Conservation
Date: 3/16

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

page ____ of ____

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: SB 482
PUBLISH DATE: 2/24/88

FISCAL NOTE

REQUEST:

Revision Date:
Title: An act relating to the farming of aquatic plants and aquatic animals:*
Sponsor: Resources Committee
Requestor: Resources Committee

Agency Affected: Environmental Conservation
BRU: Environmental Quality
Components: SERO, SCRO, WQM

*prohibiting the aquatic farming of finfish in saltwater; and providing for an effective date.

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES	--	74.7	74.7	99.6	99.6	99.6
TRAVEL	--	12.0	12.0	20.0	20.0	20.0
CONTRACTUAL	--	12.0	12.0	16.0	16.0	16.0
SUPPLIES	--	3.5	3.5	2.7	2.7	2.7
EQUIPMENT	--	2.0	2.0	1.5	1.5	1.5
LAND & STRUCTURES	--	--	--	--	--	--
GRANTS, CLAIMS	--	--	--	--	--	--
MISCELLANEOUS	--	--	--	--	--	--
TOTAL OPERATING	--	104.2	104.2	139.8	139.8	139.8
CAPITAL	--	--	--	--	--	--
REVENUE	--	--	--	--	--	--

FUNDING: (Thousands of Dollars)

GENERAL FUND	--	104.2	104.2	139.8	139.8	139.8
FEDERAL FUNDS	--	--	--	--	--	--
OTHER	--	--	--	--	--	--
TOTAL	--	104.2	104.2	139.8	139.8	139.8

POSITIONS:

FULL-TIME	--	--	--	1.0	1.0	1.0
PART-TIME	--	3.0	3.0	2.0	2.0	2.0
TEMPORARY	--	--	--	--	--	--

ANALYSIS: (Attach a separate page if necessary)

See Attachment

Prepared by:
Division: Environmental Quality
Phone: 465-2653
Date: 3/9/88

Approved by Commissioner: Dennis D. Kelso
Agency: Environmental Conservation
Date: 3/16

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

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SB 482 FISCAL NOTE ANALYSIS

The fiscal note includes funding for three functions at the Department of Environmental Conservation associated with development of mariculture projects. These are (1) regulation of sites and facilities to ensure that aquatic products are safe for human consumption; (2) testing of shellfish aquatic farm products for paralytic shellfish poisoning; (3) regulation of aquatic farm facilities to avoid unacceptable environmental impacts, particularly to water quality.

The two fiscal note forms break down costs by division. The first two functions identified above relate to the Division of Environmental Health. The third one is located within the Division of Environmental Quality.

This fiscal note relies upon the assumptions developed by the Interagency Working Group in aquatic farming for the numbers of facilities that would need to be permitted during the next several years. There are currently 50 permitted mariculture facilities in Alaska. The working group assumed that 75 new mariculture (non-salt water finfish) applications will be submitted within one year of passage of the legislation; 100 applications would be submitted the second year; 75 the third year; 75 the fourth year; and 60 the sixth year. It was further assumed that half of the applications would result in operating farms. These farms will need to be permitted and then monitored.

Division of Environmental Health

The Division of Environmental Health (DEH) will need one full time position in Sitka and one half time position in Juneau to develop regulations, monitor chemical use, provide technical assistance, collect samples for site certification, enforce labeling requirements and monitor levels of paralytic shellfish poison (PSP).

The Division will include examination for presence of heavy metals in its site certification process because of increasing concern over the propensity of shellfish to bioaccumulate heavy metals such as lead, mercury, cadmium, and arsenic. Several states, including Alaska, have initiated some testing of shellfish for heavy metals. The federal government may eventually require examination of sites for the presence of heavy metals as part of the National Shellfish Sanitation Program. DEH intends to incorporate this concern into its site certification process under the proposed legislation.

The Palmer laboratory will need 18.0 in non-recurring equipment funding to purchase a muffle furnace and a graphite furnace to conduct heavy metal analyses. Currently, the laboratory has limited ability to perform heavy metal analysis. The purchase of this equipment will allow the department to conduct heavy metals analysis without additional staff.

With the growth in the shellfish industry through the development of mariculture facilities comes a corresponding increase in the need for testing of shellfish for paralytic shellfish poisoning. Shellfish lots must be tested for PSP before they can be released into interstate commerce. The Department has a limited capacity to absorb additional testing. Beginning in FY 90, the fiscal note includes a part time environmental laboratory technician at the Palmer biological lab to handle the projected increase in the need for PSP testing. An additional $10,000 would be necessary for the purchase of mice used in the analysis for PSP. These costs do not result solely from the passage of this bill, as the requirements for PSP testing are already in place, but funding is needed to accomplish the testing that is projected to be needed.

Division of Environmental Quality

The Division of Environmental Quality (DEQ) must review proposals for mariculture facilities to ensure that they comply with air, land, and water quality regulations. DEC is also required to certify whether projects will comply with water quality standards as part of the federal permitting process. These reviews are conducted in the DEQ's regional offices. Currently, one position in each region is largely responsible for reviewing more than 200 projects per year. (Current low staffing levels require that some projects not be reviewed.) The projected workload for mariculture facilities would require additional staff in these offices to handle the increased workload. Otherwise, these projects will not receive adequate review.

Mariculture facilities have the potential to cause water quality problems through the discharge of feces and chemicals. While the concern is much less than it would be for finfish facilities, an additional workload will be created. The Department requests one half-time position in the Southeast Region and one half-time position in the Southcentral Region to handle the permitting and monitoring of these facilities for the first two years after passage of the legislation. After the third year, the position in Southeast Alaska would become full time to accommodate the increasing workload.

In making this request, the Department assumes that the siting criteria to be developed by the Department of Natural Resources will provide for separation of mariculture facilities from sewage discharges and from sources of runoff that may contain high levels of fecal coliform bacteria. Consequently, we assume that it will not be necessary for DEC to determine the precise zone of

impact of large numbers of sewage discharges. If this is not the case, then additional resources will be needed.

The proposed new positions would review mariculture project applications, participate in the coordinated consistency review process, inspect sites as needed, propose conditions needed to prevent water pollution, and perform other needed duties. Travel funds are requested for visits to some of the projected sites.

The Water Quality Management component in Juneau coordinates the Department's involvement in programs such as mariculture from a policy perspective. Funding for a part-time position in this component is requested to participate in inter-agency discussions, particularly including the development of siting guidelines and planning to address use conflicts and to assist in drafting regulations and procedures. This position would also research the experiences of other states and provinces concerning mariculture.

sb482.fis

Position Title	No. of Positions	Range/Step	Barg. Unit
Environmental Sanitarian II	1	16A	G

Time Status	Staff Months	Location	Election District
F	12	Sitka	3

Type of Expenditure		Amount
1	2	3
Salary	33.6	
Benefits	11.2	
Premium Pay	-0-	
Other	-0-	
Total Personal Services		44.8
Travel		10.0
Contractual		3.5
Commodities		1.5
Equipment		
Other		
Total Cost		59.8

Funding Source for Total Cost		
Federal Receipts	1002	-0-
G. F. Match	1003	-0-
General Fund	1004	59.8
GF Program Receipts	1005	-0-
Other		-0-

Justification

This position will develop regulations, monitor chemical use, provide technical assistance, collect samples for site certification, enforce labeling requirements and monitor levels of paralytic shellfish poison. The support funding will provide for an acceptable level of on-site inspecctions to in-product quality and safety.

Request For New Position

Agency: Environmental Conservation

BRU: Environmental Health

Component: Seafood Industry

Revised Date

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Environmental Sanitarian II	1	16A	G

Time Status	Staff Months	Location	Election District
P	6	Juneau	4

Type of Expenditure		Amount
1	2	3
Salary	16.8	
Benefits	5.6	
Premium Pay	-0-	
Other	-0-	
Total Personal Services		22.4
Travel		5.0
Contractual		3.5
Commodities		1.5
Equipment		-0-
Other		-0-
Total Cost		32.4

Funding Source for Total Cost		
Federal Receipts	1002	-0-
G. F. Match	1003	-0-
General Fund	1004	32.4
GF Program Receipts	1005	-0-
Other		-0-

Justification

This position will develop regulations, conduct plan reviews, provide technical assistance, conduct on-site inspections, and monitor product in transit for quality and wholesomeness. Support funding will provide for an acceptable level of on-site inspections and product quality monitoring.

Request For New Position

Agency: Environmental Conservation

BRU: Environmental Health

Component: Seafood Industry

Position Title	No. of Positions	Range/Step	Barg. Unit
Environmental Laboratory Technician	1	12A	G
Time Status F	**Staff Months** 12	**Location** Palmer	**Election District** 16

Type of Expenditure		Amount
1	2	3
Salary	15.0	
Benefits	4.4	
Premium Pay	1.5	
Other	-0-	
Total Personal Services		20.9
Travel		-0-
Contractual		1.5
Commodities		10.0
Equipment		18.0
Other		-0-
Total Cost		50.4
Funding Source for Total Cost		-0-
Federal Receipts 1002		-0-
G. F. Match 1003		-0-
General Fund 1004		50.4
GF Program Receipts 1005		-0-
Other		-0-

Justification

The increased workload for PSP testing will necessitate increasing PCN 7307 to permanent-full-time status in FY 90. This requested support funds will cover the increased cost for laboratory expendibles, and glassware involved in testing, communications and sample shipment and delivery. In FY 89, non-recurring equipment funds are needed to purchase a muffle furnace and a graphite furnace to conduct heavy metal analysis. At the present time, the Palmer Laboratory has limited ability to perform heavy metal analysis. The method in use is time-consuming and labor intensive. The purchase of this equipment will increase efficiency.

Request For New Position

Agency: Environmental Conservation
BRU: Environmental Health
Component: Palmer Laboratory

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Ecologist II	1	18/8	G

Time Status	Staff Months	Location	Election District
P	6	Juneau	4

Type of Expenditure		Amount
1	2	3
Salary	18.7	
Benefits	6.2	
Premium Pay		
Other		
Total Personal Services		24.9
Travel		2.0
Contractual		5.0
Commodities		.5
Equipment		1.0
Other		---
Total Cost		33.4

Funding Source for Total Cost		
Federal Receipts	1002	---
G. F. Match	1003	---
General Fund	1004	33.4
GF Program Receipts	1005	---
Other		---

Justification

This position is responsible for coordinating Department involvement in new water-related programs such as mariculture. This position will serve as a single point-of-contact for federal permitting (i.e. general permits from EPA likely), interagency review of mariculture project permits under CZM procedures, assistance in planning and siting functions, and assistance in drafting regulations in conjunction with DNR and ADF&G. This position will also research the experiences of other states and provinces concerning mariculture and assist in developing siting guidelines and criteria.

Request For New Position

Agency Environmental Conservation

BRU Environmental Quality

Component Water Quality Management

Revised Date

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Ecologist II	1	18/A	G

Time Status	Staff Months	Location	Election District
P	6	Anchorage	

Type of Expenditure		Amount
1	2	3
Salary	18.7	
Benefits	6.2	
Premium Pay		
Other		
Total Personal Services		24.9
Travel		5.0
Contractual		5.0
Commodities		1.5
Equipment		.0
Other		--
Total Cost		46.9

Funding Source for Total Cost		
		--
Federal Receipts	1002	--
G. F. Match	1003	--
General Fund	1004	46.9
GF Program Receipts	1005	--
Other		--

Justification

This position will review mariculture project applications, participate in consistency determinations, inspect sites during the permit process as needed, propose conditions needed to prevent water pollution at individual sites, inspect the mariculture facilities once they become operational, and follow-up on any monitoring required by permit conditions.

Request For New Position

Agency: Environmental Conservation

BRU: Environmental Quality

Component: SCRO

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Ecologist II	1	18/A	G

Time Status	Staff Months	Location	Election District
F	12	Juneau	4

Type of Expenditure		Amount
1	2	3
Salary	37.4	
Benefits	12.4	
Premium Pay		
Other		
Total Personal Services		49.8
Travel		5.0
Contractual		5.0
Commodities		1.5
Equipment		0
Other		-
Total Cost		79.3

Funding Source for Total Cost		--
Federal Receipts	1002	--
G. F. Match	1003	--
General Fund	1004	79.3
GF Program Receipts	1005	--
Other		--

Justification

This position will review mariculture project applications, participate in consistency determinations, inspect sites during the permit process as needed, propose conditions needed to prevent water pollution at individual sites, inspect the mariculture facilities once they become operational, and follow-up on any monitoring required by permit conditions.

Request For New Position

Agency Environmental Conservation

BRU Environmental Quality

Component SERO

FY 89

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: CSSB 482 (Resources)
PUBLISH DATE: 4/14/88

FISCAL NOTE

REQUEST:

Revision Date: _____
Title: An Act relating to the farming of aquatic plants and aquatic animals:*
Sponsor: Resources Committee
Requestor: Resources Committee

Agency Affected: Environmental Conservation
BRU: Environmental Quality
Components: SERO, SCRO, WOM

*prohibiting the aquatic farming of pacific salmon in saltwater; and providing for an effective date.

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES	--	74.7	74.7	99.6	99.6	99.6
TRAVEL	--	12.0	12.0	20.0	20.0	20.0
CONTRACTUAL	--	12.0	12.0	16.0	16.0	16.0
SUPPLIES	--	3.5	3.5	2.7	2.7	2.7
EQUIPMENT	--	2.0	2.0	1.5	1.5	1.5
LAND & STRUCTURES	--	--	--	--	--	--
GRANTS, CLAIMS	--	--	--	--	--	--
MISCELLANEOUS	--	--	--	--	--	--
TOTAL OPERATING	--	104.2	104.2	139.8	139.8	139.8
CAPITAL	--	--	--	--	--	--
REVENUE	--	--	--	--	--	--

FUNDING: (Thousands of Dollars)

GENERAL FUND	--	104.2	104.2	139.8	139.8	139.8
FEDERAL FUNDS	--	--	--	--	--	--
OTHER	--	--	--	--	--	--
TOTAL	--	104.2	104.2	139.8	139.8	139.8

POSITIONS:

FULL-TIME	--	--	--	1.0	1.0	1.0
PART-TIME	--	3.0	3.0	2.0	2.0	2.0
TEMPORARY	--	--	--	--	--	--

ANALYSIS: (Attach a separate page if necessary)

Prepared by: _____ Phone: 465-2653
Division: Environmental Quality Date: 4/28/88

Approved by Commissioner: Dennis D. Kelso Date: 4/28/88
Agency: Environmental Conservation

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

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: CSSB 482 (Resources)
PUBLISH DATE: 4/14/88

FISCAL NOTE

REQUEST:

Revision Date: --
Title: An Act relating to the farming of aquatic plants & aquatic animals;*
Sponsor: Resources Committee
Requestor: Resources Committee

Agency Affected: Environmental Conservation
BRU: Environmental Health
Components: Seafood Industry
Palmer Laboratory

prohibiting the aquatic farming of pacific salmon in saltwater; and providing for an effective date.

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES	0	67.2	88.1	88.1	88.1	88.1
TRAVEL	0	15.0	15.0	15.0	15.0	15.0
CONTRACTUAL	0	7.0	8.5	8.5	8.5	8.5
SUPPLIES	0	3.0	13.0	13.0	13.0	13.0
EQUIPMENT	0	18.0	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	110.2	124.6	124.6	124.6	124.6
CAPITAL	0	0	0	0	0	0
REVENUE	0	0	0	0	0	0

FUNDING: (Thousands of Dollars)

GENERAL FUND	0	110.2	124.6	124.6	124.6	124.6
FEDERAL FUNDS	0	0	0	0	0	0
OTHER	0	0	0	0	0	0
TOTAL	0	110.2	124.6	124.6	124.6	124.6

POSITIONS:

FULL-TIME	0	1.0	2.0	2.0	2.0	2.0
PART-TIME	0	1.0	1.0	1.0	1.0	1.0
TEMPORARY	0	0	0	0	0	0

ANALYSIS: (Attach a separate page if necessary)

Prepared by: Douglas C. Donegan, Director
Phone: 465-2609
Division: Environmental Health
Date: 4/28/88

Approved by Commissioner: Dennis D. Kelso
Date: 4/28/88
Agency: Environmental Conservation

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

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

CSSB 482 (RESOURCES) FISCAL NOTE ANALYSIS

The fiscal note includes funding for three functions at the Department of Environmental Conservation associated with development of mariculture projects. These are (1) regulation of sites and facilities to ensure that aquatic products are safe for human consumption; (2) testing of shellfish aquatic farm products for paralytic shellfish poisoning; (3) regulation of aquatic farm facilities to avoid unacceptable environmental impacts, particularly to water quality.

The two fiscal note forms break down costs by division. The first two functions identified above relate to the Division of Environmental Health. The third one is located within the Division of Environmental Quality.

This fiscal note relies upon the assumptions developed by the Interagency Working Group in aquatic farming for the numbers of facilities that would ne[illegible] to be permitted during the next several years. There are currently 50 permitted mariculture facilities in Alaska. The working group assumed that 75 new mariculture (non-salt water finfish) applications will be submitted within one year of passage of the legislation; 100 applications would be submitted the second year; 75 the third year; 75 the fourth year; and 60 the sixth year. It was further assumed that half of the applications would result in operating farms. These farms will need to be permitted and then monitored.

Division of Environmental Health

The Division of Environmental Health (DEH) will need one full time position in Sitka and one half time position in Juneau to develop regulations, monitor chemical use, provide technical assistance, collect samples for site certification, enforce labeling requirements and monitor levels of paralytic shellfish poison (PSP).

The Division will include examination for presence of heavy metals in its site certification process because of increasing concern over the propensity of shellfish to bioaccumulate heavy metals such as lead, mercury, cadmium, and arsenic. Several states, including Alaska, have initiated some testing of shellfish for heavy metals. The federal government may eventually require examination of sites for the presence of heavy metals as part of the National Shellfish Sanitation Program. DEH intends to incorporate this concern into its site certification process under the proposed legislation.

The Palmer laboratory will need 18.0 in non-recurring equipment funding to purchase a muffle furnace and a graphite furnace to conduct heavy metal analyses. Currently, the laboratory has limited ability to perform heavy metal analysis. The purchase of this equipment will allow the department to conduct heavy metals analysis without additional staff.

With the growth in the shellfish industry through the development of mariculture facilities comes a corresponding increase in the need for testing of shellfish for paralytic shellfish poisoning. Shellfish lots must be tested for PSP before they can be released into interstate commerce. The Department has a limited capacity to absorb additional testing. Beginning in FY 90, the fiscal note includes a part time environmental laboratory technician at the Palmer biological lab to handle the projected increase in the need for PSP testing. An additional $10,000 would be necessary for the purchase of mice used in the analysis for PSP. These costs do not result solely from the passage of this bill, as the requirements for PSP testing are already in place, but funding is needed to accomplish the testing that is projected to be needed.

Division of Environmental Quality

The Division of Environmental Quality (DEQ) must review proposals for mariculture facilities to ensure that they comply with air, land, and water quality regulations. DEC is also required to certify whether projects will comply with water quality standards as part of the federal permitting process. These reviews are conducted in the DEQ's regional offices. Currently, one position in each region is largely responsible for reviewing more than 200 projects per year. (Current low staffing levels require that some projects not be reviewed., The projected workload for mariculture facilities would require additional staff in these offices to handle the increased workload. Otherwise, these projects will not receive adequate review.

Mariculture facilities have the potential to cause water quality problems through the discharge of feces and chemicals. While the concern is much less than it would be for finfish facilities, an additional workload will be created. The Department requests one half-time position in the Southeast Region and one half-time position in the Southcentral Region to handle the permitting and monitoring of these facilities for the first two years after passage of the legislation. After the third year, the position in Southeast Alaska would become full time to accommodate the increasing workload.

In making this request, the Department assumes that the siting criteria to be developed by the Department of Natural Resources will provide for separation of mariculture facilities from sewage discharges and from sources of runoff that may contain high levels of fecal coliform bacteria. Consequently, we assume that it will not be necessary for DEC to determine the precise zone of

impact of large numbers of sewage discharges. If this is not the case, then additional resources will be needed.

The proposed new positions would review mariculture project applications, participate in the coordinated consistency review process, inspect sites as needed, propose conditions needed to prevent water pollution, and perform other needed duties. Travel funds are requested for visits to some of the projected sites.

The Water Quality Management component in Juneau coordinates the Department's involvement in programs such as mariculture from a policy perspective. Funding for a part-time position in this component is requested to participate in inter-agency discussions, particularly including the development of siting guidelines and planning to address use conflicts and to assist in drafting regulations and procedures. This position would also research the experiences of other states and provinces concerning mariculture.

Position Title	No. of Positions	Range/Step	Barg. Unit
Environmental Sanitarian II	1	16A	G
Time Status	**Staff Months**	**Location**	**Election District**
F	12	Sitka	3

Type of Expenditure		Amount
1	2	3
Salary	33.6	
Benefits	11.2	
Premium Pay	-0-	
Other	-0-	
Total Personal Services		44.8
Travel		10.0
Contractual		3.6
Commodities		1.5
Equipment		
Other		
Total Cost		59.8
Funding Source for Total Cost		-0-
Federal Receipts 1002		-0-
G. F. Match 1003		-0-
General Fund 1004		59.8
GF Program Receipts 1005		-0-
Other		-0-

Justification

This position will develop regulations, monitor chemical use, provide technical assistance, collect samples for site certification, enforce labeling requirements and monitor levels of paralytic shellfish poison. The support funding will provide for an acceptable level of on-site inspecctions to in-product quality and safety.

Request For New Position

Agency: Environmental Conservation
BRU: Environmental Health
Component: Seafood Industry

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Environmental Sanitarian II	1	16A	G

Time Status	Staff Months	Location	Election District
P	6	Juneau	4

Type of Expenditure		Amount
1	2	3
Salary	16.8	
Benefits	5.6	
Premium Pay	-0-	
Other	-0-	
Total Personal Services		22.4
Travel		5.0
Contractual		3.5
Commodities		1.5
Equipment		-0-
Other		-0-
Total Cost		32.4
Funding Source for Total Cost		-0-
Federal Receipts 1002		-0-
G. F. Match 1003		-0-
General Fund 1004		32.4
GF Program Receipts 1005		-0-
Other		-0-

Justification

This position will develop regulations, conduct plan reviews, provide technical assistance, conduct on-site inspections, and monitor product in transit for quality and wholesomeness. Support funding will provide for an acceptable level of on-site inspections and product quality monitoring.

Request For New Position

Agency: Environmental Conservation
BRU: Environmental Health
Component: Seafood Industry

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Environmental Laboratory Technician	1	12A	G
Time Status	**Staff Months**	**Location**	**Election District**
F	12	Palmer	16

Type of Expenditure		Amount
1	2	3
Salary	15.0	
Benefits	4.4	
Premium Pay	1.5	
Other	-0-	
Total Personal Services		20.9
Travel		-0-
Contractual		1.5
Commodities		10.0
Equipment		18.0
Other		-0-
Total Cost		50.4
Funding Source for Total Cost		-0-
Federal Receipts 1002		-0-
G. F. Match 1003		-0-
General Fund 1004		50.4
GF Program Receipts 1005		-0-
Other		-0-

Justification

The increased workload for PSP testing will necessitate increasing PCN 7307 to permanent-full-time status in FY 90. This requested support funds will cover the increased cost for laboratory expendibles, and glassware involved in testing, communications and sample shipment and delivery. In FY 89, non-recurring equipment funds are needed to purchase a muffle furnace and a graphite furnace to conduct heavy metal analysis. At the present time, the Palmer Laboratory has limited ability to perform heavy metal analysis. The method in use is time-consuming and labor intensive. The purchase of this equipment will increase efficiency.

Request For New Position

Agency: Environmental Conservation
BRU: Environmental Health
Component: Palmer Laboratory

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Ecologist II	1	18/A	G

Time Status	Staff Months	Location	Election District
F	12	Juneau	4

Type of Expenditure		Amount
1	2	3
Salary	37.4	
Benefits	12.4	
Premium Pay		
Other		
Total Personal Services		49.8
Travel		5.0
Contractual		5.0
Commodities		1.5
Equipment		0
Other		--
Total Cost		79.3
Funding Source for Total Cost		--
Federal Receipts 1002		--
G F Match 1003		--
General Fund 1004		79.3
GF Program Receipts 1005		--
Other		--

Justification

This position will review mariculture project applications, participate in consistency determinations, inspect sites during the permit process as needed, propose conditions needed to prevent water pollution at individual sites, inspect the mariculture facilities once they become operational, and follow-up on any monitoring required by permit conditions.

Request For New Position

Agency Environmental Conservation

BRU Environmental Quality

Component SERO

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Ecologist II	1	18/A	G

Time Status	Staff Months	Location	Election District
P	6	Anchorage	

Type of Expenditure		Amount
1	2	3
Salary	18.7	
Benefits	6.2	
Premium Pay		
Other		
Total Personal Services		24.9
Travel		5.0
Contractual		5.0
Commodities		1.5
Equipment		.0
Other		--
Total Cost		46.9

Funding Source for Total Cost		
		--
Federal Receipts	1002	--
G. F. Match	1003	--
General Fund	1004	46.9
GF Program Receipts	1005	--
Other		--

Justification

This position will review mariculture project applications, participate in consistency determinations, inspect sites during the permit process as needed, propose conditions needed to prevent water pollution at individual sites, inspect the mariculture facilities once they become operational, and follow-up on any monitoring required by permit conditions.

Request For New Position

Agency: Environmental Conservation
BRU: Environmental Quality
Component: SCRO

FY 89

Position Title	No. of Positions	Range/Step	Barg. Unit
Ecologist II	1	18/8	G

Time Status	Staff Months	Location	Election District
P	6	Juneau	4

Type of Expenditure		Amount
1	2	3
Salary	18.7	
Benefits	6.2	
Premium Pay		
Other		
Total Personal Services		24.9
Travel		2.0
Contractual		5.0
Commodities		.5
Equipment		1.0
Other		---
Total Cost		33.4

Funding Source for Total Cost	
Federal Receipts 1002	---
G. F. Match 1003	---
General Fund 1004	33.4
GF Program Receipts 1005	---
Other	---

Justification

This position is responsible for coordinating Department involvement in new water-related programs, such as mariculture. This position will serve as a single point-of-contact for federal permitting (i.e. general permits from EPA likely), interagency review of mariculture project permits under CZM procedures, assistance in planning and siting functions, and assistance in drafting regulations in conjunction with DNR and ADF&G. This position will also research the experience of other states and provinces concerning mariculture and assist in developing siting guidelines and criteria.

Request For New Position

Agency Environmental Conservation

BRU Environmental Quality

Component Water Quality Management

Revised Date

FY 89

CSSB 482 / SB 514

STATE OF ALASKA
1988 LEGISLATIVE SESSION

BILL VERSION: SB 482
PUBLISH DATE: 2/24/88

FISCAL NOTE

REQUEST:

Revision Date:
Title: Farming of Aquatic Plants and Animals -- Finfish Prohibition
Sponsor: Resources Committee
Requestor:

Agency Affected: Office of the Governor
BRU: Division of Governmental Coordination
Components:

EXPENDITURES/REVENUES: (Thousands of Dollars)

OPERATING	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
PERSONAL SERVICES		49.8	99.5	99.5	99.5	99.5
TRAVEL		2.0	4.0	4.0	4.0	4.0
CONTRACTUAL		3.0	4.0	2.0	2.0	2.0
SUPPLIES		0.5	1.0	1.0	1.0	1.0
EQUIPMENT		3.5	3.5			
LAND & STRUCTURES						
GRANTS, CLAIMS						
MISCELLANEOUS						
TOTAL OPERATING		58.8	112.0	106.5	106.5	106.5
CAPITAL						
REVENUE						

FUNDING: (Thousands of Dollars)

GENERAL FUND		58.8	112.0	106.5	106.5	106.5
FEDERAL FUNDS						
OTHER						
TOTAL						

POSITIONS:

FULL-TIME		1	1			
PART-TIME						
TEMPORARY						

ANALYSIS: (Attach a separate page if necessary)

See Attachment 1

Prepared by: Robert L. Grogan RLG
Division: Division of Governmental Coordination
Phone: 465-3562
Date: 3/8/88

Approved by Commissioner:
Date: 3/16/88
Agency: Office of the Governor

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

Attachment 1

Division of Governmental Coordination
Bill Analysis
SB 482

The Division of Governmnetal Coordination (DGC) currently provides assistance to applicants seeking state permits for their coastal development projects. DGC provides applicant preapplication services, establishes interagency project review schedules and comment deadlines, mediates proposed conditions which are disputed by the applicant or another state agency, and issues the conclusive state consistency determination for the project as required by AS 44.19.145(11).

Passage of SB 482 is expected to have an effect on the number of project proposals in Alaska's Southeast and Southcentral regions. The state's mariculture workgroup has projected the following number of shellfish and sea vegetables farm applications for the next five years:

FY 88	FY 89	FY 90	FY 91	FY 92	FY 93
30	50	75	100	75	75

This increase in number of project reviews, and the additional coordination needed to incorporate the Aquatic Farm Permit into each project review, requires the addition of two professional staff, Range 18, to be located in the effected regional offices.

Funding supporting these two individuals includes $2000 for travel to public meetings or site visits for controversial projects, approximately $1000 for annual phone bills and an initial $3000 contractual fee for PROFS hookup and associated setup costs. Each staff work area includes a desk, file cabinet, bookcase, computer table and a 3179 IBM Display Terminal.

csak88030801dmf

* SB 514 and SB 514 is anticipated to have a similar project and effect on the division.

5-1806La
Hein

A M E N D M E N T

Offered in the SENATE By Eliason

TO: CSSB 482 (Resources)

(3/14/88 draft)

Page 12, line 17:

Delete all material.

Insert the following material:

"* Sec. 16. AS 38.05 is amended by adding new sections to read:

Sec. 38.05.855. IDENTIFICATION OF SITES FOR AQUATIC FARMS AND HATCHERIES. (a) The commissioner, in consultation with the commissioner of fish and game, shall identify districts in the state within which sites may be selected for the establishment and operation of aquatic farms and related hatcheries required to have a permit under AS 16.40.100.

(b) The commissioner shall issue a call for nominations for each district identified under (a) of this section. A call for nominations shall invite interested persons and municipalities to identify sites within the district that are suitable for aquatic farms and related hatcheries.

(c) Based on comments received under (b) of this section, and after consultation with the commissioner of fish and game and the commissioner of environmental conservation, the commissioner shall make a preliminary written finding under AS 38.05.035(e) that proposes sites in each district for which permits may be issued under

AS 38.05.856.

(d) After notice is given under AS 38.05.945 and a hearing is held under AS 38.05.946(b), the commissioner shall issue a final written finding under AS 38.05.035(e) that identifies sites in each district for which permits may be issued under AS 38.05.856 and that specifies conditions and limitations for the development of each site."

Page 12, line 19, after "may":

Insert "by lottery"

Page 12, line 21:

Delete "appraised"

Page 12, line 22, after "site":

Insert "as established by a valuation statement"

Page 12, line 22:

Delete "reappraised"

Insert "established"

Page 12, line 25:

Delete "issuing or"

Page 13, line 3:

Delete "issuance or"

Page 13, line 6:

Delete "issuing or"

Page 13, line 9:

Delete "issuance or"

Page 13, after line 19:

Insert new bill sections to read:

"* Sec. 17. AS 38.05.945(a) is amended to read:

(a) This section establishes the requirements for notice given by the department for the following actions:

(1) classification or reclassification of state land under AS 38.05.300 and the closing of land to mineral leasing or entry under AS 38.05.185;

(2) zoning of land under applicable law;

(3) a decision under AS 38.05.035(e) regarding the sale, lease, or disposal of an interest in state land or resources; [AND]

(4) a competitive disposal of an interest in state land or resources after final decision under AS 38.05.035(e);

(5) a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries.

* Sec. 18. AS 38.05.946 is amended by adding a new subsection to read:

(b) The commissioner shall hold a public hearing in each district identified under AS 38.05.855 within 30 days after giving notice of a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries."

Renumber the following bill sections accordingly.

Page 13, line 23:

Delete "sec. 21"

Insert "sec. 23"

Page 13, line 27:

Delete "sec. 21"

Insert "sec. 23"

Page 14, line 9, before the first "permit":

Insert "of obtaining the"

Page 14, line 9, after the first "permit":

Insert "without participating in a lottery"

5-1806Lb
Hein

A M E N D M E N T

Offered in the SENATE By Eliason

TO: CSSB 482 (Resources)

(3/14/88 draft)

Page 12, line 17:

Delete all material.

Insert the following material:

"* Sec. 16. AS 38.05 is amended by adding new sections to read:

Sec. 38.05.855. IDENTIFICATION OF SITES FOR AQUATIC FARMS AND HATCHERIES. (a) The commissioner, in consultation with the commissioner of fish and game, shall identify districts in the state within which sites may be selected for the establishment and operation of aquatic farms and related hatcheries required to have a permit under AS 16.40.100.

(b) The commissioner shall hold a public hearing in each district identified under (a) of this section. At the hearing interested persons and municipalities may identify sites within the district that are suitable for aquatic farms and related hatcheries.

(c) Following a hearing under (b) of this section, the commissioner shall schedule a 60-day period during which a person may submit a preliminary application that identifies a site in the district for which the person wishes to be issued a permit under AS 38.05.856.

(d) Based on preliminary applications received under (c) of this section, and after consultation with the commissioner of fish and game

and the commissioner of environmental conservation, the commissioner shall make a preliminary written finding under AS 38.05.035(e) that proposes sites in each district for which permits may be issued under AS 38.05.856.

(e) After notice is given under AS 38.05.945 and a hearing is held under AS 38.05.946(b), the commissioner shall issue a final written finding under AS 38.05.035(e) that identifies sites in each district for which permits shall be issued under AS 38.05.856 and that specifies conditions and limitations for the development of each site."

Page 12, line 21:

Delete 'appraised"

Page 12, line 22, after "site":

Insert "as established by a valuation statement"

Page 12, line 22:

Delete "reappraised"

Insert "established"

Page 12, line 25:

Delete "issuing or"

Page 12, line 26, after "shall":

Delete all material through "that" on page 13, line 2

Insert "allow"

Page 13, line 3:

Delete "may"

Insert "to"

Delete "issuance or"

Page 13, line 6:

Delete "issuing or"

Page 13, line 9:

Delete "issuance or"

Page 13, after line 19:

Insert new bill sections to read:

"* Sec. 17. AS 38.05.945(a) is amended to read:

(a) This section establishes the requirements for notice given by the department for the following actions:

(1) classification or reclassification of state land under AS 38.05.300 and the closing of land to mineral leasing or entry under AS 38.05.185;

(2) zoning of land under applicable law;

(3) a decision under AS 38.05.035(e) regarding the sale, lease, or disposal of an interest in state land or resources; [AND]

(4) a competitive disposal of an interest in state land or

resources after final decision under AS 38.05.035(e);

(5) a public hearing under AS 38.05.855(b) or 38.05.856(c);

(6) a preliminary finding under AS 38.05.035(e) and 38.05.-855(d) concerning sites for aquatic farms and related hatcheries.

* Sec. 18. AS 38.05.946 is amended by adding a new subsection to read:

(b) The commissioner shall hold a public hearing in each district identified under AS 38.05.855 within 30 days after giving notice of a preliminary finding under AS 38.05.035(e) and 38.05.855(d) concerning sites for aquatic farms and related hatcheries."

Renumber the following bill sections accordingly.

Page 13, line 23:

Delete "sec. 21"

Insert "sec. 23"

Page 13, line 27:

Delete "sec. 21"

Insert "sec. 23"

PROPOSED AMENDMENT

Page 1, lines 6-9, delete title and replace with the following:

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of Pacific salmon in the marine environment and estuaries; and providing for an effective date."

Page 2, lines 18-26, delete, replace with following:

(d) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for the farming of, or hatchery operations involving

(1) Pacific salmon in the marine environment and estuaries;

(2) Atlantic salmon.

Justification

These amendments are designed to allow the upland farming of all finfish utilizing salt water.

This is critical to the success of many upland finfish farms as fresh water culture rules out the rearing of chinook salmon, black cod and other important marine species and the application of much technology now employed in hatchery operations in the production of viable broodstock. The use of salt water is even critical to salmon farms located in Interior Alaska where salt could be added to fresh water.

Important to consider is that upland farms would be required to treat discharges so there would be no difference between upland farms and ocean ranching hatcheries in terms of the chance of disease transference to wild stocks or significant sediment accumulations at outfalls.

There also is no chance of escapements of cultured stocks in upland farms, so wild stocks and the environment would not be affected by the use of salt water in upland farms. The impacts would be virtually identical to farms restricted to the use of fresh water.

PROPOSED AMENDMENT

Page 1, lines 6-9, delete title and replace with the following:

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of salmon in the marine environment and estuaries; and providing for an effective date."

Page 2, line 1:

hatchery operations involving, salmon in sea cages in the marine environment or estuaries [FINFISH IN SALTWATER].

Page 7, line 9, insert:

aquatic farm for the purpose of further growth or propagation[.];
(10) "salmon" means a fish of the genus oncorhynchus.

Justification

These amendments are designed to allow the farming of non-salmon finfish in sea cages, while prohibiting the pen-rearing of salmon. Since the controversy and all the objections have been strictly aimed at pen-rearing of salmon, it doesn't make any sense to prohibit the pen-rearing of rainbow trout, arctic char, black cod, or other non-salmon species of finfish. It is important to allow aquatic farmers to experiment with these species in sea cages, since capital and operating costs increase substantially with upland farming.

PROPOSED AMENDMENT

Page 1, lines 6-9, delete title and replace with the following:

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of finfish in the marine environment and estuaries; and providing for an effective date."

Page 2, line 1:
hatchery operations involving, finfish in sea cages in the marine environment or estuaries [FINFISH IN SALTWATER]. This prohibition does not affect the farming of finfish in land-based operations, including those utilizing saltwater pumped to shore.

Justification

These amendments are designed to allow the upland farming of all finfish utilizing salt water. This is critical to the success of many upland finfish farms as fresh water culture rules out the rearing of chinook salmon, black cod and other important marine species and the application of much technology now employed in hatchery operations in the production of viable broodstock. The use of salt water is even critical to salmon farms located in Interior Alaska where salt could be added to fresh water. Important to consider is that upland farms would be required to treat and screen discharges so there would be no chance of disease transference to wild stocks or significant sediment accumulations at outfalls. There also is no chance of escapements of cultured stocks in upland farms, so wild stocks and the environment would not be affected by the use of salt water in upland farms. The impacts would be virtually identical to farms restricted to the use of fresh water.

PROPOSED AMENDMENTS

Page 1, lines 6-9, delete title and replace with the following:

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; placing a moratorium until July 1, 1990, on the issuance or granting of licenses, permits, leases, or authorization for commercial salmon farming in marine waters or estuaries; establishing an Alaska Salmon Task Force; and providing for an effective date."

Page 1, line 11, add new Sections 1-3, renumber accordingly:

* Section 1. FINDINGS AND POLICY. (a) The legislature finds that

(1) aquatic farming in the state would provide a consistent source of quality food, provide new jobs, increase state exports, create new business opportunities, and increase the stability and diversity of the state's economy; and

(2) development of aquatic farming in the state would increase the availability of fresh seafood to Alaskans and would strengthen the competitiveness of Alaska seafood in the world marketplace by broadening the diversity of products and providing year-round supplies of premium quality seafood; and

(3) the pricipal responsibility for development of aquatic farming in the state rests with the private sector.

(b) It is the policy of the state

(1) to encourage the establishment and responsible growth of an aquatic farming industry in the state;

(2) that allocation of aquatic farming sites be compatible with established and ongoing beneficial activities in an area; and

(3) that a state policy on the farming of salmon in sea cages be made in a careful manner that fully considers the potential impact on Alaska's seafood industry.

* Sec. 2. SALMON FARMING MORATORIUM. (a) The following licenses, permits, leases, or authorizations may not be issued or granted for the construction or operation of commercial salmon farms in marine waters or estuaries:

[INSERT (1)-(8) ON PAGE 1, LINES 16-24, FROM SB 297.]

(b) This moratorium does not affect the farming of salmon in land-based operations, including those utilizing saltwater pumped to shore.

[NEED EFFECTIVE DATE CLAUSES FOR THE MORATORIUM.]

* Sec. 3. ALASKA SALMON TASK FORCE. (a) The legislature finds that the farming of salmon in sea cages has raised a series of socio-economic, biological and environmental issues requiring an in-depth examination.

(b) The Alaska Salmon Task Force is established to examine to study the issue and make a report of findings for administrative and legislative consideration. The governor shall appoint a five-member task force composed of Alaska residents representing a broad spectrum of expertise, including one representative of commercial salmon

fishermen, one salmon farming advocate, one private economist, one fisheries biologist and one public member with no involvement in the seafood or aquatic farming industry. The fisherman and aquatic farming representatives shall be non-voting members.

(c) The task force shall submit to the legislature, not later than January 30, 1989, a report examining the following issues:

(1) Whether the sea cage farming of Pacific salmon can be conducted in a manner that protects the health of Alaska's salmon resources;

(2) Criteria for the siting of salmon farms in marine waters and estuaries to minimize land use conflicts and to protect the environment;

(3) Net economic costs and benefits of sea cage salmon farming in Alaska to Alaska residents, including jobs created for Alaska residents, tax revenues and indirect spinoffs, cost of state regulation and monitoring, and impacts on markets for salmon caught by the state's commercial fishing fleets;

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

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

Page 7, line 9, insert:

aquatic farm for the purpose of further growth or propagation[.];

(10) "salmon" means a fish of the genus oncorhynchus.

Justification

These amendments are designed to provide a process for fully resolving the pen-rearing of salmon issue. The time-certain moratorium and establishment of a task force to study the issue would ensure that the concerns of commercial fishermen are studied in depth and findings made available to the legislature in a timely manner for action and full public debate.

This process will prevent the debate over pen-rearing of salmon from dragging on over a period of years and becoming increasingly acrimonious, serving no purpose other than creating hard feelings that will take much time to heal. At the end of this process, the issue of pen-rearing can be voted up or down on its merits, and the results will be widely accepted by the Alaska public.

The best way to resolve this controversy is to implement a process designed to fully address the public policy concerns.

PROPOSED AMENDMENTS

Page 1, lines 6-9, delete title and replace with the following:

For an Act entitled: "An Act relating to the authorization of the farming of aquatic plants, shellfish and finfish; prohibiting the aquatic farming of Pacific salmon in the marine environment or estuaries; and providing for an effective date."

Page 1, line 29, add the following, renumber accordingly:

* Sec. 2. SALMON FARMING MORATORIUM. (a) The legislature finds that salmon farming offers great economic development potential, but also creates potential risks in terms of a threat to the state's important salmon fishing industry. The legislature finds it is necessary to fully analyze these benefits and risks before making a final decision on the pen rearing of salmon in the marine environment and estuaries.

(b) Before a final decision is made on the net pen rearing of Pacific salmon in the marine environment and estuaries, the legislature finds it is necessary to resolve the following:

(1) whether the net pen rearing of Pacific salmon can occur in the marine environment and estuaries without threatening Alaska's existing salmon runs;

(2) the impact of salmon farming on the marketability of salmon caught by Alaska's commercial fishing fleets;

(3) the net benefits to Alaska from salmon farming considering the cost of providing adequate protections for Alaska wild salmon resources and the environment.

(c) The commissioner of the department of fish and game shall not issue a permit authorized under AS 16.40.100 for the operation of a commercial aquatic farm or related hatchery rearing chinook, coho, sockeye, pink or chum salmon in net pens in the marine environment or estuaries. This restriction does not effect the farming of these species in

(1) a privately owned freshwater body that has no outlet to state waters; or

(2) a tank, ponds or other enclosed structures that may contain saltwater, but which is located upland from any body of saltwater.

(d) The commissioner of the department of fish and game shall prepare a report no later than August 30, 1988, analyzing the following:

(1) the impact of salmon farming in Norway, Puget Sound and British Columbia on natural salmon runs from disease outbreaks, infestations of parasites, and genetic effects of escaped farmed salmon;

(2) the history of Alaska's public and private salmon ranching program in dealing with disease and genetic impacts on natural runs;

(3) how disease and genetics policies now applied to Alaska's salmon ranching programs could have influenced the problems outlined in section (d)(1);

(4) the experience to date of the state-federal Cooperative Salmon Farming Research Station at Osprey Bay, Alaska, with fish health and escapements.

(e) The commissioner of the department of natural resources shall prepare a report no later than August 30, 1988, analyzing the following:

(1) the land use conflicts created in British Columbia and Puget Sound by the siting of salmon farms and other floating aquatic farming facilities, and how government agencies have responded;

(2) how Alaska's current tidelands siting programs could have changed the situations outlined in section (e)(1);

(3) comparison of the siting impacts of salmon farming in Alaska with other current uses of Alaska's public lands and tidelands.

(f) The commissioner of the department of environmental conservation shall prepare a report for the legislature no later than August 30, 1988, analyzing work by the State of Washington on a comprehensive environmental impact study for the siting of floating aquatculture facilities in Puget Sound.

(g) The governor shall appoint a task force composed of three Alaska residents representing a broad spectrum of expertise. A representative of the United Fishermen of Alaska and a representative of the Alaska Mariculture Association shall serve as non-voting members of the task force. The task force shall submit to the legislature, not later than January 30, 1989, a report examining the following:

(1) Whether the net pen farming of Pacific salmon in the marine environment and estuaries can be conducted in a manner that protects the health of Alaska's salmon resources;

(2) Criteria for the siting of salmon farms in marine waters and estuaries to minimize land use conflicts and to protect the environment;

(3) Net economic costs and benefits of net pen reared salmon in Alaska to Alaska residents, including jobs created for Alaska residents, tax revenues and indirect spinoffs, cost of state regulation and monitoring, and impacts on markets for salmon caught by the state's commercial fishing fleets;

(4) The cost of providing adequate regulation of net pen rearing to protect wild stocks, the environment, public health and existing beneficial uses of Alaska's coastal waters and land, and role of the private sector in providing pathological and other services; and

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

PROPOSED AMENDMENT

Page 2, line 20:

hatchery operations involving[, PACIFIC SALMON IN SALTWATER OR] Atlantic salmon.

[(E) THE COMMISSIONER MAY ISSUE A PERMIT UNDER THIS SECTION FOR THE FRESHWATER FARMING OF, OR FRESHWATER HATCHERY OPERATIONS INVOLVING, FINFISH OTHER THAN ATLANTIC SALMON ONLY IN A PRIVATELY OWNED FRESHWATER BODY THAT HAS NO OUTLET TO A STATE-OWNED BODY OF WATER.]

PROPOSED AMENDMENT

(d) Page 16, line 20, insert the following:

*Sec. 26. Section 2 of this Act is repealed July 1, 1989.

Justification

These amendments would replace language in SB 482 imposing an indefinite ban on the rearing of Pacific Salmon in saltwater with a one-year moratorium on the pen rearing of salmon. They also would establish criteria for making a final public policy decision on the pen rearing of salmon, direct state agencies to prepare reports on various issues to aid in the decision making process, and create a citizen task force to study several issues and report back to the legislature next session.

It is important to recognize that the issue of net pen rearing of salmon is nearly certain to resurface next year regardless of what decision the legislature makes this session. Consequently, it is in the state's best interest to implement a process that will lead to a well-informed public policy decision.

These amendments will ensure that the primary issues of concern regarding the pen rearing of salmon are studied in detail during the interim. This is vital since a large number of serious issues have been raised during the debate, and opponents of salmon farming have demanded some answers before any action is taken.

Questions such as the potential threat to Alaska's important salmon resources must be addressed in depth, and the net benefits to Alaska should be explored thoroughly before any final decision is made.

The potential economic benefits from salmon farming also are too large to be dismissed without serious consideration. For instance, some studies have said that salmon farming in Alaska could create between 2,000 and 4,000 new jobs, with a final payroll of $49 million to $90 million per year, based upon final sales of up to $300 million.

Under the amendment, the following issues would be identified as necessary to resolve before pen rearing could be authorized: (1) potential threat to wild stocks; (2) market impacts; and (3) net economic benefits.

ADFG, DNR and ADEC would be directed to complete reports on the issue by August 30 for consideration by a task force of three individuals appointed by the governor. Serving as ex-officio members would be representatives of the United Fishermen of Alaska and Alaska Mariculture Association.

The task force would be required to submit a report to the legislature by Jan. 30, 1989. The task force is designed to analyze factual information, without getting bogged down into making policy recommendations. This would help de-politicize the process. The task force would study the following: (1) biological and environmental impacts; (2) land use management; (3) net economic benefits; (4) cost to the state for providing necessary protections; and (5) strategies for improving the marketability of wild salmon.

PROPOSED AMENDMENT

Page 1, line 11, add new Sections 1-3, renumber accordingly:

* Section 1. FINDINGS AND POLICY. (a) The legislature finds that

(1) aquatic farming in the state would provide a consistent source of quality food, provide new jobs, increase state exports, create new business opportunities, and increase the stability and diversity of the state's economy; and

(2) development of aquatic farming in the state would increase the availability of fresh seafood to Alaskans and would strengthen the competitiveness of Alaska seafood in the world marketplace by broadening the diversity of products and providing year-round supplies of premium quality seafood.

(b) It is the policy of the state

(1) to encourage the establishment and responsible growth of an aquatic farming industry in the state; and

(2) that allocation of aquatic farming sites be compatible with established and ongoing beneficial activities in an area.

Justification

These findings and policies are important to demonstrate the state's commitment to mariculture development, while stressing that this new industry be developed in a manner that does not disrupt important existing uses of public lands and waters.

PROPOSED AMENDMENT

Page 1, line 27-28::

(2) that allocation of aquatic farming sites be made with full consideration of [MUST BE COMPATIBLE WITH] established and ongoing activities in an area.

Justification

DNR says the existing language in CSSB 482 (3/28/88 draft) could be construed to give existing land uses preference over mariculture. That wasn't the original intent of the language which was designed to stress that ongoing, beneficial uses of the tidelands will be fully considered during siting. The new language appears to fulfill that intent.

This amendment is critical since a preference would be akin to protections afforded subsistence over other takings of fish and wildlife. Except, in this case, the priority wouldn't just kick in when there's a resource scarcity; it would put mariculture in a permanent lower priority in site selection.

This could strangle all future growth of aquatic farms. No farmer could secure a tidelands permit for a site where some other uses occur, unless it can be demonstrated there will be no disruptions of that particular activity.

Such language would set a bad precedent in resource management if that interpretation is applied.

PROPOSED AMENDMENTS

Page 1, line 29, insert the following, renumber accordingly:

* Sec. 2. LAND MANAGEMENT REPORT REQUIRED. The commissioner of the department of natrual resources shall prepare a report to the legislature no later than January 30, 1989, detailing the department's implementation of AS 38.05.083 and AS 38.05.856. This report shall include

(a) numbers of applications received under AS 38.05.083 and AS 38.05.856, and number issued, according to type of aquatic farm product;

(b) restrictions attached to permits and leases;

(c) discussion of system the department has implemented for issuing leases and tideland and land use permits;

(d) level of public involvement in the issuance process;

(e) discussion of how the program has been working and the department's plans for modifications.

Page 13, lines 10-29 - Page 14, line 1, delete Section 17.

Justification

These amendments would remove the identification of sites for aquatic farms and direct DNR to prepare a report detailing its implementation of a similar system by policy. The report signals the legislature's intent to conduct oversight of the site selection process.

DNR has testified in favor of this approach, and says it opposes placement of the site identification process in statute. The agency has said it intends to implement a similar system by policy, but is concerned about the lack of flexibility involved with having such detail in law. Any slight modifications necessary to make the program work better would require new legislation.

DNR has pointed out that AS 38.05.855 appears to require the agency to hold a public hearing even if no preliminary applications are submitted or other interest in mariculture expressed in the district under consideration. This is one example of why greater flexibility is required and the policy approach is preferable.

The practical effect of adopting these amendments is to implement option four on the sheet of land use management strategies distributed earlier by Sen. Eliason. This would provide for broad public notice requirements on tideland and land use permit applications and renewals, but leaves a public hearing at the discretion of DNR.

The "option two" approach contained in CSSB 482 (3/28/88 draft) is strongly opposed by mariculture advocates. The process is cumbersome and appears to favor larger operations over small scale farmers who have fewer resources to fully participate in this process.

Farmers also object to the 60-day window for submitting tideland applications. This means that an applicant may have to wait 10 months at a time before the agencies will even consider the application. Once the process is set in motion, it may take months before a final decision is forthcoming because of the extensive public review and interagency coordination.

After the sites are finally identified, the applicant still must go through the tidelands i suance process. All of these are <u>in addition to</u> the existing coastal management program to which all other tidelands users are subject. This means farmers would have three layers of red tape to wade through before obtaining permission to farm, while other users, even those with much larger impacts on competing uses, have only one layer of permitting with which they must contend.

This whole process would result in mariculture being the most heavily regulated natural resource industry in Alaska and would discourage mariculture development. The committee should question whether such restrictive approaches are justifiable in light of the fact that mariculture accounts for only 50 of the total 2,400 tideland permits and leases now in effect. DNR has said it does not anticipate a surge of applications with passage of SB 482.

PROPOSED AMENDMENT

Page 2, lines 5-14, delete and replace with:

(1) the physical and biological characteristics of the proposed location must be suitable for the farming of the aquatic animal or plant proposed;

(2) the proposed farm may not unreasonably or adversely affect management of natural stocks, and must not require significant alterations in traditional fisheries or other existing uses of fish and wildlife resources;

(3) the proposed farm may not significantly affect fisheries, wildlife or their habitats in an adverse manner; and

(4) the proposed farm plans and staffing plans must demonstrate technical and operational feasibility.

Justification

Shellfish farmers are concerned that the criteria for issuance of permits laid out in SB 482 is too restrictive and would not allow flexibility by state agencies. The existing language in SB 482 could be interpreted to say that any degree of adverse impact will result in denial of a permit. This concern has been driven home by the fishing industry's current concerns about the absolute language in the Marine Mammal Protection Act which some environmental groups interpret as saying any taking of an endangered marine mammal could result in a total closure of that fishery.

The suggested replacement language is taken almost verbatim from pending shellfish farming regulations promulgated by ADFG.

PROPOSED AMENDMENT

Page 3, lines 4-9:

(2) the proposed farm may not unreasonably [OR ADVERSELY] affect management of natural stocks, and must not require significant alterations in traditional fisheries or other existing uses of fish and wildlife resources;

(3) the proposed farm may not significantly affect fisheries, wildlife or their habitats in an adverse manner; and

Justification

The existing language in CSSB 482 (3/28/88 draft) is too restrictive and would not allow flexibility by state agencies. The existing language in SB 482 could be interpreted to say that any degree of adverse impact will result in denial of a permit. This concern has been driven home by the fishing industry's current concerns about the absolute language in the Marine Mammal Protection Act which some environmental groups interpret as saying any taking of an endangered marine mammal could result in a total closure of that fishery.

The suggested replacement language is taken almost verbatim from pending shellfish farming regulations promulgated by ADFG and reflects the intent of Senator Zharoff's original language submitted for consideration.

PROPOSED AMENDMENT

Page 4, line 9:

hatchery required to have a permit under AS 16.40.100, Department of Fish and Game, or to sources outside the state.

Justification

This amendment has been requested by participants in the Kodiak scallop farming project who already have been getting calls from aquatic farmers and hatcheries in B.C. and California regarding potential out-of-state sales of scallop spat. Scallop spat fishermen want the flexibility to sell to out-of-state buyers if in-state markets are inadequate.

The language would allow individuals who gather broodstock for aquatic farms to sell animals or plants gathered from the wild to the State of Alaska or out-of-state buyers. These individuals may be aquatic farmers, but many will be spat fishermen or other gatherers who are not directly connected with farms, except in sales.

This amendment would allow sales to ADFG for purposes of common property seeding operations, enhancement projects, or research and economic development projects.

PROPOSED AMENDMENT

Page 3, line 12:

hatchery required to have a permit under AS 16.40.100, Department of Fish and Game, or to sources outside the state.

Justification

This amendment has been requested by participants in the Kodiak scallop farming project who already have been getting calls from aquatic farmers and hatcheries in B.C. and California regarding potential out-of-state sales of scallop spat. Scallop spat fishermen want the flexibility to sell to out-of-state buyers if in-state markets are inadequate.

This amendment also would allow sales to ADFG for purposes of common property seeding operations, enhancement projects, or research and economic development projects.

PROPOSED AMENDMENT

Page 4, line 21:

under this section upon finding that the proposed harvest will significantly disrupt

Justification

This amendment would provide more flexibility in brood stock acquistions from wild sources since it appears the existing language could result in a denial even if existing allocations are affected only an insignificant degree.

PROPOSED AMENDMENT

Page 4, line 27:

40.100, AS 16.10.400 - 16.10.470 or to the department of fish and game.

PROPOSED AMENDMENT

Page 5, line 17, insert new language and renumber subsequent sections accordingly:

Sec. 16.40.150. RELEASE OF CERTAIN FISH PROHIBITED. Stock may not be intentionally released into the public water of the state from a hatchery or aquatic farm required to have a permit under AS 16.40.100 without prior authorization from the commissioner. Such approved releases would be subject to appropriate disease and genetics standards developed by the department of fish and game.

Justification

These amendments would allow aquatic farm hatcheries to sell stock to private nonprofit ocean ranching hatcheries or to ADFG for use in enhancement programs. This could give the state and PNPs the option of contracting with private hatcheries for production of brood for ocean ranching or enhancement programs at lower costs than constructing new facilities. This could be particularly important for use in meeting the chinook enhancement goals in the U.S.-Canada salmon treaty, and could have application for a variety of other species such as king crab, abalone, black cod, arctic char, sheefish and rainbow trout. ADFG would continue to control disease and genetics concerns.

PROPOSED AMENDMENT

Page 4, line 27:

40.100, Department of Fish and Game or to sources outside the state.

Justification

This amendment was requested by oyster farmers who are interested in constructing an oyster hatchery and believe an essential component of feasibility is the ability to sell oyster spat, seed or eyed larvae to out-of-state buyers. ADFG has no problem with out-of-state sales.

This amendment also would allow hatcheries for indigeneous species to sell stock to ADFG for enhancement programs or other purposes.

PROPOSED AMENDMENT

Page 5, line 17, insert new language and renumber subsequent sections accordingly:

Sec. 16.40.150. RELEASE OF CERTAIN FISH PROHIBITED. Stock may not be intentionally released into the public water of the state from a hatchery or aquatic farm required to have a permit under AS 16.40.100 without prior authorization from the Department of Fish and Game. Such approved releases would be subject to appropriate disease and genetics standards developed by the department of fish and game.

Justification

This amendment would make it clear that releases of aquatic farm stocks are prohibited, while giving the state flexibility to enter into agreements with private hatcheries for for reseeding programs or enhancement purposes at costs much lower than that involved in operation of state-run facilities. This could apply to such species as king crab, abalone, sea urchins, trout or even salmon from hatcheries supplying upland farms. The species, of course, would have to pass ADFG disease and genetics specifications.

PROPOSED AMENDMENT

Page 5, line 22:

among stock or aquatic farm products of the permit holder within 48 hours after discovering the outbreak or incidence.

Justification

This language was suggested by Brian Allee with the FRED Division who believes that a reporting timeframe is preferable. This should not create a burden for aquatic farmers.

PROPOSED AMENDMENT

Page 5, line 24:

40.100, AS 16.10.400 - 16.10.470, an aquatic farm or related hatchery outside of the state, or to the department of fish and game.

PROPOSED AMENDMENT

Page 6, line 14, insert new language and renumber subsequent sections accordingly:

Sec. 16.40.150. RELEASE OF CERTAIN FISH PROHIBITED. Stock may not be intentionally released into the public water of the state from a hatchery or aquatic farm required to have a permit under AS 16.40.100 without prior authorization from the commissioner. Such approved releases would be subject to appropriate disease and genetics standards developed by the department of fish and game.

PROPOSED AMENDMENT

Page 2, lines 12-15:

that are used or reared at the hatchery or aquatic farm.[A HATCHERY THAT HOLDS A PERMIT UNDER THIS SECTION MAY SELL OR OFFER TO SELL BIVALVE SHELLFISH SPAT TO AN AQUATIC FARM OR RELATED HATCHERY OUTSIDE OF THE STATE.]

Justification

Amendment # 1 would allow aquatic farm hatcheries to sell stock to private nonprofit ocean ranching hatcheries, non-Alaska buyers, or to ADFG for use in enhancement programs.

This could give the state and PNPs the option of contracting with private hatcheries for production of brood for ocean ranching or enhancement programs at lower costs than constructing new facilities. This could be particularly important for use in meeting the chinook enhancement goals in the U.S.-Canada salmon treaty. Such contractual release programs have proven highly successful in Washington State. In fact, the Squaxin Island treaty Indian tribe conducts the state's most successful delayed release program under contract. The Squaxin releases account for up to 20 percent of the hatchery returns in Puget Sound. Squaxin fishermen caught 200,000 cohos worth $3 million as a direct result of the program in 1986. This was in addition to the contributions of the program to catches of Canadian commercial fishermen and Washington sport and commercial fishermen. The effort was counted as part of Washington's contribution to the U.S.-Canada treaty.

The amendment also would have application for a variety of other species such as king crab, abalone, black cod, arctic char, sheefish and rainbow trout.

The amendment also would authorize aquatic farm hatcheries to sell to out-of-state buyers which could be critical to the viability of private, for-profit hatcheries.

Amendment # 2 would make it clear that no stock raised at aquatic farm hatcheries can be released without the specific approval of ADFG, and that ADFG would have full authority over disease and genetics in any release program. This amendment would be important if contractual release programs are conducted.

Amendment # 3 removes language from CSSB 482 (3/28/88 draft) authorizing out-of-state sales of bivalve shellfish spat. This language would not be necessary if amendment #1 is adopted. In any case, the language allowing bivalve spat sales appears to conflict with AS 16.40.140 (a) on page 5, lines 21-24 which restricts hatchery sales to licensed, in-state aquatic farms and related hatcheries.

PROPOSED AMENDMENT

Page 6, lines 18-19:

aquatic farm and sold or offered for sale[FOR THE PURPOSE OF CONSUMPTION, OR KELP THAT IS CULTIVATED FOR USE IN DYES];

Justification

This amendment is necessary to allow development of a sea vegetable farming industry. Many forms of aquatic plants are raised primarily for non-consumptive or industrial uses. Existing lanugage restricting kelp useage to dyes is too restictive, as there are many other potential uses for aquatic plants. The language also could prohibit use of salmon skins for leather, or even the culturing of oysters for pearls.

PROPOSED AMENDMENT

Page 12, line 16, add new sections 14-15, renumber accordingly:

* Sec. 14. AS 16.10.420. is amended to read:

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 by 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, unless that person holds a permit issued under AS 16.40.100;

(4) no salmon be released by the hatchery before department approval, and, for the 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 releasd 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 hactehries authorized by permit to operate under AS 16.10.400 - 16.10.470, or AS 16.40.100;

(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

(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.

* Sec. 15. AS 16.10.450 is amended to read:

Sec. 16.10. 450. SALE OF SALMON AND SALMON EGGS BY HATCHERY. A hatchery operator who sells salmon retruning from the natural waters of the state, or sells salmon eggs to another hatchery operating under AS 16.10.400 - 16.10.470 or with a permit issued under 16.40.100, after utilizing the funds for reasonable operating costs, including debt retirement, expanding its facilities, salmon rehabilitation projects, fisheries research, or for costs of operating the qualified regional association for the area in which the hatchery is located, shall expend the remaining funds on other fisheries activites of the qualified regional association. Fish returning to hatcheries and sold for human consumption shall be of comparable quality to fish harvested by commercial fisheries in the area, and shall be sold at prices commensurate with the current market.

Justification

These amendments are designed to allow private nonprofit salmon ocean ranching hatcheries to sell surplus eggs to salmon farming operations allowed by SB 482. This does not require these sales, but merely allows the private nonprofit hatcheries the option of utilizing surplus eggs which currently are destroyed. This could create additional income sources for the PNPs which are facing mounting debt retirements from the state loan program.

This amendment also would make for more efficient utilization of our enhancement programs, since surplus eggs now are destroyed.

PROPOSED AMENDMENT

Page 9, line 8 -Page 10, lines 15, delete.

Justification

This section requires the labeling of all aquatic farms products. This is an unnecessary requirement that will result in unnecessary red tape and spending with no discernible benefits to the farmers or consumers. Oyster and mussel farmers question why they are going to have to label their products as aquatic farm products, particularly when there are no other Alaska sources except the farmed products. Market research suggests such labeling does not affect consumer decisions.

This section apparently is designed to ease the concern of salmon fishermen who fear confusion between farmed and "wild" salmon. If so, then the requirement should be limited to salmon which reduce the fiscal impact and red tape to aquatic farmers.

However, the committee should consider whether this requirement makes any sense and would be effective. If the purpose is to ensure buyers have the ability to differentiate between wild and aquatic farm products, it is important to determine who the legislature can reach through such requirements.

Nearly all farmers will sell to Alaska processors, or outside brokers, wholesalers, restaurants and supermarkets. If the farmer labels a box or tote of fish as "farm raised," that label will probably be discarded at its destination. Alaska cannot require these outside buyers to label the product. So the consumer will not be reached.

Meanwhile, the restaurant, supermarket, broker or wholesaler will always know whether the product is farmed raised or harvested in common property fisheries--labeling or no labeling.

In the case of the Alaska-based processor, the state can require the company to label shipment of farmed product, but the label will meet the same fate as described above once it leaves the state.

Of course, Alaska restaurants and supermarkets can be required to label farmed raised products, but this is unlikely to be very popular and would affect a small percentage of farmed product since in-state markets are very small.

In short, the labeling requirements will result in extra work for the farmer and a cost to the state for promulgating regulations and attempting to enforce them without any discernible benefits.

PROPOSED AMENDMENT

Page 9, lines 13-14, delete (D).

Justification

This section appears to require the labeling of all aquatic farms products. This is an unnecessary requirement that will result in unnecessary red tape and spending with no discernible benefits to the farmers or consumers. Oyster and mussel farmers question why they are going to have to label their products as aquatic farm products, particularly when there are no other Alaska sources except the farmed products. Market research suggests such labeling does not affect consumer decisions.

This section apparently is designed to ease the concern of salmon fishermen who fear confusion between farmed and "wild" salmon. If so, then the requirement should be limited to salmon which reduce the fiscal impact and red tape to aquatic farmers.

PROPOSED AMENDMENT

Page 11, line 22, add new sections 14-15, renumber accordingly:

* Sec. 14. AS 16.10.420. is amended to read:

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 by 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, unless that person holds a permit issued under AS 16.40.100;

(4) no salmon be released by the hatchery before department approval, and, for the 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 any proposed releasd 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 restruning 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 hactehries authorized by permit to operate under AS 16.10.400 - 16.10.470, or AS 16.40.100;

(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

(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.

* Sec. 15. AS 16.10.450 is amended to read:

Sec. 16.10. 450. SALE OF SALMON AND SALMON EGGS BY HATCHERY. A hatchery operator who sells salmon retruning from the natural waters of the state, or sells salmon eggs to another hatchery operating under AS 16.10.400 - 16.10.470 or with a permit issued under 16.40.100, after utilizing the funds for reasonable operating costs, including debt retirement, expanding its facilities, salmon rehabilitation projects, fisheries research, or for costs of operating the qualified regional association for the area in which the hatchery is located, shall expend the remaining funds on other fisheries activites of the qualified regional association. Fish returning to hatcheries and sold for human consumption shall be of comparable quality to fish harvested by commercial fisheries in the area, and shall be sold at prices commensurate with the current market.

Justification

These amendments are designed to allow private nonprofit salmon ocean ranching hatcheries to sell surplus eggs to salmon farming operations allowed by SB 482. This does not require these sales, but merely allows the private nonprofit hatcheries the option of utilizing surplus eggs which currently are destroyed. This could create additional income sources for the PNPs which are facing mounting debt retirements from the state loan program.

PROPOSED AMENDMENT

Page 12, lines 17-18:

hatchery operations[FOR NOT LESS THAN THE APPRAISED FAIR MARKET RENTAL VALUE OF THE SITE. THE VALUE SHALL BE REAPPRAISED EVERY FIVE YEARS].

Justification

Shellfish farmers object to this approach to valuing tidelands permits, since other tideland permit holders are not charged in the same manner. This appraoch also is likely to greatly increase the fiscal cost of tidelands permits since DNR would be required to conduct appraisals. This approach probably will result in higher costs to the farming operation, most of which already are extremely marginal businesses. If this is a desirable option it should be extended to all tidelands permits.

PROPOSED AMENDMENT

Page 13, line 4-5:

commissioner shall consider all relevant testimony submitted. [BASED OM THE TESTIMONY OR OTHER GOOD CAUSE, t] The commissioner may deny the application for issuance or renewal for good cause, but must provide the applicant

Justification

This amendment is designed to clear up some ambiguous language that could be interpreted to say applications or renewals could be denied strictly on the basis of adverse comments and nct for any good public policy reasons.

PROPOSED AMENDMENT

Page 13, lines 12:

ria for the approval or denial of permits under this section[AND FOR LIMITING THE NUMBER OF SITES FOR WHICH PERMITS MAY BE ISSUED IN AN AREA IN ORDER TO PROTECT THE ENVIRONMENT AND NATURAL RESOURCES OF THE AREA].

Justification

This would delete language requiring DNR to adopt culmulative impact regulations for aquatic farms. These kinds of requirements are extremely difficult for regulatory agencies and for the industry, and result in high regulatory costs in monitoring and determining appropriate levels of growth. On what basis would DNR determine culmulative environmental and biological impacts? Does the state possess adequate data on aquatic farming upon which such decisions could be based? It appears that significant research could be required before this could be implemented. Such provisions generally end up being tremendously burdensome for the agencies and invite lawsuits from anti-development organizations.

PROPOSED AMENDMENT

Page 13, line 17-25: delete all language in sections 18-19.

Justification

Sections 18-19 would impose a freeze on all aquatic farming licensing and permitting and issuance of tideland and land use leases for aquatic farming until regulations are fully implemented. This could take months, and would result in extensive delays for applicants. For example, ADFG started working on the shellfish farming regulations now pending not long after the 1987 session and those proposals were still pending final approval by the Department of Law on the first of March. Once released by DOL, another 30 day waiting period is required before the regulations are implemented. This process, to date, has taken about eight months. These kinds of delays can be very costly to an applicant.

PROPOSED AMENDMENT

Page 14, lines 2-5:

secs. 15 and 16 of this Act[, BUT AS A CONDITION OF OBTAINING THE LEASE OR PERMIT THE PERSON MUST AGREE THAT DURING THE TERM OF THE LEASE OR PERMIT THE PERSON WILL NOT EXPAND OPERATIONS BEYOND THE SCOPE ALLOWED UNDER THE EXISTING PERMIT].

Justification

This amendment would remove language that places restrictions on farmers who are grandfathered into the new permitting and leasing procedures that do not apply to new applicants. This could prevent a farmer from expansion or other changes necessary to make an oyster or mussel farm economically viable. Existing farmers should be free to negotiate lease terms with DNR in a manner similar to new applicants or other applicants for tidelands leases.

PROPOSED AMENDMENT

Page 14, lines 7-9, delete, renumber accordingly.

Justification

This section would not allow the state to issue a mariculture permit in tidelands or lands bordering a federally designated wilderness area when the designation was made before the effective date of this legislation.

The language appears to be aimed at eliminating substantial blocks of coastal Alaska for potential mariculture development. This may not pose a substantial problem for farmers since there have been no applications for sites bordering wilderness areas, and it seems unlikely there would be many in the future. And, even if there were, it seems unlikely that the permits would be issued, unless the federal government determined the permit would be consistent with the wilderness area's management plan.

However, this section appears to set a dangerous land use management precedent by relinquishing the state's management authority over its lands in favor of federal management. This appears to be a sovereignty issue more than anything else. The state fought very hard during statehood and throughout the (d)2 debate to gain that management control, and this bill would simply give up some of that control without the federal government even making the request.

PROPOSED AMENDMENT TO CSSB 482 (3/28/88 DRAFT)

Page 14, line 10-14:

er shall allow interested persons to submit written [AND ORAL] testimony concerning the renewal to the commissioner within 30 days after the date of the notice. The commissioner [SHALL] may hold a hearing to take testimony.

Justification

This amendment takes care of a drafting error pointed out by Senator Eliason. The new language makes a public hearing on a land use permit renewal optional at DNR's discretion.

PROPOSED AMENDMENT TO CSSB 482 (3/28/88 DRAFT)

Page 14, line 26 - page 15, line 3:

ria for the approval or denial of permits under this section[AND FOR LIMITING THE NUMBER OF SITES FOR WHICH PERMITS MAY BE ISSUED IN AN AREA IN ORDER TO PROTECT THE ENVIRONMENT AND NATURAL RESOURCES OF THE AREA. THE REGULATIONS MUST PROVIDE FOR THE CONSIDERATION OF UPLAND MANAGEMENT POLICIES AND WHETHER THE PROPOSED USE OF A SITE IS COMPATIBLE WITH THE TRADITIONAL AND EXISTING USES OF THE AREA IN WHICH THE SITE IS LOCATED].

Justification

This amendment removes language directing DNR to establish culmulative impact limitations for aquatic farm tideland permits. These kinds of requirements are extremely difficult for regulatory agencies and for the industry, and result in high regulatory costs in monitoring and determining appropriate levels of growth.

The committee should ask, on what basis would DNR determine culmulative environmental and biological impacts? Does the state possess adequate data on aquatic farming upon which such decisions could be based? It appears that significant research could be required before this could be implemented.

The committee also should consider whether such culmulative impact restrictions are placed on other industries in Alaska. What is the purpose of the section? How does mariculture differ from other industries in terms of impacts? Is this a dangerous precedent in resource management in Alaska? What would happen to these idustries if such restrictions were applied: placer mining, timber, oil and gas, fishing, tourism?

DNR, and officials in the timber and mining industries have expressed concern about this provision. Little wonder since such provisions generally end up being tremendously burdensome for the agencies and invite lawsuits from anti-development organizations.

PROPOSED AMENDMENT

Page 15, lines 15-17:

(5) a public hearing under AS 38.05.856(c)[;
(6) A PRELIMINARY FINDING UNDER AS 38.05.035(E) AND 38.05.855(C) CONCERNING SITES FOR AQUATIC FARMS AND RELATED HATCHERIES].

Page 15, lines 25-29, delete.

Justification

These amendments would eliminate requirements that broad public notice be issued for a preliminary finding under the site identification process. This would result in an unnecessary 30-day waiting period, since the following section also requires the same public notice process followed by a public hearing. A single noticing and public hearing during the site identification process should be sufficient, particularly since the actual application for a site also has to go through the existing coastal management program process.

The two sections also appear to be redundant.

PROPOSED AMENDMENT

Page 16, lines 2-10, delete sections ~~18-19~~ 22-23.

Justification

Sections 22-23 would impose a freeze on all aquatic farming licensing and permitting and issuance of tideland and land use leases for aquatic farming until regulations are fully implemented. This could take months, and would result in extensive delays for applicants.

For example, ADFG started working on the shellfish farming regulations now pending not long after the 1987 session and those proposals were still pending final approval by the Department of Law on the first of March. Once released by DOL, another 30 day waiting period is required before the regulations are implemented. This process, to date, has taken about eight months. These kinds of delays can be very costly to an applicant.

Besides, new shellfish farming regulations go into effect this month (April) and these should be sufficient to guide shellfish permitting during the interim. DNR has suggested that finfish and kelp farming be handled under written policies patterned after the existing shellfish regulations until the new regulations are complete.

STATE OF ALASKA
THE LEGISLATURE

POUCH Y STATE CAPITOL
JUNEAU, ALASKA 99811
907 465 3800

LEGISLATIVE AFFAIRS AGENCY

MEMORANDUM April 6, 1988

SUBJECT: Freshwater farming of finfish
(CSSB 482 (Resources)
(5-1806N, 3/28/88 draft))

TO: Senator Arliss Sturgulewski

FROM: Edward H. Hein
Legislative Counsel

You have asked several questions about proposed Sec. 16.40.100(e), at page 2, lines 22 - 26 of the draft CS. Your questions and my responses follow.

1. What is the definition of "privately owned freshwater body?" There is no definition. I presume that it means a body of water, either natural or artificial, that does not contain saltwater and that is not owned by the state or by the federal government.

2. How would this definition apply to a man-made pond, a naturally occurring pond, or a man-made structure such as a tank? All of these could be within the definition in number 1 above.

3. Would this section allow artificially created saltwater to be used in a pond or tank, as opposed to saltwater pumped from coastal waters? No. This is a continuing requirement that it be a freshwater body. Once saltwater is used, it is no longer a freshwater body.

4. What is the definition of a state-owned body of water? State-owned means a body of water within state limits that is not owned by the federal government, by a Native corporation, or by another private person.

5. How far does the restriction prohibiting the outlet of water to a state-owned body of water extend? For example, would an outfall into coastal saltwater be allowed? Would a

discharge into the ground that may eventually merge with a stream, river, or lake be allowed? Assuming that a fish farming operation had to change water in this privately owned freshwater body, under what circumstances could this be accomplished?

"No outlet to a state-owned body of water" means that the privately owned body of water is self-contained and does not flow directly into state-owned water. The purpose of the restriction, I presume, is to prevent fish from escaping from an aquatic farm or hatchery and swimming into state-owned water. Thus, drainages into groundwater and other sorts of discharges that do not allow for fish to travel into state-owned water would be allowed. All of this is a presumption on my part because I do not know precisely what the sponsor intended. The language is derived from Sec. 2, ch. 70, SLA 1987. I do not know precisely what the intent of that language was either. There may well be some ambiguity here. Other language might work better to achieve the sponsor's intent, depending on what that intent is.

6. Would a permit be allowed under this section for freshwater farming on public land? Yes, as long as it met the other requirements. For example, a freshwater tank could be located on state land as long as it doesn't flow into state-owned water.

If you have further questions about this matter, feel free to contact me at your convenience.

EHH:gc
WKG2:098

4.

(a) O.K.

(b) In approving a permit request consideration will be given to the compatibility of a proposed project with the traditional, historical or existing uses of an area.

(c) In approving a permit request consideration will be given to the upland management policies.

SB 482, 3/28/88

ALLOWED

1. Farms

   ° All shellfish

   ° All finfish except Pacific salmon in saltwater

   --Cod
   --Halibut
   --Steelhead
   --Arctic char
   --Sheefish
   --Trout
   --Coho (freshwater)
   --Chinook (freshwater)

   ° Sea vegetables

2. Hatcheries

   ° Shellfish

   ° Finfish

NOT ALLOWED

° Pacific salmon in saltwater

° Atlantic salmon

No Legislation

ALLOWED

1. Farms

   ° Shellfish

   ° Freshwater finfish in private ponds

   --Trout
   --Char
   --Sheefish
   --Coho
   --Chinook

NOT ALLOWED

1. Farms[1]

   ° Pacific salmon in saltwater

   ° All other saltwater

   --Cod
   --Halibut
   --Char
   --Steelhead

   ° Sea vegetables

2. Hatcheries (for-profit)

   ° Shellfish

   ° Finfish

[1]Farms for some or all may be legal, subject to approval by Board of Fisheries Court action could be expected depending on Board action.

Alaska State Legislature

SENATOR
ARLISS STURGULEWSKI
Chairman, Senate Community and Regional Affairs Committee
Vice-Chairman, Senate Judiciary Committee
Member, Senate Resources Committee

2957 SHELDON JACKSON STREET
ANCHORAGE, ALASKA 99508

While in Juneau
P. O. BOX V
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Senate

MEMORANDUM April 12, 1988

TO: All Members
Senate Resources Committee

FROM: Senator Arliss Sturgulewski

RE: SB 482 Aquatic Farming

Some confusion seems to have arisen over the land use management provisions in SB 482 since the last meeting of the Resources Committee. We have dealt with three draft committee substitutes, numerous amendments, and a five-page packet of land use options.

Given the large number of alternatives offered, it is not too surprising that some confusion exists.

For example, I was surprised to discover upon further examination that the amended bill now pending before this committee contains no provisions for a public notice of initial issuance of an aquatic farm tidelands permit. This needs to be corrected since renewals of tideland permits do fall under the broad public notice provisions.

Consequently, I have prepared an amendment (attached) that would require that initial issuance of a tideland or land use permit for aquatic farming come under full public scrutiny.

Some are maintaining that the amended version of SB 482 is weak and would not provide for adequate public involvement. It might be useful to examine what happens now when someone applies for a tideland permit, and what additional steps aquatic farmers face under this legislation.

Tidelands Permitting Now--All applications for a tidelands or land use permit now are noticed as part of the Army Corps of Engineers permit for structures placed in navigable waters. The notice covers the Department of Natural Resources (DNR) permit and the Department of Environmental Conservation's federal Clean Water Act requirements. The 30-day notice must be placed in a "newspaper of common distribution in the affected area."

Upon receipt of a request for a public hearing, the Division of Governmental Coordination in the Office of Management and Budget is

required to hold a hearing in the affected area only if it "finds that the request is based on concerns not already addressed in the review."

Requirements of Aquatic Farms under SB 482--Should the committee adopt my attached amendment, SB 482 would require the issuance or renewal of an aquatic farm permit (a temporary use permit) be noticed in the following manner:

--newspaper of statewide circulation;
--newspaper of general circulation in the vicinity of the proposed farm;
--one or more of the following:

1. public service announcements on TV or radio in the area;
2. posting in a conspicuous location in the vicinity of the farm;
3. notification of parties likely to be affected; or
4. another method calculated to reach the affected public;

--municipality in which the project is located;
--if not within a municipality, regional Native corporation, Native village corporation and postmaster of a permanent settlement of more than 25 persons located within 6 miles; and
--regional fish and game advisory committees and coastal resources service areas.

Even though SB 482 no longer requires a public hearing for each permit, the legislation appears to have the most extensive public notification requirements in statute for any action regarding state land. The amended bill should become a model for other tideland and land use permitting programs.

Senator Coghill's amendment adopted earlier by this committee directing DNR to prepare a land use management report will trigger legislative oversight of the agency's implementation of SB 482.

I would also like to point out that mariculture development is being addressed in numerous land management plans now in process. For example, the attached excerpt from the draft area plan for Prince William Sound shows extensive consideration of mariculture in land use management. The plan and a similar document for Prince of Wales Island contain numerous restrictions on mariculture facilities. I would also call your attention to the Etolin Island Area Mariculture Pilot Project Draft dated March 1988.

Important in the land use management process is Alaska's coastal management program which has been strongly supported in the past by fishing and environmental groups. Among other provisions, this process requires proposals for use of state tidelands to found consistent with the state's coastal management plan. Proposals also must be found to be consistent with local coastal management plans.

I am pleased that the current version of SB 482 so strengthens public involvement in the siting process without tying the hands of land managers and strangling the industry with inflexible permitting processes.
Attachment

PROPOSED AMENDMENT

Page 14, line 10:

(c) Before issuing or renewing a permit under this section, the commissioner shall allow interested persons to submit written or oral testimony concerning the issuance or renewal to the commissioner within 30 days after the date of the notice. The commissioner may hold a hearing to take testimony.

PROPOSED AMENDMENT

Page 15, line 16-17, delete, insert following:

(6) issuance or renewal of a tideland or land use permit for an aquatic farm or related hatchery under AS 38.05.856.

PROPOSED AMENDMENT

Page 15, lines 25-29, delete.

Prince William Sound Area Plan

PUBLIC REVIEW DRAFT

NOVEMBER 1987

PLANNING TEAM

The Prince William Sound Area Plan was prepared by an inter-disciplinary planning team representing state agencies with land management responsibility in the Sound and representing the U.S. Forest Service. The Forest Service manages most of the federal land in the planning area. The planning team was coordinated by the staff of the Resource Allocation Section of the DNR Division of Land and Water Management.

DEPARTMENT OF NATURAL RESOURCES
Judith M. Brady, Commissioner

Division of Land and Water Management, Resource Allocation Section
Tom Hawkins (Division Director), Veronica Clark (Section Chief), Robert M. Loeffler (Project Manager), Yvonne Wu Goldsmith (Project Staff beginning July 1987), Karen McGuiness (Project Staff through July 1987), Rob Walkinshaw (Project Staff through July 1987), Frank Rue (Areawide Policies), Dick Mylius (Selections), Susan Peck (Graphics), and Elaine Thomas (Graphics)

Division of Land and Water Management, Southcentral Regional Office
Bruce Stafford

Division of Forestry
Dan Kethum

Division of Parks and Outdoor Recreation
Al Meiners

Division of Mining
Jerry Gallagher (Division Director)

DEPARTMENT OF FISH AND GAME
Al Carson with assistance from Kim Sundberg

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES
John Hildebrand

DEPARTMENT OF COMMUNITY AND REGIONAL AFFAIRS
Susan Cook

U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE
Dalton DuLac (Forest Supervisor, Chugach National Forest), Fred Patten, Leo Keeler, Bob Wilhelm

MARICULTURE

Goals

Economic Opportunities and Community Development. Opportunities to increase income and diversify the state's economy through the use of state tide and submerged lands for mariculture.

Optimum Use of Areas. The optimum use of the most suitable mariculture areas.

Guidelines

Note: Certain guidelines apply to fin fish operations that the department cannot currently authorize under state law. Because the Alaska legislature is considering changes to these state laws, certain guidelines address these operations. The Governor's Interagency Task Force on Mariculture is considering the Mariculture issue. This plan does not address issues such as development plans that the Task Force is covering. The final plan will be made consistent with the agreements of the Task Force.

A. Mariculture and Competing Uses. Mariculture may be allowed on state tidelands where there is no significant conflict. The siting of mariculture facilities may be more difficult on crucial fish and wildlife habitat, tidelands designated for log transfer or storage, mineral transfer or access, commercial activities, or recreation (see recreation, coordination and public notice, and fish and wildlife guidelines in this chapter and Chapter 3). These areas will be available for mariculture (a) if the land manager determines that it is possible to site, design, and operate the two or more uses compatibly in the area, or (b) there is no feasible and prudent alternative for mariculture while one exists for the competing use. In no case will mariculture be allowed to foreclose access to mineral, timber, or significant recreation resources unless feasible or prudent alternative access exists. However, in some cases it may be in the public interest to concentrate uses in one bay, (i.e., pen-reared salmon and timber transfer) rather than allowing the proliferation of uses in many bays.

B. Separation Between Facilities. The siting and spacing of mariculture operations should minimize the risk of disease transmission, competition with wild stocks of fish and shellfish, and water quality degradation through separation between operators. Permit holders that may be affected by a proposed operation should be notified and given an opportunity to comment.

C. Upland Owner Support for Mariculture Objections. Upland owners are encouraged to identify areas where mariculture (including upland facilities) should and should not be developed and to communicate their conclusions to the department and to the mariculture industry.

D. Mariculture Caretaker Facilities. Floating caretaker facilities for mariculture operations are allowed in areas where there is no significant competing use. Floating caretaker facilities for mariculture operations will not be allowed in designated recreation or personal use areas unless the regional manager determines that there is no feasible or prudent alternative. The determination will be made available for public comment.

E. Siting Near Anadromous Fish Streams. Mariculture facilities will not be sited within 300' of the mouth of a catalogued anadromous fish stream at Mean Lower Low Water without the approval of ADF&G.

F. Performance Standards. The Regional Manager will attach reasonable performance standards to the permit or lease for project development and operation. The performance standards are to ensure the permitted area is used for the approved activity, the proposal is economically viable, and the permit is not held for speculation or removal of a land base from competition. In all cases the approved development plan must be adhered to. If the performance standards are not met, the permit or lease may be cancelled.

G. Development Plans. A development plan will be required before a lease or permit application for mariculture facilities is approved. The preferred approach is for the application and development plan requirements to serve (at the minimum) as the basis for DNR, ADF&G, DEC, ACMP, and upland owner review. The development plan will be consistent with applicable agreements established through the Governor's Interagency Task force on mariculture.

H. Preferred Storage Sites. Because they are less biologically productive than salt marshes and tideflats, gravel and sand beaches are generally the preferred sites for onshore storage of shellfish while waiting for PSP test results and shipment.

I. Siting Floating Facilities to Avoid Grounding. Except where specifically allowed, floating facilities will not ground at mean lower low water.

J. Mooring Floating Facilities. Shoreties will not be used for anchoring mariculture facilities in significant public access, public recreation, or personal use areas unless doing so decreases the conflict between the mariculture facility and these public uses.

K. Coast Guard Approval. Permits or leases will not be given until the U.S. Coast Guard has certified that the proposed facility will not be a significant navigational hazard.

L. Other Guidelines Affecting Mariculture. Other guidelines will affect mariculture management practices. See in particular the following sections of this chapter.

Coordination and public notice
Fish and wildlife habitat
Public access
Recreation, tourism, cultural and scenic resources
Transportation and utilities
Shoreline development

Land Allocation Summary

Mariculture includes a variety of operations. Each type of mariculture has its own set of environmental and processing requirements and creates its own unique impacts, problems, and opportunities. The needs and impacts for growing seaweed on a rope or salting a beach for clams are likely to be quite different from more developed "sea farming." Some may require little or no land area; others may require a significant area for processing and caretaker facilities.

Because of the difficulty in identifying areas suitable for the variety of mariculture types, the plan does not designate areas for mariculture. Rather, the plan indicates the management intent for each area. Mariculture may be allowed on state tidelands if it can be made consistent with the intent. For example, the plan may indicate the primary intent for a particular area is a log transfer site. Mariculture may be allowed if the ability to use the area for log transfer operations is maintained. The

siting of mariculture may be more difficult on tidelands designated for log transfer or storage, mineral transfer or access, commercial activities, crucial fish and wildlife habitat, or recreation. However, these areas will be available for mariculture if it is possible to site, design, and operate mariculture in a manner compatible with the designated use, or if there is no feasible and prudent alternative for mariculture while one exists for the competing use.

In this way, mariculture may be allowed in most of Prince William Sound, though it must sometimes meet strict guidelines. The most restrictive guidelines apply to state tidelands adjacent to the USFS proposed wilderness areas. In these areas, mariculture or other tideland facilities may be allowed "if they are mostly underwater and cause only limited impact on the fish and wildlife, recreation, tourism and wilderness values" and if they do not create "long-term visual impacts." Other guidelines exist for the most important and frequently used recreation areas, anchorages, and sport fishing sites.

The state also encourages mariculture operations in cooperation with private upland owners adjacent to private lands in the Sound including lands in the Chenega and Fidalgo management units.

Because the industry is new and the impacts and incompatibilities are not yet clear, public notice of a proposed permit or lease for mariculture facilities will be sent to adjacent upland owners, user groups, and communities that may be affected by the activity. (This notice is in addition to the department's existing public notice procedures.)

ALASKA STATE LEGISLATURE - SENATE
SENATOR RICHARD I. ELIASON

RULES COMMITTEE, CHAIRMAN
LABOR & COMMERCE COMMITTEE, VICE-CHAIRMAN
LEGISLATIVE COUNCIL
RESOURCES COMMITTEE
FISHERIES SUBCOMMITTEE, CHAIRMAN

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M E M O R A N D U M

TO: Senator Jack Coghill, Chair
Senate Resources Committee

FROM: Senator Dick Eliason, Chair
Fisheries Subcommittee

DATE: February 23, 1988

RE: Proposed Mariculture Legislation

Last spring, the Fisheries Subcommittee of the Senate Resources Committee held several statewide hearings on S.B. 106, "An Act relating to aquatic farming". These well attended hearings were held in Dillingham, Kodiak, Anchorage, Sitka, and Ketchikan with residents from Petersburg and Wrangell connected by the teleconference system.

An overwhelming majority of those testifying were in opposition to the pen rearing of salmon. Concerns regarding possible water quality problems, increased conflict between users, competing markets, and potential disease contamination of the wild stock were voiced by those testifying at these hearings. Since that time many communities and organizations statewide have submitted resolutions opposing salmon farming. Because of this strong, broad-base opposition to permitting farming of fish in saltwater, it seems unrealistic at this time for the legislature to continue to pursue this concept.

The attached draft legislation, instead, encourages the growers of shellfish and aquatic plants as well as the farming of finfish in fresh water. This legislation sets the criteria for these economic ventures and provides for an

orderly development of the industry. Under this proposal farming of finfish in saltwater would not be allowed. Possibly at a later date when this concept gains more support, the legislature may wish to pursue this matter once again. However, until that happens, it appears most prudent to consider legislation involving the farming of shellfish, aquatic plants, and fresh water fish.

I respectfully request that this draft be introduced as a Senate Resources Committee bill and that hearings be scheduled as soon as possible to allow interested Alaskans an opportunity to respond to this proposal. Thank you very much for your thoughtful consideration of this request.

ALASKA STATE LEGISLATURE - SENATE
SENATOR RICHARD I. ELIASON

RULES COMMITTEE, CHAIRMAN
LABOR & COMMERCE COMMITTEE, VICE-CHAIRMAN
LEGISLATIVE COUNCIL
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M E M O R A N D U M

TO: Senator Dick Eliason

FROM: Sheila Peterson, staff
Senator Eliason's Office

DATE: March 7, 1988

RE: Opposition to the pen rearing of salmon

The following communities and organizations have submitted resolutions in opposition to the pen rearing of salmon:

Communities:

Kenai Peninsula Borough
Edna Bay Community, Inc.
City of Port Alexander
City and Borough of Sitka
City of Craig
City of Wrangell
Ketchikan Gateway Borough

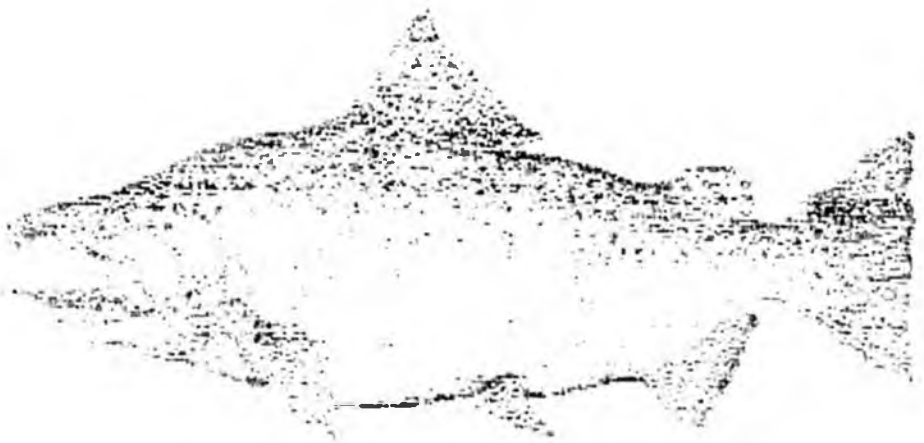
Organizations:

Craig Fish and Game Advisory
SW Regional Fish and Game Council
United Fisherman of Alaska
Northern Southeast Regional Aquaculture Association
Alaska Trollers' Association
Southeast Alaska Conservation Council
Alaska Environmental Lobby
Seafood Producers Cooperative
Southeast Regional Fish and Game Council
North Pacific Fisheries Assn.
Cook Inlet Fisheries Coalition
Cordova District Fishermen United

We have also received many, many letters and public opinion messages statewide in opposition to the pen rearing of salmon.

Baranof Warm Springs

Chinook Hatchery



Hawken Northwest, Inc.

Baranof Warm Springs Chinook Hatchery Development Proposal

Submitted by
Hawken Northwest, Inc.

Introduction

In 1976 ADFG FRED Division identified Baranof Lake in Warm Springs Bay as one of the 10 best hatchery sites in Alaska. It was given the highest rating of all the sites considered by the U.S./Canada Chinook Investigation Team. Today some 12 years later, there still is no hatchery at this location.

The economic potential at this site is worth over $43,000,000 annually to the Alaskan economy! The Alaska Department of Fish and Game estimates the average adult chinook salmon harvested in S.E. Alaska weighs 15.9 pounds and sells for an average of $2.37 per pound giving an ex-vessel value of $37.68 per fish. Using an economic multiplier of 2.1 to project this value to the overall economy, raises this to $80 per fish. Applying the standard operating assumptions developed by ADF&G and NMFS for chinook hatchery design, production, survival, and harvest, the Baranof Warm Springs site has an ultimate capacity to produce over 21,000,000 smolts resulting in almost 650,000 harvestable adults. Under current conditions this would produce over $20,000,000 annually at the current 40% harvest level. If the harvest rate could be increased through management to 85%, this annual value would attain the $43,000,000 dollar level.

History

Alaska Department of Fish and Game by-passed this site soon after its evaluation in 1976, because of high construction costs, water rights conflicts, private land ownership problems and lack of department long range planning and political support. NSRAA exercised a preference right on the site, but soon abandoned the right in favor of pursuing other projects with their coho lake stocking program. In September of 1981, Jerry McCutcheon filed a PNP application which was denied on the basis that ADF&G maintained its intent to build a hatchery. FRED Division still lacking an organized chinook rehabilitation program and facing reduced funding, abandoned this project and allow their water rights application to lapse. Wilderness Acquisitions, Inc. purchased their site in early October, 1985. On October 26, 1985, Dale and Greg Young initiated a harvest management study by applying for a PNP hatchery permit at this site and filed for appropriate water rights. NSRAA filed for a second preference right at this site without even having a project or program under development. The ADF&G requested an opinion from the Attorney General's office that stated that the state had first preference right. Wilderness

Acquisitions, Inc. approached both NSRAA and ADF&G proposing a joint venture hatchery to allow development to proceed immediately. Both parties chose not to cooperate. DNR denied Wilderness Acquisitions' water right applications. Wilderness Acquisitions appealed this decision and ultimately filed suit to force DNR to comply with state statutes.

During this period ADF&G and NSRAA made an illegal chum salmon release in Warm Springs Bay. In an attempt to create the basis of a project at the site. At the same time the mariculture issue surfaced and the Wilderness Acquisitions case became a test case for private aquaculture. The legislature imposed a moratorium on aquaculture further delaying resolution of this issue. Hawken Northwest again proposed a cooperative brood stock development program to ADF&G, who again elected to do nothing. Another proposal was submitted to the Chinook Mitigation committee. This proposal was not even considered. Following the appointment of a new FRED Division Director a smaller project of a similar scale to those funded for mitigation was submitted and again brought a response of indecision. **Some 12 years later there still is no hatchery at Baranof Warm Springs.**

Problem Statement

After 12 years of no substantive action by ADF&G or NSRAA the $43,000,000 annual economic impact of this facility is yet to be realized. Neither entity has put forth a project proposal that addresses the potential at the site and the concerns of local businesses and land owners. Due to a lack of coordination and prioritization of many different working groups and lack of the ability to make use of large volumes of production data, catch statistics, and market economics, chinook production has lagged far behind other enhancement efforts. **Private sector investors have nearly a million dollars and three years of extensive research and planning stalled by indecisiveness on the part of the state.** This proposal presents a pathway to correct this situation.

Proposal

Hawken Northwest proposes a phased approach to develop the site thus overcoming the problems that have stopped it to date.

This concept evolved during two years of extensive research and evaluation of the various U.S./Canada treaty mitigation needs and proposals and problems at this site. Although Baranof Warm Springs rated highest of all sites in the evaluation process it was not funded because of the large scale of the proposed projects, the concerns of local residents and water rights issues. This phased approach allows the project to start at a more modest level, then grow to the largest size that meets the reasonable concerns of the local people while providing the highest economic benefit from the mix of opportunities available at the site....

Phase I

On site production could start immediately with eggs and fry transported from Hidden Falls. A production level of 33,000 adults available for harvest would be

achieved while developing a stock that performed well under the Baranof site conditions and also exhibited high exploitation rates on inside fisheries.

Phase II

A production level of 100,000 adults available for harvest using the stock developed during phase I. Concurrent with this production would be the development of management procedures to increase the exploitation rates of this targeted stock.

Phase III

A level approaching 650,000 adult chinook could be produced at this site if the resulting fish and related production and harvesting activities could be accommodated in a satisfactory management scheme. By pushing current technology the upper limit could be as high as 1,000,000 chinook annually.

Capital Request		Source
Phase I	$1,500,000	U.S. /Canada Mitigation Funds
Phase II	$3,000,000	
Phase III	To be determined	

Operational Request		
Phase I	$225,000	PNP.
Phase II	$750,000	PNP
Phase III	?	

Options for Funding and Operations

The three most obvious options to develop start-up operational funding for this project are: 1. Smolt production contracts funded by mitigation monies, 2. The PNP revolving loan fund, and 3. Assessment monies. Once returns come back to the facility, cost recovery funding would be available to the extent that returns exceeded brood needs. There are various ways that these sources can be developed.

Hawken Northwest could contract directly with the state, an association, or a gear group receiving money from the state for production of a given number of fish for a lump sum. This would probably be done on a multi-year basis.

A PNP permit could be applied for by NSRAA or Hawken Northwest and operational funds could be obtained through the revolving loan fund. These monies would be contingent upon appropriation by the legislature.

Assessment funds could be distributed through one or both of the Associations until on site cost recovery options were developed.

An option that would provide more direct involvement by the target gear, would involve issuing a PNP permit to ATA with the funding coming from assessment dollars from NSRAA.

cc

ADF&G
ATA
DNR
Eliason
Grussendorf
NSRAA

	A	B	C	D	E	F
1	[illegible]en Northwest Construction Budget					
2						
3	[illegible]of Warm Springs Chinook Hatchery			Phase I		
4						
5			33,000 Adult Chinook Capacity			
6						
7						
8	[illegible]nes					$177,606
9						$0
10	[illegible]ng Tanks					$455,400
11	[illegible] ladder					
12	[illegible] Holding					
13				Area		
14	[illegible]ss Buildings			0		
15	[illegible]cubation			250		$22,770
16	[illegible]od Storage			160		$21,859
17	[illegible]op			1000		$109,296
18	[illegible]arehouse			1000		$63,756
19	[illegible]earing Cover			2500		$227,700
20	[illegible]pawning			200		$18,216
21						$0
22	[illegible]using			2000		$327,888
23						$0
24	[illegible]ck & Landing					$72,864
25						
26						
27						
28	[illegible]tal Cost - Design, Construction					$1,497,355
29	[illegible]verhead and Profit					

Science Council of Canada
Conseil des sciences du Canada

Council Statement

Aquaculture: An Opportunity for Canadians

A Statement by the Science Council of Canada
on the Role of Aquaculture in Canadian Fisheries *

March 1985

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Preface

In many countries commercial aquaculture* is creating profits, new wealth, and new employment opportunities. Yet in Canada it is still an undeveloped industry. Canada has been slow to apply the scientific knowledge available and to use new technologies of cultivation for this renewable resource.

The Science Council of Canada has identified aquaculture as an emerging area of science and technology offering new opportunities to Canadians to maximize the economic and social benefits of the natural resource industry. In July 1983 the Science Council, with the Department of Fisheries and Oceans, co-sponsored the first National Aquaculture Conference. The private sector, the research community, and different levels of government were asked to assess the potential of aquaculture in Canada. The final report from the conference participants concluded that:

> For Canada [commercial aquaculture] means an opportunity to substantially increase exports, create new jobs, provide supplemental employment and income opportunities within the traditional commercial fishery, and to expand support industries that provide equipment, supplies and services. Furthermore, aquaculture has an important role to play in enhancing stocks of fish for the recreational and commercial fisheries. Canada's abundant resource base, both fresh and salt water, is more than adequate to support an aquaculture industry of major dimensions.

The conference strongly urged the government of Canada to designate aquaculture as a high-priority opportunity for development and, in consultation with provincial governments and the private sector, to prepare a National Aquaculture Policy and Development Plan.

In response, the Science Council created an Industry Task Force on Aquaculture. In receiving their final report, Aquaculture: A Development Plan for Canada, the members of the Science Council recognized the significance of this rapidly developing, science- and technology-intensive industry to the need to restructure Canadian fisheries. This statement is based on the final report of the Industry Task Force, research contributions from private sector consultants, and consultations with representatives of the commercial fishing industry, the aquaculture industry, Native groups, and government and university departments. The Science Council believes that Canada's aquatic natural resources can benefit from the development of new technologies and methods that will increase production of commercially attractive marine and freshwater plants and animals by aquacultural methods without exerting further pressures on wild stocks.

* This and other specialized terms are defined in the glossary on pages 25 and 26.

Chapter 1

The Significance of Aquaculture

Aquaculture is expected to be one of the agri-business growth industries of the 1980s. This knowledge-intensive industry can be defined as the cultivation of aquatic organisms. It may involve careful control (intensive aquaculture) or minimal management (extensive aquaculture) of the organism's environment to increase survival and improve production. In the past, because of the abundance of wild fish, hunting and gathering met the needs of the market. Only in this century, when increases in population placed greater demands on wild stocks, has scientific understanding of aquatic species permitted the artificial cultivation of fish, shellfish, crustaceans, and seaweeds on a commercial basis. In the last two decades, the gap between demand and supply has prompted the application of farming techniques and new technologies to the cultivation of a wide range of aquatic species.

The application of science and technology to our natural resources can create new wealth and employment, especially in remote communities. Commercial aquaculture draws on a variety of technologies ranging from the development of pelletized feeds and new vaccines to the use of offshore technology in the design of marine enclosures and sea pens and automated feeding, harvesting, and processing techniques. Its advantages over conventional fish-catching methods include

- control of the environment for the organism;
- management of production and quality;
- efficient utilization of water for production;
- low energy costs;
- commercial profitability.

International Involvement in Aquaculture

Aquaculture is already established as a profitable industry in many countries. In the last decade, aquaculture production increased so rapidly that it already accounts for more than 10 per cent of the world's total harvest of fishery products. Leading aquaculture producers are China (more than 2 million tonnes or 25 per cent of its seafood production) and Japan (1 million tonnes or 10 per cent of its seafood production). In the developing countries, warm-water species such as tilapia show great promise as a source of inexpensively produced protein.

Aquaculture production has also been increasing rapidly in cool-water areas. Today, in European fish markets, all freshwater trout, most fresh salmon, mussels, oysters, and some turbot, eels, and freshwater crayfish are products of aquaculture. In North America most catfish, freshwater trout, crayfish, mussels, and oysters are produced by aquaculture. Increasing quantities of farmed shrimp, steelhead trout, abalone, clams, and salmon are also entering fresh fish markets.

The most dramatic example of recent aquacultural expansion of immediate significance to Canada is Atlantic salmon farming in Norway. In the late 1960s declining returns of wild salmon stocks were noted. At that time, Canadians and Europeans were experimenting with new techniques for artificially propagating salmon. In Norway, the application of scientific knowledge, some of it generated by Canadian scientists, allowed private-sector attempts at farming fish in the sea to succeed on a large scale. This led to the first commercial production of salmon. In 1973 Norwegian farmers

produced only 171 tonnes for sale. By 1983 Norway produced 22 703 metric tonnes of salmon and trout. Production in 1984 is projected to reach 25 000 tonnes with a first-hand sales value of more than U.S. $100 million. The Norwegian salmon-farming industry now provides direct employment for more than 2000 people on more than 400 licensed and operating farms. When the employment from supporting trades such as feed supply, transport, and processing are added, the employment figure is at least 4000. The Norwegian government information service anticipates that by the year 2000 their aquaculture industry will generate goods worth U.S. $3 billion and will employ some 50 000 people.

Smaller but similar salmon-farming industries are expanding with equal rapidity along the coasts of other North Atlantic nations such as Scotland, Ireland, Iceland, and the Faroe Islands. The prospects for the Atlantic salmon-farming industry are such that by the early 1990s, European production is expected to exceed 50 000 tonnes. This is about equal to the present total Canadian catch of Pacific salmon (see Table 1). In New Zealand and along the coast of Chile, farming and ranching of coho and chinook salmon are also developing. All these enterprises are independent, private-sector investments that reflect an entrepreneurial confidence in aquaculture.

Production from European salmon-farming industries has already had an impact on the traditional market outlets for frozen and processed Canadian salmon in Europe. What is more disturbing is the recent penetration of air-freighted fresh-farmed salmon from Europe into North American and Japanese markets. Norwegian air freight exports to North America started in 1981; by 1983 they exceeded 4000 tonnes. Totals for 1984, although unavailable at the time of going to press, are expected to have increased considerably. Indeed, Norwegian exports are limited only by the present constraints on air freight capacity between Northern Europe and the United States. This level of imports into North American markets is already more than three times the current wild harvest of Atlantic salmon in Canada (see Table 1).

The Market for Canadian Aquaculture

Developing a domestic Canadian aquaculture industry aimed at important export markets such as the United States, Europe, and Pacific Rim nations will help Canada maintain her position as the leading fish exporting nation. Whenever a species is brought into cultivation, the year-round availability of superior-quality fresh produce creates new market opportunities for both the farmed and wild products. This phenomenon is analogous to what happened in the poultry industry when reliable mass-production techniques for chickens, turkeys, and ducks were developed in the 1940s and 1950s. Techniques that allowed cost-effective mass production, continuity of supply, and the application of quality-control procedures led to a rapid expansion of markets. Today, aquaculture is becoming a similar sort of agri-business.

Those species of most importance to Canada and for which commercial aquacultural technology already exists include salmon, mussels, trout, and several species of oyster. Clams, scallops, other shellfish, turbot, and arctic char also have some potential.

Aquaculture and Fishery Management

At a time when the wild fisheries are experiencing difficulties, aquaculture is supplying an increasingly significant proportion of fish protein. Around the world, aquaculture is seen as a means of producing badly needed high-quality protein while employing the under-used skills and capacity of the traditional

Table 1: Nominal Catch and Landed Value of Main Categories of Fish in Canada and Those of Interest to Aquaculture Production (Quantity (Q) in tonnes live weight and Value (V) in $000)

Species	Atlantic Coast		Pacific Coast		Canada	
	Q	V	Q	V	Q	V
1982						
Total Groundfish	820 327	291 139	54 353	27 999	874 680	319 138
Total Pelagic and Other Finfish	270 150	52 714	98 857	198 091	306 007	250 805
Salmon	1 536	6 068	65 715	165 088	67 251	171 156
Total Shellfish	170 155	237 755	7 575	9 986	177 730	247 741
Oysters	1 321	1 323	1 579	981	2 900	2 304
Total Sea Fisheries	1 197 632	589 174	160 785	240 081	1 358 417	829 255
Inland Fisheries					57 743	58 847
Grand Total Canada					1 416 160	888 102
1983						
Total Groundfish	764 248	275 115	62 710	36 453	826 958	311 568
Total Pelagic and Other Finfish	201 785	46 757	112 293	149 228	314 078	195 985
Salmon	1 210	4 797	70 630	104 000	71 842	108 797
Total Shellfish	141 991	294 662	7 797	12 206	149 788	306 868
Oysters	1 486	1 373	1 600	1 040	3 086	2 413
Total Sea Fisheries	1 108 024	621 248	182 800	202 190	1 290 824	823 438
Inland Fisheries					50 000	50 800
Grand Total Canada					1 340 824	874 238

Source: Canadian Fisheries Highlights 1983, Statistics and Analysis Division, Fisheries and Oceans Canada, 1984.

fishing industry. The profitability of aquaculture and its ability to contribute new employment and wealth to local economies is no longer questioned. There are many large-scale aquaculture development programs for coastal areas, most of them supported by international aid financing, that retrain fishing employees in aquaculture techniques for the production of tilapia, milkfish, sea bream, prawns, and many other species.

In the European Economic Community, for example, aquacultural initiatives are an integral part of fishery management policy and a mechanism for economic development in rural communities. In Norway aquaculture and the traditional fisheries are closely allied. Almost 50 per cent of the salmon farmers are former fishermen or traditional fishing industry employees. Extensive use is made by the salmon-farming industry of the technologies developed in support of the traditional fisheries. Recent Norwegian projections indicate that by 1985 sales of farmed salmon and sea-reared trout will exceed their sales of cod, traditionally the main export species, with exports valued at about U.S. $135 million. Japanese aquacultural operations are now intertwined with those of the coastal fisheries and play an important economic role in their maintenance; the artificial harvest of several species now greatly exceeds the production of the natural stock.

The potential of aquaculture as a facet of fish production remains largely unrecognized in Canada. In maintaining its position as the number one fish-exporting nation in the world and in attempting to conserve wild stocks, Canada has established extensive programs of fishery management. These vary from catch quotas and other regulatory controls to quality-improvement and cost-reduction programs, stock enhancement, and related research programs. Such programs constitute a large part of the total costs of managing Canadian fisheries. The integration of resource management policies with commercial aquaculture development would cut down on the use of public funds and may lead to beneficial technical spin-offs.

The classic problem confronting the traditional fisheries is the common property of the resource. As long as individuals do not own the rights to harvest a specific share of the wild fisheries, they will have no individual incentive to conserve it properly or harvest it efficiently. There is a well-documented and well-analyzed tendency toward excessive exploitation of the resource and excessive investment in the industry, as individuals attempt to increase their own share at the expense of others.

Fishery management policies are intended to address this fundamental economic problem. Harvesting quotas, the establishment of privately managed terminal or "pocket" fisheries, the authorization of privately financed enhancement "ranching" operations are all methods of overcoming the problems associated with common property ownership. Commercial aquaculture is a logical extension of these measures. With fixed-enclosure aquaculture, the common property problem in harvesting is eliminated, providing the institutional framework for the efficient production of fish products from privately owned or leased farms.

This is not to suggest that aquaculture can resolve all current fishery management problems, or substitute for commercial wild production. Properly managed wild fisheries can yield considerably lower-cost fish than intensive aquaculture. However, wild resources are harvested seasonally and cannot provide sufficient quantities of

top-quality fresh produce to year-round markets. Reducing the wild catch in order to increase escapements is probably the most cost-effective short-term means of increasing wild production -- certainly more so than constructing new public hatcheries. However, aquaculture can provide an efficient source of incremental fish production to meet the growing demand for fish products and to relieve increasing pressures on the wild resource.

Aquaculture and the Sport Fisheries

Some of the pioneering efforts in Canadian aquaculture involved the construction and operation of hatcheries for sport fisheries. At present some of the private trout hatcheries across Canada stock lakes for the inland sport fisheries; the salmon and steelhead trout sport fisheries are enhanced through the work of the Department of Fisheries and Oceans. These sport fisheries are extremely important to Canada. On the west coast alone, the direct income impact of resident tidal and nontidal angling in 1980 was estimated at between $38 million and $40 million, with direct employment in the range of 3500 to 4000 person-years.

An emerging aquaculture industry with efficient methods of producing juvenile fish has a role to play in supplying the needs of sport fisheries. Reducing commercial pressure on salmon stocks by farming these species would help to meet growing sport and Native food requirements without further depleting the wild resource.

There is no reason why the aquaculture industry should not develop alongside a flourishing sport fishery. As the sport fisheries develop, so will their need for suitable stocks of juvenile fish for stocking rivers and lakes. Commercial aquaculture can supply these future needs at lower cost than current government-run hatcheries can.

Canadian Commitment to Aquaculture

Aquaculture has an important part to play in the Canadian fisheries. However, to realize its benefits, a firm commitment from both federal and provincial governments is needed. Therefore,

1. The Science Council of Canada recommends that federal and provincial governments state clearly their intention to develop a commercial aquaculture industry in Canada. In consultation with industry, specified production targets for identified species should be set. Governments should take concerted action to ensure that aquaculture is made an attractive area for investment and create lead agencies, as outlined in the final report of the Industry Task Force, to coordinate the development strategy for this emerging science-based industry.

Chapter 2

The Viability of Canadian Aquaculture

Other countries, when faced with declines in their traditional fisheries caused by environmental problems or jurisdictional limitations, have turned to large-scale aquaculture development. A recent survey of salmon farms in Norway showed that they produce an average annual operating surplus equivalent to about Cdn $30 000 per employee. A study by the Department of Fisheries and Oceans recently determined that the gross profit of Norwegian salmon farms was approximately 27 per cent of gross sales. There is every reason to believe that if an integrated industry is launched in Canada, similar profit levels could be achieved in less than a decade. Marketing studies done for salmon farming on both Canadian coasts conclude that even with the expanding production of farmed fish from other countries, Canada has sufficient market potential to support an aquaculture industry.

In order to establish a commercially viable aquaculture industry in this country, several essential components must be developed in concert.

Sites and Leasing Policy

The extensive coastline and abundant freshwater resources of Canada offer many possible sites for aquaculture, well within the acceptable temperature limits for the growth of commercially significant species. Indeed, the coasts of Canada could ultimately sustain a very large scale of production. Across Canada good sites for the cage, pond, and raceway cultivation of trout and other species abound. However, only a few have been developed even on an experimental scale.

Site availability will not limit the development of an aquaculture industry in Canada. However, the sites identified by the private sector must be opened up to commercial aquaculture development without adversely affecting other users of coastal and shoreline areas. This requires the creation of appropriate leasing policies. Various ways of influencing the development of the industry through leasing policies might include:

(a) the attachment of specific terms and conditions to aquaculture permits to limit ownership of the resource to resident individuals or companies;
(b) the provision of special incentives, such as grants, access to low-interest loans, and technical services, to locally-owned operations;
(c) the provision of similar special incentives to scattered small producers to enable them to organize into more efficient integrated cooperatives or large firms.

Clearly, aquaculture developments in rural areas can provide employment and income for the local residents. If leases can be reserved for these people (or for applicants who will ensure significant local participation) without compromising the economic performance of the operations, the developments would be doubly beneficial -- they would provide a return on investment as well as badly needed income and employment.

Commercial Fishing Interests

The negative effects of reducing the commercial fishing fleet capacity can be mitigated if new employment in aquaculture is created at the same time. Preferential access to aquaculture leases or special opportunities offered to those displaced from the wild fisheries through the buy-back programs could achieve this goal. Governments may wish to promote entry into aquaculture for anyone participating in the A-licence

(salmon fishing) buy-back program. This would also offer the side-benefit of new productive uses for existing excess fishing vessels. Since moving into aquaculture production requires new skills, training and extension courses must be organized.

Special Native Interests

For Native people, the issue of certain leasing policies affects not only economic development opportunities but also aboriginal land claims. Confrontation between Native people and private-sector entrepreneurial interests over aquaculture development must be avoided.

If leases are not allocated in an equitable way, Native people will undoubtedly argue that future land claims settlements may be compromised. This would not only be perceived as an injustice to Native groups, but might also result in the obstruction of aquaculture development with legal and political actions challenging the issuance of leases to non-Natives. Thus, in developing leasing policy, all levels of government should consult with Native groups prepared to enter into this new industry. The federal Department of Indian and Northern Affairs should ensure that Native interests are represented in all aspects of aquaculture policy and planning. Federal/provincial coordination in the development of leasing policies is also needed to ensure that matters of aboriginal and usufructuary rights within federal jurisdiction are not ignored by provincial leasing initiatives.

2. The Science Council of Canada recommends that both federal and provincial levels of governments work with the private sector and with representatives of Native groups to prepare enabling legislation to establish a legal framework for the conduct of commercial aquaculture, to clarify or create the necessary rights, supply financial incentives, and regulate the industry as appropriate.

Salmonid Enhancement and Private-Sector Ranching

Salmonid enhancement programs for Pacific salmon evolved from efforts to conserve salmon stocks, increase returns to the west-coast fishery, and improve incomes, regional employment, and economic development. Enhancement of wild salmon stocks employs extensive aquaculture techniques to artificially propagate salmon eggs in hatcheries and release juvenile salmon (smolts) into the wild. Salmonid enhancement programs (SEPs) have considerable facilities, personnel skills, research capabilities, and some brood stocks. The aquaculture industry should have access to these resources from which they could draw assistance to accelerate the growth of commercial aquaculture. Research on pathological, nutritional, genetic, and physiological problems of salmonids relate to the needs of the aquaculture industry. The aquaculture of salmonids in sea pens offers many opportunities for research investigations that could assist the enhancement of wild stocks.

Commercial salmon ranching involves technology transfer of government hatchery research and practices into the private sector as a business. Elsewhere, economic incentives for salmon enhancement that are directly linked to harvest opportunities have encouraged the private sector to share more of the responsibilities and costs for enhancement, habitat protection, and harvest management. Although biological and social concerns must be considered, there are also strong arguments in support of Canada increasing the extent of private-sector involvement in both enhancement and private-sector ranching as an adjunct to commercial aquaculture. Proponents of commercial

salmon ranching argue that it would lead to more efficient management of the fishery and to greater economic benefits for those employed in it.

A key element in the cost of salmonid enhancement is the cost of rearing juvenile salmon. The improved, more efficient techniques used in the fish-farming industry, if applied to salmonid enhancement, could help reduce rearing costs. Contracting out more of this work to the private sector could also improve the efficiency of salmonid enhancement. This might include placing some existing SEP hatcheries under private-sector management and allowing them to reduce costs by the sale of surplus eggs, fry, and smolts to salmon farmers. SEPs could also contract out new commercial hatcheries to rear fry specifically for enhancement purposes.

Tests of commercial ocean-ranching ventures, involving both Pacific and Atlantic salmon and other species, are being carried out in other countries such as the United States, Iceland, Chile, and Scotland. To enhance the public fisheries, Alaska has encouraged the development of non-profit salmon hatcheries operated by fishing cooperatives and interested individuals. Along the Pacific coast (in California, Oregon, Washington State, and Alaska), both public and private sectors are involved in enhancement, but only in Oregon and California has this been permitted on a profit-making basis. It is still premature to evaluate the success of such ventures. However, Canada should not preclude private-sector experimentation and involvement in this interesting field. In particular, using surplus fry and smolt production for ranching operations alongside farming operations may work well in Canada.

3. The Science Council of Canada recommends that the Department of Fisheries and Oceans develop policies integrating the needs of fish population enhancement with the needs of a commercial aquaculture industry. Private-sector management of enhancement programs should be permitted.

Seed Stocks

Supplies of hatchery-reared seed stock are an essential component of the industry. Mussel farmers and oyster farmers in Canada currently depend largely on the collection of wild seed. These seed collection areas must be protected from environmental degradation, commercial exploitation, and depletion of the brood stock to allow expansion of mussel and oyster production. As the oyster industry moves toward more intensive forms of cultivation and the volume of production increases, wild sources of seed (spat) will become inadequate to supply the industry. On the Pacific coast the oyster industry is already beginning to use hatchery-reared spat, and in Nova Scotia the developing industry of rearing European oysters depends exclusively on supplies of hatchery-reared seed.

Allied to seed stock availability is the need for genetic selection of suitable genotypes and for selective breeding programs. Their importance to aquaculture parallels the importance of selecting suitable strains in the poultry, pig, and cattle industries.

The supply of juvenile salmon (smolts) that have suitable genetic strains for rearing under farm conditions is an important limiting factor in the production of farmed salmon in Europe. Farmed salmon production in Canada cannot expand significantly until appropriate supplies of smolts are available from government hatcheries and a sufficient number of commercial smolt production facilities are established by the industry.

4. The Science Council of Canada recommends that Canadian governments at all levels cooperate closely with the industry to support the creation of private-sector hatcheries sufficient to supply the needs of a rapidly growing industry with superior strains of seed stock.

Feed

Shellfish cultivation usually uses the natural planktonic food in the water. Thus feed costs contribute little to the cost of production, except in the intensive hatchery production of oysters and other shellfish. However, finfish aquaculture requires the feeding of artificially formulated diets to fish enclosed in cages, tanks, ponds, or raceways. The cost of fish feed is critically important to the viability of the industry.

As in the production of feeds for poultry and other agricultural industries, feed production in fish farming involves the formulation of relatively low-cost protein, fat, and carbohydrate sources into nutritionally adequate packages. Canada is well endowed with supplies of the raw fish wastes that are used for such feed. At the moment, much of this raw product is exported rather than being upgraded by producing pellets in Canada.

Feed technology also requires scientific knowledge of the nutritional needs of fish species. Several groups of Canadian researchers already have substantial expertise in this area. To date, much of their research has been applied by feed-stock producers in other countries. Tapping these resources would lead to the development of a domestic fish-feed industry, replacing imported feed stocks. The fish-farming industry that can be supported on the west coast alone is expected to be at least as large as that of Norway where there are several fish-feed producers.

5. The Science Council of Canada recommends that the aquaculture industry develop commercial applications for Canadian raw fish wastes and sponsor research, particularly in fields such as fish nutrition and feed technology.

Technology

In order to establish an efficient, profitable industry, it is essential to reduce the costs of production. This can be done by introducing automated techniques and expanding commercial production using the most modern methods and technologies available. A great deal of the necessary commercial-scale production technology and know-how is already available. The techniques of commercial production and sea-farm management must be transferred to Canadian industry as rapidly as possible, to adapt them to Canadian conditions and to deploy them in expanding commercial ventures.

There are many ways of obtaining foreign technology and know-how. In the present context, the most relevant mechanisms are the negotiation of technology transfer agreements, attracting direct investment by companies with this know-how to Canada by joint ventures, special licensing arrangements, and technical exchange training programs.

Arrangements like these are essential to accelerate the development of Canadian aquaculture. First, they will inspire greater confidence in the growth of the industry and will attract sources of risk capital. Second, these arrangements will help Canadian companies to earn profits more rapidly. Third, they will accelerate the rate at which production increases, thereby enabling Canadian production to become known and established in world markets in the next decade. Therefore, Canadians must acquaint themselves with overseas firms from which they could

buy technology, or to which they could sell their produce.

6. The Science Council of Canada recommends that industry, with the support of the relevant government agencies and centres of aquaculture research and development, seize opportunities for technology transfer and develop new markets for species under commercial production in Canada.

This process of adapting foreign technology to the Canadian situation can draw on existing scientific capability in Canada. If some of the substantial research capability in Canada were applied to the problems inherent in commercial aquaculture, considerable advances in commercial production could be achieved in a relatively short time. The research community has an important role to play together with industry in the three distinct facets of technology development and transfer through:

a) the transfer of already-established commercial technologies and know-how to Canada;
b) research and development programs to create the indigenous technologies that will allow commercial-scale aquaculture in Canada;
c) the export of improved aquacultural technologies from Canada.

7. The Science Council of Canada recommends that governments direct their lead agencies for aquaculture to coordinate funding from all sources and, with the advice of the Regional Aquaculture Coordinating Committees recommended by the Industry Task Force, channel funds into development of the species identified as having the greatest commercial potential in each region.

Although it may be premature to discuss the export of aquacultural technologies from Canada before a commercial aquaculture industry has been established, the long term could bring significant spin-off benefits to other Canadian industries as well as constituting a component of Canadian aid to less developed nations. The International Development Research Centre and the Canadian International Development Agency are already involved in aquaculture assistance to less developed nations. The creation of an indigenous aquaculture industry in Canada could only strengthen these initiatives.

Capital

The success stories of aquaculture in other developed countries should encourage Canadian sources of capital to invest in this new area of opportunity. As the federal government's report, A New Direction for Canada: An Agenda for Economic Renewal, states:

> If we are to be competitive, we must become effective in applying leading-edge technologies in producing goods and services. Economic success will stem not only from producing technology, but from using new technology in established industries.

The basis of a successful aquaculture industry will be a core of integrated, self-sufficient companies and cooperatives that use the most advanced technologies available. Operations like this are the mainstay of the industries established in Europe. These operations need several million dollars in investment and equivalent sums of working capital. When such enterprises are fully established, smaller grow-out operations can prosper. However, the front-end costs are high, there are inherent risks in cultivating living organisms, and a

relatively long-term investment is needed (a minimum of three years before there is a return on capital), therefore it may prove difficult to attract domestic capital.

To make the transition from pioneering efforts in aquaculture to a highly capitalized industry employing sophisticated technology, four likely sources of capital could be tapped:

1. Existing Canadian aquaculture enterprises could achieve the necessary rapid growth by entering into joint ventures with large firms that have capital to invest. These might include, for example, Canadian firms with an interest in fisheries, related resource-based firms, or the food industry. They could also include foreign firms that already have expertise in aquaculture. Entering into such joint ventures may turn current owner/managers of aquaculture enterprises into minor shareholders, or even managers of their firms.

2. Existing Canadian firms already involved in fisheries or in the resources sector may invest in aquaculture on their own. They will then need to buy the necessary expertise either from domestic or from foreign sources.

3. Governments could take minority-share status in aquaculture firms. This route has been successful in remote areas of the Highlands and Islands of Scotland as a way of enabling small producers to establish new enterprises.

4. Foreign firms with capital or expertise could be encouraged to establish "greenfield operations," i.e., new businesses involving specially constructed facilities.

Canada may ultimately have to depend on a judicious blend of foreign and domestic capital to develop this sector, despite the tradition of giving preference to Canadian capital. In any case, Canadian firms must improve their operations, especially to attract capital and enhance their reputation as business partners. Before new investors will support this area of new technology, entrepreneurs must strengthen their managerial capabilities and incorporate the most modern techniques and technologies currently available.

8. The Science Council of Canada recommends that entrepreneurs in the aquaculture industry create the appropriate conditions to attract investment capital by:
   a) participating in technical exchange agreements and adapting foreign and domestic best-practice technology;
   b) examining ways of reducing risk to meet the standards set for aquaculture insurance;
   c) raising the quality of their business planning.

Although investment money is available in Canada, most of it is put into more secure, better-understood areas of investment. Government policies are needed that will create a climate of certainty to elicit the necessary investment. At the moment, jurisdictional competition between levels of government and among different departments only adds to confusion and uncertainty. A clear signal would be sent to the investment community if the government announced the development of a commercial aquaculture industry with specified production targets for particular species as a provincial or even a national goal and launched a concerted effort to achieve this goal within the decade.

9. The Science Council of Canada recommends that federal and provincial ministries clarify their departmental mandates regarding

aquaculture and evaluate their programs with a view to enhancing their support for commercial aquaculture.

Governments must reorder their investment incentives to attract Canadian capital into promising new areas of knowledge-intensive development, such as aquaculture. Tax measures that ensure the eligibility of new capital for these emerging opportunities should be instituted. There are also sound economic reasons for direct government support to sectors such as aquaculture, that are relatively risky and require "patient" capital. The federal and provincial governments could identify the most appropriate mechanisms to enhance the development of these sectors. Given its proposed new proactive mandate, Investment Canada might help by attracting new foreign investment. Similarly, governments could provide the appropriate communication, transportation, and veterinary infrastructure to signal their support for the industry and the investment community.

10. The Science Council of Canada recommends that Investment Canada use its new proactive mandate to seek out sources of both domestic and foreign capital with a view to facilitating investments that will stimulate the development of Canadian aquaculture capabilities. It further recommends that External Affairs, through its science counsellor network, assist entrepreneurs to identify opportunities for international technical exchange agreements.

Markets and Quality Assurance

Marketing is a crucial part of a successful industry. Aquaculture in other countries expanded on the basis of developing new markets and providing fresh produce to these markets "in the right place, at the right time, and at the right price." Good market potential in the United States, Europe, and the Pacific Rim countries exists for all the prime candidate species of Canadian aquaculture. To penetrate these markets, marketing strategies must be based on consistent supply and quality assurance. This requires an informed and disciplined approach to marketing and close cooperation among individual producers through their organizations and interaction with government regulatory agencies.

Indeed, it would greatly benefit the entire fishing industry if quality-assurance standards and marketing strategies developed in the context of aquacultural production were integrated with the standards and strategies that apply to the harvesting of wild stocks.

11. The Science Council of Canada recommends that the aquaculture industry create effective producer organizations to provide a forum for continuing consultations with government, to cooperate and share knowledge within the industry and enable producers to develop self-discipline concerning quality-assurance standards and market promotion.

The Role of Producer Organizations

Producer organizations are perhaps the most powerful force to influence the course of development of aquaculture. In the wild fisheries, fishing cooperatives and other industrial organizations have exerted powerful political and economic influence on the shape of the industry in the production, processing, and marketing sectors. Farmers' organizations have had a similar influence on the development of government policies and programs for agriculture.

In countries in which commercial aquaculture flourishes, producers' organizations with strong marketing interests are supported by a levy on farmers' sales or production totals. The European Economic Community offers incentives to newly created producers' associations, such as 80 per cent of their operating costs in their first year, declining gradually over five years.

Canadian aquaculture producers must work toward the development of a disciplined industry that uniformly upholds high standards of quality assurance and that can agree on the seasonal distribution of production to available markets. Strong producers' organizations can provide a coherent voice for the industry to all levels of government on the development of policy and can assist in communications and technology transfer within the industry. They must work to ensure the orderly development of the industry and to prevent destructive local competition among producers when they pool their resources to compete effectively on international markets.

However, at present, the embryonic industry does not have the resources or personnel to establish an effective organization to represent the national interests of aquaculture producers. The creation of national producer groups under the umbrella of the Aquaculture Association of Canada (formed in 1983 at the first National Aquaculture Conference) should be assisted at these early stages with government support. As the industry takes shape, such assistance should be phased out in favour of self-supporting industrial associations.

12. The Science Council of Canada recommends that governments extend assistance to the aquaculture industry for an initial five-year period to help create effective producer organizations.

Infrastructural Needs

The range of programs already in place to manage the wild fisheries is impressive. Many of the skills and resources in these programs could be applied to the development of commercial aquaculture. For example, expansion of the existing fish pathology capabilities in universities and in the federal Department of Fisheries and Oceans would provide an efficient veterinary and diagnostic service for fish farmers. Applying existing fisheries research capabilities could bring promising candidate species into commercial cultivation and initiate research on relevant diseases, nutritional problems, breeding programs, and other topics of economic significance to the industry.

An aquaculture industry will require a range of supporting services, including veterinary and diagnostic services, research and development work, quality-assurance requirements, and an advisory extension service to fish farmers (comparable to that in place for agriculture). These were outlined in more detail in the Industry Task Force report, Aquaculture: A Development Plan for Canada.

13. The Science Council of Canada recommends that the federal government work with provincial governments, in consultation with the industry, to establish appropriate services, particularly aquacultural veterinary and pathology services.

Furthermore, federal and provincial governments should cooperate to develop centres of excellence that would serve the needs of the aquaculture industry. Research and education facilities already exist in Nanaimo, Guelph, and Halifax, which could serve as the nuclei for such centres. Cooperative education programs, such as those developed at the University of Waterloo (involving several

months of practical on-site experience), and the curriculum of the University of Stirling's Institute of Aquaculture in Scotland should be considered as models for curriculum development.

14. The Science Council of Canada recommends that federal and provincial governments cooperate to develop centres of excellence to serve the needs of the aquaculture industry.

Local Community Economic Development, Job Creation, and the Public Involvement and Small Projects components of the Department of Fisheries and Oceans' Salmonid Enhancement Program has done much to interest Native people, young people, and local residents in the "hands-on" management of fish. However, technicians must be trained in the basics of commercial aquaculture and business management techniques. This can best be accomplished at the level of community colleges and technical schools in short basic learning programs augmented by extension courses (such as seminars on specific species or problems). Again, these training programs should be integrated with practical on-site experience; Scottish extension programs should be examined. Video-taped learning modules should also be prepared by Canadian colleges and universities in cooperation with universities and agencies abroad and distributed to fish farmers to show specific fish diseases or new technologies that could be adapted to Canadian fish farms. (This is already being done on a commercial basis in Norway.)

15. The Science Council of Canada recommends that federal and provincial governments support the development of commercial aquaculture with retraining programs, local employment programs, and community development projects.

Chapter 3

Agenda for Action

Canadian aquaculture is on the threshold of commercial development. Although Canada is currently lagging behind other nations in developing this technology, it now has an opportunity to develop this industry very rapidly. During the next decade, it could create an indigenous Canadian aquaculture industry of at least the same capacity as Norwegian aquaculture. Canadians must quickly adopt, adapt, and develop the necessary techniques for a viable aquaculture industry before the window on market opportunities closes. One thing is clear. At both the level of governmental policy and industrial application, a great deal can be learned from other countries.

The recommendations for aquaculture are summarized below. They are grouped according to sector and listed in order of priority.

The Science Council of Canada recommends that federal and provincial governments:

- recognize commercial aquaculture as a high-priority opportunity for development (see recommendation 1);
- establish lead agencies to coordinate and encourage the development of this emerging science-based industry (recommendation 1);
- direct these lead agencies for aquaculture to coordinate funding from all sources and, with the advice of Regional Aquaculture Coordinating Committees, channel funds into development of the species identified as having the greatest commercial potential in each region (recommendation 7);
- cooperate closely with the industry to support the creation of private-sector hatcheries sufficient to supply the needs of a rapidly growing industry with superior strains of seed stock (recommendation 4);
- extend assistance to the industry for an initial five-year period to assist in the creation of effective producer organizations to provide a forum for continuing consultations with government, to cooperate and share knowledge within the industry and to enable producers to develop self-discipline concerning quality assurance standards and market promotion (recommendation 12);
- work with the private sector and with representatives of Native groups to prepare enabling legislation to establish a legal framework for the conduct of commercial aquaculture, to clarify or create the necessary rights, supply financial incentives, and regulate the industry as appropriate (recommendation 2);
- support the development of commercial aquaculture with retraining programs, local employment programs, and community development projects (recommendation 15);
- cooperate to develop centres of excellence to serve the needs of the aquaculture industry (recommendation 14);
- clarify departmental mandates regarding aquaculture and evaluate programs with a view to enhancing support for aquaculture; in particular, Investment Canada should use its new proactive mandate to seek out sources of domestic and foreign capital with a view to facilitating investments that will stimulate the development of Canadian aquaculture capabilities; and External Affairs, through its science counsellor network, should assist entrepreneurs to identify opportunities for international technical exchange agreements (recommendations 9 and 10);

- develop policies integrating the needs of fish population enhancement with the needs of a commercial aquaculture industry (recommendation 3);
- establish appropriate services for the industry, particularly veterinary and pathology services, in consultation with the industry (recommendation 13).

The industry should:

- create effective producer organizations to provide a forum for continuing consultations with government, to cooperate and share knowledge within the industry and enable producers to develop self-discipline concerning quality assurance standards and market promotion (see recommendation 11);
- seize opportunities for technology transfer and develop new markets for species under commercial production in Canada (recommendation 6);
- create the appropriate conditions to attract investment capital by:
  a) participating in technical exchange agreements and adapting foreign and domestic best-practice technology;
  b) examining ways of reducing risk to meet the standards set for aquaculture insurance;
  c) raising the quality of their business planning (recommendation 8);
- develop commercial applications for Canadian raw fish wastes and promote scientific research, particularly in fields such as fish nutrition and feed technology (recommendation 5).

SALMON CULTURE, FISH HEALTH AND THE ENVIRONMENT

By John Pitts, D.V.M.

Opponents of salmon farming in Washington State have claimed that wild populations of salmon will suffer from increased disease problems if salmon farming is allowed to proceed. Salmon aquaculture has prospered in Puget Sound for nearly 20 years in net-pens and for over a hundred years in state and federal hatchery programs. There has been no evidence of disease transmission to wild stocks because of these programs in Washington State. In addition, our neighbors to the north have been planting fish for over 100 years and there is no evidence that Canadian fish stocks have been adversely affected by diseases introduced from hatchery aquaculture (Hicks, pers.comm., 1988).

When fish biologists and pathologists have been asked to comment on this question, the answer has been consistent: Transmission of disease from farmed salmon to wild fish could happen, but it is very unlikely and has not been observed. More probable is the transmission of disease from wild fish to cultured fish (Kevin Amos, Washington State Department of Fisheries; Dr. Ralph Elston, Batelle NW; Dr. Lee Harrell, National Marine Fisheries Service; Dr. Brad Hicks, British Columbia Veterinary Service; Dr. Mike Kent, Batelle NW; Dr. Marsha Landbolt, University of Washington; Dr. Gary Wedemeyer, United States Fish and Wildlife Service; Dr. Jim Winton, United States Fish and Wildlife Service, pers.comm, 1988). The same response was given by scientists from Europe experienced in fish culture (Dr. Hans Achefors, University of Stockholm; Dr. Ron Roberts, Stirling University; Dr. Harald Rosenthal, Hamburg, West Germany). In no case has any evidence been presented to show that disease has moved from private sector aquaculture to the wild fishery (Needham, 1981; Neuman, 1986). As stated, the opposite is true, fish in private culture frequently become sick from communicable diseases when they are exposed to wild fish (Hicks & Ferguson, 1986; Hedick, et.al.,1986; Ostland, et.al., 1987). Although we must be aware of the interaction of disease in wild and cultured stocks it is much more likely that the private sector aquaculture will be adversely affected by diseases present in wild populations than vice versa.

The potential for any disease transmission, be it direct contact, air borne or water borne, is much greater when the organism is under stress. Experience has shown that a wide variety of bacterial, parasitic and other diseases become a problem only if fish are being held under environmental conditions unfavorable

for that particular species or strain. Such unfavorable conditions include crowding, temperature fluctuations, inadequate dissolved oxygen, excessive a rough handling, sublethal levels of toxic materials, etc. (Wedemeyer, et. al., 1976). It is not in the best interests of the fish or fish farmer to crowd his farm or he may suffer crop losses. The farm itself must be located in an area of good oxygen supply and good flushing. Siting guidelines prepared by Washington State Department of Ecology require minimum depth and current requirements to ensure that the environment is protected while the fish prosper. The recent mortalities at two farm sites in Port Townsend caused by an unknown toxin in the water, points out the sensitivity of the farmed fish in a compromised environment. These fish are biological monitors, and along with our shellfish, are among the first to alert us to potential problems with water quality.

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Salmon Farming on the Sunshine Coast

By Peggy Parker

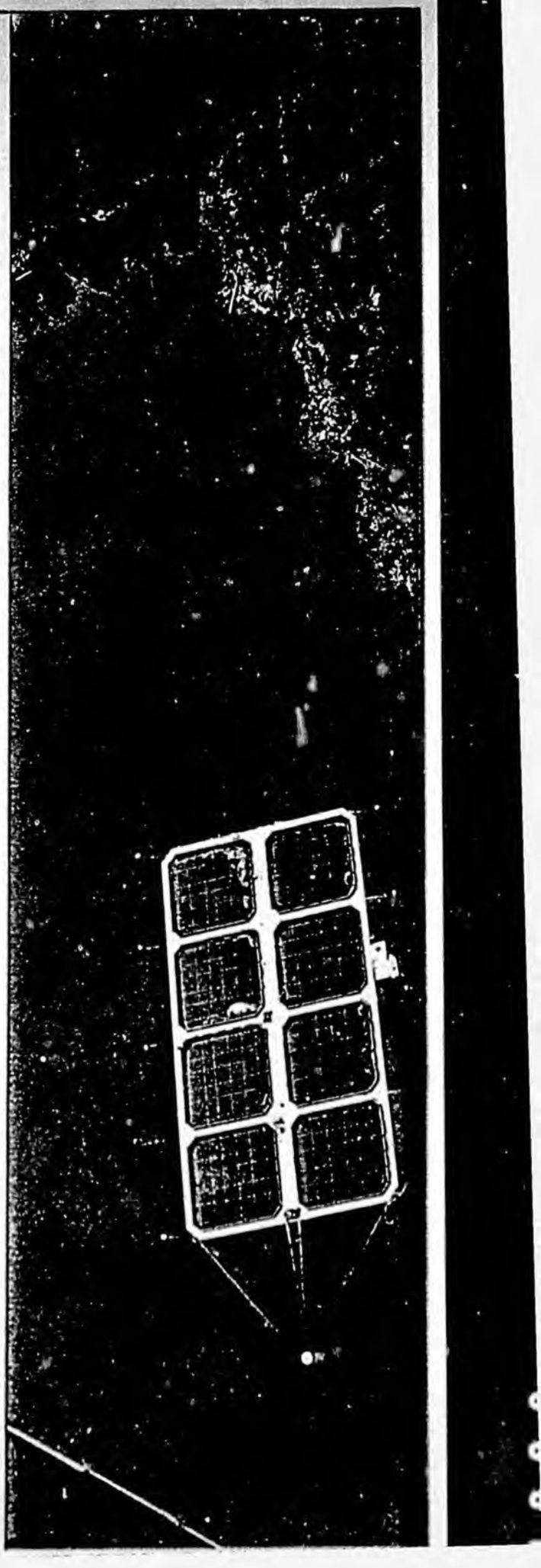
To Yvonne Kraft, the salmon she tends aren't just fish. "They're like your kids," she says. "You watch them every day, worry that they're eating enough and staying healthy. Let me show you the females we're raising for brood stock."

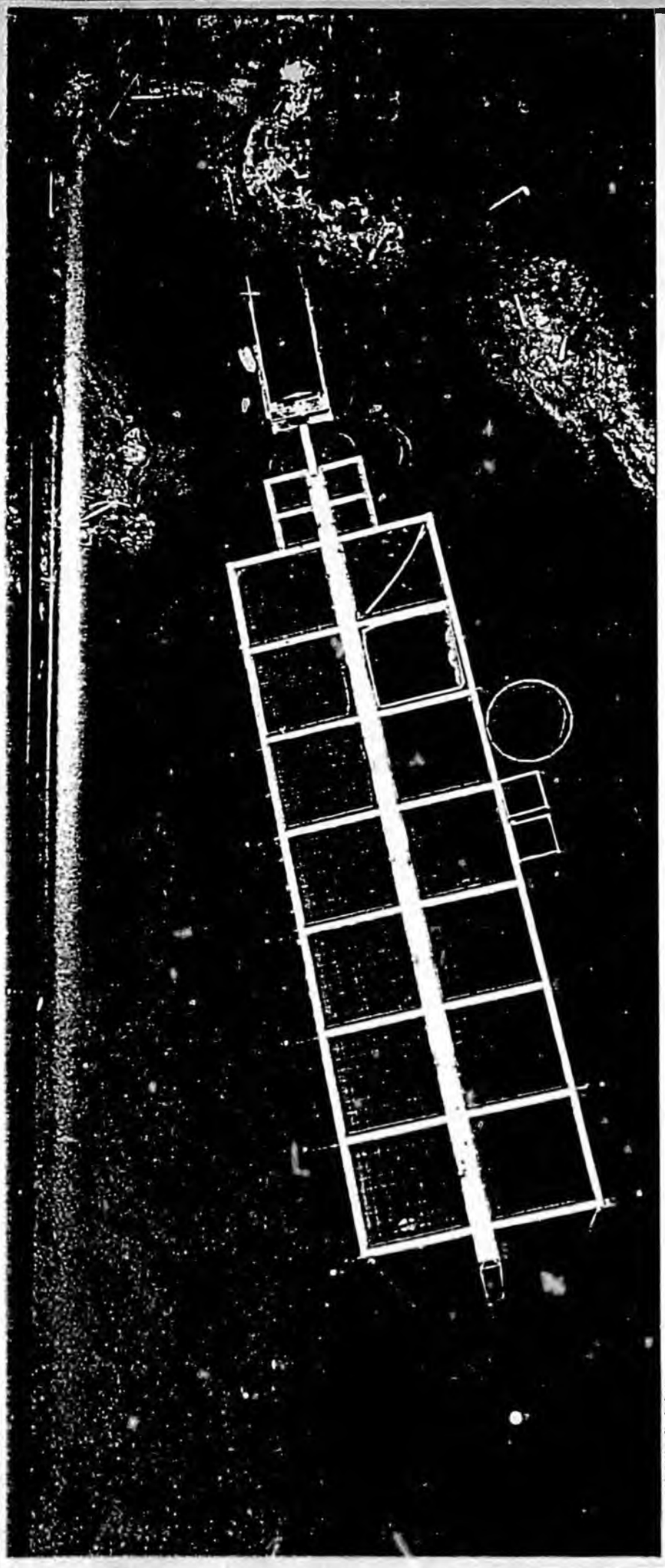
Kraft spent most of 1985 at this grow-out site in British Columbia, living in a plywood and tin shelter set on the floating farm — a series of underwater pens holding young chinook and coho salmon and connected by aluminum catwalks. The site is 40 miles from the nearest town.

"Last winter I'd be out here talking to these fish," she laughs, "talking to my girls."

Kraft is a partner in Aquarius Sea Farms, the largest producer of cultured salmon in British Columbia. In 1985, she was not the only person who was interested in the fish swimming in her net pens. U.S. buyers who had come to rely on Norwegian farmed salmon were realizing that B.C. farms could augment supplies of farmed salmon — at reduced shipping costs — if they could produce reliable quantities.

B.C.'s salmon farmers geared up to meet these demands. Now, after three years of watching the progress of this budding industry, U.S. buyers no longer have to wait. The first harvest of salmon came in September, buyers liked what they saw, and wholesale prices jumped far higher than expected. This year marks the beginning of major production for the new generation of B.C. salmon farmers. In calendar year 1988, 5,000 tons of fresh salmon will be available to U.S. and European buyers, and projected production of 20,000 tons by 1990 is well within reach.





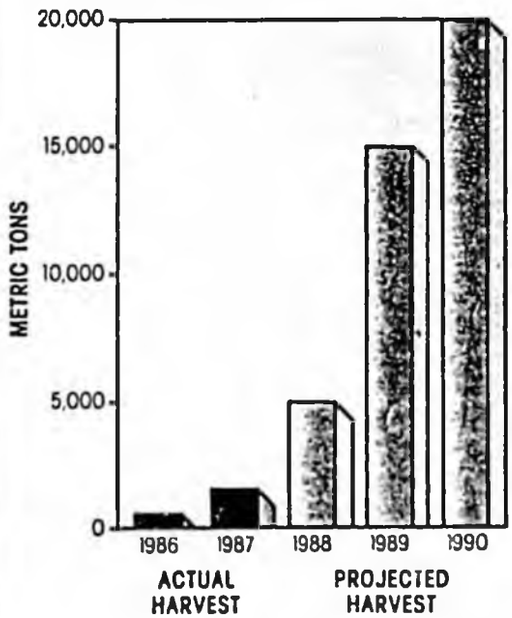
AQUARIUS SEA FARMS



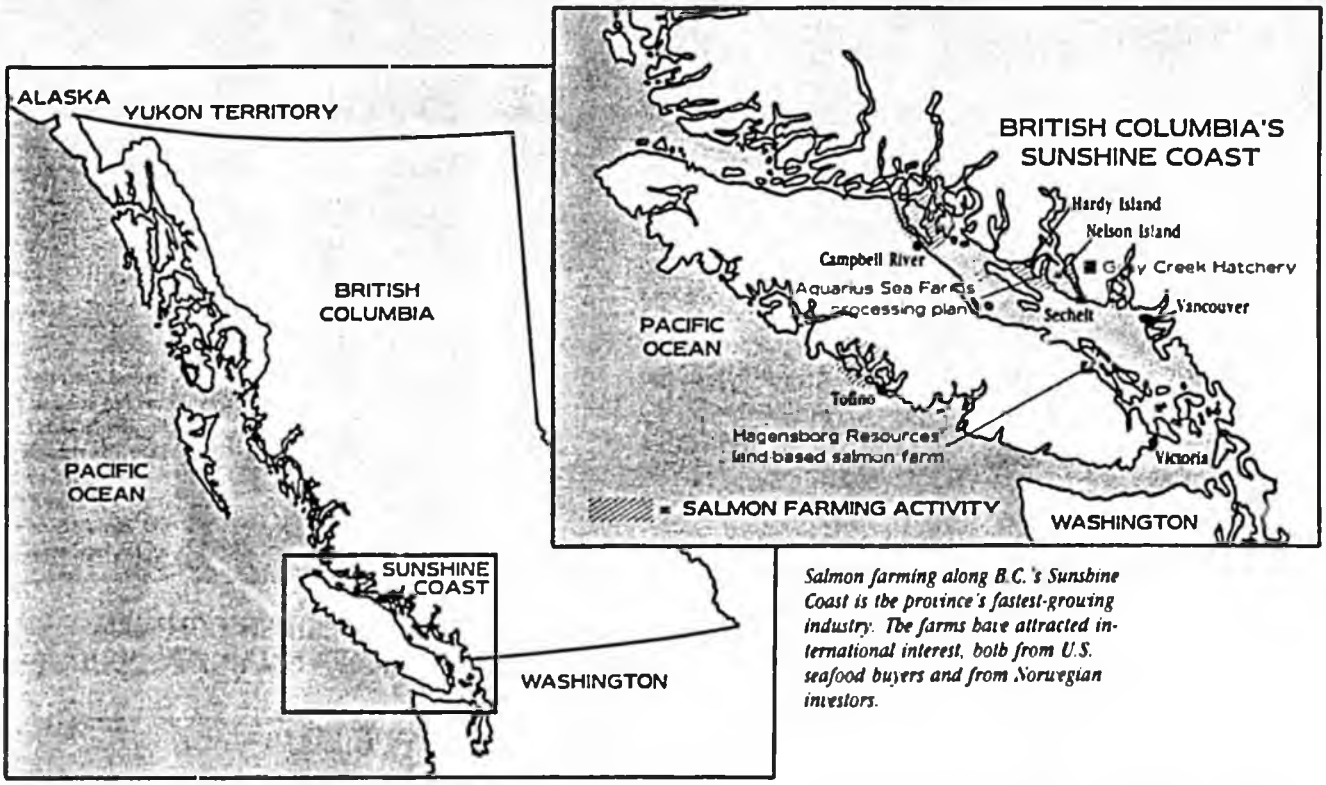
PEGGY PARKER

Yvonne Krafl (left) and her husband Norbert think big. Their Aquarius Sea Farms, owned with Norwegian investors, could produce up to 2,200 metric tons this season

BRITISH COLUMBIA FARMED SALMON PRODUCTION



British Columbia's salmon farmers will harvest 20,000 metric tons in 1990, according to projections. (For comparison, Norway was expected to produce about 48,000 mt of farmed salmon in 1987.)



Salmon farming along B.C.'s Sunshine Coast is the province's fastest-growing industry. The farms have attracted international interest, both from U.S. seafood buyers and from Norwegian investors.

Unlike the Norwegians, residents of B.C.'s productive west coast, known as the Sunshine Coast, did not turn to fish farming on the rebound from a failing commercial fishing industry. Ironically, many of the province's leading fish farmers got into it as an alternative lifestyle.

Tom and Linda May operated a successful boatyard in Seattle during the 1970s. In 1980 they sold the business, bought a parcel of waterfront on B.C.'s Nelson Island, and began raising chum salmon.

"It was a disaster," says Tom May, now president of Royal Pacific Sea Farms, one of the dominant producers in British Columbia. "In 1981 we shifted to chinook and coho. We have a definite preference for chinook now, but we're putting a large effort into breeding coho, and our emphasis may shift in the future."

This oft-heard refrain is a response to the market. Restaurant buyers pay top dollar for fish that weigh five pounds or more. Chinook will grow to that size without becoming sexually mature. Coho are less likely to reach that size before they begin to show signs of spawning. (As salmon approach spawning, their meat becomes increasingly pale and watery.) In the case of Pacific salmon, spawning is a once-in-a-lifetime event that farmers would like to avoid altogether.

To this end, George Hunter directs a staff of bioengineering technologists at Royal Pacific in a two-pronged approach to sterilization. The most effective current technology is to feed very young coho miniscule amounts of steroids for a 12-week period. Ten days after the treatment, all trace of the steroids has disappeared.

"Hormonal sterilization is a short-term answer," says Hunter. "The long-range answer is to use other methods. We're doing work on inserting genes into salmon at very early stages of development. We're calling these 'transgenic' salmon." The gene is reproduced in a petrie dish and put into the salmon at the four-cell stage or earlier. Gene manipulation can increase growth rates and disease resistance as well as affect reproductive abilities.

After Royal Pacific's initial setback with chums, the company doubled production every year. In 1986, says Tom May, "We were showing a very, very large profit on a few-million investment. We sat down and decided what direction we wanted to go in terms of the scale of the operation — what kinds of fish to raise and where our profit centers would be. We came up with a needed investment of $10 million."

Early last year, the company went public. The offering on the Vancouver Stock Exchange was successful, due in large part to the company's solid operating record. In an industry where profits often elude balance sheets for five years after start-up, Royal Pacific made money after two years, and profits have grown each year.

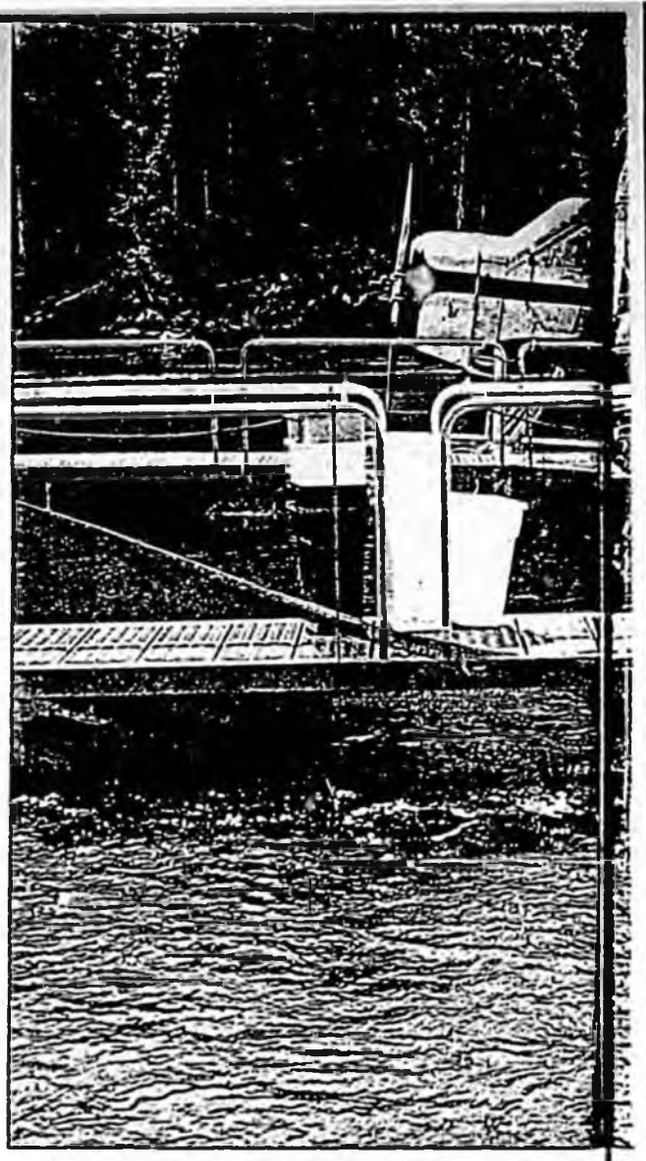
For many fish farming companies in B.C., offering shares on the Vancouver Stock Exchange is the best way to raise large amounts of money. Commercial banks in Canada have not recognized fish farms or their swimming

stock as collateral. Norwegian banks, however, familiar with the profits of salmon farms in their country, have invested heavily in British Columbia. Analysts say that of the estimated $100 million (Canadian) investment in the B.C. industry, about half is Norwegian.

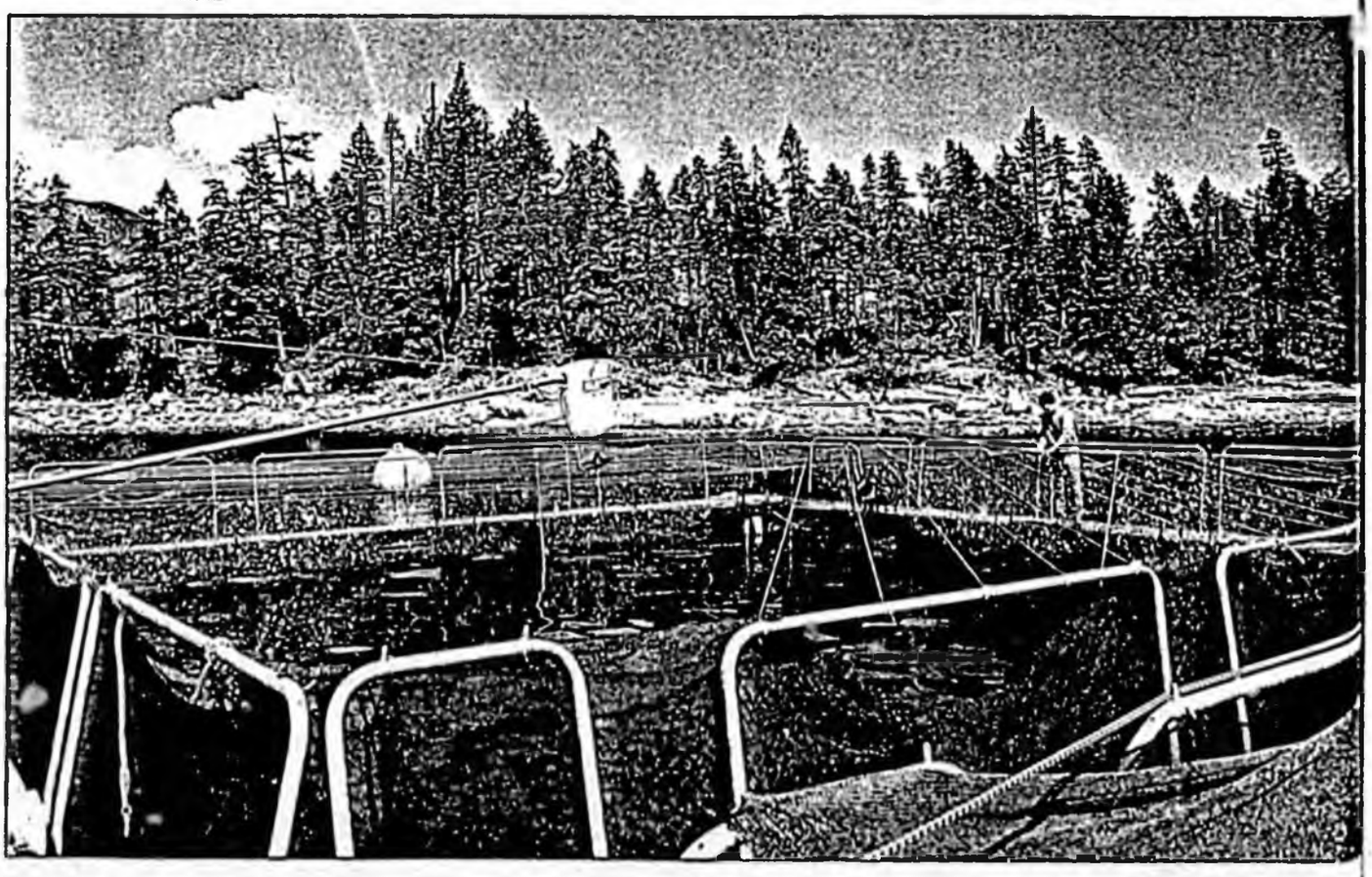
Yvonne and Norbert Kraft, founders of Aquarius Sea Farms, owe much to the faith and financing of the Norwegians. In 1984, Yvonne was a retail florist, and Norbert operated a construction business in Sechelt. A year later, they had fish in the water in a small farm in Hotham Sound. A contingent of Norwegians visited B.C. in 1985 and met with the Krafts, who decided to expand their farm and become leaders in the industry. Norbert went to Norway later that year; he came back with a financial partnership and plans for a hatchery.

This year the hatchery produced three million smolt, about half for sale to outside companies. Five million eggs will be incubated there this winter, but the hatchery will hold 12 million at full capacity — the largest production in B.C.

Yvonne and Norbert Kraft are described as "big thinkers" by their colleagues. Their production and marketing plans reflect that thinking, and the company's performance confirms it. By May Aquarius will have produced 1.5 million pounds of salmon (680 metric tons) — more than any other farm in Canada. This season they plan to harvest 4 to



Hardy Sea Farms' salmon pens eventually will share beautiful Hardy Island; prime lots are being reserved for resort development.





PEGGY PARKER (3)

An Aquarius farm — there are 10 in all — takes delivery of smolt (left). The company's batchery will incubate 5 million eggs this winter; its capacity is 12 million.



Al Archibald (left), marketing director for the B.C. Salmon Farmers Association, and Mike Mulholland, operations manager for Hardy Sea Farms.

5 million pounds — four times British Columbia's entire output of farmed salmon in 1986.

They'll probably do it. The Krafts have met every goal they've set for themselves in the past three years, and they've done it on time. Company performance has been strong enough to attract investment from oil-and-mineral tycoon Edgar F. Kaiser, Jr., who recently bought just over 10 percent of the firm.

Aquarius' latest project is a state-of-the-art processing plant with a shift capacity of 20,000 pounds. Centrally located among the company's 10 farms on B.C.'s Sunshine Coast, the plant began processing in November.

Now that harvesting and processing schedules are being met, marketing has replaced production as the farmers' first priority. The B.C. Salmon Farmers Association (BCSFA), an industry group in charge of allocating eggs from the provincial and federal hatcheries to private companies, began marketing studies in 1986. Al Archibald, marketing director for the association, has provided the farmers critical information on market needs in Europe and the U.S.

Armed with this preliminary data, individual companies began developing their own marketing plans in early 1987. Most of them either sought out, or were sought out by, established brokerages and distributors. Tom and Linda May of Royal Pacific worked out a deal with B.C. Packers, one of the largest salmon packers in North America, to process and market most of their harvest.

The Krafts wanted to sell fresh salmon under the Aquarius label and applied for trademark rights. When Marketing Director Jack McLennan learned that the name was already taken but was not being used, he contacted the company that had the rights to it. Serendipity being what it is, the company that had trademarked "Aquarius" was Clouston Foods, Canada's premier seafood broker. Clouston is now the exclusive marketing agent for Aquarius.

Pacific Aqua Foods, a huge, vertically integrated company that has been traded on the Vancouver Stock Exchange for several years, signed an agreement with the giant Canadian processor, National Sea Products, in September. The transaction provided $2 million in financing for PAF, named National Sea Products as the exclusive marketing agent for PAF's products, and put Gordon Cummings, president and CEO of National Sea, at the head of PAF's board.

Another B.C. company, Hardy Sea Farms, is affiliated with Saga Seafoods A/S, a Norwegian firm founded by Thor Mowinckle after he made A/S Mowi the leading salmon producer and marketer in Norway. The Canadian subsidiary owns Hardy Island, a beautiful tract of land off the northern reaches of B.C.'s Sunshine Coast. In these protected bays, Hardy will raise coho and chinook salmon. But it has reserved half of the island for real estate development — a carefully planned collection of prime waterfront lots for resort use.

Hardy produced about 250 tons of chinook and coho last year; it expects to triple that in 1988. "After that, production will more than double every year," says John

Spence, president of Hardy. "By 1990 we are projecting about two to three thousand tons."

Spence, a Mowinckle protege who ran and is still a shareholder in one of Ireland's most successful farms, Fanad Fisheries, recognizes the market's critical role in his company's success. "We are in a market-driven industry," he asserts. "We need to respond to what the market wants, when it wants it and at what quality."

Hardy's marketing agent is J.S. McMillan, B.C.'s largest family-owned seafood processor and distributor. McMillan will tap its broker network to promote Hardy's pen-raised salmon, but is test-marketing fresh and frozen fillets and vac-packed portions in other markets.

Hardy Sea Farms will be going public this winter, in a move to raise between $5 and $6 million. Most of the capital will be used to develop the company's domestic brood stock.

"We are self-sufficient on brood stock," says Spence, "but we've only got two generations behind us." Spence's interest in developing reliable domestic brood stock is prudent. Those companies that now do not have enough of their own brood stock rely on wild eggs allocated by the BCSFA. By controlling production of their own eggs, companies not only gain further integration, but the ability to develop a "signature" product and to plan their production more carefully.

"The farmers have placed orders for 30 million eggs this year," says Al Archibald of the BCSFA. "They've asked for 27 million chinook eggs and 3 million coho. Last year, the mix of chinook to coho was more like 50–50." Clearly, the farmers are not going to get all that they want. When *Seafood Business* went to press, allocations were expected to be only 20 million eggs.

While most B.C. salmon farmers either own or have exclusive arrangements with processing and marketing firms, there are dozens of farmers who have decided to stick to what they do best — raising salmon. This has led to the formation of companies like Sechelt Processing Ltd., a small, custom processor that serves independent farmers up and down the Sunshine Coast. To transport live fish to the plant, Sechelt uses a 40-foot vessel equipped with a "fish well." Each of four compartments has its own circulation and oxygenation systems to keep live fish healthy during a five-hour run.

This winter, farm-raised Pacific salmon will come face to face with Norwegian and Chilean product, at a time when sales of farmed salmon are strong and prices generally high. How the market shakes out will depend as much on marketing methods as on size and species.

With the involvement of such marketing heavyweights as Clouston and National Sea

Big Players in B.C.

Aquarius and Royal Pacific are the front-runners in terms of production today, but they are by no means the only — or the largest — players in B.C.'s fastest-growing industry. Many of the companies operating salmon farms in the province have corporate charts that look like detailed road maps.

Pacific Aqua Foods Ltd. (PAF), with interest in both Pacific and Atlantic salmon, was one of the first aquaculture companies to be traded on the Vancouver Stock Exchange. PAF owns Tidal Rush Marine Farms (pen-raised Pacific salmon), Aqua Foods (cultured oysters), Deluxe Seafood (processor and marketer), American Aqua Foods (pen-raised Atlantic salmon), and Nationwide Seafood Distribution Centers (California-based distributor). Its affiliates include Crystal Waters Sea Farm Inc., the largest Atlantic salmon hatchery in British Columbia, and Quatsino Sea Farms, another salmon farm.

Crystal Waters, owned jointly by PAF and Sea Farms Canada, is one of the few companies that have obtained the right to import Atlantic salmon eggs. By 1989, however, it intends to be producing enough of its own brood stock to meet egg needs.



ALBERT NORMANDIN/SEASTAR

One of Seastar's four grow-out sites.

The economic benefits of vertical integration are not lost on Hugh Cooper, chairman of Seastar Resource Corporation. Cooper grew up in the farm country of southern Manitoba and watched as farmers struggled through bad weather, poor crops, and mounting debt.

"The poor sodbusters in Manitoba never made a buck," he says. "It was the grain companies that made money. And they made it because they sold the farmer his seed grain, his fertilizer, his equipment — and then they marketed his product."

Cooper applied what he had learned when he was hired by Seastar, a former oil, gas, and mining firm that turned to renewable resources in 1985. For the next two years Seastar was in an acquisition mode, culminating in the ownership of two salmon hatcheries, four operating grow-out sites, two processing companies with major cold-storage and freezing capacities, a fish-buying station, a smoked-seafood processor, a fish-food manufacturer, a net-pen manufacturer, and a major marketing firm that imports and exports farmed Norwegian salmon all over the world.

Seastar's production of salmon is in the early stages — 160 tons, mostly coho, will be harvested this year. But once the tonnage is there, Seastar will have everything else in place. Processing will be done primarily at Long Beach Shellfish, the largest shrimp processor in B.C. and "a major cash cow" for the company now. The plant will portion and vacuum-pack salmon for the retail market, which will get about 30 percent of Seastar's production.



HAGENSBORG RESOURCES LTD. (2)

Taking to the Land

One of the most bullish of the publicly held salmon-farming firms is Hagensborg Resources, a company with trer endous vertical integration. With a $5 million line of credit from Norwegian financiers, Hagensborg is building a land-based facility large enough to produce 1,000 tons of coho and chinook salmon annually — the largest land-based operation on the continent.

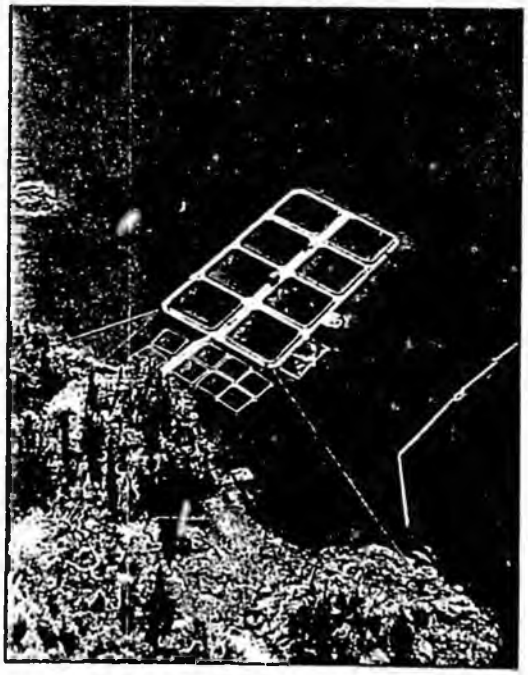
The advantages of land-based salmon farming are numerous: disease control, protection from predators, more efficient feeding, and full control of water temperatures and oxygen levels. The initial costs, however, are much higher than for a sea-pen operation. Smolt will be put into tanks early this year, with the first harvest set for late 1989.

Two company-owned sea pens on the west coast of Vancouver Island are currently producing small quantities of chinook and coho. (About 250 tons of 4/6 coho and chinook are expected to be harvested between November '87 and May '88.) Five more sites — each with production capacity of 900 tons per year — will be in operation there this year. When both land-based and sea-pen operations are in full production, 7,300 tons of salmon will be produced annually.

The base camp in Cypress Bay doubles as a staging center for other farms in the area. Hagensborg owns a ferry boat to bring in supplies from Tofino, the closest town and a major port on Vancouver Island. Space on the ferry is leased to other companies bringing supplies in to their farms.

Last summer, Hagensborg bought a 45-acre dairy farm located above the largest aquifer on Vancouver Island. This unlimited source of water will supply Hagensborg's hatchery, which in turn will provide smolt to the company as well as cash from outside sales.

Hagensborg salmon will be fed food pellets made by another company subsidiary that also sells to other farms. Finally, Hagensborg Foods (a wholly owned subsidiary) will market fresh, smoked, and frozen salmon, as well as salmon pates and other value-added products, through existing broker networks in the U.S., Europe, and Asia.



The drawing (top) shows what will be "Canada's largest Tank Fish Farm," the land-based salmon facility being built by Hagensborg Resources. The company also will have seven sea-pen operations like the one in bottom photo.

Products, B.C.'s farmed salmon will enjoy a higher profile this year than ever before. But it will be the combined efforts of all the brokers and traders handling B.C. product that determine its market position. Many have already made their moves with small amounts of fish in select markets. Besides the firms already linked to the farmers through exclusive marketing arrangements, independent brokers have flocked to the farms on the Sunshine Coast. Demand has grown exponentially since the first big harvests of last year, and B.C. salmon farmers may find that even 20,000 tons in 1990 will not be enough to satisfy everybody. □

A STIR IN THE SALMON MARKET



Salmon farmers are banking on high quality and reliable supply to sell their fresh product, while domestic producers of wild-caught fish are looking to create a market niche based on the price and year-round availability of high-quality frozen salmon.

How new supplies are changing the picture.

BY PEGGY PARKER

Despite the salmon family's abundant market forms and diverse species, the attention of today's market seems riveted on fresh and frozen salmon, both farmed and wild.

Much of the stir in the fresh market is due to the Norwegians, who began exporting large volumes of fresh Atlantic salmon to both the East and West coasts in the early 1980s. The Norwegian exports meant that, for the first time, high-quality fresh salmon was available in the winter — and in reliable quantities.

It used to be that fresh salmon was sold only from June to September. There were regional exceptions where winter runs of kings or steelhead (a member of the trout family, often sold as salmon) put fresh salmon on the tables of gourmet restaurants in February and March, but volumes were minuscule. The savvy Norwegians created a whole new market with their product, a market that went far beyond the niche of the domestic product in winter.

The urge to target this market is strong among domestic producers: returns are high, and the potential for growth is excellent. There are only two rules in this high-stakes game, but they must be followed to the letter. First, the product must be of highest quality; and second, supply must be reliable.

Salmon producers are taking two approaches to the market. One is to join the competition. Interest and investment in farming operations are high on the coasts of both Canada and the U.S. Another is to promote high-quality frozen salmon as a product that meets the aesthetic standards of fresh, yet is available — usually at lower prices — all year.

The Alaska Seafood Marketing Institute introduced "Premium Quality" salmon to the winter market this year in an effort to prove that frozen salmon beats fresh in the overall picture. The cohos selected for the promotion were troll-caught, bled and immediately iced on board, then frozen on shore using meticulous handling techniques.

No time for kid gloves

But it is unlikely that Alaskan plants will produce an elite product in great quantity anytime soon. With half a billion pounds of salmon returning to Alaskan rivers in a period of four months, processors have little time for kid-glove treatment on the majority of the catch.

Harvest timing is more critical with salmon than with any other seafood. Wild salmon must be caught



between the time they enter the fishing grounds (often a several-hour boat run from the fish plant) and the time they reach the fresh water of their spawning streams. It is during this window of time — often only a matter of hours — that wild salmon are at their peak.

Processors market the cream of this crop — troll-caught chinooks and cohos and gillnet-caught sockeyes — to high-ticket restaurants. Like fine wine, they are sold with the area of origin and the date of harvest identified. While the percentage of wild salmon that is sold fresh or frozen is much higher than it was six years ago, growth in this area has slowed. Last year, fresh and frozen salmon amounted to 53 percent of the entire pack, 10 percent *below* the 1985

figure. Short-term growth in the market for fresh and frozen salmon will most likely come from farming operations.

A rush to the fjords

Much as in the westward homestead rush of the 1850s, salmon farmers are stampeding to the fjords of Maine, Washington, and British Columbia to set up sea pens and claim their share of the market. The U.S. has been slow to embrace sea-pen salmon farming, but British Columbia has issued more than 100 permits for the floating farms.

In July 1984, the B.C. Salmon Farmers Association was formed to allocate eggs from the federal hatcheries (the surplus from the government's salmon-enhancement program) to the farmers. Today the industry-funded group not only divvies up the eggs, but screens them for disease. B.C. farmers are building their own brood stock for secure supply and quality. Garth Hopkins, the association's director of communications, says, "In another five to seven years, we will be self-sufficient on eggs."

Following the Norwegian lead, Hopkins' group is developing a marketing strategy for B.C. salmon. It expects to implement the plan before the end of the third quarter this year. Membership, at 75 firms today, is expected to grow to 250 by next year. B.C. production of farmed cohos and chinooks was about 500 metric tons last year. In 1988, that number is expected to reach 10,000 mt.

Right now, world production of farmed salmon is less than 50,000 mt. But salmon farms in New Zealand and Chile are just beginning to produce salmon in large volumes, and in the U.S., successful farms are expanding in Washington and Maine, while others wait in line for permits.

The world's first land-based fish farm is expected to open in June in Westport, Washington. Financed by Seacom A/S of Norway, the plant will raise pan-sized coho in salt water pumped from the ocean. A second facility is slated to open in British Columbia in August.

In Alaska, where pen-rearing of salmon is illegal, the legislature is considering a bill to develop a mariculture industry.

"Although the Norwegians certainly have a jump on prospective Alaska fish farmers," says Brent Paine of the Alaska Mariculture Association, "we do have some advantages, such as sharply lower transportation costs, no import duties, and the lack of currency fluctuations between producers and customers." Paine has marketed Norwegian salmon in the U.S. and worked on fish farms in both the U.S. and Norway.

1986 U.S. Imports of Salmon

FROZEN:	(IN METRIC TONS)	FRESH:
136.9	NORWAY	8,871.4
5,078.6	CANADA	2,485.0
4.2	CHILE	680.8
3.0	U.K.	367.5
263.0	OTHER	540.7
5,486.0	TOTAL	12,945.4

GRAND TOTAL FRESH & FROZEN: 18,431.4

Will prices drop?

These advantages and high wholesale prices are what make the gamble worth it for many aquaculturists in North America. But will rapid growth in the farmed sector mean a drop in prices at the wholesale level?

Norwegian producers are betting their kroner that the market will expand to support price levels, even with the added supply. Their strategy is to provide consistently excellent fish, and sell them with flair. Branded products -- not often seen in the fresh-seafood market — will become more common. Designer tags in the gill plate, such as MOWI of Norway's "Superior" tab, have great snob appeal; they also identify the fish and guarantee quality standards. The Scottish Salmon Growers Association now marks its boxes with a special "British Food Quality, Scottish Salmon" stamp. The Shetland Seafood Quality Company and the Shetland Salmon Farmers Association use a grading scheme that awards top quality a "Grade A" sticker.

But not all salmon-farming countries have the quality schemes of Norway, the U.K., or Canada. Some brokers fear that large volumes of farmed salmon may be "dumped" at low prices to gain a foothold in the U.S. market in the next year or so. That could be disastrous to small or recently established farming operations, but the major producers would likely survive.

Just how large could U.S. imports become, and how does that potential compare with domestic supply?

Norwegian salmon farmers are now producing about 30,000 mt per year. Of that amount, about 9,000 mt reached the U.S. market last year, an increase of 34 percent over 1985 imports. Total imports from other countries were just over 18,000 mt.

U.S. fishermen landed 285,000 mt last year, of which about 110,000 mt were exported. About 100,000 tons went into the domestic canned market, leaving about 75,000 mt in the domestic fresh/frozen market. Imports from all countries, then, account for about 24 percent of the domestic supply of fresh and frozen salmon.

These figures could change rapidly. Japanese sea ranching could supply more of that country's needs for salmon, which would leave more sockeyes and cohos for the domestic market. Alaska salmon landings are mercurial, but generally have been increasing over the past decade. Imports are likely to rise — perhaps even double — in the next five years. But a rapidly expanding market will move these supplies quickly. □

What is real?

A word or two about real salmon. There are two genera, or classifications of salmon: *Oncorhynchus* (on ko *rin* kus) and *Salmo.* Members of the *Oncorhynchus* genus are found in the Pacific and are all called salmon. Members of the *Salmo* genus are most often found in the sea pens of Norway (although there are still some small wild runs in the Atlantic), and are called, depending on the species, either salmon or trout. The fish that created such a splash on the winter market in the early 1980s is *Salmo salar,* or Atlantic salmon. In the wild, both Pacific and Atlantic salmon hatch in streams, migrate to open ocean for a growing period, then return to the streams of their birth to spawn. A major difference between the two groups is that *Oncorhynchus* spawn once and die; *Salmo* spawn several times.

Opinion



Rodger Painter, executive director of the Alaska Mariculture Association, formerly was executive director of the United Fishermen of Alaska, editor of a commercial fishing newspaper, and chairman of the Alaska Seafood Marketing Institute's Quality Committee.

"Fish farming in Alaska does not have to be a neolithic clash between hunters and farmers."

"Commercial fishermen are, I think, by and large philosophically unprepared for this kind of change. I am a high seas hunter."

This quote from a Canadian fisherman may be the shortest and most accurate summary of the feelings of some in the fishing community toward fish farming. Appropriately for the prevailing pattern of relationships between fishermen and aquatic farmers, the comment was delivered to a government panel studying the effects of B.C.'s newly burgeoning salmon farming during a permitting moratorium.

Fish farming in Alaska does not have to be a neolithic clash between hunters and farmers. Most of the members of my organization have close ties to the fishing industry, and, yes, many are fishermen. I am a fourth generation Alaskan, and my family has always been involved in the fishing industry.

We simply believe aquatic farming is a legitimate business with a great future and can be conducted in a fashion that protects the wild stocks and environment. As for threatening the fishing industry, consider the realities of salmon being farmed in 15-20 countries worldwide and several other states. You don't have to be an economist to figure out that Alaska's participation in salmon farming isn't going to make that much difference in the global supply picture.

The Alaska Mariculture Association is eager to work with the seafood industry in meeting the challenge posed by the phenomenal international growth of salmon farming. We believe Alaska farmed salmon will compete primarily with Norwegian and Canadian cultured products.

Working together makes a lot more sense than battling in the political arena anyway. We're willing to sit down and work out a conservative approach to development of a farming industry in Alaska.

This can be accomplished by legislation that provides adequate disease, environmental, and land use protections for the interests of fishermen, and a system to ensure farmers pay their own way through a mariculture products tax and responsible users fees.

And, importantly, we are willing to accept a reasonable method of phasing in finfish farming in an orderly manner so state agencies can slowly build adequate regulatory and support programs.

Alaskans need to refocus the enormous amount of energy spent discussing the pros and cons of fish farming toward solving the fundamental problems preventing Alaska salmon from creating the kind of excitement in the marketplace as the Norwegians. We all know what they are: quality, marketing, availability of fresh product, and consistency of supply.

These problems can be addressed. The only way for Alaska salmon to regain its premier spot in world markets is to fight back with a superior product, improved marketing, and lots of it.

Despite its loss of status as the almost exclusive world supplier of salmon, Alaska still is the Saudi Arabia of global salmon markets. With farmed salmon added to its product line, the Alaska seafood industry gains considerable strength and versatility. A well-funded joint marketing campaign between Alaska salmon farmers and fishermen could be very effective.

Fishermen should consider the reality that the world salmon farming industry is here to stay, then start exploring ways the fishing community can benefit. Here are two examples:

Hatchery Programs—Alaska's hatchery programs have been called one of the best investments ever by the State of Alaska in terms of direct returns to the economy, but cutbacks in state spending threaten to close down many of the public facilities. Repayment of the private loans will require the private hatchery systems to divert substantial amounts of fish from harvests by commercial fishermen for cost recovery programs by hatchery managers.

One of the biggest potential sources of new funding for these public and private enhancement programs could be the sale of juvenile fish to Alaska salmon farmers. The Alaska Department of Fish and Game estimates there were 88.6 million eggs surplus to the needs of state and private hatcheries in 1986. A 44 million pound salmon farming industry in Alaska would require roughly 10 million of these surplus eggs per year.

Should the state or private hatcheries decide to utilize these surplus eggs to produce the juvenile fish (smolts) needed by salmon farmers, these sales could generate $7-$10 million annually.

Fish Food Manufacturing—A fully developed salmon farming industry in Alaska would require roughly 88 million pounds of fish feed a year (worth $30-$40 million) provided by regionally based meal plants. That much fish feed would require 264 million pounds of raw product (fish waste or whole fish). At 6 cents a pound, fishermen could make $15.8 million for fish that are now unmarketable.

Production of fish feed can enhance the viability of shore-based surimi plants. In fact, Alaska's largest surimi plant already utilizes its byproducts to produce a fish meal now sold to Taiwanese eel farmers.

The Alaska Mariculture Association remains committed to working with fishermen. With both wild and farmed salmon, Alaska would regain its competitive position in world markets. Now, that's something worth fighting for.

Rodger Painter

The Agricultural Research Council of Norway
Institute of Aquaculture Research

Ås-NLH
Sunndalsøra
Averøy
Oslo

16.02.88

Dr. William W. Smoker
Juneau Center
Fisheries & Ocean Science
University of Alaska
11120 Glacier Highway
Juneau, Alaska 99801

Our ref.: TG/mw
Your ref.:

Dear Dr. Smoker,

I am sorry for late answer, but I had to get some information about the frequencies of farmed salmon in rivers. The person has been away until today.

In some rivers there has been electric fishing for broodstock in order to collect milt for deep freezing. In most rivers only a few fish were caught, and from them some high frequencies of farmed fish were obtained. In total 166 male fish were caught, and 26 % were classified as farmed fish, 79 female fish gave 11 % farmed. The classification was based on looking at damage of fins.

- So far no positive (except that more fish enter rivers for sport fishing) or negative effect has been found to be caused be renegade fish in wild populations.
- None has shown that renegade fish spawn in rivers.
- No information is available whether or not renegade fish and their progeny can compete with wild fish in a river system.

One should be aware of that a river strain is not a static population. As physical and environmental changes take place in a river, natural selection will change the fish to become better adapted to the new environment.

If renegade fish enter a river and spawn, it is likely that the genetic variation will increase. This will make the natural selection more efficient. The newcomers have to fight the wild. Positive gene will be kept, and negative will be rejected.

This is just some comments from me. You may use them as is most appropriate.

Sincerely yours,

Trygve Gjedrem

Juneau Center
Fisheries & Ocean Science
University of Alaska 11120 Glacier Highway, Juneau, Alaska 99801
(907) 789 4444

M E M O R A N D U M

Date February 16, 1988

From Bill Smoker

To Bill Heard
Brian Allee
Bob Burkett
Bob Davis
Earl Krygier
Rodger Painter

Subj Genetic Effect of Farmed Fish

In the past month a newsclipping from Fishermen's News has made the informal rounds; it told of renegade fish from salmon farms in Norway invading wild spawning populations and quoted Prof. Harald Skjervold as being concerned about the genetic effect of these fish on wild salmon.

I sent the clipping to Prof. Trygve Gjedrem of the Agriculture University of Norway. He is a PhD genetecist well known for his work on Atlantic salmon breeding in Norway and is, I believe, Prof. Skjervold's successor at the University. He is the current President of the International Association for Genetics in Aquaculture. Last month I asked him for whatever information he could provide about the newspaper article, for his opinion, and whether I could share his comments publicly. Enclosed is his reply to me. I believe Bob Davis has made a similar request of Prof. Skjervold.

It's still not entirely clear to me what interpretation can reasonably be made of the information. As I understand things some Norwegian scientists went into some Atlantic salmon rivers to collect gametes, sperm, for cryopreservation. I expect their plan is to use the gametes in future aquaculture broodstock improvement. They used electroshocking gear which in my experience can be a very efficient method of catching spawners, i.e. they could have sampled a very high proportion of fish in each river. Of 166 males captured 43 showed external evidence of coming from a farm (damaged fins.) We don't know if the fish were mature (presumably they were), what proportion of the wild fish were sampled (it may be that the 123 wild males comprised nearly all of the males in the rivers), how many rivers were sampled, or whether the mouths of the sampled rivers were all nearby to farms.

DISEASE
Department of Fish and Game
Division of Fisheries, Rehabilitation,
and Development

ISSUE:

Protect native and hatchery stocks from potential disease arising from salmon farming operations.

DISCUSSION:

All populations of fishes, whether in saltwater or fresh, in the wild or in captivity, at some time contain disease agents such as bacteria, viruses, fungi, and invertebrate parasites. In Alaska, endemic disease agents are present throughout wild stocks and the marine environment. Many are opportunistic, causing disease primarily when the fish are crowded or stressed. However, it is extremely important to recognize that populations of fishes differ in the disease agents they carry, and that diseases newly introduced to fish populations can be very devastating.

To control disease in the ocean ranching program, Alaska set in place stringent regulations that govern the movement of salmon and their gametes within the state, and prohibited the import of any fish species or their gametes for aquaculture purposes. These regulations have applied for some 16 years and include requirements for thorough broodstock screening for disease agents, routine treatment of eggs to prevent disease outbreaks, annual inspections and strict reporting requirements, and the destruction of stocks if the state finds that this is necessary to control disease. The state's prohibition on importing species ensures that no new diseases are introduced into the state. For example, many chinook salmon stocks in Washington and Oregon carry IHN virus. Importing these fish could introduce new strains of IHN virus to indigenous stocks. Similarly, importing Atlantic salmon would bring the risk of importing exotic viral and bacterial diseases not found in Alaska. This could have serious impacts on the health of existing native and hatchery stocks, and must be avoided.

To maintain adequate protection of existing fishery resources, any future fish farming industry must be governed by the same fish health regulations currently governing Alaska's ocean ranching program. The species made available for farming should be from native or hatchery stocks having complete and acceptable disease histories. Prohibitions on importing species including Atlantic salmon must be maintained. This way, any diseases would be those already present in wild populations, not exotic diseases which could cause serious harm to the native stocks. All transport and possession of fishes and their gametes needs to be closely

controlled through Fish Transport Permits, and strict reporting and inspection requirements need to be enforced.

However, extending the Department of Fish and Game's fish health services to this new industry cannot be accomplished without the addition of new staff and monies to support these activities. Private sector fish health practitioners could pick up some of this additional workload. Such private practitioners would need to be certified by the state and monitored on a routine basis to ensure acceptable performance, but presently there are no private sector fish health practitioners currently operating in-state.

SUMMARY:

Assuming that imports of Atlantic salmon or other fish species to Alaska remain prohibited, that the state continues to meet its responsibilities in fish disease control, and that monies are provided for additional fish health services, this new industry can be accommodated without the threat of disease to existing native and hatchery stocks of fish.

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

ISSUE:

Ensure that salmon farming does not impact the genetic integrity of existing natural and hatchery stocks of salmon and trout.

DISCUSSION:

Preserving the genetic diversity of Alaska's fishery resources has been recognized as an important fisheries management goal. This is especially true for the state's enormous salmon resources.

Alaska, in maintaining the health and perpetuity of its salmon resources, subscribes to the theory that identifiable units of salmon (populations, stocks, races) have through natural selection become adapted to the particular watershed that serves as home. This adaptation is preserved in the genetic make-up (gene pool) of the stock. State fisheries managers have sought to maintain stock diversity to ensure the long-term health of our salmon populations. Loss of stock diversity can occur through dilution brought about by interbreeding with other stocks. For these reasons, Alaska at the outset of its salmon ocean ranching program set in place stringent regulations that govern the movement of salmon and trout within the state and prohibited the import of salmon and trout for aquaculture purposes.

The Department of Fish and Game's genetics policy prohibits the importation of live salmonids (salmon family) into the state, and does not allow stocks to be transported between major geographic areas, such as Southeast, Kodiak Island, Prince William Sound, Cook Inlet, Bristol Bay, and AYK/Interior. The policy has been adopted in order to protect Alaska's diverse natural salmon and trout stocks.

Any new aquaculture venture, such as salmon farming, must be governed by the same policy, transport regulations, and statutes that have applied to the salmon ocean ranching program for the past 16 years. This is particularly true for provisions prohibiting the importation of exotic species, such as Atlantic salmon. Atlantic salmon are acutally a trout and are the ecological counterpart of Alaska's indigenous or native steelhead trout. Since these species have not evolved together and thereby have not developed mechanisms to avoid competition with steelhead

trout or other trout, there is a concern about negative impacts on Alaska's indigenous trout.

Therefore, the genetics policy advocates the use of locally adapted stocks of salmon and trout of natural or hatchery origin because this will maintain the state's genetic diversity. This is important in the event of escape or "leakage" through holes in nets or other damage. The magnitude of impact on natural stocks is a function of numbers of fish that escape and that survive to spawn. It is assumed that low levels (less than 5 percent) of escapees can be managed by properly designed net-pen rearing units. Impacts on natural stocks from salmon farming would be minimized because of the policy of using locally adapted stocks.

SUMMARY:

Assuming that imports of exotic species such as Atlantic salmon or other fishes remain prohibited, that current regulations and policies remain in place, and that "leakage" of fish from the pens is kept low, salmon farming can be accommodated without the threat of impact to the genetic integrity of native and hatchery stocks of salmon and trout.

INDICATOR INC.

JAN ERICKSON

P.O. BOX 92285
ANCHORAGE, ALASKA 99509

907-279-5097

INDICATOR INC.

February 8, 1988

Member
Alaska State Legislature
State Capitol
Juneau, Alaska 99801

Dear Legislator:

We believe it important that the legislature pass this year a bill which authorizes finfish mariculture and requires an effective system of regulation. Our company is intending to establish a hatchery and future fish farm facility in Anchorage and would benefit from the expeditious passage of such legislation. Our efforts for obtaining adequate financing, obviously, would be enhanced by a clear state policy in favor of development. It is not only for our own project that we would like to see finfish mariculture authorized, but also because (and more importantly) this is the one strong growth potential for economic development beneficially affecting both rural and urban areas.

A sister company, Energy Pacific Corporation, has recently assumed ownership of the old Chugach Electric Association Knik Arm Power Plant on Whitney Road near downtown Anchorage. Along with the facility comes 20 acres which line Ship creek. We are actively seeking financing for construction of a power/fisheries/tourism complex in that area. The project will eventually involve a moderate-sized aquarium, fisheries research and development facility, ponds and growing tanks and various tourism amenities.

Briefly, we are proposing to grow four species of salmon eggs, fry, and smolt for both sale and release into Ship Creek for the benefit of Upper Cook Inlet commercial and recreational fishermen. We would then harvest a portion of the returning salmon for continued propagation and commercial processing for cost recovery purposes. We would like to rear various species of finfish --salmon, arctic char, and perhaps sheefish-- on that site as well. Because we will be able to utilize inexpensive waste heat from the power plant, we can be very efficient in this operation.

Other aspects of the project involve construction of a boardwalk community around Ship Creek (which will be maintained at a high water level) with retail shops, a high quality seafood restaurant and salmon bar-be-que, below water surface windows for tourists to watch migrating salmon, and a theatre for screening films about Alaska's natural resources. Eventually, we would like to construct an Alaska Native Arts and Culture Center, A Gold Exchange (small smelter and coin mint), an historical railroad museum, and botanical gardens.

P.O. BOX 92285 • ANCHORAGE, ALASKA 99509 • 907-279-5097

There are many possible spin-offs from the power operation, not the least of which is the inexpensive manufacture of fish feed. Pending a feasibility examination, we hope to find that we can process fish carcasses and other nutritional elements to produce an economical, high quality food for use in fish farms. As you may be aware, costs for fish feed in Alaska are relatively high. This could be the critical factor in whether Alaska fish farms can be competitive in the world market.

All these components --the hatchery, fish farm, aquarium, research and development facility-- do much to build infrastructure for this important new industry. Alaska may never become headquarters for the North Pacific fishing fleet as Seattle has been for so many decades, but it could become a world model for a modern and highly successful and diversified mariculture industry.

Your support on this issue is important. Currently, there is a stalemated situation between proponents and opponents of finfish mariculture. Most legislators believe that as long as powerful senators have vowed to block a bill, any effort is futile. There appears to be a strong perception on the Senate side that the moratorium enacted last year will be extended. At the same time, House proponents of finfish mariculture legislation maintain that they have the votes to prevent an extension. We may end up on July 1 with NO moratorium and a free-wheeling situation with numerous development companies attempting to get a head start. Already a handful of persons have vowed to be preparing for construction of farms and will test what few statutory constraints exist.

A related paper (attached) suggests a strategy for enacting finfish mariculture legislation this session. We solicit your interest and support. Our state's severe recession demands that every possible avenue to increase investment and employment for Alaskans be explored.

With best regards.

Jay L. Werelius
President

March 2, 1988

BACKGROUND INFORMATION

AND A

SUGGESTED COMPROMISE ON FINFISH MARICULTURE
prepared by Indicator, Inc.

Political Situation

As you are undoubtedly aware, the legislature has before it several bills authorizing the operation of fish farms (HB 108/SB 106, SB 425/HB 518, SB 482). The stalemate which had existed for some time with Senate opposition to finfish mariculture appears to be fading. As you may be aware legislation being readied in Senate Resources for Sen. Dick Eliason (SB 482) contains some significant changes to authorize finfish mariculture, namely for freshwater finfish and to allow uplands farm operations. Amendments will be offered that would postpone saltwater pen-rearing for one year to allow for additional study. On the House side, revisions in Rep. Johnny Ellis's bill (HB108) will limit the number operators in the initial years and place some strong controls on development of this industry.

IT NOW APPEARS THAT SOME ACTION WILL TAKE PLACE THIS SESSION WITH REGARD TO AUTHORIZING A LIMITED MARICULTURE ACTIVITY. The moratorium which was enacted last year when the legislation failed to pass will expire on June 30, 1988. House proponents believe that they have the requisite number of votes to prevent the moratorium extension and to pass legislation authorizing finfish mariculture. So if no authorizing legislation is approved, then we may end up with a free-wheeling situation with No moratorium and No state policy! In our opinion, that would be a very undersirable situation.

We have met with close to 40 legislators at this point and found a general philosophical support for developing this industry among a majority of that number. Support cuts across political parties, urban and rural representation, coastal and interior regions. Most legislators in this group expressed interest in seeing finfish mariculture eventually move forward in Alaska out of a belief that the free market out to be allowed to function and that fish farming would strengthen our existing seafood industry. Of the reservations voiced, the main concerns are listed as follows:

"How can we make certain that pen-reared Alaska salmon do not directly compete with wild salmon and eventually

drive down prices?"

"How can we assure that resident Alaskans will control this industry and that benefits will go first to these folks?"

"How can we help small and medium sized operations survive and discourage large, foreign corporations from dominating the industry?"

"How can we pay for regulation and support of this new industry given that we are not adequately funding management of natural resources right now?"

"Is the potential for disease-outbreak among pen-reared salmon and a consequent spread to wild stocks serious enough to forego salmon farming?

"What are the consequences to the "genetic purity" of wild stocks should pen-reared salmon escape and mingle with the wild stocks?"

And finally:

"Does salmon farming, in fact, have a realistic chance in Alaska given in our higher costs of operation and a speculated decline in world salmon prices?"

A Compromise Solution

These and many other legitimate questions and answerable deserve to be dealt with by state leaders. Finfish mariculture is a paramount economic development issue that has tremendous import for the long-term well being of the Alaskan economy. It has proven positive economic benefits given the right kind of governmental controls. Legislators are cognizant of the fundamental need for expansion and diversification of our economic base. Public desire for new sources of jobs, new industries, and new investment is keen at this time --especially in recession-hit southcentral. Finfish mariculture will mean thousands of new jobs in both rural and urban Alaska as well as an infusion of millions of dollars in needed investment capital. Impacts in the transportation, communications, marketing, equipment supply and other areas of the state economy will be beneficial.

In conversations with state officials, potential fish farmers, and various legislators a series of possible answers to fishermen's and coastal communities' concerns have been proposed. Basically, these revolve around a a GO-SLOW, PHASE-IN APPROACH for finfish mariculture. This essentially experimental experience will last from four to

seven years and provide key pieces of information for state policy makers to better fashion the statutory authorities and regulatory processes. At the same time, the Go-Slow procedure will help allay the fears of fishermen, coastal community groups, environmentalists, and others who express fears about negative impacts in water quality, tideland usage, genetic purity and health of the wild salmon stocks, stability of fish prices, and other issues.

The main elements of this GO-SLOW APPROACH are:

1) ADOPT A PHASED-IN PROCESS FOR FINFISH MARICULTURE OPERATIONS, LASTING FOR ABOUT FIVE OR SIX YEARS. THIS PERIOD CO'RELATES WITH THE NORMAL SPAN FROM START-UP TO RECEIPT OF FIRST OR SECOND YEAR RETURN ON INVESTMENT.

2) AUTHORIZE ONLY A SELECT GROUP OF OPERATORS, INITIALLY, CHOSEN ON THE BASIS OF CAREFULLY DEVELOPED CRITERIA. AS STATE REGULATORY ABILITY INCREASES, THE NUMBER OF OPERATORS MIGHT BE INCREASED.

3) THE SELECTION CRITERIA SHOULD REFLECT KEY INFORMATIONAL NEEDS OF STATE AND LOCAL GOVERNMENTS AND SHOULD DISTRIBUTE OPERATING PERMITS OVER A BROAD SPECTRUM OF OPERATIONS, I.E., SCALE OF OPERATION, OWNERSHIP STRUCTURE, TECHNOLOGY APPLIED OFF-SHORE AND ON-SHORE, SPECIE TYPE, GEOGRAPHIC REGION, EVIRONMENTAL CHARACTERISTICS, AND OTHERS.

4) AS A CONDITION OF RECEIVING THE PERMIT TO OPERATE, MARICULTURISTS WOULD AGREE TO PROVIDE THE GOVERNMENT CERTAIN DATA FOR THE PHASE-IN PERIOD. THIS MAY RELATE TO VARIOUS PRODUCTION EXPERIENCES SUCH AS EQUIPMENT EFFECTIVENESS, POSSIBLY INCOME AND EXPENDITURES, AND OTHER ITEMS TO BE IDENTIFIED.

5) MORE IMPORTANTLY, THIS LIMITED NUMBER OF OPERATORS WILL BE FUNCTIONING UNDER STRICT BIOLOGICAL AND ENVIRONMENTAL QUALITY REGULATORY MEASURES AND WILL BE CONTINUALLY MONITORED IN THOSE AREAS. EMERGENCY REGULATIONS CAN BE QUICKLY ADOPTED AND STATUTORY AUTHORITIES ADJUSTED DURING THAT PERIOD.

6) THUS THE FLOW OF INFORMATION NECESSARY TO CAREFULLY DEVELOP APPROPRIATE POLICIES AND PROGRAMS IS ASSURED DURING THIS TIME. BECAUSE IT IS AN EXPERIMENTAL SITUATION, THERE IS THE OPPORTUNITY TO MAKE QUICK RESPONSES WHEN THE NEED ARISES.

7) POLICY WITH REGARD TO HOW RESIDENT-OWNED AND SMALLER SCALE FISH FARMS WILL BE ENCOURAGED (THROUGH TAX CREDITS, TECHNICAL SUPPORT?) CAN BE DETERMINED UNDER THE GO-SLOW APPROACH.

8) ALL THE WHILE, FISH FARMERS WILL BE OPERATING AS PRIVATE, FOR-PROFIT ENTITIES AND ESTABLISHING REAL WORLD BUSINESS EXPERIENCES UPON WHICH ALL THOSE QUESTIONS NOTED ABOVE CAN BE ANSWERED.

Several strong advantages accrue to the phased-in, experimental approach. For one thing, it is a cautious and sensible political compromise which most legislators can embrace. Secondly, it allows us a valuable opportunity to monitor this potential industry, to make adjustments based on actual experience, to collect the vital data, and to identify needs for any further in-depth studies. A ceiling on the number of fish farmers will allow for adequate public notice and thorough review on tidelands leasing questions, water quality control, and other possible environmental problems. And, a limited number of operations will have a minor impact on the fiscal resources of state natural resource management agencies.

Because the program is clearly established as an experimental undertaking, the option exists for making major policy and program changes. For instance, should we find a direct and unavoidable price competitive between pen-reared salmon and the wild stocks and this is consequently determined not to be in the general public interest, certain actions may be taken. Limitations in size (perhaps pan-size only), season limits on the sale (e.g.,not during wild runs), prohibitions on the growth of particular species, are some of these options. Insofar as the disease potential is concerned, it should be apparent that limiting the number of fish farms, providing strict controls, and assuring consistent monitoring is the best procedure to follow. Fish and Game officials, university researchers, and other experts have repeatedly stated that we have the tools to adequately respond to those threats, should they ever arise.

We believe that several special studies should be undertaken soon: one, a set of recommendations from the Alaska Departments of Labor, Commerce and Economic Development, and Revenue proposing tax and regulatory policy as well as technical assistance programs. These would be designed to help maintain Alaska resident ownership and control, encourage local investment sources, provide for the training and hiring of Alaska residents, and suggest any special arrangements that would enhance viability of small rural operations.

Other reports might include an annual one to the Governor and the Legislature on the condition of the Alaska mariculture industry, its affect on the common property fishery, and world market trends in demand and prices for various species. Additionally, a review of the type of protection that may be sought by fish farmers for when and

if disease should affect their operations. Protection through private insurance carriers may be adequate, but, if not, then some form of self-insurance pool may be needed.

There are undoubtedly many important questions that can be raised and should be dealt with; it is unfortunate that the dialogue has been so limited. But, in the end, only the actual experience of engaging in fish farming is going to give us the opportunity to determine what other consequences may occur and to develop the appropriate solutions.

If the moratorium should expire without any clear state policy, this potentially beneficial industry could be severely damaged. Not only might there be undesirable environmental and biological impacts, the future economic health of the industry would be threatened. It behooves state legislators and the governor and interested groups to begin resolving political, policy, and technical issues now.

Final Comment: The Alaska Seafood Marketing Institute recently received a $1.25 million grant from the U.S. Department of Agriculture to combat loss of market position for Alaska salmon in France and Japan, according to ASMI. Fresh Norwegian (pen-reared) salmon has captured up to 50% market share in those countries. The grant money will be used for generic product promotional purposes, but really there is no other way to effectively combat loss of market position other than by directly competing. We need to be able to sell FRESH ALASKAN SALMON year 'round any where in the world, at any time it is in demand. Only then we will be able to re-capture these significant losses.

Salmon Farming in Alaska

Economic Feasibility and Socioeconomic Impacts

Robert R. Logan

John Weddleton

University of Alaska - Fairbanks

April, 1987

Introduction

1) Overview

The dramatic increases in production of farmed Atlantic salmon has resulted in both optimism and fear for Alaskans. The optimism is expressed by those who believe salmon farming presents an alternative source of employment and income for the state. The fear is expressed by those who believe that farmed Atlantic salmon will compete with wild Pacific salmon in the marketplace, and cause reductions in employment and income for the traditional fishery.

The focal point for both groups is whether salmon farming should be legalized in the state of Alaska. (More precisely, whether the defacto restriction on production through the limitation on smolt acquisition is to be lifted.)[1] As with any public policy, the economic costs and benefits must be weighed in order to make a rational decision. The purpose of this piece is to aid in that process.

There would seem to be three important questions in this issue. The first is whether salmon farming is feasible in Alaska. If not, all arguments are moot because salmon farming wouldn't occur even if legal. If it is feasible, what kind of employment and income can we expect this industry to generate (both in terms of numbers and in terms

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1 See "Aquaculture in Alaska" for a discussion of the legal issues.

of demographics)? Finally, what affect will the development of this industry have on the traditional fishery?

The central focus of this piece is a comparison of two scenarios - one with and one without Alaskan salmon farming. It is necessary to make this comparison with the recognition that world output of farmed salmon is expected to be much higher in the future. Thus, an investigation of the impact worldwide production will have on the traditional fishery must be made first. A discussion of the incremental effects Alaskan salmon farming will have can then be made.

It would be a major error to confuse the two points above. There is nothing Alaska can do to prevent the affects worldwide production will have on the traditional fishery. That is, preventing salmon farming here will not change this. These effects should not be a part of the decision to legalize salmon farming. The main concern should be the incremental effects of Alaska's own production.

The last question may be the one with the most public controversy. There is argument about the degree to which Atlantic and Pacific (and fresh or frozen) salmon compete in the marketplace. This is a vital ingredient in discussing the effects of farmed salmon on the traditional fisheries. The view taken here is that it is better to be conservative and provide a margin of safety - to assume that the species do compete directly in order to estimate spillover affects.

Even with this conservative (pessimistic) approach, it appears that Alaskan salmon farming will laregely complement, rather than displace the traditional fishery. The increases in world production are likely to have significant effects on the Alaskan traditional fishery. However, incremental Alaskan production is likely to have only marginal effects on the Alaskan traditional fishery.

Salmon farming is likely to generate thousands of jobs, and hundreds of millions in sales dollars when both direct and indirect effects are considered. The industry should earn high marks in terms opportunities for rural Alaskans. If the industry is developed properly, it will provide opportunities for family run operations as in Norway. Finally, it is an industry that provides year round employment and will result in wage dollars being spent in Alaska rather than elsewhere.

2) Putting Things Into Perspective

Before the technical analysis begins, a brief look at the relevant markets is warranted in order to put salmon farming into perspective. There has been an enormous increase in the production of farmed salmon. 1985 farmed salmon production (Atlantic and Pacific) was approximately 267% larger than 1981 production. Output increased from 12,000 metric tons to 44,000 metric tons over this period. However, as a fraction of total world salmon production, or even total world premium (Coho, Chinook, and Sockeye) salmon, the change is much less dramatic.

Table one indicates total wild, farmed, premium, and aggregated output numbers for various years. Note that even under the fairly dramatic forecasts of 142,000 metric tons of farmed salmon production by 1990, this represents only 17% of estimated world production. Currently, less than 10% of the world salmon supply is coming from farmed sources.

The above may underestimate the magnitude of farmed salmon relative to its particular market. Farmed production is sold as a fresh premium product. It may be appropriate to compare pen-raised output with wild Coho, Chinook, and Sockeye landings. Here, the comparison is more dramatic. If one thinks of these species as comprising a particular market segment, farmed production will rocket to over 40% of premium salmon production by 1990.

Thus, the dramatic increases in farmed salmon production do represent a substantial increase in the world supply of premium salmon species. The impact this will have on Alaska depends on how the demand for salmon changes through 1990. This topic is addressed after a brief discussion of salmon farming's feasibility in Alaska.

Relative Size of Salmon Farming

Year	Wild Total	Farmed Total	Farmed+Wild Total	% of Total	Premium Wild	Premium Total	% of Prem
1983	670.7	23.4	694.1	3.4%	196.4	219.8	10.6%
1986	657.0	59.2	716.2	8.3%	200.3	259.5	29.0%
1990	677.0	142.0	819.0	17.3%	200.0	342.0	41.5%

Table 1

Sources: 1983 and 1986 Wild and Farmed total figures reprinted from "World Markets for Farmed Salmon, p 2. 1990 farmed projections from "Aquaculture in Alaska" p 55. Premium wild species (Chinook, Coho, Sockeye) from "Statistical Yearbook - North Pacific Commission, 1986" p 15. (1986 estimates). Wild production of premium species assumed constant through 1990.

Conclusion

The already dramatic increases in the production of farmed Atlantic salmon force Alaska into a decision. Should salmon farming be legalized here? This project has attempted to answer the question through a socio-economic impact analysis. This is certainly not the only important point of view. Equally important are the biological issues that have been raised, and these should be considered as well.

It appears that salmon farming will be profitable in Alaska. A transportation cost advantage to Japanese, Canadian, and U.S. markets offsets higher feed and labor costs on the farm itself. Alaska has innumerable site possibilities. The infrastructure and labor force are already compatible with such an industry.

The industry does not appear to have dramatic scale economies. Rather, farms with one manager and a small crew seem to be the most profitable. The Norwegians have built a substantial fishery based on these small rural operations. There is no reason why Alaska should expect much difference. While much of the capital may initially come from outside, the same is true for virtually every significant industry this state has developed.

If this state does allow salmon farming, it appears that even a very modest development will result in thousands of jobs (part time plus full time), and over one hundred

million in sales dollars when both direct and indirect effects are considered. The 20,000 metric ton scenario resulted in well over $300 million in final sales, around $90 million in final payroll, and over 4,000 in final employment.

The numbers are promising largely because second round effects are substantial. This is an industry that provides stable employment and pays year round wages - much of which will be respent within the state rather than outside.

There has been argument about the degree to which wild Alaskan salmon (both fresh and frozen) compete with the farmed Atlantic and Pacific salmon product. This is indeed the key in calculating the spillover affects of salmon farming on the traditional fishery. This study took a rather pessimistic approach, and assumed direct competition between farmed and wild products. In this way, the maximum feasible impacts may be calculated.

It was shown that the traditional fishery has reason to be concerned with the increases in worldwide production. The worst case scenario indicated a $36.4 million loss to the fishery through reduced revenues. However, incremental Alaskan production only added another $4.7 million loss on top of this. The gain from the development of the industry here was $132 million in direct sales, and the final effects listed above.

Note that these figures are the result of some very pessimistic assumptions - that demand for salmon fails to

increase over time (in conflict with recent experience); that farmed and wild salmon compete directly (also in conflict with recent experience); that the enormous projected increases in world production in fact occur. For these and other reasons discussed in the text, these numbers are substantial overestimates of the effects world and Alaskan salmon farming will have on the traditional fishery.

This is not to say that salmon farming will not affect the traditional fishery. World salmon farming probably does mean millions of dollars in reduced revenue to the traditional fishery over the long run. In particular, technological and genetic improvements will make salmon farming an ever more efficient enterprise. The crucial point Alaska policymakers must not miss is that as salmon markets become larger and more competitive, the effect of one's own production on market price becomes ever smaller.

Therefore, the issue of salmon farming in Alaska involves a choice between two futures: One is a future without salmon farming, but with a permanently lower level of employment and income in the fishery and the state as a whole. The other is a future with salmon farming, and with a higher level of employment and income in the fisheries sector as well as the state as a whole.

INDICATOR INC.

March 16, 1988

Members
Senate Resources Committee
Alaska State Legislature
Juneau

Dear Senators:

RE: aquafarm legislation amendments

We have reviewed the committee draft (3/8/88) of CS for SB 482 and found some serious errors as well as areas of general policy disageement. The most fundamental of which are the severe limitations SB 482 places on the potential healthy development of the industry. The bill may be written to satisfy as many of the various interest gruops as possible, but it does so in a way which ignores basic economic facts about how the industry actually functions. A review of the economic studies conducted by the State, the university, and other groups will support this point.

Both the title and a key provision, Section 16.40.100 (d) are ambiguous and could result in major unintended consequences. If the real objective is to circumscribe the growth of salmon in a marine saltwater environment, then the language ought to reflect that. As it stands, it could be interpreted to ban the growth of all saltwater non-salmon species and disallows the use of synthesized and pumped saltwater to uplands sites.

Some suggested major goals of the committee re-write are:

1. To specifically authorize the growth of non-salmon finfish in fresh and saltwater.

RATIONALE: WE NEED TO BE ABLE TO DEVELOP BLACK COD, HALIBUT, ARCTIC CHAR, SHEEFISH, SABLEFISH, OTHER SPECIES --SOME OF WHICH REQUIRE SALTWATER. THIS WOULD ALSO ALLOW FOR THE PUMPING OF SALTWATER TO UPLANDS OPERATIONS.

2. Safequard the authorization of uplands sites on both public and private lands, with all the necessary notice, hearing, and permit process controls.

RATIONALE: IT IS GENERALLY AGREED THAT UPLAND SITES PROVIDE LITTLE OR NO THREAT TO NATIVE STOCKS AND REPRESENT A JUSTIFIABLE USE OF STATE RESOURCES.

3. Adoption of language placing a one year moratorium on marine-sited pen-rearing of salmon and directing a task force to recommend

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any additional statutory and regulatory authorities by January, 1989.

RATIONALE: THERE IS NO SOLID EVIDENCE THAT MARINE PEN-REARING OF SALMON REPRESENTS AN UNMANAGEABLE THREAT TO NATIVE STOCKS AND THERE IS A SUBSTANTIAL BODY OF SUPPORT IN BOTH THE SENATE AND THE HOUSE FOR THE EVENTUAL DEVELOPMENT OF THIS INDUSTRY IN ALASKA.

Additionally:

4. Authorize a very limited number (5) of uplands sites to rear salmon, beginning this year, with permits distributed by geographic region.

RATIONALE: WE NEED TO BEGIN GROWING SUFFICIENT QUANTITIES OF SMOLT TO SUPPLY AQUAFARMS AS SOON AS THEY ARE GENERALLY AUTHORIZED. THE LEAD TIME HERE WOULD BE IN MULTIPLE YEARS....FURTHER DELAY WOULD PLACE THE INDUSTRY ENTRY INTO THE MARKET IN THE MID TO LATE 1990'S. ALSO, WE NEED REAL WORLD PRODUCTION AND MARKETING EXPERIENCE WITH WHICH TO FINE TUNE THE EFFECTIVENESS OF STATE LAWS AND REGULATIONS.

Finally, we would ask that a minor amendment be added to allow for operators to enter into contractual agreements with the Department of Fish and Game to obtain the department's assistance in developing sufficient supplies of non-salmon finfish broodstock. This addition would be critical to our own proposed operation in Anchorage and others like it. Suggested language is as follows:

New Section to follow Sec. 16.40.150 (page 6, line 3 or so) "the department is authorized to enter into an agreement with a permit holder in order to assist in the collection and production of non-salmon finfish broodstock. Costs for the activity will be borne by the permit holder."

Enclosed please find materials that may be of assistance in your further consideration of SB 482. Thank you for your interest and support.

Regards,

Jan Erickson
Vice President

Alaska Mariculture Association

Sen. Jack Coghill
P.O. Box V
Juneau, AK 99811

Dear Sen. Coghill:

Salmon farming may be one of the least understood issues pending before the legislature, despite the fact that we have accumulated impressive piles of reports, studies and research, and scores of Alaskans have offered testimony and written comments of pros and cons.

As you are fully aware, this issue of salmon farming has aroused strong opposition among commercial salmon fishermen and has become a highly emotional subject of debate in coastal communities. This opposition has led some lawmakers to believe mariculture, and in particular salmon farming, is a commercial fishing issue.

This is not the case. What mariculture is all about is economic development. It is no more a commercial fishing issue than logging, mining or oil and gas development. Each have potential impacts on fisheries habitats and wild stocks that should be closely examined before decisions are made on how to proceed.

The Alaska Mariculture Association (AMA) believes that the legislature would be setting a dangerous precedent in resource development if it opts to decide the fate of mariculture based upon a popularity contest among fishermen. Certainly, it is critical that you carefully weigh the potential adverse impacts on commercial salmon fishing, but a decision to prohibit salmon farming simply because fishermen don't like it would be akin to blocking coal mining to protect oil producers from competition.

AMA urges you to carefully analyze the facts about salmon farming and its potential costs and benefits, and make a good public policy decision. We realize this is difficult on a controversial issue, but resource development issues are never easy to make in Alaska and salmon farming definitely is no exception.

One of the most critical factors to keep in mind is that a prohibition of salmon farming in Alaska really doesn't give salmon fishermen anything except a moral victory. About 20 other countries and even such unlikely states as Minnesota, South Dakota and Pennsylvania will continue to produce enormous quantities of farmed salmon.

The market impacts will not change by Alaska's non-involvement. Alaska restaurants and supermarkets will continue rely on foreign farmed salmon, and our processors will have to continue purchasing farmed salmon from other countries to satisfy consumer demand.

This means Alaska still has all the adverse impacts, but reaps

none of the benefits. We believe this policy option doesn't make sense, and we urge you to firmly reject it.

The potential economic benefits from salmon farming simply cannot be dismissed without serious consideration. AMA believes that aquatic farming is one of Alaska's best opportunities for diversification of our economy and is a necessary step to ensure our long-term competitiveness in world seafood markets. This is particularly true of salmon farming, which currently appears to be a unique opportunity for state government to immediately create long-term jobs and attract significant private investment capital without investing state funds.

Salmon farming does not require government to initiate publicly financed markets campaigns designed to change world demand, convince trading partners to invest their money in Alaska, or provide subsidized loan programs or other giveaways. All the state needs to do is to put reasonable rules in place to protect public health, wild stocks and the environment. The private sector will do the rest.

The attached articles from the leading trade journal Seafood Business on British Columbia's salmon farming industry illustrate the economic development opportunities available to Alaska. The B.C. industry has come a long way in a very short period of time, and government officials now estimate that the value of the province's aquaculture industry will surpass commercial fishing by the early to mid-1990s.

Despite the opposition from commercial salmon fishermen, salmon farming even offers major economic opportunities for the fishing fleets. The attached opinion piece from Pacific Fishing outlines some of the ways AMA believes commercial fishermen could benefit from salmon farming.

One issue which appears to be a major concern to many legislators is the potential effect of salmon farming on our wild stocks. This is valid concern and deserves to be thoroughly examined, as our salmon fishing industry has been a mainstay in the Alaska economy since the turn of the century.

Fortunately, Alaska has tremendous experience in salmon aquaculture, and we possess some of the world's leading salmon culturists, geneticists and pathologists. These scientists have studied the issue closely and have determined that salmon farming offers no bigger threat to the wild stocks than our current hatchery program. The enclosed issues papers by the Alaska Department of Fish and Game outline the department's position regarding disease and genetics impacts of farmed salmon.

I have also enclosed a copy of a letter from Dr. Trygve Gjedrem, director of the Norwegian Institute of Aquaculture Research and president of the International Association of Genetics in Aquaculture, to Dr. William Smoker, University of Alaska geneticist, regarding recent news reports that "renegade" farmed salmon were threatening Norway's wild stocks.

Dr. Smoker said the widely publicized "study" actually appears to be what scientists refer to as "anecdotal observations" made by Norwegian scientists while collecting salmon sperm for a wild stock gene bank. Dr. Gjedrem's comments indicate the information gathered by the institute is insufficient to draw many conclusions, and that even if successful spawning were to occur no major problems would be

anticipated.

This is not to suggest that escaped farmed salmon isn't a matter of serious concern, because it is, but only that it should be placed in context. Recent articles from fishermen's newspapers have made it appear that the Norwegians have convincing evidence that escaped farmed salmon threaten the very existence of the country's very small natural runs.

The current debate over the threat of fish farming to the wild stocks is reminiscent of the opposition mounted by many fishermen against the state's salmon hatchery program. The record of Alaska's success at boosting natural runs without adversely affecting wild stocks has convinced most fishermen to strongly support the program. The scientists are convinced that salmon farming could be conducted as safely.

On an final note, I'd like explain AMA's position on the pending mariculture legislation. AMA's board of directors has endorsed sponsor substitute for HB 108 (Ellis, Rieger, et al) and strongly opposes the current versions of SB 482, SB 425, HB 455 and HB 518. AMA believes HB 108 offers a good compromise on the salmon farming issue, while clearing a path for Alaska to take full advantage of its tremendous opportunity in other species.

The other bills mentioned are decidely anti-mariculture development and are as strongly opposed by AMA's shellfish and kelp members as those interested in finfish. Shellfish farmers are generally satisfied with the recent shellfish farming regulations proposed by the Cowper Administration and do not believe any significant changes should be made.

In addition to adversely affecting shellfish and kelp farming, these bills would restrict finfish farming to the uplands where development and operating costs are significantly higher. This decreases the ability of Alaskans to participate and may prevent the farming of such species as arctic char, rainbow trout and black cod. It is vital that we be able to farm these species in net pens in the marine environment. The opposition has been directed at salmon farming in net pens and any restrictions should not extend beyond the five species of Pacific salmon (genus Onchorynchus) and, of course, Atlantic salmon.

We continue to support salmon farming, and oppose a decision to prohibit it or to impose a moratorium. There is sufficient evidence available to answer the questions posed during public hearings.

We have tremendous amounts of information available and would be pleased to respond to any questions you may have regarding mariculture.

Thank you for consideration of my lengthy comments.

Sincerely,

Rodger

Rodger Painter
Executive Director

Alaska Mariculture Association

M E M O R A N D U M

TO: Senator Jack Coghill, Chairman
Senate Resources Committee

FROM: Rodger Painter, AMA Executive Director

DATE: March 14, 1988

RE: CSSB 482

I have reviewed in detail the original version of Senate Bill 482 and the committee substitute developed by Senator Eliason. While AMA opposes both versions, the committee substitute does offer a couple of important improvements, specifically in making permits transferable and eliminating public notice requirements imposed on applicants for tidelands.

These changes are relatively minor, however, in context of the impact of the bill overall on mariculture development. Our continuing opposition focuses on impacts on shellfish and aquatic plant farming, non-salmon finfish pen rearing, uplands finfish farming, and the prohibition of pen rearing of salmon.

Shellfish/Kelp

Policy--SB 482 should have a findings and policy section to provide better policy direction to state agencies on mariculture development issues. This is critical to all developing resource industries where agencies have to deal with many problems that aren't directly addressed in enabling legislation, and will be especially important in the case of mariculture because of the controversy surrounding the issue.

Criteria--AS 16.40.105 provides criteria for issuance of permits that AMA believes is too restrictive and would not allow flexibility by state agencies. The existing language could be interpreted to say that any degree of adverse impact will result in denial of a permit. This concern has been driven home by the fishing industry's current concerns about the absolute language in the Marine Mammal Protection Act which some environmental groups interpret as saying any taking of an endangered marine mammal could result in a total closure of that fishery.

Sales of Broodstock--AS 16.40.120 (b) restricts the sales of spat or other broodstock gathered from wild sources to Alaska farms and

aquatic farming hatcheries. Participants in the Kodiak scallop farming project have requested that this section be amended to allow sales to out-of-state buyers who already have been calling about potential purchases. Spat fishermen want this flexibility because initial in-state markets could be insufficient.

Oyster farmers who are acutely interested in construction of a shellfish hatchery have requested a similar amendment to AS 16.40.140. Oyster farmers believe sales to outside buyers may be critical to feasibility of an Alaska oyster hatchery.

Releases--SB 482 does not include language provided in SB 106 that specifically precludes the intentional release into common property waters without prior approval of ADFG. This is an important protection for wild stocks. Farmers favor language that prohibits unauthorized releases, while allowing approved releases as a method of lower cost common property enhancement programs involving private hatcheries.

Disease Reporting--AMA endorses language developed at the suggestion of Brian Allee with the FRED Division that requires the reporting of disease incidents within 48 hours of detection. AS 16.40.150 (a) now requires the reporting of disease outbreaks, but lacks a time-certain reporting requirement.

Definitions--AS 16.40.199 (3) limits aquatic farm products to consumptive sales, except for kelp cultivated for use in dyes. This is much too restrictive a definition for aquatic plants which could be used for a wide variety of purposes in addition to dyes. The language also could prohibit, for instance, cultivation of pearls or other non-consumptive uses of aquatic animals. AMA suggests the language be amended to allows the sale of aquatic farming for all consumptive and non-consumtive uses.

Labeling--SB 482 adds language to AS 03.05.020(a) that requires DEC to label all cultivated seafood as aquatic farm products. This is a costly requirement that appears to serve no useful purpose for the farmer or consumer. We particularly question the applicability of this section to oysters and mussels (the only two seafoods presently being produced by Alaska farms) since there are no wild products available on the market from Alaska. This requirement also would apply to aquatic plants and a wide variety of finfish, such as arctic char, rainbow trout, sheefish and other species.

AMA does not believe that such labeling really affects consumer purchases, and will only result in unnecessary government spending. This section appears to be directed at farmed salmon. If commercial fishermen want to distinguish their salmon from farmed salmon then they should take the initiative to label their products as "wild." AMA believes it is inappropriate to impose this requirement on farmers.

Tideland Permit Fees--Perhaps the most objectionable provision of SB 482 is AS 38.05.856(a) which requires DNR to charge aquatic farmers "not less than the appraised fair market rental value" for nontransferable tideland permits. AMA strongly objects to aquatic farmers being charged more than other users of state tidelands. We believe this is unfair, and could result in additional costs that would push many existing farmers out of business. We also believe the required appraisals will be costly and could result in significant

additions to a DNR fiscal note.

Denial of Permits--Subsection (d) of AS 38.05.856 is ambiguously worded and one interpretation is that permit issuance and renewal could be denied simply on the basis of adverse public comments, rather than for public policy purposes. AMA suggests this section be rewritten to clarify that permits applications and renewals can be denied for good cause or if DNR finds it is in the state's best interests.

Culmulative Impacts--AMA also strongly objects to subsection (f) of AS 38.05.856 which directs DNR to adopt regulations providing for limits on the number of aquatic farming sites to be approved in an area to protect the environment and natural resources. These kinds of culmulative impact requirements are extremely difficult for regulatory agencies and for the industry, and result in high regulatory costs in monitoring and determining appropriate levels of growth.

On what basis would DNR determine culmulative environmental and biological impacts? Does the state possess adequate data on aquatic farming upon which such decisions could be based? It appears that significant research could be required before this could be implemented. Such provisions generally end up being tremendously burdensome for the agencies and invite lawsuits from anti-development organizations.

Permitting Freeze--Sections 18 and 19 would impose a freeze on all aquatic farming licensing and permitting and issuance of tideland and land use leases for aquatic farming until regulations are fully implemented. This could take months, and would result in extensive delays for applicants. For example, ADFG started working on the shellfish farming regulations now pending not long after the 1987 session and those proposals were still pending final approval by the Department of Law on the first of March. Once released by DOL, another 30 day waiting period is required before the regulations are implemented. This process, to date, has taken about eight months. These kinds of delays can be very costly to an applicant.

Critical to keep in mind is that ADFG's proposed shellfish farming regulations should become effective before the end of the legislative session and will be in place to deal with shellfish farming applications.

AMA strongly objects to this moratorium since the 40 existing permitted farms represent a tiny fraction of the 2,400 tidelands permits and leases issued statewide. There are no indications that any problems will occur while agencies are working on implementation of SB 482 or other legislation.

Grandfather Limitations--While AMA is very happy that SB 482 includes provisions to grandfather existing shellfish farmers into the lease preference section, we object to the limitations that come attached. The language restricts the grandfathered farmers to conditions of existing permits and preclude the farmer and DNR from negotiating a lease. The grandfathered farmers should be treated like all other lease applicants.

FINFISH FARMING

Sales of Broodstock--SB 482 does not allow private nonprofit hatcheries to sell surplus salmon eggs to upland aquatic farms. Some large surpluses of eggs now exist in some PNP hatchery programs, and AMA believes these operations should be allowed to sell these valuable eggs to upland farmers. Existing language in AS 16.10.420 and AS 16.10.450 prohibit PNPs from selling these surplus eggs to anyone other than another PNP. Consequently, many of these surplus eggs are destroyed.

AMA believes the PNPs should be given the option of selling these surplus eggs to in-state salmon farmers as a method of generating additional revenues to help retire debt obligations incurred under the state's enhancement loan program. This new source of revenue could allow the PNPs to reduce cost recovery harvests, creating the opportunity for increased common property harvests.

These amendments should be made in conjunction with additional amendments specifying that aquatic farm animals may not be intentionally released into public waters without prior approval of ADFG. The language also should require that such releases be subject to the disease and genetics standards standards of the department.

Salt Water Prohibitions--AS 16.40.100(d) prohibits the farming of finfish in salt water. This language appears to limit upland finfish farms to the use of fresh water. AMA believes it is critical to amend this language to allow upland farms to pump salt water to upland farms, as fresh water salmon and other finfish do not perform very well in fresh water culture. Even such landlocked farms as the Fairbanks' coho salmon farm require the use of some artificially created salt water in incubation and smoltification procedures.

Critical in consideration of this issue is the fact that discharges from upland farms will be subject to the same kinds of treatment requirements now applied to hatcheries. Discharges will be screened and treated so there is no opportunity for disease transference or sediment accumulations by outfalls.

In short, upland farms utilizing salt water will have no greater impact on the environment, natural stocks or use of public tidelands that those employing fresh water cultivation, but will be much more economically viable. AMA believes it is critical that such an amendment be adopted.

Prohibitions on Pen Rearing of Non-salmon Finfish--One of the most critical amendments necessary to SB 482 is the lifting of prohibitions on the pen rearing of non-salmon species of finfish. Upland farming is far more expensive than sea cage based systems from developmental and operational perspectives, and it is vital that farmers be allowed to experiment with sea cage rearing if Alaska is to achieve its potential with the farming of such species as arctic char, rainbow trout and black cod.

The controversy over fish farming has been narrowly focused on the pen rearing of salmon, and we do not understand why the prohibitions on free enterprise has been extended beyond the Onchorynchus genus. There will be no "gold rush" to farm these species as they are more in the experimental stage of development, so government does not have to fear that agencies will be overwhelmed

with applications and face a myriad of land managment conflicts.

Should the committee decide it is vital that the pen rearing of salmon be prohibited, then AMA urges you to narrow the prohibitions to the pen rearing of Onchorynchus in the marine environment and estuaries.

Prohibition on the Pen Rearing of Salmon--AMA believes it is poor public policy to pass a permanent ban on the pen rearing of salmon. While it probably is not necessary to repeat the many reasons we oppose such a prohibition, it may be useful to point out that even the most ardent opponents of salmon farming have stated that the issue will not be closed with passage of SB 482 in its present form.

With this recognition, AMA urges you to consider a method for fully resolving the salmon farming issue. We believe the pen rearing issue will not be resolved until there is a full public discussion of salmon farming in Alaska focused on fact rather than emotionalism and power politics.

The best way of settling the salmon farming issue is to impose a moratorium on limited duration on the pen rearing of salmon and appoint a task force to gather factual information on the costs and benefits of salmon farming, including an in depth analysis of disease, environmental, market and fiscal concerns voiced by opponents. The membership of such a task force would have to be well balanced, and specific goals would have to be imposed. It also would be important to give the task force the charge of simply gathering and analyzing existing information so no costly and lengthy studies are required. Its mission should not include policy recommendations as this would politicize the process.

Passage of SB 482 with a flat ban on pen rearing and no public process will only lead to a continuation or even esculation of the current debate which has been driven by wildly divergent claims by proponents and critics. This atmosphere will only serve to make the process increasingly divisive. AMA is fully prepared to accept a legislative ban on pen rearing of salmon following a well informed public policy debate.

STATE OF ALASKA

DEPARTMENT OF COMMERCE & ECONOMIC DEVELOPMENT

DIVISION OF BUSINESS DEVELOPMENT

STEVE COWPER, GOVERNOR

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JUNEAU, ALASKA 99811-0800
PHONE: (907) 465-2017

DATE: March 4, 1988

TO: Distribution

FROM: Paul Peyton, Project Manager
Division of Business Development
Department of Commerce & Economic Development

SUBJECT: Preliminary Findings of Socioeconomic Studies

NOTE: Final reports are due March 11 and these findings are presented in the interim to aid discussions. These are not complete, but should not change materially.

The Department of Commerce and Economic Development (DCED) has received preliminary reports from the contractors working on the cost of production model and salmon market model. In addition, staff met with the contractors to go over the results to date and to evaluate the probable work products and timing of results.

Meetings were also arranged with several marketers of troll and farmed products, including Barry Lester, President of the Alaska Troll Salmon Producers Association, and Arnie Einmo of Dory Seafoods, a major broker of B.C., Chilean, and Norwegian salmon in Seattle. They were asked to provide input and critique the work done by others to assist in evaluating the reliability of the results.

The study topics, as related in the department's earlier memo to interested parties, were chosen to answer the maximum number of questions posed by the resource committees with the monies available. Those questions focused on the economic feasibility and ex-vessel price impacts of pen rearing salmon in Alaska. In addition, questions as to industry structure, location, and participants were posed. As these were in large part dependent on the basic feasibility and funding was not adequate to do an in-depth analysis of those questions, the Fisheries Cabinet elected to answer the feasibility and price impact questions first.

Attached are copies of the letters from the contractors, a review of the B.C. industry for 1987 by DPA Group, Inc., and excerpts from a study done by DPA Group, Inc. and Dr. Anderson in 1987 for the B.C. Salmon Farmers Association which analyzes the market for farmed salmon. That report concludes that the North American market has the best potential for B.C. farmed fish, and most of the study is directed at analyzing that market.

While this last study does not answer many of the questions concerning Alaska's potential entry into pen rearing, it does help put in perspective the world supplies and markets for pen reared fish, and B.C.'s strategy for selling their product in the U.S. Many of the same observations can be applied in analyzing Alaska's potential as a pen rearing area. This document is being reviewed by various marketers of troll and pen reared production, and we will report on their evaluation. To date none have found any serious cause for disagreement.

That study did not, however, address the Japanese market in any detail. A major focus of the study underway by DCED is to evaluate the market in Japan, and to refine the information on west coast U.S. markets. The other major effort will be in price forecasting, something DPA Group, Inc.'s study did not do in any detail.

Based on results to date, the contractor feels it should be possible to:

1. Evaluate in general terms the extent to which potential Alaskan farmed salmon would compete with Alaskan wild production in likely markets for Alaskan farmed salmon -- Japan and the west coast of the U.S.

2. Gauge the relative impact of Alaska's increment of potential production on wholesale salmon prices. As the funds are not adequate to build a worldwide supply and demand model, it is not possible to predict with certainty the overall effect of world production on markets for Alaskan wild salmon.

3. In the near term, predict what will be the actual market prices for farmed salmon potentially produced in Alaska. A point estimate for 1995 will be produced and, if possible, high and low bounds will also be determined.

The contractors have both had trouble obtaining some data and requested one week extensions, to March 11, for the final report. Given the complexity of the issues, they were in turn asked to be available to present the findings to the legislative committees. They have agreed. Dates will need to be determined.

The department is holding approximately $4.0 in reserve to address questions that arise after the costs and markets have been addressed. An overall evaluation of the positive and negative impacts might be undertaken, for example.

SUMMARY OF SIGNIFICANT FINDINGS TO DATE

WILD PRODUCTION OF KINGS AND COHOS

1976-86 average king + coho 70,000 mt
all gear types
West Coast, B.C., and Alaska

Source: Compilation of NMFS and ADF&G data.

NOTE: The production is increasing with ocean ranching and conservation measures taking effect. Estimates of this increase are being prepared by the contractors.

WORLD SUPPLY AND DEMAND FOR ALL FROZEN AND FRESH SALMON

Total world consumption of fresh and frozen salmon including all species and all sources in 1984.

Japan	273,600
United States	52,700
Canada	12,100
Europe	
France	21,100
U.K.	10,600
Other	18,300
Total	388,400

Total world production of salmon by species in 1983.

Atlantic Wild	7,518	1%
Farmed	17,795	3%
Pacific (Wild)		
Chinook	19,784	3%
Coho	34,445	5%
Sockeye	164,000	24%
Chum	188,850	27%
Pink	252,830	37%
Masu (Cherry)	3,300	-
Total All Salmon	688,522	100%

Note: Figures are from UN Food and Agriculture Organization.

Source: DPA Group, Inc. Market Access and Penetration Strategy

PROJECTED WORLD PRODUCTION OF FARMED SALMON BY 1990

Atlantic	150,000 mt
Pacific	35,000 mt
Projected Increase in Supply to U.S.	49,400 mt

Projected Increase in U.S. Demand at current prices 47,000 mt

Conclusion - "This result suggests that the forecasted supply of salmon to the U.S. market until 1990 could be absorbed by the market at current prices, provided no supply and distribution constraints exist . . . . In reality, average real prices for farmed salmon likely will continue to decline until 1990 but not greater than 25-30% below current prices . . . . Production efficiencies in regions like Norway and Chile are improving, and increasing competition is forcing producers to reduce the fairly healthy profit margins they have enjoyed to date."

Source: Market Access and Penetration Strategy - DPA Group, Inc.

FARMED SALMON PRICES IN U.S. (AVERAGE)

	1986	1987	Jan	Feb
Atlantics 4-6 lb.	$3.85	4.60	5.50	
Pacific Salmon 4-6 lb.				
Coho, Chile		$3.83	4.20	3.65*
Canada		$3.59		
King		$4.04		

Source: Seafare Group, Preliminary findings

* Seattle price during large scale promotion at $4.99/lb. retail. Fish did not sell well and price dropped from $4.20 to $3.65 as distributors dumped their inventories.

OBSERVATIONS CONCERNING 1987 PRICE MOVEMENTS

A disease (hitra) outbreak in Norway in late 1986 led to a surplus of farmed salmon early in 1987 as vulnerable fish were harvested early, and to a shortage later. This shortage was compounded by a poor harvest of wild cohos, resulting in unusually high prices for farmed and wild salmon in 1987 (and high prices for Alaskan fishermen). The prices of both Norwegian and Alaskan salmon can be expected to come down again as production picks up.

Source: Barry Lester, SPC Sales Manager

NOTES ON THE EUROPEAN MARKETS

It should be noted that the European market for Alaskan salmon seems to be holding up in terms of volume due to the decades old relationship between Alaskan suppliers and their markets, primarily smokers, and the price and product attributes of wild Pacific salmon - lower price, firmer flesh, redder color, larger sizes. Market share is declining, however, as the market expands, and the overall supply of

both wild and farmed fish determines the price. The long-term trend is probably for continued sales volume, but lower price and eroding market share.

The European market is very important for troll and high quality net kings and cohos. The Norwegians and Scots are also starting to smoke fish for export to these markets in direct competition with the buyers of Alaskan salmon. Major efforts are underway by ASMI to promote Alaskan salmon there using Federal monies.

Source: Combination of Market Access and Penetration Strategy by DPA Group, Inc., and data in ASMI TEA application concerning sales volumes, corroborated in discussions with several major brokers.

FRESH MARKETS FOR WILD PACIFIC SALMON

Currently, much of the Washington, Oregon, and California king and coho production is marketed fresh in the restaurant, fish shop, and retail trades. The large majority of fresh kings and cohos marketed in the U.S. come from these sources. Only 10% or less of Alaskan king and coho production is sold fresh due to higher margins available in the frozen markets and the difficulties of getting fresh product out of Alaska in volume.

Source: Seafare Group, personal communication, corroborated by various Alaska producers.

COSTS OF PRODUCTION FOR FARMED SALMON

Estimated total costs of production		FOR Farm	FOB U.S. Port LA	NY
B.C. 1987	$5 Cdn/kg =	$1.70 U.S./lb.	$1.95	$2.75
Norway 1984	31 Kr/kg =	$1.56 U.S./lb.		
at current exch rate		$2.22 U.S./lb.	3.37	3.02
Washington 1987		$2.05 U.S./lb.	2.10	2.75
Scotland 1985	3.20UKL/kg =	$1.94 U.S./lb.		
at 1987 exch rate		$2.66 U.S./lb.	?	?

Sources: B.C. - DPA Group, Inc. Overview of the B.C. Salmon Farming Industry
Norway - Norwegian Directorate of Fisheries, Study of Profitability of Fish Farms
Washington - Seafood Leader, Winter 1987 "Farming Washington's Inland Sea"
Scotland - Highlands and Islands Development Board From "Atlantic Salmon Farming Industry: Past Performance and Future Potential" by Irish Sea Fisheries Board Oct. 1986

NOTES ON LIKELY EFFECT OF INCREASED PRODUCTION AND PRICE DECLINES ON MARKETING STRATEGY OF FARMING INDUSTRY

"There appear to be few feasible market opportunities for B.C. farmed salmon other than in fresh form. At current costs of production, expected prices for farmed product as a frozen, canned, smoked, or further processed product would not yield sufficient net returns to be a viable option over the long run . . . .

Much of the value inherent in farmed fish is lost if it is sold in any product form other than fresh. As a frozen or canned product, it is unlikely to receive prices better than those prevailing for wild product . . . .

Less than top quality farmed product can be sold as fresh, frozen, or higher value-added processed form (e.g., smoked, pate product) . . . . A scarred fish exterior or extensive scale loss may be acceptable if the fish is going to be steaked or filleted."

Source: Market Access and Penetration Strategy, DPA Group, Inc., pg. 6-7.

PRODUCERS CAN BE EXPECTED TO DEVELOP VALUE ADDED LINES

Some Norwegian and Scottish salmon farming companies are building smokers in European countries and marketing their fish as finished product -- Barry Lester, Troll Producers Association

"Norwegian producers are finally offering their farmed salmon in forms other than the traditional whole, dressed, head-on. U.S. buyers have been clamoring for more frozen salmon and more convenient forms for years. This summer Frionor complied, bringing out a new line of frozen sides and loins . . . . The move to portions will allow Norwegian producers to increase exports without straining an already overburdened airline system that hauls thousands of tons of fresh salmon to the U.S. each year . . . .

Meanwhile, Alaskan salmon producers (who introduced frozen steaks and loins several years ago) are readjusting market strategies in the face of an unexpectedly low harvest." Seafood Business, November/December 1987, pg. 66.

Norwegian and Chilean salmon farmers can be expected to produce fillets and steaks from lower quality or small fish in particular as competition heats up and freight costs become more important in determining profitability. Both producers are far from the North American market and shipping heads and backbones that far is expensive. Overall, the price of head-on fresh Norwegian fish may drop about a dollar by the early 1990's. The price difference between Norwegian and B.C. fish will not hold up. Arnie Einmo, Dory Seafoods personal communication.

ALASKA'S COMPETITIVE POSITION

Water temperatures affect fish growth rates quite markedly. The optimum temperature range for salmon growout is 10-15° C. Water temperatures in areas of Alaska with large amounts of glacial runoff have colder summer water temperatures compared to areas with a more oceanic character, such as the outer coast of Southeast Alaska, outer Prince William Sound, Kodiak, and the Alaska Peninsula. Areas such as inner Prince William Sound, northern and eastern Southeast Alaska, and to some extent central Southeast Alaska, are at the lower end of the range.

Winter temperatures of colder than 4° C are considered poor for growing conditions, while 5-7° is medium, and greater than 7° is best. Areas close to the mainland such as inner Prince William Sound, upper Cook Inlet, and eastern and northern Southeast Alaska have winter water temperatures in the 2-4° range. More oceanic areas have temperatures in the 4-5° range. While techniques such as upwelling can be used to raise the temperature, this would also increase the costs.

Areas that have significant ice accumulation in the winter are not likely to be either warm enough or suitable from an engineering standpoint.

There are many other factors that affect the suitability of a site. While temperature is the most important factor in determining growth rates, other factors affecting mortality, such as algal blooms, are less common in colder waters. Evaluating the suitability of a site requires looking at quite a few factors. These have been surveyed in B.C. and that information is available. However, how the various factors affect economic viability has not been fully analyzed.

Source: Biophysical Criteria for Siting Salmon Farms in British Columbia, B.C. Ministry of Agriculture and Fisheries.

EXCHANGE RATES

Perhaps the most important factor affecting prices for both farmed and wild salmon is the strength of the dollar. With the dollar weak, export prices for salmon from the U.S. are more favorable, but the profit margin for imported salmon is less favorable. Salmon produced and consumed in the U.S. is not directly affected except to the extent that U.S. consumers must compete with foreign consumers.

The recent decline in the dollar has cut into the profit margins of foreign farmers, and they have raised their prices as much as possible. In addition, there is currently a shortage of salmon available which has also pushed the price up. Prices to fishermen and farmer alike are quite good. A turnaround in the dollar would put U.S. farmers and fishermen at a disadvantage, and make domestic markets relatively more desirable than in the weak dollar situation.

Another complicating factor is the movement of various foreign currencies relative to the dollar. For instance, the yen has appreciated considerably more than the kroner. A table follows that lays out the recent changes in exchange rates.

BACKGROUND ON CONTRACTORS

Three contractors were selected, DPA Group, Inc. to do the cost of production model, and Seafare Group working with Dr. James Anderson of the University of Rhode Island to do the market study.

DPA Group, Inc. is a medium sized Canadian consulting firm with extensive experience in farmed salmon economics in B.C. They have done market studies, industry financing studies, feed studies, and world supply estimates for the B.C. government and industry. They have much more extensive data on the actual costs in B.C. than anyone else we could find, and B.C. is obviously more similar to Alaska in terms of environment and species than other farming regions.

Seafare Group is a Seattle consulting company that edits Seafood Leader magazine and organizes seafood expositions. They will be working with Dr. James Anderson, a recognized authority on salmon markets who has also worked with DPA Group, Inc. Dr. Anderson's work is the most definitive available on market sizes and competitive interactions between competing products. He will be building on work already done and trying to answer some of the competition and market size and price questions.

There is also a considerable body of work that has been done by the B.C. and federal governments in Canada. This includes long-term modeling work that projects the impacts of increases in wild, ranched, and farmed salmon production on prices. Through cooperating with the Canadians on studies of this type the state will gain access to some of this information, which will be of use in planning for hatcheries and salmon marketing.

PP/ltOO95r
Attachment
030488a

DISTRIBUTION:

Senate Resources Committee
House Resources Committee
Governor Cowper
Fisheries Cabinet members
United Fishermen of Alaska
Alaska Mariculture Association
Barry Lester, Alaska Troll Producers Association
Arnie Einmo, Dory Seafoods
Peter Redmayne, Seafood Leader Magazine
David Egan, DPA Group, Inc.
Dr. James Anderson, University of Rhode Island

MEMORANDUM State of Alaska

TO: Distribution

DATE: March 16, 1988

FILE NO:

TELEPHONE NO:

THRU:

SUBJECT: Cost of Production Model for Pen Rearing and World Markets for Salmon: Pen Reared Salmon Impacts

FROM: Paul Peyton, Program Manager
Division of Business Development
Department of Commerce & Economic Development

Attached is the final report on Costs of Production. The World Market report is still being worked on due to difficulties in identifying existing domestic markets for Alaska's salmon. This information is not compiled anywhere and must be derived indirectly. The task has proved more difficult than anticipated and the completion date has been moved to March 23.

Please call if you have any questions or suggestions concerning these findings. I have asked the contractors to be available for hearings next week and they will be available the 22nd and later.

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Attachment
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COST OF PRODUCTION MODEL
FOR PEN-REARING OF SALMON IN ALASKA
AND CURRENTLY PRODUCING REGIONS

FINAL REPORT

Prepared for:
State of Alaska Department
Department of Commerce
and Economic Development
Juneau, Alaska

Prepared by:
The DPA Group Inc.
In association with
Hatfield Consultants Ltd.
and Dr. Trond Bjorndal
Vancouver, B.C.

March, 1988

EXECUTIVE SUMMARY

A. PURPOSE OF STUDY

The purpose of this study is to determine costs of production for net-pen rearing of salmon in Alaska. The State Department of Commerce and Economic Development commissioned the study in December, 1987 in conjunction with a second study to assess the impacts of projected farmed salmon supplies on markets for Alaska's wild salmon. Together, these studies can be used to determine the potential economic viability of production in Alaska.

The study first analyzes costs of production in the regions projected to be the largest suppliers. It then develops costs of production for Alaska from an analysis of biological, environmental and logistic conditions in the state.

B. SCOPE OF STUDY

Costs of production (COP) for Norway and Scotland were developed largely from recent studies. Costs of production for Chile were developed from recent studies and from COP models developed by Hatfield Consultants Ltd. for the Chilean industry. Costs of production for British Columbia were developed from a unit cost model recently developed by the DPA Group Inc. for the industry.

Costs of production for Japan were not developed because no cost of production data is available in the public domain or from the firsthand experience of study team members. However, sufficient data was obtained from previous studies and a recent visit by a study team member to draw some important conclusions about its cost structures and its development potential. These are presented in a narrative form.

In order to assess conditions for pen rearing salmon in Alaska we conducted reviews of previous environmental studies in Alaska. We also held telephone interviews with several fisheries officials in the state of Alaska Department of Fish and Game and the National Marine Fisheries Service.

In order to develop growth data and feed conversion ratios we compared published results of the National Marine Fisheries Service salmon farming research projects at Little Port Walter and Auke Bay to those of a recent broodstock management program in British Columbia.

C. COSTS OF PRODUCTION IN CURRENTLY PRODUCING REGIONS

A summary of unit costs for farmed salmon in each major supply region is shown in Exhibit 3.13. In all cases, product is assumed to be sold in a head-on, dressed form. In

the exhibit, a yield factor is applied to the unit costs previously calculated on a round weight basis. Yield factors range between 85% and 90%. Yields are highest with larger fish.

EXHIBIT A: COMPARATIVE DRESSED-WEIGHT UNIT COSTS IN US DOLLARS

	Norway	Scotland	B.C.	Chile	Japan
Unit Costs Per kg Round Wt. Basis	$5.05	$5.46	$3.32	$3.20	$5.67
Average Size	4 kg	2.5 kg	3.4 kg	2.5 kg	2.0 kg
Processing Yield	.90	.87	.89	.87	.85
Unit Costs Per kg Dressed Wt. Basis	$5.61	$6,28	$3.73	$3.68	$6.67
Unit Costs Per lb	$2.55	$2.85	$1.70	$1.67	$3.03

Exchange rates to US dollars are 1987 year-end rates:
NOK: 6.2325; UK pound: 1.8715; CDN$: 0.7693; Yen: 0.0081.

Source: As in Exhibit 3.12.

Chile and British Columbia have the lowest unit costs. Japan has the highest. However, the lower unit costs of the Chilean and British Columbian industries do not necessarily mean that higher returns are being earned in these regions. Freight costs to major markets are a significant factor. Pricing is based on numerous factors including size, species, and grade. Generally larger sizes and high quality are preferred attributes. Preferences for particular species will generally vary by area. Time of harvests and level of marketing effort will also influence net returns.

Large areas of southcentral and southeast Alaska are not suitable for salmon culture due to the presence of ice, icebergs and large river systems. Salinities are generally more consistent throughout the year in areas away from mainland waters, where blooms are also less likely to occur.

Smolt production capacity in both southcentral and southeast Alaska is likely adequate to meet potential demand from a salmon farming industry. Some fish feed production capability exists in southcentral, however fish feed would most likely be imported from Washington State or British Columbia because of more specialized production in these regions.

The following areas would be favoured for development in terms of their proximity to population centers, airports and processing plants:

- along the eastern half of southeast Alaska near Juneau, Ketchikan and Petersburg/Wrangell;
- along the western side of Baranof Island near Sitka;
- in southcentral Alaska near Kodiak, Homer, Seward, Cordova, Valdez and Whittier.

Netpen operations in these areas would also be less likely to be affected by phytoplankton blooms. However, all areas are likely to be affected by predators.

D. COSTS OF PRODUCTION IN ALASKA

The area around Ketchikan is probably the best area for development of pen rearing of salmon in Alaska because of warmer summer and winter temperatures. This area also has more constant salinities throughout the year. Chinook could be expected to reach a harvestable size of two kilograms during the second winter in saltwater. However, the Ketchikan area would have lower growth rates and higher conversion rates than in most areas of British Columbia where salmon farming occurs because of seasonally lower water temperatures.

The cost profile of a farm assumed to be located in the Ketchikan area is summarized below.

Capital Investment

Capital investment is assumed to be similar to that of British Columbia. However, cage systems and equipment are assumed to be imported and slightly more expensive. The estimated total capital investment for the farm is shown below.

	U.S. $
Sea cage system and equipment	$380,000
Facility on floating barge with equipment	250,000
	$630,000

The total capital investment is $2,520 per tonne. Like British Columbia accommodation and other facilities are assumed to be on a floating barge due to the lack of extensive road systems in the south central portion of southeast Alaska.

Unit Costs

Unit costs are shown in Exhibit B. Unit costs are $4.49 per kilogram.

EXHIBIT B: ESTIMATED UNIT COSTS PER KG FOR CHINOOK SALMON IN ALASKA

	Unit Costs (US Dollars)	%
Variable Costs		
Smolts	0.40	9
Feed	2.00	45
Stock Insurance	0.07	2
Processing	0.52	11
Interest on Working Capital	0.27	6
Total Variable Costs	3.26	73
Fixed Production Costs		
Wages	0.32	7
Overhead	0.24	5
Depreciation	0.49	11
Interest	0.18	4
Total Fixed Costs	1.23	27
Unit Costs per Kilogram	4.49	100%

Source: The DPA Group Inc.

Assuming a yield factor of about 85%, unit costs on a dressed weight basis would be $5.28/kg or $2.40/lb.

E. SUMMARY

The landed costs of farmed salmon from each major supply region and from Alaska in three major markets are shown in Exhibit C.

EXHIBIT C: COMPARISON OF LANDED COSTS PER LB IN MAJOR MARKETS (U.S. DOLLARS)

	Supply Region					
Market	Norway	Scotland	B.C.	Chile	Japan	Alaska
Los Angeles	3.80	4.17	2.06	2.63	N/A	2.77
New York	3.46	3.83	2.44	2.63	N/A	3.18
Tokyo	4.25	4.62	2.89	3.85	3.21	3.36

As indicated in the exhibit, Alaska is competitive from a cost standpoint in all markets.

However, costs at an industry level are only well known for Norway. As a result, the cost comparisons should be viewed with caution. Alaska would be selling farmed salmon in smaller sizes than Norway, Scotland and British Columbia and would compete more directly with Chile. British Columbia and Chile have cost advantages over Alaska in both Los Angeles and New York.

Alaska would also likely have a short window period in which to sell. This would also likely result in more direct competition with the Chileans.

Landed costs in major markets are sensitive to exchange rates. Fluctuating exchange rates could make Alaskan farmed salmon more or less competitive in all markets. However, the U.S. and Canadian currencies are closely linked and generally shift from each other only slowly. As a result, British Columbia would likely have cost advantages over Alaska in all major markets.

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1.0 PURPOSE AND SCOPE OF STUDY

Purpose of Study

The purpose of this study is to determine costs of production for net-pen rearing of salmon in Alaska. The State Department of Commerce and Economic Development commissioned the study in December, 1987 in conjunction with a second study to assess the impacts of projected farmed salmon supplies on markets for Alaska's wild salmon. Together, these studies can be used to determine the potential economic viability of production in Alaska.

The study first analyzes costs of production in the regions projected to be the largest suppliers. It then develops costs of production for Alaska from an analysis of biological, environmental and logistic conditions in the state.

Scope of Study

Costs of production (COP) for Norway and Scotland were developed largely from recent studies. Costs of production for Chile were developed from recent studies and from COP models developed by Hatfield Consultants Ltd. for the Chilean industry. Costs of production for British Columbia were developed from a unit cost model recently developed by the DPA Group Inc. for the industry.

Costs of production for Japan were not developed because no cost of production data is available in the public domain or from the firsthand experience of study team members. However, sufficient data was obtained from previous studies and a recent visit by a study team member to draw some important conclusions about its cost structures and its development potential. These are presented in a narrative form.

In order to assess conditions for pen rearing salmon in Alaska we conducted reviews of previous environmental studies in Alaska. We also held telephone interviews with several fisheries officials in the state of Alaska Department of Fish and Game and the National Marine Fisheries Service.

In order to develop growth data and feed conversion ratios we compared published results of the National Marine Fisheries Service salmon farming research projects at Little Port Walter and Auke Bay to those of a recent broodstock management program in British Columbia.

In the following section of the report we present an overview of worldwide farmed salmon production. In Section 3.0 we analyze and compare costs of production in each major supply region. In Section 4.0 we estimate costs of production in areas suitable for pen-rearing salmon in Alaska. In Section

5.0 we summarize Alaska's potential cost advantages and disadvantages.

2.0 OVERVIEW OF WORLDWIDE FARMED SALMON PRODUCTION

2.1 Introduction

Aquaculture is defined as the culturing of finfish, shellfish and aquatic plants. Species currently being cultured commercially include shrimp, oysters, carp, tilapia, catfish and salmon. Worldwide production from aquaculture has grown rapidly from about 2.6 million tonnes in 1970 to about 10 million tonnes in 1986, accounting for 10-12% of total fisheries output worldwide. China and Japan account for 35 percent of world aquaculture production. The United States produces two percent of the world total. Production is mostly catfish.

Aquaculture production can be classified as either extensive, semi-intensive or intensive. The extensive method is the simplest. Aquatic environments such as oceans and lakes are stocked at low densities with little management of the species and little or no supplemental feeding. The semi-intensive method involves higher stocking densities in smaller culture units, more intensive management and some supplemental feeding. The intensive method employs still higher stocking densities in a controlled environment.

Salmon ranching, roe on kelp and scallop spat collection in Alaska can be classified as extensive forms of aquaculture. Pond rearing of catfish and trout in several other states and seapen rearing of salmon in Washington and Maine are classified as semi-intensive production.

Intensive forms of aquaculture for the most part have only been successful with some tropical species although rearing of trout in Idaho could possibly be classified as such. Intensive rearing of Atlantic salmon in land-based tank farms has been attempted but has generally not been successful. Much greater success with rearing salmon has been achieved with netpen rearing of Atlantic salmon in Norway. Production has increased from 1,500 tonnes in 1975 to over 45,000 tonnes in 1986. Along with growing demand for fresh seafood in major markets, this industry has spurred the development of netpen rearing of salmon around the world.

The first phase of the production cycle is in a freshwater hatchery. Fertilized salmon eggs reach the smoltification stage anywhere between six and 18 months. Juveniles are then placed in netpens supported by floating cages situated in marine locations. The growout period in saltwater can take up to three years.

Supplemental feeding exists through most of the freshwater phase and virtually all of the saltwater phase. Pen-reared fish are typically fed commercially-produced pelleted feed.

World production of farmed salmon in 1986 is shown in Exhibit 2.1.

EXHIBIT 2.1: WORLDWIDE PRODUCTION OF FARMED SALMON IN 1986 (Metric Tonnes)

	Atlantic	Chinook	Coho	Total
Norway	45,675	-	-	45,675
Scotland	10,300	-	-	10,300
Ireland	650	-	-	650
Faroes	600	-	-	600
Iceland	100	-	-	100
Sweden	150	-	-	150
Finland	40	-	-	40
Spain	150	-	-	150
France	-	-	180	180
Italy	50	-	-	150
Eastern Canada	297	-	-	297
B.C.	-	89	400	489
Washington State	-	-	1,400	1,400
Chile	-	-	1,000	1,000
New Zealand	-	500	-	500
Japan	-	21	7,200	7,221
	58,012	610	10,180	68,802

Source: The DPA Group Inc. Worldwide Farmed Salmon Production Forecasts to Year 2000, Department of Fisheries and Oceans, 1988.

As indicated in the exhibit, Norway was the world's largest producer of farmed salmon in 1986, producing about two thirds of the world supply (or about 8% of the 1986 total supply of farmed and wild salmon). The other supply region with considerable Atlantic salmon production in 1986 was Scotland.

The culturing of Pacific species has been more recent and Japan was the only significant producer in 1986. In Washington State, pan-sized Coho production is well established but relatively static.

The production figures in 1986 significantly understate the production potential of British Columbia and Chile, where rapid expansions in the number and size of farms has occurred during the last three years. In British Columbia, emphasis has been with production of Chinook and Coho, with more limited production of trout and Atlantic salmon.

In a recent study conducted by the DPA Group Inc., we estimated that due to economic and biological factors, Norway, Scotland, B.C., Chile and Japan would emerge as the leading producers of farmed salmon, producing nearly 82% of the world's supply of farmed salmon by the year 2000.

A summary of actual farmed salmon production in 1986 and projections for 1990 and 2000 by major producing regions is shown in Exhibit 2.2.

EXHIBIT 2.2: PRODUCTION OF FARMED SALMON TO 2000 (tonnes)

	1990	(%)	1995	(%)	2000	(%)
Norway	100,000	63	150,000	56	200,000	51
Scotland	25,000	16	37,500	14	50,000	13
British Columbia	15,600	10	25,500	9	33,000	8
Chile	5,500	4	14,370	5	23,000	6
Japan	10,000	6	15,100	6	15,100	4
Other	2,260	1	27,590	10	72,860	18
Total	158,460	100	270,060	100	393,960	100

Source: The DPA Group Inc. Worldwide Farmed Salmon Production Forecasts to the Year 2000, Department of Fisheries and Oceans, 1988.

Norway and Scotland are projected to continue as world leaders in farmed salmon production to the end of the century because there is still significant opportunities for both industries to become more efficient and new cage technologies should allow them to continue with new site development in more exposed marine environments.

British Columbia and Chile have considerable areas with undeveloped coastlines and are generally believed to have better growing conditions than their European counterparts. To a large extent the salmon farming industries in these regions are less mature and opportunities to reduce costs are greater.

Japan on the other hand is affected by lethal water temperatures in summer which prevents long growout periods and requires harvesting within a short time period. Production is expected to continue to increase substantially however because farmed salmon can reach market size in less than one year.

The four largest supply regions are all expected to export most of their production. Japan is expected to consume all of its production to the end of the century. The major markets for farmed salmon are in the U.S., Japan and Europe. As indicated in Exhibit 2.2, the total production of farmed salmon in the year 2000 is projected to be about 0.4 million tonnes. The five major producing countries are expected to produce 0.32 million tonnes. Competition in these markets is therefore expected to increase, particularly in the U.S. where all of the major exporters currently compete.

In order to determine the viability of production in Alaska, the costs of producing pen-reared salmon in these supply regions should be compared to estimated costs of production in the state.

In the following section of the report we describe the costs of production in each major supply region.

3.0 COMPARATIVE COSTS OF PRODUCTION

3.1 Introduction

Costs of production of farmed salmon are largely determined from biological, environmental and technological factors. Industrial structure and political factors also influence costs. Industrial structure refers to the number and size of farms and their degree of vertical integration. Political factors include government support and restrictions.

However, there are several important factors to consider in the analysis. Firstly, the economics of salmon farming in most supply regions is not well understood. Industry-wide cost of production surveys in Norway, for example, have often overstated costs because many farms surveyed were in their development phases (Bjorndal, 1987). Surveys similar to those periodically undertaken in Norway have also yet to occur in British Columbia and Chile. Even if they had, the surveys would also likely not be very representative of the future cost structure of these industries since most farms established since 1984 first began production at small (pilot) scales and have yet to complete their second production cycle at larger scales.

Secondly, particularly with Pacific species, there is a considerable amount of experimentation being undertaken with genetic selection, sex manipulation, size and time of entry of smolts into saltwater, and stocking densities. The impacts of rapid improvements in broodstock and husbandry on costs of production are difficult to measure.

Empirical data from Norway suggests that there are modest economies of scale in production at the farm site level (Salvanes, 1986). However, the size of farms in Norway is restricted for the most part to small and medium-sized farms, yet in Scotland, B.C. and Chile hoirzontal integration, i.e. multi-site farms, is common. The level of vertical integration in these industries is also higher. Assessing how these structural differences and political constraints impact on costs of production are beyond the scope of this study. Structural aspects of each major supply region can however be described.

The approach adopted in the study is to develop unit costs for an efficient, industrial-scale growout site in each major supply region. This makes sense from several perspectives:

- there is a general trend worldwide towards larger, industrial scale production units;

- even though some industries have salmon farms with production capacities in excess of 1,000 tonnes annually, these tend to be spread over several

sites, in order to reduce risk; a typical site has a production capacity ranging between 100 and 400 tonnes;

- it requires an assumption as to the location of the site which simplifies estimations of freight costs for inputs and shipments of production to market;

- with increased competition for markets worldwide only the more efficient producers will likely survive.

Another factor to consider is how farms in each supply region are financed. The debt to equity ratio of farms in all regions is highly variable. To some extent they are dependent on the amount of government financial support available to farms in each region. However, as will be explained, government financial support in all regions is becoming less important. The rate of return therefore can be expected to equate to a firm's long run cost of capital. In the analysis a real rate of interest of 7% is assumed for all regions. Also land costs are disregarded.

A related factor is the tax structure to pay for the level of government support. However, only in Scotland is there a direct tax on production, although Norway may soon introduce an application fee for licences.

Also disregarded are general taxes. General tax rates vary considerably from region to region. In addition to income taxes, there are sales taxes, tax allowances and depreciation rates to consider. Comparative analyses of these by region would be very complex and are beyond the scope of the study.

Two final considerations are worthy of mention. While costs of production in various industries have been described in previous studies, they are not all in the same year and are not expressed in the same currencies. The approach taken is to first discuss costs of production in their local currencies. This should allow an easier comparison of costs in future years should exchange rates fluctuate. Costs of production from each major supply region are however translated to US dollars in the summary of this section.

The metric system is the recognized system of measurement in most countries. As a result, unit costs of production are first presented in this fashion and are also later converted to the U.S. system.

3.2 Norway

Structural Aspects

Norway is projected to continue as the world's largest producer of farmed salmon to the end of the century.

Production of Atlantic salmon in the year 2000 is forecasted to be 200,000 tonnes.

In 1985, there were about 559 growout farms with total growout capacity of about 3.4 million m^3. Also there were about 150 new licences issued in 1985 (Bjorndal, 1987). By 1987, there were also 611 smolt producers with a total capacity of about 183 million smolts (Hempel, 1988).

The most important structural aspect is the presence of the large number of small farms because both pen volume and ownership of multiple site farms are restricted. These restrictions reflect the regional development policies of the Norwegian government. With the exception of some of the earliest farms, the size of farms is limited to a maximum of 8000 m^3 of netpen capacity.

The Norwegian government is considering a proposal from the Fish Farmers Association to allow a 50% increase in the maximum size of each farm, to 12,000 m^3. Smolt production capacity is limited to one million smolts annually per unit although multiple unit ownership is permitted. Sea Farm A/S was the largest producer in 1985 and produced 9% of total output (Bjorndal, 1987).

The distribution of farms surveyed in the profitability survey in 1984 by size category is shown in Exhibit 3.2. Except for new entrants, the distribution is considered representative of the total population of farms. Most farms in the >7000 m^3 category are between 7000 m^3 and 8000 m^3. A summary of the profitability study itself is shown in Appendix B.

EXHIBIT 3.2: DISTRIBUTION OF FARMS BY SIZE CATEGORY IN NORWAY IN 1984

	<3000m^3	3000-4999m^3	5000-6999m^3	>7000m^3	Total
No. of farms	19	31	20	27	97
Percent of Total	19%	32%	21%	28%	100%

Source: Profitability Study of Fish Farms, Directorate of Fisheries, 1984.

A regional breakdown of farms in 1985 is shown in Exhibit 3.3

EXHIBIT 3.3: DISTRIBUTION OF FARMS BY REGION IN NORWAY IN 1985

	Finnmark, Troms and Nordland	Nord- and Sor-Trondelag, More and Romsdal	Sogn og Fjordane, Hordaland	Rogaland, Skagerakkyst
No. of Farms	161	183	156	59
Percent of Total Production	22%	34%	38%	6%

Source: T.Bjorndal, Fiskeoppdretts - økonomi (Economics of Aquaculture) Oslo: Cappelen, 1987.

The area with the largest amount of production includes the counties of Sogn og Fjordane and Hordaland which are located in the south. The city of Bergen is located in Hordaland. Profitability of farms in this area is also highest (see Appendix B).

The industry is supported by a strong marketing organization which negotiates with exporters minimum prices for producers and manages promotion campaigns for the industry. A levy of 1.25% of sales is assessed to both producers and purchasers/ exporters to support these activities.

Government Support

Considerable government support has been provided to the industry since its inception. Financial assistance is provided mostly through the Regional Development Fund, in the form of loans, loan guarantees and grants to new business establishments in the regions. Financial support provided by the Regional Development during the period 1961-1986 totalled 1,279.3 million kroner as shown in Exhibit 3.4. However, in 1986, the Norwegian government made a decision to reduce financial support to farms. Further, it eliminated financial support programs for smolt producers.

EXHIBIT 3.4: NORWEGIAN GOVERNMENT FINANCIAL SUPPORT TO SALMON FARMING 1961-1986 (MILLION NOK)

Year	Loans	Guarantees	Grant	Total
Total	388.0	678.9	212.4	1,279.3

Source: The Royal Norwegian Ministry of Fisheries

Significant public funds for scientific research and development are also allocated to the industry. Funding provided to government research institutions, universities, and research councils increased from 52.2 in 1984 to 152.1 million NOK in 1987 (Hempel, 1988).

The government does not provide any direct marketing support. However, two special marketing programs were recently introduced to increase exports of Norwegian seafood products to Japan and the U.S. No subsidies for export credit or transportation exists. However, between 1978 and 1980, Scandinavian Airline Systems (SAS), cooperated with major exporters in developing a transport and distribution system for fresh fish. During this period, SAS did offer preferential rates, but no longer does so. The government does not levy special taxes against the industry. However, it is considering charging an application fee for new licences.

Production Plan

Scale and Location

The analysis is undertaken for a fish farm raising Atlantic salmon in 8000 m^3 of pen volume. The farm is assumed to be relatively efficient and can support stocking densities as high as 25 kg/m^3 and therefore produce about 200 tonnes annually.

The farm is assumed to be located in an area between Bergen and Trondheim with nearby access to road connections.

Capital Investment

The total capital investment for the farmer is shown below.

	NOK (000's)
Sea cage system with equipment	1,835
Facility on land with equipment	1,765
	3,600

Source: Bjorndal, 1987.

The total capital investment is 3.6 million NOK or 1,800 NOK per tonne.

Operating Expenses

The estimated operating costs are based on the following assumptions:

- 60,000 salmon smolts are set out every year in May;
- The smolt price is 14 kr;
- The feed price is 6 kr per kilogram;
- The feed conversion ratio is 1.7:1;
- Mortalities are:
  - 7% in the first month after release
  - 4% during the next four months
  - 2% per half year for the balance of the production cycle;
- Processing costs are 5 kr per kilogram;
- Stock insurance is 3% of the average carrying value of inventory;
- Labour: 4 person years;
- Wages including benefits are:
  - 250,000 kr for a farm manager
  - 200,000 kr for three farm labourers;

- Overhead costs include insurance on fixed assets, electricity, fuel, repair and maintenance, medicine, and administration;

- Harvesting begins about 20 months after the release of smolts and continues at the same rate over the year;

- Average weight of fish is 4 kg at harvest.

With these assumptions this farm will be capable of producing about 50,000 fish for a total production of 200 tonnes per year after the third year from startup.

Fixed assets are depreciated on a straight line basis over the following periods:

	Years
Buildings	20
Seapen system and equipment	6
Site investments	50

The investment in buildings includes a processing facility. The seapen system is depreciated over a 6-year life. However the economic life of newer steel cage systems used in Norway is not yet well known. Technological obsolescence may also become a factor beyond a certain period.

Unit Costs

Unit costs are shown in Exhibit 3.5. They are derived from 1986 cost data. Unit costs per kilogram are 31.45 kroner (14.30 kr/lb).

EXHIBIT 3.5: UNIT COSTS PER KG FOR ATLANTIC SALMON PRODUCTION IN NORWAY

	Unit Costs (kr)	%
Variable Costs		
Smolts	4.20	13
Feed	10.70	35
Stock Insurance	0.85	3
Processing	4.40	14
Interest on working capital	2.00	6
Total Variable Costs	22.20	71
Fixed[1] Costs		
Wages	4.25	14
Overhead	2.00	6
Depreciation	1.70	5
Interest on capital	1.30	4
Total Fixed Costs	9.25	29
Unit costs per kilogram	31.45	100

Source: Bjorndal, 1987.

[1] includes some semi-variable costs such as wages.

3.3 Scotland

Structural Aspects

Scotland is projected to produce 50,000 tonnes of farmed salmon in the year 2000 and remain the world's second largest producer of farmed salmon to the end of the century. Like Norway, Scotland will continue to produce Atlantic salmon.

No restrictions on size or ownership exist in Scotland. In 1987, 126 companies operated 196 cage sites and 11 tank sites. There were also 72 smolt production companies who operated 80 tank and 51 cage sites.

Groupings of sea farm sites by their scale of production in 1987 is shown in Exhibit 3.6. As indicated in the exhibit, the largest concentration of farms are in the 101-200 to 201-300 tonne range.

In contrast to Norway, there is more concentration of production and more vertical integration. In 1987, 45% of production was from the largest 20 farms.

EXHIBIT 3.6: DISTRIBUTION OF SEA FARM SITES IN SCOTLAND BY SCALE OF PRODUCTION IN 1987

Production (tonnes)	Number of Sites	% Share of Production
0	49	0
<10	21	0.9
10-25	41	5.5
26-50	15	4.4
51-100	24	13.9
101-200	26	30.5
201-300	13	24.2
300-400	5	12.9
400-500	1	3.4
>500	1	4.3
Total Sites	196	100

Source: Department of Agriculture and Fisheries for Scotland.

Salmon and smolt production in various regions of Scotland are shown in Exhibit 3.7.

EXHIBIT 3.7: SALMON AND SMOLT PRODUCTION IN VARIOUS REGIONS OF SCOTLAND

	Western Isles	Northern Isles	Rest of Scotland	Totals
1987 salmon (tonnes)	1,830	2,211	8,680	12,721
1987 smolts (numbers '000)	2,059	112.8	11,122.6	13,294.4

Source: Department of Agriculture and Fisheries for Scotland.

Most production is off the mainland of Scotland, particularly on its western shores.

The Scottish Salmon Growers Association provides marketing support to the industry through advertising campaigns. The Association charges a levy on smolts in inventory to pay for the costs of promotion.

Government Support

The Highlands and Islands Development Board has been central in channelling UK government financial support to the industry. Most farms are sited within the area covered by its jurisdiction. Between 1965 and the end of 1987 the Board itself had provided a total of 50.7 million pounds in financing to the industry. Most of this was in the form of grants which after a qualifying period, are non-repayable, but part constituted loans and equity participation. During the same period, about 4.1 million pounds have gone to scientific research and development. Two EEC programs, FEOGA and IDP, have also provided funding to the industry. However, like HIDB, funds have not increased with the growth in the industry.

A royalty is now being collected by the government on output. A royalty of 50 pounds per metric tonne applies to farms with production in excess of 50 tonnes. For those with less than 50 metric tonnes of production, a royalty of 45 pounds per metric tonne applies. Royalties in 1987 could have represented as much as 15% of the research and development funds provided to the industry through HIDB.

Production Plan

Scale and Location

The analysis is undertaken for a fish farm raising Atlantic salmon at annual production levels of 200 tonnes.

The farm is assumed to be located on the Scotland's west coast.

Capital Investment

The total capital investment for the farms is shown below.

	Pounds Sterling (000's)
Sea cage system and equipment	220.0
Facility on land with equipment	146.3
	366.3

Source: Shaw and Muir, 1987.

The capital investment is 0.366 million pounds or 1,831.5 pounds per tonne.

Operating Expenses

The estimated operating costs are based on similar assumptions to those of Norway except for the following:

- smolt prices are slightly lower at 1.25 pounds
- smolt to harvest survival rate is 80%
- wages are also lower:

Farm Manager	25,000 pounds
Labour	7,500 pounds

The average size of fish at harvest is also lower at 2.5 kg. As a result, about 100,000 smolts are initially required to reach production of 200 tonnes.

Unit Costs

Unit costs are shown in Exhibit 3.8. They are derived from 1986 cost data. Unit costs per kilogram are 2.92 pounds (1.33 pounds/lb).

EXHIBIT 3.8: UNIT COSTS PER KG FOR ATLANTIC SALMON PRODUCTION IN SCOTLAND

	Unit Costs (Pounds)	%
Variable Costs		
Smolts	0.65	22
Feed	1.00	34
Stock Insurance	0.10	3
Processing and Packaging	0.20	7
Interest on working capital	0.12	4
Total Variable Costs	2.07	72
Fixed Costs		
Wages	0.28	9
Overhead	0.27	9
Depreciation	0.17	6
Interest on capital	0.13	4
Total Fixed Costs	0.85	28
Unit Costs per Kilogram	2.92	100%

Source: S.A. Shaw and J.F. Muir, Salmon: Economics and Marketing, Croom Helm, 1987.

3.4 British Columbia

Structural Aspects

British Columbia is projected to be the world's third largest producer of farmed salmon by the end of the century. Production is forecast to be 33,000 tonnes in 2000, 75% of which is projected to be comprised of chinook salmon.

No restrictions on size or ownership exist in British Columbia. In 1987, 85 farms operated 115 sites. Smolt production is concentrated to a few producers. Eight smolt producers produced about 90% of production in 1987. Total production capacity was about 30 million smolts. (B.C. Salmon Farmers Association).

No breakdown by production size or geographic area was available for 1987. However, DPA conducted a study in 1986 which projected the number and size of farms for 1987 through to 1990 (the projected number of farms for 1987 was 82 farms operating 113 sites). The study projected a trend towards increased concentration of production: 60% of the production in 1990 would be from 12% of the farms. The area projected to have the largest amount of production through to 1990 was the Sunshine Coast.

The study also projected a trend towards more vertical integration, including backward integration by fish processing companies through the provision of working capital financing to farms.

Technologies employed are similar to those of Norway and Scotland. However, stocking densities, particularly with chinook, are much lower than in the Norwegian or Scottish industries. Stocking densities are generally less than 8 kg/m^3, significantly lower than in Norway.

The B.C. Salmon Farmers Association (BCSFA) provides marketing support to the industry. The BCSFA began a generic promotion campaign in 1987. A levy was previously charged on wild salmon eggs distributed to producers. In 1988, the levy is being shifted to smolt sales, since increasingly the industry is becoming self sufficient in egg supplies.

Government Support

Direct financial assistance to the industry has been mostly loans provided by a joint federal/provincial program for industrial development and an agricultural credit program of the provincial Ministry of Agriculture and Fisheries. The total outstanding loans at the end of 1987 from these programs were $3.8 million (57 loans) and $0.3 million (11 loans) respectively. The joint federal/provincial program expires in 1988.

Aquaculture is also a qualifying industry for a provincial venture capital corporation (VCC) program in which investors can qualify for a credit of up to 30% of their investment. A total of five aquaculture VCC's have been formed.

Support for scientific research and development is also being provided by the provincial Ministry of Agriculture and Fisheries and the federal Department of Fisheries and Oceans. Total support in 1987 was about $3 million.

There are no special taxes or royalties levied against the industry. Annual lease costs for aquatic land are ususally less than $2,000.

Production Plan

Scale and Location

The analysis is undertaken for a fish farm raising chinook salmon at an annual production level of 250 tonnes.

The farm is assumed to be located in the Sunshine Coast area.

Capital Investment

The total capital investment for the farm is shown below.

	$Cdn (000s)
Sea cage system and equipment	442
Facility on floating barge with equipment	308
	750

Accommodation and storage facilities are assumed to be on a floating barge. The total capital investment is $3,000 per tonne.

Operating Expenses

The estimated operating costs are based on the following assumptions:

- 104,000 salmon smolts are set out every year in June;
- the smolt price is $.75 which includes a BCSFA levy of $.08;
- the feed price is $1.00 per kg;
- the feed conversion ratio ranges between 1.3 and 1.9;

- Mortalities range between 1% and 3% per month;
- Processing costs are $0.77 per kg;
- Stock insurance is calculated as 4% of the average carrying value of inventory;
- Labour - 4 person years;
- Wages including benefits are:

General Manager	$35,000
Farm Manager	25,000
Labourer 1	17,500
Labourer 2	17,500
	$95,000

- Fixed costs include insurance on buildings and equipment, electricity, fuel, repair and maintenance, medicine and administration;
- Harvesting occurs between 16 and 24 months in saltwater;
- Average weight of fish is 3.4 kg at harvest.

With these assumptions the farm will be capable of producing about 73,500 fish for a total production of 250 tonnes per year. The harvest weight of 3.4 kg reflects the current production strategies of most farms. However, the average size of chinook harvested to date has been less than 3 kg (B.C. Salmon Farmers Association).

Fixed assets are depreciated on a straight line basis over the following periods:

	Years
Buildings	20
Seapen system and miscellaneous equipment	6
Site investments	50

The economic life of fixed assets in British Columbia is assumed to be the same as Norway's and Scotland's because similar technologies are employed in each industry.

Unit Costs

Unit costs are shown in Exhibit 3.9. They are derived from 1987 cost data. Unit costs are $4.32 per kilogram ($1.96/lb).

EXHIBIT 3.9: UNIT COSTS PER KG FOR CHINOOK SALMON IN BRITISH COLUMBIA

	Unit Costs $Cdn	%
Variable Costs		
Smolts	0.26	6
Feed	1.47	34
Stock insurance	0.09	2
Processing and packaging	0.77	18
Interest on working capital	0.29	7
Total Variable Costs	**2.88**	**67%**
Fixed Costs		
Wages	0.38	9
Overhead	0.30	7
Depreciation	0.56	13
Interest on capital	0.20	5
Total Fixed Costs	**1.44**	**33%**
Unit Costs per Kilogram	**4.32**	**100%**

Source: The DPA Group Inc., 1988

3.5 Chile

Structural Aspects

Chile is projected to be the world's fourth largest producer of farmed salmon by the end of the century. Production by the year 2000 is forecast to be 23,000 tonnes, about 60% of which is expected to be coho salmon. The balance is expected to be mostly Atlantic salmon, with only limited production of chinook salmon. Chinook production is mostly limited by shortages of eggs available for import.

In 1986, 22 farms producing salmon and/or trout were in operation.

No restrictions on size or ownership exists. Groupings of farms by their installed capacity in 1986 is shown in Exhibit 3.10. The data includes an unspecified amount of trout production capacity.

EXHIBIT 3.10: DISTRIBUTION OF FARMS IN CHILE BY SCALE OF OPERATION IN 1986

Production Range	No. of Farms	Total
1-10	3	14
11-100	3	14
101-300	6	27
301-500	6	27
501-1000	2	9
>1000	2	9
	22	100%

Source: Ricardo Mendez Zamorano Desorrollo Y Estado De Situacian Actual De La Salmoniculture En Chile, Fundacion Chile, 1987.

Salmon production in Chile is concentrated in an area south of Puerto Montt.

The industry is characterised by sizeable companies rather than small family operations. A number of the companies also own seafood processing plants in southern Chile.

Growing conditions in Chile are generally considered to be slightly better than British Columbia. To date the industry has been mostly reliant on imports of coho salmon from the states of Washington and Oregon. Typically, juveniles are placed in saltwater after 10 months in freshwater which is

usually in December when they have reached 35 grams. The reliance on wild coho eggs has meant that production has been mostly harvested after 12 to 16 months in saltwater in sizes ranging from 1.5 to 2.5 kilos. If fish are not harvested in this time period, early maturation usually occurs and they cannot be held over until the following fall and winter.

Government Support

No direct financial assistance is provided to the industry. There are also no export credits or transportation subsidies. Some support for research and development is provided through Fundacion Chile, CORFO and some state universities. Some marketing support is also provided through PROCHILE (Mendez (1988).

Production Plan

Scale and Location

The analysis is undertaken for a fish farm raising coho salmon at annual production levels of 200 tonnes.

The farm is assumed to be located in an area south of Puerto Montt.

Capital Investment

The total capital investment for the farm is shown below (prices in Chile are usually quoted in U.S dollars):

Sea cage system and equipment	$124,000
Facility on land with equipment	83,000
Total	**$207,000**

Source: Mendez, 1987.

The total capital investment is about $1,000 per tonne.

Operating Expenses

The estimated operating costs are based on the following assumptions:

- 93,000 salmon smolts are set out every year in December;
- the smolt price is $0.40;
- the smolt size is 35 grams;

- the feed price is $0.65 per kg;

- the average feed conversion ratio is 2:1;
- Mortalities are:

  . 7.5% in the first quarter;
  . 4.5% in the second quarter;
  . 1.5% in subsequent quarters;

- Labour:

. Farm General Manager	14,400
. Operations Manager	12,000
. Technical Support (2 Advisors)	24,000
. Labourers (17)	20,400
	70,800

- Fixed costs include annual lease costs, insurance, electricity, fuel, repair and maintenance, medicine, and administration;

- Harvesting begins in mid December, 12 months after the release of smolts and continues until the end of March;

- Average weight of fish is 2.5 kg at harvest.

With these assumptions the farm will be capable of producing about 80,000 fish for a total production of 200 tonnes per year.

Fixed assets are depreciated on a straight-line basis over the following periods:

	Years
Building	10
Seapen system and miscellaneous equipment	3
Site investments	25

Fixed assets are depreciated over fewer years than in Europe or British Columbia because lower quality designs, i.e. wooden cages, are typically used.

Unit Costs

Unit costs are shown in Exhibit 3.11. They are derived from 1987 cost data. Total unit costs are $3.20 per kilogram ($1.45/lb).

EXHIBIT 3.11: UNIT COSTS PER KG FOR COHO SALMON PRODUCTION IN CHILE

	Unit Costs USD	%
Variable Costs		
Smolts	0.19	6
Feed	1.21	38
Stock insurance	0.10	3
Processing	0.50	16
Interest on working capital	0.18	6
Total Variable Costs	2.18	69
Fixed Production Costs		
Wages	0.60	18
Overhead	0.26	8
Depreciation	0.09	3
Interest on capital	0.07	2
Total Fixed Costs	1.02	31
Unit Costs per Kilogram	3.20	100%

Sources: Hatfield Consultants Ltd. (1987), Mendez (1987), Wurmann (1987).

3.6 Japan

Japan is projected to be the world's fifth largest producer of farmed salmon by the end of the century. Production by the year 2000 is projected to be 15,000 tonnes and almost entirely comprised of coho salmon. Virtually all production in 1986 was coho salmon. About 20-25 tonnes of chinook was reportedly produced. Experimentation with Atlantic salmon rearing is also being undertaken.

Production is largely at small scales and organized through cooperatives. In 1986, a total of 19 organizations operated 264 sites. Average production per site in 1986 was 28 tonnes, indicating small scale production. Bjorndal confirmed this in a visit in 1987. Further he indicate low level technologies for cage design and feeding systems are employed.

Eighty seven percent of the sites were located around Miyagi, near the northeast end of Honshu. In 1986 these sites produced 81% of the total production.

Although the scale of growout sites is very small compared to other industries, processing and marketing is concentrated to three large processing companies, most notably Nichero Fisheries.

Since the industry began in 1973, it has relied on imports of coho salmon eggs from Washington and Oregon.

Feed production is also not undertaken at a large scale. Supplies of mackerel, sardine and mysid shrimps are available year around for feed production from local parts.

Government Support

No direct financial assistance has been provided to the industry.

Production Plan

Coho smolts are usually one year olds (SI's) when they are placed in saltwater at average sizes of 150 grams from mid-October to early November. The fish are then raised in net pens for about 7-9 months at stocking densities of 10 to 15 kg/m^3.

The coho can grow to 2.5 kilograms by July and are harvested between 1.5 kg and 2.5 kg. Coho must be harvested before August because lethal temperatures are reached.

Unit Costs

Unit cost data for Japan is not available in the public domain. However, the production cost of farmed salmon in 1986 was reportedly about 700 yen/kilo (318 yen/lb) (Sato, 1987). Prices for eggs were six yen per egg. Prices for smolts weighing between 100 grams and 250 grams were 1,000-1,500 yen per tonne. Feed consists of moist pellets manufactured from mostly raw fish (sardine, mackerel and filefish) with some formulated feed added.

3.7 Summary

A summary of capital investment per tonne is shown in Exhibit 3.12.

EXHIBIT 3.12: COMPARATIVE CAPITAL INVESTMENT PER TONNE IN U.S. DOLLARS

	Norway	Scotland	B.C.	Chile	Japan
Capital Investment per tonne (local currency)	18,000	1,832	3,000	238,140	N/A
Capital Investment per tonne					
1987	2,888	3,428	2,308	860	-
1986	2,432	2,701	2,173	1,000	-

Conversion to U.S. dollars are at 1987 (1986) year-end rates:[1]
NOK: 6.2325 (7.400); U.K. pound: 0.5343 (0.6782); Cdn $ 1.2998 (1.3805); Peso: 238.14 (204.73).

1 International Financial Statistics, Vol. XLI No. 1, January, 1988. International Monetary Fund, Washington, D.C.

Scotland has the highest capital investment per tonne. The significant difference in capital costs between Scotland and Norway in 1987 is largely due to exchange rate fluctuations. However, sites are generally more costly to develop in Scotland because they are located in areas more remote from population centres. Also, sites with greater exposure are more common in Scotland. In addition, cage systems tend to be imported from Norway. British Columbia has lower investment costs than Norway because facilities are assumed to be on floating barges and they do not conclude processing facilities.

The economic life of fixed assets in the regions is assumed to be the same since similar technologies in cage design are employed in each area. Chile has the lowest capital investment cost per tonne because of the use of lower quality cage systems and lower building costs. However the economic life of fixed assets is assumed to be half that of other regions. The capital investment per tonne in Japan is not known but is assumed to be similar to Chile's.

A summary of unit costs for farmed salmon in each major supply region is shown in Exhibit 3.13. In all cases, product is assumed to be sold in a head-on, dressed form. In the exhibit, a yield factor is applied to the unit costs previously calculated on a round weight basis. Yield factors range between 85% and 90%. Yields are highest with larger fish.

EXHIBIT 3.13: COMPARATIVE DRESSED-WEIGHT UNIT COSTS IN US DOLLARS

	Norway	Scotland	B.C.	Chile	Japan
Unit Costs Per kg Round Wt. Basis	$5.05	$5.46	$3.32	$3.20	$5.67
Average Size	4 kg	2.5 kg	3.4 kg	2.5 kg	2.0 kg
Processing Yield	.90	.87	.89	.87	.85
Unit Costs Per kg Dressed Wt. Basis	$5.61	$6,28	$3.73	$3.68	$6.67
Unit Costs Per lb	**$2.55**	**$2.85**	**$1.70**	**$1.67**	**$3.03**

Exchange rates to US dollars are 1987 year-end rates:
NOK: 6.2325; UK pound: 1.8715; CDN$: 0.7693; Yen: 0.0081.

Source: As in Exhibit 3.12.

Unit costs in local currencies are not all expressed for the same years. As previously indicated they are not converted to US dollars in the year collected because the impact of fluctuations in exchanges rates would then be difficult to gauge. In addition a domestic inflation factor for each country since the year the data is collected is also not applied because for the most part input costs do not correlate directly with general price indices. For example, the cost of feed is largely dependent on the world price of fish meal and fish oil which can fluctuate significantly due to biological factors such as El Nino's in South America.

As indicated in the exhibit, Chile and British Columbia have the lowest unit costs. Japan has the highest. However, the lower unit costs of the Chilean and British Columbian industries do not necessarily mean that higher returns are being earned in these regions. Freight costs to major markets are a significant factor (these are discussed in Section 5.0). Pricing is based on numerous factors including size, species, and grade. Generally larger sizes and high

quality are preferred attributes. Preferences for particular species will generally vary by area. Time of harvests and level of marketing effort will also influence net returns.

Exchange rates can affect costs significantly, particularly since the largest producers (except Japan) export most of their production. Exhibit 3.14 compares the same unit costs translated at average rates in 1986.

EXHIBIT 3.14: IMPACT OF EXCHANGE RATES ON UNIT COSTS PER LB

	Norway	Scotland	B.C.	Chile	Japan
Unit Costs/lb 1987	2.55	2.85	1.70	1.67	3.03
Unit Costs/lb 1986	2.18	2.25	1.60	1.44	2.35
% Change	7%	27%	6%	6%	29%

Exchange rates to U.S. dollars are at 1987 (1986) year-end rates:
NOK: 6.2325 (7.400); U.K. pound: 0.5343 (0.6782);
Cdn $ 1.2998 (1.3805); Peso: 238.14 (204.73); Yen: 0.0081 (0.0063)

Source: As in Exhibit 3.12

The exhibit indicates that all unit costs expressed in US dollars were lower in 1986. The impact was most dramatic with the change in value of the pound sterling. The analysis partially explains some trends in the industry, including less than anticipated sales by Norway in the US in 1987. Norway did however place more emphasis on penetrating the Japanese market. In 1987 Chile also began selling to Japan.

4.0 COST OF PRODUCTION MODEL FOR ALASKA

4.1 Introduction

Development of likely costs of production in Alaska requires an analysis of conditions for rearing. British Columbia is considered the best model for analysis of Alaska's potential for three important reasons:

- British Columbia more closely parallels Alaska socio-economically and environmentally than other regions;
- the predominant species reared in British Columbia are Pacific species and these would also be the predominant species reared in Alaska because of restrictions on imports of exotic species into the state;
- British Columbia and Alaska would likely serve similar markets.

In this section we summarize the following analysis described in a technical appendix prepared by Hatfield Consultants Ltd.:

- general environmental and logistic conditions for pen-rearing salmon in Alaska;
- differences in growth and feed conversion rates between British Columbia and Alaska.

We then develop likely unit costs of production for Alaska from these for the area with the best development potential.

4.2 Environmental and Logistic Conditions

Conditions which are important in considering the location of a netpen site can be classified under environmental or logistic categories.

Environmental factors include water quality characteristics and potential problems with plankton blooms and predators. Logistic factors include access to critical inputs such as smolts, feed, labour and transportation routes.

These conditions are discussed for southcentral and southeast Alaska, the two areas which according to state fisheries officials contacted, development of net-pen rearing of salmon would most likely occur.

4.2.1 Physical Marine Conditions

An overview of ice formation and iceberg conditions, temperatures and salinities in southcentral and southeast Alaska is presented. The information is then used to develop assumptions about growing conditions, growth rates and feed conversions.

Southcentral Alaska

Ice Formations and Icebergs

Ice formation and the presence of icebergs in embayments and low winter air temperatures impose constraints on development of netpen sites in southcentral Alaska; in particular, these are:

- the presence of pack ice and fast ice in Cook Inlet;
- the presence of ice and icebergs in embayments connected to Prince William Sound and near Seward; and
- the potential for ice formation on floating structures.

Apart from the presence of sea ice and glacier ice in embayments in southcentral Alaska, the air temperature and wind conditions in that area make it generally susceptible for ice formation on floating structures (La Belle et. al. 1983).

Water Temperatures

Studies have shown that growth of salmon fed normal rations is highest at approximately 15°C (Brett, 1982). Below 5°C, conversion drops off appreciably. Mean winter surface temperatures in South Central can be expected to be between 2.5 and 5.0°C and mean summer surface temperatures can be expected to range between 7°C and 13°C.

Salinity

Lower and fluctuating salinities can affect the physiological condition of the salmon (i.e. in relation to the osmoregulatory adaptation to ambient salinity levels) and can influence outbreaks of harmful phytoplankton. In other words sudden variation in salinity levels can cause stress in fish. Generally growth is best under conditions of moderate salinity.

Xiong and Royer (1984) state that average surface salinities in summer are 27.3‰ and in winter are 31.2‰, based on intensive studies near Seward. At greater depths (i.e. 250 m), salinities are approximately 33‰ year round. Colonell (1980) and Muench and Nebert (1973) describe the presence of relatively fresh water lying in a thin surface layer in Valdez Arm and Port Valdez during summer and autumn. Muench and Nebert (1973) indicate that minimum mean surface

October period, though salinities in the upper 20 m were, at times, less than 1% near the head of Port Valdez (in late July/early August). Lower surface salinities over the summer period are attributed to freshwater runoff from land areas and high precipitation.

Southeast Alaska

Icebergs

Icebergs are present in several bays and straits in northern and eastern Southeastern Alaska (LaBelle et al, 1983):

- Cross Sound, Icy Strait and Glacier Bay;
- Taku Inlet;
- Tracy Arm and Endicott Arms; and
- the end of Frederick Sound.

The presence of icebergs suggests a potential for damage to floating structures and, in general, these areas would be avoided. Also, the icebergs apparently can greatly reduce summer temperatures in surface waters (Pickard, 1967).

Water Temperatures

Mean monthly surface temperatures for the coastal waters along southeast Alaska (Brower et al, 1977) and five lighthouse installations (Jones, 1978) in southeast Alaska and in Auke Bay near Juneau (Bruce et al, 1977) were analyzed.

These data show mean high temperatures in summer to range between 9.0°C and 14.6°C. Mean low temperatures in winter range between 2.3°C and 5.2°C. The mean low temperature for the general coastal area (Brown et al, 1977) is slightly higher than these values at 6.0°C.

Salinities

Larger rivers along the mainland shoreline can produce lower and fluctuating salinities (Pickard, 1967) and consequently make nearby areas unsuitable for locating netpens for adult growout. These areas include the mouths of the Stikine River, Taku River, Unuk River, Chilkat River and Speel River.

4.2.2 Phytoplankton and Marine Mammals

Phytoplankton

Two phytoplankton species, Chaetoceros convolutus and Heterosigma akashiwo, have caused serious mortalities amongst salmon cultured in marine netpens in British Columbia. Chaetoceros convolutus causes asphyxiation through physical damage of the gills by silicate processes projecting from the diatom. Heterosigma akashiwo can also lead to asphyxiation because they are toxic to salmon and cause irritation and

mucus buildup in gills. Conditions appear suitable for both species in southcentral and southeast Alaska (Gaines and Taylor, 1986). Chaetoceros diatoms have been responsible for chinook salmon mortalities in seapens at Little Port Walter (National Marine Fisheries Service, unpublished). Chaetoceros convolutus has also been collected during surveys near Valdez in Prince William Sound (Horner et al 1973.) The occurrence and intensity of phytoplankton blooms vary greatly both geographically and temporally and prediction is difficult (Gaines and Taylor, 1987). In general, Heterosigma blooms tend to occur in early summer, often in association with lower salinities resulting from increasing river flow, while Chaetoceros blooms tend to occur in the late summer or fall.

Harmful phytoplankton could affect sites in both southcentral and southeast Alaska. As in British Columbia, the effects on production could be direct mortalities or reduced growth when oxygen depletion occurs and rations are restricted.

Marine Mammals

Marine mammals such as otters and sea lions have affected production at sites in British Columbia by killing fish in pens, by damaging netpens allowing fish to escape, and by causing high stress levels in the fish thereby reducing growth rates. A National Marine Fisheries Service report (unpublished) indicates that otters, seals and possibly sea lions have killed fish at the experimental facilities near Little Port Walter. Steller's sea lions and harbour seals occur essentially along the entire Gulf of Alaska coastline (U.S. Department of the Interior, 1984).

Predation from marine mammals will likely be a similar problem in southcentral and southeast Alaska waters to that which occurs in British Columbia. This will require investment in predator control measures such as predator nets. Again, density levels would likely be kept low so that if stress develops when predators are nearby (but do not necessarily attack fish in the pens), it would not compound stress already resulting from high densities.

4.2.3 Smolt Production Capabilities

Southeast Alaska

Four state hatcheries in southeast Alaska produce chinook salmon and three hatcheries produce coho salmon (Hansen, 1987). In addition, 10 private non-profit hatcheries operated by regional aquaculture associations and other non-profit groups raise chinook or coho or are permitted to raise these species.

In 1986, nearly 5 million chinook eggs were collected from these facilities and more than 2.7 million juvenile chinook

were released. Similarly, slightly more than 4 million coho eggs were collected and 1.5 juvenile coho were released.

In 1986, private non-profit hatcheries in southeast Alaska had total permitted chinook egg capacities of 6.73 million and total permitted coho egg capacities of 15.47 million eggs. Most fry production of both species is in the Whitman Lake and Neets Bay hatcheries operated by the Southern Southeast Regional Aquaculture Association.

Southcentral Alaska

Five state hatcheries in southcentral Alaska produce chinook salmon and five hatcheries produce coho salmon. In 1986, 1.5 million chinook eggs were collected and 1.5 million juvenile chinook were released. Slightly more than 6.5 million coho eggs were collected and 7 million coho juveniles were released.

Three private non-profit hatcheries operated by regional aquaculture associations and other non-profit groups raise chinook or coho salmon or are permitted to raise these species. In 1986, the private non-profit hatcheries had total permitted chinook egg capacities of 1.15 million and total permitted coho egg capacities of 3.1 million.

Clearly, a large smolt production capability exists in both southcentral and southeast Alaska and this production is spread throughout each region. Hansen (1987) indicates that a number of hatcheries are constructed below lakes and water intakes in the lakes are placed at different depths so temperatures can be adjusted. This means juvenile growth rates and smolt timing can be manipulated to achieve release objectives.

4.2.4. Fish Feed

Currently there is fish feed production capacity in southcentral. However, capacity is limited and technologies employed in production are not as advanced as those in Europe, British Columbia or Washington State.

The main ingredients in commercial fish feeds are fish meal and fish oil. These are manufactured in the reduction process from whole fish or fish waste from the processing sector. Alaska's reduction industry is not well developed, despite the availability of significant quantities of fish waste. In addition the reduction plants in Alaska produce fish meal and fish oil which is unsuitable for fish feed. According to representatives of a fish feed manufacturer in Washington State, if a new feed plant were to be constructed, it would likely be constructed in tandem with a new reduction plant, both of which would require significant capital investment. Alaska would more likely be supplied by fish feed manufacturers in Washington State or British Columbia since transport by barge to Alaska is not a significant cost.

4.2.5 Potential Development Areas

Initial development could be expected to occur in suitable bays or shoreline areas (protected from high winds or waves) away from areas affected by water ice cover, icebergs and large river systems and as close to transportation centers and processing/packing facilities as possible.

Small to medium-sized communities having airport and port facilities are distributed throughout both southcentral and southeast Alaska. Apart from the major airport in Anchorage, smaller airfields and port facilities are located throughout the area (e.g., Homer and Seward).

Larger airports and port facilities are situated along eastern southeast Alaska (Juneau, Petersburg, Wrangell and Ketchikan) and Sitka. These are also the major population centers. Ideally, fish farms would locate within three to four hours by boat from logistic centers to minimize the amount of time that harvested fish are in transit prior to boarding flights to market areas.

The following areas would be favoured for development in terms of their proximity to population centers, airports and processing plants:

- along the eastern half of southeast Alaska near Juneau, Ketchikan and Petersburg/Wrangell;
- along the western side of Baranof Island near Sitka;
- in southcentral Alaska near Kodiak, Homer, Seward, Cordova, Valdez and Whittier.

4.3 Growth and Conversion Rates

4.3.1 Generalized Temperature Regimes

The temperature data reviewed for South Central and southeast were used to develop four generalized temperature regimes in which salmon culture might take place:

- relatively cool winter temperatures and warm summer temperatures (that might occur in bays in southcentral Alaska and near Juneau);
- relatively warm winter temperatures and warm summer temperatures (that might occur in bays near Ketchikan);
- relatively warm winter temperatures and cooler summer temperatures (that might occur in the Frederick Sound/Petersburg area); and
- relatively cool winter temperatures and cool summer temperatures (that might occur in the northern inlets of southeast Alaska close to iceberg areas).

Clearly, general good-case and poor-case growing conditions would be, respectively, warm winter/warm summer conditions and cool winter/cool summer conditions. Since specific conditions can vary from site to site and from year to year, extreme best case and worst case conditions would likely lie outside these general scenarios.

Probable monthly growth rates for chinook were developed for a scenario of relatively warm winter temperatures and warm summer temperatures that might occur in the south central portion of southeast Alaska. Chinook would likely be preferable to coho for net pen rearing in Alaska since they have shown greater survival rates than coho during longer growout periods in British Columbia (B.C. Salmon Farmers Association). The fish sizes and growth rates obtained for chinook salmon at Little Port Walter and at five locations in British Columbia, together with unpublished growth rate data from the Pacific Biological Station in Nanaimo, B.C., have been used to develop the growth profile. These are shown in Exhibit 4.1.

Juvenile chinook are assumed to be placed into saltwater in June at 7 grams. In the warm winter, warm summer temperature regime, they are projected to reach a harvestable size of at least 2 kilograms after 21 months and are projected to grow to 2.5 kilograms after 24 months in saltwater.

In the cool winter/cool summer temperature regime, chinook are projected to reach only about 1 kilogram after 24 months in saltwater. If chinook were held over a third summer and harvested in October they would still be less than 2 kilograms.

4.3.2 Feed Conversion

Feed conversion rates are influenced by environmental variables (such as temperature, salinity, photoperiod, oxygen concentration) and operational variables (such as fish size, ration, food quality). Food conversion efficiency is normally greater for smaller fish sizes, decreasing as the fish grow (Brett and Groves, 1979). Over a given temperature range, on the other hand, food conversion efficiency usually reaches a maximum at a particular temperature and is lower at both lower and higher temperatures. Similarly, the optimum ration amount for maximum food conversion is normally lower than the maximum ration that the fish will consume. In turn, maximum conversion efficiency occurs at a lower ration quantity, as temperature is reduced below the optimum. Generally, optimum feed conversion efficiency for salmon appears to occur at temperatures between 10°C and 15°C at ration levels at 60-90% of maximum.

EXHIBIT 4.1: ESTIMATED GROWTH RATES FOR CHINOOK SALMON GROWN UNDER TWO GENERALIZED MEAN MONTHLY TEMPERATURES REGIMES IN SOUTHEAST ALASKA

	WARM WINTER/WARM SUMMER				COOL WINTER/COOL SUMMER			
	Temp.	Approx. Size (grams)	Daily Growth Rate (%)	Food Conversion	Temp.	Approx. Size (grams)	Daily Growth Rate (%)	Food Conversion
June	10.0	13	2.2	1.5	8.0	12	2.0	1.7
July	11.0	25	2.1	1.5	9.5	24	2.1	1.7
August	12.0	49	2.2	1.5	9.5	45	2.1	1.7
September	10.5	92	2.1	1.5	8.5	79	1.9	1.7
October	7.5	125	1.0	1.7	7.5	108	1.0	1.9
November	5.0	149	0.6	1.7	5.0	125	0.5	1.9
December	3.5	174	0.5	1.7	3.5	133	0.2	1.9
January	5.0	197	0.4	1.7	3.5	142	0.2	1.9
February	5.0	222	0.4	1.6	3.0	146	0.1	1.8
March	4.5	243	0.3	1.6	5.0	165	0.3	1.8
April	5.0	266	0.3	1.6	5.0	165	0.3	1.8
May	6.0	301	0.4	1.6	6.0	187	0.4	1.8
June	10.0	406	1.0	1.7	8.0	237	0.8	1.9
July	11.0	570	1.1	1.7	9.5	323	1.0	1.9
August	12.0	851	1.3	1.7	9.5	439	1.0	1.9
September	10.5	1181	1.1	1.7	8.5	575	0.9	1.9
October	7.5	1512	0.8	1.9	7.5	736	0.8	2.0
November	6.0	1704	0.4	1.9	5.0	805	0.3	2.0
December	5.5	1870	0.3	1.9	3.5	830	0.1	2.0
January	5.0	1990	0.2	1.9	3.5	856	0.1	2.0
February	5.0	2104	0.2	3.0	3.0	881	0.0	2.1
March	4.5	2170	0.1	2.0	3.0	908	0.0	2.1
April	5.0	2236	0.1	2.0	5.0	936	0.1	2.1
May	6.0	2454	0.3	2.0	6.0	1027	0.3	2.1

For potential sites in Alaska having similar temperatures and salinities to those in British Columbia (e.g., the north B.C. coast site), similar conversion rates could be expected. However, potential locations in southeast Alaska will likely have winter temperatures lower than those experienced in British Columbia (i.e., less than 5°C). Food conversion rates under these conditions will be slightly poorer than for comparably sized fish grown at higher temperatures.

Also the feed conversions obtained from dry feeds at British Columbia sites were mainly under conditions of moderate salinity. Similar conditions can be expected in areas of southeastern Alaska, particularly along the mainland side. However, along the western side, salinities could, on average, be higher. The feed conversion efficiency of dry feeds could be reduced at high salinities (greater than 25%) given higher energy requirements for osmoregulatory functions (Shaw et al, 1975; Brett, 1979).

Probable feed conversions for dry feeds utilized in southeastern Alaska for the two temperature regimes are also shown in Exhibit 4.1. These feed conversions have been adjusted to reflect a decrease in feed conversion efficiency as the fish increase in size, and decreases that might occur at seasonally lower temperatures.

4.3.3. Summary

Large areas of southcentral and southeast Alaska are not suitable for salmon culture due to the presence of ice, icebergs and large river systems. Salinities are generally more consistent throughout the year in areas away from mainland waters, where blooms are also less likely to occur.

Smolt production capacity in both southcentral and southeast Alaska is likely adequate to meet potential demand from a salmon farming industry.. Some fish feed production capability exists in southcentral, however fish feed would most likely be imported from Washington State or British Columbia because of more specialized production in these regions.

The following areas would be favoured for development in terms of their proximity to population centers, airports and processing plants:

- along the eastern half of southeast Alaska near Juneau, Ketchikan and Petersburg/Wrangell;
- along the western side of Baranof Island near Sitka;
- in southcentral Alaska near Kodiak, Homer, Seward, Cordova, Valdez and Whittier.

Netpen operations in these areas would also be less likely to be affected by phytoplankton blooms. However, all areas are likely to be affected by predators.

The area around Ketchikan is probably the best area for development of pen rearing of salmon in Alaska because of warmer summer and winter temperatures. This area also has more constant salinities throughout the year. Chinook could be expected to reach a harvestable size of two kilograms during the second winter in saltwater. However, the Ketchikan area would have lower growth rates and higher conversion rates than in most areas of British Columbia where salmon farming occurs because of seasonally lower water temperatures.

A profile of a salmon farm can now be developed to allow comparison to costs in other supply regions by assuming that the growth of chinook in this area would approximate that of the warm winter/warm summer condition shown in Exhibit 4.1. Costs for major inputs such as smolts, feed and labour will be estimated for this area.

4.4 Estimated Costs of Production

4.4.1 Production Plan

Scale and Location

The analysis is undertaken for a fish farm raising chinook salmon at an annual production level of 250 tonnes, or the same at British Columbia.

The farm is assumed to be located in the Ketchikan area.

Capital Investment

Capital investment is assumed to be similar to that of British Columbia. However, cage systems and equipment are assumed to be imported and slightly more expensive. The estimated total capital investment for the farm is shown below.

	U.S. $
Sea cage system and equipment	$380,000
Facility on floating barge with equipment	250,000
	$630,000

The total capital investment is $2,520 per tonne. Like British Columbia accommodation and other facilities are assumed to be on a floating barge due to the lack of extensive road systems in the south central portion of southeast Alaska.

Operating Expenses

The estimated operating costs are based on the following assumptions:

- 140,000 salmon smolts at 7 grams are set out every year in June
- smolts are assumed to be supplied from Alaskan hatcheries
- the smolt price of $0.54 is the same at that of British Columbia except without the BCSFA levy
- feed is imported from Washington State by barge and the feed standard price is $1.01 per kg
- the feed conversion ratio is slightly higher than British Columbia and ranges between 1.5:1 and 2.0:1
- processing costs of $0.52 per kg are slightly lower than British Columbia because of lower labour rates in the processing sector
- stock insurance, farm wages and fixed costs are comparable to British Columbia
- harvesting occurs after 20 to 24 months in saltwater
- average weight of fish is 2.5 kg at harvest (this assumes slightly better growth than that shown in Exhibit 4.1).

With these assumptions, the farm will be capable of producing about 73,500 fish for a total production of 250 tonnes per year.

Depreciation is based on the following assumptions:

Buildings	20
Seapen system and equipment	6
Site investments	50

The economic life of fixed assets is assumed to be similar to that of British Columbia, Norway and Scotland.

Unit Costs

Unit costs are shown in Exhibit 4.2. Unit costs are $4.49 per kilogram.

EXHIBIT 4.2: ESTIMATED UNIT COSTS PER KG FOR CHINOOK SALMON IN ALASKA

	Unit Costs (US Dollars)	%
Variable Costs		
Smolts	0.40	9
Feed	2.00	45
Stock Insurance	0.07	2
Processing	0.52	11
Interest on Working Capital	0.27	6
Total Variable Costs	3.26	73
Fixed Production Costs		
Wages	0.32	7
Overhead	0.24	5
Depreciation	0.49	11
Interest	0.18	4
Total Fixed Costs	1.23	27
Unit Costs per Kilogram	4.49	100%

Source: The DPA Group Inc.

Assuming a yield factor of about 85%, unit costs on a dressed weight basis would be $5.28/kg or $2.40/lb.

5.0 SUMMARY

In order to assess Alaska's potential competitiveness with other supply regions, the landed costs of production in major markets must be compared. In order to do so, we first determine selling and freight costs per unit. These are shown in Exhibit 5.1.

EXHIBIT 5.1: SHIPPING AND SELLING COSTS PER LB TO MAJOR MARKETS[a] (U.S. DOLLARS)

	Supply Region					
	Norway	Scotland	B.C.	Chile	Japan	Alaska
Selling Costs	0.06	0.11	0.14	0.14	0.14	0.14
Freight to shipping point	0.05	0.07	0.10	0.09	0.04	0.09
	0.11	0.18	0.24	0.23	0.18	0.23
Additional Freight[b] to:						
Los Angeles	1.14	1.14	0.12	0.73	N/A	0.14
New York	0.80	0.80	0.50	0.73	N/A	0.55
Tokyo	1.59	1.59	0.95	1.45	as above	0.73

[a] Shipping and selling costs are current to March, 1988.
[b] All shipments were assumed to be air freighted to their destinations, except for shipments from B.C. to L.A. which were assumed to be trucked. The bulk rate for fresh fish or an LD3 container rate from current tariff sheets were used for shipments by air. No allowances were made for ice in containers since the increased costs associated with ice can often be offset by volume discounts.

Selling costs in Norway are less than other regions because of the participation of the Fish Farmers Sales Organization. Scotland's selling costs are also less because of a higher level of vertical integration.

With regard to the major exporters, freight costs from Norway and Scotland to major markets are comparable. British Columbia has the best freight cost advantage to Los Angeles and New York. However, Alaska has the lowest freight cost to Japan.

The landed costs of farmed salmon from each major supply region and from Alaska in three major markets is shown in Exhibit 5.2.

EXHIBIT 5.2: COMPARISON OF LANDED COSTS PER LB IN MAJOR MARKETS (U.S. DOLLARS)

Market	Supply Region					
	Norway	Scotland	B.C.	Chile	Japan	Alaska
Los Angeles	3.80	4.17	2.06	2.63	N/A	2.77
New York	3.46	3.83	2.44	2.63	N/A	3.18
Tokyo	4.25	4.62	2.89	3.85	3.21	3.36

As indicated in the exhibit, Alaska is competitive from a cost standpoint in all markets.

However, as previously indicated, costs at an industry level are only known for Norway. As a result, the cost comparisons should be viewed with caution. Alaska would be selling farmed salmon in smaller sizes than Norway, Scotland and British Columbia and would compete more directly with Chile. British Columbia and Chile have cost advantages over Alaska in both Los Angeles and New York.

Alaska would also likely have a short window period in which to sell. This would also likely result in more direct competition with the Chileans.

As discussed in Section 3.7, landed costs in major markets are sensitive to exchange rates. Fluctuating exchange rates could make Alaskan farmed salmon more or less competitive in all markets. However, the U.S. and Canadian currencies are closely linked and generally shift from each other only slowly. As a result, British Columbia would likely have cost advantages over Alaska in all major markets.

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APPENDIX A

METRIC CONVERSION RATES

APPENDIX A

Metric Conversion Rates

1 kilogram = 2.2046 pounds
1 Kilogram = 1,000 grams
454 grams = 1 pound

1 metric tonne = 2204.6 pounds
1 metric tonne = 1,000 kilograms
1 metric tonne = 1.1 ton

1 metre = 1.1 yards
1 kilometre = 1,000 metres
1 kilometre = 0.62 miles

APPENDIX B

PROFITABILITY STUDY OF FISH FARMS IN NORWAY, 1984

Production cost per kilo farmed salmon, 1984. Figures in 1984 kroner.

	Size of facility			
	Under 3.000 m^3	3.000-4.999 m^3	5.000-6.999 m^3	7.000 m^3 & over
Smolt	7.93	5.45	6.82	5.97
Feed	10.99	9.97	10.98	10.57
Other variable cost	0.60	0.69	0.62	0.58
Wages	6.51	5.06	4.82	4.80
Total variable costs	26.03	21.17	23.24	21.87
Fixed operating costs	3.77	3.38	4.37	4.16
Depreciation	1.42	1.40	1.43	1.61
Interest[a)]	2.65	3.03	3.18	3.10
Total	33.87	28.98	32.22	30.74
Production (tonnes)	28.30	69.80	101.20	141.10
Man-years per farm	1.59	2.50	3.98	5.07
Sample size	19	31	20	27

a) Interest includes interest on debt and calculated interest on equity.

Source: Directorate of Fisheries: Profitability Study of Fish Farms, 1984.

APPENDIX C

POTENTIAL DEVELOPMENT AREAS FOR SALMON FARMING IN ALASKA:

TECHNICAL SUMMARY

Prepared for:
State of Alaska
Department of Commerce
and Economic Development
Juneau, Alaska

Prepared by:
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Vancouver, B.C.

March, 1988

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1.0 INTRODUCTION

The purpose of this study is to determine the feasibility of pen-rearing salmon in Alaska. The approach is to develop likely costs of production for pen-rearing of salmon in Alaska and compare these costs to those of existing supply regions.

Development of likely costs of production in Alaska requires an analysis of conditions for rearing. British Columbia is emerging as a major supply region and is considered the best model for analysis of Alaska's potential.

This technical report summarizes the following:

- general environmental and logistic conditions for pen-rearing salmon in Alaska;
- differences in growth and feed conversion rates between British Columbia and Alaska.

In order to assess conditions for pen rearing salmon in Alaska we conducted reviews of previous environmental studies in Alaska. We also held telephone interviews with several fisheries officials in the state of Alaska Department of Fish and Game and the National Marine Fisheries Service.

In order to develop growth data and feed conversion ratios we compared published results of the National Marine Fisheries Service salmon farming research projects at Little Port Walter and Auke Bay to those of a recent broodstock management program in British Columbia.

In the following section of the report we determine areas suitable for pen-rearing salmon in Alaska. In section 3.0 we estimate growth and conversion rates. Also, in this section we describe how the analysis of the potential for pen-rearing salmon in Alaska from a biophysical standpoint will be used to determine its economic viability.

2.0 ENVIRONMENTAL AND LOGISTIC CONDITIONS

2.1 Introduction

Conditions which are important in considering the location of a netpen site can be classified under environmental or logistic categories.

Environmental factors include water quality characteristics and potential problems with plankton blooms and predators. Logistic factors include access to critical inputs such as smolts, feed, labour and transportation routes.

These conditions are discussed below.

2.2 Physical Marine Conditions

This section contains an overview of ice formation and iceberg conditions, temperatures and salinities in southcentral and southeast Alaska. According to fisheries officials contacted, these are the two areas where development of net pen-rearing would most likely occur. The information is then used to develop assumptions about growing conditions, growth rates and feed conversions.

Southcentral Alaska

Ice Formations and Icebergs

Ice formation and the presence of icebergs in embayments and low winter air temperatures impose constraints on development of netpen sites in southcentral Alaska; in particular, these are:

- the presence of pack ice and fast ice in Cook Inlet;
- the presence of ice and icebergs in embayments connected to Prince William Sound and near Seward; and
- the potential for ice formation on floating structures.

LaBelle et al (1983) indicate that during late December open pack ice can normally be expected along Cook Inlet between the head of the inlet and a line approximately between Cape Douglas and a point just south of Ninilchik. At times, close pack ice can extend further to a line approximately between Cape Douglas and Homer. Within Prince William Sound, LaBelle et al (1983) indicate that icebergs from glaciers can normally be encountered in the vicinity of Glacier Island (at the mouth of Valdez Arm), in Unakwik Inlet and Port Wells (between Valdez Arm and Whittier), in Blackstone Bay (to the south of Whittier), in the head of Port Nellie Juan and in Knight Island Pass (to the south of Port Nellie Juan). Near Seward they indicate icebergs are present in Aialik Bay and Harris Bay (southwest of Seward) and in the East Arm of Nuka Bay.

Apart from the presence of sea ice and glacier ice in embayments in southcentral Alaska, the air temperature and wind conditions in that area make it generally susceptible for ice formation on floating structures (La Belle et. al. 1983).

Water Temperatures

Mean monthly sea surface water temperatures are summarized in Exhibit 2.1. These data suggest that, in general, mean winter surface temperatures can be expected to be approximately 2.5 - 5.0°C and mean summer surface temperatures can be expected to be approximately 0 - 13°C.

Surface temperatures are often recorded as routine measurements because they are easier to measure than temperatures at greater depths. However, salmon are suspended in structures that place them below the surface, but in the upper 6-10 m of the water column (depending on the net depth selected by individual operators). Therefore, subsurface temperatures (between 0 and 10 m) are usually more appropriate for determining the growing conditions for salmon. Temperatures recorded at 10 m near Seward are also shown in Exhibit 2.1. These data indicate that at that depth mean spring and early summer temperatures are slightly lower than the surface temperatures, while mean fall and winter temperatures are approximately the same.

EXHIBIT 2.1: SUMMARY OF MONTHLY SEA SURFACE TEMPERATURE IN SOUTHCENTRAL ALASKA

	Coastal[1]		Seward[2]	
Month	Kodiak-Cook Inlet	Prince William Sound	0 Meters	10 Meters
January	4.0	4.5	4.0	4.0
February	3.0	5.0	4.0	4.0
March	4.0	4.0	2.8	2.8
April	4.0	5.0	3.3	3.3
May	5.0	6.0	6.0	5.4
June	7.0	9.0	9.2	7.0
July	9.0	11.5	12.9	10.8
August	11.5	12.5	12.8	12.8
September	10.5	12.0	11.4	11.7
October	9.0	9.0	7.6	8.2
November	7.0	8.0	7.0	7.1
December	5.5	6.0	5.0	6.0

[1] Estimates based on isopleths and cumulative percent frequency graphs

[2] Based on graphed monthly means, 1979-1983.

Source: Brower et. al. 1977; Xiong and Royer 1984.

Salinity

Xiong and Royer (1984) state that average surface salinities in summer are 27.3‰ and in winter are 3.12‰ based on intensive studies near Seward. At greater depths (i.e. 250 m), salinities are approximately 33‰ year round. Colonell (1980) and Muench and Nebert (1973) describe the presence of relatively fresh water lying in a thin surface layer in Valdez Arm and Port Valdez during summer and autumn. Muench and Nebert (1973) indicate that minimum mean surface salinities (0-125 m) were approximately 3‰ over the July - October period, though salinities in the upper 20 m were, at times, less than 1‰ near the head of Port Valdez (in late July/early August). Lower surface salinities over the summer period are attributed to freshwater runoff from land areas and high precipitation.

Southeast Alaska

Icebergs

Icebergs are present in several bays and straits in northern and eastern Southeastern Alaska (LaBelle et al, 1983).

- Cross Sound, Icy Strait and Glacier Bay;
- Taku Inlet;
- Tracy Arm and Endicott Arms; and
- the end of Frederick Sound.

The presence of icebergs suggests a potential for damage to floating structures and, in general, these areas should be avoided. Also, the icebergs apparently can greatly reduce summer temperatures in surface waters (Pickard, 1967).

Water Temperatures

Mean monthly surface temperatures for the coastal waters along southeast Alaska (Brower et al, 1977) are presented in Exhibit 2.2. Mean surface temperatures recorded at five lighthouse installations (Jones, 1978) in southeast Alaska and in Auke Bay near Juneau (Bruce et al, 1977) are also summarized.

These data show mean high temperatures in summer (August) to range between 9.0°C (Decision Rock) and 14.6°C (Guard Island). Mean low temperatures in winter (February/March) range between 2.3°C (February at Point Retreat) and 5.2°C (February at Lincoln Rock). The mean low temperature for the general coastal area (Brown et al, 1977) is slightly higher than these values at 6.0°C. The Five Fingers location is at the junction of Stephens Passage and Frederick Sound. The cooler summer temperatures at the Five Fingers location (and possibly further westward at Decision Rock) could reflect the cooling influence of glaciers in Stephens Passage and Frederick Sound. Pickard (1967) notes that Stephens Passage appears to receive considerable freshwater from the Taku River and Juneau Icefield and that flow from Stephens Passage

could influence water property features at its junction with Frederick Sound. He also notes that water in the eastern portion of Frederick Sound is cool in summer as a result of nearby glaciers. Pickard (1967) reported average temperatures of 6.7°C for Stephens Passage and 8.0°C for Frederick Sound in the upper 10 m of water during August, 1965. Average temperatures in other locations range from approximately 4.0°C (in inlets containing icebergs, for example, Tracy and Endicott Arms along Stephens Passage and Glacier Bay) to approximately 12-14°C in other locations (such as Lynn Canal, near Juneau and Boca de Quadra, near Ketchikan).

EXHIBIT 2.2: SUMMARY OF MEAN MONTHLY SEA SURFACE TEMPERATURE IN SOUTHEAST ALASKA

Month	Coastal[1]	Guard Island	Lincoln Rock	Decision Light	Five Finger Light	Point Retreat	Auke Bay
January	6.5	5.2	4.4	3.9	3.6	2.6	3.2
February	6.5	4.9	5.2	4.2	3.0	2.3	2.5
March	6.0	5.2	5.3	4.5	3.4	2.9	3.0
April	6.5	6.2	6.2	5.1	4.3	3.6	4.8
May	8.0	8.3	8.1	6.0	5.4	4.9	8.0
June	10.0	12.4	11.4	7.1	7.8	8.5	12.0
July	12.5	14.5	12.8	9.2	9.6	11.4	13.2
August	13.0	14.6	13.6	9.0	9.6	12.3	13.5
September	12.5	12.9	11.5	8.7	8.1	10.2	11.0
October	10.5	10.4	9.3	7.5	6.5	7.3	7.2
November	9.0	7.8	6.7	5.6	5.5	5.3	5.0
December	7.5	5.9	5.1	4.0	4.2	3.7	4.5

1 Estimates based on isoplaths and cumulative percent frequency graphs

Source: Brower et. al. 1977; Bruce et al. 1977; Jones 1978.

In general, winter temperatures are lower, as expected, and show less variation amongst locations (compared to summer values); with a trend from south to north of approximately 4.5 - 5.0°C in southern locations (i.e., near Ketchikan) to 2.5 - 3.0°C in more northern locations (i.e., near Juneau).

As described previously, surface temperatures are commonly recorded as routine measurements because they are easier than temperatures taken at greater depths. Temperatures can differ between surface and greater depths in southeast Alaska, particularly over the summer (Bruce et al. 1977; Pickard, 1967). Bruce et al (1977) show little difference over the fall, winter and spring period between the surface and 5 m but show water at a 5 m depth to be 2.0 - 3.0°C cooler in summer (July). Pickard (1967) shows a similar

trend amongst vertical depth profiles developed for inlet site samples in August, 1965. Data recorded by the National Marine Fisheries Service for several years at facilities in Auke Bay near Juneau and Little Port Walter on Baranof Island are summarized in Exhibit 2.3. These data suggest winter temperatures at 4 - 5 m are similar to surface measurements near those locations (see Exhibit 2.2). However, the summer temperatures at the greater depth appear to be several degrees cooler than surface temperatures in Auke Bay (as noted above). The temperatures at Little Port Walter appear to be similar to surface measurements recorded nearby (e.g. Decision Light shown in Exhibit 2.2). The August data in Pickard (1967) indicate lower surface temperatures (9°C) in portions of Chatham Sound (where little Port Walter is located) south of its junction with Frederick Sound, compared to locations further north (e.g., near Angoon) where surface temperatures were approximately 12°C.

EXHIBIT 2.3: SUMMARY OF AVERAGE MEAN MONTHLY TEMPERATURES RECORDED AT 4-5 M DEPTHS AT AUKE BAY AND LITTLE PORT WALTER

Month	Auke Bay[1]	Little Port Walter[2]
January	4.5	5.2
February	3.0	5.0
March	3.0	5.4
April	4.0	4.8
May	6.5	5.6
June	10.0	8.1
July	12.0	9.6
August	12.0	9.4
September	11.0	8.4
October	9.5	7.3
November	6.0	5.8
December	3.5	5.4

[1] Approximations based on averaged graphical data, 1960-68.
[2] Average mean monthly temperatures, 1984-1987.

Sources: Bruce et al. 1977, Thrower pers. comm.

Salinities

Larger rivers along the mainland shoreline can produce lower and fluctuating salinities (Pickard, 1967) and consequently make nearby areas unsuitable for locating netpens for adult growout. These areas include the mouths of the Stikine River, Taku River, Unuk River, Chilkat River and Speel River.

Lower and fluctuating salinities can affect the physiological condition of the salmon (i.e. in relation to the osmoregulatory adaptation to ambient salinity levels) and could influence outbreaks of harmful phytoplankton.

Pickard (1976) shows that most larger rivers in southeast Alaska (e.g. Stikine, Taku, and Chilkat) have peak flows over the summer period from melting glaciers and snow packs. Smaller rivers either have high flows in both summer and fall/early winter (from precipitation) or high flows primarily in fall/early winter. Low flows for all systems generally occur over late winter and early spring.

As a result, one would expect:

- generally higher surface salinities during late winter and early spring; and
- generally lower surface salinities and greater fluctuation in salinities, in waters closer to the mainland (where most large and moderate-sized river systems are located) relative to seaward coastal areas.

In general, Pickard (1967) found surface salinities over the summer in inlets without icebergs were lower at the head ends (range 1-11% compared to the inlet mouths (range of 17-32%). Salinities in deeper waters during summer ranged from 31.2 to 34%, which are similar to surface values recorded at ocean recording stations off the western shore of southeast Alaska.

Bruce et al (1977) indicate that in Auke Bay, surface salinities are typically much lower (16-17%) in summer (July) than in winter and early spring (30% January and April), and in winter/early spring are similar to deep water values (30-31%). They also show that at depths of 5 m, the summer values (20-21%) are typically more saline than surface values. Lower summer surface salinities are attributed to peak runoff from nearby large, glacial-fed streams. At Little Port Walter (which is located further from the mainland streams), mean monthly salinities at 4 m depth are generally higher ranging from 26-30% in summer/early fall to 31-33% in winter. Pickard (1967) shows high surface salinities (greater than 30%) in southern Chatham Sound (near Little Port Walter), Sumner Sound and Clarence Strait, recorded during June and August.

2.3 Phytoplankton and Marine Mammals

Phytoplankton

Two phytoplankton species, Chaetoceros convolutus and Heterosigma akashiwo, have caused serious mortalities amongst salmon cultured in marine netpens in British Columbia. Conditions appear suitable for both species in southcentral and southeast Alaska (Gaines and Taylor, 1986). Chaetoceros

diatoms have been responsible for chinook salmon mortalities in seapens at Little Port Walter (National Marine Fisheries Service, unpublished). Chaetoceros convolutus has also been collected during surveys near Valdez in Prince William Sound (Horner et al 1973.) The occurrence and intensity of phytoplankton blooms vary greatly both geographically and temporally and prediction is difficult (Gaines and Taylor, 1987). In general, Heterosigma blooms tend to occur in early summer, often in association with lower salinities resulting from increasing river flow, while Chaetoceros blooms tend to occur in the late summer or fall.

Harmful phytoplankton could affect sites in both southcentral and southeast Alaska. As in British Columbia, the effects on production could be direct mortalities or reduced growth when oxygen depletion occurs and rations are restricted. In British Columbia, the strategy in stocking is to maintain densities at low levels (e.g., less than 8 kg/m3) to minimize losses should bloom conditions occur.

Marine Mammals

Marine mammals such as otters and sea lions have affected production at sites in British Columbia by killing fish in pens, by damaging netpens allowing fish to escape, and by causing high stress levels in the fish thereby reducing growth rates. National Marine Fisheries Service (unpublished) indicate otters, seals and possibly sea lions have killed fish at the experimental facilities near Little Port Walter. Steller's sea lions and harbour seals occur essentially along the entire Gulf of Alaska coastline (U.S. Department of the Interior, 1984).

Predation from marine mammals will likely be a similar problem in southcentral and southeast Alaska waters to that which occurs in British Columbia. This would likely require investment in predator control measures such as predator nets. Again, density levels would be kept low so that if stress develops when predators are nearby (but do not necessarily attack fish in the pens) it will not compound stress already resulting from high densities.

2.4 Smolt Production Capabilities

Southeast Alaska

Four state hatcheries in southeast Alaska produce chinook salmon and three hatcheries produce coho salmon (Hansen, 1987):

Hatchery	Location	Species Reared
Snettisham	near Juneau	chinook, coho
Hidden Falls	northeastern Baranof Island	chinook
Crystal Lake	near Petersberg	chinook, coho
Deer Mountain	near Ketchikan	chinook
Klawock	near Craig	coho

In 1986, nearly 5 million chinook eggs were collected from these facilities and more than 2.7 million juvenile chinook were released. Similarly, slightly more than 4 million coho eggs were collected and 1.5 juvenile coho were released.

In addition, 10 private non-profit hatcheries operated by regional aquaculture associations and other non-profit groups raise chinook or coho or are permitted to raise these species:

Hatchery	Location
Whitman Lake, Neets Bay, Meyers Chuck and Burrard Inlet	near Ketchikan
Gunuk Creek	near Petersburg
Medvejie Creek, Sheldon Jackson College and Port Armstrong	near Sitka
Salmon Creek and Sheep Creek	near Juneau

In 1986, private non-profit hatcheries in southeast Alaska had total permitted chinook egg capacities of 6.73 million and total permitted coho egg capacities of 15.47 million eggs. Most fry production of both species is in the Whitman Lake and Neets Bay hatcheries operated by the Southern Southeast Regional Aquaculture Association.

Southcentral Alaska

Five state hatcheries in southcentral Alaska produce chinook salmon and five hatcheries produce coho salmon:

Hatchery	Location	Species Reared
Big Lake	near Anchorage	coho
Fort Richardson	near Anchorage	coho, chinook
Elmendorf	near Anchorage	coho, chinook
Trail Lake	near Seward	coho, chinook
Kitoi Hatchery	near Kodiak	chinook, coho.

In 1986, 1.5 million chinook eggs were collected and 1.5 million juvenile chinook were released. Slightly more than 6.5 million coho eggs were collected and 7 million coho juveniles were released.

Three private non-profit hatcheries operated by regional aquaculture associations and other non-profit groups raise chinook or coho salmon or are permitted to raise these species:

Hatchery	Location
Eklutna	near Anchorage
Esther Lake	near Whittier
Solomon Gulch	near Valdez

In 1986, the private non-profit hatcheries had total permitted chinook egg capacities of 1.15 million and total permitted coho egg capacities of 3.1 million. Clearly, a large smolt production capability exists in both southcentral and southeast Alaska and this production is spread throughout each region. Hansen (1987) indicates that a number of hatcheries are constructed below lakes and water intakes in the lakes are placed at different depths so temperatures can be adjusted. This means juvenile growth rates and smolt timing can be manipulated to achieve release objectives.

2.5 Fish Feed

Currently there is fish feed production capacity in southcentral. However, capacity is limited and technologies employed in production are not as advanced as those in Europe, British Columbia or Washington State.

The main ingredients in commercial fish feeds are fish meal and fish oil. These are manufactured in the reduction process from whole fish or fish waste from the processing sector. Alaska's reduction industry is not well developed, despite the availability of significant quantities of fish waste. In addition the reduction plants in Alaska produce fish meal and fish oil which is unsuitable for fish feed. According to representatives of a fish feed manufacturer in Washington State, if a new feed plant were to be constructed, it would likely be constructed in tandem with a new reduction plant, both of which require significant capital investment. Alaska would more likely be supplied by fish feed manufacturers in Washington State or British Columbia since transport by barge to Alaska is not a significant cost.

2.6 Potential Development Areas

As discussed previously, certain areas of southcentral and southeast Alaska are not suitable for salmon culture given the presence of ice, icebergs and large river systems. Therefore, initial development would be expected to occur in suitable bays or shoreline areas (protected from high winds or waves) away from these areas and as close to transportation centers and processing/packing facilities as possible.

Small to medium-sized communities having airport and port facilities are distributed throughout both southcentral and southeast Alaska. The population sizes of coastal communities in the lower Cook Inlet, Kodiak Island and Prince William Sound areas are shown in Exhibit 2.4. Apart from the major airport in Anchorage, smaller airfields and port facilities are located throughout the area (e.g., Homer and Seward).

Larger airports and port facilities are situated along eastern southeast Alaska (Juneau, Petersburg, Wrangell and Ketchikan) and Sitka. As shown in Exhibit 2.4, these are also the major population centers. Ideally, new fish farms would want to locate within three to four hours by boat from logistic centers to minimize the amount of time that harvested fish are in transit prior to boarding flights to market areas. This would tend to create development in physically suitable areas along the eastern half of southeast Alaska (near Juneau, Ketchikan and Petersburg/Wrangell) and along the western side of Baranof Island (near Sitka), and in southcentral Alaska (near Kodiak, Homer, Seward, Cordova, Valdez and Whittier).

2.7 Summary

Large areas of southcentral and southeast Alaska are not suitable for salmon culture due to the presence of ice, icebergs and large river systems. Salinities are generally more consistent throughout the year in areas away from mainland waters, where blooms are also less likely to occur.

Smolt production capacity in both southcentral and southeast Alaska is likely adequate to meet potential demand from a salmon farming industry. Some fish feed production capability exists in southcentral, however fish feed would most likely be imported from Washington State or British Columbia because of more specialized production in these regions.

The following areas would be favoured for development in terms of their proximity to population centers, airports and processing plants:

- along the eastern half of southeast Alaska near Juneau, Ketchikan and Petersburg/Wrangell;
- along the western side of Baranof Island near Sitka;
- in southcentral Alaska near Kodiak, Homer, Seward, Cordova, Valdez and Whittier.

Netpen operations in these areas would also be less likely to be affected by phytoplankton blooms. However, all areas are likely to be affected by predators.

EXHIBIT 2.4: POPULATIONS OF COMMUNITIES IN SOUTHCENTRAL AND SOUTHEAST ALASKA (1980)

Southcentral		Southeast	
Keani/Cook Inlet		Juneau	19,528
		Sitka	7,803
Kenai	4,324	Ketchikan	7,198
Soldotna	2,320	Petersburg	2,821
Homer	2,209	Wrangell	2,184
Seldovia	479	Metlakatla	1,056
Ninilchik	341	Haines	993
Port Graham	161	Skagway	768
English Bay	124	Hoonah	680
		Kake	555
Kodiak Island/Shelikof Strait		Craig	527
		Angoon	465
Kodiak	4,756	Klawock	318
Old Harbor	340	Hydaburg	298
Port Lions	215	Saxman	273
Ouizinkie	173	Pelican	180
Larsen Bay	141	Tenakee Springs	138
Akiak	105	Klukwan	135
Karluk	96	Meyers Chuck	50
		Kupreanof	47
Prince William Sound		Kasaan	25
Valdez	3,079		
Cordova	1,879		
Seward	1,834		
Whittier	198		
Tatitlek	68		

Source: U.S. Census Population 1981 and 1982, cited in U.S. Department of the Interior 1984.

3.0 GROWTH AND CONVERSION RATES

3.1 Generalized Temperature Regimes

The temperature data reviewed in Section 2.1 (Physical Marine Conditions) have been used to develop four generalized temperature regimes (Exhibit 3.1) in which salmon culture might take place:

- relatively cool winter temperatures and warm summer temperatures (that might occur in bays in southcentral Alaska and near Juneau);
- relatively warm winter temperatures and warm summer temperatures (that might occur in bays near Ketchikan);
- relatively warm winter temperatures and cooler summer temperatures (that might occur in the Frederick Sound/Petersburg area); and
- relatively cool winter temperatures and cool summer temperatures (that might occur in the northern inlets of southeast Alaska close to iceberg areas).

Clearly, general good-case and poor-case growing conditions would be, respectively, warm winter/warm summer conditions and cool winter/cool summer conditions. Since specific conditions can vary from site to site and from year to year, extreme best case and worst case conditions would likely lie outside these general scenarios.

EXHIBIT 3.1: GENERALIZED MEAN MONTHLY TEMPERATURES AT 4 M DEPTHS

Month	Cool Winter/ Warm Summer	Warm Winter/ Warm Summer	Warm Winter/ Cool Summer	Cool Winter/ Cool Summer
January	.5	5.0	5.0	3.5
February	3.0	5.0	5.0	3.0
March	3.0	4.5	4.5	3.0
April	5.0	4.5	4.5	3.0
May	6.0	6.0	6.0	6.0
June	10.0	10.0	8.0	8.0
July	11.0	11.0	9.5	9.5
August	12.0	12.0	9.5	9.5
September	10.5	10.5	8.5	8.5
October	7.5	7.5	7.5	7.5
November	5.0	6.0	6.0	5.0
December	3.5	5.5	5.5	3.5

3.2 Growth Rates

Chinook would likely be preferable for net pen rearing in Alaska since they have shown greater survival rates than coho during the longer growout periods in British Columbia needed to attain market size (B.C. Salmon Farmers Association).

The fish sizes and growth rates obtained for chinook salmon at Little Port Walte- and at five locations in British Columbia are summarized in Exhibit 3.2. These data have been used together with unpublished growth rate data from the Pacific Biological Station, Nanaimo, B.C. (R. Brett, H. Kreiberg, pers. comm.) and the mean monthly temperatures shown in Exhibit 3.1 to develop probable monthly growth rates for the south central portion of southeast Alaska. Estimated maximum growth rates for different fish sizes and the temperature range expected for marine growout sites in Alaska are shown in Exhibit 3.3. Seasonal growth scenarios for the generalized good growing temperatures and poor growing temperatures (Exhibit 3.1) are shown in Exhibit 3.4. As indicated in Exhibit 3.4, the approximate size of chinook after 26 months in saltwater is 3.5 kg under good growing temperatures and 2.5 kg under poor growing temperatures. With good growing temperatures, chinook could be expected to reach a harvestable size of two kilograms during the second winter in saltwater. Most farmed salmon is sold between October and April, during the off-season of the wild fishery. With poor growing temperatures, chinook would likely have to be held over until the following fall.

EXHIBIT 3.3: ESTIMATED MAXIMUM GROWTH RATES[1] FOR CHINOOK AT DIFFERENT WEIGHTS AND TEMPERATURES

	TEMPERATURE °C						
WEIGHT (g)	2	4	6	8	10	12	14
5	0.4	0.9	1.3	1.8	2.2	2.7	3.1
10	0.3	0.7	1.0	1.4	1.8	2.2	2.5
50	0.2	0.3	0.5	0.6	0.8	1.0	1.2
100	0.2	0.3	0.5	0.6	0.8	1.0	1.2
500	0.2	0.2	0.3	0.4	0.5	0.6	0.7
1000	0.1	0.2	0.2	0.3	0.3	0.4	0.5
2000	0.1	0.1	0.2	0.2	0.3	0.3	0.4
3000	0.1	0.1	0.1	0.2	0.2	0.2	0.3

[1] Percent body weight per day.

Sources: Brett, pers. comm.; Kreiberg, 1981a; 1987b; National Marine Fisheries Service, unpublished.

EXHIBIT 3.2: MEAN MONTHLY TEMPERATURES AND GROWTH RATES FOR CHINOOK SALMON AT LITTLE PORT WATER, ALASKA AND FIVE LOCATIONS IN BRITISH COLUMBIA

	LITTLE PORT WALTER			LITTLE PORT WALTER			NORTH B.C. COAST			SOUTH B.C. COAST (Gulf Islands)			SOUTH B.C. COAST (Sunshine Coast)			SOUTH B.C. COAST (Pacific Biological Station)			SOUTH B.C. COAST (West Coast of Vancouver Island)		
	1982 BROOD STOCK			1984 BROOD STOCK																	
MONTH	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate
JUNE	-	-	-	7.3	5.0	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	-	-	-	9.2	-	1.7	12.1	4.5	2.7	-	4.5	2.5	18.8	4.5	3.3	18.0	4.5	2.4	-	4.5	3.2
AUGUST	-	-	-	8.8	-	1.7	12.0	-	2.7	13.8	-	2.5	16.8	-	3.3	16.8	-	2.4	16.1	-	3.2
SEPTEMBER	-	-	-	7.7	-	1.7	8.8	-	2.7	12.6	-	2.5	15.1	-	3.3	14.4	-	2.4	13.2	-	3.2
OCTOBER	-	82	0.5	6.0	-	1.7	8.8	59	2.7	11.3	50	2.5	11.9	84.0	3.3	11.3	40	2.4	11.4	129	3.2
NOVEMBER	-	-	0.5	4.4	-	0.3	6.5	-	0.6	9.6	-	0.6	9.7	-	0.6	8.0	-	0.8	9.7	-	0.6
DECEMBER	-	-	0.5	5.2	-	0.3	5.0	-	0.6	-	-	0.6	6.7	-	0.6	6.7	-	0.8	6.9	-	0.6
JANUARY	-	-	0.5	4.8	-	0.3	5.5	-	0.6	-	-	0.6	6.7	-	0.6	7.8	-	0.8	7.2	-	0.6
FEBRUARY	-	-	0.5	-	-	0.3	5.1	-	0.6	7.3	-	0.6	7.6	-	0.6	7.1	-	0.8	7.5	-	0.6
MARCH	-	-	0.5	-	-	0.3	6.0	166	0.6	-	180	0.6	7.9	208	0.8	9.0	180	0.6	8.7	286	0.7
APRIL	-	-	0.5	4.7	150	0.3	8.0	-	0.6	8.5	-	0.5	9.0	-	0.8	10.2	-	0.6	8.6	-	0.7
MAY	-	276	0.5	5.8	-	1.0	8.3	232	0.6	-	246	0.6	11.8	391	0.8	12.0	250	0.6	10.0	442	0.7
JUNE	9.0	-	0.9	7.7	-	1.0	10.9	-	0.7	12.3	-	0.9	14.9	-	1.0	15.5	-	0.7	13.2	-	0.8
JULY	10.1	636	0.9	8.7	273	1.0	12.5	-	0.7	13.4	-	0.9	16.6	-	1.0	16.8	-	0.7	16.2	-	0.8
AUGUST	10.1	-	0.9	8.3	-	1.0	13.1	-	0.7	14.7	-	0.9	16.7	-	1.0	19.0	-	0.7	16.2	-	0.8
SEPTEMBER	9.3	-	0.9	8.1	591	1.0	11.5	-	0.7	13.8	-	0.9	15.8	-	1.0	15.9	-	0.7	14.5	-	0.8
OCTOBER	8.8	946	0.9	6.8	-	-	10.2	537	0.7	11.2	931	0.9	12.1	1302	1.0	13.2	630	0.7	11.9	1317	0.3
NOVEMBER	6.5	-	0.3	6.4	-	-	8.6	-	-	10.4	-	-	9.4	-	-	10.5	-	-	11.7	-	-
DECEMBER	5.2	-	0.3	5.8	-	-	7.0	-	-	9.0	-	-	7.7	-	-	9.3	-	-	8.7	-	-

EXHIBIT 3.2: (Cont'd)

	LITTLE PORT WALTER						NORTH B.C. COAST			SOUTH B.C. COAST (Gulf Islands)			SOUTH B.C. COAST (Sunshine Coast)			SOUTH B.C. COAST (Pacific Biological Station)			SOUTH B.C. COAST (West Coast of Vancouver Island)		
	1982 BROOD STOCK			1984 BROOD STOCK																	
MONTH	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate	Temp.	Size	Rate
JANUARY	4.9	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FEBRUARY	5.0	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MARCH	4.6	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
APRIL	4.8	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MAY	5.4	1814	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JUNE	7.3	2198	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JULY	9.2	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AUGUST	8.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SEPTEMBER	7.7	3776	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ASF-313/5264P)

EXHIBIT 3.4: ESTIMATED GROWTH RATES FOR CHINOOK SALMON GROWN UNDER TWO GENERALIZED MEAN MONTHLY TEMPERATURES REGIMES IN SOUTHEAST ALASKA

	WARM WINTER/WARM SUMMER				COOL WINTER/COOL SUMMER			
	Temp.	Approx. Size (grams)	Daily Growth Rate (%)	Food Conversion	Temp.	Approx. Size (grams)	Daily Growth Rate (%)	Food Conversion
June	10.0	13	2.2	1.5	8.0	12	2.0	1.7
July	11.0	25	2.1	1.5	9.5	24	2.1	1.7
August	12.0	49	2.2	1.5	9.5	45	2.1	1.7
September	10.5	92	2.1	1.5	8.5	79	1.9	1.7
October	7.5	125	1.0	1.7	7.5	108	1.0	1.9
November	5.0	149	0.6	1.7	5.0	125	0.5	1.9
December	3.5	174	0.5	1.7	3.5	133	0.2	1.9
January	5.0	197	0.4	1.7	3.5	142	0.2	1.9
February	5.0	222	0.4	1.6	3.0	146	0.1	1.8
March	4.5	243	0.3	1.6	5.0	165	0.3	1.8
April	5.0	266	0.3	1.6	5.0	165	0.3	1.8
May	6.0	301	0.4	1.6	6.0	187	0.4	1.8
June	10.0	406	1.0	1.7	8.0	237	0.8	1.9
July	11.0	570	1.1	1.7	9.5	323	1.0	1.9
August	12.0	851	1.3	1.7	9.5	439	1.0	1.9
September	10.5	1181	1.1	1.7	8.5	575	0.9	1.9
October	7.5	1512	0.8	1.9	7.5	736	0.8	2.0
November	6.0	1704	0.4	1.9	5.0	805	0.3	2.0
December	5.5	1870	0.3	1.9	3.5	830	0.1	2.0
January	5.0	1990	0.2	1.9	3.5	856	0.1	2.0
February	5.0	2104	0.2	3.0	3.0	881	0.0	2.1
March	4.5	2170	0.1	2.0	3.0	908	0.0	2.1
April	5.0	2236	0.1	2.0	5.0	936	0.1	2.1
May	6.0	2454	0.3	2.0	6.0	1027	0.3	2.1

Growth rates normally decrease as fish increase in size and maximum growth rates occur at a temperature optimum and are therefore lower at lower temperatures and at higher temperatures (Brett, 1979). Brett et al (1982) estimated the optimum temperature for juvenile chinook salmon fed a maximum ration to be 19°C and fish fed a 60% ration to be 15°C.

In addition to temperature, growth rates can be affected by other factors including the presence of stressing factors (e.g., densities, handling, and the presence of predators), feed quality and ration level. Consequently, under commercial production conditions, maximum growth rates are often not achieved. In fact ration levels are usually reduced deliberately to obtain more cost-effective feed utilization (e.g., at 70 - 90% of maximum rations). In general, if other factors were the same in British Columbia and Alaska, the mean winter growing temperatures expected for Alaskan waters indicate winter growth rates could be substantially lower than those occurring in British Columbia cf. temperatures in Exhibit 3.2). Rates of digestion and feed consumption are highly reduced at low temperatures (1-5°C) resulting in growth rates that could be 20-40% of the maximum achievable at optimum temperatures (Brett, 1979).

3.3 Feed Conversion

Feed conversion rates are influenced by environmental variables (such as temperature, salinity, photoperiod, oxygen concentration) and operational variables (such as fish size, ration, food quality). Food conversion efficiency is normally greater for smaller fish sizes, decreasing as the fish grow (Brett and Groves, 1979). Over a given temperature range, on the other hand, food conversion efficiency usually reaches a maximum at a particular temperature and is lower at both lower and higher temperatures. Similarly, the optimum ration amount for maximum food conversion is normally lower than the maximum ration that the fish will consume. In turn, maximum conversion efficiency occurs at a lower ration quantity, as temperature is reduced below the optimum. Generally, optimum feed conversion efficiency for salmon appears to occur at temperatures between 10°C and 15°C at ration levels at 60-90% of maximum. Brett et al. (1982) found the temperature for maximum food conversion for juvenile chinook salmon fed a maximum ration to occur approximately 20-21°C but for salmon consuming 60% of the maximum ration appeared to occur at approximately 15°C.

Feed conversion rates for dry diets obtained at five farm locations in British Columbia are shown in Exhibit 3.5. For sites having similar temperatures and salinities to those in Alaska (e.g., the north B.C. coast site) similar conversion rates would be expected.

EXHIBIT 3.5: FEED CONVERSION RATES AT FIVE MARINE SITES GROWING CHINOOK SALMON IN BRITISH COLUMBIA

TIME PERIOD	NORTH B.C. COAST 5			SOUTH B.C. COAST (Gulf Islands) 2			SOUTH B.C. COAST (Sunshine Coast) 3			SOUTH B.C. COAST (Pacific Biological Station) 1			SOUTH B.C. COAST (West Coast of Vancouver Island) 4		
	Size		F.C.R.	Size		F.C.R.	Size		F.C.R.	Size		F.C.R.	Size		F.C.R.
	St.	End		St.	End		St.	End		St.	End		St.	End	
JULY - OCT. 1985	4.5	59	1.3	4.5	50	-	4.5	84	-	4.5	40	2.1	4.5	129	1.3
OCT. 1985 - MAR. 1986	59	166	1.4	50	180	1.8	84.0	208	2.1	40	180	1.6	129	286	2.3
MAR. - OCT. - 1986	166	537	1.0	180	931	-	208	1302	1.6	180	630	1.9	286	1317	1.7

Sources: Kreiberg 1987a; Kreiberg 1987b.

However, as previously described, potential locations in southeast Alaska will likely have winter temperatures lower than those experienced in British Columbia (i.e., less than 5°C). Food conversion rates under these conditions will be slightly poorer than for comparably sized fish grown at higher temperatures. Brett (1979) suggests that conversion efficiencies at relatively low temperatures (1-5°C) are 50% of the maximum efficiencies which, as discussed above, occur at higher temperatures (e.g., between 10°C and 20°C). Therefore, for lower mean winter temperatures (3-5°C) that might occur in Alaska growout waters, slightly poorer conversions can be assumed compared to fish grown in British Columbia.

The feed conversions obtained for dry feeds at British Columbia sites were mainly under conditions of moderate salinity (Exhibit 3.6). As previously discussed, similar conditions can be expected in areas of southeastern Alaska, particularly along the mainland side. However, along the western side, salinities could, on average, be higher. The feed conversion efficiency of dry feeds could be reduced at high salinities (greater than 25%) given higher energy requirements for osmoregulatory functions (Shaw *et al*, 1975; Brett, 1979).

EXHIBIT 3.6: RANGE OF MEAN MONTHLY SALINITIES RECORDED AT FIVE CHINOOK SALMON CULTURE SITES IN BRITISH COLUMBIA; JULY 1985 - DECEMBER 1986.

LOCATION	MEAN MONTHLY SALINITY RANGE
1	24.8 - 29.9
2	21.6 - 27.7
3	19.5 - 26.4
4	19.1 - 32.0
5	19.9 - 25.1

Sources: Kreiberg 1987a; Kreiberg 1987b.

Probable feed conversions for dry feeds utilized in southeastern Alaska for the two temperature regimes described in Section 3.1 are shown in Exhibit 3.4. These feed conversions have been adjusted to reflect a decrease in feed conversion efficiency as the fish increase in size, and decreases that might occur at seasonally lower temperatures.

Near surface salinities (4 m depth) at the Little Port Walter Research facility ranged from 26.8 to 32.6‰; these are similar to but, in general, slightly higher than the salinities occurring at sites in B.C. (Exhibit 3.6). Experiments at Little Port Walter suggest that fish grow at similar rates using a dry pellet (Icicle Seafoods, Seward) and a semi-moist diet (Biodiet). Semi-moist and moist diets are preferred by some growers when salinities are high because they produce less physiological demand on the fish for osmoregulatory functions (Brett and Groves, 1979), compared to dry diets. However, dry diets are often preferred over moister diets, particularly in remote locations, because they are less expensive to transport and have longer storage times.

Summary

The area around Ketchikan is probably the best area for development of pen rearing of salmon in Alaska because of warmer summer and winter temperatures. Chinook could be expected to reach a harvestable size of two kilograms during the second winter in saltwater. However, the Ketchikan area would have lower growth rates and higher conversion rates

than in most areas of British Columbia where salmon farming occurs because of seasonally lower water temperatures.

We will assume that the growth of chinook in this area would approximate that of the warm winter/warm summer condition shown in Exhibit 3.4. In other words, a profile of a salmon farm can now be developed to allow comparison to costs in other supply regions. Costs for major inputs such as smolts, feed and labour will be estimated for this area.

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STATE OF ALASKA
DEPT. OF ENVIRONMENTAL CONSERVATION

STEVE COWPER, GOVERNOR

OFFICE OF THE COMMISSIONER
P.O. BOX O, JUNEAU, ALASKA 99811-1800 (907) 465-2600

March 16, 1988

Senator Dick Eliason
Alaska State Senate
PO Box V
Juneau, AK 99811

Dear Senator Eliason:

We have reviewed SB 482. We believe that the bill outlines a workable approach to mariculture and is cognizant of all the issues involved. We appreciate the work that you and your staff have done with the state agencies involved in this issue. We have a few comments on the bill.

We support the approach that the bill takes to use the existing permit coordination procedure for review of proposals for mariculture. We believe that this is the most cost effective and efficient approach and that it is superior to creating a new permitting structure.

We agree that it is important to us to clarify agency authorities and give each agency the appropriate legal authority to properly manage mariculture development. Our comments are intended to remove any ambiguity about agency roles and to ensure that we have adequate authority to address this new type of enterprise.

Section 1, page 1, lines 19 to 23 is workable as long as it is interpreted to mean that the sale or transfer of aquatic farm products is subject to the requirements of AS 03.05, even after a permit from the Department of Fish and Game (DFG) is received under AS 16.40.100. AS 03.05 includes the Department of Environmental Conservation (DEC) requirements for seafood product sanitation and labeling. These requirements apply at the time that product is transferred and sold. We understand that this is

your intent.

In Section 1, page 1, lines 24 to 27, we would suggest that the references to DEC be deleted. We would address public health concerns under our authorities. This section would then read:

> (c) The commissioner may attach conditions to a permit issued under this section that are necessary to protect natural stock.

In Section 1, page 2, lines 6 - 7, we would suggest the following revised wording:

> (1) the biological and environmental capability of the site for the proposed aquatic farm or hatchery to support the proposed operation;

This would clarify that the purpose of the review by DFG is to ensure that the site is capable of supporting the use for which it is proposed. Other environmental issues would be considered as part of DEC's review and permitting process.

In Section 2, page 7, lines 26 to 29, and page 8, line 1, we would suggest a slight revision to the proposed wording to read as follows:

> (9) establishment of standards and conditions of operation and siting of aquatic farms including but not limited to
>
> > (A) restrictions on the use of chemicals; and
> > (B) requirements to protect the public from contaminants that pose a risk to health in aquatic farm products.

We would also suggest moving the current section AS 03.05.020(a)(6) into AS 03.05.011(a) as a new section (10) and rewording it to say:

> (10) monitor aquatic farms and farm products to ensure compliance with this chapter and the requirements of the national shellfish sanitation program manual of operations published by the Food and Drug Administration.

We appreciate the opportunity to comment.

Sincerely,

Amy D Kelso /fn

Dennis D. Kelso
Commissioner

cc: Senator Coghill, Chairman, Senate Resources Committee

STATE OF ALASKA

JAY S. HAMMOND, GOVERNOR

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

P.O. BOX 3-2000
JUNEAU, ALASKA 99802
PHONE: (907) 465-4100

November 12, 1982

Mr. James L. McCormack
Project Manager, Ice Palace Farms
3321 Seppala Drive
Anchorage, Alaska 99503

Dear Mr. McCormack:

This letter is in response to yours of October 12, 1982, to Commissioner Skoog, regarding your interest in a commercial marine net-pen farm for coho salmon in Southeast Alaska. We are enclosing the $100.00 check you submitted since we will be unable to issue a permit for your proposed operation.

In explanation, as stated in your letter, it is correct that State of Alaska law does not allow conduct of salmon ranching for a profit, only on a nonprofit basis. From the text of your letter, you appear to have received insufficient information about the legality of hatching and rearing stock coho for commercial purposes. The Alaska Department of Revenue does have available a Fish Farming License, which allows for the rearing of fingerlings, fry, or smolt to commercial marketing size, but this license does not allow the operator to incubate and hatch eggs. That can only be done in the private sector under a Private Nonprofit (PNP) Hatchery Permit, which cannot be secured for profit-making purposes. It would be for such a permit that a $100.00 fee would be appropriate.

Functions under the fish farming license may only be conducted in a land-locked situation, so that would rule out net-pen rearing of coho in a bay, as is indicated in your proposal.

If you can define a land-locked location for fish farming and can determine a source of coho fry or smolt, it would be necessary for you to secure a Fish Transport Permit from Dave Daisy at the Anchorage Office, in order to assure that the source of stock is disease-free before you would be allowed to transport fish.

Finally, it would be necessary that you secure information on health inspection requirements for preparing for market and actual marketing of any fish produced. For information in that regard, please contact the following:

Alaska Department of Environmental Conservation
Anchorage Regional Office
P.O. Box 1328

Anchorage Alaska 99510
Attn: George Hart
Telephone: 907-745-3236

Also, I am enclosing for your use copies of application forms and background information for fish, game and/or fur farm licenses. The above references and enclosed information should give you the materials necessary to pursue a fish farm license, if you desire.

Should you have further questions, please contact me or Jerry L. Madden at the follcwing address:

Alaska Department of Fish and Game
P.O. Box 3-2000
Juneau, Alaska 99802

Thank you for your interest in the Alaska salmon industry.

Sincerely,

Don W. Collinsworth

Don W. Collinsworth
Deputy Commissioner
Resource Management

Enclosures

cc: Dave Daisy

United States Department of Agriculture
Forest Service
Stikine Area, Tongass National Forest
Box 309, Petersburg, Alaska 99833

Reply to: 2720

Date: August 6, 1982

Mr. James L. McCormack
Project Manager
T. Ferguson Construction, Inc.
3321 Seppala Drive
Anchorage, AK 99503

Dear Mr. McCormack:

I have read your proposal for a net pen farm to be located in Washington Bay.

I will try to assist you by listing some of the things that must happen before your project can proceed as you have described it.

You must obtain approval from the Alaska Department of Fish and Game. We would follow their lead in this matter; therefore, this is the first step you must take. You need to obtain a State tidelands permit, a Corps of Engineer's permit, and a license or waiver from the Federal Energy Regulatory Commission; to mail application to the Forest Service for a special land use permit; and to prepare (or have prepared) an environmental assessment document to be approved by the Forest Service before a permit can be issued. Detailed engineering plans and drawings are also required by us and others. Unless you are one and the same, another party from Kake was also interested in developing a fish farm in Washington Bay. If this is the case, agreement between the parties would have to be reached before we could consider a permit application.

Twenty percent of the total project cost is not an unreasonable estimate of dollars needed to be spent just to get to the construction stage for a project of this type.

A fee is charged for the special use permit, payable each year. A decision would have to be made on whether or not to require a performance bond. Land on the National Forest is not available for sale.

You also must show that the National Forest is the only land suitable for your use. State and private land is available throughout southeast Alaska.

I am not trying to discourage you; I am simply trying to point out what we all must live with these days. Good luck.

Sincerely,

JOHN M. HUGHES
Forest Supervisor

FS-6200-11b (7/81)

DR-206

STATE OF ALASKA
DEPARTMENT OF REVENUE - JUNEAU
FISH, GAME AND FUR-FARM LICENSE

No. 174 FISH FARM

EXPIRES DEC. 31, 1988

T Wayne O.D. Ferguson, SR.
(NAME)

2495 Crataegus Ave.
(ADDRESS)

Anchorage AK 99508

Location of farm [illegible]

is licensed to possess commercially fish, game and fur-bearing animals legally acquired and to buy, sell and transport such animals during the year ending December 31, 1988, subject to the regulations of the Alaska Department of Fish and Game.

Issued at Juneau, Alaska 12/22/1986

Linda Jacobs
(ISSUING OFFICER)

(INVALID WITHOUT SIGNATURE OF LICENSEE)

NOTE

THIS LICENSE IS VALID ONLY IN ACCORDANCE WITH A PERMIT TO HOLD LIVE FISH OR GAME ISSUED TO THE LICENSEE BY THE COMMISSIONER OF THE DEPARTMENT OF FISH AND GAME.

Alaska Department of Revenue
Public Services Division
Fish & Game Licensing Section

1111 W. 8th. St., Rm. # 108
Juneau, AK 99801
Phone # (907) 465-2376

Dear Licensee:

Enclosed you will find your 1987 Fish and Game License. Please check the license to see that all of the information is correct. If not, please return it to our office so that we may make the necessary changes. Also, in order for this license to be valid it must be signed by you. If you have any further questions please contact us at the office shown above. Thank you. We hope you enjoy your visit to Alaska.

3430F

Chronology of Fish Farm Development
Ferguson Family

T. Ferguson Construction is a small family owned and operated firm. All four family members are Alaskan Natives and were born and raised in Southeast Alaska.

1978 - 1979 Ferguson's interest in fish farming began in the summer of 1978 with the contraction of a fish weir at Auke Creek, Juneau, Alaska for the NOAA. We started to study the feasibility of raising salmon in upland ponds with help from the Northwest and Alaska Fisheries Center and study programs from the University of Washington.

1980 - 1981 A search for a site with the ideal condition to raise salmon was initiated. Several private individuals and public agencies were contacted to investigate the possibilities of leasing or purchasing their land holdings.

1982 - 1983 Family members visited and studied sites in Washington State, British Colombia, Canada, and Maui, Hawaii. In addition visits were made to government facilities in Washington State and British Colombia. Contacts were made with Jon Lindberg a noted consultant in the industry.

1984 Land was located for the proposed site on the west coast of Prince of Wales Island, in Copper Harbor. In December the land was secured with the help of the Farmers Home Administration under their Agriculture Loan Program.

1985 In the spring of this year surveying was begun and permits were applied for from the state and federal agencies as applicable. In addition clearing and leveling were begun. Visits to several sites in Washington State both private and public were conducted.

1986 Clearing and leveling was continued through the year and planning for the purchase of materials and equipment was begun. Permits applied for in previous years were granted and plans for docks and other tidelands activities were started. Attended a seminar in Seattle on fish farming put on by the Trade Commission of Norway.

1987 A Fish Farm License was acquired and plans to begin construction were made for the Spring of the following year. Negotiations for the acquisition of brood stock began. Attended a seminar in Juneau on fish farming hosted by the Trade Commission of Norway.

To date the Ferguson Family has invested 10 years and approximately $500,000 in personal capital into this project in addition to the long term debt on the property. If the present legislation is passed without some provision for upland farming of salmon in salt water ponds on private land it will strike a crippling if not fatal blow to the family business and negate all the work and capital invested in the project.

February 20, 1988

Our family began investigating the feasibility of fish farming in Southeast Alaska well over 10 years ago. All four family members are native Alaskans, born and raised in Southeast Alaska. We moved to the Anchorage area 12 years ago and soon after began a feasibility study. Three years ago we purchased a large parcel of land in Copper Harbor near Hydaburg on Prince of Wales Island specifically for developing a fish farm.

In 1986 we obtained a Corps of Engineer's permit for the waterfront construction and a Fish Farm License from the Department of Fish and Game, which expires at the end of 1988.

A good deal of the property was cleared in 1986 and 1987. We have invested well over $500,000 in this venture.

Our operating plan is to raise salmon, and other fish, in upland tanks. Salt water will be withdrawn from the inlet as needed and all discharge water will be filtered and treated prior to discharge. The market for pen raised fresh salmon is largely in the off season when fresh caught natural slamon are not available in sufficient quantity.

Because we will have an upland farm, we believe that our operation does not present any threat to the salmon fishing industry. We urge you in this session of the legislature to either not extend the moratorium on fin fish farm permits or make a provision for several demonstration projects that are upland such as ours. Even though we have a fish farming license, we cannot commence operations without the oth permits which are required such as a permit to approriate water.

Our economic studies indicate that the development of a fish farm such as ours will actually bring economic benefit to the commercail fisherman through market developme and broadening the amortization of the fresh fish handling and marketing infrastruct

Thank you.

Thorne W. Ferguson, Jr.
3321 Seppala Drive
Anchorage, Alaska 99517

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

STEVE COWPER, GOVERNOR

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

March 9, 1988

The Honorable Jack Coghill, Chair
Senate Resource Committee
Alaska State Legislature
P.O. Box V
Juneau, Alaska 99811

Dear Senator Coghill:

Subject: Senate Bill 482, an act relating to the farming of aquatic plants and aquatic animals, and prohibiting the aquatic farming of finfish in saltwater.

Position: The Department of Natural Resources' comments address the technical provisions of this bill, pursuant to the policies outlined in the Governor's position paper issued in March, 1988.

Background: As outlined in a position paper last March, it has been the Governor's policy to promote responsible growth in the shellfish industry. The Governor's Mariculture Task Force has been working for nearly a year to coordinate the permitting of shellfish applications. The agencies involved have prepared a tri-agency application form to simplify the confusing application process, the Department of Fish and Game has developed a new permit for shellfish, and the Department of Natural Resources has been working on a plan to address the cumulative impacts of the mariculture industry and on the tideland permit process.

For the most part, the directives of SB 482 do not appear to conflict with the work completed by the task force; however, the department recommends several changes in order for the efforts to be consistent:

(1) Up to three year rather than five year tideland permits. At the recommendation of the Governor's Mariculture Task Force, the Department of Fish and Game is in the final stages of preparing a three-year Shellfish Permit. The three-year term is used by the Corps of Engineers in permitting tideland activities. The Department of Natural Resources has been planning to use the three-year term as well in granting tideland permits for shellfish. (For a project that is experimental, a one or two year permit may be desirable.) If our permit terms could match, confusion to the applicant would be reduced, and agency permit coordination would be simplified.

(2) A valuation statement should be sufficient to determine the fair market value of a permit. The department supports the change requiring not less than fair market value to be charged for permits. Appraisals are expensive, however, so we have devised a short cut. An appraiser (or an appraiser's apprentice) completes a valuation statement. It is similar to a full appraisal, but not as thorough. If the applicant does not feel the rental determined in this manner is fair, then he/she can hire a certified appraiser and the department will accept the new number. A full appraisal will be required prior to granting a lease, as now required by statute.

(3) The notice requirements should be integrated into the process that the department is adopting to address cumulative impacts. The notice described in the bill will be cumbersome for the applicant, and will not always produce the desired result: that the people affected have the opportunity to comment on the project. While the specifics of the system have not yet been defined, the department is proposing a means of addressing cumulative impacts of the mariculture industry that entail opening districts for application, holding an agency meeting to screen out unreasonable applications, and then holding a hearing (within the affected area if funding is available) to obtain public comment.

(4) The addition of policy direction to guide the agencies in promulgating regulations and adjudicating permits. The bill clearly states that finfish farming in saltwater is not legal, and it regulates the farming of shellfish and sea vegetables, but it is unclear what the state's policy is toward shellfish and vegetables. It has been the Governor's policy to encourage the establishment and responsible growth of these industries in the state. Is that the legislative intent as well?

Recommendations: The department recommends the following specific changes in the bill:

(1) Section 16 (Sec. 38.05.856 (b)). A permit under this section should be valid for up to three years.

(2) Section 16 (Sec. 38.05.856 (a)). The value of a permit should be assessed prior to issuance or renewal. A valuation statement is acceptable for determining fair market value of a permit.

(3) Section 16 (Sec. 38.05.856 (c)). Before issuing or renewing a permit under this section, at a minimum, notice must be given as specified in AS 38.05.945. Written testimony may be submitted for 30 days after the notice, and the commissioner may hold a hearing in the affected area if necessary.

(4) Section 1. A statement should be added to make it clear that the policy of the state is to encourage the establishment and responsible growth of the shellfish and sea vegetable farming industries.

If I may provide additional information, do not hesitate to contact me.

Sincerely,

Dennie Gorsuch

for Judith M. Brady
Commissioner

cc: Members of the Committee
Bill Sponsors
Rod Swope
Bob Evans

bcc: Division Directors

SENATOR FRED F. ZHAROFF
ALASKA STATE LEGISLATURE

P.O. BOX 405, KODIAK, ALASKA 99615 (907) 486-5259
DURING SESSION:
P.O. BOX V, JUNEAU, ALASKA 99811 • (907) 465-3473 • 465-3474

DISTRICT N
ALASKA PENINSULA • ALEUTIAN CHAIN • BRISTOL BAY • KODIAK ISLAND • LAKE CLARK/LAKE ILIAMNA • PRIBILOF ISLANDS • SHUMAGIN ISLANDS

MEMORANDUM

TO: Senator Richard Eliason

FROM: Senator Fred F. Zharoff

DATE: March 22, 1988

RE: Proposed amendments for CSSB 482

In committee last week, I expressed my concern that the mariculture bill we finally pass contain provisions that would allow the individuals interested in shellfish farming in my district to proceed with their plans. These individuals should be governed by regulations and guidelines that protect the public interest without subjecting the mariculturists to excessive or cumbersome restrictions.

Below are my proposed amendments to CSSB 482 that will take care of my concerns in regard to shellfish farming, and also be of benefit to shellfish and sea vegetable farmers throughout the state.

1. Add a balanced Findings and Policy section to explain the legislature's intention behind this legislation.

On page 1, line 15, add new section:

> FINDINGS AND POLICY. (a) The legislature finds that
>
> (1) aquatic farming in the state would provice a consistent source of quality food, provide new jobs, increase state exports, create new business opportunities, and increase the stability and diversity of the state's economy; and
>
> (2) development of aquatic farming in the state would increase the availability of fresh seafood to Alaskans and would strengthen the competitiveness of Alaska seafood in the world marketplace by broadening the diversity of products and providing year-round supplies of premium quality seafood.
>
> (b) It is the policy of the state
>
> (1) to encourage the establishment and responsible growth of an aquatic farming industry in the state; and
>
> (2) that allocation of aquatic farming sites be compatible with established and ongoing beneficial activities in an area.

2. Remove language in the permit issuance section that is too restrictive. I am concerned that with the present language, permits may be denied where there is any degree of adverse impact.

On page 2, lines 15-25, delete language and replace with the following.

(1) the physical and biological characteristics of the proposed location must be suitable for the farming of the aquatic animal or plant proposed;

(2) the proposed farm may not unreasonably or adversely affect management of natural stocks, and must not require significant alterations in traditional fisheries or other existing uses of fish and wildlife resources;

(3) the proposed farm may not significantly affect fisheries, wildlife or their habitats in an adverse manner; and

(4) the proposed farm plans and staffing plans must demonstrate technical and operational feasibility.

3. Allow aquatic farmers and hatchery operators to sell shellfish spat and other products to the Alaska Department of Fish and Game and to aquatic farms and hatcheries outside the state. This would open up markets for Alaskan aquatic farmers and still protect the state's interest. Fish and Game also would have access to the stock needed for common property seeding operations, enhancement or research projects.

On page 3, line 23, at the end of the sentence add:

..., Department of Fish and Game, or to sources outside the state.

On page 5, line 4, at the end of the sentence add:

..., Department of Fish and Game or to sources outside the state.

4. Make clear that while releases of aquatic farm stocks are prohibited, the state can enter into agreements with private hatcheries for reseeding programs or enhancement purposes.

On page 5, line 28, insert new section:

RELEASE OF CERTAIN FISH PROHIBITED. Stock may not be intentionally released into the public water of the state from a hatchery or aquatic farm required to have a permit under AS 16.40.100 without prior authorization from the Department of Fish and Game. Such approved leases would be subject to appropriate disease and genetics standards developed by the Department of Fish and Game.

5. Give aquatic farmers a definite timeframe in which they must report disease outbreaks.

On page 6, line 4, add new language at the end of sentence:

....within 48 hours after discovering the outbreak or incidence.

6. Remove language which limits sea vegetable product forms.

On page 6, line 29 and page 7, line 1 delete:

....FOR THE PURPOSE OF CONSUMPTION, OR KELP THAT IS CULTIVATED FOR USE

IN DYES.

7. Allow the industry to go forward while the final regulations are being developed. The Department of Fish and Game will soon implement its Shellfish Farm Permit regulations. The Department of Natural Resources already has regulations in place for handling use of the tidelands. There will be no free-for-alls or "gold rushes". The mariculture industry should not have a moratorium imposed on it while the agencies take an indefinite period of time to write and develop their regulations.

On page 14, delete lines 1-9 (Sec. 19 and Sec. 20).

8. Allow existing aquatic farmers to expand into other species of shellfish and/or increase production. People who have invested in this industry should be allowed to respond to opportunities and make their farms economically viable, subject to lease or permit terms negotiation -- on an individual basis -- with the Department of Natural Resources.

On page 14, lines 15-18 delete:

> ...., BUT AS A CONDITION OF OBTAINING THE LEASE OR PERMIT THE PERSON MUST AGREE THAT DURING THE TERM OF THE LEASE OR PERMIT THE PERSON WILL NOT EXPAND OPERATIONS BEYOND THE SCOPE ALLOWED UNDER THE EXISTING PERMIT.

With the above amendments, SB 482 not only establishes state policy on salmon and finfish farming, but provides positive encouragement for the shellfish and sea vegetable farming industries.

I also have some concerns regarding the tidelands permits and leases, but feel it would be best to hold off raising them until we have finished our discussion of the various siting options.

STATE OF ALASKA

STEVE COWPER, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

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

March 9, 1988

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

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If I may provide additional information, do not hesitate to contact me.

Sincerely,

Jennie Gorsuch

for Judith M. Brady
Commissioner

cc: Members of the Committee
Bill Sponsors
Rod Swope
Bob Evans

bcc: Division Directors

MARICULTURE AND LAND USE MANAGEMENT

Land use management may be the most critical decision made by the Senate Resources Committee on SB 482, as it will affect all forms of mariculture and could determine the viability of even existing shellfish farmers.

The Alaska Mariculture Association (AMA) strongly questions why the committee is considering such a restrictive approach to mariculture development. The land use management provisions in the legislation are far more restrictive than any regulations currently imposed on any industry in Alaska. The amendments favored by Senator Eliason would make the situation substantially worse, and we believe will ensure that not only will the potential of mariculture never be acheived but existing farmers could be pushed right out of business.

The rationale for such restrictions should be questioned, and the committee should consider the implications of these kinds of approaches on other industries. The site selection process, tidelands rental fees, and other restrictive provisions of SB 482 could set some dangerous precedents.

Stop for a minute and apply the land use options proposed to other industries.

How do you think the timber and placer mining industries would view imposition of the culmulative impact provisions (page 13, lines 22-26, 3/16/88 work draft)?

What would the impact be on the oil industry if commercial fishing, hunting, recreation, trapping and other traditional uses were made priority uses, such as is proposed in Senator Eliason's paper entitled, "Important Aspects in all Land Options."?

How would commercial fishermen react to DNR beginning to require tideland permits with "fair market" rental values of $250-450 per acre for crab pot storage areas? (There currently are no permits issued for crab pot storage areas, although some pots are not moved literally for years and technically anything located in one spot for more than three consecutive months requires a permit. This includes boats anchored in isolated areas.)

Mariculture is not inherently different than many other uses of state tidelands now allowed that would not be affected by this legislation. Why should it be treated differently?

The following points are critical:

Cost of temporary tidelands use permits--SB 482 requires DNR to charge a "fair market" rental fee for tidelands permits. DNR estimates this would cost existing oyster farmers between $250-450 per acre, compared to the existing flat fee of $50 per acre now charged all tideland permit holders. What will this do to an oyster farmer grossing $20,000 per year? Does DNR view this as a precedent to apply to other tidelands permits? If not, why should mariculture permits be valued differently? If the goal is to promote the development of small scale "mom and pop" businesses this is not the way to accomlish that objective.

Tidelands adjacent to wilderness and other special use areas--Senator Eliason apparently favors a complete prohibition on

mariculture in tidelands adjacent to wilderness and other special use areas such as refuges, critical habitat areas, marine sanctuaries etc. Existing statutes contain a provision giving upland owners a preference in the use of adjoining tidelands. If someone were to propose placing a raft in state tidelands immediately adjacent to a wilderness area, DNR is required by law to seek comments from the upland owner (USFS, U.S. Park Service, etc.). If the agency says that a mariculture facility would not be compatible with the management plan for the area, DNR would be required to develop a "best interests of the state" finding to override this objection.

This appears to offer strong protections. As Senator Zharoff pointed out most of Kodiak Island in located within a federal refuge system and could be off limits to mariculture under Senator Eliason's suggestion. Envision the huge amounts of wilderness areas, state and federal parks, refuges, critical habitat areas, and other special use areas where mariculture would be prohibited. Does this make sense if the managers find mariculture to be a compatible use? Again, consider the precedents this approach would set.

Priorities for traditional uses--Remember the major battles over making subsistence a priority use? Just think of the effect of making traditional activities, such as commercial fishing, hunting, trapping, recreation, priority uses over mariculture? There would be virtually no way a farmer could obtain a site.

Under the current coastal management process, new uses of the tidelands and submerged lands must be found to be consistent with state and local coastal management plans. These plans generally offer strong protections for traditional uses, and the emphasis throughout the process is upon ensuring new activites are found to be compatible with traditional uses.

Culmulative impact requirments--The issue of culmulative impacts of mariculture has been greatly overplayed. The facts are that of about 2,100 tidelands leases and permits, there are roughly 50 mariculture permits. No aquatic farmers have long term leases. These figures simply do not justify the imposition of culmulative impact requirements. This would be a dangerous precedent for other natural resource industries. Ponder the probable impacts of these requirements on logging, mining, tourism, fishing and other industries.

DNR favors dealing with this issue through policy, and shares our concern for putting these requirements in statute. Such laws are like waving red flags before the environmental community as an invitation to sue. These kinds of requirements generally are utilized to stymie economic growth, and could strangle the mariculture industry's potential for long term growth. If such limitations are imposed, it would be more appropriate to approach them in more flexible policies and not through rigid statutes.

Permit moratorium--Sections 19-20 of the bill prohibit ADFG and DNR from issuing new mariculture permits or leases until the regulations necessary to implement SB 482 become effective. This could take up to a year to accomplish, if recent experience with writing new shellfish farming regulations is any indication. ADFG

began working on the new regulations last summer and they will not become effective until mid-April.

Why should shellfish farmers have to wait for regulations to implement SB 482 when they will be subject to a new set of comprehensive regulations? DNR has testified that the department does not anticipate a dramatic increase in the rate of growth in shellfish farming as a result of the passage of mariculture legislation. Remember there are only 50 permits out there right now.

There has never been application submitted for farming of aquatic plants, and it is unlikely many will be received in the near future. As for finfish, if the 3/16/88 finfish provisions are adopted, there are likely to be a small number of pilot projects proposed for arctic char or, perhaps, black cod. Finfish could be handled by interim policies based upon the shellfish farming regulations scheduled to take effect next month.

The four management options--Senator Eliason has outlined for approaches to land use management under SB 482. All four represent a major departure from the current process in which all tideland permits are issued, and mariculture operators would be subject to much stricter regulations than any other tidelands users.

Option 1 is an extremely cumbersome process patterned after the state's oil and gas leasing program that would be an onerous burden on smaller operators. Sites would be selected through a call for nominations process, much consulting between agencies is required, two public hearing would have to be held, proposed sites would be knocked out based upon public comments, and permits would be awarded on a lottery basis. This approach will require a large fiscal note and will discourage participation by small scale famrers, particularly from rural communities.

Option 2 is a somewhat simpler version of option 1, but is nearly as unacceptable to farmers. It would be like asking farmers if they want second or third degree burns. This approach would open up the permitting process only 60 days per year, but would allow individuals to make appl;ications for specific sites. The agencies would narrow down the proposed sites, ghold public hearings, and again whittle back proposed sites.

Option 3 would require extensive public notice and a public hearing on each mariculture site application. This is an improvement, but a public hearing on each permit application will be expensive for the state and burdensome to the applicant.

Option 4 was proposed by AMA as a compromise approach. This would require extensive public notice, but mandate a public hearing only in those situations where DNR determines significant land use conflicts may be created.

SB

482

- file 2 -

Governor's Statement on
Mariculture
Senate Resources Committee
March 9, 1988

Governor Cowper has not taken a position on any specific piece of legislation. However, the Governor has determined that he does not support legislation authorizing salmon farming in saltwater at this time.

The Governor is strongly supportive of legislation which serves to clarify the legal status of mariculture and which opens the door for new economic initiatives through shellfish and sea vegetable farming.

The Governor believes that legislation must rely on existing agency roles and should enhance or supplement existing agency authorities to accommodate this emerging industry. For example, legislation should include appropriate measures to provide adequate levels of disease and genetics controls, inspection requirements, product quality and wholesomeness, and resolve user conflicts for use of our tidelands.

Generally, SB 482 fits many of these criteria. However, the respective agencies will be working with you to resolve any technical issues.

Interagency Mariculture Workgroup
Report on Activities Over the Legislative Interim

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MEMORANDUM State of Alaska

TO: Fisheries Cabinet

DATE: January 12, 1988

FILE NO:

TELEPHONE NO: 465-4100

FROM: Interagency Mariculture Workgroup

SUBJECT: Report on Activities Conducted During the Legislative Interim

The Interagency Mariculture Workgroup is pleased to present to you this report on our activities conducted over the legislative interim. The products contained in this report are in response to the tasks the Cabinet outlined last May. In the report you will find eight issue papers on a variety of biological, land-use, water quality and product quality issues which are central to the mariculture debate. Other products include a matrix summarizing how four other areas address these subjects, a description of the on-going socioeconomic studies, and the uniform shellfish permitting system we developed. Additional information is contained in the appendices.

Background

Last legislative session, the issue of authorizing expanded mariculture in Alaska received considerable attention. In particular, the prospect of pen-rearing salmon in Alaska became one of the hottest topics in the state. The market success of the Norwegian salmon farming industry, and the growth worldwide in fish farming generally have spurred interest in all forms of mariculture in Alaska. During last year's session of the Alaska State Legislature, bills were introduced to legalize expanded mariculture activities, including salmon pen-rearing. Senate Bill 106 and House Bill 108 would "encourage the establishment and growth of an aquatic farming industry" in Alaska. The bills would establish a permit system which would be administered by the Department of Commerce and Economic Development for aquatic farms and private-for-profit hatcheries.

In response to this action in the Legislature, Governor Cowper directed the Fisheries Cabinet to review the mariculture issue and prepare a recommendation to him. The Cabinet, after careful consideration, prepared for the Governor a set of criteria for judging any authorizing legislation. The Governor approved these criteria, which were then presented to the Legislature.

Late in the session it became apparent that authorizing legislation was not going to pass. All parties became concerned that the questionable legal status of pen-rearing

salmon could lead to speculation on tidelands sites and a "gold rush" mentality similar to the situation which developed in British Columbia. The resulting confusion and inevitable litigation would not be to anyone's advantage, so a carefully crafted moratorium bill was introduced and passed in the waning hours of the session. This bill, Senate Bill 297, placed a moratorium which expires July 1, 1988 on issuing permits for most finfish farming. It also authorized shellfish farming and limited finfish farming in fresh water.

The Fisheries Cabinet met on May 19, 1987 to develop a plan of action for addressing the mariculture issue over the legislative interim. At that time the Cabinet identified two general tasks which needed to be performed.

First, the administration needed to develop a uniform approach to permitting shellfish mariculture. This has been done. The staff workgroup reviewed existing authorities and permitting procedures, and developed the consolidated permit application form to establish a uniform application process. In conjunction with this, the Department of Fish and Game prepared regulations authorizing a shellfish farm permit, and a Fish Transport Permit for holding and transporting shellfish for commercial farming purposes. This cleared the way to allow expanded shellfish mariculture activities.

The second task identified by the Cabinet was to systematically address the issues raised during the legislative hearings. Senator Eliason and Representative Herrmann presented us additional questions which needed to be addressed as well. The issue papers, matrix, and the socioeconomic studies are the products we prepared to address this task.

The issues papers are designed to briefly discuss and summarize a number of biological, land-use, product quality, and water quality issues which are central to the mariculture debate. The matrix briefly summarizes how British Columbia, Maine, California, and Washington address many of these same issues. The socioeconomic studies, which are in progress, will address the questions regarding markets and cost of production.

Also included in the appendices are copies of SB 297, the issues lists from Senator Eliason and Representative Herrmann, a list of the staff on the workgroup, and Governor Cowper's Position on Mariculture.

LAND USE
Department of Natural Resources

ISSUE:

How will the state encourage the development of tide and submerged lands through mariculture while at the same time minimize conflicts with existing uses?

DISCUSSION:

Mariculture is a new and expanding industry in Alaska, and may become a significant long-term use of tide and submerged lands. Currently, mariculture activities are being permitted on a case-by-case basis with little or no comprehensive planning. Notable exceptions include the Prince William Sound Area Plan and the Prince of Wales Island Plan. The state needs a comprehensive approach to planning for mariculture activities in order to ensure the stable growth of this new industry and to minimize conflicts with existing uses. Such an approach should provide guidance to minimize conflicts on individual proposals and address the potential cumulative impact of numerous mariculture developments taking place over time.

Some of the potential land use problems associated with mariculture include: displacement of public uses such as recreation and subsistence; conflicts with other commercial uses of tide and submerged lands; land speculation; impacts on adjacent land holders; and cumulative impacts over time from the incremental expansion of mariculture activities.

Displacement of Public Uses such as Recreation and Subsistence

Mariculture sites may block or inhibit public access to important recreation and subsistence use areas. The expectation and desire for seclusion when recreating in rural Alaska is highly valued by residents and visitors. If the sense of seclusion is lost, an important part of the aesthetics of many bays is lost, and the recreational experience is less valuable. A mariculture facility, particularly with caretaker facilities located in a smaller cove, will essentially eliminate that sense of seclusion for recreational users other than the permit holder. In essence, the tendency will be for traditional recreational users of the cove to try to find other secluded and aesthetically pleasing areas.

Subsistence is an important activity in most of the areas where mariculture may occur. Conflicts between mariculturists and subsistence users could occur as more and more facilities are developed over time. This could entail

direct competition for subsistence resources as new residents enter rural areas, or loss of subsistence opportunities if mariculture facilities are placed in important subsistence resource areas. Siting criteria can minimize most of these problems.

And finally, the mariculturist may not want any intrusions into his or her area. There could be concerns over pollution, theft, damage, interference, or just the loss of privacy. This could lead to conflicts between the farmer and other users, in the end excluding other uses of the coastal area.

Conflicts with Other Commercial Uses of the Tide and Submerged Land

The best sites for mariculture facilities may often be the best sites for other uses such as mineral or timber transfer and support facilities, log storage, commercial fishing grounds or anchorages, or commercial recreation development. Although mariculture is a new industry in Alaska, experiences in British Columbia and Washington have demonstrated there can be conflicts with other uses. The potential for such conflicts has already surfaced in Kodiak, Prince William Sound, and Southeast.

Besides the need for space, water quality standards for mariculture may preclude the use of favored sites for other commercial or industrial facilities. Forcing more stringent mitigation measures or alternative siting for timber or mineral transfer or tailings disposal could reduce or eliminate the economic viability of the resource extraction industry in a given area.

Conversely, mineral or timber transfer [illegible] storage, and floating camps associated with resource [illegible]opment activities may limit the space available or degrade water quality for mariculture facilities, thus making mariculture development more difficult and less likely.

Land Speculation

British Columbia experienced a dramatic rush for Section 10 permits prior to 1986. These permits allow the holder to enter and occupy a site to conduct research for up to one year. It appears that these permits were being issued for large areas of land with little regard for potential impacts to the public. This created a gold rush image which resulted in a great deal of public concern, and subsequently a moratorium was imposed. Alaska does not have an investigative permit similar to the Section 10 permit but we could experience land speculation in other forms, most notably by applying for tidelands and leases to tie-up a site.

Land speculation in this case is described as obtaining land use rights with the intent of not using the land for the proposed use but selling those rights for a profit. This problem is not unique to mariculture and it can occur in any use of state land. Speculation can be greatly reduced by close monitoring of development schedules and writing conditions in the land use document that would allow the state to revoke that document if the development is not proceeding as proposed.

Impacts on Adjacent Land Owners

Mariculture can impact adjacent land owners in a variety of ways: loss of tidelands access or boat moorage, loss of view, noise and loss of privacy, loss of habitat or water quality. This has been a significant issue in Washington and British Columbia, and may become a matter of concern in Alaska as well.

The adjacent land owner has a number of ways to influence the siting of mariculture facilities. They can participate in development of state land use plans, coastal zone management plans, and local comprehensive plans. The adjacent owner or owners are notified by mail of pending applications and are given an opportunity to comment on the project. A 30-day public notice pursuant to AS 38.05.945 is required for leases and the local government or regional native corporation is also notified if the project is within their boundaries. The local government or regional native corporation may hold public hearings if necessary. The Department of Natural Resources reviews all of these comments and weighs the use and enjoyment of the adjacent owner against what is considered to be the state's best interest. These determinations are made on a case-by-case basis and may or may not include consideration of cumulative impacts.

Cumulative Effects of Expanding Tidelands Use

The vast majority of the tide and submerged lands in Alaska are owned and managed by the State of Alaska. The remainder is owned by the federal government or by individuals and first class cities that acquired the land pursuant to AS 38.05.820.

The State of Alaska allows the development of its tide and submerged lands by granting leases and permits. The sale of tide and submerged land to a private entity is presently not legal. AS 38.05.045 excludes tide and submerged land from the public land that can be sold.

Tideland permits may be issued for a term not to exceed 5 years (11 AAC 62.720). This permit allows the use of tide and submerged lands for mariculture but does not provide the

security of a lease and does not constitute a preference to a lease.

Leases for tide and submerged land are issued in two ways, by public auction or negotiation. Leases may be negotiated for a term up to 55 years to an adjacent upland owner or upland lessee if the lease is for water transportation or another water-dependent purpose (AS 38.05.075(c)). Leases may also be negotiated for a period of no more than 10 years if the appraised value of the transaction is $5000.00 a year or less (AS 38.05.070(b)). All other tideland leases are offered at public auction and anyone may bid on the lease parcel (AS 38.05.075(a)). The procedures for processing a tideland lease in each case is the same with the exception of the negotiated leases which do not have a public auction prior to the issuance of the lease.

For most of coastal Alaska, mariculture facilities will be permitted on an individual basis. The impact from one or two farms may be minimal, but the cumulative effects of numerous farms on existing uses may be dramatic. Under current statutes, management and area plans provide a process for resolving use conflicts on a regional basis, and the best interest finding required under AS 38.05.035(e) provides a mechanism for resolving conflicts on individual permits/leases. Although a regional perspective is preferred, the cost of management and area plans prohibits their use as a routine method of sorting out problems and resolving conflicts. This lack of a regional perspective could lead to significant conflicts over time and is one of the major problems with the existing system.

In developing statewide guidelines, Alaska should evaluate what British Columbia experienced during its initiation to finfish aquaculture. They had an immediate need for coastal planning because they were seeing a loss of access, a loss of anchorages, impacts on upland owners, and impacts on recreation and tourism. British Columbia placed a moratorium on leases and licenses for finfish farming and began an inquiry into finfish aquaculture and its impacts. The inquiry was completed in 1986 and many of their recommendations could be applied to Alaska. Some of the recommendations that apply to land use in Alaska are as follows:

1. The government should develop an aquaculture policy which clarifies direction, agency roles, and the responsibilities of both government and the private sector for the industry. The inquiry indicated that a clear policy would alleviate public concerns over lack of controls and lack of protection of the public resource. It would also serve to offset creation of the image of an uncontrolled land rush, which has

generated misunderstanding and suspicion about government objectives.

2. Initiate land use studies that would identify sites of high value for other important coastal interests. Use these studies to direct aquaculture away from major resource and user conflict areas.

3. Local governments should be encouraged to develop or revise local zoning laws to address mariculture within their boundaries. This would also involve modifications of local coastal zone management plans.

4. The land management agencies should review their practices involving advertising and notification for proposed aquaculture facilities. This includes notification to local governments. The inquiry recommended a 60-day review period.

5. The land management agencies should require a commitment bond to reduce speculation and a clean-up bond in the event of abandonment.

6. The aquaculture industry should be encouraged to institute a program to provide anchorage, access, and emergency assistance to other coastal users.

7. Establish a minimum distance separation guideline for farms as a means of reducing impacts on upland owners and other resource users.

Fees

Current statutes and regulations provide only two methods to collect fees for use of state land. AS 38.05.085 provides for a percentage of the fair market value as determined by appraisal. The parcel is not reappraised for 25 years. There are fees attached to permits which may be set by the regions. These fees may not provide a fair return to the state for the use of its resources. Options to consider for legislation may include: 1) a percentage of gross receipts; 2) revise lease terms to require reappraisal every five years (private sector norm).

Preference

Current statutes provide only a preference for adjacent owners. Any preference for Alaskan's would require a change in statutes.

Other statutory changes might include a lottery for new sites or a negotiated lease as well as the high bid method currently available.

SUMMARY:

It appears that most land use problems associated with mariculture can be resolved through state land use plans and the permit review process. The most comprehensive procedure to determine areas of public use is to develop state land use plans, such as the Prince of Wales Island Area Plan and the Prince William Sound Area Plan. Developing comprehensive area plans is desirable but time consuming (2-3 years) and expensive. A streamlined process needs to be developed and implemented which evaluates land-use issues, including the cumulative effect of multiple mariculture operations. Such a process should include provisions for strong local participation and be designed to meet the needs of reconciling land-use conflicts in a timely manner.

While the land use plans address siting considerations they do not resolve current statutory restrictions such as: how fees are charged; should and can Alaskans be allowed a preference to lease tide and submerged land.

WATER QUALITY
Department of Environmental Conservation
Division of Environmental Quality

ISSUE:

Ensure that high water quality is maintained during mariculture operations and that measures are taken so that preexisting uses and activities can continue without adversely affecting mariculture activities.

DISCUSSION:

Mariculture requires clean water. Water quality in areas surrounding the culture facility, however, can be affected by both the mariculture activity itself and by other nearby uses or activities. The state needs to ensure that water quality is adequate for mariculture, that high water quality is maintained during culture operations, and that measures are taken so that preexisting permitted uses and activities can continue.

Two key water quality issues associated with mariculture are:

1. Changes in water quality caused by mariculture operations; and
2. Potential siting conflicts with other uses or activities.

1. Changes to water quality from mariculture operations

Mariculture facilities can have significant impacts on local water quality and habitats if not properly sited, operated, and monitored. The impacts on water quality can be in three areas: 1) the creation of water quality and environmental conditions unfavorable for the growth and survival of cultured species; 2) a reduction of water circulation near culture facilities; and 3) the introduction of toxic or deleterious substances to the water.

One of the major concerns with mariculture operations is the unfavorable changes in water quality and environmental conditions that may develop during normal facility operations. Specific changes that may occur include:

a) increased concentrations of particulates and organic matter (feed and fecal material) as byproducts of the culturing activity which accumulate as organic-rich deposits beneath culture facilities;

b) increase in fecal coliform bacteria and ammonia due to increased production of waste; and

c) decrease in dissolved oxygen due to increased oxygen demand by the cultured organisms and the bacteria that feed on their waste.

DEC has developed water quality criteria applicable to aquaculture operations (18 AAC 70.020). These criteria specify standards that must be met and maintained for aquaculture activities to take place. Specific criteria concern: fecal coliform bacteria, dissolved gas, pH, turbidity, temperature, dissolved inorganic substances, and sediments, among others. Mariculture operations, however, generate substantial amounts of waste products, unconsumed food and other debris which can settle, accumulate and affect nearby water quality and the benthic substrate.

The amount of organic matter which is produced and can subsequently accumulate below culture facilities is dependent upon several factors including the size of the mariculture facility, its production level, and environmental factors such as water depth, current velocity, flushing, and bottom topography at the facility site. This accumulation of wastes and sediments can also induce chemical and biological changes in the natural bottom habitat and water column.

An extensive accumulation of waste would stimulate the bacterial decomposition process. The biochemical oxygen demand (BOD) of this accumulated material can deplete dissolved oxygen in the water column, causing stress for the cultured organisms. Salmonids, for example, have a high dissolved oxygen requirement, 5.0 - 7.0 mg/l, which must be maintained in a crowded culture situation. Water quality criteria for aquaculture also specify that dissolved oxygen concentrations may not be less than 4.0 mg/l at any point beneath the water surface, and not greater than 17.0 mg/l in any location.

Another possible problem resulting from the deposition of excess food and feces is a change in the benthic macroinvertebrate community. Species unable to tolerate organic enrichment may disappear, and other more tolerant species become dominant. These changes may persist for the duration of the culture activity and for at least several years following its cessation.

Most, if not all of the unfavorable changes in water quality and environmental conditions can be avoided by properly siting mariculture facilities. Water quality problems would be anticipated only in areas of limited flushing or intensive culturing activity. Field studies rarely have shown organic deposition or dissolved oxygen to be a problem around culture facilities in well-flushed areas.

The second concern is that the culturing structure itself may reduce water circulation in the local area, particularly in the down-current direction. A number of variables can affect this flow reduction including flow rate, density of water, enclosure size and shape, degree of fouling, mesh type and material, and stocking density. This reduced circulation can also reduce dilution and dispersal of waste products from the culture facility. A reduction of this sort in water circulation, combined with an increased level of nutrients in the water from excess feed and feces, can promote phytoplankton blooms. This may be a particular problem in water bodies with naturally low levels of nutrients which normally result in nutrient-limited phytoplankton production. Some types of dinoflagellate blooms are associated with paralytic shellfish poisoning (PSP) and may pose a health hazard to humans who consume shellfish. Other dinoflagellate blooms can directly affect fish health and growth rates. These and other phytoplankton blooms also compete with cultured organisms for available dissolved oxygen, which could exacerbate problems of low oxygen stress. These water quality problems would be most likely to occur in areas of inadequate flushing or intensive culturing activity.

The third concern for water quality is that toxic or deleterious substances could be introduced during mariculture operations. The major problem substances include, but are not limited to, antibiotics, anti-fouling agents, and pathogens and parasites that could affect product quality and be transmitted to consumers. Chemical usage is highly regulated but also needs to be closely monitored. The accumulation of chemicals or pathogens in the cultured product must also be carefully monitored. Additional concerns regarding regulation of antibiotics, antifouling agents and shellfish pathogens are covered in the issue paper prepared by the Division of Environmental Health on the use of chemicals and additives.

Research has shown that properly sited and operated facilities will avoid many of the water quality problems described above. The state needs to develop siting criteria and guidelines to use in permitting these facilities. Specifically, criteria for tidal volumes, flushing action, currents, and water depth need to be developed. Certain of these criteria will need to be specific to the species being cultured, as environmental requirements may vary. It is also vital to have adequate information about the proposed facility during the permit review so that potential water quality problems can be avoided.

2. Potential siting conflicts with other uses or activities

The most suitable sites for mariculture facilities often are the most suitable sites for other water-dependent and water-related activities. Because mariculture facilities need clean water to operate, they may be incompatible with other activities in the surrounding area. Proper siting of the mariculture facility and subsequent monitoring of activities that occur around them are critical. A mariculture facility proposal may be submitted for an area which has historically been used for other activities, and these activities may not easily coexist. For example, some preexisting activities could have a discharge that would be detrimental to the cultured organisms. Non-point sources of pollution (e.g., sediment runoff from upland activities) may also affect water quality of embayments suitable for mariculture facility siting.

Another specific area of potential conflict with mariculture operations is the discharge for sewage from upland development, caretaker facilities associated with the mariculture project, and boat traffic. Shellfish are filter feeders and thus easily concentrate fecal coliform bacteria and heavy metals in their bodies. The National Seafood Sanitation Program has set strict standards for fecal coliform levels and heavy metal concentrations in shellfish. Currently, all shellfish growing areas in the state must be certified by DEC, Division of Environmental Health. In addition, all shellfish that will be marketed must also be certified by the Division of Environmental Health to ensure the the product is within safe limits. The State of Alaska Water Quality Standards also specify the levels of allowable fecal coliforms that are required by designated water use. These levels vary depending on the use under consideration. For example, in waters designated for industrial use, the allowable level of fecal coliforms (FC) is not to exceed 200 FC/100ml, based on a minimum of five samples taken over a period of 30 days. The allowable level of fecal coliforms for harvesting and consumption of raw mollusks or other aquatic life is 14 FC/100ml. Since all marine waters are classified to protect all uses, the most stringent use requirements prevail (e.g., 14 FC/100ml).

Siting conflicts arise when an area has historically been used for something other than mariculture and mixing zones have been established which allow fecal coliform or other water quality parameters to be above acceptable limits for an adjacent proposed mariculture operation. The determination before the department is whether to reduce the size of mixing zones for existing uses to allow mariculture facilities in the vicinity, or whether to find that the area is unsuitable for mariculture. DEC also needs to determine how long fecal coliforms persist in marine waters and the

size of contaminated areas. Information of this sort will give us an idea of the necessary separation distance between mariculture facilities and sewage discharges. It is essential information for the responsible permitting of mariculture facilities.

Summary

Mariculture requires clean water. Two key water quality issues associated with mariculture are changes in water quality caused by mariculture operations and potential siting conflicts with other uses and activities. The impacts on water quality can be in three areas: 1) the creation of water quality and environmental conditions unfavorable for the growth and survival of cultured species; 2) a reduction of water circulation near culture facilities; and 3) the introduction of toxic or deleterious substances to the water. Most, if not all of the unfavorable changes in water quality and environmental conditions can be avoided by properly siting and operating mariculture facilities. The state needs to develop siting guidelines to be used in permitting these facilities.

The most suitable sites for mariculture facilities often are the most suitable sites for other water-dependent and water-related activities. Because mariculture facilities need clean water to operate, they may be incompatible with other preexisting activities. The state needs to take measures to ensure that preexisting permitted uses and activities can continue.

DISEASE
Department of Fish and Game
Division of Fisheries, Rehabilitation,
and Development

ISSUE:

Protect native and hatchery stocks from potential disease arising from salmon farming operations.

DISCUSSION:

All populations of fishes, whether in saltwater or fresh, in the wild or in captivity, at some time contain disease agents such as bacteria, viruses, fungi, and invertebrate parasites. In Alaska, endemic disease agents are present throughout wild stocks and the marine environment. Many are opportunistic, causing disease primarily when the fish are crowded or stressed. However, it is extremely important to recognize that populations of fishes differ in the disease agents they carry, and that diseases newly introduced to fish populations can be very devastating.

To control disease in the ocean ranching program, Alaska set in place stringent regulations that govern the movement of salmon and their gametes within the state, and prohibited the import of any fish species or their gametes for aquaculture purposes. These regulations have applied for some 16 years and include requirements for thorough broodstock screening for disease agents, routine treatment of eggs to prevent disease outbreaks, annual inspections and strict reporting requirements, and the destruction of stocks if the state finds that this is necessary to control disease. The state's prohibition on importing species ensures that no new diseases are introduced into the state. For example, many chinook salmon stocks in Washington and Oregon carry IHN virus. Importing these fish could introduce new strains of IHN virus to indigenous stocks. Similarly, importing Atlantic salmon would bring the risk of importing exotic viral and bacterial diseases not found in Alaska. This could have serious impacts on the health of existing native and hatchery stocks, and must be avoided.

To maintain adequate protection of existing fishery resources, any future fish farming industry must be governed by the same fish health regulations currently governing Alaska's ocean ranching program. The species made available for farming should be from native or hatchery stocks having complete and acceptable disease histories. Prohibitions on importing species including Atlantic salmon must be maintained. This way, any diseases would be those already present in wild populations, not exotic diseases which could cause serious harm to the native stocks. All transport and possession of fishes and their gametes needs to be closely

controlled through Fish Transport Permits, and strict reporting and inspection requirements need to be enforced.

However, extending the Department of Fish and Game's fish health services to this new industry cannot be accomplished without the addition of new staff and monies to support these activities. Private sector fish health practitioners could pick up some of this additional workload. Such private practitioners would need to be certified by the state and monitored on a routine basis to ensure acceptable performance, but presently there are no private sector fish health practitioners currently operating in-state.

SUMMARY:

Assuming that imports of Atlantic salmon or other fish species to Alaska remain prohibited, that the state continues to meet its responsibilities in fish disease control, and that monies are provided for additional fish health services, this new industry can be accommodated without the threat of disease to existing native and hatchery stocks of fish.

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

ISSUE:

Ensure that salmon farming does not impact the genetic integrity of existing natural and hatchery stocks of salmon and trout.

DISCUSSION:

Preserving the genetic diversity of Alaska's fishery resources has been recognized as an important fisheries management goal. This is especially true for the state's enormous salmon resources.

Alaska, in maintaining the health and perpetuity of its salmon resources, subscribes to the theory that identifiable units of salmon (populations, stocks, races) have through natural selection become adapted to the particular watershed that serves as home. This adaptation is preserved in the genetic make-up (gene pool) of the stock. State fisheries managers have sought to maintain stock diversity to ensure the long-term health of our salmon populations. Loss of stock diversity can occur through dilution brought about by interbreeding with other stocks. For these reasons, Alaska at the outset of its salmon ocean ranching program set in place stringent regulations that govern the movement of salmon and trout within the state and prohibited the import of salmon and trout for aquaculture purposes.

The Department of Fish and Game's genetics policy prohibits the importation of live salmonids (salmon family) into the state, and does not allow stocks to be transported between major geographic areas, such as Southeast, Kodiak Island, Prince William Sound, Cook Inlet, Bristol Bay, and AYK/Interior. The policy has been adopted in order to protect Alaska's diverse natural salmon and trout stocks.

Any new aquaculture venture, such as salmon farming, must be governed by the same policy, transport regulations, and statutes that have applied to the salmon ocean ranching program for the past 16 years. This is particularly true for provisions prohibiting the importation of exotic species, such as Atlantic salmon. Atlantic salmon are acutally a trout and are the ecological counterpart of Alaska's indigenous or native steelhead trout. Since these species have not evolved together and thereby have not developed mechanisms to avoid competition with steelhead

trout or other trout, there is a concern about negative impacts on Alaska's indigenous trout.

Therefore, the genetics policy advocates the use of locally adapted stocks of salmon and trout of natural or hatchery origin because this will maintain the state's genetic diversity. This is important in the event of escape or "leakage" through holes in nets or other damage. The magnitude of impact on natural stocks is a function of numbers of fish that escape and that survive to spawn. It is assumed that low levels (less than 5 percent) of escapees can be managed by properly designed net-pen rearing units. Impacts on natural stocks from salmon farming would be minimized because of the policy of using locally adapted stocks.

SUMMARY:

Assuming that imports of exotic species such as Atlantic salmon or other fishes remain prohibited, that current regulations and policies remain in place, and that "leakage" of fish from the pens is kept low, salmon farming can be accommodated without the threat of impact to the genetic integrity of native and hatchery stocks of salmon and trout.

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

ISSUE:

Availability of salmon eggs, fry, and smolts for salmon farming.

DISCUSSION:

The current form of salmon aquaculture in Alaska is ocean ranching. In this system, adult salmon return to their point of release after undergoing and extensive marine migration and contribute to the commercial, sport, subsistence, and personal-use fishery. This ocean ranching program is made up of public and private nonprofit (PNP) freshwater hatcheries and estuarine, juvenile net-pen rearing facilities. Enabling legislation created the public system in 1971, and in 1974, legalized the PNP Program.

Ocean ranching is not only the most successful form of aquaculture in Alaska, it is the largest program in North America and about the third largest in the world being Japan and Russia. The combined public and PNP ocean ranching harvest to the common property fishery in 1987 was in excess of 16 million salmon; this is projected to grow to 34 million for and estimated gross value of approximately $78 million by 1993. In terms of evaluating the economic impact of the statewide ocean ranching program on the Alaskan economy, it represents $75 million in resident-only personal income and 2,030 jobs for alaskans. It is in the context of a successful and building ocean ranching program that we need to evaluate the availability of salmon smolts for the proposed salmon farming industry.

When salmon farming is initially legalized in Alaska, a major factor limiting development will be the availability of smolts for these saltwater farms. The current public and PNP ocean ranching program produces salmon smolts which, as adults, contribute to the common property fishery. Since the common property fishery harvest is regulated by the Alaska Board of Fisheries, it also follows that the availability of smolts is also part of the allocation process. The principle reason salmon smolts would be surplus to the common property fishery is that the present ocean ranching program is operating below capacity due to funding constraints. However, if the salmon smolts are determined by the Board of Fisheries to be surplus to the common property fishery, then they could be sold by the Commissioner. Under existing law, only the state through the Commissioner of the Department of Fish and Game (ADF&G) can sell eggs, fry, or smolts. The PNP hatcheries are

prohibited from selling eggs, fry, or smolt except to another PNP hatchery or to the state. therefore, a change in the law would be required in order to extend the sales opportunity to the private sector. Once the private for-profit salmon farming industry begins to evolve, there will be a demand to have private for-profit freshwater hatcheries to produce smolts for the mariculture industry. These will come from either eggs taken by permit from natural salmon stocks, or by purchase of eggs from public or PNP hatcheries, or eventually from private broodstock produced from the saltwater farming operations. The latter will represent the preferred source of eggs because of the need to develop domesticated broodstock. This will take ate lease one generation, 4-5 years for chinook salmon to provide eggs, but generally three generations to initiate change towards domestication. Therefore, in the interim, the availability of eggs for salmon farmers with freshwater hatcheries or smolts for those with only saltwater farms will need to be addressed.

On the one hand, sale of eggs or smolts could assist in the financial health of the salmon ocean ranching program which benefits the common property fishery. This dilemma represents the heart of the public policy debate; specifically, the allocation of resources from an established common property fishery to a proposed private for-profit industry. This issue clearly belongs in the legislative arena, but it needs to be resolved so that agencies such as ADF&G know how to allocate eggs, fry, or smolts to the potentially new salmon farming industry.

SUMMARY:

The availability of eggs, fry and smolts for the salmon farming industry is an allocation decision, and is central to the public policy debate regarding allocation of resources from the common property fishery to the private for-profit farmer. Under the current law, the Board of Fisheries would probably make the determination of whether or not eggs, fry, or smolts are surplus. If the Legislature legalizes salmon farming and the Board of Fisheries determines that a surplus exists, then eggs, fry or smolts could be sold to potential salmon farmers by the commissioner of ADF&G.

HABITAT PROTECTION
Department of Fish and Game
Division of Habitat

ISSUE:

Ensure protection of important habitat through proper siting and design of mariculture facilities.

DISCUSSION:

Floating mariculture operations can result in one or both of the following environmental effects: (1) accumulation of organic-rich sediments on the benthic substrate beneath the facility, and (2) changes in water quality.

Proper siting of mariculture facilities is essential if there is to be minimal environmental effect from a mariculture operation. If not properly sited, the accumulation of organic-rich sediments in the form of wastes, uneaten food, and shell debris below the facility can cause physical and chemical changes in the natural bottom sediments. Included in these changes are increased oxygen consumption within the sediment; and increased concentrations of total volatile solids, total organic carbon, sulfides, nitrogenous compounds, and phosphates.

Accumulation of such sediments and resultant oxygen depletion in the interstitial water can have effects upon the infaunal invertebrate community in the immediate area. Loss of species that are intolerant of organic enrichment often occurs in these areas. In addition, if such accumulation occurs in an area of extensive bottom vegetation such as eelgrass beds, important habitats can be lost. It should be noted, however, that wastes generated by the farming operation generally are not similar to city wastes which can contain detergents, heavy metals, and other contaminants. The wastes referred to here are purely organic in nature.

In order to prevent organic-rich sediments from building up on the benthic substrate and affecting infaunal invertebrates and important habitats, facilities should be sited in areas known to be well flushed in water with adequate depth. Facilities should not be sited in sensitive habitats such as eelgrass beds, herring spawning areas, or mouths of anadromous fish streams. Siting over eelgrass beds or other marine vegetation can result in degredation of these habitat types by sediment accumulation or possibly shading. Likewise, if these habitat types are providing substrate for herring spawn, additional impacts would result from their loss. The mouths and intertidal area of anadromous fish streams serve as feeding and marine

accumulation areas for outmigrating fry and smolts. Such areas should be avoided to minimize impacts to these sensitive areas and prevent possible disturbance to returning adults.

High concentrations of marine mammals and waterfowl can result in increased predation problems. In addition, disturbance to important wildlife could occur from increased human activity in the area. To minimize such problems, known concentration areas such as haulouts, nesting areas, and marine mammal or bird feeding areas should be avoided when possible.

SUMMARY:

Mariculture facilities could have a significant impact on important habitat areas if improperly designed and sited. These problems can be minimized by implementing proper siting and design criteria.

PREDATION
Department of Fish and Game
Division of Habitat

ISSUE:

Minimizing Predation and Bear/Human Conflicts

DISCUSSION:

Predation is a common problem with mariculture operations. The list of predators includes all types of fish or shellfish-eating mammals, fish and birds. Generally, the most serious problems with predator control involve mammals and birds. In Alaska, these categories can be expected to include seals, sea lions, mink, marten, otters, and various birds. If shore-based facilities are involved, improperly disposed garbage and wastes will attract bears and result in confrontation problems.

The problem of predation can be reduced by installation of screening or netting, and attempting to avoid known concentration areas such as bird nesting areas, marine mammal haulouts, or heavily used bird or mammal feeding areas. The department will consider mariculture facilities to be "attractive nuisances" to predators and would not favor destruction of predators under 5 AAC 92.410(a) (2), defense of life or property. The Department of Fish and Game is working closely with the Department of Environmental Conservation and the U.S. Forest Service to address the problem of bears and garbage, and garbage and wastes at shore-based facilities must be disposed of properly.

SUMMARY:

Predation could be a significant problem at mariculture facilities, but with proper design and siting predation can be minimized or prevented altogether.

PRODUCT WHOLESOMENESS
Department of Environmental Conservation
Division of Environmental Health

ISSUE:

Ensure product wholesomeness through site certification and by regulating the use of chemicals in mariculture operations.

DISCUSSION:

Currently, Alaskan seafood products have a world-wide reputation for quality and wholesomeness. The state has invested considerable resources in this reputation, through DEC's seafood inspection program and Alaska Seafood Marketing Institute's promotional efforts. It is important to ensure the safety and wholesomeness of any seafood produced through a mariculture industry. The Department of Environmental Conservation believes that safe and wholesome mariculture products can be produced if the department is given the authority to regulate certain aspects of the industry.

The Department of Environmental Conservation needs additional authorities to develop standards and regulation for the certification of mariculture sites and for the control of chemicals used to treat the product or their environment.

Chemical Usage

Currently the use of chemicals in mariculture operations is regulated by the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA). The FDA regulates the use of medicines and food colorings, and the EPA controls the use of chemicals such as anti-fouling compounds and parasiticide.

These chemicals must be registered with the appropriate federal agency. The manufacturer for registration submits scientific data supporting claims for efficacy and safety and identifying any environmental hazards. If the regulating agency finds the data to be adequate, the agency issues a label for the product, including instructions for use and safety precautions.

The regulatory agencies have established, for some of these chemicals, required minimum time periods between the time when the chemicals are applied to food products and the time when the food product may be marketed. For some chemicals, there are restrictions on levels allowable in the tissues of

the product when it is sold. If label instructions for these chemicals are followed, use of these products should be safe and not present any harm to the consumer.

Chemical compounds are used as anesthetics to reduce trauma to the animals during handling; disinfectants are used to remove pathogens from gear and equipment; food colorings are used to alter the color of the animal's flesh; and antiseptics, antibacterials, viricides, fungicides, and parasiticide are used to control disease organisms.

The potential problem with the use of chemicals is ensuring that they are being applied according to the label instructions. Currently, the FDA and EPA are responsible for monitoring their use. However, both agencies have limited resources available for surveillance in Alaska. To maintain consumer confidence in the safety of mariculture products, the Department of Environmental Conservation needs specific authority to develop regulations to control the use of chemicals and authority to conduct inspections to confirm application according to label instructions. State regulations adopted pursuant to such statutory authority would refer to federal regulations so that federal labels would be accepted by the state. The purpose of monitoring would be to confirm that the chemicals were used properly. Regulations would likely include requirements for training and certification of applicators of these chemicals and requirements for record keeping and testing.

Site Certification

In order for any state's shellfish to be sold in interstate commerce, it is necessary for the state to have a shellfish site certification and processing inspection program that meets the requirements of the federal Food and Drug Administration. The Department of Environmental Conservation administers an Alaskan shellfish program which has been approved by the FDA. Under this program, all shellfish growing areas in Alaska must be certified, and harvesters and processors must be permitted by the Department of Environmental Conservation.

The Department of Environmental Conservation surveys growing areas for sources of pollution and extensively samples and tests the water quality to determine if it meets regulatory requirements. Sampling and testing is also conducted to determine levels of paralytic shellfish toxins.

If the site is acceptable, then it is certified by the Department of Environmental Conservation. Only shellfish from certified growing areas may enter commerce. The specific requirements for growing area water quality and site surveys are contained in the National Shellfish

Sanitation Programs Manuals which are referred to in Department of Environmental Conservation's regulations.

Legislation should give the Department of Environmental Conservation the authority to develop a certification and permitting program for other mariculture species similar to the one presently in place for shellfish. Mariculture sites should be surveyed and certified. The site certification program would ensure that Alaskan mariculture products were free from exposure to pollutants and contamination in the growing site. The site certification program would prevent mariculture products from being raised in areas which are subject to pollution.

Labeling

DEC is responsible for ensuring that seafood produced in Alaska is safe and wholesome. DEC also assists the Alaska Seafood Marketing Institute in developing programs to produce and promote quality products. It is important to ensure the safety and wholesomeness of any seafood produced through a mariculture industry. Current statutes and regulations would not require any differentiation in labeling between wild products and farmed products. It might be helpful to consumers to distinguish mariculture products from "wild" products. The Department of Environmental Conservation would enforce such requirements if they are instituted.

SUMMARY:

The production of safe and wholesome mariculture products and the preservation of Alaska's seafood product's reputation for quality can be maintained and enhanced by giving the the Department of Environmental Conservation's Division of Environmental Health the authority necessary to regulate the use of chemicals and insure that mariculture sites are free from contaminants which might affect public health.

Summary of Mariculture Requirements

(British Columbia, Maine, California, Washington)

The following chart is a compendium of information from four separate systems of implementing mariculture programs. For detailed information regarding actions taken by each program, please refer to the corresponding footnotes.

(Y) Issue addressed | [N] Issue not addressed | ? Information not available | [1] Footnote

	British Columbia	Maine	California	Washington
General				
Lead Agency	(Y)	(Y)	(Y)	(Y)
Site Survey	(Y)[1]	[N][2]	[N][3]	(Y)[4]
Public Notice/Hearings	(Y)	(Y)[5]	(Y)[6]	(Y)
Application Fees	(Y)[7]	?	(Y)[8]	(Y)[9]
Annual Report	(Y)[10]	?	(Y)[11]	(Y)[12]
Land Use				
Size/Density of Farm	?	(Y)[13]	?	(Y)[14]
Land Use Planning Designation for Mariculture	?	?	?	(Y)
Leases Issued for Mariculture	(Y)[15]	(Y)[16]	(Y)[17]	(Y)[18]
Land Use Preferences	?	(Y)[19]	?	(Y)[20]
Conflict Resolution	(Y)	(Y)	(Y)	(Y)
Clean-up/Performance Bonds	(Y)	(Y)	?	(Y)
Land Rent	(Y)	(Y)[21]	(Y)[22]	(Y)[23]
Survey Plat Required	?	?	(Y)[24]	(Y)[25]
Water Quality				
Separation of Facilities	(Y)[26]	[N]	[N][27]	(Y)[28]
Waste Discharge	(Y)[29]	[N]	(Y)[30]	(Y)[31]
Water Quality Siting Criteria	(Y)[32]	[N]	(Y)[33]	(Y)[34]
Water Quality Monitoring	(Y)[35]	(Y)[36]	(Y)[37]	(Y)[38]
Fish and Wildlife				
Broodstock Acquisition	(Y)[39]	?	(Y)[40]	?
Disease Controls	(Y)[41]	?	(Y)[42]	(Y)[43]
Genetic Controls	(Y)[44]	?	(Y)[45]	(Y)[46]
Exotic Species	(Y)[47]	?	(Y)[48]	(Y)[49]
Private For-Profit Hatcheries	(Y)[50]	?	(Y)[51]	?
Protection of Existing Wild Stocks or Other Fish & Wildlife	(Y)[52]	?	?[53]	(Y)[54]
Measures to Protect Sensitive Habitats	(Y)[55]	(Y)[56]	(Y)[57]	(Y)[58]
Product Quality/Wholesomeness				
Site Certification and Evaluation	(Y)[59]	?[60]	(Y)[61]	(Y)[62]
Control and Monitoring of Chemicals and Additives	(Y)[63]	?	?[64]	(Y)[65]
Product Labeling	(Y)[66]	?	(Y)[67]	?[68]

Mariculture Requirement Footnotes

General

1. Finfish: An environmental assessment of site suitability must be completed for every potential net pen site. Possible requirements, in addition to a site plan (location and boundaries), include: depth contours, current patterns, maps of sub-tidal vegetation, invertebrate studies and pre-installation water quality data. A SCUBA survey is required in areas where water depth is less than 20 meters to describe substrate, vegetation and faunal presence. In areas deemed "sensitive", may also require: seasonal assessment of oceanographic characteristics, identification of other effluent discharges in the same area, measurements of background water quality and sediment quality characteristics, vegetation mapping, and compilation of fisheries resources information.

   Other species: The culture of molluscs, crustaceans and marine plants may also have significant environmental impacts. Site survey information required may vary depending on the proposal. Department of Fisheries and Oceans (DFO) offices should be contacted. Information required may include certain of the survey elements required for finfish culture.

2. No requirements at present. Maine is in the process of developing standards for siting and other criteria for management of mariculture activities.

3. No standardized site survey requirements. The Sanitary Engineering Branch of the Department of Fish and Game studies and decides on the acceptability of all shellfish areas. Applicants are required to provide preliminary water quality data (no specifics listed) to evaluate the areas for pollution. Also, the application for the lease of state water bottoms for aquaculture must include, when available, high and low tide lines.

4. Finfish: Prior to permit application, an initial site characterization survey is required, Requirements vary by facility size (i.e. Class I = production capacity less than 25,000 lbs/year; Class II = production capacity greater than 25,000 lbs/year but less than 100,000 lbs/year; Class III = production capacity greater than 100,000 lbs/year). Requirements for all classes: recommended consultation with state and local authorities, bathymetric survey, hydrographic survey (i.e. current and velocity), and diver survey of biological resources done April thru September. Class III additional requirements: drogue tracking, vertical hydrographic profiling (as part of hydrographic survey), sediment chemistry sampling and benthic infauna sampling.

   Other species: Site survey requirements vary; are dependent upon local SEPA (State Environmental Policy Act) requirements.

5. Mandatory public hearings after 20 day notice in newspaper and trade journal.

6. Mandatory public hearings after 90 day notice in newspaper.

7. $25

8. $100

9. $25

10. Annual health report required by the Fish Transport Committee, Department of Fisheries and Oceans (DFO). Operational log with monthly or quarterly production figures required. Water quality monitoring report specified on a site-specific basis.

11. Yearly registration with the California Department of Fish and Game required.

12. Annual report must be submitted to the Department of Natural Resources which distributes it to other resource agencies. Facilities with less than 20,000 lbs/year production are exempt. Those with productions of 20,000 to 100,000 lbs/year must submit benthic dive survey only. Facilities with production greater than 100,000 lbs/year must submit complete report (benthic survey, water quality survey and hydrographic survey).

Land Use

13. 5 acres per lease with a maximum acreage of 200 acres per person.

14. Maximum of 40 acres per oyster farm, salmon farms are divided into Class I, Class II and Class III farms depending on the carrying capacity of the site. The class determines how many thousands of pounds can be produced at the site.

15. Lease or license of occupation issued, section 10 permit used for one year to allow site research.

16. Leases issued up to 10 years, negotiated if there is no competitive interest.

17. Leases issued for up to 25 years auctioned.

18. Leases issued for 5 to 10 years.

19. First to the state, second to riparian owner of the intertidal area within the lease area, third to fisherman who have traditionally fished in or near the lease, fourth to the riparian owner within 100 feet of the lease area.

20. To adjacent upland owner.

21. Based on tvpe of use.

22. Auction amount plus privilege tax charged for amount of product sold.

23. Fair market value plus value of existing edible shellfish within the lease.

24. Paper plat tied to existing upland monuments.

25. Paper plat tied to existing upland monuments.

Water Quality

26. Minimum distance between operation lease boundaries must be at least 5 km to minimize risk of disease transfer and minimize potential cumulative water quality impacts.

27. No spacing or size limits; many sites are contiguous. The size and location of allotments is decided by the Department of Fish and Game on a case-by-case basis as they work with the applicants.

28. No specific distance limits, however, may limit fish production due to local water conditions (i.e. they restrict production in areas with chronic water problems due to dissolved oxygen and nitrogen concentrations). Washington also limits maximum production to 1,000,000 lbs/year/square nautical mile.

29. The Ministry of Environment, Waste Management Branch, has draft regulations that exempt finfish farm effluent (feces and feed) from waste management permit requirements. Shellfish farms are also exempt. Sewage facilities associated with farm facilities are required to get a waste management permit for water discharge, although this permit requirement has not been strictly enforced. B.C.'s main waste concern at this time is dead fish and possible disease transmission from disposal in open water. They are hoping a multi-collection and disposal service can be arranged.

30. Regional Water Quality Boards (9 in state) issue water quality discharge permits - NPDES permits. Water quality discharge standards are the same as the federal standards.

31. A NPDES permit is required for the discharge of pollutants into surface waters of the state by a point source. Both aquaculture activities and processing operations require permits. For aquaculture, this includes "Concentrated Aquatic Animal Production Facilities" such as ponds, raceways, or similar structures which produce 20,000 pounds per year of cold water species or more, and which feed 5,000 pounds per month of feed or more, and which discharge at least 30 days per year. Permits for such facilities require sedimentation basins for cleaning wastewater and require monitoring of effluent quality. Also included are in-water aquaculture projects in which a discharge of pollutants is used to grow aquatic organisms. Washington has water quality and effluent standards that all discharges must meet. Also, any activity or action which would cause short-term violation of the State's Water Quality Standards requires a Water Quality Standards modification from the State Department of Ecology.

32. For finfish: Pens must be anchored in not less than 10 meters of water at zero tide. Minimum of 2 meters between bottom of pen and ocean floor. Net pens should be located in areas of good circulation and tidal flushing. No direct sewage discharge from living quarters on the lease site.

33. No preconceived rules or standards. Decisions are made on a case-by-case basis. The proposed area must have good flushing.

34. For finfish: Required minimum depth between pen bottom and ocean floor ranges from 20 to 60 feet, depending on the size of operations and local currents.

35. Monitoring of approved net pen operations may be required to provide information on substrate quality, water quality (distribution of dissolved and suspended solids, nutrients, pathogens, chemicals), accumulation patterns of organic deposits, alterations in vegetation distribution patterns, change in benthic structure or other site-specific information. Once a site has been in operation for some time, reporting requirements may be required if there is increased production, negative impact on the environment, or as part of a general coastwide aquaculture impact assessment program. Sample measures, replicates and frequency are specified on a site-specific basis.

36. The Department of Marine Resources may conduct an annual review of each aquaculture lease if the operation has been conducted in a manner injurious to marine organisms.

37. Operators are required to provide on-going water quality data as deemed necessary to evaluate the area and ensure year-round protection of the shellfish consumer. The amount of sampling required depends on the location and susceptability of harvest sites to pollution problems. At any time the state may obtain water samples.

38. Annual monitoring requirements vary by facility size. Class I = none; Class II = Benthic survey/diver survey; Class III = Annual summer monitoring to include benthic/diver survey, sediment chemistry, benthic infauna, water quality sampling, current velocity and direction.

Fish and Wildlife

39. Eggs obtained from surplus eggs at federal hatcheries or purchased from private hatcheries.

40. Broodstock purchased from commercial sources (commercial license holders or registered aquaculturists). If no commercial supply available, then broodstock can be collected from wild stocks under permit from the California Department of Fish and Game (CFG). The broodstock remains the property of the state, but the progeny belong to the applicant.

41. Eggs must be certified as disease free by the Department of Fisheries and Oceans (DFO). Fish Health Protection Regulations (DFO) apply.

42. Covered by Aquaculture Disease Control Regulations of the CFG.

43. Requires permit from the Washington Department of Fisheries (WDF) for transportation or import of live fish or viable sexual parts.

44. DFO and Provincial Ministry of Environment require approval for transport of eggs, smolts, or fish over 50km.

45. Any fish planting requires approval of the CFG.

46. Covered by fish transport permit (WDF).

47. All salmonid importation must comply with Federal-Provincial Policy for the importation of live salmonids into British Columbia.

48. All importation, transportation, and planting of fish is controlled by the CFG.

49. Covered by fish transport permit (WDF).

50. Must be licensed by DFO.

51. Controlled by CFG regulations.

52. Federal-Provincial importation policy for salmonids.

53. Importation, transportation, and planting of fish is controlled by the CFG.

54. Site location controlled by Interim Guidelines of the Department of Ecology. WDF and the Washington Department of Game review site locations.

55. Location approval by DFO. Detailed dive survey required. No finfish pens located within 1km radius of the mouth of anadromous fish streams. No net pens in "sensitive habitats" as defined by Sec. 31(5) of the Fisheries Act.

56. Applicant cannot unreasonably interfere with ingress and egress of riparian owners, navigation, fishing or other uses of the area (Department of Marine Resources regulation).

57. Leasee may not unreasonably impede public access to state waters, but may limit public access to the extent necessary to protect facility (CFG regulations). CFG reviews location of sites.

58. Interim guidelines do not allow siting over "habitats of special significance" (determined by WDF) in waters 75 feet or less in depth.

Product Quality and Wholesomeness

59. Siting criteria is considered one of the most important criteria for aquaculture development. Information may be required for current patterns, sub-tidal vegetation mapping, invertebrate studies, and water quality parameters.

    Net pens are restricted by distance from shellfish operations and from other lease operations. This restriction prevents contamination of shellfish or other fish from transfer of pathogenic organisms and chemicals.

60. No information on product quality or wholesomeness available from materials on hand.

61. Requires an actual on-site inspection by a representative before a permit is given. Aquaculture proposals are required to include a description of plans and maps showing locations of proposed harvesting areas. They also must include a description of type and location of any facilities to be used for handling, packaging, or string products within the state.

62. Applicants must have submitted a site assessment prior to the application process which included 1) a bathymetric survey 2) a hydrographic survey and 3) a dive survey of biological resources.

    Washington has also divided the coastline into "habitats of special significance" which identify 1) areas important to commercial or sport fisheries, 2) those of critical ecological importance and 3) those especially sensitive to degredation by culture activities.

63. They are looking into effects of anti-foulant and antibiotic use on net pen farms. Initial indications show that oysters accumulate chemicals that are used to treat nets with the result of reduced growth and poisonous flesh. No research available yet on accumulation in farm fish of anti-foulants. Because of this, distance restrictions are in place for proximity of net pens to shellfish and other fish farms. From literature, it does not appear that B.C. has any definate restrictions or federal guidelines regarding the use of chemicals or additives.

64. Use of chemicals was not mentioned in material available.

65. Applications for aquaculture must go through an environmental assessment by submitting an operations plan which includes chemical and anti-foulant use. Also as a guideline, Washington has determined that TBT should not be used as an anti-foulant agent. Use of other anti-foulants must be reviewed on a case-by-case basis and reported to the Washington Department of Ecology.

    Only antibiotics licensed by FDA are allowed to be used at the present time. This limits use to oxytetrecycline, sulfamerizine, and Romet 30. These should be used sparingly on a short-term basis (there did not appear to be minimum time and dosage requirements for this).

    Annual monitoring report includes types of antibiotics used and frequency of use over past year. Also includes types of anti-foulants used and frequency of net treatment.

66. Fish crossing provincial lines must have proof of coming from registered facility. This is also true for exporting fish.

67. Department of Health Services, Food and Drug Branch sets requirements for proper packaging and labeling of fish and shellfish moved in commerce.

68. No information on labeling from information available.

STATE OF ALASKA

OFFICE OF THE GOVERNOR

DIVISION OF GOVERNMENTAL COORDINATION

STEVE COWPER, GOVERNOR

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NORTHERN REGIONAL OFFICE
675 SEVENTH AVENUE
STATION H
FAIRBANKS, ALASKA 99701-4596
PHONE: (907) 456-3084

Dear Applicant:

The Shellfish Farm Application is designed to help you obtain most of the authorizations you will need from the State of Alaska Departments of Natural Resources (DNR), Fish and Game (ADF&G), Environmental Conservation (DEC), and Division of Governmental Coordination (DGC) in order to begin your shellfish mariculture project. A Coastal Project Questionnaire, which is available from any of these agency offices, must also be submitted with your application to help determine which specific permits must be obtained prior to constructing your project.

Please read this application carefully. A fully completed application will help the state agencies to process your request promptly. Incomplete or incorrect information may result in requests for additional information, processing delays, or the application may be returned to you for resubmission. You will receive a notice and processing schedule for the state coastal zone consistency review from DGC when your application has been accepted for processing. Your permits will also be processed on this schedule.

If you need technical assistance in completing this application, please refer to the list of agency representatives provided at the back of this application packet. If you have questions about this application process, or you are not able to determine which agency can best answer your technical questions, contact the Division of Governmental Coordination in Juneau at 465-3562, in Anchorage at 274-1581, or in Fairbanks at 451-2818.

Additional Permits

In addition to the permits and approvals which you are applying for in this consolidated permit application, you will also need to separately apply for and obtain a Fish

Transport Permit from ADF&G to obtain and hold broodstock; and a Growing-Area Certification and a Harvester's Permit from DEC in order to sell your product. These permits are not covered by this application since they are required for later phases of your project.

A Fish Transport Permit is required by ADF&G in order to hold, transport, and raise live fish including shellfish. You will need this permit before you can obtain, hold, or begin raising your product. We encourage you to contact the Fisheries Rehabilitation, Enhancement and Development (FRED) Division in Juneau at 465-4160 or in Anchorage at 267-2157 as early as possible in order to apply for and obtain a Fish Transport Permit.

You should contact DEC regarding area certification requirements so that you can be reasonably sure that your site will qualify. We recommend that you apply for growing area certification and a harvester's permit at least six months before you intend to harvest shellfish. To obtain more information on certification requirement please contact DEC in Anchorage at 272-1561 or in Juneau at 465-2609 or 465-2696.

jbak87122401DMF

Consolidated Shellfish Farm Permit Application

General Instructions

1. Fill in the blanks on the form provided.

2. If additional space is needed to fully answer a particular question, attach additional pages marked with the corresponding number in the application.

3. Applications must be ***typed*** or ***printed*** clearly in ***ink***.

4. Applications must be signed by the applicant or an authorized representative.

5. The application should be forwarded to the appropriate regional office of the Office of Management and Budget's Division of Governmental Coordination for the region in which the farm is to be located (see attached map for regional boundaries).

Southeast Reginal Office
431 North Franklin Street
P.O. Box AW, Suite 101
Juneau, Alaska 99811-0165
(907) 465-3562

Southcentral Regional Office
2600 Denali Street
Suite 700
Anchorage, Ak 99503-2798
(907) 274-1581

Northern Regional Office
675 Seventh Avenue
Station H
Fairbanks, AK99701-4596
(907) 451-2818

6. ***Please note:*** This application is for a specific mariculture project. You will need to submit a new application if you change any of the following:

   A. The species to be propogated
   B. The size or design of your operation
   C. The location of your operation
   D. Request a long-term tidelands lease for a previously permitted site

PERMIT APPLICATION
State of Alaska Consolidated Shellfish Farm

APPLICANT INFORMATION

1. _____
Name

_____
Mailing Address

_____ _____ _____
City State Zip Code

_____
Phone

2. _____
Business Name (if applicable)

_____
Business Address

_____ _____ _____
City State Zip Code

_____
Phone

3. _____
Authorized Agent (if applicable)

_____
Address

_____ _____ _____
City State Zip Code

_____
Phone

PROJECT INFORMATION

1. Provide a brief description of the facility and your overall proposal. Include upland facilities as well as tide and submerged land facilities.

_____

_____

_____

2. What experience, expertise, and other resources do you have available for this project?

_____

_____

_____

PROJECT LOCATION

1. Is the Project on: (please mark with ✓)

State Land _____ Federal Land _____ Private Land _____ Municipal Land _____

2. Township _____ Range _____ Meridian _____ Section _____

3. Number of acres applied for:

Uplands _____ Tidelands _____

4. Provide the names and addresses of the landowners of adjacent uplands and tidelands.

Uplands	Tidelands
A _____	A _____
B _____	B _____
C _____	C _____

5. Attach topographic maps (U.S.G.S. Scale 1; 63360) and nautical charts to this application that show the site location and general area. Clearly indicate the site location on the charts and maps.

SITE PLAN & PHYSICAL DESCRIPTION

1. Provide a site plan drawn to scale (no less than 1" = 50') which shows the layout and location of the following:

   A. The rafts or other production facilities employed (please include size and number).
   B. Anchoring systems and shoreties.
   C. Docks, floathomes, or caretaker facilities, including source of freshwater for domestic use and processing water, wastewater disposal systems, and solid waste storage and disposal.
   D. Any freshwater discharges.
   E. Roads or air strips.
   F. Other upland or tideland facilities at the site associated with the farming operation.
   G. Fuel and chemical storage.
   H. Property lines referenced in #4 of the previous section.

2. On the site plan, draw lines and identify the tide level at the following stages:

   - Mean Lower Low Water (MLLW)
   - Mean Higher High Water (MHHW)
   - Mean High Water (MHW)

3. Diagram surface tidal current speed and direction at maximum tide flow on the site plan or nautical chart.

4. Water depth at the site of culture gear at MLLW would be: _____

SITE SUITABILITY

1. Physical and Biological Characteristics

   A. Have you conducted an on-site investigation? yes____ no____

   B. Provide any information you may have regarding tidal flushing, water temperature, salinity, and turbidity/sedimentation at the site. Include the dates these data were obtained.

   _____

   _____

   _____

   C. Describe the bottom type composition at the site (if more than one type, indicate percent).

   sand____ mud____ rock____ gravel____ eelgrass____

   other: _____

   _____

   _____

   D. Describe winter conditions at the site (temperatures, icing, storms, etc.).

   _____

   _____

   _____

E. Do anadromous fish (e.g. salmon) use any streams in the area for spawning? yes____ no ____

If yes, indicate which streams are used and label them as such on the site plan.

_____

_____

_____

F. Is the target species naturally present in the area? yes____ no____

If yes, describe abundance condition.

_____

_____

_____

G. Describe measures you would propose to control predation by marine mammals, seabirds, or other potential predators.

_____

_____

_____

WATER QUALITY

NOTE TO APPLICANT: Sewage or industrial discharge(s) may accumulate in, or harm the growth or consumptive use of your shellfish product. Oysters, mussels and scallops are filter feeders and may accumulate fecal coliform bacteria from sewage discharges. If a caretaker facility is located near the culturing operation there may be a risk of contamination. DEC will require that the wastewater treatment systems used on caretaker facilities meet Alaska State Water Quality Standards criteria for harvest or consumption of raw mollusks or other aquatic life.

A. Were there any sources of past pollution at the site, such as a shorebased seafood processor, industrial facility, or a town or village? yes____ no ____

If you answered yes to the above, identify:

- The type of previous use (i.e. mine, village, seafood processor) _____
- The last known date of use _____
- The distance from site of previous use to your project site _____

B. Are there any currently active sources of human or industrial pollution in the area? yes____ no____

If yes, please describe:

- The type of discharge(s) _____
- The location and distance from your site _____
- The name of the discharger(s), if known _____

C. If there is a caretaker facility proposed for the site, please identify:

- The sewage treatment method to be used _____
- The expected volume of seawater and greywater _____
- The location of the treated sewage's discharge point _____

CURRENT LAND USE STATUS

Describe the type and intensity of all present uses of the project site and the surrounding area (e.g. commercial development, mining, timber harvest or transfer, sheltered anchorage, subsistence, recreation, commercial fishing, sport fishing, or residential use, etc.).

_____

_____

_____

FARM OPERATION AND DEVELOPMENT

1. Species to be raised:

	Species	Annual Production Goal
A	_____	_____
B	_____	_____
C	_____	_____

2. Please provide a timetable showing approximate dates for installation of spat collection gear, placement of production facilities, date of first sale, and a schedule for reaching expected maximum production.

_____

_____

_____

3. Donor Stock

Have you submitted a Fish Transport Permit application to the Department of Fish and Game?
yes_____ no _____

If yes, date of application _____

Certification Statement

I certify that all of the information contained herein is true and complete to the best of my knowledge. I also understand that I must separately apply for and hold a Fish Transport Permit from the Department of Fish and Game in order to hold, transport, and raise shellfish, and a Growing Area Certification and a Harvesters Permit from the Department of Environmental Conservation in order to sell my product.

_____ _____

Signature of Applicant or Agent Date

TITLE 5.
FISH AND GAME
CHAPTER 41.
TRANSPORTATION, POSSESSION, AND RELEASE OF LIVE FISH

ARTICLE 1.
SCOPE OF REGULATIONS

5 AAC 41.001 is amended to read:

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, and the transportation and possession of shellfish for commercial purposes in conjunction with a shellfish farming operation.

(In effect before 1988; am __/__/88, Register __)

Authority: AS 16.05.251(a)

ARTICLE 3.
GENERAL PROVISIONS

5 AAC 41.100 is amended to read:

5 AAC 41.100. DEFINITIONS. In addition to the definitions set out in AS 01.10.060 and AS 16.05.940, in 5 AAC 41.001--5 AAC 41.100

(1) "completed application" means a form, series of forms, letters or other documents which provide all of the information necessary for the commissioner or his authorized designee to issue, condition or deny a permit;

(2) "department regional office" means the Alaska Department of Fish and Game, Fisheries Rehabilitation, Enhancement and Development Division offices located as follows:

Region I - Southeastern Region
Island Center Building
P. O. Box 2-
Douglas, Alaska 99824-0020

Region II - Central, Westward and
Arctic-Yukon-Kuskokwim Region
333 Raspberry Road
Anchorage, Alaska 99502

(3) "fish pathology section" means the Alaska Department of Fish and Game, Fisheries Rehabilitation, Enhancement and Development Division, Fish Pathology Section, located at 333 Raspberry Road, Anchorage, Alaska 99502, telephone (907) 344-0541;

(4) "ornamental fish" means a fish commonly known as "tropical fish," "aquarium fish," or "goldfish" which are imported, cultured, or sold in the state customarily for viewing in aquaria or for raising in artificial systems, and not customarily used for sport fishing or human consumption purposes;

(5) "permit" means a fish transport permit, including any amendment or condition issued or approved by the commissioner or his authorized designee, which has not been suspended, terminated or expired;

(6) "permittee" means the holder of a permit and includes anyone employed, contracted, or assigned by the person to whom the permit was issued.

(In effect before 1988; am __/__/88, Register __)

Authority: AS 16.02.251(a)

5 AAC 41 is amended by adding a new article:

ARTICLE 4.
SHELLFISH FARMING

Section
200. Applicability of Regulations
210. Permit Required
220. Shellfish Farm Permit Application
230. Additional Information
240. Review and Determination
250. Permit Conditions
260. Inspection of a Farm
270. Annual Report
400. Definitions

5 AAC 41.200. APPLICABILITY OF REGULATIONS. The provisions of 5 AAC 41.200 -- 5 AAC 41.400 govern the permit application process for shellfish farm permits, and establish guidelines and procedures regarding the operation of permitted shellfish farms. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.210. PERMIT REQUIRED. A shellfish farm permit, issued by the commissioner, is required for the operation of a shellfish farm. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.220. SHELLFISH FARM PERMIT APPLICATION. An applicant must submit a consolidated shellfish farm permit application and coastal project questionnaire to the nearest office of the Office of Management and Budget, Division of Governmental Coordination for purposes of complying with the project consistency review of the Alaska Coastal Management Program as identified in 6 AAC 50.010-6 AAC 50.190. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.230. ADDITIONAL INFORMATION. If, after an application has been distributed to the department, and the department determines that information in the application is insufficient for an adequate evaluation of the proposed shellfish farm, the department will request additional information from the applicant. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.240. REVIEW AND DETERMINATION. (a) The commissioner will review the recommendations resulting from the department's review of the application before rendering a decision on an application.

(b) The commissioner will render a decision on the application within 5 days after a determination on project consistency with the Alaska Coastal Management Program has been issued by the Office of Management and Budget. The commissioner's decision will be based on the following considerations:

(1) the physical and biological characteristics of the proposed location must be suitable for a shellfish farming operation;

(2) the proposed farm may not unreasonably or adversely affect management of natural stocks, and must not

require significant alterations in traditional fisheries or other existing uses of fish and wildlife resources;

(3) the proposed farm may not significantly affect fisheries, wildlife or their habitats in an adverse manner; and

(4) the proposed shellfish farm plans and staffing plans must demonstrate technical and operational feasibility.

(c) An application for a shellfish farm permit which has been denied by the commissioner will, in the commissioner's discretion, be reconsidered if the applicant provides new or additional information that may have altered the original decision. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.250. PERMIT CONDITIONS. The commissioner will include conditions to the permit that are appropriate to ensure the shellfish farm does not significantly affect fisheries, wildlife or their habitats in an adverse manner. Permits will be issued for a period of three years. Permits may be renewed by submitting a request in writing to the commissioner. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.260. INSPECTION OF A FARM. A permit holder shall allow inspection of the shellfish farm by department inspectors at any time the farm is operating. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.270. ANNUAL REPORT. A person who holds a permit for a shellfish farm shall submit an annual report no later than December 15 to the department. The annual report form shall be distributed to permit holders by the department. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.400. DEFINITIONS. In 5 AAC 41.200 -- 5 AAC 41.400

(1) "commissioner" means the commissioner of the Department of Fish and Game or his designee;

(2) "department" means the Alaska Department of Fish and Game;

(3) "farm" means a specific location where shellfish are raised in captivity or under positive control as in a pen, pond, raft, bottom culture or an area of water completely enclosed by a generally escape-proof barrier for the purposes listed in 5 AAC 41.200 -- 5 AAC 41.280;

(4) "shellfish" means any species of crustacean, mollusk, or other invertebrates, in any stage of their life cycle, found in or introduced into the state, consistent with the definition of "fish" in AS 16.10.296. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

DOC 0062r

MEMO -- January 12, 1988

TO: Fisheries Cabinet

FROM: Paul Peyton

RE: Aquaculture socioeconomic studies

Legislators and others considering proposed regulation of aquaculture activities in Alaska have asked for additional information concerning the social and economic impacts of the various possible forms of development in Alaska. Central to most of the discussion is whether salmon can be profitably farmed in Alaska and compete in the marketplace with wild salmon and farmed fish from other areas. If farm production was to be permitted, what are the potential impacts to the existing common property fishery? What sort of commitment, in terms of time and dollars, would be required of the State to manage and support salmon farming activities?

The DCED has entered into a $20,000 contract with the Sea Fare Group in Seattle to conduct a study of world salmon markets and evaluate the extent of market competition between wild and farmed salmon, including farmed salmon which potentially could be produced in Alaska. Principle investigator for this study will be Dr. James Anderson of the University of Rhode Island. Anderson is a recognized authority in the area and has authored several papers dealing with the market's response to increasing world supplies of farmed salmon. Market contacts, statistical research and report editing functions of the contract will be conducted by the Sea Fare Group which is a commercial consulting business operated by those people that put out the Seafood Leader magazine.

A second $20,000 contract has been undertaken with the DPA group of Vancouver, B.C. DPA will evaluate the relative costs of farmed salmon production in major producing regions around the world, develop a proforma cost of production model for the Alaska situation and assess the sensitivity of major cost factors to overall costs of production. DPA has done similar work for the Government of British Columbia and others and has identified specific sources for the necessary data.

Both contracts call for an interim or progress report to be submitted about February 1st and the final report during the first week of March.

A third phase of the project, that of developing a policy options matrix will be postponed at least until preliminary results from the two contracted studies are reported. At that time we may elect to select a limited number of issues for policy option development and conduct the required work in-house or through an RSA agreement with ISER. There is about $5,000 remaining in the project budget.

STATE OF ALASKA

STANDARD AGREEMENT FORM
FOR PROFESSIONAL SERVICES CONTRACT

1. Agency Contract Number	
2. ATN Number	88-0200
3. Service Code(s)	5950
4. Financial Coding	08751001
5. Agency Assigned Encumbrance Number	0881427
6. Vendor Number	7. AK Bus. Lic. #

This contract is between the State of Alaska,

8. Department of: Commerce and Economic Development — hereafter, the State, and

9. Contractor: The DPA Group, Inc. — hereafter, the Contractor

Mailing Address / Street or PO Box	City	State	Zip Code
601 West Cordova Street	Vancouver, B.C. (Canada)		V6B 1G1

10

ARTICLE 1. Appendices: Appendices referred to in this contract and attached to it are considered part of it.

ARTICLE 2. Performance of Services:

2.1. Appendix A (General Provisions), Articles 1 through 14, governs the performance of services under this contract.

2.2. Appendix B sets forth the liability and insurance provisions of this contract.

2.3. Appendix C sets forth the services to be performed by the contractor.

ARTICLE 3. Period of Performance: The period of performance this contract begins December 21, 19 87, and ends March 15, 19 88. Performance may be extended for additional periods by the written agreement of the parties.

ARTICLE 4. Consideration:

4.1. In full consideration of the Contractor's performance under this contract, the State shall pay the Contractor a sum not to exceed $ 20,000 (U.S.) in accordance with the provisions of Appendix D.

4.2. When billing the State, the Contractor shall refer to the ATN Number and send the billing to:

11. Department of	Attn: Division of
Commerce and Economic Development	Business Development
Mailing Address	**Attention**
P.O. Box D, Juneau, AK 99811	Larry Merculieff

NOTICE: This contract has no effect as an offer by the Contractor until it is approved by the Department of Administraton.

12. CONTRACTOR	14. APPROVAL BY THE STATE CONTRACTING AGENCY
	NOTICE! This certifies the availability of funds. I am aware that certifying false, inaccurate, or misleading documents constitutes an unsworn falsification punishable under AS 11.56.210
Name of Firm: The DPA Group, Inc.	Signature of Head of Contracting Agency or Designee: [signature] — Date: 12/29/87
Signature of Authorized Representative: [signature] — Date: [illegible]	Typed or Printed Name of Authorizing Official: John D. Williams
Typed or Printed Name of Authorized Representative: [illegible]	Title: Deputy Commissioner
Title: [illegible] — Employer I.D. No. (EIN) or SSN:	15. APPROVAL BY THE DEPARTMENT OF ADMINISTRATION
13. REQUESTING AGENCY #8751	
Department/Division: Division of Business Development	
Signature of Project Director: [signature] — Date: 12/23/87	
Typed or Printed Name of Project Director: Larry Merculieff	
Title: Director	

n/a

APPENDIX A
GENERAL PROVISIONS

Article 1. Definitions.

1.1. In this contract and appendices, "Project Director" means the person who signs this contract on behalf of the Requesting Agency and includes a successor or authorized representative.

1.2. "State Contracting Agency" means the Department for which this contract is to be performed and for which the Commissioner or Authorized Designee acted in signing this contract.

Article 2. Inspection and Reports.

2.1. The Department may inspect, in the manner and at reasonable times it considers appropriate, all the Contractor's facilities and activities under this contract.

2.2. The Contractor shall make progress and other reports in the manner and at the times the Department reasonably requires.

APPENDIX C
SERVICES TO BE PERFORMED

COST OF PRODUCTION MODEL FOR PEN-REARING
OF SALMON IN ALASKA AND CURRENTLY PRODUCING REGIONS
ATN No. 88-0200

This study will be conducted in two phases. In the first phase, The contractor will determine the relative costs of production in major pen-rearing regions. In the second phase, the contractor will develop a cost of production model for pen-rearing salmon in Alaska and assess the sensitivity of major cost factors to overall costs of production.

Phase I - Comparative Cost of Production Analysis

The steps to be undertaken by the contractor in Phase I are detailed as follows:

1. Discuss with representatives of the Department of Commerce and Economic Development to clarify the scope of the study.

2. Conduct a literature review of recent studies (to include Bjorndal, Salvanes, Ridley, Shaw, BIM, Anderson, Wurmann, Nasaka) on cost of production in the five major supply regions.

3. Develop profiles for B.C. and Chile from previous models developed by study team members to complete the comparison of costs of production.

4. From a literature review, determine the public support provided to the five major supply regions. The types of public support to be quantified will include the following:

   - final assistance;
   - research and development;
   - education; and
   - other services (for example, diagnostic and extension).

In addition, the type of tax structure established to pay for the support provided by governments in each country will be determined.

5. Prepare an interim report that summarizes the findings of Phase I (refer to reporting requirements in appendix D).

Phase II - Cost of Production Analysis for Alaska

The detailed steps that are to be undertaken by the contractor in Phase II are listed as follows:

1. Collect and analyze background information on likely general development areas. This activity will include a preliminary assessment of expected salmon farm development locations in the southeastern and southcentral areas, to guide the formulation of general biophysical assumptions for the production model. The assessment will include a brief examination of:

   - location of logistic centers;
   - transportation methods;
   - probable areas excluded based on pollution, major alternate user groups, proximity to river mouths, excessive exposure to wind, etc.;
   - location of existing potential smolt suppliers; and
   - location of possible new hatchery locations.

   These data will be collected in part during discussions with personnel in the Department of Commerce and Eocnomic Development and the Department or Fish and Game.

2. Collect and review general biophysical dats from selected development areas. This activity will include examination of:

   - marine and freshwater temperature data;
   - salinity data;
   - location of major streams entering saltwater;
   - phytoplankton data;
   - important marine mammal concentrations; and
   - location of major spawning streams and hatcheries.

   These data will be obtained through discussion with personnel in government agencies and review of published data and additional unpublished data provided by government personnel. Agencies to be contacted will include:

   - the Alaska Department of Fish and Game; and
   - the National Oceanic and Atmospheric Administration, National Fisheries Service (Auke Bay Laboratory, Alaska, and Northwest and Alaska Fisheries Centre, Seattle, Washington).

3. Collect and review recent salmon culture activities in Alaska. This activity will include a review of recent state hatchery production data, particularly for chinook and coho salmon, and experimental marine farming results within the state (e.g., Little Port Walter Research Station). These data will be obtained through discussion with personnel in the government agencies identified in Step 2. This information will be used together with the biophysical data (especially temperature) collected in Step 2 to develop growth projections.

4. Prepare production criteria and assumptions for site areas suitable for pen-rearing of salmon. The information analyzed in Step 1 will be used to identify:

- theoretical average monthly temperatures;
- expected growth rates based on the average temperatures;
- seasonal differences in feed conversion rates;
- average monthly feeding rates; and
- stocking densities.

Where possible, the data will indicate the range of values or conditions that could exist within the study area. In addition, the analysis will identify:

- the likelihood of problems with phytoplankton outbreaks and preditor populations; and
- expected smolt acquisition, transportation and acclimation requirements and problems.

5. Adapt the British Columbia growth models to Alaska by estimating the impact of differences in temperature and other factors between B.C. and Alaska on the likely growth of pen-reared salmon.

6. Estimate the cost of critical inputs for the selected areas for site development. The inputs would include the following:

   - capital costs (net cages, nets, etc.);
   - smolts;
   - fish feed;
   - labor; and
   - diagnostic services.

7. Conduct sensitivity analyses to establish break-even points for pen-rearing salmon in Alaska. This would include an assessment of the following scenarios:

   - production at small and large scales;
   - with and without fish feed production within the state;
   - with and without direct transport to market; and
   - with constant and changing prices.

8. Write and present to the Project Director a draft report of the study findings (refer to the reporting schedule in Appendix D). In addition, the contractor will supply the State with a computer diskette in JAVELIN format containing the cost of production model with supporting documentation. The draft report will also incorporate the findings of the interim report.

9. After review by the project director, make required changes, if any, to the report and to the cost of production model.

APPENDIX D
CONSIDERATION, REPORTING SCHEDULE AND GENERAL CONDITIONS

COST OF PRODUCTION MODEL FOR PEN-REARING
OF SALMON IN ALASKA AND CURRENTLY PRODUCING REGIONS
ATN No. 88-0200

REPORTING SCHEDULE: The contractor will submit an interim project report in writing to the Project Director which summarizes the findings of Phase I (Comparative cost of Production Analysis) by February 1, 1988.

A draft of the final project report containing all study findings, including those findings contained in the interim report, will be submitted in writing to the Project Director for review and approval by February 23, 1988. At the same time the contractor will submit a computer diskette containing the cost of production model with supporting documentation. The contractor will incorporate changes to the draft material suggested by the Project Director and submit ten copies of the approved final report and two copies of the production model diskette on or before March 4, 1988. This schedule allows three days for the Project Director to complete his review of the draft report.

CONSIDERATION: The contractor will submit an invoice for payment with the interim project report on or before February 1, 1988 which reflects all expenditures and services rendered for that period of the contract. A second and final invoice for payment will be submitted with the final project report on or before March 4, 1988 which reflects all expenditures and services rendered for the remaining period of the contract. Payments on both the interim and final invoices are subject to the limitations and conditions described below. All invoice amounts will be stated in U.S. dollars and all payments will be made in U.S. dollars.

Fees charged for services performed by the contractor's various study team members will not exceed the rates shown in the schedule below. (All amounts are in U.S. dollars):

Study team member	Per day	Per hour
D. Egan	$375	$47
J. Dale	200	25
M. Winsby	350	44
T. Bjorndal	520	65

Upon acceptance of the interim and final project reports and receipt of the accompanying invoices by the Project Director, the State will pay the contractor within 30 days. Failure of the contractor to comply with the reporting provisions of this contract will result in the State withholding payment until such compliance is obtained.

If the total amount due on the contractor's interim invoice exceeds $12,000 (U.S. dollars), the State will withhold payment of the excess until the final project report and model is received and accepted by the Project Director. Payment of any excess due on the interim invoice will be made at the same time as the final payment. Under no circumstances will the State be liable for total project costs in excess of $20,000 (U.S. dollars).

If the State cancels the project at any time during the course of this contract, the Contractor shall submit a final billing based on actual expenses incurred up to the termination date.

CONTRACT DISPUTES: All contract disputes will be subject to the provisions of Appendix A, Article 3 of the Standard Form For Professional Services Contract, unless other specifically identified statutes and/or legal requirements apply.

REQUESTS FOR CONTRACT EXTENSION: Requests to extend the ending date for contract performance must be submitted in writing at least 21 days prior to March 4, 1988. The written request should specify the reason why the contract extension is requested and the proposed date to which extension is needed. Upon receipt of the requested extension, the Project Director will send contract amendment forms to the contractor. Contract amendment forms must be signed by the Contractor's authorized agent and returned to the Project Director at least 10 days prior to expiration of the contract. Requests for contract amendments will not be considered if such requests are not received within the time frames specified. Because the value of this study to the State is highly dependent on having the required reports completed according to the schedule specified above, it is unlikely that the Project Director will approve an extension of the contract.

STATE OF ALASKA

STANDARD AGREEMENT FORM
FOR PROFESSIONAL SERVICES CONTRACT

1. Agency Contract Number	
2. ATN Number	88-0198
3. Service Code(s)	5950
4. Financial Coding	08751001
5. Agency Assigned Encumbrance Number	0881438
6. Vendor Number	7. AK Bus. Lic. #

This contract is between the State of Alaska,

8. Department of: Commerce and Economic Development — hereafter, the State, and

9. Contractor: The Sea Fare Group — hereafter, the Contractor

Mailing Address	Street or PO Box	City	State	Zip Code
3510 1st Avenue N.W.		Seattle	Washington	98107

10.

ARTICLE 1. Appendices: Appendices referred to in this contract and attached to it are considered part of it.

ARTICLE 2. Performance of Services:

2.1. Appendix A (General Provisions), Articles 1 through 14, governs the performance of services under this contract.

2.2. Appendix B sets forth the liability and insurance provisions of this contract.

2.3. Appendix C sets forth the services to be performed by the contractor.

ARTICLE 3. Period of Performance: The period of performance this contract begins December 24, 1987, and ends March 30, 1988. Performance may be extended for additional periods by the written agreement of the parties.

ARTICLE 4. Consideration:

4.1. In full consideration of the Contractor's performance under this contract, the State shall pay the Contractor a sum not to exceed $ 20,000 in accordance with the provisions of Appendix D.

4.2. When billing the State, the Contractor shall refer to the ATN Number and send the billing to:

11. Department of	Attn: Division of
Commerce and Economic Development	Business Development
Mailing Address	**Attention**
P.O. Box D, Juneau, Alaska 99811	Bonnie Jo Borchick

NOTICE: This contract has no effect as an offer by the Contractor until it is approved by the Department of Administraton.

12. CONTRACTOR		14. APPROVAL BY THE STATE CONTRACTING AGENCY	
		NOTICE! This certifies the availability of funds. I am aware that certifying false, inaccurate, or misleading documents constitutes an unsworn falsification punishable under AS 11.56.210	
Name of Firm: The Sea Fare Group		Signature of Head of Contracting Agency or Designee: J. Williams for	Date: 12/30/87
Signature of Authorized Representative: Sandi McKenzie	Date: 12/22/87	Typed or Printed Name of Authorizing Official: J. Anthony Smith	
Typed or Printed Name of Authorized Representative: Sandi McKenzie		Title: Commissioner	
Title: President	Employer I.D. No. (EIN) or SSN: 91-1224431	15. APPROVAL BY THE DEPARTMENT OF ADMINISTRATION	
13. REQUESTING AGENCY #87951			
Department/Division: DCED/Division of Business Development			
Signature of Project Director: S. Merculieff	Date: 12/29/87	N/A	
Typed or Printed Name of Project Director: Larry Merculieff			
Title: Director			

APPENDIX A
GENERAL PROVISIONS

Article 1. Definitions.

1.1. In this contract and appendices, "Project Director" means the person who signs this contract on behalf of the Requesting Agency and includes a successor or authorized representative.

1.2. "State Contracting Agency" means the Department for which this contract is to be performed and for which the Commissioner or Authorized Designee acted in signing this contract.

Article 2. Inspection and Reports.

2.1. The Department may inspect, in the manner and at reasonable times it considers appropriate, all the Contractor's facilities and activities under this contract.

2.2. The Contractor shall make progress and other reports in the manner and at the times the Department reasonably requires.

0477D

02-093 (Rev. 6/85)

(OVER)

APPENDIX C
SERVICES TO BE PERFORMED

WORLD MARKETS FOR SALMON -- PEN-REARED SALMON IMPACTS
ATN No. 88-198

The purpose of this project is to evaluate the extent of potential market competition between wild and farmed Alaska salmon, and between Alaska salmon and farmed salmon from other states and countries.

Questions such as the following are of key concern and will be addressed by the contractor:

- Will world markets be able to absorb farmed Alaskan salmon, from 1990 (when the potential first harvests of Alaskan pen-raised salmon would take place) onward at a price that will be profitable for the producers?

- Will the amount of farmed salmon projected for production worldwide in this time frame dampen current markets for Alaskan wild salmon, and if so, to what extent?

- Would the Alaskan pen-raised salmon be directly competitive with Alaskan wild salmon or simply a part of the farmed salmon supply?

TASK 1: BASELINE MARKET AND PRICE INFORAMTION

In-house files of recent and on-going studies of the contractor, Dr. James Anderson's sources and other existing information will form the basis of data for this task, however, some original data gathering will be performed. In particular, supermarket representatives and Japanese salmon buyers will be interviewed. Interviews will be conducted so that the data gathered is consistent with work performed by Dr. Anderson for New England food service groups.

The contractor will first outline the current distribution channels for farmed salmon and Alaskan wild production and describe the areas in which wild and farmed stocks may directly compete.

Next, historical prices will be examined for any trends relative to supply for both farmed and wild salmon. While average prices will be reported in this step, exceptions to the rule will be noted. Of particular interest are exceptions that reflect higher prices through unique marketing or product identification efforts, particularly where products are specifically identified as Alaskan.

A. Where are Alaska's King, Coho and Sockeye Salmon Marketed?

The contractor will present a thorough overview of the current market and marketing conditions for Alaskan king, coho and sockeye salmon. The overview will be specific as to species, product form, transportation modes, purchase arrangements, export assistance, tariff barriers, trade promotion activities and other information which will help to thoroughly discribe the existing markets for Alaska wild salmon.

A survey will be performed for major institutional and retail market sectors to delineate the geographic sales distribution, utilization of various product forms, seasonality of sales, and usual distribution channels.

B. Price Levels Over the Past 10 Years for King, Coho and Sockeye Salmon.

The contractor will present an accurate historical description of market price trends for Alaskan salmon. Government and private seafood price data sources will be analyzed to determine domestic and export price and volume of sales information by major product form. The contractor will include supply level (landings) figures and a comparison by product form.

C. Existing Markets for Farmed Salmon.

The contractor will present a thorough and quantitative overview of the major world supply sources and markets for farmed salmon. The overview will be specific as to species, product form, transportation modes, purchase arrangements, export assistance, tariff barriers, trade promotion activities and other information which will help to thoroughly describe existing market conditions. This will be drawn in part from the contractor's in-house studies of domestic and world salmon farming activities and markets, such as recent work by Anderson and Brooks analyzing buyer preferences for farmed and wild salmon in the northeast. The contractor will expand the analysis to include other countries and geographic regions of the United States as part of this task. Particular emphasis will be given to the market in Japan. Additional information will be obtained from interviews with trading companies and other firms and individuals active in and knowledgable about the salmon industry.

D. Price Levels of Pen-Reared Salmon Over the Past Five Years.

The contractor will describe and compare the prices and volumes of pen-reared salmon products over the past five years in all major world markets.

E. Effects of the Exchange Rate and Supply Changes on Market and Price Distribution.

Exchange rate information will be collected and correlated with import/export figures and the price levels of major salmon products over the last five years. The contractor will compare the fluctuating value of the dollar to the price and volume of salmon products traded on the world market.

TASK 2: MARKET FORECASTS

Because farmed salmon production could not occur in Alaska for several years, forecasts of future market conditions are important to investment decisions. Forecasts of expected demand levels and prices will be presented by the contractor. Using information collected in Task 1, the relationship between wild and farmed products stocks will be examined.

A. Volume of Farmed Salmon Expected to Enter the Marketplace Over the Next 10 Years.

The contractor will review recent studies of farmed salmon production trends and projections for the next ten years. Where discrepencies are evident, the contractor will provide an evaluation of the accuracy of the studies presented.

B. Future Markets and Price Level Expectations for Potential Alaskan Farmed Salmon.

The contractor will develop a matrix of market size and price forecasts to be used in evaluating the effects of production increases expected over the next ten years. The matrix will be derived from available econometric work, interviews with industry, academic and government experts and research completed in the tasks above. The contractor will project a range of possible volumes of farmed Alaska salmon, and predict the effects on major markets, including the an analysis of the most likely market niches these salmon could occupy and the price ranges available. An analysis of the effects of possible exchange rate changes will be included.

C. Analyze the Degree of Overlap or Competition Between Alaskan Wild Salmon, Potential Alaskan Farmed Salmon and Other Farmed Salmon in Major Markets

The contractor will predict the degree of market competition expected in the future between Alaska wild salmon and potential farmed salmon products. The analysis will compare projected

prices, availability, product forms and characteristics (fresh/frozen, size, color, method of harvest and etc.), of the major Alaskan wild salmon fisheries and farmed salmon harvests. The major marketing attributes that may cause substitution or differentiation of the types of salmon will be analyzed in the particular areas where there might be market overlap or competition.

The contractor will suggest the probable outcome of any future market overlaps which are identified. This work will identify Alaska salmon products that may not be competitive in the marketplace and the characteristics which make them noncompetitive, which products would have advantages in specific markets and the reasons, and will analyze the possiblities of undertaking effective marketing programs to improve sales and maximize prices.

APPENDIX D
CONSIDERATION, REPORTING SCHEDULE AND GENERAL CONDITIONS

WORLD MARKETS FOR SALMON -- PEN-REARED SALMON IMPACTS
ATN No. 88-198

REPORTING SCHEDULE: The contractor will submit an interim project report in writing to the Project Director which summarizes the results of work completed to date by February 5, 1988, as described in Appendix C..

A draft of the final project report containing all study findings, including those findings contained in the interim report, will be submitted in writing to the Project Director for review and approval by February 25, 1988. The contractor will incorporate changes to the draft material suggested by the Project director and submit ten copies including the unbound original (for further duplication) of the approved final report on or before March 4, 1988. This schedule allows three days for the Project Director to complete his review of the draft report.

CONSIDERATION: The contractor will submit an invoice for payment with the interim project report on or before February 5, 1988 which reflects all expenditures and services rendered for that period of the contract for review and approval by the Department. A second and final invoice for payment will be submitted with the final project report on or before March 4, 1988 which reflects all expenditures and services rendered for the remaining period of the contract. Payments on both the interim and final invoices are subject to the limitations and conditions described below.

Fees charged for services performed by the contractor's various study team members will not exceed the rates of $75 per hour. Upon acceptance of the interim and final project reports and receipt of the accompanying invoices by the Project Director, the State will pay the contractor within 30 days. Failure of the contractor to comply with the reporting provisions of this contract may result in the State withholding payment until such compliance is obtained.

If the total amount due on the contractor's interim invoice exceeds $12,000, the State will withhold payment of the excess until the final project report and model is recieved and accepted by the Project Director. Payment of any excess due on the interim invoice will be made at the same time as the final payment. Under no circumstances will the State be liable for total project costs in excess of $20,000 (twenty thousand dollars).

If the State cancels the project at any time during the course of this contract, the Contractor shall submit a final billing based on actual expenses incurred up to the termination date.

WORK PLAN: Work on the various segments of this contract will be shared by Dr. James L. Anderson and other individuals in The Sea Fare Group. The contractor will obtain written approval of the Project Manager, and if necessary an approved contract amendment, before any significant change is made in the following schedule:

TASK 1: BASELINE MARKET AND PRICE INFORMATION

Where are Alaska's king, coho and sockeye salmon marketed?

Sea Fare Group 90%
James L. Anderson 10%

Price levels over the past ten years for king, coho and sockeye salmon.

Sea Fare Group 98%
James L. Anderson 2%

Existing markets for farmed salmon

Sea Fare Group 70%
James L. Anderson 30%

Price levels of pen-reared salmon over the past five years

Sea Fare Group 98%
James L. Anderson 2%

Effects of the exchange rate and supply changes on market and price distribution.

James L. Anderson 100%

TASK 2: MARKET FORECASTS

Volume of farmed salmon expected to enter the market place over the next ten years.

Sea Fare Group 70%
James L. Anderson 30%

Future markets and price level expectations for potential Alaskan farmed salmon

James L. Anderson 100%

Analyse the degree of overlap or competition between Alaskan wild salmon, potential Alaskan farmed salmon and other farmed salmon in major markets.

James L. Anderson 100%

CONTRACT DISPUTES: All contract disputes will be subject to the provisions of Appendix A, Article 3 of the Standard Form For Professional Services Contract, unless other specifically identified statutes and/or legal requirements apply.

REQUESTS FOR CONTRACT EXTENSION: Requests to extend the ending date for contract performance must be submitted in writing at least 21 days prior to March 4, 1988. The written request should specify the reason why the contract extension is requested and the proposed date to which extension is needed. Upon receipt of the requested extension, the Project Director will send contract amendment forms to the contractor. Contract amendment forms must be signed by the Contractor's authorized agent and returned to the Project Director at least 10 days prior to expiration of the contract. Requests for contract amendments will not be considered if such requests are not received within the time frames specified. Because the value of this study to the State is highly dependent on having the required reports completed according to the schedule specified above, it is unlikely that the Project Director will approve an extension of the contract.

APPENDIX E

A) For the purposes of this work it is understood that unless specified all data sources are secondary sources.

B) Because of the tight schedule required by this contract, the final draft may be received chapter by chapter. Jim Anderson's original work may be part of the final draft.



Offered: 5/16/87
Referred: Rules

5-1188L

Original sponsors: Zharoff, Eliason and Duncan

IN THE SENATE BY THE RESOURCES COMMITTEE

HOUSE CS FOR CS FOR SENATE BILL NO. 297 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - FIRST SESSION

A BILL

For an Act entitled: "An Act placing a moratorium until July 1, 1988, on the issuance or granting of licenses, permits, leases, or authorizations for commercial finfish farming; providing for a bivalve spat collection permit; and providing for an effective date."

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

* Section 1. FINFISH FARMING MORATORIUM. (a) Except as provided in (b) of this section, the following licenses, permits, leases, or authorizations may not be issued or granted for the construction or operation of a commercial finfish farm:

(1) authorization for use of an interim-use permit or the experimental commercial taking of a fishery resource (AS 16.05.050(10));

(2) fish farming license (AS 16.05.340(a)(14));

(3) collection permit (AS 16.05.340(b));

(4) land use or tidelands permit (AS 38.05.035);

(5) a land lease (AS 38.05.070);

(6) fish transport permit (5 AAC 41.005);

(7) permit to appropriate water (11 AAC 93.120);

(8) temporary water use permit (11 AAC 93.210 - 11 AAC 93.220).

(b) A fish farming license and a fish transport permit may be issued for commercial finfish farming in a privately owned freshwater body that has no outlet to state water.

* Sec. 2. NO PREFERENCE INTENDED. A license, permit, lease, or authorization described in sec. 1 of this Act that is issued or granted for a

purpose other than commercial finfish farming and that is in effect during the period of the moratorium imposed by sec. 1 of this Act does not create a right or preference with regard to the issuance, granting, or renewal of, or conditions or limitations placed on, any license, permit, lease, or authorization for aquatic farming after the period of the moratorium.

* Sec. 3. AS 16.05.340(b) is amended to read:

(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. <u>The commissioner also may issue a permit for the collection of bivalve spat for use in connection with an aquatic farm.</u> 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.

* Sec. 4. Section 1 of this Act is repealed July 1, 1988.

* Sec. 5. This Act takes effect immediately under AS 01.10.070(c).

5373

ALASKA STATE LEGISLATURE - SENATE

SENATOR RICHARD I. ELIASON

RULES COMMITTEE CHAIRMAN
LABOR & COMMERCE COMMITTEE VICE-CHAIRMAN
LEGISLATIVE COUNCIL
RESOURCES COMMITTEE
FISHERIES SUBCOMMITTEE CHAIRMAN

P.O. BOX 143
SITKA, ALASKA 99835

P.O. BOX V
JUNEAU, ALASKA 99811
(907) 465-4916

May 11, 1987

COMMISSIONER'S OFFICE
RECEIVED
MAY 12 1987
DEPARTMENT OF FISH AND GAME

Commissioner Don Collinsworth
Department of Fish and Game
P.O. Box 3-2000
Juneau, Alaska 99802

Dear Commissioner Collinsworth,

Recently hearings on Senate Bill 106, an act relating to aquatic farming, were conducted by the Senate Resources Subcommittee on Fisheries at five different locations -- Dillingham, Kodiak, Anchorage, Ketchikan, and Sitka. The individuals testifying at the hearings raised many concerns which must be addressed fully prior to the Legislature taking any formal action on permitting aquatic farming in Alaska.

Some of the unanswered questions asked are as follows:

1) How will land use conflicts be resolved?

2) How can favoritism or the appearance of favoritism be avoided in the awarding of tide land permits?

3) What steps will be implemented to reduce tide land speculation?

4) What is the role of the non-profit hatcheries in the sea farming industry?

5) Will the role of a non-profit hatchery change if the hatchery chooses to rear pen salmon?

6) What will be the role of borough governments if a sea farm is within the borough's jurisdiction?

7) What will be the procedures in determining the monetary value for the tide land sites?

8) Will additional safeguards be established if the potential sea farm site is in a designated wilderness area?

9) How will the upland owners' concerns be resolved?

10) What exactly is known regarding any potential environmental danger in raising salmon in a concentrated area?

As these questions and other unresolved concerns regarding aquatic farming are reviewed and discussed during the interim by the Subcommittee on Fisheries, it will be most helpful if the various affected state agencies take an active role in the discussion. As chair of the interdepartmental work group on mariculture, the subcommittee looks forward to working with you and other members of the working group during the interim.

Commissioner Collinsworth, hopefully time will allow the subcommittee to meet with the agency representatives prior to adjournment in order to formalize plans for the next few months.

Sincerely,

Senator Dick Eliason, Chair
Senate Resources Subcommittee on Fisheries

cc: Senate Resources Committee Members
House Resources Committee Members

Suggested questions to be addressed
from the Office of Representative Herrmann

1 BIOLOGICAL CONSIDERATIONS

1) What is the potential disease and genetic threat to wild stocks?
2) How can these be controlled
3) What type of oversight and supervision of mariculture operations is necessary to ensure that wild stocks are not threatened
4) How should pens be stocked?
5) Who should regulate egg take?
6) Should Atlantic Salmon be allowed? and should other species be imported?
7) What are the potential effects on habitat for anadromous fish streams?

11 MARKET QUESTIONS

1) Is foreign marketing of pen-reared salmon currently effecting markets for Alaska's wild stocks?
2) If Alaska got into pen-rearing of salmon, would our pen-raised salmon be able to compete?
3) Could increased efforts at marketing the advantages of wild salmon give Alaska fishermen a competitive edge in certain markets over pen-reared salmon?
4) Would development of pen-reared salmon in Alaska displace fishermen? - If so, How many?
5) How valid is the statement that the world market will be glutted with salmon by the time Alaska is ready to get into the industry?

111 ECONOMIC FEASIBILITY & BENEFITS

1) What is the range of options for proceeding with mariculture operations?

   A) What would be the economic costs and benefits if the state only permitted small operations? or only large operations?(How many jobs would be created? How much would they pay, How much revenue would be generated? How many people would be displaced? What would be the economic impacts to the state if the fishing industry experienced displacement? Would these operations be economically viable?

   B) What would be the best way to proceed if the goal of the state was to maximize the revenues generated?

5/20/87

III. Government Involvment

B. To what extent should the state be involved in necessary monitoring/oversight. What is the state required to do? (i.e. Federal NSSP requirements).

C. To what extent should the state be involved in providing technical assistance in site selection and necessary environmental analysis?

1. How much should the industry contribute to offset administrative costs?

D. 2. To what extent should the industry be required to pay for the use of the public resources and the resulting externalities such as pollution and landscape alterations?

E. What role should the state play in market development?

F. Given the fiscal and technical policy impacts of the different options - should we proceed to encourage various mariculture operations, and if so, in what areas?

G. What criteria should be established to determine a whether or not a permit applicant is "fit, willing and able".

1. How do we avoid excluding small, locally owned operations?

2. Should bonding be required to discourage speculation and protect the state in the case of failure? (Clean-up costs).

H. How are permits going to be transferred? Who decides?

I. To what extent should the state provide investment incentives? (State subsidization through loans, tax credits ect.) Several sources say that tax credit incentives are necessary to attract venture capital.

J. How much should the industry pay for necessary regulation, monitoring and oversight?

C) What would be the best way to proceed to create the most jobs and steady employment?
D) What would be the best way to provide economic benefits to rural areas?
E) What would be the best way to provide economic benefits to urban areas?
F) What would be the best way to minimize the effects on fishermen who may be displaced
G) What would be the comparative costs and benefits of not going ahead with mariculture but instead increasing marketing strategies so that wild salmon could compete?

IV LAND USE & SITING CONFLICTS

1) How should best interest findings be made?
2) What guidelines should be established to determine whether a site should be permitted if there are competing uses (some of which may not be permitted?)

V ENVIRONMENTAL IMPACTS

1) Water Quality
2) Land Use Impacts
3) Impacts on habitat for wild stocks

VI GOVERNMENT INVOLVEMENT

Will financial resources be diverted from other fisheries programs such as hatcheries, and economic development of other existing fisheries?

(See Attached)

5/20/87

INTERAGENCY WORKGROUP ON MARICULTURE

David Benton 465-4100
Department of Fish and Game

Doug Donegan 465-2609
Department of Environmental Conservation

Rick Focht 465-4081
Commercial Fisheries Entry Commission

Kerry Howard 465-2653
Department of Environmental Conservation

Mike Kaill 465-4160
Department of Fish and Game

Amy Kruse 789-3151
Deapartment of Environmental Conservation

Diane Mayer 465-3562
Office of Management and Budget

Bob Palmer 465-3400
Department of Natural Resources

Paul Peyton 465-2162
Department of Commerce & Economic Development

Rick Reed 465-4290
Department of Fish and Game

Jim Wakefield 465-2700
Department of Labor

Cowper Administration Position on Mariculture

Mariculture may provide substantial economic benefits to our coastal communities and help diversify and stabilize our economy if it is developed in an orderly fashion which provides the maximum benefit to Alaskans while ensuring protection for our fisheries resources, other resource users and the environment. In order to accomplish these objectives, any legislation authorizing a mariculture industry must satisfy the following principles:

1. The mariculture industry must benefit Alaskans.

   The mariculture industry must be developed in a manner which does not result in unfair competition with existing fisheries or cause undue economic displacement in our coastal communities. Legislation should, to the extent possible under the law, provide for local hire at mariculture facilities and give preferential access to mariculture permits and mariculture related tidelands leases to Alaskans.

2. The mariculture industry must pay for itself and the state should get a fair return for the use of state resources.

   Legislation should contain provisions for recovering administrative and other state costs associated with managing the industry. The legislation should also ensure that the state gets a fair return for the use of tidelands and other resources.

3. The development of the mariculture industry in Alaska should be done in an orderly fashion which encourages a stable, dependable industry.

   Legislation should provide general criteria which will lead to the development of a regulatory program which discourages speculation on permits and tidelands leases, encourages sound financial planning, and provides for a diverse industry ranging from "Mom and Pop" ventures to larger corporate operations.

4. The mariculture industry must meet all state and federal requirements for human health, product quality and sanitation.

   Legislation should ensure that mariculture facilities meet all state and federal requirements for human health, safety, and sanitation. Legislation should also require that mariculture products meet or exceed

   all state and federal product quality and human health standards, and provide the means to ensure that state

regulators can protect human health and product quality.

5. Mariculture activities must be managed to ensure protection of the biological integrity of natural plant and animal stocks.

Legislation must address the issues of pathological and genetic protections for natural sea vegetable and fish stocks.

6. Mariculture activities must be managed in a manner which ensures adequate environmental safeguards and habitat protection.

Legislation must ensure that mariculture facilities are sited, designed and operated to protect air and water quality, to provide for proper disposal of wastes, and to minimize adverse effects to important fish and wildlife habitat.

7. Mariculture facilities must be sited to minimize land-use conflicts, maintain navigation and ensure access to upland areas.

Legislation should provide guidance for siting facilities to minimize conflicts with other tidelands users, reducing visual and aesthetic impacts, maintaining navigation and ensuring access across state tidelands.

8. Broodstock acquisition for mariculture purposes should be carefully regulated, especially for species subject to limited entry fisheries.

Legislation should contain provisions limiting the acquisition of broodstock for species subject to limited entry fisheries. Legislation should grant the Department of Fish and Game the authority to regulate the acquisition, transport, and propagation of mariculture broodstock, and provide the Board of Fisheries the ability to resolve allocation decisions regarding broodstock acquisition if necessary.

Alaska State Legislature

Senate Resources Committee

Sen. John B. (Jack) Coghill, Chairman
Sen. Paul Fischer, Vice-Chairman
Sen. Lloyd Jones
Sen. Arliss Sturgulewski
Sen. Jim Duncan
Sen. Fred Zharoff
Sen. Dick Ellason

Box V
Juneau, Alaska 99811
(907) 465-4907

I. call to order
II. This week's meeting
(probably will only do SB 482)

Agenda
Senate Committee on Resources
April 4-11

April 4:	No Meeting
April 6:	SB 482, Aquatic Farming SB 483, Conservation & Protection of Natural Rangelands SB 280, Issuance of Permits and Consistency Determinations SB ~~493~~ 494, Salmon Enhancement Tax SB 411, Firearms in State Parks
April 8:	SB 465, Yagataga State Forest SB 475, Tugidak Critical Habitat Area
April 11:	Previous Scheduled bills

TELECONFERENCE PARTICIPATION

SPONSOR (S) Res

DATE/TIME 4/16 1:30 - 3:30

SUBJECT SB 482 - Aquaculture

LIO'S
(moderator)

	TESTIFY	OBSERVE
ANCHORAGE ( )		
BARROW * ( )		
BETHEL ( )		
DELTA JUNCTION * ( )		
DILLINGHAM * ( )		
FAIRBANKS ( )		
GLENNALLEN * ( )		
JUNEAU ( )		
KETCHIKAN ( )		
KODIAK ( )		
KOTZEBUE ( )		
MAT-SU ( )		
NOME ( )		

	TESTIFY	OBSERVE
PETERSBURG * ( )		
SITKA ( )		
SOLDOTNA ( )		
VALDEZ * ( )		
LTC'S		
HOMER		
WRANGELL		
OFFNETS		
OFF1 Cordova		
OFF2 KAKE		
OFF3		
OFF4		
OFF5		
OFF6		

LISTEN ONLY

VTS'S ON BACK

* SESSION ONLY

VTS'S	U	T	O	TOTAL		U	T	C	TOTAL
AMB - AMBLER					MET - METLAKATLA				
ANA - ANAKTUVUK PASS					MOS - MOSQUITO LAKE				
AND - ANDERSON					NAK - NAKNEK				
ANG - ANGOON					NEN - NENANA				
CAN - CANTWELL					NEW - NEWHALEN				
CHS - CHISTOCHINA					NIK - NIKISKI				
CHI - CHITINA					NOR - NOORVIK				
COP - COPPER CENTER					NOT - NORTH TONSINA				
COR - CORDOVA					NOW - NORTHWAY				
CRA - CRAIG					PEL - PELICAN				
DOT - DOT LAKE					PTH - POINT HOPE				
EAG - EAGLE					SAV - SAVOONGA				
FTY - FT. YUKON					SDP - SAND POINT				
GAK - GAKONA					SEW - SEWARD				
GAL - GALENA					SLW - SELAWIK				
GAM - GAMBELL					SHS - SHISHMAREF				
HNS - HAINES					SLA - SLANA				
HEA - HEALY					SKG - SKAGWAY				
HOO - HOONAH					STP - ST. PAUL				
HPB - HOOPER BAY					TOG - TOGIAK				
HYD - HYDABURG					TOK - TOK				
KAK - KAKE					OOK - TOOKSOOK				
KAT - KAKTOVIK					UAK - UNALASKA				
KEN - KENNY LAKE					UNK - UNALAKLEET				
KLA - KLAWOCK					WAI - WAINWRIGHT				
MEN - MENTASTA					YAK - YAKUTAT				

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*                                                                    *
* DELIVER TO: LSNCRES                                                *
*                                                                    *
*                                                                    *
* ORIGINAL                                                           *
* SENT:          03/23/88  TIME: 15:58                               *
* FROM:          LIOCDJT                                             *
* SUBJECT:       SRES,FS;SB402,MARICULTURE,3-23                      *
* PRINT DATE:    03/23/88  TIME: 16:03                               *
*                                                                    *
**********************************************************************
```

DATE: MARCH 23, 1988
SITE: DELTA JUNCTION
SPONSOR: SENATE RESOURCES
SUBJECT: LEG. PUBLIC HEARING: SB 402, MARICULTURE
MODERATOR SANDI

FINAL STATS

TESTIFIED

NAME/REPRESENTING	ADDRESS	PHONE #
NONE		

OBSERVED

NAME/REPRESENTING	ADDRESS	PHONE #
NONE		

TESTIFIED: 0
UNABLE: 0
OBSERVED 0
TOTAL 0

START/END TIME 1:30-2:30PM

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**********************************************************
*                                                        *
* DELIVER TO: LSNCRES                                    *
*                                                        *
*                                                        *
* ORIGINAL                                               *
* SENT:          03/23/88  TIME: 15:45                   *
* FROM:          LIOCKOT                                 *
* SUBJECT:       FS, SEN RESOURCES, SB 402, OTZ          *
* PRINT DATE:    03/23/88  TIME: 16:02                   *
*                                                        *
**********************************************************
```

DATE: MARCH 23, 1988
SPONSOR: SENATE RESOURCES
SUBJECT: LEG. PUBLIC HEARING\SB 402, MARICULTURE
SITE: KOTZEBUE
MODERATOR: KAREN JOHNSON

FINAL STATS

TO TESTIFY

NAME/REPRESENTING	ADDRESS	PHONE #
1. NO PARTICIPANTS IN KOTZEBUE		
2.		
3.		
4.		
5.		

TO OBSERVE

NAME/REPRESENTING	ADDRESS	PHONE #
1.		
2.		
3.		
4.		
5.		

TESTIFIED: 0
UNABLE: 0
OBSERVED: 0
TOTAL: 0

START/END TIME

DELIVER TO: LSNCRES

ORIGINAL
SENT: 03/23/88 TIME: 15:36
FROM: LTCCFBX
SUBJECT: SRES,FS,SB482,3-23-88
PRINT DATE: 03/23/88 TIME 16:02

DATE: MARCH 23, 1988
SITE: FAIRBANKS
SPONSOR: SENATE RESOURCES
SUBJECT: SB 482 MARICULTURE
MODERATOR: FRAN

TESTIFY:
NAME\REPRESENTING ADDRESS PHONE #

FAIRBANKS HAD NO PARTICIPANTS

OBSERVE:
NAME\REPRESENTING ADDRESS PHONE #

TESTIFIED 0
OBSERVED 0
TOTAL 0

TIME START
TIME END

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**********************************************************************
*                                                                    *
* DELIVER TO: LSNCRES                                                *
*                                                                    *
*                                                                    *
* ORIGINAL                                                           *
* SENT:          03/23/88  TIME: 15:22                               *
* FROM:          LTCCGLN                                             *
* SUBJECT:       S.RES,FS;SB 482;3-23-88                             *
* PRINT DATE:    03/23/88  TIME: 16:02                               *
*                                                                    *
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DATE            MARCH 23, 1988
SITE            GLENNALLEN
SPONSOR:        SENATE RESOURCES
SUBJECT:        HB 482 - MARICULTURE
MODERATOR       CATHY MACKINNON


                          FINAL STATS

TESTIFIED
NAME/REPRESENTING          ADDRESS                    PHONE #     BILL #
1.   0

OBSERVED
NAME/REPRESENTING          ADDRESS                    PHONE #     BILL #
1.   0

     TESTIFIED      0
     UNABLE:
     OBSERVED:      0
     TOTAL:         0
               START END TIME

THERE WERE NO PARTICIPANTS.  DID NOT SIGN ON.
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* DELIVER TO: LSNORES                                    *
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* ORIGINAL                                               *
* SENT:          03/23/88  TIME: 15:19                   *
* FROM:          LIOCPSG                                 *
* SUBJECT:       S RES,SB482-MARI;3-23-88                *
* PRINT DATE     03/23/88  TIME: 16:01                   *
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DATE: MARCH 23, 1988
SITE: PETERSBURG
SPONSOR: (S) RESOURCES
SUBJECT: SB 482 - MARICULTURE
MODERATOR: DOROTHY PENTTILA
CRIS MORRISON

FINAL STATS

TESTIFIED

NONE LISTEN ONLY

OBSERVED:

	NAME/REPRESENTING	ADDRESS	PHONE #
1.	STEVE LAPOSKI	BOX 1471 PSG	NONE
2.	DEBRA LYONS	BOX 296 PSG	772-3572
3.	JULIE HURSEY	BOX 213 PSG	772-3967
4.	GERRY MERRIGAN	BOX 1065 PSG	772-4445
5.	JOHN W. ENGE	BOX 166 PSG	772-4637

0 TESTIFIED
5 OBSERVED
5 TOTAL

1 30 PM / 2 40 PM START/END TIME

EOM

DELIVER TO: LSNCRES

ORIGINAL
SENT: 03/23/88 TIME: 15:05
FROM: LIOCBET
SUBJECT: SRES;FS;SB482;3-23-88
PRINT DATE: 03/23/88 TIME: 16:01

DATE: MARCH 23, 1988
SITE: BETHEL
SPONSOR: SENATE RESOURCES
SUBJECT: SB482 - MARICULTURE
MODERATOR WALLY RICHARDSON

** FINAL STATS **

I DID NOT HAVE ANY PARTICIPANTS, I DID NOT CALL-IN.

TESTIFIED; -0-
UNABLE,-0-
OBSERVED, -0-
TOTAL, -0-

NO START/END TIME.

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* DELIVER TO: LSNCRES                                                  *
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* ORIGINAL                                                             *
* SENT:          03/23/88  TIME: 15:01                                 *
* FROM:          LIOCKTN                                               *
* SUBJECT:       S RES;MARICULTURE;FS,3-23-88                          *
* PRINT DATE:    03/23/88  TIME: 16:01                                 *
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DATE: MARCH 23,1988
SPONSOR: SEN RESOURCES
SUBJECT: MARICULTURE SB482
SITE  WRANGELL
MODERATOR: MABLE FENNIMORE
                                FINAL STATS
**********************************************************************
TO OBSERVE:
NAME/REPRESENTING                ADDRESS                    PHONE NO.
1. JIM GOVE - CITY OF WRANGELL
        P.O. BOX 307  WRANGELL,AK 99929          874-3564

TESTIFY:
UNABLE:

TOTAL

START TIME    1:30PM
END TIME:     2:45PM

EON
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* DELIVER TO: LSNCRES                                                *
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* ORIGINAL                                                           *
* SENT:          03/23/88  TIME: 14:57                               *
* FROM:          LIOCSIT                                             *
* SUBJECT:       SRES,FS;SB482;3-23                                  *
* PRINT DATE:    03/23/88  TIME: 16:00                               *
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MARCH 23, 1988
SENATE RESOURCES
SB 482: MARICULTURE
SITKA
MODERATOR: ELAINE/KATHY

PARTICIPANT LIST

TO OBSERVE

NAME/REPRESENTING	ADDRESS	PHONE #	BILL #
1. SIGURD MATTISEN, PETERSBURG VESSEL OWNERS ASSOC.,	BOX 232, PETERSBURG 99833,	772-3056	
2. PETE ESQUIRO, NSRAA,	103 MONASTERY, SITKA 99835,	747-6850	

0 TESTIFIED
0 UNABLE
2 OBSERVED
2 TOTAL

1:30 - 2:45 PM START/END TIME

DELIVER TO: LSNCRES

ORIGINAL
SENT: 03/23/88 TIME: 14:53
FROM: LIOCKTN
SUBJECT: S RES;MARICULTURE;FS,3-23-88
PRINT DATE: 03/23/88 TIME: 16:00

DATE: MARCH 23,1988
SPONSOR: SEN RESOURCES
SUBJECT: MARICULTURE SB482
SITE: KETCHIKAN
MODERATOR: RAE RHODES

FINAL STATS

TO OBSERVE:
NAME/REPRESENTING ADDRESS PHONE NO.
1.DONALD AMEND/SOUTHERN SOUTHEAST REGIONAL AQUACULTURE ASSOC.
1621 TONGASS AVE. KETCHIKAN,AK 9?901225-2605
2.JAMES E. CARLTON 1943 WOODLAND KETHCIKAN,AK 9?901225-4241

TESTIFY: 0
UNABLE: 0
OBSERVE: 2
TOTAL: 2

START TIME 1:28PM
END TIME: 2:41PM

EOM

DELIVER TO: LSNCRES

ORIGINAL
SENT: 03/23/88 TIME: 14:50
FROM: LIOCDAV
SUBJECT: SEN.RES.;MARICULTURE;FS;3-23
PRINT DATE: 03/23/88 TIME: 15:59

*** FINAL TELECONFERENCE STATISTICS ***

DATE: MARCH 23, 1988
SITE: ANCHORAGE
SPONSOR: SENATE RESOURCES COMMITTEE
SUBJECT: MARICULTURE
LOCAL MODERATOR: DAVID

LISTEN ONLY TELECONFERENCE--->OBSERVERS: NAME\REPRESENTING
ADDRESS PHONE #

JERRY MCCUTCHEON ANCHORAGE ONLY ADDRESS GIVEN
LARRY NELSON " "
DAVID FUHS " "

TESTIFIED: 00
OBSERVED: 03
TOTAL: 03

START TIME: 1:30PM
END TIME: 3:00PM

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* DELIVER TO: LSNCRES                                                *
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* ORIGINAL                                                           *
* SENT:          03/23/88  TIME: 14:53                               *
* FROM:          LIOCVAL                                             *
* SUBJECT:       S RES.;FS;SB 482;3-23                               *
* PRINT DATE:    03/23/88  TIME: 15:59                               *
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DATE:         MARCH 23, 1988
SITE:         VALDEZ
SPONSOR:      SENATE RESOURCES
SUBJECT:      SB 482:  MARICULTURE
MODERATOR:    DONNA GRENIER

                                FINAL STATS

TESTIFIED     0
NAME/REPRESENTING                ADDRESS              PHONE #     BILL#


OBSERVED      0
NAME/REPRESENTING                ADDRESS              PHONE #     BILL #

          TESTIFIED   0
            UNABLE    0
          OBSERVED    0
             TOTAL:   0

                              START/END TIME:

VALDEZ DID NOT DIAL IN.   * NO PARTICIPANTS
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* DELIVER TO: LSNCRES                                    *
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* ORIGINAL                                               *
* SENT:          03/23/88  TIME: 14 37                   *
* FROM           LIOCNOM                                 *
* SUBJECT        SRES;FS;SB402.MARICULTURE,3-23          *
* PRINT DATE     03/23/88  TIME: 15:57                   *
*                                                        *
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NONE HAD NO PARTICIPANTS FOR TODAY'S SENATE RESOURCES TELECONFERENCE ON SB 402, MARICULTURE. PLEASE CONSIDER THIS THE FINAL STATS.

THANK YOU.

PAPER: NONE

DELIVER TO: LSNCRES

ORIGINAL
SENT: 03/23/88 TIME: 14.34
FROM: LIOCKOD
SUBJECT: SRES,FS;SB482;3-23-88
PRINT DATE: 03/23/88 TIME: 15:57

DATE: MARCH 23, 1988
SPONSOR SENATE RESOURCES
SUBJECT: SB 482 MARICULTURE
SITE: KODIAK L.I.O.
MODERATOR MARY JO SIMMONS

FINAL STATS

KODIAK HAD NO PARTICIPANTS AND DID NOT DIAL INTO THE BRIDGE

TOTAL ()

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*                                                                    *
* DELIVER TO: LSNCRES                                                *
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* ORIGINAL                                                           *
* SENT:          03/23/88  TIME: 14:33                               *
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* SUBJECT:       FS;3-23;SRES,MARICULTURE                            *
* PRINT DATE:    03/23/88  TIME: 15:57                               *
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3-23-88
SENATE RESOURCES
SB482-MARICULTURE
SOLDOTNA
VESTA

                              FINAL STATS

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TO TESTIFY
NAME/REPRESENTING                    ADDRESS                  PHONE #
1.
2.     NO ONE PARTICIPATED.  DID NOT DIAL IN.


     TESTIFIED
     UNABLE
     OBSERVED
     TOTAL

                    START/END TIME
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*                                                                    *
* DELIVER TO: LSNCRES                                                *
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* ORIGINAL                                                           *
* SENT:          03/23/88  TIME: 14:14                               *
* FROM:          LIOCMAT                                             *
* SUBJECT:       FS 3-23-88 SRES MARICULTURE                         *
* PRINT DATE:    03/23/88  TIME  15:56                               *
*                                                                    *
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DATE:           3-23-88
SITE:           M-S L10
SPONSOR:        SRES
SUBJECT:        NB 482 MARICULTURE, ETC.
MODERATOR       NONE

                        PARTICIPANT LIST
                          FINAL STATS


     TESTIFIED:    0
     UNABLE:       0
     OBSERVED:     0
     TOTAL         0

               START  1:30 PM
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ALASKA NATIONAL INTEREST LANDS CONSERVATION ACT

DECEMBER 2, 1980

P.L. 96-487

National Wildlife Refuge System

1. Alaska Maritime NWR*
   a. Chukchi Sea Unit
   b. Bering Sea Unit
   c. Aleutian Islands Unit
   d. Alaska Peninsula Unit
   e. Gulf of Alaska Unit
2. Alaska Peninsula NWR
3. Arctic NWR
4. Becharof NWR
5. Innoko NWR
6. Izembek NWR
7. Kanuti NWR
8. Kenai NWR
9. Kodiak NWR
10. Koyukuk NWR
11. Nowitna NWR
12. Selawik NWR
13. Tetlin NWR
14. Togiak NWR
15. Yukon Delta NWR
16. Yukon Flats NWR

——— Refuge ▭ Wilderness

*The Alaska Maritime National Wildlife Refuge consists of all the public lands in the coastal waters and adjacent seas of Alaska consisting of islands, islets, rocks, reefs, capes and spires.

National Park System

17. Aniakchak Nat'l Monument and Preserve
18. Bering Land Bridge Nat'l Preserve
19. Cape Krusenstern Nat'l Monument
20. Denali Nat'l Park and Preserve
21. Gates of the Arctic Nat'l Park and Preserve
22. Glacier Bay Nat'l Park and Preserve
23. Katmai Nat'l Park and Preserve
24. Kenai Fjords Nat'l Park
25. Kobuk Valley Nat'l Park
26. Lake Clark Nat'l Park and Preserve
27. Noatak Nat'l Preserve
28. Wrangell-Saint Elias Nat'l Park and Preserve
29. Yukon-Charley Rivers Nat'l Preserve

——— Park, Monument
– – – – – Preserve
▭ Wilderness

Bureau of Land Management System

30. Steese Nat'l Conservation Areas
31. White Mountains Nat'l Recreation Area

-.-.-.- NCA, NRA

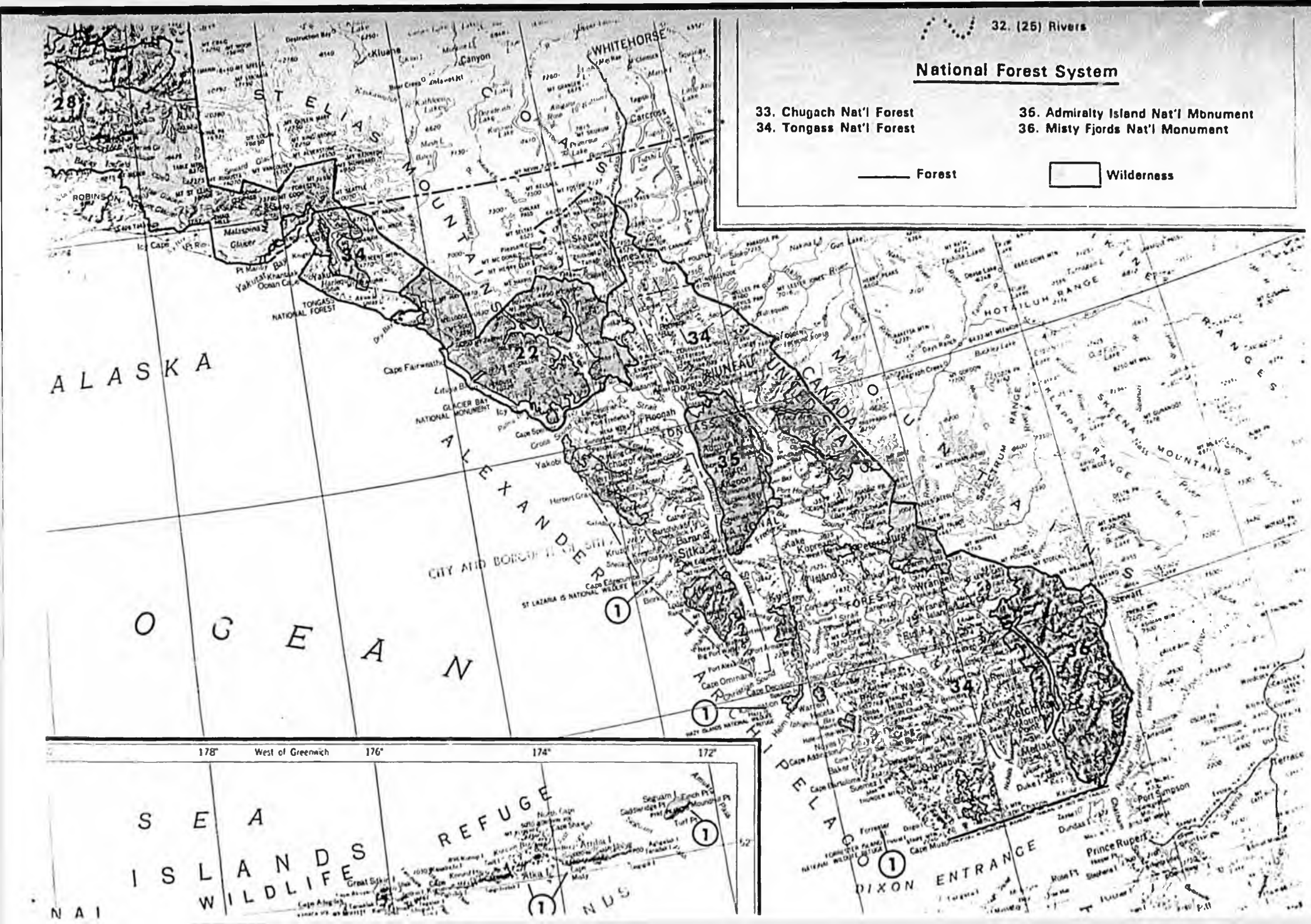
National Wild and Scenic Rivers System

32. (25) Rivers

National Forest System

33. Chugach Nat'l Forest
34. Tongass Nat'l Forest
35. Admiralty Island Nat'l Monument
36. Misty Fjords Nat'l Monument

——— Forest ▭ Wilderness


32. (25) Rivers
National Forest System
33. Chugach Nat'l Forest
34. Tongass Nat'l Forest
35. Admiralty Island Nat'l Monument
36. Misty Fjords Nat'l Monument
Forest
Wilderness
ALASKA
OCEAN
STELIAS MOUNTAINS
ALEXANDER ARCHIPELAGO
COAST MOUNTAINS
WHITEHORSE
Kluane
Canyon
Carcross
ROBINSON
Malaspina Glacier
Yakutat
TONGASS NATIONAL FOREST
Cape Fairweather
GLACIER BAY NATIONAL MONUMENT
Icy Strait
Hoonah
Yakobi
Chichagof
Baranof
Sitka
Kruzof
Cape Edgecumbe
ST LAZARIA IS NATIONAL WILDLIFE REFUGE
CITY AND BOROUGH OF JUNEAU
JUNEAU
Douglas
Admiralty
Kootznoowoo
Kupreanof
Petersburg
Wrangell
Kuiu
Kake
Prince of Wales Island
Ketchikan
Metlakatla
Revillagigedo
Annette
Gravina
Duke I
Cape Chacon
Cape Ommaney
Cape Decision
Port Alexander
Port Armstrong
Port Walter
Port Protection
Forrester
Dundas I
Port Simpson
Prince Rupert
Terrace
Stewart
HOTAILUH RANGE
SPECTRUM RANGE
KLAWASAN RANGE
SKEENA MOUNTAINS
CANADA
UNITED STATES
DIXON ENTRANCE
178° West of Greenwich 176° 174° 172°
SEA
ISLANDS
WILDLIFE
REFUGE
Segula I
Attu I
Alaid I
Nizki I
Semisopochnoi I
Great Sitkin I
Kiska I
Misty Pt
Turf Pt
Amchitka Pass


Spenard
Eagle River
ANCHORAGE
Kenai
Soldotna
Seward
Cordova
Homer
Seldovia
Valdez
Montague I
Illiamna Lake
Dillingham
Naknek
Kodiak
KODIAK ISLAND
Alitak
Afognak Island
BARREN IS
Stevenson Entrance
Shelikof Strait
Cape Douglas
Cape Chiniak
Cape Greig
Cape Trinity
Cape Ikolik
Cape Gull
Cape Kasilof
Cape Resurrection
Cape Hinchinbrook
Cape Clear
Cape Puget
Cape Elrington
Cape Cleare
Cape Nukshak
Cape Douglas
Cape Kumlik
Cape Kuliak
Cape Kanatak
Cape Kovrizhka
Cape Kuiukta


BRISTOL BAY
ALEUTIAN ISLANDS
FOX ISLANDS
PRIBILOF ISLANDS
St Paul Island
St George Island
Unimak Island
Unalaska Island
KRENITZIN ISLANDS
SEMIDI ISLANDS
SHUMAGIN ISLANDS
ALEUTIAN ISLANDS NATIONAL WILDLIFE REFUGE
ALASKA PENINSULA NATIONAL WILDLIFE REFUGE
IZEMBEK NATIONAL WILDLIFE RANGE
BECHAROF NATIONAL WILDLIFE REFUGE
KODIAK NATIONAL WILDLIFE REFUGE
CAPE NEWENHAM NATIONAL WILDLIFE REFUGE
HAGEMEISTER ISLAND WALRUS ISLANDS STATE GAME SANCTUARY
Unga
170°
168
166°
164°
162°
160°
158

1200 E. 76th Ave. Suite 1222
Anchorage, Alaska 99518
(907) 349-6485

April 01, 1988

Senator Arliss Sturgulewski
P.O. Box V
Juneau, Alaska 99811

Dear Senator Sturgulewski,

We were in support of Senator Eliasons' 3/16/88 draft of Senate Bill 482 which would allow fish farming in upland salt water pens. We feel this is a fair compromise. Needless to say we are very disappointed in his 3/28/88 draft of this bill.

Salt water upland farms are economically and environmentally feasible. All of our upland fish farm discharge will meet or exceed Federal Clean Water Standards.

As we have previously stated, we have invested many years of time and effort in this project. The money invested is substantial and should this bill pass, as it is now written, we would suffer a substantial loss of both time and money.

We urge you to reconsider and include salt water upland fin fish farming in any bill dealing with mariculture.

If you would like additional information on our project please feel free to contact us.

Sincerely,

Thorne Ferguson, Jr.

F91

MAR – 4 1988

2432 Engineers Cut off
Juneau, Alaska 99801
March 1, 1988

Jack Coghill
P.O. Box V (MS 3100)
Juneau, Alaska 99811

Dear Senator,

This is in reference to Salmon Farming in Alaska.

We greatly oppose this and want your support on this issue.

Here is what Alaska can do to foster economic diversity:

1. Restore Fish and Game Department Fisheries Rehabilitation and Enhancement Division budget to at least the 1985 level. (In other words, make more salmon for harvest.)

2. Bring all effort possible to bear against foreign harvest, and intervention of Alaska's resources.

3. Increase funding of Alaska Seafood Marketing Institute.

More fish means more jobs and real fish don't eat pellets!

Thank you for your time and consideration on this.

Sincerely,

Kenneth & Helen McGee

Alaska State Legislature

Please enter into the record my testimony to the Senate Resources
committee name

committee on SB 482 - Mariculture , dated 3/11/88
bill/subject

I believe there should be a moratorium on mariculture and salt and fresh water except the land-locked lakes for all species of finfish. I support Senator Eliason's bill except I would like to see a moratorium on fresh-water rearing of finfish except in land-locked lakes.

He was unreached in. I took this testimony over the phone. Jean Schneider, teleconference moderator

Signed: Craig Matkin
Testifier

Director, North Gulf Oceanic Society
Representing (Optional) a non-profit Alaskan research group

P.O. Box 15240 F.C.B. Homer, AK 99603
Address

235-6690
Phone No.

0-55 Legislative Information Office

Alaska State Legislature

Please enter into the record my testimony to the Senate Resources committee name

committee on SB 482: Mariculture, dated 3/11/88
bill/subject

Senate Bill 482 from the Senate Resources Committee addresses the concerns we have had with the development of mariculture in Alaska. These concerns are, but are not limited to: site leases, disease control, sale and transfer of stocks, importation of aquatic plants and shellfish, and criteria for the issuance of permits.

Most importantly, SB 482 prohibits the aquatic farming of finfish in saltwater. The adverse effects that finfish farming in saltwater would have in Alaska are so numerous, that I will not take the time needed to address these problems here.

I believe that the passage of this bill will allow the careful, deliberate development of a needed industry. I urge the passage of SB 482 into law for the benefit of all Alaskans.

Signed: George Eliason, Commercial Fisherman
Testifier

Representing (Optional)

102 Kihule Dr., Sitka AK 99835
Address

747-6817
Phone No.

TESTIMONY

TO: SENATE RESOURCES COMMITTEE

FROM: DICK GRIFFIN, SITKA

RE: MARICULTURE LEGISLATION

DATE: 3-11-88

After sitting through several hours of testimony today, I decided to type out mine and send it to you....

I am no newcomer to the issues and controversies surrounding mariculture in the state of Alaska.

Eight years ago this spring several Kake high school students and myself travelled to visit Mr. Jefferds of Penn Cove Mussels on Whidbey Island in Washington state. Mr. Jefferds, as some of you know, developed and operates a very successful mariculture business.

The students had been studying ways in which young people in the villages of Southeast Alaska could develop new industry for the region so they could live and work in their home towns. The traditional means of making a living in Southeast centered around the woods or the water. Since limited entry had nearly eliminated the possibility of them entering the common fisheries, they were exploring other water related careers. They were eager to try something that was quite foreign to the traditional lifestyle familiar to their parents.

The students returned home from Washington full of excitement due to the fact that Mr. Jefferds had agreed to come to Alaska, teach the students how to set up the mussel business, market their product in Puget Sound and assist in getting the product tested at the labs in Seattle.

Enter the state of Alaska bureaucracy. After being told by several state agencies that it would take years and much money to ever get such a business started in Kake and that the product could not be shipped without being tested in the state, the students gave up.

What is interesting to me is that the students were willing to explore something different than the acceptable lifestyle of their parents. They were excited to try something new which had the promise of developing into a way of keeping them gainfully employed in their home environment.

The people who testified against mariculture are some of the same people you have heard oppose any development in the minerals industry (Alaska pipeline, placer mining, etc.),

development in the state and federal forests (Tongass Forest issues, Southcentral state forest issues, etc.), development in the tourism industry (Kelp Bay Lodge, Hatcher Pass Ski resort, etc.) and any development that has an effect on their lifestyle.

The arguments put forth by those opposed to mariculture that this industry will have a negative economic impact on existing industries do not hold water. You have at your disposal study after study conducted by your own researchers that dispute those claims. i.e. Memo of 4/28/87 to Representative Grussendorf from Brad Pierce, Legislative Analyst.

The arguments put forth by those opposed to mariculture that the industry would cause biological devastation do not hold water. Reference the works of many fishery biologists in Alaska who state the contrary.

I believe that those who support the several bills before you that would restrict or prohibit mariculture are simply trying to add to the bureaucratic bouillabaisse and introduce protectionist legislation to benefit the few who have a privileged position in the fishing industry. They are not willing to give the kids from Kake the chance to work on their future because they perceive risk of some change in the status quo. They are not willing to give all Alaskans the chance to break away from their dependance on state support for programs and individual social needs.

Please try to see through the selfish claims of the anti-mariculture folks and think of all the young people in the state who have dreams like the kids from Kake.

Thank you very much for the opportunity to testify....

TELECOPY COVER SHEET
ANCHORAGE INFORMATION OFFICE

TO: Juneau FOR: Senate Resources PHONE: ___ ___ ____

FROM: Anch L.I.O. PHONE: _____

ADDITIONAL INSTRUCTIONS: Please forward this for the members.

DATE/TIME SENT: 3-11-88 ; 2:45pm PLEASE ACK. RECEIPT: _____

DISPOSAL OF ORIGINAL: ✓ THROW AWAY

_____ HOLD FOR PICK UP

NUMBER OF PAGES: 1 (NOT COUNTING COVER SHEET)

BY: DJ

THE ALASKA WILDLIFE ALLIANCE
P.O. BOX 190953
ANCHORAGE, ALASKA 99519
907-277-0897

To: Sen. Resources Comm.

The following are the comments of the Alaska Wildlife Alliance. We are against SB492 because the bill is weak on land use planning. We need a bill this year to prevent development with no controls. Shellfish and sea vegetable farming are already occurring without comprehensive planning, and fish farming will be legal after the moratorium lifts in July. We need to prevent conflict and help establish a planning and permitting system for any type of tideland development, including floating lodges. That development is now happening piecemeal. We need legislation that includes provisions that statutorily prevent development of tidelands adjacent to all wilderness areas and state parks, valuable fish and wildlife habitat areas, popular recreational areas, Critical Habitat Areas, bird rookeries, marine mammal hauls outs, and important subsistence areas. Development should focus on the tidelands of interested private property holders. The permit and leasing processes should include commitment bonds, development schedules, and restrictions on permit and lease transfers to prevent tideland speculation. Clean up bonds should be required to ensure site rehabilitation and structure removal in case of site abandonment. And proposed developments should be subjected to public review. Annual review must be mandated to ensure compliance with the laws.

The Alaska Wildlife Alliance is concerned that mariculture facilities will attract marine mammals and birds to a penned source of food. The Marine Mammal Protection Act and the Bald Eagle Protection Act may not be sufficient to prevent unlawful predator control by mariculturalists.

Again, we must know the likely results of various development scenarios if we are to make responsible decisions. Therefore, we encourage a bill with more land use planning in place.

Lisa J. DeBruyn

3-11-88
DATE

TO: Senate Resources Committee / 465-4745

FROM: John Bell - KANA 486-5725

NUMBER OF PAGES (INCLUDING COVER SHEET): 4

THIS IS BEING SENT BY THE
LEGISLATIVE INFORMATION OFFICE,
KODIAK, ALASKA

Please note that we have a Rapicom 200 Auto-Telecopier. This machine transmits pages up to 8½ X 14 inches. Our telecopier direct line is (907) 486-5264.

PLEASE TELEPHONE (907) 486-8116 IF ANY PAGES
ARE MISSING OR ILLEGIBLE.

BILLING
NUMBER:

Senator Coghill ask that a copy of this be sent down to him.

use this paragraph as a guide if you want.

you can skip this part and just introduce yourself

Good afternoon and thank you for this opportunity to testify on the proposed mariculture legislation. My name is John Bell and I work as a Mariculture Technician for the Kodiak Area Native Association on the scallop mariculture feasibility study. The statement I am about to read was prepared by Bill Osborne who is the Mariculture Specialist for the Kodiak Area Native Association.

For two years, the Kodiak Area Native Association has been cooperating with the Departments of Fish and Game and Commerce and with the Japanese Overseas Fishery Cooperation Foundation in a study on the feasibility of scallop aquaculture in the Kodiak Island area. The ultimate goal of this project is to promote economic development and increase job opportunities in the Native villages of the Kodiak Island area by developing a self-sustaining aquaculture industry.

While pursuing the feasibility study, KANA has also taken initial steps toward commercial scallop aquaculture by obtaining a tidelands permit near the village of Akhiok. We are currently rearing pink scallop spat collected last summer, and we will be harvesting spat again this summer.

The collection of spat for commercial purposes was legalized last summer after the passage of Senate Bill 297, the compromise mariculture moratorium bill. This bill put a hold on the issuance of most types of mariculture permits while work was supposed to continue on a comprehensive mariculture bill. While we are now able to some applications [illegible] permits and regulations, we are still [illegible]

aquatic farmers

will resolve some areas of uncertainty for both ~~farmers~~ and for traditional users of marine resources.

As it is written, Senate Bill 402 is not the comprehensive legislation we are hoping for. On the surface, SB 402 appears to encourage shellfish and kelp farming, but in fact, the bill creates a much more restrictive environment for mariculture than currently exists. We are particularly concerned about the criteria for issuance of permits listed on page 2. It is doubtful that one could use the marine environment in any way without adversely affecting wild stocks or their management. This case reference to adverse effects on marine mammals in the marine mammals act was recently interpreted in court to mean that while commercial fisheries could be shut down because they disturb the mammals in some way. The subject of the harvest does not need to be quantified; the commercial activity must cease.

This bill requires an aquatic farmer to plan with another set of still undefined criteria. On page 13 the commissioner of Natural Resources is required to develop a separate set of criteria for issuing fisheries permits. Why require two, possibly conflicting sets of criteria?

This bill will not allow the sale of harvested or hatchery-produced spat to operations outside of Alaska. Why should Alaska prevent this possible source of revenue? We have already been approached by firms from other states which are interested in purchasing scallop spat.

On page six, under the definitions of private non-profit aquatic farm product, it is implied that the only allowable commercial use of the kelp to be used is dried. [illegible] the kelp

potential uses of aquatic products by farmers, such practices and products into legislation? Consultation with potential aquatic farmers would provide suggestions for many products with which to broaden that definition.

Referring to the tidelands use permit section on page 12, although it is not clear how a fair market price can be determined for a non-transferable five year permit, we are concerned that this provision may drive the cost of operation below the profitable margin.

Finally, the operation of salmon net pen farms is very different from the short term rearing of salmon fry in net pens. This is a proven technique to enhance wild and hatchery salmon returns around the world. By [illegible] the use of net pen culture of salmon, we are not closing the door on a culture technique. We are just closing the door on which groups can produce and sell salmon in Alaska. The limited entry program has left many small communities in western Alaska with limited opportunity to participate in the salmon fishery. Studies have just been conducted on the potential impacts of salmon farming in Alaska. The studies should at least be read before the door is closed on salmon farming in Alaska.

Unless this bill is revised in order to [illegible] restrictions on shellfish and help culture and [illegible] its total opposition to salmon culture, it should not be allowed to pass. This current bill is not a comprehensive, compromise mariculture bill.

Thank you for the opportunity to testify.

[illegible]
[illegible]
[illegible] Center Ave.
[illegible]

486-5725

Alaska State Legislature

Please

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Address

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Alaska State Legislature

Please enter into the record my testimony in the

committee on

Title

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Phone No.

Alaska State Legislature

Please enter into the record my testimony to the Senate Resources committee

committee on [illegible]

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Name

Address

Phone No.

THE PRECEDING DOCUMENT(S) MAY NOT FILM LEGIBLY BECAUSE OF POOR QUALITY OF THE ORIGINAL.

ASCC

ALASKA STATE CHAMBER OF COMMERCE
310 Second Street
Juneau, Alaska 99801
(907) 586-2323

April 5, 1988

The Honorable Richard Eliason
Alaska State Senate
P.O. Box V
Juneau, AK 99811

Dear Senator Eliason:

The Alaska State Chamber of Commerce (ASCC) supports the development of a shellfish and sea vegetable farming industry in Alaska, but we believe that additional research is necessary before proceeding with the pen rearing of salmon.

While your legislation (Senate Bill 482) reflects this general approach, we are concerned about the effect of some of the provisions of your bill and the precedents it might set in other areas of resource development.

Alaska's existing aquatic farms are very small scale business operations, and it appears quite likely that shellfish farms will remain "mom and pop" businesses. It is vital to the success of these businesses that the State's regulatory programs be simple and streamlined.

We are concerned that the original version of SB 482 and subsequent drafts will be cumbersome and expensive for small scale shellfish farmers. It appears that aquatic farmers would be better off operating under the existing regulatory programs.

We are particularly concerned that under SB 482 mariculture operators would be working under what might be the heaviest regulatory burden facing any Alaska industry. In addition, the measure would raise the tidelands fees for aquatic farmers to fair market value, while other tidelands fees are left untouched.

Singling out any industry for special regulatory treatment is not the best approach to economic development. We should be promoting the growth of this promising new industry, not trying to strangle it.

We also are concerned about the clause in SB 482 requiring the Department of Natural Resources to develop regulations limiting the number of sites in an area. These cumulative impact requirements would set a dangerous precedent in Alaska's management of natural resource industries. The impact of these kinds of regulations could be devastating to industries such as timber, mining, and oil and gas. We believe these requirements should be removed.

We also are worried that proposals to prohibit mariculture in State tidelands adjacent to federal wilderness areas could lead a diminishing of the State's sovereignty and a significant loss of the State's ability to manage its own lands. This is something we have fought hard to achieve, and we believe this proposal again would set a dangerous precedent.

ASCC has reviewed your 3/16/88 draft committee substitute, and we believe it represents a reasonable approach to finfish farming. While we are not prepared to support pen rearing of salmon at this time, the farming of other species of finfish appears to be acceptable to most coastal communities.

Upland finfish farming and the pen rearing of arctic char and other non-salmon species can be conducted without threatening wild stocks, the environment, or fishermen's markets. The five-year sunset clause on the prohibitions against the pen rearing of salmon also would allow ample opportunity to research the potential impacts and come to a lasting determination of whether the activity should be allowed.

The proposals contained in the 3/16/88 draft bill appear to be a reasonable compromise approach to the finfish farming issue. We would like to commend you for your efforts to reach a settlement in this area.

Your consideration of our comments is greatly appreciated.

Cordially,

George Krusz
President

cc: Governor Steve Cowper
Commissioner Don Collinsworth
Commissioner Judy Brady
Senate Resources Committee
House Resources Committee

DOC 0062r

MEMO -- January 12, 1988

TO: Fisheries Cabinet

FROM: Paul Peyton

RE: Aquaculture socioeconomic studies

Legislators and others considering proposed regulation of aquaculture activities in Alaska have asked for additional information concerning the social and economic impacts of the various possible forms of development in Alaska. Central to most of the discussion is whether salmon can be profitably farmed in Alaska and compete in the marketplace with wild salmon and farmed fish from other areas. If farm production was to be permitted, what are the potential impacts to the existing common property fishery? What sort of commitment, in terms of time and dollars, would be required of the State to manage and support salmon farming activities?

The DCED has entered into a $20,000 contract with the Sea Fare Group in Seattle to conduct a study of world salmon markets and evaluate the extent of market competition between wild and farmed salmon, including farmed salmon which potentially could be produced in Alaska. Principle investigator for this study will be Dr. James Anderson of the University of Rhode Island. Anderson is a recognized authority in the area and has authored several papers dealing with the market's response to increasing world supplies of farmed salmon. Market contacts, statistical research and report editing functions of the contract will be conducted by the Sea Fare Group which is a commercial consulting business operated by those people that put out the Seafood Leader magazine.

A second $20,000 contract has been undertaken with the DPA group of Vancouver, B.C. DPA will evaluate the relative costs of farmed salmon production in major producing regions around the world, develop a proforma cost of production model for the Alaska situation and assess the sensitivity of major cost factors to overall costs of production. DPA has done similar work for the Government of British Columbia and others and has identified specific sources for the necessary data.

Both contracts call for an interim or progress report to be submitted about February 1st and the final report during the first week of March.

A third phase of the project, that of developing a policy options matrix will be postponed at least until preliminary results from the two contracted studies are reported. At that time we may elect to select a limited number of issues for policy option development and conduct the required work in-house or through an RSA agreement with ISER. There is about $5,000 remaining in the project budget.

Sea Otter Seafood Farm
Debra & David Lyons
Box 296
Petersburg AK 99833

March 24 1988

Dear Senator Ellason,

I must speak to you on a matter of great concern to us as shellfish growers.

We received a letter from the AMA listing "problems" with fledgling mariculture bills and informing us that "our livelihood is at stake"!

Quite frankly, we do not see any of the points Mr. Painter brings up as anything but attempts to create an industry that works with existing uses of our marine resources rather than against them.

It is difficult to politely convey our frustration when we see an individual such as Mr. Painter very active in pursuit working continually against policies which are being developed for the benefit of all Alaskans.

I am continually negatively impressed by how short-sighted and self-serving the views of Rodger Painter and the AMA are.

Fortunately we survived his campaign for pen-reared salmon, now we have to put up with him charging about claiming to represent the shellfish industry.

Of his seven points to ponder obviously a freeze on the expansion of existing permits would most negatively affect us. But if that would be the most fair thing to do: SO BE IT.

Anyone who can not see the reasoning behind making leases non-transferable as a way to avoid speculation is blind to Alaska's long-term best interests. Perhaps the key here is that a ~~permit~~ lease could be transfered but not for profit.

Addressing his second point, we certainly do not wish to bring an industry into Alaska that will adversely affect wild stocks.

We have no problem with putting a label on our product and we feel Fish and Game should be involved in the review process.

On the subject of fair market value, I very much appreciated debate attempting to to clarify value determination of uplands, tidelands and sea water acreage in the permit or lease situation. However I do believe Paula Burgess when she stated that DNR does not wish to over value areas merely to create revenue. This area does deserve to be better defined and resolved within the department. As growers we do not mind paying a reasonable lease. Our industry should pay its own way!

It is said that Robin Lorsen of the Shellfish Growers Assn is on the Board of Directors of the AMA which is where Rodger claims credibility in speaking for the shellfish industry.

I spoke to Robin about this and

his attitude seemed to be; "Rodger has made himself available to work for us in Juneau and has accomplished some good. We just don't have any one else to monitor the legislature and speak for our interests".

At present I do not feel the shellfish Growers are a strong united or well directed group.

A bad situation.

So please keep our comments in mind. AMA does not represent shellfish growers who are interested in developing an industry that respects the rights and wishes of all Alaskans.

Yours Truly

Debra Lyons

copies to
Sen Lloyd Jones
Rep John Sund
Rep Robin Taylor
Rep Peter Goll

DNR Pamela Burgess

P.S. Just read Robin Hansen's letter to your committee and though we differ on siting and transferance he brings up many very valid and thoughtful points

Alaska Mariculture Association

March 2, 1988

Dear Alaska Shellfish Farmer:

Enclosed are copies of two bills recently introduced that address the mariculture issue.

AMA's board of directors has opposed both measures as being anti-mariculture, and we believe they could put some existing oyster and mussel farmers out of business.

We urge you to examine the bills closely and to let the legislature know how you feel it could affect your mariculture business. Both measures are riddled with problems and we are working with the sponsors on amendments to correct these shortcomings.

Your involvement is critical. Please study the bills closely, and call me with any questions or for clarifications. Pay particular attention to the following features:

--Farming permits would be nontransferable. This would prevent you from selling your farm or offering it as collateral.

--Criteria for issuance of permits appears to say any adverse impacts on wild stocks, habitats or fisheries management would result in permit denial.

--Your oysters or mussels would have to be labeled as "aquatic farm products." This is another unnecessary government regulation that provides no discernible benefit to the industry or consumers.

--You would have to pay "fair market value" for tideland permits, and might be required to pay for public notices.

--ADFG will be required to develop culmulative impact regulations limiting the number of farms to protect the "economy, environment and natural resources" of an area.

--No new permits will be issued until final adoption of new regulations to implement the legislation.

--"Grandfather" provisions for existing permit and lease holders will not allow you to "expand operations beyond the scope allowed under the existing permit."

Your livelihood is at stake. Take a close look and contact the legislature today. All legislators can be reached by writing: P.O. Box V, Juneau, AK 99811.

Sincerely,

Rodger

Rodger Painter
Executive Director

130 Seward St., Suite 201 • Juneau, Alaska 99801 • (907) 463-3600

Sheila → Dale

Sea Otter Seafood Farm
David & Delma Lyons
Box 296
Petersburg AK 99833
March 23, 1988

Dear Senator Eliason,

I'd like to offer a few comments on the legislative teleconference with Paula Burgess. Presently, the advertising system for permits and leases is lacking. However, a few changes could help this process more serve the public.

The presence of a POSTMASTER seems to be a criteria for issuance of advertisements to be posted. These notices should go to every place mail is dropped. Edna Bay, Tokeen, Baukati, Port Alice etc. Each of these places has a central spot for mail pick-up. All other commercial users, permit and lease holders, such as other mariculturists, log camps and lodge owners should be notified. DNR might also offer to maintain a mailing list to interested parties of pending permits, in the present manner of the Forest Service.

A few changes would go a long way towards making the process work in its intended fashion.

I also favor a case by case review. Permits that are negatively commented on should be given a hearing. The permit process is viewed as a flexible one by DNR: a time for trying out options both on the part of the permittee and the state. It should be made clear to permit applicants that if any conflicts arise, they may be asked to choose an alternate site etc.

Overall, I think DNR is handling the permit process remarkably well, however, we do desperately need development of maps of areas with specific designations of sites OFF LIMITS to any commercial development. The public is alarmed about site use conflicts. They have received no assurance that every bay, cove, and pass is not going to have a commercial outfit operating there.

So, lets identify these sensitive areas. Anchorages, travel routes, especially scenic or recreational areas and subsistence areas. It may be very true that aquaculture sites can co-exist with anchorages and recreational use by why do they have to when they are so many sites available. I see a tendency of aspiring aquaculture to choose most obvious sites, these often have other uses. I truly believe the industry can be encouraged to locate in non-conflicting areas without great hardship.

As a grower we would like to see a bill developed that will be fair to all users of our great marine resource. We feel you and your staff are working very constructively to that end and we complement you!

Yours Truly

Debra Lyons

Copies to
Sen Kamo Torres
Rep Taylor, Sund, Gall
DNR Paula Burgess

Testimony in Support of Fish Farming in Alaska

submitted by

Greg L. Young [1]

Genetics-Perceived vs. Actual Problems

There appear to be two major genetic concerns relative to fin fish farming.

1. Introduction of so called exotics that will displace indigenous species.

Domestic Atlantic salmon is the one of the major species that would be considered for importation at this time. These fish are domesticated to such a degree that captive broodstocks are deemed the only practical means of assuring sufficient supplies of eggs that are disease free. Fin fish farming has far more rigid requirements for disease control than does salmon ranching. The history of salmonid rehabilitation and culture provides an extensive documentary on the difficulty of establishing self sustaining populations of anadromous salmonids. Millions of dollars have been spent trying to reintroduce Atlantic salmon to their former range with only limited results. Some of these projects have been abandoned in favor of the more aggressive Pacific coho stocks.

The reason for importing domestic stock would be to take advantage of their superior growth and survival characteristics under culture conditions. It would also eliminate conflicts with wild fish markets

2. Escapement of "domestic" fish that will interbreed with wild stocks.

---

[1]Greg Young has a Masters Degree in Fisheries Science and over 20 years experience in the aquaculture and fisheries industries working for the Federal government three states including Alaska and private sector industry. He is currently involved with a project a Baranof Warm Springs trying to develop a smolt production facility that would double the entire present enhancement capacity for the common property fisheries. This facility would also be able to supply smolts to a segment of the fish farming industry. This valuable project has been stalled by Fish and Game now for over 10 years.

This interbreeding problem is not at all unique to farm fish but is occuring right now between wild and ranched stocks. The implications are as follows:

IMPACTS OF STOCKED AND TRANSPLANTED(ESCAPED) FISH ON THE GENETICS OF WILD STOCKS

It is possible that the fitness of stocked fish will be less than the fitness of the wild population. Fitness would be reduced if the stocked fish were poorly adapted to the local environment, if the number stocked was large relative to the wild stock, and more importantly if the stocked fish actually successfully spawned with the wild stock.

IMPACTS OF HATCHERY MANAGEMENT ON THE GENETICS AND FITNESS OF HATCHERY STOCKS.

Inadvertent selection in the hatchery due to non-random collection of spawners by size, run timing(getting broodstock during terminal fish openings), age, hatchery domestication. The difficulties involved in obtaining broodstock at random from all portions of an enhanced terminal fishery are monumental. At best most hatcheries get fish from one or two segments of the run with the fisheries eagerly mopping up the rest of the fish. Most facilities don t have sufficient holding space to keep early run fish alive until later ripe fish show up. The end result is selection for a new hatchery modified stock.

IMPACTS OF HARVEST MANAGEMENT ON THE GENETICS OF WILD FISH STOCKS.

Over-harvest which has occurred on virtually all of our wild stocks at one time or another in the last three decades, and has precipitated the current U.S./Canada Treaty, leads to reduced effective population. This has been a common impact on our wild stocks.

An equally prevalent problem exists on our mixed stock fisheries. Reproductive overfishing can occur in mixed stock fisheries when some stocks are more productive than others. This is especially true when catch quotas are based on statistical districts rather than actual stock statistics.

Unintentional artificial selection occurs because of the non random nature of the fishery and it acts on fitness related traits or traits genetically correlated with fitness.

For any of these impacts to occur large numbers of domestic fish have to be released into the wild. Does it really seem reasonable that an industry would accept the escape of significant numbers of fish with a value of more than $1.00. Does anyone even fathom the loss of 870 million fish a year? This is the number of fish from hatchery altered gene pools released into the natural waters of the state in 1987. Fish farming could never begin to mount an impact of this magnitude. The issue of genetic impacts from fin fish farming exists only in the emotions of ignorant people. Trying to use genetics as a reason to delay finfish culture is an irresponsible attempt to cover up the serious and rapidly increasing genetic problems created by ~~ocean ranching~~ that are facing our wild stock fisheries today.
mixed stock fisheries

Disease-Are there any real problems unique to aquaculture?

Again there are two major issues to consider. Transmission of disease between hatchery and wild stocks, and introduction of non-indigenous diseases.

I hope previous testimony by Dr. Allee has convinced some of you that Alaska has one of the best pathology programs in North America. They have the facilities, the staff, and the expertise to recognize and evaluate the known disease agents that could affect fish in Alaskan waters.

1. I would like to pose the question of whether fish farming is any different than other intensive aquaculture as far as disease transmission is concerned? Does it pose any unique new risks to the wild stocks? No on both accounts. As pointed out by Dr. Allee the most likely scenario involving farmed fish and wild stocks would be for the wild stocks to infect the domestic fish. This is a result of the very basic principal of <u>stress as a predisposing factor in fish diseases</u>(as well as in all other organisms). Wild fish are typically continuously exposed to or actually harbor the infective agents of the indigenous fish diseases. Stress as caused by poor environmental conditions or the close contact that is typical in farmed fish interacts with these pathogens supplied from the wild fish to cause a disease outbreak. The dispersed nature of the wild fish during most of its life cycle doesn t combine the stress and the close contact necessary to create a significant epizootic. Do disease outbreaks in hatcheries endanger wild stocks? It is a standard practiss in the hatchery industry to release fish that are showing signs of disease if there are no readily available effective treatments. This is a stadnard practive in Alaska also and has been practiced recently at Crystal Lake. The fish have a better chance of survival

in a less crowded situation and the risks associated with transmitting the disease to wild fish have been judged to be minimal.

2. Does the importation of domestic strains of fish create a significant risk of bringing new diseases into Alaska?
If only fish of known disease free status are allowed to be imported and then only as the basis to establish a resident captive disease free broodstock, there is no significant risk to our wild or hatchery stocks. There are broods of domestic Atlantic salmon that have been certified as disease free for three generations. These fish in all probability are freer of disease than any of our wild stocks. To even further reduce any risks, these fish could be held in quarantine until it was decided that they were indeed disease free. It would be advantageous to limit this type of importation to broodstock establishment purposes and not be allowed for routine egg, fry, or smolt acquisition.

Disease then as genetics does not pose any unique or new problems to Alaska. It is being used just as herpes was and AIDS now is being used as an emotion evoking means to accomplish other social or moral ends.

WHAT ISSUES ARE LEFT ?

Impacts on markets of wildstock fisheries-primarily chinook and coho

One of the few issues raised that has any merit at all is the impact that farmed fish will have on markets for wild stocks. This impact will occur regardless of Alaskan participation.
It is a grevious deception of the fishermen to lead them to believe that by stopping finfish culture in Alaska that there will be any less impact on them. The production of chinook in British Columbia this year alone is projected to be 2-3 times the entire Alaskan wild catch. A reasonable approach to this impact lies not in burying ones head in the sand, but in formulating an aggressive marketing plan to create a distinction between products to forming a market niche for the wild fish. Previous testimony by the Trollers indicates that they are doing this right now. I want to stress the importance of maintaining this effort. The almost five year lag time before any Alaskan farmed fish could reach the market provides ample time to establish this distinction for Alaskan fish. Wild fish supplies in Alaska will peak at a level above what they are now, because of the natural limit to wild stock production, and the increasing genetic problems created by enhancement production. This level of production could occur within ten years or less. Alaskan finfish production should be made available to meet

the these futuremarket needs. If Alaska intends to maintain and expand its market share, the supply of product has to be available in a steady uninterrupted supply of uniform quality.

Pollution-A matter of nutrient redistribution.

Pollution has been another windmill that opponents of aquaculture have been tilting at. If common sense and simple observation have any chance of prevailing over rhetoric and emotion this problem too will fall into proper perspective.

Pollution from aquaculture is primarily nutrient enrichment. These nutrients are "soft wastes" for the most part, readily absorbed and used as basic nutrients by the aquatic food web. If this enrichment exceeds the local capacity for absorbtion it becomes pollution. The amounts of nutrients released into the water are easily calculated and are directly proportional to the volume of food fed. This is a site by site consideration that is quite well addressed by current wastewater management science and the extensive CZM, DEC, DNR, ADFG, U.S.F.S review procedures. The combined effects of aquatic farms can actually be managed as an important part of the redistribution of the nutrient base currently disrupted by the wild stock fisheries.

By constrast the current wild stock fisheries harvest on the order of 9 billion pounds of fish products from Alaska's near shore and fresh waters each year. This tremendous volume of product once formed the nutrient base for our stream and estuarine environments. The collapse of many of our sockeye runs is a direct result of nutrient loss due to this nutrient harvest. We are now spending money and reevaluating escapements to correct this problem.
Not all of this 9 billion pounds of material is removed from our waters. The wastes from the fish processing plants are usually coarsely ground and discharge directly as "hot wastes" that cause oxygen depletion and serious pollution, until they too are decomposed and absorbed by the food web.

So the real issue once again is not one of pollution caused by a new industry, but is one of an opportunity to mitigate pollution problems caused by the current dumping of fish wastes by using these wastes as by-product raw materials for feed manufacture. These by-products can then be redistributed as useful enrichment to help mitigate the current nutrient mining occurring from the wild stock fisheries. The result is a symbiotic relationship between two segments of the same industry.

BENEFITS FROM FISH FARMING

Operations using native chinook or coho smolts for production will have the benefit of produceing smolts for the wild stock enhancement programs as part of their broodstock development programs. Even after captive broodstocks are domesticated, smolt production for wild stocking would be an important adjunct to the industry. It is important to get these smolt production facitilities on line several years before grow out facilities to guarantee that present enhancement programs are not robbed. This has been one of the legitimate criticisms of programs outside of Alaska, yet is one of the easiest to prevent.

Alaska can and should become a seafood leader on world markets, this means producing and marketing a wide variety of products that cover the entire range of fish food items. We should strive to be a one stop shopping source for these products and farmed fish, shellfish and sea vegetables are an integral part of this menu.

There would be opportunities for wood fibre based packaging industry development to supply Alaskan markets, and also Pacific rim countries that are short on wood fibre.

The aquaculture industry would provide a stimulus for expansion of the transportation infra structure within Southeast Alaska. The shipment of feeds and supplies and the back shipment of fish will promote new and more frequent freighting services in A E Alaska.

Fish farming technology and the manufacturing of equipment to support it will form the basis for exporting businesses.

The demand for fish feeds would help expand the fish feed manufacturing businesses in Alaska that utilize seafood by-product wastes as well as Alaskan produced grains

The Alaskan Shellfish Grower's Assn.
P.O. Box 1499 • Wrangell, Alaska 99929

March 14, 1988

To the Senate Resources Committee,

Regarding SB 482:

P1, Line 28 -- All of the permits issued to the sea farmer must be transferable. No-one will enter into a business of any description if he cannot sell his investment. The new owner should, however, meet the same State stipulated criteria as the original possessor of the permits.

P2, Line 20-24 -- Any "plan" and obligatory adherance to a "plan" is unrealistic and premature unless the necessary infrastructure is in place for the shellfish industry:

1. An Alaskan Shellfish Hatchery

   a. Genetics: To produce an Alaskan strain of Crassostrea Gigas. Our lower 48 sources of spat result in approximately 20% of our seed growing well. This percentage could be increased to better than 80% if we were to develop an Alaskan strain in a hatchery. FRED has a proposal for a shellfish hatchery on its'89 budget. This should be implemented.

   b. Disease: We could virtually eliminate the possibility of the importation of disease with an Alaskan hatchery; thereby significantly reducing the State's expenses in this area and assuring the industry that their product will not be decimeted by oyster drills and the like.

   c. Logistics: In 1984, ASGA made a collective purchase of spat. The shipment "overheaded" Wrangell; flew to Juneau, overheaded Wrangell, and returned to Seattle. Then it was shipped to us again. We experienced better than 90% mortality -- no spat that year. If we had an established market this would have been a disaster because it would have resulted in a year with no product.

2. A PSP lab strategically located somewhere in SE Alaska is essential to sales. The product must be kept out of the water while the mailed samples are tested in Palmer. Alaska's most promising oyster product must be delivered alive to the restaurant and will be consumed raw. Testing in Palmer reduces its' shelf-life by three days. A lab in SE would be able to telephone a release to the distrubutor on the same day that the oysters were taken from the water.

3. A permit system that provides the necessary investment security.

4. With 1,2,and 3 in place, a revolving loan program would be appropriate.

With 1,2,& 3 in place, the State could reasonably expect a would be farmer to have a "plan" and adhere to it; baring unforeseen events or acts of God.

P3, Line 24-29 -- I don't see that any of this is appropriate to the issuance, or non-issuance of Shellfish or Sea Vegetable gathering permits. This seems to be directed at Finfish. Comment: It is not possible for a board of fisheries to fully understand the needs and problems of a shellfish and sea vegetable farming industry. The industry and the State of Alaska need a Board of Shellfish and Sea Vegetable Mariculture.

P4, Line 21-25 -- Not acceptable! Prohibits interstate and foreign sales of Shellfish Hatchery product.

P4, Line 26- P3, Line 5 -- This has to be re-written so as to not interfere with the smooth and continuous flow of product to distribution points and to the consumer. Latest word from FRED Pathology and the disease control plan currently being implemented: "Farmer or distributor must have a Shellfish Transport Permit that needn't be applied for with each shipment provided the "spat" are from a certified source and raised at the same certified farm-site." The industry can live with this.

P9, Line 8 -- In the case of the oyster -- Crassostrea Gigas -- (that will not spawn naturally in Alaskan Waters) this would be useless and costly. All C.G. in Alaska will necessarily be farmed.

P10, 5 -- Why should shellfish farming "improve" the health of the citizens of the state? Granted -- oysters may improve their reproductive potential.

P12, Line 2 -- New lessee should have opportunity to make new use proposal. He may plan to farm mussels or scallops in addition to oysters and there is no biological or political reason why he should not.

P12, Line 16 -- "The permit may not be transferred." Why?

P12, Line 17- P13, Line 3 -- After five years of capital and energy investment, a permit cannot be thrown open to a debate as to whether or not it is going to be re-issued. No other established industry has this kind of uncertainty facing them. With this provision is place, it is totally illogical to make any significant investment in a farm.

Would anyone invest in a limited entry permit and a suitable vessel if, after five years of operation, his right to fish was in jeopardy -- subject to the opinion of the commission and of the public?

This bill must take into consideration the use of slightly protected, or even unprotected beaches for the cultivation of oysters and possibly clams.

Also it must provide for the leasing of holding areas as a necessary part of the "half-shell oyster" distribution system.

P14, Line 1 -- Must make provision for growth.

On the teleconference March 11, 1988 someone requested that Sec. 38.05.855 "Identification of sites for Aquatic Farms and Hatcheries (which was a part of SB425) be incorporated into SB 482. This provision would be devastating for the industry. It would present an opportunity for anyone with whatever reasoning or reaction, to prevent the utilization of a given site for the purpose of shellfish or sea vegetable farming. The end result would be almost zero availability of suitable farm sites for that purpose.

I suggest that the multiple use concept be applied to all perspective sites. There is no reason that a farmed area cannot continue to be a subsistance area, a recreation area, or an anchorage while it supports a Mariculture activity.

Latest rumor is that DNR would like to increase the tidelands permit cost from the present $50/acre (with a $100 minimum) to $200/acre. When we have an established industry, a re-evaluation of land values may be appropriate; but, to raise the rent by 400% at this time would further discourage and possibly defeat the efforts of Alaskan families to enter into this fledgling industry. It would, however, present no problem to large corporations.

Summary: SB 482, as written, is riddled with finfish-buckshot apprehension. I would like to see it re-written by an individual or a group that is thinking about shellfish farming -- its relationship to the State of Alaska, and the wise utilization of our national resources.

Oyster farming and the cultivation of other shellfish and sea vegetables, offer an opportunity for the State and its citizens to enter into a partnership with significant benefits for all. A new industry that does not threaten the Alaskan ecosystem; but, rather, by its nature requires clean water and an aquatic environment that is in balance.

A prerequisite to the industry is the evistance of very special people able to live in the wilderness. These special people are not common, even in Alaska. They must adapt to the challenge of living without electricity, indoor-plumbing telephone, TV, etc. There are few family units that can endure to the point of making a living. They need all the help they can get.

If this bill is poorly designed, the Alaskan will be unable to farm because of unreasonable and paralyzing constraints, and large corporations will dominate the industry; taking their profits out of the State. If this bill is well designed the State will have a sizable cottage industry that will fulfill the Alaskan Dream, and provide employment for many families that will keep their profits in Alaska.

Sincerely,

Robin Larsson

Robin Larsson
President, ASGA

cc: Senator Jones
Representative Taylor
Representative Ellis
Representative Sund

1200 E 76th Ave. Suite 1222
Anchorage, AK 99518
(907) 349-6485

March 15, 1988

Senator Jack Coghill
Alaska State Senate
P.O. Box V
Juneau, AK 99811

Dear Senator Coghill

We have been involved in the development of a fish farm since 1978. In 1982 we began the permitting process with the Alaska Department of Fish & Game and at their suggestion began a development of a land locked (upland) fish farm on private property. In December of 1986 we were issued a license. We have invested a significant amount of time and money in development of a viable commercial fish farm operation. If we were denied the opportunity to proceed with this venture now we would be more than disappointed.

In our first attempts to locate a suitable site we looked at an area in Washington Bay, which was owned by the U.S. Forest Service. As you can see from the enclosed letter, they were not at all encouraging.

It is our understanding that the only permit we need, once our tanks are installed, is a Fish Transport Permit.

We have reviewed proposed Senate Bill 482. If it is necessary for the bill to pass we would suggest the words "except for land locked saltwater pens" be added to the end of Sec. 16.40.100, paragraph (e).

Additional information regarding our efforts is enclosed for your use.

Thank you for your attention.

Sincerely yours,

Thorne W. Ferguson, Jr.

Thorne W. Ferguson, Jr.

Encl.

DOC 0062r

MEMO -- January 12, 1988

TO: Fisheries Cabinet

FROM: Paul Peyton

RE: Aquaculture socioeconomic studies

Legislators and others considering proposed regulation of aquaculture activities in Alaska have asked for additional information concerning the social and economic impacts of the various possible forms of development in Alaska. Central to most of the discussion is whether salmon can be profitably farmed in Alaska and compete in the marketplace with wild salmon and farmed fish from other areas. If farm production was to be permitted, what are the potential impacts to the existing common property fishery? What sort of commitment, in terms of time and dollars, would be required of the State to manage and support salmon farming activities?

The DCED has entered into a $20,000 contract with the Sea Fare Group in Seattle to conduct a study of world salmon markets and evaluate the extent of market competition between wild and farmed salmon, including farmed salmon which potentially could be produced in Alaska. Principle investigator for this study will be Dr. James Anderson of the University of Rhode Island. Anderson is a recognized authority in the area and has authored several papers dealing with the market's response to increasing world supplies of farmed salmon. Market contacts, statistical research and report editing functions of the contract will be conducted by the Sea Fare Group which is a commercial consulting business operated by those people that put out the Seafood Leader magazine.

A second $20,000 contract has been undertaken with the DPA group of Vancouver, B.C. DPA will evaluate the relative costs of farmed salmon production in major producing regions around the world, develop a proforma cost of production model for the Alaska situation and assess the sensitivity of major cost factors to overall costs of production. DPA has done similar work for the Government of British Columbia and others and has identified specific sources for the necessary data.

Both contracts call for an interim or progress report to be submitted about February 1st and the final report during the first week of March.

A third phase of the project, that of developing a policy options matrix will be postponed at least until preliminary results from the two contracted studies are reported. At that time we may elect to select a limited number of issues for policy option development and conduct the required work in-house or through an RSA agreement with ISER. There is about $5,000 remaining in the project budget.

John Ippolito
Box 770918
Eagle River AK
99577

MAR 2 1 1988

Senate Resource Committee:

In addition to my testimony via teleconference on SB 482, I would like to submit this copy of a petition to the Governor opposing fin-fish farming in Alaska. I believe this echos sentiment from fishermen throughout the state.

Sincerely,

John Ippolito

P. O. Box 770918
Eagle River, AK 99577

March 9,1988

Governor Steve Cowper
P. O. Box "A"
Juneau, AK 99811

Dear Governor Cowper:

The attached petition represents our FIRM OPPOSITION to the pen-rearing of fin fish in Alaska. We consider this to be the most important topic on the legislative agenda. At stake is the future well being of Alaska's healthiest industry. Therefore, we find it imperative to receive proper representation from our elected officials.

To avoid compromise over the various mariculture bills before the legislature, consider our efforts an endorsement of the proposals and amendments to legislation supported by United Fishermen of Alaska (U.F.A.).

We will continue to scrutinize legislative progress on this most important issue and are counting on your support. In addition, we are requesting your position on fin fish farming.

Sincerely,

EAGLE RIVER/CHUGIAK FISHERMANS
ASSOC. AND CONCERNED CITIZENS;

By: John Ippolito

ji/atch

Governor Steve Cowper:

We the undersigned are dreadfully concerned about the potential destruction of Alaska's healthiest natural fisheries resource's and therefore want you to vote **AGAINST** any legislation which would allow the establishment of a **PEN-REARED SALMON** Industry **in ALASKA**.

We feel that due to the number of questions and uncertainties that pen-reared fin fish pose, allowing or encouraging its existence in Alaska will destroy years of work and effort as well as effect the community we live in. At this time, we feel that pen-reared salmon are not in the best interest of the State. We have a healthy and vigorous commercial fishing industry, an industry that directly bolsters the Eagle River-Chugiak economy by many millions of dollars annually. How many millions of dollars will Pen-reared salmon bring to our community if we lose our most important natural resource?

Print Name	Signature	Address	Phone #
William E. Kuhlmann	Wm. E Kuhlmann	P.O. Box 770891, Eagle River.	694-2426
Diane L. Kuhlmann	Diane L Kuhlmann	P.O. Box 891, E.R.	694-2426
Erik W. Kuhlmann	Erik W. Kuhlmann	P.O. Box 770891, E.R.	694-2426
John Ludwick Jr	John Ludwick	Po box 771811 Eagle river	688-1192
KATHLEEN M. LANGE	Kathleen M Lange	19325 WAR ADMIRAL RD. EAGLE RIVER	694-9626
STEVEN W STOEBER	Steve Stoeber	P.O. Box 770025 EAGLE RIVER	6942677
JACK C. IVY	Jack C Ivy	P.O. BOX 770025 EAGLE RIVER	6942677
Robert J. Kelly	Robert J. Kelly	20215 Ranch Drive E.R.	694-2636
KEN R. REST	Ken R. Rest	671282 CHUGIAK, AK.	688-9300
TOM L. HUFFEL	Tom L. Huffel	17707 SANCTUARY DR. EagleRiver AK	694-3326
John L. Everitt	John L. Everitt	17422 Tekkanika Dr., Eagle River AK	694-6662

Print Name	Signature	Address	Phone #
BILL JARDEL	William A. Jardel	HC 79 BOX 6755 Chugiak AK	688-9599
DIANE L. RIPPLE	Diane L. Ripple	HC 79 Box 6755 Chugiak AK	688-9599
ANNEILA COOPER	Anneilia Cooper	P.O. Box 918 Eagle River AK 99577	694-2109
JOHN IPPOLITO		Mile 5 E/R Road Box 770918 E.R. 99577	694-0559
JAMES M LOCKMAN	James M Lockman	4840 E 45RD APT #2-A 99508	333-2578
Jeff Duck	Jeffrey W. Duck	801 Airport Hts 475 15th Ave 99508	278-4887
John Russell	John M Russell	14727 W Colorado Eagle River 99501	694 3375
~~Clayton Petranovich~~			
CLAYTON PETRANOVICH	Clayton Petranovich	STAR RT 1 Box 2295 Chugiak 99567	688 2542
Roderic H. Perry	Roderic H. Perry	HC 78 Box 2263 Chugiak 99567	688-2149
Richard J Person	Richard J Person	HC 80 Box 7149 Chugiak 99567	688 3608
ANTONE R COELHO	Antone R Coelho	10808 KATLIAN EAGLE RIVER	694-2585
LILLIAN M. PERSON	Lillian M. Person	HC 80 Box 7149 Chugiak AK 99567	688-4678
Lonnie S Thomas	Lonnie S Thomas	20718 Melody Cir. E.R. AK 99577	694-4092
Frank W. Neumann	Frank W. Neumann	P.O. 670683 Chugiak Ak 99567	688-3953
Tim Mauk	Tim Mauk	P.O. Box 670725 Chugiak Ak 99567	688-2641
Carol Johnson	Carol Johnson	10416 High Bluff, Eagle River 99577	694-8764
Herbert Fassler	HERBERT FASSLER	P.O. Box 670181 Chugiak ak.	688-2504

Print Name	Signature	Address	Phone #
JAMES O. THOMSON	James O. Thomson	ST. R. 2 Box 1635 Chugiak	688-2989
DANE SMOOT	Dane Smoot	10107 Wildwood Eagle River	694-4479
Linda Bassett	Linda Bassett	2625 Darby Cir. Anchorage	276-3831
ZACHARY WILLIAMS	Zachary Williams	Falls Bay C/o Concord AK	699-1198
ERNEST R. JOHNSON	Ernest R. Johnson	10416 HIGH BLUFF DR. EAGLE RIVER	694-9744
Karen M. Perry	Karen M. Perry	HC 78 Box 2263 Chugiak AK	688-2149
Bruce C Rupp	Bruce C Rupp	Box 544 Chugiak AK	688-3349
Juliann N Duffus	Juliann N Duffus	10052 BAFFIN ST EAGLE RIVER, AK	694-2359
Mardi K. Hutchens	Mardi K Hutchens	11340 Borealis Eagle River AK	699-5063
Evelyn J. Coelho	Evelyn J. Coelho	10808 Katlian E.R. AK 99577	694-2585
LEONARD DUBAY	Leonard Dubay	SR Box 9125 E.R. AK. 99577	694-9844
Dave Doyle S	Dave Doyle	3711 Matthews Dr	345-3571
Robert Witman	Robert Witman	1220 Old Glen E.R. AK 99577	694-3297
Mark Reamer	Mark Reamer	2453 South Birchwood AK 99567	688-5860
FRED SMITH	Fred F Smith	17618 JUANITA LOOP	694 EC77
THOMAS F. WALKER	Thomas F. Walker	9289 HILAND DR. EAGLE RIVER, AK. 99577	694 5683
Patti L. Hamilton	Patti L Hamilton	P.O. Box 770532 ER AK 99577	696-2763
Nick Hamilton	Nick Hamilton	Box 532 Eagle River AK 9957	696-2763

Print Name	Signature	Address	Phone #
KEITH A TIMOTHY	Keith A Timothy	18708 Mile Alaska EK	694-4645
Michele BALES	Michele Bales	13350 Eagle Cir	345-5823
Jeanette Rust	Jeanette Rust	PO Box 770916 EK	694-9242
C) Rust	C) Rust	PO Box 770916 Eagle River	694-4581
NANCY L. HEUN	Nancy L Heun	POBOX 1228 Palmer AK	746-0248
L.T. JOHNSON	L.T. Johnson	1731 EARLY VIEW DR. AK	337-7440
RANDY RICHMOND	Randy Richmond	P.O. BOX 211416 ANCH., AK	786-8877
ROB HEUN	Robert Heun	PO Box 1228 Palmer AK	746-0248
[illegible]	[illegible]	17647 Beedercreeden, Eagle River	622-5140
D. A. LONG	D. A. Long	SR 1794 EAGLE RIVER AK. E.R.	6949661
Richard W Austin	Richard W Austin	P.O. Box 110743 and Colorado 99514	6289819
Mary J Whitley	Mary J Whitley	4.37 Park Dr Chugiak AK 99567	688-9819
DIANA L. WHITLEY	Diana L. Whitley	21117 SPARKLE DR. APT. #A	688-9819
RICHARD B AUSTIN	R. Austin	21117 SPARKLE DR APT #B	688-9819
PATSY F. AUSTIN	Patsy F. Austin	P.O. Box [illegible] AK 99574	688-9819
PATRICIA M SHOREY	Patricia M. Shorey	P.O. Box 670923 Chugiak 99567	276-1656
MARION C SHOREY	Marion C. Shorey	P.O. Box 670923 Chugiak 99567	276-1656

Print Name	Signature	Address	Phone #
Terry Gall	Terry Gall	P.O. Box 671703 Chugiak AK 99567	688-2435
Sandra Guthrie	Sandra Guthrie	P.O. Box 671241 Chugiak AK 99567	688-5391
KATHLEEN FI NIEDER HAUSER	[illegible]	RR ~~Box~~ HC 80 Box 7147 Chugiak AK 99567	688-4917
Tamara Maus	Tamara Maus	P.O. Box 671556 Chugiak AK 99567	688-3712
Anna Maus	Anna Maus	P.O. Box 670725 Chugiak AK 99567	688-2041
Susie Maus ~~Susie Maus~~	Susie Maus	SRJ Box 4110 Chugiak AK 99567	688-2760
Dianne Gentry	Dianne Gentry	333 Davis St Anchorage AK 99508	337-4740
Colwitcha M. Gentry	Colwitcha M. Gentry	333 Davis St Anchorage AK 99508	337-4741
Daniel Maus	Daniel P. Maus	P.O. Box 671534 Chugiak AK 99567	688-3533
TAMMY R. MAUS.	Tammy R. Maus	HC 79 Box 4110 Chugiak AK 99567	688-2760
~~Norman D Vaughan~~	Trapper		
NORMAN DANE VAUGHAN	Norman D Vaughan	P.O. Box 13-174 Trapper Creek AK 99683	None
DANIEL J. OWENS	Daniel J. Owens	POB 2886 PALMER, AK.	745-5631
Karen M. Owens	Karen M Owens	Do Box 2386 Palmer, AK 99645	745-5631
Dennis J Lozano	Dennis J Lozano	17724 N Sunrise Loop Rd Eagle River	694-3425
Carol Reed	Carol Reed	Box 141 Palmer, AK.	745-4601
~~Pat Reed~~			
F. PAT REED	F. Pat Reed	P.O. Box 877341 Wasilla, AK, 99687	376-6826

Print Name	Signature	Address	Phone #
Michael W. Lyon	Michael W Lyon	18008 Meadow Crk Eagle River AK	694-9757
Catherine L Lyon	Catherine L Lyon	18008 meadow Crk Eagle River AK	694-9757
Jerry L Sather	Jerry L Sather	P.O. 770726 Eagle River AK 9577	688-4987
Marydith W. Beeman	Marydith W. Beeman	Box 134 Chugiak AK 99567	688-2727
Julius Raphael	Julius Raphael	11340 Eagle River	6945063
Malcolm D. Pressley	Malcolm D. Pressley	12343 E. Prince of Peace Dr. Eagle River	694-0803
John Ginsburg	John Ginsburg	P.O. Box 771143 Eagle River, AK 99577	694-2194
Stuart Gilbert	Stuart Gilbert	P.O. Box 771047 Eagle River	694-7112
Rebecca Fender	Rebecca Fender	PO Box 771747 Eagle River	1094-7112
Donald Hery	Donald Hery	SR Box 211 Eagle River AK	6942940

Print Name	Signature	Address	Phone #
Marie Lozano	Marie E Lozano	17724 Granite Loop Eagle River AK	694-3425
Stanley M. Reed	Stanley M Reed	P.O. Box 141 Palmer Alaska 99645 Mile 6 Palmer-Fishhook Road	745-4601
Jane S. Lupo	Jane S. Lupo	P.O. Box 773166 Eagle River AK 99577	694-5678
~~Duane Halverson~~			
Duane Halverson	Duane Halverson	P.O. Box 13183 Trapper Creek 99683	—
Steve Flodin	Steve Flodin	SR1 Box 2570 CHUGIAK AK 99567	688-2230
Mabel Flodin	Mabel Flodin	SR1 Box 2570 Chugiak AK 99567	688 2230
Kookie Wright	Kookie Wright	P.O. BOX 670384 CHUGIAK AK	688-9449
Hazy & Stan Hayes	Hazy & Stan Hayes	P.O. Box 94 Chugiak AK 99567	688-9484

Governor Steve Cowper:

We the undersigned are dreadfully concerned about the potential destruction of Alaska's healthiest natural fisheries resource's and therefore want you to vote **AGAINST** any legislation which would allow the establishment of a **PEN-REARED SALMON** Industry **in ALASKA**.

We feel that due to the number of questions and uncertainties that pen-reared fin fish pose, allowing or encouraging its existence in Alaska will destroy years of work and effort as well as effect the community we live in. At this time, we feel that pen-reared salmon are not in the best interest of the State. We have a healthy and vigorous commercial fishing industry, an industry that directly bolsters the Eagle River-Chugiak economy by many millions of dollars annually. How many millions of dollars will Pen-reared salmon bring to our community if we lose our most important natural resource?

Print Name	Signature	Address	Phone #
FRANKLIN D MAUS	Franklin D Maus	ST RTE 2 BOX 4110 CHUGIAK AK 99567	688-2760
Quentin C. Guthrie	Quentin C. Guthrie	P.O. Box 671041 Chugiak, AK 99567	688-5391
Ebe Brown	Ebe Brown	RR 2 Box 4493 Chugiak AK	688-0731
Robert L. Hill Sr	Robert L. Hill	P.O. Box 670431 Chugiak AK 99567	688-2362
Audrey Hill	Audrey Hill	P.O. Box 670431 Chugiak Ak. 99567	688-2362
Eleanor J Maus	Eleanor J. Maus	5901 E. 6th. Anchorage 99504	331-5670
Juanita T. Gould	Juanita T Gould	Box 45 Matanuska, AK 99613	696-2346
LARRY A HILL	Larry A Hill	BOX GT-1703 CHUGIAK 99567	688-2435
Eleanor Maus	Eleanor Maus	H.C. 79 Box 4110 Chugiak AK 99567	688-2760
Tom A. Maus	Tom A Maus	P.O. Box 671556 Chugiak AK 99567	688-3712
G. A. NIEDERHAUSER	G.A. Niederhauser	P.O. Box 773575 EAGLE RIVER AK 99577	688 4417

SET 2

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Print Name	Signature	Address	Phone #
Darlene Dubay	Darlene Dubay	SR Box 9125 Eagle River AK 99577	694-5844
MARIE M. ZIB	Marie M. Zib	10121 CARIBOU ST. EAGLE RIVER	694-2551
Stephen S. Wilson	Stephen S. Wilson	SR2 BOX 411 Raven Court CHUGIAK AK 99567	688-2281
Patricia J. Murphy	Patricia J. Murphy	900 S. Klevin #2 Anchorage 99508	333-5613
Louis J Zib	Louis J Zib	10121 CARIBOU EAGLE RIVER AK	694-2551
CORINNE HEIDEMANN	Corinne Heidemann	PO Box 770061 Eagle River, AK 99577	688-4497
Steven P Heidemann	Steven P Heidemann	P.O Box 3455 Eagle River AK 99577	688-3598
JOHN E GROVE	John E Grove	10351 STEWART DR, EAGLE RIVER 99577	694-9267
KAREN A. WEATHERMAN	Karen A. Weatherman	P.O. Box 112652 Anch AK 99511	345-4499
JAMES MEEHAN	James Meehan	17320 TOKLOMA WAY, EAGLE RIVER 99577	694-9658
Robert M Gray JR	Robert M Gray	PO Box 231604 Anch	786-8740

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Print Name	Signature	Address	Phone #
Ted Dueers	Ted Dueers	10052 Bobbin St. Eagle River	694-1355
Dea Crewdson	Dea K. Crewdson	4014 Westwood Dr Anch 99517	243-1358
Greg Bowdish	Greg Bowdish	860 E 75th Ct Anch 99518	344-4356
DEIREE GORSUCH	Deiree Gorsuch	4439 Castle Ct. 99508	337-2596
Michelle Grube	Michelle Grube	4331 Macalister 99515	248-7711
TINA Smith	Tina Smith	P.O. Box 240553 99524	564-2718
WANDY HAMORDAUX	Wendy Hamordaux	7040 Viburnum Dr. 99507	522-8553
Barbara Boduch	Barbara Boduch	10224 Jamestown 99507	349-7976
LINDA J. LINDQUIST	Linda J Lindquist	14508 Don Ci E.R. 99577	696-3733

North Pacific Fisheries Association, Inc.

HEADQUARTERS:

BOX 796 • HOMER ALASKA 99603

March 4, 1988

Senator Richard Eliason
Alaska State Legislature
Pouch V (MS311)
Juneau, AK 99811

Dear Senator Eliason:

This letter addresses Senate Bill No. 482.

NPFA supports the idea of allowing shellfish and aquatic plant mariculture to go forward. We feel that a major concern, the siting process, needs to be strengthened in the present bill. We suggest that Senator Jones' Bill 425 addresses these problems and we would appreciate the "Identification of Sites for Aquataic Farms and Hatcheries" portion of Bill 425 be included in SB 482.

We can support fin-fishing farming only in completely enclosed fresh water systems. A further concern is due to the major problems and unanswered questions about genetic pollution and disease in pen-farmed salmon. We would like to allow fin-fish farming to take place only under the conditions that the present moratorium allows. Our intent is to allow no fin-fish farming in bodies of water that have outlets to either the ocean or other fresh water systems in the State.

We support laws that would require fish farmers to prove to the State that they have proper disposal methods and equipment available. We would like additional language dealing with the problem of dumping diseased fish. The hatchery system in Alaska has only dealt with diseased eggs and smolts. Finding ways to dispose of tons of diseased four to eight pound fish is another matter all together and has developed into a major problem in Canada. The experience in British Columbia has shown that the disposed diseased fish have occasionally been disposed of in the ocean, and on a regular basis have been thrown into open landfills. We would like ADF&G to address the proper disposal of large quantities of diseased fish and require the fish farmers to submit a contingency plan when they are issued a permit.

We would support an amendment to this Bill that would limit the quantity of fin-fish that a single farm could produce. Some countries have limited farm size to 70 metric tons in order to prevent the industry from being taken over by

large corporations. Individual businessmen and communities are then targeted to benefit by the industry. This in not government interference. Alaska has always restricted salmon entry permit holders to fish in only one area. A salmon boat may not fish in two areas. This law has kept the salmon fishery in the hands of the maximum number in individuals and has succeeded in allowing coastal communities to benefit from the resource.

You may be aware that the Kodiak Mariculture Association supports a split mariculture bill. I include for you their article from the latest edition of The Kodiak Fisherman. The last paragraph of the article addressed this bill. Also I include some articles that address problems of diseased drug-filled fish being put on the consumer market with photos of improperly disposed fish.

We appreciate your efforts to write legislation that will safeguard Alaska's wild salmon and ecosystem while also allowing mariculture to exist in Alaska. We recognize what a major step for our coastlines this legislation represents and if NPFA can be of any help to you in the future, please contact us.

Sincerely,

Sonja Corazza

Sonja Corazza
NPFA UFA Delegate and Secretary



Alaska Environmental Lobby, Inc.

P.O. Box 22151 Juneau, Alaska 99802 907-586-2345

March 3, 1988

Senator Dick Eliason
Alaska State Legislature
Pouch V
Juneau, Alaska 99811

Dear Senator Eliason:

The Alaska Environmental Lobby would like to take this opportunity to comment on SB 482, relating to farming of aquatic plants and animals. We would like to extend our thanks to you and your staff for the effort you have put into this issue. In general, we support the major components of the bill and feel that it addresses many of the public concerns raised during the previous hearings on the mariculture issue.

Though we support many aspects of the bill, we feel further clarification and additional language is necessary to fully address public concerns. The use and development of state tidelands is an important issue for us. While we are pleased to see mariculture-permitting criteria outlined in the bill, we must register concern that the land use and tideland uses are not as directly addressed. Our major concern is the lack of regional perspective in the current land use planning system. We feel the bill should include a directive to initiate tideland use studies and comprehensive regional planning to minimize use conflicts and to address cumulative impacts.

Legislation should also clearly outline siting criteria and provide guidelines for planning and development. Planning should include scoping sessions to identify areas that should be excluded from development and to direct activities toward previously developed areas and private lands of interested parties. There needs to be statutory prohibition on development of tidelands adjacent to sensitive areas such as wilderness, state parks, important subsistence areas, and anadromous fish streams. Additionally, Critical Habitat Areas, popular recreation areas, bird rookeries, marine mammal haul outs, and estuarine habitat for shellfish and benthic organisms need to be given special consideration to minimize negative impacts.

DNR should adopt regulations that provide guidelines and specific siting criteria to minimize these conflicts and environmental impacts. Guidelines should include requirements for minimum distance between facilities and a limit on the number and size of facilities. Potential development sites within a given area should be nominated by districts and addressed in a thorough public review process. We firmly believe that thorough public participation is necessary to address the cumulative effects of development and minimize conflicts for users of tidelands and navigable waters. It will also afford industry the certainty that sites being considered do not have public opposition. DNR currently has the regulatory authority to address our

ALASKA CENTER FOR THE ENVIRONMENT • ALASKA CHAPTER, SIERRA CLUB • JUNEAU GROUP, SIERRA CLUB • SITKA GROUP, SIERRA CLUB
KNIK GROUP, SIERRA CLUB • DENALI GROUP, SIERRA CLUB • ANCHORAGE AUDUBON SOCIETY • ARCTIC AUDUBON SOCIETY
DENALI CITIZENS' COUNCIL • ALASKA FRIENDS OF THE EARTH • JUNEAU AUDUBON SOCIETY • KACHEMAK BAY CONSERVATION SOCIETY
KENAI PENINSULA AUDUBON SOCIETY • KODIAK AUDUBON SOCIETY • LYNN CANAL CONSERVATION • ALASKA WILDLIFE ALLIANCE
SITKA CONSERVATION SOCIETY • NORTHERN ALASKA ENVIRONMENTAL CENTER • SOUTHEAST ALASKA CONSERVATION COUNCIL
KNIK KANOERS AND KAYAKERS

concerns but we feel establishment of specific guidelines and siting criteria are needed to refine current policy in order to avoid scenarios similar to the Kelp Bay Lodge and Susitna Valley Timber Sale incidences.

Additionally, we support the establishment of standards and conditions for aquatic farms, including restrictions on the use of chemicals. These standards should also include guidelines for size and type of facility, distance separation between facilities, water depth, currents, tides, flushing capacity, and requirements for training and certification of chemical handlers, and requirements for record keeping and testing. We are concerned that currently DEC would not have the capacity to adequately monitor and enforce these regulations.

Listed below are some proposed amendments to SB 482 that we feel would help tighten up and further define the permitting and leasing process.

Page 2 Line 2 — after "finfish" insert "except on private property with no outlet to public waters"

This would prevent development of land-based mariculture facilities and potential impacts on public water resources.

Page 2 Line 20 — after "include" insert "a commitment bond, and"

Page 2 Line 22 — after "issued" insert ", and authority for the commissioner to revoke permits if development is not proceeding as proposed"

Page 3 Line 21 — after "commissioner" replace "may" with "shall"

Page 5 Line 6 — after "department" replace "may" with "shall"

Page 5 Line 28 — after "agency or a" insert "state certified"

Page 12 Line 9 — Insert Sec. 38.05.855. "IDENTIFICATION OF SITES FOR AQUATIC FARMS AND HATCHERIES." See attachment A.

This should be included to strengthen land use planning.

Page 12 Line 12-13 — after "operations" insert "at a site identified under AS 38.05.855(d). A permit under this section shall be issued by lottery"

Page 12 Line 13 — after "value" delete "of the permit"

We recommend the following amendment taken from SB 425 to ensure local public participation in the planning process.

Page 12 Line 26 — "The commissioner shall hold a public hearing in each district identified under AS 38.05.855 within 30 days after giving notice of a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries"

Page 12 Line 26 after "commissioner" delete "may"

Page 12 Line 26-27 after "hearing" delete "if necessary to take testimony"

Page 13 Line 5 "commissioner shall require..."
This is a technical amendment.

Page 13 Line 8 Section (f) should be deleted if above amendments are adopted.

Page 14 Line 3 after "Sec. 21" add "AS 43 is amended by adding a new chapter to read: ...." Add aquatic farm products tax. See attachment B.

Page 14 Line 3 after "Sec." replace "21" with "22"

The following list of citations requires further clarification.

Page 12 Line 2 Clarify (c). Does changing the use by the assignee include increasing the size of the development?
We are concerned that this may have the potential to allow site takeover by a larger company and expansion of the existing project beyond initial intent.

Page 12 Line 5 The meaning of "performance bond" is not clear in this context.
Lessees should post a clean-up bond to ensure site rehabilitation in case of site abandonment.

Page 13 Line 5 The meaning of "performance bond" is not clear in this context.
Permittees should be required to post a commitment bond, development schedules, and clean-up bonds.

Finally, the agencies lack funding to adequately carry out the mandates of this bill. Where will the additional monies for testing, monitoring, enforcement, and permitting come from? A tax levied on the mariculture industry would provide a source of funds for the future but would not solve current agency funding needs.

We appreciate the time and effort you and your staff have put into developing workable solutions to this issue. We would like to continue working with your office. Please let us know if we can provide you further assistance.

Sincerely,

Gail Gatton
Executive Director

Kelly Kavanaugh
AEL Assistant

Laura Dameron
Mariculture Coordinator

(5) "fishery resource" means finfish, shellfish and fish by-products, including but not limited to salmon, halibut, herring, flounder, crab, clam, cod, shrimp, and pollack, that are not aquatic farm products as defined in AS 08.06.900;

* ~~Sec. 24.~~ AS 43 is amended by adding a new chapter to read:

CHAPTER 77. AQUATIC FARM PRODUCTS TAX.

Sec. 43.77.005. POLICY AND PURPOSE. It is the policy of the state to ensure a fair return to the state for the use of public water and tideland by aquatic farm businesses. The purpose of the aquatic farm product tax is to provide a mechanism for compensating the state for the use of these common property resources, for covering the cost of state services for the aquatic farming industry, and for ensuring that local governments have the financial resources to provide support services to aquatic farms.

Sec. 43.77.010. AQUATIC FARM PRODUCTS TAX. (a) A person licensed under AS 08.06.010 is liable for and shall pay the tax levied by this section on the value of each of the following aquatic farm products sold, consigned, or otherwise transferred during the year at the rate set out after each:

(1) aquatic farm finfish -- three percent;

(2) aquatic farm shellfish and aquatic farm sea vegetables -- two percent; and

(3) aquatic farm experimental species designated under AS 08.06.085 -- one percent.

(b) A person is not liable for the tax under (a) of this section for an aquatic farm product that

(1) is sold, consigned, or otherwise transferred by the taxpayer for the purpose of sale or resale by another for consumption within the state; and

Attachment B

(2) before the sale, consignment, or transfer by the taxpayer, is not processed beyond heading, gutting, cleaning, or shucking.

Sec. 43.77.020. FILING RETURN AND PAYMENT OF TAX. A person subject to the tax under AS 43.77.010 shall file a return, pay the tax, keep records, and provide information required by the department in the same manner as provided for the fisheries business tax under AS 43.75.030. All other provisions of AS 43.75.030 apply to this section, as appropriate.

Sec. 43.77.030. SECURITY FOR COLLECTION OF TAXES. Each applicant for a license under AS 08.06.010 shall, in or with the application, state under oath the amount of each of the aquatic farm products that the applicant expects to produce during the license year. The applicant shall further state the extent of lienable real property owned by the applicant in the state against which the tax under AS 43.77.010 may be collected, and other information with respect to description, location, and value of the property that the department specifies. If the lienable value of the property is not equal to three times the amount of the tax for which the applicant will probably be liable under this section, the Department of Commerce and Economic Development may not issue the license until the applicant files with the department a surety bond approved by the attorney general in a penal sum equal to twice the probable amount of the tax for which the applicant will be liable, conditioned upon payment of the tax in full when due, with interest if not paid before delinquency. The department may waive the bond requirement if the applicant posts other security in the form of collateral acceptable to the department, or prepays the estimated tax.

Sec. 43.77.040. REFUNDS TO LOCAL GOVERNMENTS. The commissioner

of revenue shall make refunds of the aquatic farm products tax to local governments in the same manner and in the same percentages as provided for refunds of the fisheries business tax under AS 43.75.-130(a).

Sec. 43.77.100. DEFINITIONS. In this chapter, unless the context indicates otherwise,

(1) "aquatic farm product" has the meaning given in AS 08.-06.900;

(2) "processing" means the preparation of aquatic farm products for marketing by cleaning, gutting, heading, filleting, freezing, canning, cooking, salting, shucking, smoking, or other methods;

(3) "value" means the market value of an aquatic farm product when taken from the water before processing or exporting from the state, or otherwise transferring from the ownership of the aquatic farmer for the ultimate purpose of processing or exporting from the state.

* Sec. 25. AS 16.05.340(a)(14) is repealed.

* Sec. 26. AS 08.06.012 is repealed.

* Sec. 27. Sections 1 - 25 of this Act take effect July 1, 1988.

* Sec. 28. Section 26 of this Act takes effect July 1, 1993.

farm products as defined in AS 03.06.900;

* Sec. 13. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.088. AQUATIC FARM PERMITTEE'S LEASING PREFERENCE. Before offering to the public for lease a site that has been developed for aquatic farming or related hatchery activities under a permit issued under AS 38.05.856, the commissioner shall offer the site for leasing to the permittee at not less than its appraised fair market value.

* Sec. 14. AS 38.05 is amended by adding new sections to read:

Sec. 38.05.855. IDENTIFICATION OF SITES FOR AQUATIC FARMS AND HATCHERIES. (a) The commissioner, in consultation with the commissioner of fish and game, shall identify districts in the state within which sites may be selected for the establishment and operation of aquatic farms and related hatcheries required to have a permit under AS 08.06.010.

(b) The commissioner shall issue a call for nominations for each district identified under (a) of this section. A call for nominations shall invite interested persons and municipalities to identify sites within the district that are suitable for aquatic farms and related hatcheries.

(c) Based on comments received under (b) of this section, and after consultation with the commissioner of fish and game, the commissioner of environmental conservation, and the commissioner of commerce and economic development, the commissioner shall make a preliminary written finding under AS 38.05.035(e) that proposes sites in each district for which permits may be issued under AS 38.05.856.

(d) After notice is given under AS 38.05.945 and a hearing is held under AS 38.05.946(b), the commissioner shall issue a final written finding under AS 38.05.035(e) that identifies sites in each

Attachment A

district for which permits shall be issued under AS 38.05.856 and that specifies conditions and limitations for the development of each site.

Sec. 38.05.856. TIDELAND AND LAND USE PERMITS FOR AQUATIC FARMING. (a) The commissioner shall issue a tideland or land use permit for the establishment and operation of an aquatic farm and related hatchery operations at a site identified under AS 38.05.855(d). A permit under this section shall be issued by lottery for not less than the appraised fair market value.

(b) A permit under this section is valid for three years after the date of issuance. The permit may not be transferred.

(c) Before renewing a permit under this section, the commissioner shall require the applicant to (1) provide a copy of the application to newspapers, radio and television stations for public service announcement or (2) to provide paid notice of the application once each week for three successive weeks in a newspaper or by radio. The notice required in this subsection must be in more than one language if the commissioner decides it is necessary. The notice must state that interested persons may submit written testimony concerning the renewal to the commissioner within 30 days after the date of the notice.

(d) Before renewing a permit under this section, the commissioner shall consider all relevant testimony submitted. Based on the the testimony or other good cause, the commissioner may deny the application for renewal, but must provide the applicant with written findings that explain the reason for the denial.

* Sec. 15. AS 38.05.945(a) is amended to read:

(a) This section establishes the requirements for notice given by the department for the following actions:

(1) classification or reclassification of state land under

Alaska
Mariculture
Association

TESTIMONY TO THE SENATE RESOURCES COMMITTEE ON SB 482
by Rodger Painter, AMA Executive Director

Before addressing Senate Bill 482 directly, I'd like to ask the committee to deal with an abstract concept.

Imagine a renewable resource industry in rural Alaska producing hundreds of millions of dollars of exportable goods annually which are in high demand throughout the world. Tremendous new business opportunities would be created in direct production and support activities in urban transportation hubs, and thousands of Alaskans would be employed year-round.

The industry would be financed with private capital and would ask for no subsidies, permitting shortcuts, loan programs or other giveaways. All reasonable environmental and land use protections would be accepted and the new industry actually would propose a special new production tax on itself.

In abstract, the concept sounds too good to be true, particularly since the legislature and governor have both made economic diversification the top priorities of the session. What the Alaska Mariculture Association has discovered in trying to carry out such a proposal is that we are having to struggle to even stay alive long enough to deliver our message.

Last year we got slapped with a 13-month moratorium on finfish farming and this year our offer has been greeted with several bills designed to complete the kill. Caught in the crossfire are a handful of shellfish farmers struggling to scratch a living.

Our message to the legislature now is very simple: thanks for all your offers for support, but at this point we'd prefer that you do nothing. This includes Senate Bill 482 which my board of directors strongly opposed as introduced. This sentiment is shared by groups representing shellfish farmers in Southeast, Kodiak and Southcentral Alaska.

The committee substitute offered by Senator Eliason eliminates a number of objections AMA had with the original legislation and I'd like to thank Senator Eliason for responding to some of our suggestions. While my board hasn't been able to meet yet to consider the new measure, I would guess the changes probably would downgrade our position from being vehemently to strongly opposed.

Several additional major modifications and some cleanup amendments would have to be made to neutralize the anti-mariculture provisions of SB 482, and it will require even more work before it would be perceived as even being pro-shellfish farming.

I also would like to state that AMA does view some provisions of the committee substitute as positive steps. These include tranferable farming permits which should help farmers secure private financing, authorization of private hatcheries, and a lease preference for aquatic farmers. These provisions are important first steps toward creation of legislation that

would help development of mariculture.

Shellfish farmers object to SB 482 because it unfairly singles them out of all other tidelands users for special restrictions when they comprise only a tiny fraction of existing use and have smaller impacts than many other users.

Consider, for example, these estimates developed by the Department of Natural Resources in May 1987:

total number of tideland leases 2,000, mariculture none; and

total number of one-year tideland permits 370, mariculture 50.

Frankly, we don't believe these number justify the extraordinary approaches for mariculture uses of the tidelands contemplated in SB 482. We're at a particular loss to understand how a showing of 50 of a total of 2,370 tidelands permits and leases supports the imposition of a moratorium on the issuance of all permits and leases until the new systems are in place. I believe it will take a year or more to fully implement SB 482.

While it is difficult to estimate the fiscal impact of this legislation on shellfish farmers, we are concerned that costs to the operator will increase substantially. This is a source of serious concern since most existing shellfish farms are extremely marginal and a substantial portion of incomes already are tied up in meeting government regulations.

I'd like to provide some examples. Established oyster farmers probably handle between 25,000 and 150,000 oysters per year. At an average value to the farmer, the range of gross incomes are between $10,000 and $50,000 annually. We estimate that it costs the farmer $2,000 to $4,000 to certify the water quality at farm sites with DEC. A survey of a remote parcel to qualify for a lease costs about $1,500 to $3,000; we have no estimates of appraisal costs.

Although DEC does not charge for paralytic shellfish poisoning testing, farmers estimate it costs them about $60 in destroyed product per test, plus at least six hours of labor. The cost of testing and time involved prohibit the sales of small amounts of product. These figures do not include oysters lost to mortalities while sitting out of the water waiting for testing results.

We are concerned that the language in section 16 on page 12 of the committee substitute will result in much higher fees to these economically marginal operations for use of the tidelands. Presently, tideland permits cost $50 per acre for all users. We believe aquatic farmers would be singled out for substantially higher rental fees by going to the appraised fair market rental value of the site.

Since the shellfish farming industry believes pending regulations proposed by the Cowper Administration removes most existing regulatory barriers, we question what incentives farmers have to support a change in status quo. Although we do support some provisions in SB 482, our conclusion is that the gains do not offset the problems created by the bill.

Those interested farming arctic char, rainbow trout and black cod are restricted from taking advantage of the only real competitive edge Alaska has in mariculture--our superior marine environment. Since the controversy over fish farming has narrowly focused on the pen rearing of salmon, we can't understand why the legislature would be interested in blocking the farming of other finfish in the marine environment.

Maybe we've missed something, but we have not heard any specific

objections raised to the culturing of any finfish except salmon.

We also are concerned with SB 482's permanent ban on the farming of salmon in salt water. Although upland farming of salmon apparently is comtemplated in this legislation, it appears to preclude the pumping of salt water to upland farms.

This prohibition doesn't make sense to us since upland farms utilizing seawater would have no greater impact on wild stocks, the marine environment or competing uses of the tidelands than those using fresh water. Upland farms would be required to treat and filter discharges so there would be no chance of disease transference, sediment accumulation, farmed brookstock escapees or any of the other impacts feared by commercial fishermen from net pen rearing.

The use of seawater in upland salmon farms is critical, as slower growth rates and other factors make the farming of salmon an extremely marginal situation. As it is, upland salmon farms have several distinct disadvantages, since investment and operating costs are significantly higher than sea cage farms.

We also believe a permanent ban on the pen rearing of salmon represents poor public policy and would signal a shift towards resource development by popularity contests. AMA believes the legislature would be setting a dangerous precedent in resource development if it opts to ban salmon farming simply because commercial fishermen don't like it.

Such a move would be akin to the state deciding not to develop ANWAR until the environmental community decides it's a good idea, or to stopping oil development until coal producers are satisifed they won't suffer from economic competition by a new energy source.

We urge you to carefully analyze the facts about salmon farming and make a decision based upon the costs and benefits. Certainly you should carefully consider the potential impacts on commercial fishermen, but base your final decision on whether this new activity can occur in a manner that does not threaten wild stocks, the environment or beneficial existing uses of our coastal waters.

We respectfully request that you carefully weigh the enormous amount of information available and determine whether the Alaska Department of Fish and Game is correct that salmon farming is no more of a threat to wild stocks than our present hatchery programs. Reject it if you don't believe scientists who say that properly sited farms will not damage the environment. And decide whether the economists are correct that salmon farming in Alaska does not threaten the prices Alaska fishermen receive for their catches.

In summary, AMA opposes SB 482 and the proposed committee substitute as written. We believe that no mariculture legislation is necessary at this time unless the legislature decides it wants to actively promote growth of the promising new industry. However, we do offer to work constructively to improve this legislation to at least remove the most damaging provisions should you determine that a bill must pass out of this committee.

AQUABIONICS INC.
NEW WAVE SEAFOODS
P. O. BOX 80165
FAIRBANKS, AK 99708

STATEMENT TO THE SENATE RESOURCES COMMITTEE ON SENATE BILL NO. 482 - MARICULTURE. MARCH 11, 1988.

My name is Jack Van Hyning. I reside in Fairbanks, but we operate a family fishing business in Prince William Sound out of Whittier. I am a biologist and we have an application pending for a mariculture permit in Prince William Sound. I oppose No. 482 because of what Mr. Painter has stated in terms of its effect on shellfish farming and for its prohibition against farming finfish in salt water. I have attended several mariculture meetings this winter -- Hawaii, Olympia, Sitka -- and let me tell you gentlemen, the world is running ahead while we are sitting around cutting bait. An old fisherman's axiom is: "Are we going to fish or cut bait?" While we cut bait people everywhere else are growing fish. Pacific salmon in Hawaii! Pumping cold, rich water from the deep ocean and their coho are growing like mad; they have abalone ponds there the size of football stadiums. You have heard of the salmon farming in Norway and Canada; in addition a number of other countries are getting into the business -- Denmark, Iceland, Scotland, Ireland, Chile, New Zealand, etc. By the year 2,000, 12 years from now, it is estimated that one-half the world's sea food will be farm raised and already one-half the world's shrimp production comes from farms. At the turn of the century where will Alaska be in the mariculture business? A few subsistence oyster farms and nonprofit salmon hatcheries if we keep going the way we are headed.

Although the Canadians have done a lot of things wrong, they have a huge production of salmon in their pens which will be coming on line in the next couple of years aimed directly at the U. S. market. I was in Anchorage last week and at a leading seafood restaurant the only fresh salmon on the menu was Canadian farmed salmon. At Ivars in Seattle last month, farmed salmon from Puget Sound was the only fresh salmon. It is senseless to argue whether wild salmon are better than farmed. They are both good, but the fact is that farmed salmon are out in the market place, and a lot more are coming, and we better compete or Alaska will become a minor league player in the salmon game.

As British Columbia farmed salmon is pointed directly at the heart of the U.S. market, we Alaskans should be aiming at the huge Asian market. I attended a seminar on Japanese and Korean export potentials a few days ago put on by the State Office of International Trade. Everyone knows about the large seafood exports to Japan and the speaker from Korea stated that they too were very much interested in obtaining more quality Alaskan salmon. Our company successfully exports fresh, gourmet-quality Alaskan shrimp to Japan right in the face of the great Asian shrimp production. We can compete and the key is quality and reliability. The demand for salmon is increasing and the demand is being filled by foreign producers. Alaska no longer has a corner on the salmon business; we have to get in all markets with all products otherwise we will lose out.

Alaskan salmon fishermen have done very well indeed with aquaculture programs -- the public and private hatcheries -- but they do not seem to want other mariculture entrepreneurs to have a piece of the action. For example, between 50 and 75% of the near record pink salmon catch in Prince William Sound last year was from hatchery-produced fish. In terms of disease and genetics, there is nothing intrinsically different between the present hatchery program and proposed pen rearing. Most ocean ranching operations feed the fingerlings in salt-water pens before release and have the same disease and nutrition problems as would a salmon farmer. Last Wednesday, Dr. Allee of the FRED Division ably described the Department's excellent program of disease monitoring and control; there should be no concern at all that the ADFG will not make sure that the salmon farmers raise healthy fish. In fact, one cannot stay in business very long with chronic disease problems. In terms of genetics, it is very unlikely that any escaped farm salmon could breed successfully with wild salmon and the present hatchery program is a greater threat to genetic integrity than farming. These points have been repeated by several competent scientists and they are non-problems, but fishermen continue to bring them up. The greatest threat to wild stocks, in my opinion, is the overharvesting of wild stocks while the managers try to maximize the catch of hatchery fish. With proper siting, pollution is not a factor and the fish farmer must maintain a good environment or risk losing his investment. Disease, genetic and pollution problems have been greatly exaggerated.

Norway and B.C. both had a gold rush, frontier mentality in salmon farming. We can learn from their experience, both good and bad. We have a Coastal Zone Management Plan in place and an excellent program for agency review. In the case of Prince William Sound, both the U. S. Forest Service and the State Department of Natural Resources have completed large land-

use planning documents with extensive public participation. Multiple use is encouraged and special areas designated for wilderness, wildlife habitat, fisheries, mariculture, etc. I am confident that ADFG and the other agencies would not permit any operation that impacted the wild salmon stocks, wildlife, important fishery and recreations sites or the environment. Obtaining a permit should not be easy, but the process should be fair and reasonable.

I personally could live without salmon farming, if a compromise is possible, but not a total prohibition of farming fin fish in saltwater. Black cod or sablefish is a hot item under development in Canada and appears to offer some real potential for Alaska. Rainbow trout (steelhead) is native to our coast and is an important component of mariculture in the Scandinavian countries and might be a possibility for Alaska saltwater pen rearing. Arctic char is a topic of great interest in Norweigan and Canadian aquaculture circles and could be a winner for Alaska. Norweigans report that char do very well in salt-water pens. A Canadian report notes that the farming of spot prawns could be profitable in conjunction with polyculture in salmon net pens.

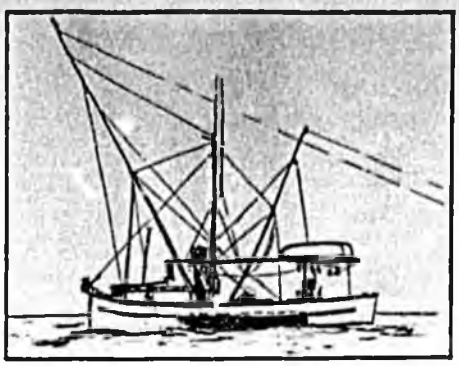
A speaker on Wednesday said there was only a few areas in Alaska that could grow salmon successfully. Experts said that oysters would not grow in Prince William Sound; apparently the oysters didn't hear that as they grow very well. The major constraints in other areas to mariculture is water pollution and lack of suitable sites. We in Alaska have an abundance of good, productive, clean water and a vast area to work in. The major expense in salmon farming is feed and here we have a great amount of fishery byproducts that are presently mostly wasted and could be used in the manufacture of fish feeds. As world fish farming expands there is concern about future fish food supplies and a whole new industry could develop here.

In summary, let us face reality, mariculture will be all around us whether we like it or not. Let us protect our traditional fisheries and other coastal values with appropriate environmental safeguards, but permit an orderly development which does not preclude the salt water farming of finfish.

Thank you,

Jack Van Hyning

Jack M. Van Hyning, Ph.D.



Alaska Trollers Association

REPRESENTING ALASKA POWER TROLLERS

130 Seward St., No. 213
Juneau, Alaska 99801
(907) 586-9400

February 24, 1988

Senator Richard Eliason
Alaska State Legislature
PO Box V (MS 3100)
Juneau, Alaska, 99811

Dear Senator Eliason,

This letter is to reaffirm my suggested changes to Senate Bill 482, per my conversation with Sheila on February 24, 1988.

The following comments are from the 2-23-88 draft:

Item 1. We suggest changing "or" to "and" on line 14 page 2.

Item 2. The words "substantially" and "significantly" on lines 20 and 23 of page 3 may allow too much interpretation as to protecting the species or disrupting users of the resource.

Item 3. We suggest that the term "aquatic animals" be inserted in item #3 lines 16 to 18 page 6, and the words "a plant" be replaced by "those". This is needed to define the concept of aquatic animals mentioned in the title.

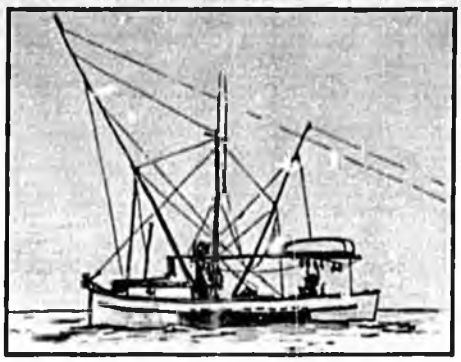
Item 4. We believe that either the "IDENTIFICATION OF SITES FOR AQUATIC FARMS AND HATCHERIES" lines 10 through 29, and lines 1 and 2 on pages 10 and 11 of Senator Jones' Bill 425 be inserted on page 11 line 22 of your Bill. The section of your Bill which is under the purview of DNR (AS 38-05) needs special protection under the development orientation of Commissioner Brady. In this manner the inclusion of "site identification criteria" would assure consideration of traditional users of areas even when existing users are not permitted (ie. winter anchorages, troll drags, gillnet drifts, etc)

We sincerely appreciate your efforts to conclude this thorny issue during this session of the Legislature.

Sincerely,

Earl E. Krygier

Earl E. Krygier
Executive Director



Alaska Trollers Association

REPRESENTING ALASKA POWER TROLLERS

130 Seward St., No 213
Juneau, Alaska 99801
(907) 586-9400

March 31, 1988

Senator Jack Coghill: Chairman
Senate Resources
PO Box V (MS 2100)
Juneau, Ak 99811

Dear Senator Coghill and members of Senate Resources:

We wish to submit the following questions, concerns and comments on the 3-28-88 CS for Senate Bill number 182 "An Act relating to the farming of aquatic farming --etc.":

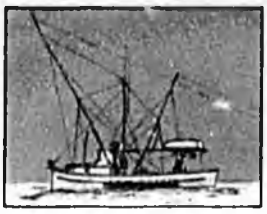
Page 1 Line 14-18) With what obligations would the state of Alaska encumber itself by formulating items 1 and 2 as "policies of the state". If these become a policy of the State, what then are the State's obligations?

Page 2 Line 12-15) We believe that this authorization to sell bi-valve spat outside the state may harm some Alaskan farmers although it may offer others short-term benefits. For example Kodiak is working to develop new technology on scallop culture, one farmer could "give away" the benefits of our research and development simply by selling spat to competing outside interests. An additional example involves the University of Washington who shared salmon eggs with Chile; now Chile is one of the major competitors with the Washington fishing industry for selling salmon.

Page 2 Line 15-16) We believe that the wording in this section needs to be corrected slightly to be consistent with existing similar statutes. The portion which reads "to a state owned body of water" should more correctly read: "into the waters of state." The meaning of the former is incorrectly worded to afford the protections DEC and other regulatory agencies require to safeguard the State's resources. Additionally, it may encourage legal challenges.

Page 2 Lines 17-19 and Page 3 Line 1-11) We believe that the rewrite of the "Criteria For Issuance Of Permits" is an excellent synopsis of the testimony presented during the recent teleconferences. In particular, criteria #3 and #4 addressed the most often expressed concerns. Criteria #3 affords a positive protection for fish and wildlife from the "adverse" effects of mariculture activities and its inclusion will moderate a lot of fears of other users.

Page 5 insert on line 21) The comments "Except that bi-valve spat ----" is reflective of our previous concerns commented on in Page 2 Line 12-15.



Alaska
Trollers
Association
130 Seward St., No. 213
Juneau, Alaska 99801
(907) 586-9400

Page 13 Section 17) We strongly encourage the members of the Senate Resource Committee to retain this whole section known to the members of the work group as "option #2". We can only suggest one addition: that is on line 26 adding after "hearing" the phrase ",between September 1 and May 15 of each year,". This clause is critical to insure that the comment period does not occur during the height of the fishing/tourism/outing season, thereby excluding input from important user groups.

Page 14 Line 29 - Page 15 Line 4) We strongly encourage the retention of this sentence to afford protection to both farmers and other users of the uplands. The conflict between upland use and seaward mariculture is best illustrated in the Robin Larson (oyster grower) conflict with the state land disposal sale upland from his site near Wrangell.

Page 15 Line 21) Shouldn't the word "advisory" go between "game" and "council" in this sentence?

Our Association, who has been involved in the development of a State mariculture policy since September 1985, believes that though the acceptance of this working draft is a major concession in the area of fish culture for fishermen, we could accept its implementation with the above mentioned modifications and/or retention of safeguards. If this committee can retain the strengths embodied in this draft, I believe that we can encourage the fishing industry to support its passage this session.

Sincerely,

Earl Krygier
Executive Director

UNITED FISHERMEN OF ALASKA

211 4th Street, Suite 106
Juneau, AK 99801
907-586-2820

March 2, 1988

Senator Richard Eliason
Alaska State Legislature
P.O. Box V
Juneau, Alaska 99811

Dear Senator Eliason:

The Board of Directors of United Fishermen of Alaska is appreciative of your efforts to resolve the issue of mariculture during this legislative session.

We have some suggestions for modifications to Senate Bill 482 which we believe will clarify and strengthen the bill.

* We suggest you add, on page 2, after line 2, a new section (f) that uses the same language found in the moratorium passed by the Legislature last spring: "A fish farming license may be issued for commercial finfish farming in a privately owned freshwater body that has no outlet to state water." This wording satisfies our concerns about the possible escapement of domesticated fish and about the possibility of environmental degradation. It addresses the concern Senator Fahrenkamp raised last spring about a project one of her constituents was beginning. It makes clearer the restrictions on on-land tank farming. We think it's a compromise most of us can agree with.

* We suggest changing "or" to "and", both on page 2 line 14 and on page 4 line 10. We can see the possibility that impacts on traditional fisheries could still occur with the present wording. Since proponents of mariculture have stated many times that they do not want to hurt the commercial fishing industry, we are sure there will be no objection to this change.

* We suggest deleting the word "significantly" on page 3 line 23, and the word "substantially" on page 2 line 12, page 3 line 20 and page 5 line 7. We think they allow too many possibilities for harm to the fish stocks or conflicts with the fishermen, both of which mariculture proponents have said they wish to avoid.

* We urge you to add on page 6 a definition for aquatic animals to clarify the prohibition on salmon farming and to ensure that everyone is "singing off the same sheet of music," as Senator Abood says.

* We ask that you include in SB 482 the section on pages 10 and 11 of Senator Jones' bill (SB 425) called "Identification of sites for aquatic farms and hatcheries." We think these provisions will help avoid siting conflicts and ensure the orderly development of mariculture in Alaska. The Department of Natural Resources, when considering tidelands use applications, has a tendency to forget about tidelands uses for which a permit is not required. These include recreational boating and fishing and subsistence activities, as well as commercial fishing. DNR also has a tendency to consider applications on a case-by-case basis without realizing the potential cumulative impacts on an area.

We think these modifications will be acceptable to most people and will strengthen the bill that already has so many good features. We are particularly pleased that it places the primary authority in the Department of Fish and Game, and that it addresses our concerns about land speculation.

Thank you for requesting our comments. We look forward to achieving resolution of this issue.

Sincerely,

Kate Graham

Kate Graham
Executive Director

UNITED FISHERMEN OF ALASKA

211 4th Street, Suite 106
Juneau, AK 99801
907-586-2820

April 8, 1988

Members of Senate Resources Committee:

As you are aware, United Fishermen of Alaska has stated its opposition to any form of finfish farming until enough information has been gathered to know the resulting effects on Alaska's wild fish stocks, fish habitat and commercial fishing industry.

UFA has stated its support for shellfish and kelp farming as long as an adequate site selection process is required to alleviate both potential conflicts and potential damage to fish habitat.

UFA has applauded the site identification process, which you now call Option 1, contained in SB 425. We were both surprised and pleased when the Department of Natural Resources proposed a less stringent but still reasonable version of this process (Option 2).

We have been finding it extremely difficult to understand why DNR now says it prefers the version suggested by the Alaska Mariculture Association (Option 4).

UFA believes that the committee may not have understood what Option 2 does. Option 2 does not put additional regulatory requirements on the mariculture industry. What Option 2 does is establish a public process to assess the need for sites by the mariculture industry in a given area, and it allows state agencies the opportunity to evaluate the carrying capacity of a given area for mariculture activities.

Option 2 has the advantage of providing the mariculture industry with information on site capabilities and possible user conflicts before spending great sums of money. It also allows the public and other interested parties an opportunity to understand how mariculture activities may affect other uses of the tidelands and hopefully minimize conflicts among all the users of our state tidelands.

We were very concerned to hear DNR say in your committee meeting yesterday that they want to issue tidelands leases and permits based not on statutes nor on regulations, but instead on something they call a policy. A policy is established at the discretion of the commissioner and may be changed at any time. What guarantee is there that DNR will implement the type of policy outlined in Option 2?

This is an especially important issue given that the bill provides a permit holder with a priority preference for a lease to the site. The amendments you have passed, plus the remaining amendments you are considering on Title 38, will remove virtually all public notice provisions,

all public hearing requirements, and any requirements that DNR develop and implement criteria to ensure that mariculture sites are compatible with existing uses. UFA recommends that, if these amendments are adopted, this preference provision be deleted as well until DNR presents their land use report to the next Legislature.

You had already voted to allow permits and leases to be issued before regulations were in place. Surely this is not the way to encourage orderly development of mariculture activities. Does the Legislature routinely allow commercial activities to take place with no regulation of them? Surely not in the case of the commercial fishing industry. We are probably the most regulated commercial activity in Alaska. We recognize, however, the need for these regulations. Why then is an exception being made for mariculture? We are sure the Alaska Mariculture Association supports us on this because they have stated time and again that they are asking for no permitting shortcuts and would accept all reasonable environmental and land use protections.

We cannot emphasize strongly enough how important an adequate site selection process is to UFA's members. Please keep in mind that we supported non-finfish mariculture only if such a process were in place.

In other amendments already agreed on you have:

- decided that established and ongoing uses of an area must be considered, but that a new farm does not have to be compatible with them;

- allowed the commissioner of DNR to use her own discretion as to whether or not to hold a public hearing when renewing a tidelands permit;

- removed language designed to ensure that mariculture activities do not adversely affect the ability of ADF&G to manage natural stocks.

You still have before you proposals that:

- refuse to insist that DNR limit the number of sites in an area to protect the natural resources, and that DNR consider whether the proposal is compatible with the traditional and existing uses of the area;

- say DNR does not have to provide public notice for a preliminary finding concerning siting proposals.

You have as your goal the establishment and responsible growth of mariculture activities in Alaska. How can this be possible if there are no provisions for advance planning, for the development of regulations prior to allowing the activities, or for the assurance that Alaskans who are already using the tidelands will not be displaced?

On behalf of the 12,000 commercial fishermen this organization represents, we urge you to reconsider these proposals.

Sincerely,

Kate Graham

Kate Graham
Executive Director

Kodiak Area Native Association

402 Center Avenue
Kodiak, Alaska 99615
Phone (907) 486-5725

MAR 18 1988

March 15, 1988

Senator Coghill
Alaska State Legislature
P.O. Box V (MS 3100)
Juneau, Alaska 99811

Dear Sen. Coghill:

Attached is the testimony that was submitted on behalf of the Kodiak Area Native Association to the Senate Resources Committee on March 11, 1988. Also attached is a copy of a resolution drafted by the KANA Board of Directors at their most reecent meeting encouraging the legislature to draft legislation supporting mariculture development in Alaska.

We support the efforts of your committee to develop a bill that encourages mariculture development. We hope that the necessary changes can be made to Senate Bill 482 so that it will support mariculture development. Without those changes, we cannot support the bill.

Thank you for you interest in our position.

Sincerely,
KODIAK AREA NATIVE ASSOCIATION
GORDON L. PULLAR, PRESIDENT

Bill Osborne

Bill Osborne
Mariculture Specialist

cc: Senate Resource Committee members

encl: testimony
Resolution 88-06

TESTIMONY BY THE KODIAK AREA NATIVE ASSOCIATION
SUBMITTED TO THE SENATE RESOURCE COMMITTEE
MARCH 11, 1988

For two years, the Kodiak Area Native Association has been cooperating with the Departments of Fish and Game and Commerce and with the Japanese Overseas Fishery Cooperation Foundation in a study on the feasibility of scallop aquaculture in the Kodiak Island area. The ultimate goal of this project is to promote economic development and increase job opportunities in the Native villages of the Kodiak Island area by developing a self-sustaining aqu ulture industry.

While pursuing the feasibility study, KANA has also taken initial steps toward commercial scallop aquaculture by obtaining a tidelands permit near the village of Akhiok. We are currently rearing pink scallop spat collected last summer, and we will be harvesting spat again this summer.

The collection of spat for commercial purposes was legalized last summer after the passage of Senate Bill 297, the compromise mariculture moratorium bill. This bill put a hold on the issuance of most types of mariculture permits while work was supposed to continue on a comprehensive mariculture bill. While we are now able to farm scallops legally under current statutes and regulations, we are still looking forward to legislation that will resolve some areas of uncertainty for both maricul turists and for traditional users of marine resources.

As it is written, Senate Bill 482 is not the comprehensive legislation we are hoping for. On the surface, SB 482 appears to encourage shellfish and kelp farming, but in fact the bill creates a much more restrictive environment for mariculture than current exists. We are particularly concerned about the criteria for issuance of permits listed on page 2. It is doubtful that one could use the marine environment in any way without adversely affecting wild stocks or their management. This same reference to adverse effects on marine mammals in the marine mammals act was recently interpreted in court to mean that whole commercial fisheries could be shut down because they disturb the mammals in some way. The amount of disturbance does not need to be quantified; the commercial activity must cease.

This bill requires an aquatic farmer to pass yet another set of still undefined criteria. On page 13 the commissioner of Natural Resources is required to develop a separate set of criteria for issuing tidelands permits. Why require two, possibly conflicting sets of criteria?

This bill will not allow the sale of harvested or hatchery-produced spat to operations outside of Alaska. Why should Alaska prevent this possible source of revenue? We have already been approached by firms from other states which are interested in purchasing scallop spat.

On page six, under the definition of aquatic farm product, it is implied that the only possible products are consumables, or kelp to be used in dyes. Is there any reason to limit the potential uses of aquatic products by writing such exclusive end products into legislation? Consultation with potential aquatic

farmers would provide suggestions for many products with which to broaden that definition.

Referring to the tidelands use permit section on page 12, although it is not clear how a fair market price can be determined for a non-transferable five year permit, we are concerned that this provision may drive the cost of operation below the profitable margin.

Finally, the operation of salmon net pen farms is not very different from the short term rearing of salmon fry in net pens. This is a common technique at most of the state and non-profit salmon hatcheries around Alaska. By closing the door on net pen culture of salmon, we are not closing the door on a culture technique. We are just closing the door on which groups can produce and sell salmon in Alaska. The limited entry program has left many small communities in western Alaska with limited oportunity to participate in the salmon fishery. Studies have just been concluded on the potential impacts of salmon farming in Alaska. The studies should at least be read before the door is closed on salmon farming in Alaska.

Unless this bill is revised to relax its restrictions on shellfish and kelp culture and its total opposition to salmon culture, it should not be allowed to pass. This current bill is not a comprehensive, compromise mariculture bill.

Thank you for this opportunity to testify.

Kodiak Area Native Association

402 Center Avenue
Kodiak, Alaska 99615
Phone (907) 486-5725

KANA BOARD OF DIRECTORS

RESOLUTION 88 - 06

A RESOLUTION OF SUPPORT FOR LEGISLATION TO PERMIT AQUATIC FARMING IN THE STATE OF ALASKA

WHEREAS the Kodiak Area Native Association is a non-profit organization whose mission is to promote pride and self-determination on the part of the Native peoples of the Kodiak Island area, and to promote the educational, physical, economic and social well-being of the Native individual and community; and

WHEREAS, in order to promote economic development of the Native villages of the Kodiak Island area, the KANA initiated plans to diversify village economies and increase employment opportunities by developing a self-sustaining mariculture industry; and

WHEREAS mariculture industry development can create substantial job opportunities in villages facing unemployment rates of up to 90 percent;

NOW THEREFORE BE IT RESOLVED in a public meeting at which a quorum is present that this Board encourages the Alaska Legislature to approve legislation to permit the farming by Alaskans of aquatic plants and animals.

Passed this 26th day of February 1988

by a vote of 6 for and 0 against.

Margaret Roberts
Chairperson

Attest: Gloria Cornell

CORDOVA DISTRICT FISHERMEN UNITED

P.O. Box 939

Cordova, Alaska 99574

(907) 424-3447

April 15, 1988

APR 19 1988

Cordova District Fishermen United has some grave concerns about the manner in which site selections and public notice for mariculture are being approached. We feel that commercial fishermen, as customary and traditional users of state tidelands and bodies of water should have some consideration in concentrated commercial fishery areas, especially in Coghill and private non-profit hatchery areas. We addressed this problem in the Cordova meetings on the proposed Prince William Sound Area Draft Plan and still maintain some areas should be closed to mariculture. Mariculture permanently takes up acres of tidelands which could possibly have other uses.

To avoid user conflicts, public participation is needed as a necessary component of the process. Public notice provisions should be expanded to require notice regarding tideland uses, especially mariculture, to appropriate commercial fisheries groups and commercial fish area managers in each area of the state.

Historic uses of both tidelands and adjacent upland areas should be documented to avoid user conflicts. Such uses include recreation, tourism, anchorages, navigation and areas of subsistence and commercial harvest. Public notice should be the DNR's number one concern along with public comment to avoid lawsuits and user conflict. We feel at this point that the DNR has not fulfilled their responsibility to the public or the state to avoid user conflicts or lawsuits by responding to the public.

Sincerely,

CORDOVA DISTRICT FISHERMEN UNITED

Gerald McCune

Gerald McCune
President

GM/mbl

MEETING NOTES

PWS Area Plan & Commercial Fishing Industry Concerns

December 9 & 10, 1987

Present (at one time or another):

James Brady, ADF&G Cordova
Herman Griese, ADF&G Cordova
Jack Hopkins, PWS Aquaculture Corporation
Bob Loeffler, DNR, Project Manager, PWS Area Plan
Jerry McCune, CDFU
Sam Sharr, ADF&G Cordova
Rick Steiner, Marine Advisory Program
Kim Sundberg, ADF&G, Anchorage, Planning Team Rep, PWS Area Plan
Wayne Donaldson, ADF&G Cordova
Dan Warren, PWS Aquaculture Corporation

Introduction. These meeting notes were written to be used to by ADF&G staff in Cordova in making their comments on the PWS Area Plan known to Kim Sundberg, the ADF&G representative on the planning team. In addition, they may help Jerry and other folk use them as they wish, either in writing their own comments, or signing on to ADF&G's comments, or whatever. In some cases, these notes suggest changes in wording; in other cases, they just identify problems and leave suggested wording changes to Kim Sundberg or to the planning team.

Organization. The notes are divided into the following categories:

* comments on the Chapter 2,
* a proposed new section on fisheries and hatcheries in Chapter 2,
* need for changes in management intent
* conflicts between a proposed lodge and existing Esther Island hatchery,
* mineral closures
* comments by Dan Warren,
* extension of the comment deadline, and
* scenes from coming attractions.

Dan Warren's comments are separated from the rest because we didn't suggest resolutions to his comments, but we did make suggested resolution for many other comments. Most of Dan's comments were covered in other suggestions, but it is still useful to record his concerns in the meeting notes.

CHAPTER 2 COMMENTS

Chapter 2 - Fish and Wildlife Habitat.

1. Salmon Spawning Areas. Add salmon spawning areas to Crucial Habitat. The definition of salmon spawning areas should be written so that it clear it includes all salmon spawning areas under state ownership or state jurisdiction -- streams on state uplands, navigable streams, tideland spawning, and the mouths of anadromous streams (that are on state tidelands).

2. Herring Spawning Areas. There was a discussion about whether Herring Spawning should be labelled "crucial" or "prime." After some discussion, it seemed that the category should stay in "prime," but that a guideline should be added to insure sufficient protection. A guideline could be worded as follows: To the extent feasible and prudent, permitted activities in mapped herring spawning areas will be conditioned to avoid or otherwise mitigate adverse affects on kelp, eel grass, and other substrates important for herring spawning."

3. Mountain Goat Winter Range. There was a discussion about the quality of existing information concerning mountain goat winter range, that most existing areas were not on state land, but that activities on state land should take account of adjacent non-state winter range areas. The suggestion was to note in the glossary that information did not exist to note winter range areas which met the crucial definition, but that as more information becomes available, some winter range areas are likely to be determined as crucial. In addition, the plan should contain a guideline that indicates that the state should avoid locating activities on state tidelands where the activity will produce a concentration of public use, repeated acoustical disturbance, or other activities likely to disturb the goats.

4. Other Crucial/Prime Definitions (actually, this is part of Appendix A.) James Brady was confused (justifiably so), about the fact that Purse Seine Hook-offs were shown under Crucial Habitat, but not listed in the Appendix. In addition, it was confusing to have sport fishing, but not any mention of commercial fishing in the Crucial, Prime, Important, sequence.

   The suggestion was to reorganize the definitions to include only habitat types under Crucial, Prime, and Important, and to add a new section called Human Use and Harvest that lists human use areas including at least, Purse Seine Hook-off Points, sport fishing sites, traditional purse seine areas, Herring Sac Roe fishery, etc....

5. Guideline B. Guideline B1 on page 2-6 (ie, the one that begins, "In estuaries; lagoons;..." needs a catch-all phrase at the end. Something like, "or other impacts that reduces the productivity and value of the habitat."

6. Guideline B (Problem #2). Take out the word "intertidal" before "salmon spawning" because the guideline should apply to stream spawning as well as intertidal spawning.

7. Guideline B (Problem #3). There was discussion indicating that 300 feet from anadromous fish stream was too close. There was considerable discussion about what the correct, minimum distance should be. Folks eventually thought that 300 yards should be substituted for 300 feet. This number should be changed from feet to yards elsewhere it appears in the plan.

8. Guideline L. (Page 2-9). The first sentence of the Fish and Game Enhancement on State Lands guideline should be changed. "Fish and Game" should be deleted and the guideline should read, "Enhancement activities on state lands whether by ADF&G or other agencies will be consistent with the..."

9. Guideline M. (Page 2-9). In the Soil Erosion Guideline, the word-"streams" should be changed to "water bodies" so that it is clear that it applies to lakes and the ocean.

10. Land Allocation Summary. (Pages 2-9 though 2-10). The summary should be changed to reflect changes made above and in other parts of the plan.

Chapter 2 - Forestry Guidelines.

1. Floating Logs. There was a discussion that the Chapter 2 guidelines did not contain adequate safeguards to minimize or prevent introduction of floating logs as a consequence of log transfer activities. People said that boats, now, can generally travel at night in Prince William Sound, but that they can't do so in Southeast, partly as a consequence of floating logs. There was also a discussion of possible resolutions to this problem including: using barges rather than log rafts; bundling (or banding) so that storms couldn't dislodge logs from a log raft as easily (including the requirement to recover the bands as opposed to dropping them in the water); limiting the amount of time logs can be stored in the water; requiring on-land storage; or other means. Requiring branding was brought up as a means of making guidelines more self-enforcing (i.e., that the damaged party could more easily claim liability), but ADF&G staff and Jerry McCune was skeptical that required branding would have any effect.

   The suggesting was that there was not enough detail in current log transfer proposals to determine which of these methods was correct for any of the general proposals in the plan, but that Chapter 2 should be revised to be sure that the permitters were given direction to include some method to minimize or avoid the problem.

2. Anchorages. LTS's should avoid taking up anchorages. This concept should be added to the chapter.

3. Retaining commercial fish use around the LTS. There was concern that an LTS could take up an entire bay if it was designed poorly. That is, that even though an LTS could be sited in part of the bay, through barge traffic, log rafts, and associated activities, seine or drift net use of the bay could effectively be blocked, or that the LTS could operate such that fishermen could use the bay only at risk to their gear. Chapter 2 guidelines should insure that an LTS is designed such that continued, safe commercial fishing use can be made of the bay around the log transfer site free from the threat of having a barge or tug run over someone's gear.

4. Guideline Q. (page 2-12). The title says Avoid (i.e., "Operating RTSs to avoid..."), but the sentence "RTFs should minimize." "Minimize" should be changed to "avoid."

Chapter 2 - Mariculture Guideline.

1. Application to fin-fish. The notes should be clear that these guidelines only apply to non-finfish mariculture, and that should finfish mariculture become legal, a set of guidelines will be developed appropriate for that use.

2. Step-down plan for fin fish mariculture. The plan should recommend that a separate, more detailed plan with guidelines and siting criteria be compiled for fin fish be completed if that type of mariculture becomes legal.

3. Guideline B. (page 2-17). The last sentence that reads, "Permit holders that may be affected by a proposed operation should..." should be changed to "Mariculture permit holders that may be affected by a proposed operation will..."

Chapter 2 - Materials.

1. Guideline A. (page 2-20). The last sentence of this guideline should be changed to read as follows "Sales or permits for gravel extraction will not be permitted in known fish spawning areas or crucial estuaries."

2. Guideline C. (page 2-20). Strike the last sentence that begins, "Where it is not feasible..."

Chapter 2 - Recreation.

1. Guideline A.2.b. "Inappropriate Locations". This guideline should be expanded to reference areas inappropriate because of conflicts with habitat and harvest use.

2. Guideline A.5. (page 2-27 & 2-28). There was a concern that floatlodge clients would deplete the fish, or huntable animal populations near the facility. This problem currently occurs with outfitters. A guideline specifically to address that should be added as guideline A.5.h., or that guideline A.5.b. (carrying capacity) should be beefed up. However, it wasn't exactly clear what to do. Herman thought that DNR and ADF&G may not really have all the tools necessary to control this problem.

3. Other Floatlodge problems. There was a general, somewhat wide-ranging discussion about floatlodges on Wednesday evening after most people had left. There was a feeling that the plan does not give the permitter enough direction to adequately address the problem should an application be received. But no solutions were proposed. Bob said that this problem has been similarly recognized at a number of the public meetings, and will have to be addressed in some fashion before the plan is finalized.

4. Miscellaneous. The third sentence in the third paragraph under the Land Allocation Summary (page 2-29) that reads, "Recreation is the primary use..." should be changed to "Recreation is a primary use..."

Chapter 2 - Subsurface Resources.

1. Application of Mineral Closures. (page 2-47). Guideline A on this page talks about standard DNR policy for closing four categories, but it doesn't mention salmon or habitat. Bob explained that there wasn't a standard policy for these resources. Everyone else said, "Yeah, well that may be true, but the way its written is still confusing, and you should change it so its clear what you're doing about salmon and other habitat." People suggested that a number 5 should be added and in it the salmon, Copper River and other closures should be noted.

2. OPPs, Guideline H on page 2-46 and 2-47. Sam was confused about how OPPs worked and what it meant that ADF&G has determined it was a non-conforming use. Bob explained it and then he understood it (or at least was agreeable enough to nod politely); however, Sam said that it should be rewritten to be made clearer to general public.

3. Esther Bay Closure. The Land Allocation Summary, last paragraph on page 2-48, states that four hatcheries are closed. It leaves out Esther Island Hatchery, because it is already closed. People said that unless you already know that, it's confusing and Esther Island hatchery should be mentioned.

PROPOSED NEW SECTION FOR CHAPTER 2 - FISHERIES AND HATCHERIES

People thought that hatcheries and commercial fishing was not adequately addressed in the plan. They felt that a new section of Chapter 2 was the most appropriate forum for these guidelines. We didn't make an effort to write any final guidelines, but just noted that guidelines should be written to address the following problems.

1. Conflicts with Terminal Harvest Areas. THA's are the areas near the hatcheries where much of the hatchery fish concentrate and where there is extremely concentrated purse seine and gill net fishing during certain openings.
   a. Mariculture, disease, pollution, and use of habitat. Because the THAs are so important for the hatchery, mariculture or similar uses should not be allowed because of the risk of disease transmission and ruining the hatchery stock. In addition, any use that is likely to complete with the available food supply for hatchery stock (e.g., plankton), make the habitat less productive for the hatchery stock, or introduce pollution should not be allowed.
   b. Interfering with commercial fishing operations. Because the drift and seine fleet use so much of the THA, particularly nearshore areas, any tideland facility that would obstruct the THA (i.e., rafts, floats, mooring systems, etc.) should be located elsewhere. These facilities could have a significant conflict with the commercial fishing fleet.
   c. Protecting water quality of hatchery source water. A guideline should be added that insures that DNR permits protect the water quality of the hatchery source water (for example, Esther Lake) or doesn't locate uses likely to pollute the water. It was recognized, however, that most of these lakes fall on USFS land.

d. Protection of future hatchery sites. Because there are only a limited number of potential future hatchery sties in PWS, DNR should avoid permitting activities at those locations if activities will preclude development of the hatchery. Two locations with the highest near-term hatchery development potential are Cascade Falls and Princeton Creek (Icy Bay). (Note: the existing plan has this protection for Cascade Falls, Princeton Creek, Marsha Bay, West Gable Cannery in McClure Bay (also called Port Nellie Juan)

2. Anchorages. This section should cross-reference the "anchorage" guideline in the recreation section. In addition, it should provide additional guidance for important fishing fleet anchorages (eg., Fox Farm anchorage) where 10-15 or more boats raft up, and for anchorages used by fishing fleet tenders.

3. Purse Seine Hook-offs. The existing purse-seine hook-off guideline from page 2-7 should be moved to the new section.

4. Concentrated Use Purse Seine and Gill Net Areas. Some areas of the Sound receive particularly concentrated commercial fishing use. A Guideline should be developed (similar or identical to the THA guideline needed under 1.b. above) that insure that tideland facilities do not interfere with the use of these areas. Jerry and James marked these areas on a map.

5. Herring. Guidelines need to reference the Herring Fishery. They should protect areas used for Sac Roe fishery, Herring Pounding, and Wild Kelp Harvest. The most specific protection that the group discussed was for Herring Pounding. This use requires protected anchorages for moorage. The anchorages need to be near the herring spawning areas. Thus, protected anchorages in these areas need special protection. Areas appropriate for these guidelines were also marked on the map.

6. Public Notice. Public notice provisions should be expanded to require notice of appropriate commercial fisheries groups. There was some discussion that not everything requires public notice -- the groups don't want to be inundated with paper about everything DNR does in the Sound; however, for significant actions in significant locations, the groups should be notified. We did not resolve exactly what is "significant."

PROPOSED CHANGES IN MANAGEMENT INTENT

There was some discussion that the management intent for the plan (ie., the written stuff in Chapter 3) did not recognize the importance of the commercial fishing industry and the resources it relies on. Therefore, Bob suggested that everywhere where traditional purse seine or gill not fishery exists, that the management intent be beefed up in some fashion. The traditional areas were reviewed on a 1:250,000 scale up. Exactly what the language is that would be inserted in these areas was not determined. (Jerry did inform Bob however, that the management intent for Main Bay needed to include Drift Net Use as well as set net use.) Bob will draft language with help from Kim and circulate it to James, Jerry, etc. for review.

CONFLICTS BETWEEN THE ESTHER IS. HATCHERY & THE PROPOSED LODGE AT QUILLIAN BAY

People thought the proposed commercial recreation site in Quillian Bay would conflict with operation of the hatchery at Esther Bay. The conflicts were of two types. First, there are so many commercial fishing boats near the hatchery and the mouth of Lake and Quillian Bay at certain times of the year, that the addition of many recreational boats would make everything difficult. Neither the recreational boats nor the fishing boats would appreciate it. Second, people were concerned that recreational use of Esther Lake (if encouraged or facilitated by the recreation site) might endanger the water quality of Esther Lake. People suggested that the recreation site be moved to either Granite Bay or Perry Island.

Bob noted that negotiating would be needed with interests representing commercial recreation. The Division of Parks (or whomever) might be able to suggest guidelines to minimize the impact, and would need to be sure that any new site created sufficient benefits. Bob wasn't predicting an irreconcilable conflict, just that other interests would need be present at the table to complete the discussion.

There was also a similar discussion about the possible settlement use of Esther Bay (two bays east of the Hatchery). While there was somewhat lesser conflict with the seining and drift net use is somewhat less concentrated at the mouth of the bay, boats do pursue fish most the way up the bay. In addition, an anchorage in the bay is used by commercial fishermen to raft up their boats during interruptions in the fishery -- that is, during periods when the fishery temporarily closes.

MINERAL CLOSURES

There was a very brief discussion of mineral closures. Bob said that these are likely to be very controversial, and the DNR would probably not reopen the issue to discus additional closures unless officially requested by ADF&G. Even then, the discussion is guaranteed to be controversial. The decision to reopen the discussion on mineral closures would need to be made at the Commissioner level.

DAN WARREN'S COMMENTS

Most of Dan Warren's comments have been covered above. They are summarized here to record what he said.

1. He was unsure of what the document was designed to do. He felt that Chapter 1 should be expanded to include more explanation of its purpose.

2. He noted the revision time as every five years. He felt that revision between the five-year benchmark should be addressed. Bob explained that every year the planning team gets together to discuss whether revisions are needed. Dan said that if so, the document should say that. After getting back to Anchorage, Bob reread the section about plan modification and noted that it does say that the planning team gets together once a year to see where amendments are needed. (Third sentence in the only full paragraph on page 1-7.)

3. He noted that there was very little mention of commercial fishing.

4. He had specific complaints about how the plan treated terminal hatchery areas near the Esther Island and Main Bay Hatchery. These are covered int he pages above and not repeated here. In addition, he also noted the conflict between the commercial recreation site on Esther Island the existing hatchery.

EXTENSION OF THE COMMENT PERIOD

There was some discussion that a January 8th comment deadline was too short. After the session was over, Bob agreed to extend the deadline to January 25th. He also offered to help Dan (and others) find easy and efficient ways for them to make their comments.

SCENES FROM COMING ATTRACTIONS

Bob spent a few minutes going over the process by which the comments (when they are officially submitted) will be incorporated in the plan. He said that another official public meeting is not planned, but that there is a 30-day comment period that people can review proposed changes to the draft before the commissioner signs the plan. In addition, ADF&G in Cordova and the commercial fishing community should get a chance to see how their comments are dealt with in advance of the 30-day comment period because of the number of recommended changes.

Bob also speculated (not guaranteed, mind you -- just speculated) that while some of the recommendations may require some discussion, there appeared to be little problem with adding most of the proposed changes to the plan. He also though it might be useful to have James Brady, Jerry McCune, or others available for certain planning team meetings.

FISH FARMING

Alaska aquaculture: an overview

Aquaculture, or the cultivation of seafood, is a controversial concept in fisheries that could change the way Alaskan fishermen make their livings. Free-lance writer Christopher Batin has prepared a four-part series on aquaculture in Alaska that will appear in the Outdoors section. This is the first installment. Succeeding installments will appear the following weeks.

By CHRISTOPHER BATIN
Correspondent

When oil prices dropped to a new low in 1986, economists were wide-eyed when a single sockeye salmon was bringing $10 while a single barrel of North Slope crude sold for only $9.

It's a success story to warm the hearts of investors everywhere, one where Alaskans are still reaping millions of dollars a year in economic benefit.

In the early 1970s, Alaska salmon stocks were at an all-time low. Realizing the importance of Alaska's fishing industry to the future of the state, the Alaska Legislature invested millions of oil revenue earnings into state and private nonprofit hatcheries.

The results are evident. The 1987 season marks the eighth consecutive year the total Alaska fish harvest exceeded 100 million salmon. Economists predict that Alaska's investment in the renewable natural resource will be producing dollars for the state long after the Prudhoe Bay oil derricks become rusted and inoperative.

When it comes to seafood, Alaska is second to none. In 1985, the state produced 90 percent of the U.S. commercial salmon landings and approximately 43 percent of the world salmon supply, according to a study by Brad Pierce.

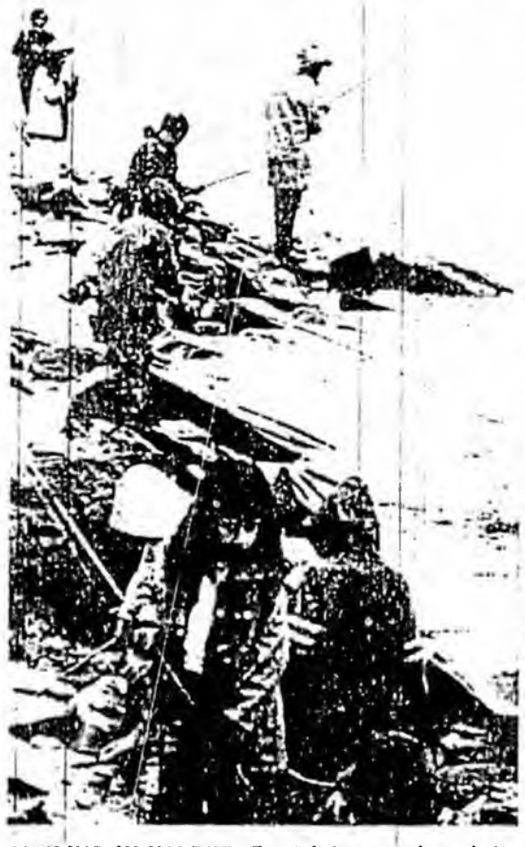
The controversy isn't whether Alaska should continue investing in its fisheries, but rather the means in which to do it.

The new kid on the block is aquaculture, a generalized term that means the cultivation of seafood. In Alaska, aquaculture refers specifically to three major areas: ocean ranching, where eggs and salmon smolt are raised in hatcheries and released to grow in the sea to be harvested by commercial, sport and subsistence fishermen; mussel and oyster farming, where shellfish are grown for commercial harvest; and fish farming, where fish are raised their entire lives in concrete or net pens and sold to expensive restaurants and special markets.

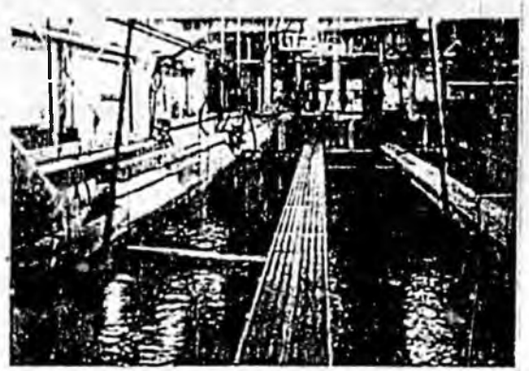
If you've eaten trout or salmon in an Outside restaurant during the off season, chances are they were pen-raised fish. Farmers have been cultivating catfish and trout for the nation's supermarkets for years. And now they're interested in salmon. They predict that by 1990, "farmers" will be producing one out of every seven salmon worldwide.

Yet, salmon farming is an ugly word among Alaska's commercial fishermen. They say salmon farming is incompatible with traditional





ANGLING IN VALDEZ—Sport fishermen drop their lines into Port Valdez near the nonprofit Solomon Gulch Hatchery. Hatcheries have contributed to a healthy salmon industry in the state and may be a vital force in



SALMON REARING—Rearing pens line the interior of the state-run Clear Hatchery. In the early 1970s, Alaska salmon stocks were at an all-time low. Realizing the importance of Alaska's fishing industry to the future of the state, the Alaska Legislature invested millions of oil revenue earnings into state-run hatcheries.

Photo courtesy of Clear Hatchery

could put an end to Alaska's commercial fishing industry. As a precautionary move the Alaska Legislature placed a moratorium on all finfish farming until July 1 of this year, allowing only mussel and oyster farms.

If Alaska hopes to retain its share in the world market, it would do well to size up its competition. Many world leaders in fish farming, such as Norway, have a 25-year jump in farming technology. The expertise shows.

By 1990, Norway is expected to produce 80,000 metric tons, or 176 million pounds of farmed Atlantic salmon. The United Kingdom, Finland, Ireland, Canada, Iceland and Denmark are expected to produce a combined total of 23,160 metric tons of salmon. Of those countries raising Pacific salmon, Japan and Canada are expected to produce 14,000 and 15,000 metric tons, respectively. The United States is estimated to produce a mere 5,000 metric tons by 1990, with New Zealand, France and Chile expected to produce lesser amounts.

Alaska commercial fishermen say developing the fish farming industry would displace existing fishermen, leading to higher unemployment. It also would result in significant regulatory costs to the state through state agency involvement in areas such as disease and quality control, they say. To start many of the farms, the state would probably need to create subsidies and technical support, which would create additional expense on an already strained budget.

Proponents say development of salmon farming could create thousands of jobs as well as millions of dollars in support services such as equipment, marketing, fish food and distribution. Fish farming would develop the economies in rural, coastal areas receiving only seasonal monies from tourism and commercial fishing.

Proponents say the North American commercial fishing industry is not supplying enough salmon preferred by the U.S. white tablecloth restaurants. Foreign and domestic salmon farmers are taking advantage of those sales. Advocates of farming argue that unless Alaska immediately establishes control in the farmed and ranched salmon markets, its market share will decrease significantly over the next decade, further eroding salmon prices, which will ultimately put commercial fishermen out of business.

In "World Salmon Farming: An Overview with Emphasis on Possibilities and Problems in Alaska," author and biologist Curt Kerns writes: "If we elect not to farm salmon, the Alaskan salmon fishing industry will probably continue to be highly seasonal, staffed by seasonal workers. Tendering, processing, and distribution facilities and personnel will continue to be underused during late fall, winter and early spring. One thing is clear: commercial salmon growing will not go away. It is permanently changing the shape, form and substance of salmon production, marketing, distribution and consumption."

Christopher Batin is an award-winning outdoor journalist and frequent contributor to the Outdoors section.

The need for more fish

By CHRISTOPHER BATIN
Correspondent

Many experts predict the world is in the early stages of a "blue revolution," similar to the "green revolution" of the 1960s when the United States and Canada—food producing giants—turned food importing countries such as India and Indonesia into food exporters. Now, instead of crops, the harvest is fish, and lots of them.

Improvements in commercial fish harvesting techniques have improved ten-fold in recent years, resulting in world-wide fish catches of nearly 160 billion pounds. The National Marine Fisheries Service predicts an annual increase in catch of approximately 171 billion pounds by 2010, with landings subject to minor annual fluctuations. Analysts suggest that despite the improvements, fish are being harvested at or near their natural, upper level of capacity.

This would supply adequate food if the world population would hold steady. By the year 2000, however, the world population is expected to increase from today's 5 billion to 6.1 billion.

In addition, the U.S. Department of Commerce estimates that the current world per capita consumption of fish and shellfish is 28.6 pounds. That figure is expected to increase to 34 pounds by the year 2000, which would call for an additional 33 million pounds per year to meet worldwide demands.

Add to that the growing interest in seafood and fish in American diets. The U.S. Department of Commerce says that Americans ate 12.8 pounds of seafood in 1980. Current interest in eating seafood, the trend away from red meat, and heavy marketing campaigns by the U.S. seafood industry has increased the per capita consumption of seafood by 549 million pounds, to 14.5 pounds per capita by 1985.

The Alaska Mariculture Advisory Committee, in an effort to outline aquaculture development for the state, defined development into three categories: ocean ranching salmon, fish raised in hatcheries, then released to sea; pen-rearing salmon, where fish are grown for all their lives in holding pens; and other forms of mariculture, such as mussel and oyster growing.

Alaska is in a competitive and strategic position to develop aquaculture projects. The state has the [illegible] to provide processors, marketing programs and dependable air transportation to rush the salmon to market. Yet, unless the state agrees to finance fish farming, foreign investors will move in and develop the industry to their economic benefit.

Alaska residents are generally against outside economic domination of the fishing industry. At the turn of the century, Alaska's fisheries were caught in a stranglehold by Seattle-based companies. The industry was developed with Outside monies, and managed by companies with interests outside the state. This "colonial heritage" concept was the operating philosophy for many companies. Alaska was a far-off destination, and companies invested little in the hopes of reaping as much of the fish resources, and profits, as possible.

When Alaska implemented limited entry more than a decade ago, the Japanese high-seas catch of salmon declined from approximately 83 million fish to about 20 million fish. It was a major step in protecting a resource that was already severely depressed.

A special study by the Alaska Department of Labor indicates that in 1984, 65 percent of the 18,683 jobs and $58 million in earnings of Alaska's food processing industry (almost all seafood processing plants) went to non-residents who stayed for the fishing season and left to spend their earnings outside the state.

It doesn't stop there. According to a legislative report compiled by Brad Pierce on aquaculture in Alaska, the harvesting sector of the state's salmon industry in 1984 had 17,283 Alaska residents with gross earnings of 219.1 million ($12,700 per capita) while 5,858 nonresidents earned 121.8 million ($20,800) per capita). More than 20 percent of the permit holders in Alaska's limited fisheries are nonresidents. Additional revenue, in the form of investment capital by anglers in their equipment and boats, and secondary employment for services to the fishing fleet, escapes Alaska's economy.

Alaska's commercial fishermen insist that Alaska should follow the example of other countries and continue developing its ocean ranching program. It is the only way, they claim, that Alaska's salmon fishing industry can continue to develop, and the key to further diversification in salmon aquaculture.

CORDOVA DISTRICT FISHERMEN UNITED

P.O. Box 939

Cordova, Alaska 99574

(907) 424-3447

April 1, 1988

Cordova District Fishermen United supports the orderly and controlled development of shellfish and plant mariculture, but opposes pen rearing salmon in Alaska. The moratorium on fin fish farming will run out and we still have not seen any impact studies to commercial fisheries. So far fish farming has been promoted as a safe, controlled industry perfectly suited for Alaska.

The Alaska Mariculture Association has made the statement that "Alaskan fishermen are too emotional" and they compare this battle to the range wars of the 1800's.

We value our natural ocean resources and our present commercial and sportfishing industries too much to roll over and play dead. There is more evidence every day about hormone uses, antibiotics, and the effects to the wild stocks from escaping salmon from pens.

At this point, CDFU believes Alaskan fisherman should be emotional about their livelihood. We are being attacked by an industry which could reduce access to traditional fishing grounds and harm the environment for the hatcheries and the wild stocks. The biological impacts on Alaskan wild salmon are real and could very possibly alter our wild stocks. Wild salmon in Ireland and Norway are non-existent and their streams are now polluted with Atlantic stocks forcing Norway to close gillnetting and start a gene pool to try to rebuild the wild stocks. Canada already has escaped salmon in the wild streams that spawn with wild stocks. Canada has already allowed Atlantic stocks importation into Canada because domestic stocks are too costly and slow growing to raise economically. This is one of our arguments, fish farmers in Alaska will ultimately go broke growing domestic stocks and appeal to the State to allow importation of Atlantic stocks.

All farmed salmon raised in Alaska will be advertised as "Alaskan Salmon," taking advantage of an excellent wild salmon market, which took the State, Alaska Seafood Marketing Institute, fishermen and processors years to build. Fishermen have survived botulism, low prices and many closures to build and promote fisheries and build the private non-profit hatcheries.

The general public of Alaska elected to enhance wild salmon runs by building hatcheries for commercial, sportsfishermen, personal use and subsistence users. This program is having tremendous success in Prince William Sound and has contributed more money to commercial fisheries and the State of Alaska than it took to build the private non-profit hatcheries. The sportsfishermen alone caught 100,000 pinks returning to Valdez Fisheries Development Association in Valdez.

The whole pen-raising industry is dominated by foreign interests and backed by foreign governments. The Norwegian franchise system, which can be compared to McDonald's, is that "we finance, insure and get you started, complete with Norwegian wo kers, and gladly take the farm back if you are not successful." Ireland blocked Norway out because of the fear of losing their whole coastline to the Norwegian franchise machine.

An American Bank will not finance a fish farm nor will American insurance companies insure an industry with fish as their only collateral. Encouraging foreign interests to invest and take contr·· of fish farming in Alaska is not in the best interest of Alaskans.

Pen rearing salmon will compete with existing commercial, subsistence users, sportfishing and future enhancement programs. All wild and hatchery fry will have to pass through fish farm sites upon their release to the ocean causing farmed fish predation on the hatchery fry.

In Prince William Sound, we are on the threshold of a great breakthrough in the fisheries due to Prince William Sound Aquaculture Corporation's great success in enhancing the wild runs. A new cannery and cold storage facility is currently being built in Valdez by Peter Pan Fisheries. St. Elias Ocean Products and Chugach Alaska Fisheries have increased their cold storage capacities, which will enable them to process and distribute more product throughout Alaska and create more jobs. The State of Alaska and fishermen have been waiting for breakthroughs in marketing and distribution of Alaskan products outside of Alaska.

Washington Dom Sea, which is a Norwegian investor, has switched from Pacific to Atlantic salmon; and the Norwegians have done the same in Canada. Safeway stores report they sold only half of the farmed fish this year compared to last year at this time. At the same time, we see tremendous sales in Southeast Alaska of wild winter kings. The general public shows a desire for nutritious wild Alaskan salmon caught by Alaskan fishermen.

Sincerely,

CORDOVA DISTRICT FISHERMEN UNITED

Gerald McCune

Gerald McCune
President

GM/mbl

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The general public of Alaska elected to enhance wild salmon runs by building hatcheries for commercial, sportsfishermen, personal use and subsistence users. This program is having tremendous success in Prince William Sound and has contributed more money to commercial fisheries and the State of Alaska than it took to build the private non-profit hatcheries. The sportsfishermen alone caught 100,000 pinks returning to Valdez Fisheries Development Association in Valdez.

Cordova Fishermen Say No to Net Pens

Cordova District Fishermen United (CDFU) supports the orderly and controlled development of shellfish and plant mariculture, but we are opposed to pen rearing salmon in Alaska. Norway, Iceland and Ireland ve altered or destroyed most of ir salmon rearing and spawning abitat and have chosen to fish farm. Keeping in mind Alaska has 43% of the world's wild stocks, I will address the concerns of fish farming when introduced into a highly populated wild stocks area.

Introduction of Exotic Species

If culture operations require the importation of live materials into the state, the potential introduction of exotic species probably represents the greatest environmental threat posed by mariculture. Introduced species may establish self-sustaining wild populations, potentially becoming a pest or eliminating natural species. Norwegian fish farmers have had serious disease problems in several operations caused by importing Atlantic salmon smolts from Scotland because they were unable to produce sufficient quantities.

When antibiotics are administered to cultured fish, what effects do the often major additions of disease treatment chemicals have on the surrounding environment? Could the antibiotics eventually result in treatment-resistant strains of certain pathogens (a disease-producing organism) previously not encountered by wild fish stocks in the vicinity? This may be a very real and dangerous possibility.

One note here is that Prince William Sound has about 900 wild streams and the conditions are the same in Southeast Alaska. Where are the salmon farms going to be placed so as not to interfere with wild stream or hatchery fry or migration patterns?

Diseases

Cultural environment may serve as a reservoir for these diseases which are present in an environment but demonstrating no clinical symptoms in wild fish. There is fear that the disease organism may proliferate among the cultured fish, become more virulent and reinfect the wild stocks. However, there is no evidence to indicate that this scenario has ever occurred. The outbreak of a disease is often associated with some forms of stress. In the cultural environment, fish may be stressed by overcrowding, undernourishment, poor water quality and physical damage associated with handling and confinement. Fish held in culture are likely to show more frequent appearance of disease than wild fish.

Salmon netpens, unless located properly, may cause smothering of valuable fish habitats such as herring spawning substrates and intertidal clam beds. Netpens may attract juvenile wild salmon and herring in the vicinity of migration routes, resulting in predation on the small fish by penned stocks or disease transfer between wild and cultured fish. There are five hatcheries in Prince William Sound which also release fry.

The rapid expansion of salmon farms and other mariculture operations on the Pacific coast has raised concerns about possible environmental impacts on herring spawning areas. There are also concerns about impacts on herring roe-fishery sites which occur mainly in the vicinity of spawning areas. Salmon farms and herring could interact in several ways. Organic waste from netpens could contaminate nearby spawning locations and force herring to spawn in other secondary locations or it could jeopardize egg survival after spawning. Alternately, herring will spawn on fishing nets and netpens, and heavy egg deposition on salmon netpens could be deleterious to fish farm operators. Some diseases may be transmitted between wild herring stocks and salmon in farms. Further, if netpens were located in the vicinity of near-shore herring gillnet fisheries, there could be mutual gear interference during the fishing season.

A person could go on forever, but as you can see, the concerns are real. Will the State of Alaska harm the wild stocks or hatchery fry by introducing salmon farming. If this is the case, a valuable resource could be severely damaged. The revenues gained would be lost on progress we have already made on private non-profit hatchery programs and wild stock lost. The present forecast for Prince William Sound is a harvest up to 16 million fish. If both the wild stock and hatchery forecasts are correct, then it will be the second year in a row that Prince William Sound hatcheries have contributed the largest portion of pink salmon to the common property fisheries.

The question is, can Alaska take the chance of any of these disease factors coming true?

Sincerely,
Gerald McCune
President, Cordova District
Fishermen United

LETTERS

continued from previous page

North Pacific Fishery Management Council that you reference, I and other members of the legislature's bush caucus requested the council to make a "sufficient" Pacific cod allocation so that joint ventures could continue with the resident fishermen of Bristol Bay and Norton Sound. We did not request a specific amount. The council's final decision was to recommend that the longliners receive a 22,000 m.t. allocation, leaving 258,000 m.t. to be taken by the domestic industry.

I signed the letter in order to support the herring joint venture between the Japanese longliners and the Bristol Bay Herring Marketing Cooperative. This joint venture directly benefits the resident, small boat gillnetters of Bristol Bay, who, to date, have never been able to secure commitments from domestic processors for markets. The joint venture, unfortunately, would not be economically viable unless the longliner fleet had access to Bering Sea bottomfish, in this case Pacific cod. The herring cooperative is on notice that it cannot count on the continued presence of the Japanese in our waters. It must develop alternate markets. While I am willing to support this exception this year in

see **LETTERS** page 32

Aquaculture—third of a series

Fairbanks Daily News-Miner, Fairbanks, Alaska

Commercial fishermen cite farming threat

Tourism, fishing grounds may be affected

Thursday, February 11, 1988

Aquaculture, or cultivation of seafoods, is a controversial concept in fisheries that could change the way Alaskan fishermen make their livings. This is the third part of a four-part series on the subject.

By CHRISTOPHER BATIN
Correspondent

Alaska is a state divided over the issue of fish farming: the raising of fish in made-made pens for sale to domestic and world markets.

According to commercial fisheries officials, Alaska boasts 70 percent of the U.S. salmon production and 43 percent of the world salmon production, excluding pen-reared salmon. Yet, farmed salmon is one of the most rapidly growing segments of the U.S. fish market. Pen-raised Atlantic salmon have increased dramatically, growing to more than 16 million pounds in just three years, at a net value of $50 million.

But, commercial fishermen claim a fish-farming industry will cripple them, cause a glut of fish on world markets and provide an inferior product to the consumer.

"We've seen our market share for trolled fish from Alaska get smaller over the last seven years," said Barry Lester with the Alaska Troll Salmon Processors Association. "The foreign fish farmers are definitely making inroads."

Fishermen say pen-reared salmon will either be a "Mom and Pop" industry, with farms scattered up and down the coast, or the state will use its resources to develop a market for foreign investors to exploit and take home the profits.

Lester said the problem facing commercial fishermen lies in educating salmon buyers and improving the quality and grading system of salmon.

"We don't want to tell people that farmed salmon swim in their own waste and are filled with chemicals against disease. We just want people to know the virtues of wild salmon," he said.

Kate Graham, executive director of United Fishermen of Alaska, said Alaska commercial fishermen strongly support the moratorium imposed on salmon farming in Alaska. "We're reaping the benefits of our non-profit hatchery system. It would be a real mistake to bring fish farms in here."

UFA represents 19 organizational members and about 12,000 commercial fishermen. The 22-member board of directors is concerned that when the moratorium prohibiting finfish farming expires in July, regulations won't be in place.

"If the moratorium expires, without clarification, farmers



industry that has virtually no regulation. We want to make it (fish farming) illegal," Graham said. "The state would need to make a tremendous investment, in addition to what it's already made, if it hopes to see fish farming take off."

Alaska commerical fishermen list several reasons for being against fish farming. One is the disruption of traditional fishing grounds and anchorages. Depending on the location of the farms, waterfront properties could diminish.

It also could affect tourism, they say.

Also, opponents of fish farming claim fish feed and feces can collect on the ocean bottom under pens in layers a foot deep. Biologists say that a salmon farm of a few acres could generate as much feces and urine as a city of 4,000 people.

They also cite toxics. Last year, British Columbia's Ministry of the Environment discovered a substance called tributyltin, or TBT, in pen-reared salmon sold in U.S. seafood markets. TBT, with toxicity levels reached in as little as five parts per trillion, is commonly used in anti-fouling paint for boat bottoms, and is sometimes used to treat netting in salmon pens. European countries have banned the substance because of the damage it inflicts on the environment. Researchers have concluded that exposure to low doses of TBT may increase susceptibility of disease among salmon and other fish.

Among penned fish, the spread of bacterial disease is a gray area that needs more study. The use of antibiotics—especially oxytetracycline—would help control disease. Yet opponents to farming claim bacteria could develop a resistance to the antibiotic, and be harder to treat, especially if spread among wild fish stocks.

Also, after several cycles of pen rearing, they claim genetic alterations could occur and domestic pen-raised salmon could affect the gene pool of wild salmon stocks.

As for costs, "Fish farming is touted as an activity for small, coastal villages," Graham said. "The trouble is, the costs of operation are so high, that it'll be extremely difficult for a small family or village to meet everyday costs, let alone the cost of services offered by FRED (Fish and Game's Fisheries Rehabilitation Enhancement Division). Farmers want the state to wait until after they've made a profit to collect fees. That's two to three years after the start-up, and that's if they survive that long. Commercial fishermen have always had to take their

don't have to pay our enhancement tax until we make a profit.

"The state should meet its current needs before creating a new industry," Graham said.

House Research Agency analyst Brad Pierce indicated that Alaska fishermen will face competition from farmed salmon whether or not fish come from Alaska farms.

"At the rate that worldwide production of farmed salmon is growing, domestic markets can be expected to become saturated in the intermediate (next five to 10 years) future. This means that there is a limited 'window of opportunity' for Alaska to enter salmon farming and gain a market share. If traditional fishermen in Alaska can learn from their counterparts in other countries and adopt some of the cooperative methods that have made others more competitive, then the greatest loss they suffer from farmed salmon may be some of their sense of autonomy and individual freedom."

"Fish farmers would have the public believe that they're not competition for us," Graham said. "You bet they'll be competition. But that's not the main reason we're fighting it. There are serious problems that need to be addresed that concern everyone, from the sport fisherman to the subsistence user to the man on the street.

"Alaska has the last great runs of wild salmon in the world. With the proper marketing, and additional help from the state, we need to continue extolling the wonders and virtures of Alaska wild salmon. We already have the resource. Let's use it."

In Alaska, commercial fishermen claim in-state salmon farming will seriously hurt Alaska's salmon market.

Salmon farmers disagree, saying the state's commercial salmon fishery supplies fish predominantly during the summer months. Fish farmers also claim that profits, timing of the salmon run and competition from other boats often are reasons why some fishermen don't treat their fish with the care that premium salmon

(The exception is troll fish men who fish year-round kings and cohos and handle process their fish individua Both farmers and troll fish men sell premium salmon to same markets.)

Fish farmers say they p duce carefully handled f without bruises or blemish that are uniform in size, and t are fresh, not frozen, every of the year.

Proponents of Alaska salm farming say the state shou cash in on the market bef other nations take control. Th claim the benefits to Alask economy are many and incl market penetration and c tinuity of product during winter when commercial mon fishing is at a standstill

Also, fish wastes and entr can be remanufactured into food and fertilizers.

A variety of species are av able in-state to reduce the ris disease, they add. Prospect species for Alaska fish farm are coho, chinook and steelhe Arctic char might also be a sibility because of its red-ora flesh and high prices in the E pean market.

FRED's Mike Kaill said m fish farmers he's talked to ar favor of an industry that is supportive.

In regard to fears stresse the commercial fishermen environmental groups, he re red to Gov. Steve Cowp eight-point policy on mari ture released in 1987. That p stresses that mariculture m benefit Alaskans; must pay itself and the state must g fair return for its resour must be done in an ord fashion to develop a stabl dustry; must meet all fed and state requirements health and sanitation; mus manage to protect plant animal stocks; must be m aged to ensure adequate vironmental safeguards habitat protection; must m mize land use conflicts; n allow for navigation and em access to upland areas; stipulate that brood stoc carefully regulated when t from limited entry fisherie

Kaill said despite the res tions, there's much interes salmon farming from in-s and Outside investors.

"The type of farm will d mine the type of investor y attract," he said. "Large fa will probably attract la firms, perhaps from Outsid the state wants to keep ership in Alaska, with local ple, the farms will probabl small."

Christopher Batin is an as

Pen-raised fish cut into market for Alaska troll-caught salmon

Fairbanks Daily News Feb 18'88

Aquaculture, the cultivation f seafood, is a controversial oncept in fisheries that could hange the way Alaskan fisher-ien make their livings. This fin-l segment of a four-part series n the subject looks at narketing.

By CHRISTOPHER BATIN
Correspondent

An elite restaurant in New ork has a menu listing two ypes of salmon: fresh frozen laska king salmon, cooked to rder, or fresh Norwegian tlantic salmon air-shipped the ame day from Norway, pre-ared to order. Prices are the ame for both.

If you were the customer, you night assume that both fish vere caught fresh and silvery rom the high seas. While this is sually the case with Alaska Pacific salmon sold fresh-frozen o Outside restaurants, it is not he case with Norwegian Atlan-ics.

Most Atlantic salmon shipped o "white tablecloth res-aurants" in major U.S. cities re pen-raised fish that have ived their entire lives in huge olding pens with hundreds of ther salmon. Years of domes-ication have conditioned the fish to feed strictly on fish food pellets.

When the fish are ready to be harvested, they are vacuum pumped out of their pen and taken on a turbulent ride to a processing plant, where they are killed with a blow to the head, then gutted and chilled before being sent to market.

Alaska is battling for position in restaurants around the world against Norwegian Atlantics and pen-raised kings. It's a battle that commercial fishermen say needs to be won now, before Alaska loses its share of the market.

"It would be nice if we could make wild Alaska salmon as common in homes as tuna fish," said Pete Carlson, a comptroller with the Alaska Seafood Marketing Institute in Juneau. "But we have lots of competition from foreign markets dealing pen-raised fish."

The differences between pen-raised fish and troll-caught salmon deal with price, uniformity and seasonal availability. Commercial fishermen fear these differences will shrink in the near future, hurting the entire salmon fishing industry.

Based on opposition from commercial fishing interests, and uncertainty about its potential impact on the economy, the Legislature issued a moratorium until July 1 on the granting of licenses, permits, leases or authorizations for commercial finfish farming. "The Legislature has advised us that we can promote only naturally raised and traditionally harvested fish at this time," Carlson said.

He said the institute has taken a neutral position regarding farmed fish and fish farming.

"We do have, however, several campaigns at the present that promote the overall qualities of Alaska salmon."

One of those campaigns is aimed at promoting canned salmon in the southeast and northeast United States. "The canned salmon market is big in these areas," he said. "The scare over botulism-tainted canned salmon that took place in 1982 has long been neutralized."

ASMI also promotes fresh and frozen Alaska salmon, along with halibut and shellfish nationwide.

Carlson said his agency spends about $4.2 million to market the advantages of Alaska seafood to consumers around the world.

"Part of our advertising revenue comes from federal funds," he said. "We're involved in Target Export Assistance (TEA), a federal program that helps us penetrate known trade barriers in foreign countries.

"There s resistance to marketing Alaska salmon to Japan and western Europe, countries that have already established seafood industries or supply markets. We're trying to turn that around."

Economists indicated the rapidly growing national trade deficit can be slowed by enhancing overseas markets for Alaska salmon. Yet, Carlson said the Alaska seafood industry is undoubtedly going to face some stiff competition in the United States from foreign farmed fish.

"Alaska is a world leader in commercial fisheries," he said. "That's the main thrust of our marketing strategy, to sell a consistently good product, and lots of it."

Sandra Cesarini, executive vice president of Sea Hawk Seafoods in Valdez, said interest in Alaska salmon is rising annually, especially for specific types of salmon.

"We deal with a high quality of salmon," she said. "Over 20 percent of our product comes in alive, mostly on larger boats that can refrigerate seawater and hold the fish they catch. These are bright, silver, deep-running fish. If the salmon has a tint of blush, it's a second-hand fish for us."

Processors like Cesarini say that most of their sales go to Asian and European markets, with premium prices coming from refrigerated saltwater fish. The demand by Japanese consumers for whole frozen and dressed Alaska sockeye salmon has seen phenomonal growth. Japan imported more than 227 million pounds of frozen U.S. salmon in 1985, roughly 83 percent of the total U.S. exports of salmon. Japan doesn't have the lake systems necessary to raise large quantities of sockeye salmon. Chum salmon also is popular fresh or frozen, however, Japan su' 'ltutes Alaska-



total Alaska salmon harvest has exceeded 100 million fish per year. About 97 percent of the premium species—coho, king and sockeye salmon—is sold frozen and 3 percent fresh. Washington, Oregon and British Columbia typically sell a higher percentage fresh. According to seafood distributors, West coast residents prefer the deep red color of premium Pacific salmon over the light pink color of pen-raised salmon. Yet despite consumer preferences for wild Alaska salmon, economic surveys show fresh pen-raised salmon are making inroads into the Alaska troll-caught salmon market.

Alaska salmon has several advantages over imported Atlantics. One is price. Wild salmon sells for about $2.50 a pound, wholesale, while farmed salmon sells for over $5 a pound. But analysts predict current technological advances in fish farming could eventually make it extremely competitive with wild fish.

Barry Lester, president of the Alaska Troll Salmon Processors Association, said that European fish farmers have established a good foothold in the U.S. salmon market, with an effective campaign that promotes their fresh, pen-reared salmon over frozen.

He said marketing efforts need to educate consumers on the gray areas of frozen and fresh.

"Pen-raised salmon labled 'fresh' is often misleading to the consumer," Lester said. "That product could have been sitting there three or four days or longer. The consumer has no idea of when those fish were taken from the water."

He said fresh-caught Alaska salmon can be frozen within hours of being caught.

"Oftentimes, the fish is better quality. It maintains its color, texture and flavor longer than fresh unfrozen fish that have been sitting in a refrigerated locker.

"We need to make Alaska salmon more attractive to the world," he said. "If we're unable to develop a market preference for wild salmon, the only thing left is price competition. We can't allow farmers to sell an inferior product from pens for less than what it takes us to catch wild salmon. The Alaska fishing industry will disappear, because the price of salmon will be very low, due to the glut of fish."

caught Alaska king salmon isn't always that easy.

"I've been having problems in obtaining fresh king salmon on a regular basis," he said. "When I started my business eight years ago, I could get fresh, troll caught Alaska kings during 9(percent of the season. Now I can only get them about 50 percent o the season.

"We use troll-caught kings be cause they're the best," he said "When they're unavailable, w use fresh frozen king, which i also excellent."

He said Norwegian pen-raise king salmon is excellent, and i the price would drop, he'd cor sider using it.

"It's a bit paler than troll caught kings, but the quality i excellent."

Winther said that while o business travels outside Alask he's constantly on the lookout fc salmon on restaurant menus.

"Many of the restaurants Ou side carry Norweigian, pen raised salmon," he said. "I'v had it in Chicago, and just r cently, in Disneyland. It's exce lent fish."

Biologists say there may b nutritional differences betwee wild salmon and farmed sa mon. Wild salmon is rich in anc that helps prevent heart attacl and high blood pressur Farmed salmon contain less this oil because of a diet based c processed fish pellets rath(than a natural diet of forage fis such as herring.

Alaska also has a distin advantage over countries th export salmon to the Unit(States. State processors have i international borders to cross. factor that will assist in elim nating marketing and shippi hassles, a major deterrent foreign fish farmers.

Farmed salmon has adva tages, though. It's availab year round. Alaska wild salm is available only from M. through September.

Freshness of product another angle that troll fish men are finding difficult to be Restaurants and caterers New York or Los Angeles c order a 10-pound box of ba coho and choose from 8-, 10- 12-ounce fish, all uniform shaped and sized, and proces according to specifications. I customer orders on Wednesd the farmers take the fish fr the water the next morning, a it's usually delivered within hours.

While fresh seems to be fir there is a growing demand canned salmon. The Unit Kingdom imports about 50 p cent of Alaska's canned pink mon, followed by Australia percent) and Canada (17 p cent).

While prices for salmon v seasonally, based on harv levels and time of return, e nomists are finding Ameri consumers are shifting aw from canned salmon, preferr more fresh and frozen produ



FISH FARMING — First hand experiences during recent trip to Norway are related to TFN's Marilyn E. Geoerge, SE Alaska correspondent. TFN photo

Alaska Senator Lloyd Jones reports on Norwegian farming

by Marilyn E. George

"We do not want Alaska to go into fish farming if it will be a detriment to the existing fishery. It needs to complement what we now have," Alaskan Senator Lloyd Jones told your reporter when he visited Petersburg in September after a week long visit to Norwegian salmon farms.

"It could be a viable industry here, but they have an entirely different situation as little commercial fishing exists on wild stocks. The uplands are privately owned, and often those owning the uplands set-up the fish farms.

None of the farms were far from the end of the roads, making getting in supplies and shipping out fish relatively easy. They also have many small ferries and freight boats plying between the settlements," Jones continued.

Jones along with seven other Alaskan legislators flew to Norway in July to observe the Norwegian fish farming. The MOWI farm, the largest in Norway, was producing 500,000 fish a year. It had started with trout before restrictions as to size were in effect. It needed 200,000 cubic meters of water. As only one meter of tide flowed there, they set up large propellers to drive the water around the pens and through the channels.

The National Government was doing the majority of the research needed. They determined what areas would support salmon farms. Jones did not know the criteria used to determine who obtained the rights to set up the farms.

Family farms not profitable

The 2,000 meter family farm has not been profitable and they are merging into associations or being acquired by corporations, Jones found. The 8,000 meter farm with an investment of $1 million is needed to be efficient. Now pressure is being put on the government to allow these farms to expand to 10,000-12,000 cubic meters in order to be profitable.

Norway now has 700 farms employing 3-4 workers per farm, and producing 50,000 metric tons of fish. When they are in full production, they have a potential to produce 90,000 metric tons. Norway is shipping 27 percent of this to U.S. markets and 26 percent is going to France, Jones reported.

The Norwegian government has found a way to vaccinate the fish by absorption so as not to transfer the antibiotics into the final product. The

Protecting the fish and the fishermen

American fishermen apparently have clear and convincing evidence that foreign trawlers have been operating illegally in U.S. waters. Videotape of seven ships — four Japanese, three unidentified — 39 miles inside the 200-mile limit north of the Aleutians seems to provide incontrovertible proof of the illegal activity.

Quite rightly, the U.S. fishermen want the violators punished and not just with the rather minor 90-day confinement to port provided by Japanese law. Foreign fishermen who enter U.S. waters threaten American fishermen's livelihood — and the health of fish stocks that are the basis for the billion dollar bottomfish industry.

Washington should make it clear to the Japanese that such intrusions will not be tolerated, perhaps by proposing stiff new penalties for documented violations. Banning foreign violators from joint ventures with American fishermen is a potent example of what could be done.

The federal government also should fund improved Coast Guard surveillance in the Bering Sea. The waters along Alaska's coast deserve protection in the national interest — and only Uncle Sam can do the job.

But laying down the law to Japan and tougher enforcement may not be the only measures needed to protect U.S. fishermen and the fish.

The history of big-time fishing is replete with stories of boom and bust. The bottomfish industry is booming today but will bust if improperly managed. The North Pacific Fishery Management Council is attempting to keep catches well below maximum sustainable yields, but does it have enough biological information to guarantee such protection? Is its management system adequate to ensure a steady harvest?

If the Japanese are poaching in U.S. waters they should be disciplined. But U.S. fishery managers must remain ever vigilant to the dangers of over-fishing even if the Japanese toe the line.

1-21-87 Juneau Daily News

Fish farming legislation remains stalled

By LARRY PERSILY
The Associated Press

JUNEAU — Supporters of salmon mariculture in Alaska says they're disappointed by lack of action on the issue, but still hope to answer fishermen's concerns about competition and diseases.

"It is counterproductive not to discuss it," said Rep. Johnny Ellis, D-Anchorage, prime sponsor of a bill that would clear the way for fish farming in Alaska.

"This is not a fishing debate; this is an economic development issue," said Rodger Painter, executive director of the Alaska Mariculture Association.

However, the Senate president and the Senate majority leader are not optimistic about the measure's chances this year.

"We don't want to create an industry that in any way will hinder or hamper an existing industry," said Senate President Jan Faiks, R-Anchorage.

Senate Majority Leader Dick Eliason, R-Sitka, said there is a future for mariculture in Alaska for seaweed, oysters and shellfish, but not necessarily for pen-reared salmon.

"I for one am not going to support a bill that is not supported by the fishing industry," Eliason said. The Senate mariculture bill (SB106) has been stuck since last year in the Resources subcommittee on fisheries, chaired by Eliason.

"It is not a high priority of many of the people I represent," said the Sitka senator.

Another coastal senator with a large constituency of fishermen, Fred Zharoff, D-Kodiak, refused to proclaim the bill "stalled in the water."

He said not all of the conflicts

See Page C-7, MARICULTURE

MARICULTURE: Supporters still hope to address concerns

Continued from Page C-6

have been resolved between commercial fishermen and fish farming supporters, and those issues would have to be settled before he could actively support pen-rearing of salmon.

Ellis said he wants to amend mariculture legislation this session to address concerns of commercial fishermen, including the issues of alleged competition from salmon farming and diseases spreading from pens to natural stocks.

The House bill (HB108) is in the Resources Committee.

Painter said he disagrees with the position of Faiks and Eliason that fish farming could harm the state's fishing industry.

Commercial fishermen could benefit from an increased presence of Alaska salmon in the worldwide market with a year-round supply from fish farms, Painter said.

"It's a fairly emotional issue," he said, comparing the debate to the range wars of the late 1800s between cowboys and farmers.

Mariculture already exists on a small scale in Alaska, with some oyster farming near Wrangell and mussel farming at Halibut Cove. The legislature last year approved a moratorium on finfish farming in Alaska, but it does not apply to oysters or shellfish.

The moratorium expires in July.

"The moratorium falling is really a no-win situation for everybody," he said. Although there is no law against fish farming, there is no law specifically allowing it either, he said, and lawsuits could result if the legislature fails to address the issue before the moratorium expires.

An extension of last year's moratorium is not the best answer, Painter said.

Panel: Ban salmon ranching

KETCHIKAN — The Southeast Alaska Conservation Council (SEACC) is calling for a ban on salmon ranching and a moratorium on all other forms of tideland development. The environmentalist group says mariculture would result in reduced concern over the maintenance and retention of wild stocks of salmon and their habitat.

Mariculture is hot topic among state legislators

By LARRY PERSILY
The Associated Press

JUNEAU — Despite efforts to amend the mariculture bill to make it more palatable to its adversaries, opponents of salmon farming still resist the measure.

The legislature last year imposed a moratorium on salmon farming, with the prohibition on the new industry due to expire this summer.

A measure that would allow salmon farms (HB108) was amended this session to limit their number and size, an attempt to win support from those who favor continuing the ban.

Although some legislators favor extending the moratorium, one opponent, Sen. Lloyd Jones, goes a step beyond that — he has introduced a bill (SB425) to impose a permanent ban on salmon farming.

Extending the moratorium, the Ketchikan Republican said, would only extend the turmoil by creating uncertainty every time the moratorium comes up for consideration.

Jones wants to end that uncertainty by prohibiting salmon farms, and then studying the issue for possible future changes in the law.

"We're not precluding further research for finfish farming," Jones said.

His bill would allow shellfish and plant farming.

Neither shellfish nor plant farms have attracted the controversy generated by salmon farming proposals.

There is some oyster farming near Wrangell and a mussel project near Halibut Cove, but efforts to set up salmon farms have been blocked by opponents who fear its impact on the commercial fishing industry.

Salmon farms would raise the fish in floating pens, providing a year-round supply of fresh salmon.

Rep. Robin Taylor has a bill (HB455) that would extend the moratorium 10 years.

The Wrangell Republican said he worries about the impact

See Page B-3, SALMON



Lloyd Jones

Ban on salmon farming urged

KENAI — The Kenai Peninsula Borough Assembly has passed a resolution asking the state legislature to continue a ban on salmon farming in Alaska waters. The measure, which also asks the state to carefully regulate shellfish mariculture projects, passed unanimously Tuesday. It also asks lawmakers to avoid using depleted commercial and sports fishing budgets to underwrite any mariculture industry. Salmon are farmed — reared in pens until processed — throughout the world. Opponents of the industry say diseases and the genetic inferiority of pen-reared salmon could devastate native Pacific salmon.

SALMON: Lawmakers worried about impact on market

Continued from Page B-1

salmon farms would have on the market share and prices paid for natural salmon. The pen-reared fish could cost Alaska's commercial fishermen a share of the market for fresh fish, he said.

He also questions whether salmon farms would take away too many of the state's favorite beachfront recreation sites.

Rep. Johnny Ellis, sponsor of the bill to allow salmon farms, said, "It's an important potential industry in Alaska." Another moratorium would be disservice to those who are waiting to go to work.

The Anchorage Democrat is waiting for a report due next month from the Department of Fish and Game, which will review the potential impact of pen-reared salmon on the Alaska seafood market.

Ellis said he hopes the report will answer market questions raised by opponents and increase the chance of passing his bill this year.

In addition to limiting the size and number of salmon farms, his amended bill would impose taxes on all mariculture products.

It would allow Fish and Game to order destruction of diseased farm stocks, to reduce the possibility of spreading the infection to natural salmon runs.

"While many of my members are not exactly thrilled with the level of government controls in Ellis' new bill, we believe it does adequately respond to criticism of the original bill," said Rodger Painter, Alaska Mariculture Association executive director.

"Mariculture is one of Alaska's best opportunities for diversifying our private economy," Painter said. "Salmon farming offers the greatest immediate opportunity for creating year-round jobs."

Agencies study shellfish mariculture on Etolin Island

The Associated Press

KETCHIKAN — Researchers from several state and federal agencies have started a study on Etolin Island to determine the possibility of developing shellfish mariculture sites in Southeast Alaska.

The completed study should provide a comprehensive package of information on shellfish mariculture, said Terry Rader of the Alaska Department of Natural Resources. Rader is coordinator of the project.

The project addresses only shellfish and kelp development, he said, and is not a plan for fish farming.

Etolin Island, near Wrangell, was selected for the project because there are a dozen mariculture permits in the area. The permits are for oyster mariculture, the main target of the project. The study also will look at kelp, mussels and scallops, Rader said.

The area is not subject to a coastal management plan and appears viable for shellfish mariculture, he said.

Researchers plan to develop mariculture criteria for potential shellfish farmers and agencies that issue the necessary permits.

The project will study access to mariculture sites, power, source of labor, security, distance to market, supplies and user conflicts. Possible conflict with recreational uses will be looked at closely, Rader said.

"We're trying to find out what the existing uses are," he said. "We'll look at what is compatible and possible mitigation measures that could be recommended."

Researchers also will evaluate potential sites for water temperature, phytoplankton counts, water strata, paralytic shellfish poisoning, oxygen and current, he said.

Some of the information may come from a satellite being used in a project being done by the state's Marine Advisory Program.

A French satellite, named Spot, will pass over southeast Alaska, taking photos which could give information on water temperature, salinity, sediment and color.

The satellite will record information for the new project four times a year. Each pass

New Guinea, will cost as much as $2,000. But officials say the cost would be minimal compared to the expense of using a boat to gather the information.

Public workshops are slated in Wrangell and Petersburg later this month.

After a draft report is compiled, the agencies will go back to the communities in May. The report is scheduled to be completed June 30.

State should weigh mariculture decisions carefully

By SONJA CORAZZA

Those interested in passing a mariculture bill have proposed that all Alaskans have to do is stand back and let the industry develop, that government is merely in the way of an innovative new industry. But Alaskans who value our natural ocean resources and present commercial and sportsfishing industries believe this is an unacceptable attitude.

Who will own this industry and who will reap the economic benefits? How will use of our tidelands and waterfront property values be affected? How will our natural salmon runs and shellfish populations co-exist with an industry that puts hormones and antibiotics directly into the ocean?

Norway has been involved in mariculture for more than 20 years and has recently discovered that 10-57 percent of the salmon in their streams are escaped pen-reared salmon. This concerns scientists so greatly that they have instituted a wild salmon gene bank and stringent restrictions on their own industry to protect the few remaining wild salmon. The last of their wild stock commercial fishery will be closed down in 1989 and their sports fishery will be severely limited.

Alaska contains 43 percent of the wild salmon runs left in the world and 90 percent of the wild salmon left in the United States. Scientists worldwide admit they don't know the effects of genetic engineering and the use of antibiotics and hormones.

People concerned with our ecosystem regard the pen-farming of salmon as an example of the "anything to make a fast buck" syndrome. Unfortunately, what may be at stake is the health of the last natural salmon fisheries in the world.

Canada opened their doors to mariculture of finfish several years ago and now reports that 65 to 90 percent of the industry is owned by Norwegian corporations — the joke is if you want a job on the fish farm, you'd better speak Norwegian. Canadians complain that only low-paying jobs are left for them.

The Prince Rupert Fisherman's Co-Op that was to be an example of how local residents and fisherman could succeed announced last summer that they were selling out due to the technical difficulties of raising fish, diseases in the pens and a problem with marine mammals as predators. Canadians say any hope they had of salmon farming being profitable for small local operations was "just a dream."

In July 1986, Ireland slapped a ban on foreign ownership of salmon farm leases to head off what officials feared could be a takeover of the country's leading industry. "We could fill every bay on the Irish Coast with salmon cages within two years if we allow the Norwegians in without restriction," they said, and referred to Scotland where they claimed that Norwegians owned over 60 percent of the industry. In Seattle, Global Aqua A-S, a Norwegian corporation, is buying the oldest and largest salmon farm in Washington, previously owned by Campbell Soup Co.

Why are the Norwegians expanding worldwide? Obviously they have the technology to grow fish and want to dominate the markets. But just as importantly, they now face strict regulations in Norway where in the past three years they have lost thousands of tons of fish to diseases in the pens. Disease and environmental problems, combined with the genetic questions, forced Norway to place controls on salmon farmers that do not presently exist in other countries.

People concerned with our ecosystem regard the pen-farming of salmon as an example of the "anything to make a fast buck" syndrome.

Lest Alaskans think we will be immune from this Norwegian takeover trend, our coastal residents have already been approached by Alaskan-named, Norwegian-backed companies who have offered them deals for their waterfront ... "just sign your name and you will be the proud owner of a fish farm ... all equipment built in Norway." Is this what Alaskans choose for their future?

Years ago, Alaskans did make a choice — they chose to enhance natural stocks through an ocean ranching program (wild salmon enhancement). Alaskans also wisely chose to make ocean ranching private non-profit so all public user groups would benefit.

Last summer in Prince William Sound sportsfishermen caught 100,000 pink salmon. Sports, commercial and subsistence users all profited from the state's and the commercial fishermen's direct investment in fisheries enhancement.

How successful monetarily are our present enhancement programs? For example, the Cook Inlet Aquaculture Association reports a 458 percent profit on enhanced fish plus 21 permanent full-time jobs and 60-70 established seasonal jobs, most of which go to Alaskans. Alaska is recognized as having one of the strongest ocean ranching programs, third only to Japan and Russia. It is inconceivable that our government is cutting back on our state hatchery system.

Lastly, Norway views Pacific Ocean ranching as their greatest competitor and has started their own private ocean ranching program.

This year promises to be a crucial one for both the future of our natural resources and the future of our common property fisheries. Let's hope Alaskans make decisions that we won't regret for generations to come.

☐ Sonja Corazza is President of the North Pacific Fisheries Association.

South Point coalition formed, claiming, Hood Canal salmon farm would obstruct fishery

/ Gina McMather

The South Point Coalition, an liance of commercial fishermen and efferson County property owners, lebrated its first anniversary in ctober, 1987.

I'm not sure "celebrated" is the ght word, however, to describe a ear of intense frustration. A grass ots organization of "little guys," e're still battling the corporate uaculture interests who want to ace a huge salmon pen complex at outh Po t in the Hood Canal.

The major beef of the gillnetters nd purse seiners in the organization s simple – the pens would create a langerous obstacle that would dislace fishing operations in a heavily shed area. At the peak of the fall eason, Area 12, just south of the lood Canal Bridge, has frequently een described by local residents as a city of boats." The guys on the ater are constantly jockeying for oom to lay their gear and trying to void running over each other's nets. his is where they want to put a fish rm!

The first permit request Olympic ea Farm, Inc. brought to Jefferson ounty showed 22 pens, each 49'x49', o be attached to the old South Point erry dock, about two miles below the lood Canal Bridge on the west side. he complex would have extended 00 feet out into the canal.

Frank Fletcher, president of the cal PSGA chapter, estimated as any as 30 percent of the customary rift gillnet sets between Hood Canal ridge and the U.S. Navy installation t Bangor would be obstructed. For einers it would mean the loss of the ustomary South Point set.

It never occurred to county offic-ls the proposal might impact fishing perations. The project had already assed through the preliminary oops in the county permitting rocess before fishermen even learnd about it. (We became aware of the roposal because something possessd me to read the legal notices in the cal paper the week it was to go efore the shorelines advisory comittee.)

When we did raise our voices, we ound we had little effect. County horelines advisors and the county ommissioners had little understandng of fishing operations. Why one pot might be better fishing than nother or why we couldn't just "go round it" was a mystery to them. esides, the local shorelines manageent plan didn't address the possibil- problem some other agency should deal with."

It was true, the local management plan was no help. It had been adopted when aquaculture was generally meant to mean oyster-growing. The fact that the commissioners' meetings were held on days that conflicted with fishing openings in Area 12 also made it difficult to convey the depth of our concern.

John Pitts, an outspoken proponent of aquaculture, resigned from the county commission only several months previously to accept the post of Director of Aquaculture by appointment from Governor Booth Gardner. His influence on the board was still evident.

The two remaining commissioners approved the Olympic Sea Farm, Inc. permit.

Enter the South Point Coalition!

When the commissioners approved the request, the frustrated opponents of the project milled in the high-ceilinged, Victorian hallways of the Jefferson County courthouse. One indefatigable, middle-aged woman who owned property near South Point, approached one of the fishermen. What could we do now? She wanted to know.

What happened next was the founding of the South Point Coalition and the forging of an alliance between property owners and fishermen. We hired a lawyer, and recruited members. We raised money, and we appealed the county's decision to the state Shorelines Hearings Board.

It was a real grass roots effort. We have no millionaires -- at least that we know of -- among our members, who can step forward to pick up the tab for legal fees. Often it has been a week-to-week struggle to keep up with the legal bills, telephone and postage. Except for our attorney, all labor is volunteer.

Peter Eglick, ecology issue lawyer, built our case and detailed our objections. At a pre-hearing conference in December, 1986, both sides laid their cards on the table. The Washington Department of Fisheries and the Department of Ecology joined as appellant-intervenors on the side of the Coalition, although their objections to the proposal did not exactly coincide with ours.

The Department of Natural Resources, who would be leasing state tidelands to Olympic Sea Farm, Inc., took the fish farmers side -- as did Jefferson County, which had approved the permit.

Each side drew up its list of witnesses who would be called upon to testify and noted the exhibits they planned to present. The Shorelines Hearings Board scheduled a final hearing for June 1986, and estimated it would take at least twelve days for all parties to have their say. The projected expense of such a long hearing was staggering.

Only a matter of weeks before the hearing, the Shorelines Hearings Board considered a pre-hearing motion our attorney had filed. Based on his brief, the board decided that the county had committed a procedural error. The county had failed to notify the affected Indian tribes of this proposed project, as the county is specifically required by law to do. The shorelines hearings board therefore negated the county's permit and cancelled the hearing.

While the appeal was in the works, the Jefferson County Commissioners were persuaded to enact a moratorium on fish pens until such time as the county management plan is brought up to date. All new permit applications were put on hold.

Olympic Sea Farm returned with their new proposal (Fall 1987), with an application looking much like their old one. The only significant difference is that the two shoremost pens were eliminated in an attempt to counter the DOE's previous objection that the shoremost pens were sited in water too shallow.

This time, we were ready for them. Their "enfironmental checklist" submitted with their proposal did not deal adequately with all the probable impacts -- especially the conflict with the pre-existing commercial fishery, we argued.

This time, someone was listening. A new commissioner had taken John Pitts' vacant seat and he has expressed skepticism about unrestricted fish pen development.

The other two commissioners now seem to be [illegible] the conflict with the commercial fishery is part of the county's responsibility. The commissioners wanted Olympic Sea Farm to return with more information about possible impacts the project might have.

At the time of this writing, that is where the project stands. We expect Olympic Sea Farm, Inc., to return before the county commissioners after the first of the year, armed with a fuller defense of the project.

onvince the commissioners' that our concerns are not only valid but of such magnitude, that the county should require the proponents to prepare an environmental impact study before proceeding further.

That is the step the law requires if the commissioners feel the project would have significant adverse impacts to the environment -- which includes any commercial fishing operations which occur at the site.

Then finally, if we succeed to that point, we need to convince the commissioners that *salmon pens should not be allowed to displace the traditional fishery.*

In the light of the governor's whole-hearted support of any and all aquaculture, it may require courage on the commissioners' parts to arrive at a conclusion that departs from the governor's political agenda.

It appears we may have been the first group to raise the issue of site conflicts between aquaculture projects and commercial fisheries. *We certainly won't be the last.*

In fact, Sea Farms of Norway has just changed their name to Sea Farm Washington and has applied for offshore sites along the Strait of Juan de Fuca.

Another project is proposed for the bight between Hood and Tekiu Points in the Hood Canal in salmon management Area 12B.

Sometimes it seems like we are fighting a series of flash fires and can't stop passing the water buckets to deal with the long term problem.

But there is hope. The SPC has been providing input into a new, revised county shoreline management plan, which we hope will address the problem of conflict with commercial fisheries, and presents the potential for fish escapement and transmission of disease to wild stocks, along with concerns raised by property owners.

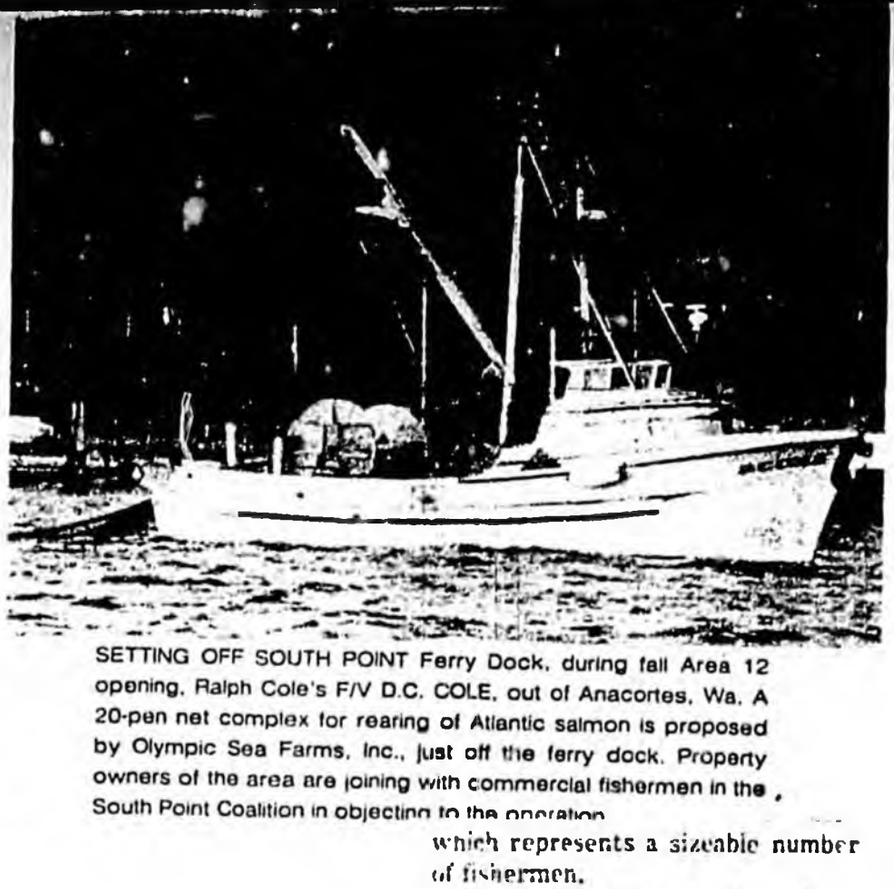
The SPC has joined a collection of other citizen groups around Puget Sound who are trying to get the state legislature to regulate the aquaculture industry more stringently in regard to fish pen culture.

So far, the SPC is the only group among the dozen or so comprising the Marine Environment Consortium which represents a sizeable number of fishermen.

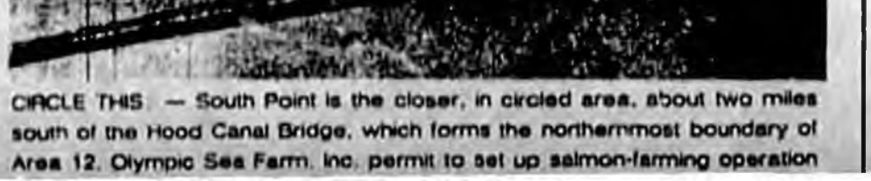
The MEC this year is supporting a lobbyist in Olympia to counteract the efforts of the heavily financed salmon growers lobby.

With our second year of effort underway, it begins to appear that "we've only just begun..."

(Ed.: Gina McMather is crew on the gillnet boat *F/V Hoojan*, and serves as president of the South Point Coalition. She urges fishermen interested in joining or contributing to the SPC, to contact her at (206)385-2602, or write The South Point Coalition, P.O. Box 506, Port Townsend, WA 98368. The SPC is endorsed by the Puget Sound Gillnetters' Association and the Purse Seine Vessel Owners' Association and has members from all over Puget Sound and as far away as Alaska and California.)



SETTING OFF SOUTH POINT Ferry Dock, during fall Area 12 opening. Ralph Cole's F/V D.C. COLE, out of Anacortes, Wa. A 20-pen net complex for rearing of Atlantic salmon is proposed by Olympic Sea Farms, Inc., just off the ferry dock. Property owners of the area are joining with commercial fishermen in the South Point Coalition in objecting to the operation.



CIRCLE THIS — South Point is the closer, in circled area, about two miles south of the Hood Canal Bridge, which forms the northernmost boundary of Area 12. Olympic Sea Farm, Inc. permit to set up salmon-farming operation



SHORE ATTACHMENT is indicated by arrow, of the 700-foot dock outermost pen of 20-net pen complex proposed by Olympic Sea Farm, I The proposed salmon farm would stretch out into 80-to 100-foot water fr former South Point ferry terminal.

Apprcach fish farming with a degree of caution

By SEN. RICHARD I. ELIASON

COMPASS
POINTS OF VIEW FROM OUR COMMUNITY

There is a groundswell of interest in Alaska and around the world in the mariculture/aquatic farming industry, including the farming of finfish, shellfish and sea vegetables. Alaskans are actively exploring economic development possibilities, and the concept of launching a new renewable resource industry is a tantalizing one. Enthusiasm, however, needs to be tempered with prudence.

The states and foreign countries currently involved in intensive fish-farming have become involved because their natural stocks are no longer strong. However, the opposite is true in Alaska. Our wild salmon stocks yield harvests among the most abundant in the world.

Alaska now produces 43 percent of the worldwide total wild salmon, and 99 percent of all the wild salmon produced in the U.S. It's no exaggeration to assert that salmon is a mainstay of the state economy.

The actual economic impact of Alaska's salmon harvest is worth many times the harvest value. Processing alone can nearly double the value of the catch. The seafood industry, in which salmon play the leading role, provides more jobs than any other.

The state's natural fishing resources and the industry they support must be protected. Conscientious stewardship of Alaska's valuable seafood resources is of overriding importance. If Alaska proceeds with finfish farming, the cost of this stewardship will increase significantly.

Concern has been expressed about the potentially negative effect of fish farms on water quality. Water pollution from fish feces, unconsumed feed and land-based farm operations must be carefully controlled, necessitating the careful development of siting guidelines and a process for site reviews. The appropriate regulatory agency must have funding to carry out monitoring and enforcement. A means for resolving disputes over use of coastal waters must be created: Many of the best prospective sites for finfish farming are cherished as safe harbors by fishermen and recreational boaters.

The subject of fish disease has generated heated controversy. Indigenous fish diseases are found in natural stocks, but most are self-limiting in the wild. Wild fish tend to be dispersed, and are not subject to the stress of a pen-rearing environment. The effects of large concentrations of biomass in a limited area are largely unknown. The presence of unconsumed fish feed and feces provides a nutrient-rich environment conducive to the growth of bacterial populations harmful to fish, and no matter how clean the environment of a pen, there is always the risk of disease: bacterial, viral and parasitic.

The most disturbing aspect of the subject of fish disease is that most diseases are easily transferable. Many pens are not designed to adequately safeguard against escapement of farm fish, wild fish can be attracted to the proximity of the pen by the presence of nutrients, and some diseases can even be borne in the water by currents. One can only speculate upon the impact of intensive pen-rearing of salmon on wild fish stocks. It won't necessarily be detrimental, but not enough scientific research has been conducted to prove that it won't be detrimental.

If private for-profit pen-rearing of salmon is authorized, the state will have to determine what government's regulation and support role will be. To what degree should the state regulate salmon farms to insure their stocks are healthy? Is Alaska willing to expend public funds to gear up for a large-scale application of technical disciplines including fish-disease control? Failure to do so has been a source of a number of British Columbia's problems in its trouble-plagued experience with salmon farming.

The Norwegian government subsidies have effectively reduced the price of their farmed salmon enabling that nation to become a leader in this new industry. Assistance takes the form of capital investment subsidies, capital grants, salmon shipping and transportation subsidies (including the creation of a complete road-sea-air system), and salmon product and price subsidies.

If private for-profit pen-rearing of salmon is authorized, the state will have to determine what government's regulation and support role will be.

The government provides support in the areas of research and development, quality control, advisory services, free disease-diagnostic services and marketing assistance including international trade provision.

These forms of government support make Norway a formidable competitor and will enable that nation to outstrip the United States as a leading fish exporter by 1990. By that time, worldwide farm production of the premium species of salmon may account for half of total production of fresh and frozen salmon available on the world market. Some industry analysts predict that the supply of Atlantic salmon will overtake the demand by 1990.

Given this scenario, will Alaska fish-farmers be able to compete successfully? Just in order to gear up for the industry, the state would need to make operating budget appropriations to various agencies. How much support can the state afford to provide, or not to provide? Where will the money come from? Will we take resources away from our existing rehabilitation programs and product promotion efforts, programs which have already suffered from significant budget cuts the last two years? Will we really be creating new jobs or will we be taking them away from one group and giving them to another? (Norway's 500 gillnetters will be legislated out of business next year — permanently.)

There may indeed be a place for mariculture in Alaska, but the unanswered questions about market conditions, profitability, fish disease and its impact on natural stocks, and the degree to which the state is willing to support and subsidize the industry point to a cautious approach to finfish farming.

□ **Sen. Richard I. Eliason chairs the Fisheries Subcommittee of the Senate Resource Committee in the Alaska Legislature. He was one of the legislators who traveled to Norway in August to study Atlantic salmon farming.**

Net pen dispute faces mediation

by Jim Larsen

A mediated solution to differences is omething South Whidbey foes of almon net pens look upon with kepticism if not outright fear and athing, but they have no choice but to ooperate.

Several bills to regulate salmon net ens and other forms of aquaculture ot nowhere in the state Legislature his year. A major reason is that the overnor's office and legislative eaders have decided mediation - not gislation - is the path to follow.

To that end, an all-day meeting has een called for Saturday, March 12 at horeline Community College to iscuss mediation. The topic will be et pen aquaculture.

The state Department of griculture, which promotes quaculture, is paying for the initial ediation effort, according to Frank affner, project director for Norwest Renewable Resources Center in eattle.

Gaffner's organization mediated the ispute over logging practices in which mber companies, environmentalists nd other interest groups were at one nother's throat.

The effort became known as the timber, fish and wildlife" mediation nd resulted in the state's new forest ractices act that just took effect Jan.

The logging practices mediation ffort took over 100 meetings and six onths and cost $165,000, Gaffney said y telephone Friday. He was project irector of timber, fish & wildlife ediation.

Generally, the mediated agreement as heralded as a success. Gaffney nd it attracted nation-wide attention, nd now other states are seeking to ediate difficult issues involving pposing interest groups.

Aquaculture certainly has its opposing interest groups. Environmentalists and shoreline roperty owners say the industry is olluting, interferes with traditonal ses of the waters, and threatens ative salmon runs as well as the ommercial fishing industry.

(Please turn to page 3)

Salmon farm owner to switch harvests

The Associated Press



SEATTLE — The state's oldest and largest salmon farm has been purchased by a Norwegian aquaculture business which plans to switch the fish-farming operation from Pacific salmon to Atlantic salmon.

The Domsea salmon farm was sold by Campbell Soup Co. to Global Aqua USA Inc. which says it will harvest four million pounds of Atlantic salmon a year and hatch another four million young salmon annually, a spokesman said.

Global Aqua is owned by Global Aqua A-S of Norway and a Norwegian investor group. The sale price was not disclosed. The sale involved four farm sites, three off Bainbridge Island and one near Port Townsend.

John Pitts of the Washington Department of Agriculture said Atlantic salmon are easier to domesticate than Pacific salmon and that the switch should be seen as a positive move for the state.

"It will combine Norwegian and American expertise that will contribute to the further development of fish farming here," said Havard Rabben, general manager of Global Aqua.

"By raising Atlantic salmon we will not be competing with the commercial fishery of Pacific salmon," Rabben said.

Under the Campbell Soup Co.'s ownership the Domsea farm raised chinook salmon and produced about 1 million pounds of fish per year.

salmon pens subject of mediation

(Continued from page 1)

Net pen supporters disagree on all unts, of course, and have received rong support from Governor Booth arner and the Dept. of Agriculture.

There are several net pens in Puget und but none in Island County. The unty has a moratorium on new quaculture applications until a state vironmental Impact Statement is ne on the industry, an endeavor that ll take about 15 months. However, me net pen sites have already been ohsed for, particularly in the quaculture district off Bell's Beach in ratoga Cove.

Margaret Johnston, Bell's Beach sident and legislative liason for the ratoga Cove Foundation, said of the ediation effort, "That's the way the me is trying to be played in Olympia ese days."

Because of the fondness for ediation, legislative efforts to stop

"doesn't like all those (aquaculture) bills coming at them." Sayan is a major force behind the mediation effort.

Johnston said "we can't help but be skeptical" of the mediation effort, but her group will have to go along. "The state is pushing it, we don't want to get blamed for breaking it down."

The other Whidbey Island anti-aquaculture group, Save Our Shores shares Johnston's feelings, according to leader Joe Miller who lives south of Lagoon Point.

Miller worries that net pen opponents will face unwelcome pressure to compromise during the mediation process, "but we have no choice but to participate."

Miller and Johnston agree that in the initial meeting they will seek a moratorium on further net pen development during mediation if it is decided to proceed with the process.

issues which might be covered in negotiations, and to decide if enough opportunity exists to proceed beyond this first meeting. It is simply an effort to identify issues and assess the opportunity to proceed."

Gaffney acknowledges there are huge differences of opinion on the subject of net pens, but he said the timber practices interests "were just as contentious as these folks at the beginning."

The meeting begins at 9 a.m. and is scheduled to last until 4:30. The address is 16101 Greenwood Avenue North, in Building 900 of Shoreline Community College. For a box lunch costing $4 call the Northwest Renewable Resources Center, 623-7361, before March 1, or bring your own lunch.

Fish farming in Alaska — a no win proposition

By FRANK MULLEN

COMPASS
POINTS OF VIEW FROM OUR COMMUNITY

Recently there has been much talk regarding mariculture as a developing industry in Alaska. Proponents of mariculture have unleashed a lobbying program designed to convince Alaskans that an aggressive mariculture program would be a great addition to the economy. The idea is being considered so seriously that a delegation of Alaska politicians took some time over the summer to make a trip to Norway to inspect some salmon rearing facilities there.

There are few, if any, objections to the idea of allowing the domestic production of shellfish or crustaceans. But the idea of raising salmon in pens along the coastline of Alaska has raised the concerns and objections of those Alaskans who currently harvest wild salmon.

Salmon pen operations proliferate in various parts of the world. Norway, Chile, British Columbia, the State of Washington (and others) are currently raising and marketing salmon in vast quantities. Proponents of "pens" insist that if Alaska doesn't jump into the feed-lot salmon business very quickly, we'll be left in the dust. Skeptics contend that if we accept this idea without considering some of the negative effects, the adverse consequences will far exceed those of the Delta barley project or the MacKenzie dairy project.

To allow pen-reared salmon operations to dot the Alaskan coastline invites conflict with the wild salmon harvesters who helped pioneer this state. It is inevitable that there will be marketing conflicts. It will be easy for salmon buyers to offer unrealistically low prices to commercial fishermen, using the threat of being able to fill contracts with pen-reared salmon.

Decision-makers in Alaska ought to closely scrutinize the dollar-for-dollar exchange which would likely occur if salmon pens are allowed to proliferate. Taking value from existing businesses and giving it to new businesses represents no gain to the state's economy.

The cost of establishing a viable salmon pen operation and carrying it until salmon could be marketed has been estimated to exceed $500,000. This amount would prohibit "mom and pop" operations. So are we to allow large companies to lease Alaskan tidelands and operate marginal business ventures that employ relatively few Alaskans and ship their profits south? Or should we encourage the continued development of wild salmon fisheries and thereby further strengthen the economic basis of our state?

If pen-reared salmon proliferate along Alaska's coastline, these domesticated salmon could introduce disease and genetic dilution to wild stocks. Norwegian salmon farmers, who are now 18 years into an aggressive salmon farming program, are now becoming aware of problems caused by [illegible]ees from salmon pens mixing with wil[illegible]

The cost to the state [illegible]ate and maintain a mariculture in[illegible] will be substantial. These costs wi[illegible] predictably come out of sportfish budgets and commercial fish budgets which have been greatly reduced in the past two years, and cannot afford to be stretched any thinner.

The mature approach to promoting the fishing industry in Alaska is to take care of and enhance the billion-dollar industry we alread[illegible] have. We can promote Alaska salmon on the worldwide market. In a few short years, this may be the last place on earth where consumers can be assured of purchasing a truly wild product. To be able to put "WILD" or "NATURAL" on the label could be a tremendous advantage.

It just doesn't make sense to encourage a fish farming industry that will likely be controlled by out-of-state interests and provide relatively few jobs for Alaskans, particularly when the ultimate losers on this deal will be commercial and recreational users with longtime investments in family, equipment, lifestyle, and Alaska heritage.

There remains significant opportunity in Alaska to increase wild stock production through aquaculture and enhancement programs. I hope Alaskans agree that the best way to cultivate and ensure long-term economic health in Alaskan fisheries is to promote the wild stock fishery which currently exists, rather than threaten it with a competitive fish farming program.

☐ Frank Mullen is a Soldotna businessman and commercial fisherman.

Environmentalists oppose mariculture: The Southeast Alaska Conservation Council is calling for a ban on salmon ranching and a moratorium on all other forms of tideland development.

The environmentalist group says mariculture would result in reduced concern over the maintenance and retention of wild stocks of salmon and their habitat.

"In Southeast Alaska, 85 percent of the salmon harvested are spawned and reared within the watersheds of the Tongass National Forest. Reduced concern over protecting natural habitat for wild stocks could open the door for increased logging and road building in important fish habitat areas," said Bart Koehler, SEACC's executive director.

"We think that it would be a very dangerous course to take, especially when a number of top commercial fishing watersheds within the Tongass are currently threatened by logging and roads."

The council also proposed a moratorium on shellfish and sea vegetable farms until regional planning for state tidelands has been completed. The permitting process needs to be stopped until the public and scientific groups have been included in planning and locating of projects, according to the SEACC.

The Alaska Legislature, while showing little interest in permitting salmon farming, has been moving toward a bill revamping a ban on all mariculture imposed last year. The bill would permit oyster and sea vegetable farming.

The entire issue is still under debate by both the Senate and House Resources Committees.

Letters to the Editor

Junk salmon

April 27, 1987
120 Katlian St.
Sitka, AK 99835

To the editor:

I am appealing to you to get this message out to all the people that make their living fishing ocean-going salmon of all species, also sports fishermen. This mariculture bill before both branches of our Legislature is the biggest threat to our way of life that we have faced since Alaska became a state. For the past five years, we have had a 15 to 20 percent drop in our price structure because of the flood of immature pen-raised Atlantic salmon exported from Norway to compete with our product on world markets.

Gourmet fish-eaters the world over would not touch this tasteless immature salmon with a 10-foot pole, and call it sanitary garbage that has a low oil content and is not even fit for pet food.

Hundreds of tons of this inferior junk has been palmed off on the American public and through unethical advertising has been labeled chinook (or king) salmon. Our system of enhancing our wild salmon stocks through aquaculture associations has succeeded more than we dared hope. So make your feelings known by writing to your state legislators.

Sincerely,
Al Brookman Sr.

Renegade Norwegian farm salmon polluting wild runs

FISHERMEN'S NEWS 1/85

"Renegade" salmon from Norway's
farms are destroying important
aracteristics and genetic
ferences between farm and river
lmon, says Professor Harald
jervold, following the discovery
s autumn that up to 57 percent
the salmon stocks in some
rwegian rivers are of the farm
ciety.

f the genetic pollution continues
its present rate, the hereditary
iations among some of the river
cies will be halved within seven
ars. Nature takes tens of
usands of years to fit the
mon to its special environment,
l in the light of this fact, the
sent developments are
rming, says Skjervold.

he head of the Directorate for
ture Management, Helge Vikan,
o finds the latest findings
quieting and stresses the vital
portance of preserving the most
uable of the salmon species in
genes bank now being built up
Trondheim, incidentally the first
ts kind in the world.

perm from 47 species of
rwegian river salmon were
red in the bank last year, and
s number will be **doubled** by the
of 1987. Vikan blames the
ensive genetic pollution in
rs on the import of smolt. This import is not only responsible for spreading disease, it is also a major hazard for river salmon, says Vikan. He intends proposing to the Ministry of Environment that the Directorate be involved in the assessment of smolt import licenses.

Farm fish diseases killing the wild stocks in Norway

The Atlantic Salmon Trust has warned Norway's neighbours that diseases from fish farms may spread to wild stocks in their countries.

But Canadian officials say farmed fish won't infect wild stocks in Canada because of strict regulations controlling fish management and the importation of eggs.

In letters to the agriculture ministers for England, Scotland and Wales, the trust warns of the "dire threat to wild salmon from a disease now sweeping Norway."

The letter, written by the trust's director Rear Admiral John Mackenzie, states: "Insufficient attention is being paid to the dangers of the spread of disease and parasites from fish farms to wild stocks. With the explosion of salmon farming in the British Isles, I consider it essential, that everyone concerned with the well-being of wild salmon should be aware of what continues to happen in Norway."

The parasite in question is Gyrodactylus Salaris, and it has wiped out about 300 tons of salmon in Norway's commercial and river fishing catches, according to an article in the England based *Shooting Times*.

In Canada, DFO's head of aquaculture Ron Ginetz dismissed any suggestion that farmed fish could have the same impact on wild stocks here as they have in Norway.

"My personal opinion is that I am not overly concerned with a threat to wild stocks from diseases indigenous to this coast," he said. "I am concerned about the importation of exotic diseases from other parts of the world.

"The Norwegians have not paid much attention to wild fish stocks and the protection of them," he said. "Canada has the most stringent fish protection (regulations) anywhere in the world."

After an initial round of Atlantic salmon egg imports several years ago, the industry is now limited to 300,000 at at time. Because of the stringent environmental considerations, this restricts the import of Atlantic eggs to a few operators.

These eggs come from only one farm in Scotland where the farm meets government standards.

Eggs are also allowed from Washington or Alaska, but the regulations are so tough, it is almost impossible to bring in the eggs.

"We sent a message to the industry that permission would be difficult to obtain," he said.

Already some Atlantic salmon have escaped from the pens and are mixing with the wild stocks. Ginetz confirmed fishermen's reports that the fish escaped in the Johnstone Strait area, but he said the DFO was not concerned about the impact of the fish on the wild stocks.

Meanwhile, the UFAWU is organizing a major tour of Norway to investigate the fish farm industry and see what are the impacts on the wild stocks have been.

As well, the group will look at the Norwegian government's regulation over the farms and how successful they have been in controlling the problems.

NORWEGIAN "Renegade Salmon" are mingling with wild stocks. Salmon that were released or escaped Norway's fish farms are returning as spawning adults and creating "genetic pollution." If the run-away rate continues, scientists predict variations among some of Norway's wild stocks will be halved within seven years. The Norwegian Directorate for Nature Management reports that genes from wild salmon found in 47 different rivers were stored in a sperm bank in 1986 and that twice that number will be stored in 1987. The sperm bank is reportedly the first of its kind in the world. Fears about disease interaction from farmed fish to wild stocks continue as well. The UK-based Atlantic Salmon Trust reports that the parasite Gyrodactylus salaris is destroying stocks of wild salmon in Norwegian rivers. The parasite has reportedly killed 300 tons of wild salmon. Officials believe too little attention is being paid to the danger of spreading disease and parasites from fish farms to wild stocks.

Ocean ranching: Valdez hatchery contributes to the success of the industry

Aquaculture, or the cultivation of seafood, is a controversial concept in fisheries that could change the way Alaskan fishermen make their livings. This is the second installment of a four-part series prepared by free-lance writer Christopher Batin.

By CHRISTOPHER BATIN
Correspondent

VALDEZ—Strolling down the wooden planks at noon, Jason Wells doesn't quite resemble the gun toting rancher of the Wild West. He doesn't wear a stetson, nor does he dress in rawhide and chaps. Instead, he's casually dressed in a blue shirt and dark slacks. But Wells is a rancher—a rancher of the future. He's responsible for overseeing the management of nearly 153 million head from his two-story office. Upon receipt of a call, he hops into his boat to view his stock on the range, the largest in the world. Wells is a salmon rancher and his range is the Pacific Ocean.

"Ocean ranching has come of age the last few years," said Wells, executive director of Valdez Fisheries Development Corp., which owns the Solomon Gulch Hatchery in Valdez. "We just get them started, and Mother Nature does the rest."

Ocean ranching entails taking eggs and milt from mature salmon, artificially spawning the two, rearing the fry in hatcheries, releasing them into rivers or estuaries, and recapturing them as returning adults.

According to biologists, ocean ranching has been one of Alaska's unheralded success stories.

Seeing the decline in salmon stocks, the Legislature enacted the 200-mile limit that kept foreign fleets away from prime salmon grounds off Alaska's coast. It also created the Fisheries Rehabilitation and Enhancement Division (FRED) to plan programs that would increase production of the state's fisheries. One of those was to administer the Private Nonprofit Hatchery Program and coordinate the development of regional aquaculture associations and programs.

In 1976 and 1978 voters overwhelmingly supported bond issues totaling $56.17 million to finance the construction and operation of hatcheries in each region of the state. Money also went toward the enhancement of rearing habitat, fish stock introduction and lake fertilization, all of which greatly increased the freshwater survival of salmon eggs, fry and smolt.

In 1985, about 17.1 million salmon returned statewide from releases made in previous years. The statewide commercial catch of natural plus hatchery stocks that year was a record-breaking 144.6 million fish. This is a far cry from the dismal harvests of the early 70s, when catches numbered less than 25 million fish, according to Wells.

Solomon Gulch is a private nonprofit hatchery and helped contribute to the success with large returns of salmon.

"The natural stocks of coho salmon returning to spawn in the Valdez area number about 4,000 fish," said Wells. "With enhancements from our hatchery, we harvested about 8,000 cohos for sale to fish processors and for brood stock. Sport fishermen caught about 4,000. That's a significant increase over past years.

"Our efforts will take a substantial jump in 1989, when we're expecting about 30,000 coho salmon returning to the hatchery. Remember, these are in addition to natural runs of fish."

Pink salmon are the most numerous of Alaska's salmon. The species follows an even-odd year cycle. Large runs in southcentral Alaska take place in odd numbered years, while even numbered years see less fish returning. However, Wells said ocean ranching has made it possible for large runs to occur every year.

"We had about 5.5 to 6 million pinks in 1987. We're expecting 3 million pinks returning to the hatchery in 1988."

The permitted capacity for the Solomon Gulch hatchery as authorized by the Fish and Game Department is 136 million pinks, 18 million chums, one million coho and 300,000 chinook.

In 1986, hatcheries in Prince William Sound contributed about 60 percent of the fish caught in Prince William Sound. According to Wells, these figures are exptected to climb.

But commercial fishermen are not the only ones to benefit from private nonprofit hatcheries. The goal of Alaska's salmon ranching program is to provide catchable fish for the common property fishery.

"Although we provide fish for all user groups—sport fishermen, commercial fishermen and subsistence, the hatchery is involved in two types of harvests to satisfy its own interests—sale of fish to the processing plant, and eggs and milt for brood stock," said Wells.

"Fish are put out for bid on a daily basis," he said. "Last year we had as many as seven active bidders during the couple of weeks we sold fish."

Processors had more than they could handle in 1985, when the pink salmon catch was 100 million fish.

"The number of fish did affect the marketplace," he said. "Product development wasn't fully in place in 1985 to absorb that many fish."

However, he said production standards are now up to par to handle the increase in fish catches. The growing use of seafood in the United States has helped processors to update their technology and marketing efforts.

"They're making pink salmon into salmon burgers," he said, "and it's having good success in the Seattle area. One of the prerequisites for successful development of a salmon product, whether it be salmon burgers or fresh fish, is producing fish on an annual basis in large quantities. Prince William Sound hatcheries will be geared up to produce large volumes of fish consistently within the next two years."

However lucrative they may seem, nonprofit hatcheries are not without financial risk. Wells gave numerous reasons as to why hatcheries fail.

Improper site selection can be one main reason, he said. "Water flow needs to be maintained constantly and measures taken to ensure it doesn't freeze up. Hatchery fish require care 365 days a year. They are released and allowed to fend for themselves in the ocean, which is a high-risk area. And don't forget the interceptions by foreign fleets, and predation.

"The risk factor in such an endeavor is quite high," he said. "There's no guarantee with a common property fisheries that you'll receive back all the fish you raised," he added.

And, he said, the run can still be wiped out if Fish and Game extends a commercial season or allows more boats to fish.

In 1986, he said, the Valdez Fisheries Development Corp. pleaded a case of overfished hatchery stocks to the Board of Fisheries. As a result, a directive was issued to Fish and Game to manage enhanced runs so that the hatchery would receive brood stock and economic escapement.

"As a result of that decision, we did very well in in 1987," he said.

According to Wells, the Valdez Fisheries Development Corp. is repaying state loans of $3.9 million for capital construction and operational costs.

The association also borrowed about $300,000 from the city of Valdez for operational costs from 1979 to 1981. The city also co-signed a loan for a hatchery water pipe, and paid a consultant $285,000 to conduct a feasibility study on the viability of the hatchery. Wells said these costs have already been repaid.

Independent studies show a typical hatchery takes about two years to start, operating totally on state or commercial loans, before a single egg is incubated. It takes anywhere from four to 12 years, depending on species, before enough revenues are generated from the sale of fish carcasses, eggs or surplus fish to repay those loans.

The total value of fish harvested and sold from the Solomon Gulch Hatchery was $8 million in 1987.

Wells said, "We had the potential to pay off the state loan in one year. And this was operating at only one-third capacity."

Wells said research in expediting the growth of salmon smolt can make hatcheries more profitable by reducing rearing time.

"We've experimented with what is called 'zero-age' coho salmon," he said. "We raise juvenile salmon in warmer water than they'd experience normally in the wild, and accelerate their feeding schedule."

He said although smolt mortality is greater, the fish are more economical to raise, allowing the hatchery to produce up to four times more zero-age silver smolt than yearling smolt.

Wells said fish farming is not a big issue with commerical seine fishermen in Prince William Sound.

"Fishermen and hatcheries deal specifically with pink salmon, and coho and king salmon are the species raised by fish farms," he said. "PNP (private nonprofit) hatcheries are not a threat to any one user group, because we provide fish for all groups.

"The Valdez Fishery Development Board oversees the fisheries corporation," Wells said. "A variety of people serve, from commercial and sport fishermen, to businessmen. They ensure what's taking place at the hatchery follows state guidelines. All of them serve on a volunteer basis."

Wells said the majority of the members on the boards of PNP hatcheries are commercial fishermen.



HATCHERY REARED—Solomon Gulch Hatchery Manager Paul McCollom dips a sampling of pink salmon fry from a holding pond. The private nonprofit hatchery has contributed to the success of Alaska's ocean ranching industry. *News-Miner library*

Prepared by Senator Eliason's staff

SECTIONAL ANALYSIS

CSSB 482 (Res) - "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting aquatic farming of finfish in saltwater; and providing for an effective date."

Section 1 AS 16.40 is amended by adding new sections to read:

16.40.100 - A person may not operate or construct an aquatic farm or hatchery (for the purpose of supplying aquatic plants or animals to an aquatic farm) without a permit from the Commissioner of Fish and Game. Conditions that are necessary to protect the public health or natural stock may be attached to the permit.

The Commissioner of Fish and Game may not issue a permit for the farming of, or hatchery operations involving, finfish in saltwater.

16.40.105 - The Commissioner of Fish and Game shall issue the aquatic farm or hatchery permits on the basis of the following -

- the biological and environmental suitability of the site

- the ability of applicant to establish the site without adversely affecting the Department of Fish and Game's management of the stock, without requiring substantial alterations in traditional fisheries, or without adversely affecting the wild stocks

16.40.110 - An applicant for an aquatic farm or hatchery permit must submit a development and operation plan to the Commissioner of Fish and Game.

An application for renewal or transfer must be accompanied by a fee determined by the Commissioner of Fish and Game, a report of the disease history, and a report by the applicant on how the site was developed.

The Department of Fish and Game may conduct a health inspection of the farm or hatchery as a condition of renewal.

A transferred permit maybe used only for the purposes for which the permit was authorized,

subject to the same conditions and limitations.

16.40.120 - An aquatic farm stock acquisition permit is required from the Commissioner of Fish and Game before a person may acquire aquatic plants or animals from wild stock for the purpose of supplying stock to an aquatic farm or hatchery.

The Commissioner of Fish and Game shall specify the expiration date of the acquisition permit and may attach conditions relating to the time, place, and manner of harvest. The commissioner shall issue or deny a permit within 30 days after receiving an application.

The Commissioner of Fish and Game shall deny an acquisition permit if the proposed harvest will impair sustained yield of the species. The Commissioner may deny a permit if the proposed harvest will disrupt established uses of the resources by commercial, sport, personal use or subsistence users.

The Board of Fisheries will act on requests for an acquisition permit involving species that are subject to limited entry. The Board of Fisheries will consider any requests for an acquisition permit denied by the Commissioner of Fish and Game. The Board may adopt regulations.

Except for the reasons stated above for denial, the Commissioner of Fish and Game shall issue an acquisition permit if -

- wild stock is necessary to meet the initial needs of an aquatic farm or hatchery,

- there are technological limitations on the propagation of cultured stock,

- wild stock sought is not fully utilized, or

- wild stock is need to maintain the gene pool

Stock acquired under an acquisition permit becomes the property of the permit holder.

16.40.130 - An aquatic plant or animal may not be imported into the state unless authorized by the Board of Fisheries.

16.40.140 - A private hatchery permitted under AS 16.40.100 may sell or transfer stock only to an aquatic farm or hatchery. Stock may not be transferred

without notifying the Commissioner of Fish and Game at least 30 days before the proposed date of transfer.

A notice of transfer must be accompanied by a report of a health inspection of the stock. The Department of Fish and Game may restrict or disapprove a transfer if the Department finds that the transfer would present a substantial risk of spreading disease.

16.40.150 - An aquatic farm or hatchery permit holder shall notify the Department of Fish and Game of an outbreak or incidence of disease among the stock. The Department shall order the quarantine or the destruction of stock when necessary to protect the wild stock.

The holder of an aquatic farm or hatchery permit shall allow the Department of Fish and Game to inspect the farm or hatchery. The cost of this inspection shall paid by the Department.

The Department of Fish and Game shall develop a disease management and control program for aquatic farms and hatcheries. The Department can contract with a state or federal agency or a private state-certified provider to conduct the health inspections.

16.40.160 - The Commissioner of Fish and Game may adopt regulations necessary to implement this statutes.

16.40.170 - A person who violates these statutes is guilty of a class B misdemeanor.

16.40.199 - The following terms are defined: aquatic farm, aquatic farm product, aquatic plant, aquatic animal, commissioner, hatchery, positive control, shellfish, and stock.

Section 2 AS 03.05.011(a) is amended to read:

The Commissioner of Environmental Conservation may adopt regulations regarding the standards and conditions of operating an aquatic farm or hatchery including the restrictions on the use of chemicals and the requirements necessary to protect the public from contaminants that pose a risk to health.

Section 3 AS 03.05.020(a) is amended to read:

The Commissioner of Environmental Conservation

shall adopt regulations regarding the labeling of aquatic farm products as aquatic farm products and shall monitor aquatic farms to ensure compliance with the requirements of the national shellfish sanitation program manual.

Section 4 AS 03.05.040(a) is amended to read:

The Commissioner of Environmental Conservation may inspect an aquatic farm or hatchery.

Section 5 AS 03.05.100 is amended to read:

The definition of an aquatic farm and aquatic farm product have the meanings given in AS 16.40.199.

Section 6 AS 16.05.050 is amended by adding a new paragraph to read:

The Commissioner of Fish and Game has the authority to permit and regulate aquatic farming in the state.

Section 7 AS 16.05.251 is amended by adding a new subsection to read:

Except for taking action on acquisition permits regarding species subject to limited entry and regulating the importation of an aquatic plant or animal for the purpose of supplying stock to an aquatic farm or hatchery, the Board of Fisheries may not adopt regulations regarding an aquatic farm permit or an aquatic farm acquisition permit.

The regulations adopted by the Board of Fisheries under AS 16.05.251 do not apply to a harvest under an acquisition permit.

Section 8 AS 16.05.330(a) is amended to read:

The reference to farming of fish is removed from existing statutes.

Section 9 AS 10.05.930 is amended by adding a new subsection to read:

The statutes regarding licensing of sport fishing and hunting and the licensing of commercial fishing crewmembers and vessels do not apply to an activity authorized by an aquatic farm permit or an aquatic farm stock acquisition permit.

Section 10 - AS 16.05.940(14) is amended to read:

The reference to fish farming is deleted from the definition section of this chapter.

Section 11 - AS 16.10 is amended by adding a new section to read:

16.10.269 - The statutes regarding purchase of fish from permit holders and possession of permit and identification by seller do not apply to the purchase or sale of aquatic farm products from a holder of an aquatic farm permit or an aquatic farm stock acquisition permit.

Section 12 - AS 16.10.400 is amended by adding a new subsection to read:

The statutes regarding existing salmon hatcheries do not apply to the construction or operation of a private hatchery that has an aquatic farm permit.

Section 13 - AS 16.43.140 is amended by adding a new subsection to read:

The statutes regarding entry permit systems does not apply to activities authorized under an aquatic farm permit or an aquatic farm stock acquisition permit.

Section 14 - AS 16.51.180(5) is amended to read:

The definition of "seafood" in the Alaska Seafood Marketing Institute chapter is amended as not to include aquatic farm products.

Section 15 - AS 38.05 is amended by adding a new section to read:

38.05.083 - The Commissioner of Natural Resources may offer for lease a site that has been developed for aquatic farming or hatchery operations. Before offering the site to the public, the Commissioner shall offer the site to the permittee.

The site shall be leased for not less than the appraised fair market value of the lease. The value of the lease shall be reappraised every five years.

The lease may be assigned, but if the assignee changes the use of the site the lease reverts to the state.

The lessee shall post a performance bond or provide other security to cover the costs to the Department of Natural Resources of restoring the leased site in the event the lessee abandons the site.

Section 16 - AS 38.05 is amended by adding a new section to read:

38.05.856 - The Commissioner of Natural Resources may issue a tideland or land use permit for the establishment and operation of an aquatic farm or hatchery for not less than the appraised fair market value of the site. The value shall be reappraised every five years.

A tideland or land use permit issued for an aquatic farm or hatchery is valid for five years and the permit may not be transferred.

The Commissioner of Natural Resources shall provide a copy of the application to the media for a public service announcement or shall provide paid notice of the application to the newspaper or radio once each week for three successive weeks. The Commissioner of Natural Resources shall hold hearings to take testimony before issuing or renewing a tideland or land use permit.

Based on the testimony or other good cause, the Commissioner of Natural Resources may deny the application for issuance or renewal.

The permittee shall post a performance bond or provide other security to cover the costs to the Department of Natural Resources of restoring the permitted site in the event the permittee abandons the site.

The Commissioner of Natural Resources shall adopt regulations establishing criteria for the approval or denial of permits and for limiting the number of sites to protect the environment and natural resources of the area.

Section 17 - AS 16.05.340(a)(14) is repealed.

The current fish farming biennial license of $200 is repealed.

Section 18 - Except for the grandfather clause in Section 20, the Commissioner of Fish and Game may not issue an aquatic farm permit or an aquatic farm stock

acquisition permit under regulations have been adopted.

Section 19 - Except for the grandfather clause in Section 20, the Commissioner of Natural Resources may not issue a lease, a tideland, or land use permit for an aquatic farm or hatchery until regulations necessary for the implementation of the program has been adopted.

Section 20 - A person who is lawfully operating an aquatic farm or hatchery may obtain an initial lease or permit under AS 38.05.083 or 38.05.856, but as a condition of obtaining the lease or permit the person must agree that during the term of the lease or permit the person will not expand operations beyond the scope allowed under the existing permit.

Section 21 - This Act takes effect immediately.

STATE OF ALASKA
THE LEGISLATURE

LEGISLATIVE AFFAIRS AGENCY

POUCH Y - STATE CAPITOL
JUNEAU, ALASKA 99811
907 465 3800

MEMORANDUM April 13, 1988

SUBJECT: Amendments to mariculture bill (CSSB 482(Res))

TO: Senator Jack Coghill
Chairman, Senate Resources Committee

FROM: Edward H. Hein EHH
Legislative Counsel

Enclosed is a draft CS requested by your assistant, Elizabeth Ziegler. Please note that the addition of paragraphs (2) and (3) at page 4, lines 9 - 10, appear to require a change in the bill title. These two paragraphs would allow an aquisition permit holder to acquire wild aquatic plants or aquatic animals for supplying the Department of Fish and Game or "sources" outside of the state, without any requirement that the acquisition or supplying have anything to do with aquatic farming. In addition, it is not clear what "sources" are. I note that one does not normally "supply" sources. A "source" is usually thought of as a place from which one might receive something.

If you have any questions about this matter, feel free to contact me at your convenience.

Enclosure

EHH:bb
b4/129

SECTIONAL ANALYSIS

CSSB 482 (Res) (3/28/88 5-1806N version) - "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting aquatic farming of Pacific salmon in saltwater; and providing for an effective date."

Section 1 FINDINGS AND POLICY are listed

Section 2 AS 16.40 is amended by adding new sections to read:

16.40.100 - A person may not operate or construct an aquatic farm or hatchery (for the purpose of supplying aquatic plants or animals to an aquatic farm) without a permit from the Commissioner of Fish and Game. A hatchery may sell shellfish spat to an aquatic farm or related hatchery outside of the state.

Conditions that are necessary to protect the natural stock may be attached to the permit.

The Commissioner of Fish and Game may not issue a permit for the farming of, or hatchery operations involving, Pacific or Atlantic salmon in saltwater. A permit may be issued for freshwater farming of, or hatchery operations involving, finfish other that Atlantic salmon in a privately owned freshwater body that has no outlet to a state-owned body of water.

16.40.105 - The Commissioner of Fish and Game shall issue the aquatic farm or hatchery permits on the basis of the following -

- the physical and biological characteristics of the location

- the farm may not unreasonably affect the management of natural stocks

- the farm may not adversely affect fisheries, wildlife or their habitats

- farm plans must demonstrate technical and operational feasibility

16.40.110 - An applicant for an aquatic farm or hatchery permit must submit a development and operation plan to the Commissioner of Fish and Game.

An application for renewal or transfer must be accompanied by a fee determined by the Commissioner of Fish and Game, a report of the disease history, and a report by the applicant on how the site was developed.

The Department of Fish and Game may conduct a health inspection of the farm or hatchery as a condition of renewal.

A transferred permit may be used only for the purposes for which the permit was authorized, subject to the same conditions and limitations.

16.40.120 - An aquatic farm stock acquisition permit is required from the Commissioner of Fish and Game before a person may acquire aquatic plants or animals from wild stock for the purpose of supplying stock to an aquatic farm or hatchery.

The Commissioner shall specify the expiration date of the acquisition permit and may attach conditions relating to the time, place, and manner of harvest. The commissioner shall issue or deny a permit within 30 days after receiving an application.

The Commissioner shall deny an acquisition permit if the proposed harvest will impair sustained yield of the species. The Commissioner may deny a permit if the proposed harvest will disrupt established uses of the resources by commercial, sport, personal use or subsistence users.

The Board of Fisheries will act on requests for an acquisition permit involving species that are subject to limited entry. The Board of Fisheries will consider any requests for an acquisition permit denied by the Commissioner of Fish and Game. The Board may adopt regulations.

Except for the reasons stated above for denial, the Commissioner shall issue an acquisition permit if -

- wild stock is necessary to meet the initial needs of an aquatic farm or hatchery,

- there are technological limitations on the propagation of cultured stock,

- wild stock sought is not fully utilized, or

- wild stock is need to maintain the gene pool

Stock acquired under an acquisition permit becomes the property of the permit holder.

16.40.130 - An aquatic plant or animal may not be imported into the state unless authorized by the Board of Fisheries.

16.40.140 - A private hatchery permitted under AS 16.40.100 may sell or transfer stock only to an aquatic farm or hatchery. Stock may not be transferred without notifying the Commissioner of Fish and Game at least 30 days before the proposed date of transfer.

A notice of transfer must be accompanied by a report of a health inspection of the stock. The Department of Fish and Game may restrict or disapprove a transfer if the Department finds that the transfer would present a substantial risk of spreading disease.

16.40.150 - An aquatic farm or hatchery permit holder shall notify the Department of Fish and Game within 48 hours after the discovery of an outbreak or incidence of disease among the stock. The Department shall order the quarantine or the destruction of stock when necessary to protect the wild stock.

The holder of an aquatic farm or hatchery permit shall allow the Department to inspect the farm or hatchery. The cost of this inspection shall paid by the Department.

The Department shall develop a disease management and control program for aquatic farms and hatcheries. The Department can contract with a state or federal agency or a private state-certified provider to conduct the health inspections.

16.40.160 - The Commissioner of Fish and Game may adopt regulations necessary to implement this statutes.

16.40.170 - A person who violates these statutes is guilty of a class B misdemeanor.

16.40.199 - The following terms are defined: aquatic farm, aquatic farm product, aquatic plant, aquatic animal, commissioner, hatchery positive control, shellfish, and stock.

Section 3 AS 03.05.011(a) is amended to read:

The Commissioner of Environmental Conservation may adopt regulations regarding the standards and conditions for the operation and siting of an aquatic farm or hatchery including the restrictions on the use of chemicals and the requirements necessary to protect the public from contaminants that pose a risk to health. The Commissioner shall monitor aquatic farms to ensure compliance with the requirements of the national shellfish sanitation program manual.

Section 4 AS 03.05.020(a) is amended to read:

The Commissioner of Environmental Conservation shall adopt regulations regarding the labeling of aquatic farm products as aquatic farm products.

Section 5 AS 03.05.040(a) is amended to read:

The Commissioner of Environmental Conservation may inspect aquatic farm product or aquatic farm sites.

Section 6 AS 03.05.100 is amended to read:

The definition of an aquatic farm and aquatic farm product have the meanings given in AS 16.40.199.

Section 7 AS 16.05.050 is amended by adding a new paragraph to read:

The Commissioner of Fish and Game has the authority to permit and regulate aquatic farming in the state.

Section 8 AS 16.05.251 is amended by adding a new subsection to read:

Except for taking action on acquisition permits regarding species subject to limited entry and regulating the importation of an aquatic plant or animal for the purpose of supplying stock to an aquatic farm or hatchery, the Board of Fisheries may not adopt regulations regarding an aquatic farm permit or an aquatic farm acquisition permit.

The regulations adopted by the Board of Fisheries under this section do not apply to a harvest under an acquisition permit.

Section 9 AS 16.05.330(a) is amended to read:

The reference to farming of fish is removed from existing statutes.

Section 10 AS 10.05.930 is amended by adding a new subsection to read:

The statutes regarding licensing of sport fishing and hunting and the licensing of commercial fishing crewmembers and vessels do not apply to an activity authorized by an aquatic farm permit or an aquatic farm stock acquisition permit.

Section 11 - AS 16.05.940(14) is amended to read:

The reference to fish farming is deleted from the definition section of this chapter.

Section 12 - AS 16.10 is amended by adding a new section to read:

16.10.269 - The statutes regarding purchase of fish from permit holders and possession of permit and identification by seller do not apply to the purchase or sale of aquatic farm products from a holder of an aquatic farm permit or an aquatic farm stock acquisition permit.

Section 13 - AS 16.10.400 is amended by adding a new subsection to read:

The statutes regarding existing salmon hatcheries do not apply to the construction or operation of a private hatchery that has an aquatic farm permit.

Section 14 - AS 16.43.140 is amended by adding a new subsection to read:

The statutes regarding entry permit systems does not apply to activities authorized under an aquatic farm permit or an aquatic farm stock acquisition permit.

Section 15 - AS 16.51.180(5) is amended to read:

The definition of "seafood" in the Alaska Seafood Marketing Institute chapter is amended as not to include aquatic farm products.

Section 16 - AS 38.05 is amended by adding a new section to read:

38.05.083 - The Commissioner of Natural Resources may offer for lease a site that has been developed for aquatic farming or hatchery operations. Before offering the site to the public, the Commissioner shall offer the site to the permittee.

The site shall be leased for not less than the appraised fair market value of the lease. The value of the lease shall be reappraised every five years.

The lease may be assigned, but if the assignee changes the use of the site the lease reverts to the state.

The lessee shall post a performance bond or provide other security to cover the costs to the Department of Natural Resources of restoring the leased site in the event the lessee abandons the site.

Section 17 - AS 38.05 is amended by adding new sections to read:

38.05.855 - The Commissioner of Natural Resources shall identify districts within which sites for aquatic farms or hatcheries may be selected. A 60-day period shall be scheduled in which a person may submit an application for a permit.

After consulting with the commissioners of Fish and Game and Environmental Conservation, the Commissioner of Natural Resources shall make a preliminary decision regarding the site applications.

After public notice is given and a hearing is held, the Commissioner shall issue a final finding.

38.05.856 - The Commissioner of Natural Resources may issue a tideland or land use permit for the establishment and operation of an aquatic farm or hatchery. The permit is valid for three years and may not be transferred.

The Commissioner may not issue a permit for tideland or land that borders a federal designated wilderness area that was designated before the effective date of this bill.

Before renewing a permit, interested persons shall be allowed to submit testimony concerning

the renewal to the Commissioner within 30 days after the notice.

The Commissioner shall consider all relevant testimony and may deny the application for issuance or renewal for good cause.

The permittee shall post a performance bond or provide other security to cover the costs to the Department of Natural Resources of restoring the permitted site in the event the permittee abandons the site.

The Commissioner of Natural Resources shall adopt regulations establishing criteria for the approval or denial of permits and for limiting the number of sites to protect the environment and natural resources of the area. The regulations shall provide for the consideration of upland management policies and whether the proposed use of a site is compatible with the traditional and existing uses of the area in which the site is located.

Section 18 - AS 38.05.945 (a) is amended to read:

The notice requirements of this section apply to the preliminary finding and the subsequent public hearing held concerning a tideland permit for an aquatic farm or related hatchery.

Section 19 - AS 38.05.945 is amended by adding a new subsection to read:

Regional fish and game councils and coastal resource service areas are to be notified at least 30 days before the preliminary finding and the subsequent public hearing occurs.

Section 20 - AS 38.05.946 is amended by adding a new subsection to read:

The Commissioner shall hold a public hearing within 30 days after reaching a preliminary decision concerning sites for aquatic farms or related hatcheries.

Section 21 - AS 16.05.340(a)(14) is repealed.

The current fish farming biennial license of $200 is repealed.

Section 22 - Except for the grandfather clause in Section 24, the Commissioner of Fish and Game may not issue an aquatic farm permit or an aquatic farm stock

acquisition permit under regulations have been adopted.

Section 23 - Except for the grandfather clause in Section 24, the Commissioner of Natural Resources may not issue a lease, a tideland, or land use permit for an aquatic farm or hatchery until regulations necessary for the implementation of the program has been adopted.

Section 24 - A person who is lawfully operating an aquatic farm or hatchery may obtain an initial lease or permit under AS 38.05.083 or 38.05.856, but as a condition of obtaining the lease or permit the person must agree that during the term of the lease or permit the person will not expand operations beyond the scope allowed under the existing permit.

Section 25 - This Act takes effect immediately.

5-1806N
Hein
3/28/88

Original sponsor: Resources Committee

IN THE SENATE BY THE RESOURCES COMMITTEE

CS FOR SENATE BILL NO. 482 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of Pacific salmon in saltwater; and providing for an effective date."

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

* Section 1. FINDINGS AND POLICY. (a) The legislature finds that

(1) aquatic farming in the state would

(A) provide a consistent source of quality food;

(B) provide new jobs;

(C) increase state exports;

(D) create new business opportunities; and

(E) increase the stability and diversity of the state's economy; and

(2) development of aquatic farming in the state would increase the availability of fresh seafood to Alaskans and would strengthen the competitiveness of Alaska seafood in the world marketplace by broadening the diversity of products and providing year-round supplies of premium quality seafood.

(b) It is the policy of the state

(1) to encourage the establishment and responsible growth of an aquatic farming industry in the state; and

(2) that allocation of aquatic farming sites must be compatible with established and ongoing activities in an area.

* Sec. 2. AS 16.40 is amended by adding new sections to read:

ARTICLE 2. AQUATIC FARMING.

Sec. 16.40.100. AQUATIC FARM AND HATCHERY PERMITS. (a) A person may not, without a permit from the commissioner, construct or operate

(1) an aquatic farm; or

(2) a hatchery for the purpose of supplying aquatic plants or aquatic animals to an aquatic farm.

(b) A permit issued under this section authorizes the permittee, subject to the conditions of AS 03.05 and AS 16.40.100 - 16.40.199, to acquire, purchase, offer to purchase, transfer, possess, sell, and offer to sell stock and aquatic farm products that are used or reared at the hatchery or aquatic farm. A hatchery that holds a permit under this section may sell or offer to sell bivalve shellfish spat to an aquatic farm or related hatchery outside of the state.

(c) The commissioner may attach conditions to a permit issued under this section that are necessary to protect the natural stock.

(d) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for the farming of, or hatchery operations involving, Pacific salmon in saltwater or Atlantic salmon.

(e) The commissioner may issue a permit under this section for the freshwater farming of, or freshwater hatchery operations involving, finfish other than Atlantic salmon only in a privately owned freshwater body that has no outlet to a state-owned body of water.

Sec. 16.40.105. CRITERIA FOR ISSUANCE OF PERMITS. The commissioner shall issue permits under AS 16.40.100 on the basis of the following criteria:

(1) the physical and biological characteristics of the proposed farm or hatchery location must be suitable for the farming of the aquatic animal or aquatic plant proposed;

(2) the proposed farm may not unreasonably or adversely affect management of natural stocks, and must not require alterations in traditional fisheries or other existing uses of fish and wildlife resources;

(3) the proposed farm may not affect fisheries, wildlife, or their habitats in an adverse manner; and

(4) the proposed farm plans and staffing plans must demonstrate technical and operational feasibility.

Sec. 16.40.110. PERMIT APPLICATION, RENEWAL, AND TRANSFER. (a) An applicant for an aquatic farming or hatchery permit required under AS 16.40.100 shall apply on a form prescribed by the commissioner. An application for a permit must include a plan for the development and operation of the aquatic farm or hatchery, which must be approved by the commissioner before the permit is issued.

(b) An application for renewal or transfer of a permit must be accompanied by fees required by the commissioner, a report of the disease history of the farm or hatchery covered by the permit, and evidence that satisfies the commissioner that the applicant has complied with the development plan required under (a) of this section. The commissioner may require a health inspection of the farm or hatchery as a condition of renewal. The department may conduct the inspection or contract with a disease diagnostician to conduct the inspection.

(c) A person to whom a permit is transferred may use the permit only for the purposes for which the permit was authorized to be used by the transferor, and subject to the same conditions and limitations.

Sec. 16.40.120. AQUATIC FARM STOCK ACQUISITION PERMITS. (a) A person may not acquire aquatic plants or aquatic animals from wild stock in the state for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100 unless the person holds an acquisition permit from the commissioner.

(b) An acquisition permit authorizes the permit holder to acquire the species and quantities of wild stock in the state specified in the permit for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100.

(c) The commissioner shall specify the expiration date of an acquisition permit and may attach conditions to an acquisition permit, including conditions relating to the time, place, and manner of harvest. Size, gear, place, time, licensing, and other limitations applicable to sport, commercial, or subsistence harvest of aquatic plants and aquatic animals do not apply to a harvest with a permit issued under this section. The commissioner of fish and game shall issue or deny a permit within 30 days after receiving an application.

(d) The commissioner shall deny or restrict a permit under this section upon finding that the proposed harvest will impair sustained yield of the species. The commissioner may deny or restrict a permit under this section upon finding that the proposed harvest will disrupt established uses of the resources by commercial, sport, personal use, or subsistence users. The commissioner shall forward to the Board of Fisheries for action permit applications for species that support commercial fisheries subject to limited entry under AS 16.43. A denial of the permit by the commissioner must contain the factual basis for the findings.

(e) The Board of Fisheries may adopt regulations for the conservation, maintenance, and management of species for which an

acquisition permit is required.

(f) Except as provided in (d) of this section, the commissioner shall issue a permit if

(1) wild stock is necessary to meet the initial needs of farm or hatchery stock;

(2) there are technological limitations on the propagation of cultured stock for the species sought;

(3) wild stock sought is not fully utilized by commercial, sport, personal use, or subsistence fisheries; or

(4) wild stock is needed to maintain the gene pool of a hatchery or aquatic farm.

(g) Aquatic plants and aquatic animals acquired under a permit issued under this section become the property of the permit holder and are no longer a public or common resource.

Sec. 16.40.130. IMPORTATION OF AQUATIC PLANTS OR AQUATIC ANIMALS FOR STOCK. A person may not import into the state an aquatic plant or aquatic animal for the purpose of supplying stock to an aquatic farm or hatchery unless authorized by a regulation of the Board of Fisheries.

Sec. 16.40.140. LIMITATION ON SALE, TRANSFER OF STOCK, AND PRODUCTS. (a) A private hatchery required to have a permit under AS 16.40.100 may sell or transfer stock from the hatchery only to an aquatic farm or other hatchery that has a permit issued under AS 16.40.100, except in value-added form to be sold outside of state

(b) Stock may not be transferred to or from an aquatic farm or hatchery required to have a permit under AS 16.40.100 without prior notice of the transfer to the commissioner. A notice of transfer shall be submitted at least 45 days before the proposed date of transfer.

(c) A notice of transfer must be accompanied by a report of a health inspection of the stock. The department shall conduct the inspection or contract with a disease diagnostician to conduct the inspection. The cost of inspection shall be borne by the department.

(d) The department may restrict or disapprove a transfer of stock if it finds that the transfer would present a risk of spreading disease.

(e) A person may not sell, transfer, or offer to sell or transfer, or knowingly purchase or receive, an aquatic farm product grown or propagated in the state unless the product was grown or propagated on a farm with a permit issued under AS 16.40.100. The permit must be in effect at the time of the sale, transfer, purchase, receipt, or offer.

Sec. 16.40.150. DISEASE CONTROL AND INSPECTION. (a) The department shall order the quarantine or the destruction and disposal of diseased hatchery stock or of aquatic farm products when necessary to protect wild stock. A holder of a permit issued under AS 16.40.100 shall report to the department an outbreak or incidence of disease among stock or aquatic farm products of the permit holder within 48 hours after discovering the outbreak or incidence.

(b) A holder of a permit issued under AS 16.40.100 shall allow the department to inspect the permit holder's farm or hatchery during operating hours and upon reasonable notice. The cost of inspection shall be borne by the department.

(c) The department shall develop a disease management and control program for aquatic farms and hatcheries.

(d) The department may enter into an agreement with a state or federal agency or a private, state-certified provider to provide services under (b) and (c) of this section, or inspections under

AS 16.40.110(b).

Sec. 16.40.160. REGULATIONS. The commissioner may adopt regulations necessary to implement AS 16.40.100 - 16.40.199.

Sec. 16.40.170. PENALTY. A person who violates a provision of AS 16.40.100 - 16.40.199, a regulation adopted under AS 16.40.100 - 16.40.199, or a term or condition of a permit issued under AS 16.40.-100 - 16.40.199, is guilty of a class B misdemeanor.

Sec. 16.40.199. DEFINITIONS. In AS 16.40.100 - 16.40.199

(1) "aquatic animal" means shellfish or finfish;

(2) "aquatic farm" means a facility that grows, farms, or cultivates aquatic farm products in captivity or under positive control;

(3) "aquatic farm product" means an aquatic plant or aquatic animal, or part of an aquatic plant or aquatic animal, that is propagated, farmed, or cultivated in an aquatic farm and sold or offered for sale;

(4) "aquatic plant" means a plant indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(5) "commissioner" means the commissioner of fish and game;

(6) "hatchery" means a facility for the artificial propagation of stock, including rearing of juvenile aquatic plants or aquatic animals;

(7) "positive control" means, for mobile species, enclosed within a natural or artificial escape-proof barrier; for species with limited or no mobility, such as a bivalve or an aquatic plant, "positive control" also includes managed cultivation in unenclosed water;

(8) "shellfish" means a species of crustacean, mollusk, or other invertebrate, in any stage of its life cycle, that is indigenous

to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(9) "stock" means live aquatic plants or aquatic animals acquired, collected, possessed, or intended for use by a hatchery or aquatic farm for the purpose of further growth or propagation.

* Sec. 3. AS 03.05.011(a) is amended to read:

(a) To carry out the requirements of this title, the commissioner of environmental conservation may issue orders, regulations, permits, quarantines, and embargoes relating to

(1) examination and inspection of premises containing products, articles, and commodities carrying pests;

(2) establishment of quarantines for eradication of pests;

(3) establishment of standards and labeling requirements pertaining to the sale of meat, fish, and poultry;

(4) tests and analyses which may be made and hearings which may be held to determine whether the commissioner will issue a stop order or quarantine;

(5) cooperation with federal and other state agencies;

(6) regulation of fur farming; for purposes of this paragraph, "fur farming" means the raising of and caring for animals for the purpose of marketing their fur, or animals themselves for breeding stock;

(7) examination and inspection of meat, fish, and poultry advertised for sale or sold to the public;

(8) enforcement of quality assurance plans developed in cooperation with appropriate industry representatives;

(9) establishment of standards and conditions for the operation and siting of aquatic farms and related hatcheries, including

(A) restrictions on the use of chemicals; and

(B) requirements to protect the public from contaminated aquatic farm products that pose a risk to health;

(10) monitoring aquatic farms and aquatic farm products to ensure compliance with this chapter and with the requirements of the national shellfish sanitation program manual of operations published by the Food and Drug Administration.

* Sec. 4. AS 03.05.020(a) is amended to read:

(a) The commissioner shall

(1) require routine inspection of food animals, fish, poultry and derivative food products, to protect the public against fraud, disease and spoilage, and in this connection adopt uniform regulations establishing standards of identity and composition of these food products and minimum standards of sanitation and handling methods as to all phases of slaughtering, processing, storing, transporting, displaying and selling of these food products;

(2) issue orders or cause the orders to be issued by an authorized veterinarian prohibiting transportation and sale of food products intended for human consumption which do not meet the minimum requirements established under (1) of this subsection, and limiting their use and disposal in conformity with protection of the public;

(3) adopt a schedule of fees or charges, and credit provisions, for services rendered by state veterinarians to farmers and others at their request in caring for livestock and poultry, and all the fees shall be transmitted to the commissioner for deposit in the state treasury;

(4) designate points of entry for admission of livestock or poultry into the state, and arrange inspection at those points with or without collaboration and assistance of the federal government, and

bar entry of stock or poultry not shipped under a valid permit or not free from contagious or infectious disease;

(5) adopt, repeal, and amend regulations consistent with existing law for

(A) the labeling and grading of milk and milk products and standards of cleanliness and sanitation, to at least the minimum of current recommendations of the United States Public Health Service, for the operation of dairies selling, or offering for sale, milk or milk products;

(B) the production and sale of ice cream and allied frozen desserts;

(C) the production and sale of imitation milk and imitation milk products;

(D) the labeling of aquatic farm products as aquatic farm products.

* Sec. 5. AS 03.05.040(a) is amended to read:

(a) On any business day during the usual hours of business the commissioner or an authorized inspector may, for the purpose of inspecting agricultural, [OR] fisheries, or aquatic farm products or aquatic farm sites subject to regulation, enter a storehouse, warehouse, cold storage plant, packing house, slaughterhouse, retail store or other building or place where those products are kept, stored, processed or sold.

* Sec. 6. AS 03.05.100 is amended to read:

Sec. 03.05.100. DEFINITIONS. In this chapter,

(1) "agricultural products" does not include fish or fisheries products;

(2) "aquatic farm" and "aquatic farm product" have the meanings given in AS 16.40.199;

(3) "fish or fisheries products" means any aquatic animal including amphibians, or aquatic plants or parts of those plants, animals or amphibians that are usable as human food.

* Sec. 7. AS 16.05.050 is amended by adding a new paragraph to read:

(17) to permit and regulate aquatic farming in the state in a manner that ensures the protection of the state's fish and game resources and improves the economy, health, and well-being of the citizens of the state;

* Sec. 8. AS 16.05.251 is amended by adding a new subsection to read:

(f) Except as expressly provided in AS 16.40.120(d) and 16.40.-130, the Board of Fisheries may not adopt regulations or take action regarding the issuance, denial, or conditioning of a permit under AS 16.40.100 or 16.40.120, the construction or operation of a farm or hatchery required to have a permit under AS 16.40.100, or a harvest with a permit issued under AS 16.40.120. Regulations or orders adopted by the Board of Fisheries under this section do not apply to a harvest with a permit issued under AS 16.40.120.

* Sec. 9. AS 16.05.330(a) is amended to read:

(a) Except as otherwise permitted in this chapter, a person may not engage in sport fishing, including the taking of razor clams; in hunting, trapping, or fur dealing; in the farming of [FISH,] fur [,] or game; or in taxidermy, without having the appropriate license or tag in actual possession.

* Sec. 10. AS 16.05.930 is amended by adding a new subsection to read:

(g) AS 16.05.330 - 16.05.720 do not apply to an activity authorized by a permit issued under AS 16.40.100 or 16.40.120, or to a person or vessel employed in an activity authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 11. AS 16.05.940(14) is amended to read:

(14) "[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 game [THEIR] products, and "captivity" means having the [FISH OR] game under positive control, as in a pen [, POND,] or an area of land that [OR WATER WHICH] is completely enclosed by a generally escape-proof barrier;

* Sec. 12. AS 16.10 is amended by adding a new section to read:

Sec. 16.10.269. LIMITATIONS. AS 16.10.265 - 16.10.267 do not apply to the purchase or sale of aquatic farm products from a holder of a permit issued under AS 16.40.100 or stock from a holder of a permit issued under AS 16.40.120.

* Sec. 13. AS 16.10.400 is amended by adding a new subsection to read:

(h) AS 16.10.400 - 16.10.475 do not apply to the construction or operation of a private hatchery that has a permit issued under AS 16.40.100.

* Sec. 14. AS 16.43.140 is amended by adding a new subsection to read:

(d) This chapter does not apply to activities authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 15. AS 16.51.180(5) is amended to read:

(5) "seafood" means finfish, shellfish, and fish by-products, including but not limited to salmon, halibut, herring, flounder, crab, clam, cod, shrimp, and pollock, but does not include aquatic farm products as defined in AS 16.40.199;

* Sec. 16. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.083. AQUATIC FARMING AND HATCHERY SITE LEASES. (a) The commissioner may offer to the public for lease a site that has been developed for aquatic farming or related hatchery operations under a permit issued under AS 38.05.856. Before offering the site to the public, the commissioner shall offer the site to the permittee.

(b) A site shall be leased under this section for not less than the appraised fair market value of the lease. The value of the lease shall be reappraised every five years.

(c) A lease under this section may be assigned, but if the assignee changes the use of the site the lease reverts to the state.

(d) Before entering into a lease under this section, the commissioner shall require the lessee to post a performance bond or provide other security to cover the costs to the department of restoring the leased site in the event the lessee abandons the site.

* Sec. 17. AS 38.05 is amended by adding new sections to read:

Sec. 38.05.855. IDENTIFICATION OF SITES FOR AQUATIC FARMS AND HATCHERIES. (a) The commissioner shall identify districts in the state within which sites may be selected for the establishment and operation of aquatic farms and related hatcheries required to have a permit under AS 16.40.100.

(b) The commissioner shall schedule a 60-day period during which a person may submit a preliminary application that identifies a site in a district for which the person wishes to be issued a permit under AS 38.05.856.

(c) Based on preliminary applications received under (b) of this section, and after consultation with the commissioner of fish and game and the commissioner of environmental conservation, the commissioner shall make a preliminary written finding under AS 38.05.035(e) that proposes sites in each district for which permits may be issued under AS 38.05.856.

(d) After notice is given under AS 38.05.945 and a hearing is held under AS 38.05.946(b), the commissioner shall issue a final written finding under AS 38.05.035(e) that identifies sites in each district for which permits shall be issued under AS 38.05.856 and that

specifies conditions and limitations for the development of each site.

Sec. 38.05.856. TIDELAND AND LAND USE PERMITS FOR AQUATIC FARMING. (a) The commissioner may issue a tideland or land use permit for the establishment and operation of an aquatic farm and related hatchery operations. A permit under this section is valid for three years after the date of issuance. The permit may not be transferred.

(b) The commissioner may not issue a permit under this section for tideland or land that borders a federally designated wilderness area that was designated before the effective date of this Act.

(c) Before renewing a permit under this section, the commissioner shall allow interested persons to submit written and oral testimony concerning the renewal to the commissioner within 30 days after the date of the notice. The commissioner shall hold a hearing to take testimony.

(d) Before issuing or renewing a permit under this section, the commissioner shall consider all relevant testimony submitted under this section or AS 38.05.946(b). The commissioner may deny the application for issuance or renewal for good cause, but shall provide the applicant with written findings that explain the reason for the denial.

(e) Before issuing or renewing a permit under this section, the commissioner shall require the permittee to post a performance bond or provide other security to cover the costs to the department of restoring the permitted site in the event the permittee abandons the site.

(f) The commissioner shall adopt regulations establishing criteria for the approval or denial of permits under this section and for limiting the number of sites for which permits may be issued in an area in order to protect the environment and natural resources of the area. The regulations must provide for the consideration of upland

management policies and whether the proposed use of a site is compatible with the traditional and existing uses of the area in which the site is located.

* Sec. 18. AS 38.05.945(a) is amended to read:

(a) This section establishes the requirements for notice given by the department for the following actions:

(1) classification or reclassification of state land under AS 38.05.300 and the closing of land to mineral leasing or entry under AS 38.05.185;

(2) zoning of land under applicable law;

(3) a decision under AS 38.05.035(e) regarding the sale, lease, or disposal of an interest in state land or resources; [AND]

(4) a competitive disposal of an interest in state land or resources after final decision under AS 38.05.035(e);

(5) a public hearing under AS 38.05.856(c);

(6) a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries.

* Sec. 19. AS 38.05.945 is amended by adding a new subsection to read:

(g) Notice at least 30 days before action under (a)(5) or (6) shall be given to appropriate

(1) regional fish and game councils established under AS 16.05.260; and

(2) coastal resource service areas organized under AS 46.40.110 - 46.40.210.

* Sec. 20. AS 38.05.946 is amended by adding a new subsection to read:

(b) The commissioner shall hold a public hearing in each district identified under AS 38.05.855 within 30 days after giving notice of a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries.

* Sec. 21. AS 16.05.340(a)(14) is repealed.

* Sec. 22. Except as provided in sec. 24 of this Act, the commissioner of fish and game may not issue a permit under AS 16.40.100 or 16.40.120, enacted by sec. 2 of this Act, until regulations have been adopted under AS 16.40.160, enacted by sec. 2 of this Act.

* Sec. 23. Except as provided in sec. 24 of this Act, the commissioner of natural resources may not enter into a lease under AS 38.05.083 or issue a permit under AS 38.05.856, enacted by secs. 16 and 17 of this Act, until the commissioner adopts regulations necessary for the implementation of AS 38.05.083 and 38.05.856.

* Sec. 24. Notwithstanding any other provisions of law, a person who is lawfully operating an aquatic farm or related hatchery in the state on the effective date of this Act is entitled to continue lawful operations at the existing site. The person may obtain an initial lease or permit for the person's existing operations under AS 38.05.083 or 38.05.856, enacted by secs. 16 and 17 of this Act, but as a condition of obtaining the lease or permit the person must agree that during the term of the lease or permit the person will not change the use of the site.

* Sec. 25. This Act takes effect immediately under AS 01.10.070(c).

5-1806N
Hein
3/28/88

Original sponsor: Resources Committee

IN THE SENATE BY THE RESOURCES COMMITTEE

CS FOR SENATE BILL NO. 482 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of Pacific salmon in saltwater; and providing for an effective date."

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

* Section 1. FINDINGS AND POLICY. (a) The legislature finds that

(1) aquatic farming in the state would

(A) provide a consistent source of quality food;

(B) provide new jobs;

(C) increase state exports;

(D) create new business opportunities; and

(E) increase the stability and diversity of the state's economy; and

(2) development of aquatic farming in the state would increase the availability of fresh seafood to Alaskans and would strengthen the competitiveness of Alaska seafood in the world marketplace by broadening the diversity of products and providing year-round supplies of premium quality seafood.

(b) It is the policy of the state

(1) to encourage the establishment and responsible growth of an aquatic farming industry in the state; and

(2) that allocation of aquatic farming sites must be compatible with established and ongoing activities in an area.

* Sec. 2. AS 16.40 is amended by adding new sections to read:

does this mean traditional activities have priority

ARTICLE 2. AQUATIC FARMING.

Sec. 16.40.100. AQUATIC FARM AND HATCHERY PERMITS. (a) A person may not, without a permit from the commissioner, construct or operate

(1) an aquatic farm; or

(2) a hatchery for the purpose of supplying aquatic plants or aquatic animals to an aquatic farm.

(b) A permit issued under this section authorizes the permittee, subject to the conditions of AS 03.05 and AS 16.40.100 - 16.40.199, to acquire, purchase, offer to purchase, transfer, possess, sell, and offer to sell stock and aquatic farm products that are used or reared at the hatchery or aquatic farm. A hatchery that holds a permit under this section may sell or offer to sell bivalve shellfish spat to an aquatic farm or related hatchery outside of the state.

good

what about next growth cycle — like seed?

(what about char smolts) or kelp?

i.e. other life stages

(c) The commissioner may attach conditions to a permit issued under this section that are necessary to protect the natural stock.

(d) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for the farming of, or hatchery operations involving, Pacific salmon in saltwater or Atlantic salmon.

(use scientific names) for clarity

(e) The commissioner may issue a permit under this section for the freshwater farming of, or freshwater hatchery operations involving, finfish other than Atlantic salmon only in a privately owned freshwater body that has no outlet to a state-owned body of water.

does not allow saltwater tank farms

Sec. 16.40.105. CRITERIA FOR ISSUANCE OF PERMITS. The commissioner shall issue permits under AS 16.40.100 on the basis of the following criteria:

private land?

size limits

(1) the physical and biological characteristics of the proposed farm or hatchery location must be suitable for the farming of the aquatic animal or aquatic plant proposed;

(2) the proposed farm may not unreasonably or adversely affect management of natural stocks, and must not require significant alterations in traditional fisheries or other existing uses of fish and wildlife resources;

(3) the proposed farm may not affect fisheries, wildlife, or their habitats in an adverse manner; and how broad is this

(4) the proposed farm plans and staffing plans must demonstrate technical and operational feasibility.

Sec. 16.40.110. PERMIT APPLICATION, RENEWAL, AND TRANSFER. (a) An applicant for an aquatic farming or hatchery permit required under AS 16.40.100 shall apply on a form prescribed by the commissioner. An application for a permit must include a plan for the development and operation of the aquatic farm or hatchery, which must be approved by the commissioner before the permit is issued.

(b) An application for renewal or transfer of a permit must be accompanied by fees required by the commissioner, a report of the disease history of the farm or hatchery covered by the permit, and evidence that satisfies the commissioner that the applicant has complied with the development plan required under (a) of this section. The commissioner may require a health inspection of the farm or hatchery as a condition of renewal. The department may conduct the inspection or contract with a disease diagnostician to conduct the inspection.

(c) A person to whom a permit is transferred may use the permit only for the purposes for which the permit was authorized to be used by the transferor, and subject to the same conditions and limitations.

Sec. 16.40.120. AQUATIC FARM STOCK ACQUISITION PERMITS. (a) A person may not acquire aquatic plants or aquatic animals from wild stock in the state for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100 unless the person holds an acquisition permit from the commissioner.

(b) An acquisition permit authorizes the permit holder to acquire the species and quantities of wild stock in the state specified in the permit for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100.

(c) The commissioner shall specify the expiration date of an acquisition permit and may attach conditions to an acquisition permit, including conditions relating to the time, place, and manner of harvest. Size, gear, place, time, licensing, and other limitations applicable to sport, commercial, or subsistence harvest of aquatic plants and aquatic animals do not apply to a harvest with a permit issued under this section. The commissioner of fish and game shall issue or deny a permit within 30 days after receiving an application.

(d) The commissioner shall deny or restrict a permit under this section upon finding that the proposed harvest will impair sustained yield of the species. The commissioner may deny or restrict a permit under this section upon finding that the proposed harvest will disrupt established uses of the resources by commercial, sport, personal use, or subsistence users. The commissioner shall forward to the Board of Fisheries for action permit applications for species that support commercial fisheries subject to limited entry under AS 16.43. A denial of the permit by the commissioner must contain the factual basis for the findings.

(e) The Board of Fisheries may adopt regulations for the conservation, maintenance, and management of species for which an

acquisition permit is required.

(f) Except as provided in (d) of this section, the commissioner shall issue a permit if

(1) wild stock is necessary to meet the initial needs of farm or hatchery stock;

(2) there are technological limitations on the propagation of cultured stock for the species sought;

(3) wild stock sought is not fully utilized by commercial, sport, personal use, or subsistence fisheries; or

(4) wild stock is needed to maintain the gene pool of a hatchery or aquatic farm.

(g) Aquatic plants and aquatic animals acquired under a permit issued under this section become the property of the permit holder and are no longer a public or common resource.

Sec. 16.40.130. IMPORTATION OF AQUATIC PLANTS OR AQUATIC ANIMALS FOR STOCK. A person may not import into the state an aquatic plant or aquatic animal for the purpose of supplying stock to an aquatic farm or hatchery unless authorized by a regulation of the Board of Fisheries. ~~and~~ or Comm. of Fish & Game.

Sec. 16.40.140. LIMITATION ON SALE, TRANSFER OF STOCK, AND PRODUCTS. (a) A private hatchery required to have a permit under AS 16.40.100 may sell or transfer stock from the hatchery only to an aquatic farm or other hatchery that has a permit issued under AS 16.40.100. Except a

(b) Stock may not be transferred to or from an aquatic farm or hatchery required to have a permit under AS 16.40.100 without prior notice of the transfer to the commissioner. A notice of transfer shall be submitted at least ~~10~~ 45 days before the proposed date of transfer.

(c) A notice of transfer must be accompanied by a report of a health inspection of the stock. The department shall conduct the inspection or contract with a disease diagnostician to conduct the inspection. The cost of inspection shall be borne by the department.

(d) The department may restrict or disapprove a transfer of stock if it finds that the transfer would present a risk of spreading disease.

(e) A person may not sell, transfer, or offer to sell or transfer, or knowingly purchase or receive, an aquatic farm product grown or propagated in the state unless the product was grown or propagated on a farm with a permit issued under AS 16.40.100. The permit must be in effect at the time of the sale, transfer, purchase, receipt, or offer.

Sec. 16.40.150. DISEASE CONTROL AND INSPECTION. (a) The department shall order the quarantine or the destruction and disposal of diseased hatchery stock or of aquatic farm products when necessary to protect wild stock. A holder of a permit issued under AS 16.40.100 shall report to the department an outbreak or incidence of disease among stock or aquatic farm products of the permit holder within 48 hours after discovering the outbreak or incidence.

(b) A holder of a permit issued under AS 16.40.100 shall allow the department to inspect the permit holder's farm or hatchery during operating hours and upon reasonable notice. The cost of inspection shall be borne by the department.

(c) The department shall develop a disease management and control program for aquatic farms and hatcheries.

(d) The department may enter into an agreement with a state or federal agency or a private, state-certified provider to provide services under (b) and (c) of this section, or inspections under

AS 16.40.110(b).

Sec. 16.40.160. REGULATIONS. The commissioner may adopt regulations necessary to implement AS 16.40.100 - 16.40.199.

Sec. 16.40.170. PENALTY. A person who violates a provision of AS 16.40.100 - 16.40.199, a regulation adopted under AS 16.40.100 - 16.40.199, or a term or condition of a permit issued under AS 16.40.-100 - 16.40.199, is guilty of a class B misdemeanor.

Sec. 16.40.199. DEFINITIONS. In AS 16.40.100 - 16.40.199

(1) "aquatic animal" means shellfish or finfish;

(2) "aquatic farm" means a facility that grows, farms, or cultivates aquatic farm products in captivity or under positive control;

(3) "aquatic farm product" means an aquatic plant or aquatic animal, or part of an aquatic plant or aquatic animal, that is propagated, farmed, or cultivated in an aquatic farm and sold or offered for sale;

(4) "aquatic plant" means a plant indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(5) "commissioner" means the commissioner of fish and game;

(6) "hatchery" means a facility for the artificial propagation of stock, including rearing of juvenile aquatic plants or aquatic animals;

(7) "positive control" means, for mobile species, enclosed within a natural or artificial escape-proof barrier; for species with limited or no mobility, such as a bivalve or an aquatic plant, "positive control" also includes managed cultivation in unenclosed water;

(8) "shellfish" means a species of crustacean, mollusk, or other invertebrate, in any stage of its life cycle, that is indigenous

to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(9) "stock" means live aquatic plants or aquatic animals acquired, collected, possessed, or intended for use by a hatchery or aquatic farm for the purpose of further growth or propagation.

* Sec. 3. AS 03.05.011(a) is amended to read:

(a) To carry out the requirements of this title, the commissioner of environmental conservation may issue orders, regulations, permits, quarantines, and embargoes relating to

(1) examination and inspection of premises containing products, articles, and commodities carrying pests;

(2) establishment of quarantines for eradication of pests;

(3) establishment of standards and labeling requirements pertaining to the sale of meat, fish, and poultry;

(4) tests and analyses which may be made and hearings which may be held to determine whether the commissioner will issue a stop order or quarantine;

(5) cooperation with federal and other state agencies;

(6) regulation of fur farming; for purposes of this paragraph, "fur farming" means the raising of and caring for animals for the purpose of marketing their fur, or animals themselves for breeding stock;

(7) examination and inspection of meat, fish, and poultry advertised for sale or sold to the public;

(8) enforcement of quality assurance plans developed in cooperation with appropriate industry representatives;

(9) establishment of standards and conditions for the operation and siting of aquatic farms and related hatcheries, including

(A) restrictions on the use of chemicals; and

(B) requirements to protect the public from contaminated aquatic farm products that pose a risk to health;

(10) monitoring aquatic farms and aquatic farm products to ensure compliance with this chapter and with the requirements of the national shellfish sanitation program manual of operations published by the Food and Drug Administration.

* Sec. 4. AS 03.05.020(a) is amended to read:

(a) The commissioner shall

(1) require routine inspection of food animals, fish, poultry and derivative food products, to protect the public against fraud, disease and spoilage, and in this connection adopt uniform regulations establishing standards of identity and composition of these food products and minimum standards of sanitation and handling methods as to all phases of slaughtering, processing, storing, transporting, displaying and selling of these food products;

(2) issue orders or cause the orders to be issued by an authorized veterinarian prohibiting transportation and sale of food products intended for human consumption which do not meet the minimum requirements established under (1) of this subsection, and limiting their use and disposal in conformity with protection of the public;

(3) adopt a schedule of fees or charges, and credit provisions, for services rendered by state veterinarians to farmers and others at their request in caring for livestock and poultry, and all the fees shall be transmitted to the commissioner for deposit in the state treasury;

(4) designate points of entry for admission of livestock or poultry into the state, and arrange inspection at those points with or without collaboration and assistance of the federal government, and

bar entry of stock or poultry not shipped under a valid permit or not free from contagious or infectious disease;

(5) adopt, repeal, and amend regulations consistent with existing law for

(A) the labeling and grading of milk and milk products and standards of cleanliness and sanitation, to at least the minimum of current recommendations of the United States Public Health Service, for the operation of dairies selling, or offering for sale, milk or milk products;

(B) the production and sale of ice cream and allied frozen desserts;

(C) the production and sale of imitation milk and imitation milk products;

(D) the labeling of aquatic farm products as aquatic farm products.

* Sec. 5. AS 03.05.040(a) is amended to read:

(a) On any business day during the usual hours of business the commissioner or an authorized inspector may, for the purpose of inspecting agricultural, [OR] fisheries, or aquatic farm products or aquatic farm sites subject to regulation, enter a storehouse, warehouse, cold storage plant, packing house, slaughterhouse, retail store or other building or place where those products are kept, stored, processed or sold.

* Sec. 6. AS 03.05.100 is amended to read:

Sec. 03.05.100. DEFINITIONS. In this chapter,

(1) "agricultural products" does not include fish or fisheries products;

(2) "aquatic farm" and "aquatic farm product" have the meanings given in AS 16.40.199;

(3) "fish or fisheries products" means any aquatic animal, including amphibians, or aquatic plants or parts of those plants, animals or amphibians that are usable as human food.

* Sec. 7. AS 16.05.050 is amended by adding a new paragraph to read:

(17) to permit and regulate aquatic farming in the state in a manner that ensures the protection of the state's fish and game resources and improves the economy, health, and well-being of the citizens of the state;

* Sec. 8. AS 16.05.251 is amended by adding a new subsection to read:

(f) Except as expressly provided in AS 16.40.120(d) and 16.40.-130, the Board of Fisheries may not adopt regulations or take action regarding the issuance, denial, or conditioning of a permit under AS 16.40.100 or 16.40.120, the construction or operation of a farm or hatchery required to have a permit under AS 16.40.100, or a harvest with a permit issued under AS 16.40.120. Regulations or orders adopted by the Board of Fisheries under this section do not apply to a harvest with a permit issued under AS 16.40.120.

* Sec. 9. AS 16.05.330(a) is amended to read:

(a) Except as otherwise permitted in this chapter, a person may not engage in sport fishing, including the taking of razor clams; in hunting, trapping, or fur dealing; in the farming of [FISH,] fur [,] or game; or in taxidermy, without having the appropriate license or tag in actual possession.

* Sec. 10. AS 16.05.930 is amended by adding a new subsection to read:

(g) AS 16.05.330 - 16.05.720 do not apply to an activity authorized by a permit issued under AS 16.40.100 or 16.40.120, or to a person or vessel employed in an activity authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 11. AS 16.05.940(14) is amended to read:

(14) "[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 game [THEIR] products, and "captivity" means having the [FISH OR] game under positive control, as in a pen [, POND,] or an area of land that [OR WATER WHICH] is completely enclosed by a generally escape-proof barrier;

* Sec. 12. AS 16.10 is amended by adding a new section to read:

Sec. 16.10.269. LIMITATIONS. AS 16.10.265 - 16.10.267 do not apply to the purchase or sale of aquatic farm products from a holder of a permit issued under AS 16.40.100 or stock from a holder of a permit issued under AS 16.40.120.

* Sec. 13. AS 16.10.400 is amended by adding a new subsection to read:

(h) AS 16.10.400 - 16.10.475 do not apply to the construction or operation of a private hatchery that has a permit issued under AS 16.40.100.

* Sec. 14. AS 16.43.140 is amended by adding a new subsection to read:

(d) This chapter does not apply to activities authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 15. AS 16.51.180(5) is amended to read:

(5) "seafood" means finfish, shellfish, and fish by-products, including but not limited to salmon, halibut, herring, flounder, crab, clam, cod, shrimp, and pollock, but does not include aquatic farm products as defined in AS 16.40.199;

* Sec. 16. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.083. AQUATIC FARMING AND HATCHERY SITE LEASES. (a) The commissioner may offer to the public for lease a site that has been developed for aquatic farming or related hatchery operations under a permit issued under AS 38.05.856. Before offering the site to the public, the commissioner shall offer the site to the permittee.

(b) A site shall be leased under this section for not less than the appraised fair market value of the lease. The value of the lease shall be reappraised every five years.

(c) A lease under this section may be assigned, but if the assignee changes the use of the site the lease reverts to the state.

(d) Before entering into a lease under this section, the commissioner shall require the lessee to post a performance bond or provide other security to cover the costs to the department of restoring the leased site in the event the lessee abandons the site.

* Sec. 17. AS 38.05 is amended by adding new sections to read:

Sec. 38.05.855. IDENTIFICATION OF SITES FOR AQUATIC FARMS AND HATCHERIES. (a) The commissioner shall identify districts in the state within which sites may be selected for the establishment and operation of aquatic farms and related hatcheries required to have a permit under AS 16.40.100.

(b) The commissioner shall schedule a 60-day period during which a person may submit a preliminary application that identifies a site in a district for which the person wishes to be issued a permit under AS 38.05.856.

(c) Based on preliminary applications received under (b) of this section, and after consultation with the commissioner of fish and game and the commissioner of environmental conservation, the commissioner shall make a preliminary written finding under AS 38.05.035(e) that proposes sites in each district for which permits may be issued under AS 38.05.856.

(d) After notice is given under AS 38.05.945 and a hearing is held under AS 38.05.946(b), the commissioner shall issue a final written finding under AS 38.05.035(e) that identifies sites in each district for which permits shall be issued under AS 38.05.856 and that

specifies conditions and limitations for the development of each site.

Sec. 38.05.856. TIDELAND AND LAND USE PERMITS FOR AQUATIC FARMING. (a) The commissioner may issue a tideland or land use permit for the establishment and operation of an aquatic farm and related hatchery operations. A permit under this section is valid for three years after the date of issuance. The permit may not be transferred.

(b) The commissioner may not issue a permit under this section for tideland or land that borders a federally designated wilderness area that was designated before the effective date of this Act.

(c) Before renewing a permit under this section, the commissioner shall allow interested persons to submit written and oral testimony concerning the renewal to the commissioner within 30 days after the date of the notice. The commissioner ~~shall~~ may hold a hearing to take testimony.

(d) Before issuing or renewing a permit under this section, the commissioner shall consider all relevant testimony submitted under this section or AS 38.05.946(b). The commissioner may deny the application for issuance or renewal for good cause, but shall provide the applicant with written findings that explain the reason for the denial.

(e) Before issuing or renewing a permit under this section, the commissioner shall require the permittee to post a performance bond or provide other security to cover the costs to the department of restoring the permitted site in the event the permittee abandons the site.

(f) The commissioner shall adopt regulations establishing criteria for the approval or denial of permits under this section and for limiting the number of sites for which permits may be issued in an area in order to protect the environment and natural resources of the area. The regulations must provide for the consideration of upland

management policies and whether the proposed use of a site is compatible with the traditional and existing uses of the area in which the site is located.

* Sec. 18. AS 38.05.945(a) is amended to read:

(a) This section establishes the requirements for notice given by the department for the following actions:

(1) classification or reclassification of state land under AS 38.05.300 and the closing of land to mineral leasing or entry under AS 38.05.185;

(2) zoning of land under applicable law;

(3) a decision under AS 38.05.035(e) regarding the sale, lease, or disposal of an interest in state land or resources; [AND]

(4) a competitive disposal of an interest in state land or resources after final decision under AS 38.05.035(e);

(5) a public hearing under AS 38.05.856(c); —

best interest finding

(6) a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries.

* Sec. 19. AS 38.05.945 is amended by adding a new subsection to read:

(g) Notice at least 30 days before action under (a)(5) or (6) shall be given to appropriate

(1) regional fish and game councils established under AS 16.05.260; and

(2) coastal resource service areas organized under AS 46.40.110 - 46.40.210.

* Sec. 20. AS 38.05.946 is amended by adding a new subsection to read:

(b) The commissioner shall hold a public hearing in each district identified under AS 38.05.855 within 30 days after giving notice of a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries.

* Sec. 21. AS 16.05.340(a)(14) is repealed.

* Sec. 22. Except as provided in sec. 24 of this Act, the commissioner of fish and game may not issue a permit under AS 16.40.100 or 16.40.120, enacted by sec. 2 of this Act, until regulations have been adopted under AS 16.40.160, enacted by sec. 2 of this Act.

* Sec. 23. Except as provided in sec. 24 of this Act, the commissioner of natural resources may not enter into a lease under AS 38.05.083 or issue a permit under AS 38.05.856, enacted by secs. 16 and 17 of this Act, until the commissioner adopts regulations necessary for the implementation of AS 38.05.083 and 38.05.856.

* Sec. 24. Notwithstanding any other provisions of law, a person who is lawfully operating an aquatic farm or related hatchery in the state on the effective date of this Act is entitled to continue lawful operations at the existing site. The person may obtain an initial lease or permit for the person's existing operations under AS 38.05.083 or 38.05.856, enacted by secs. 16 and 17 of this Act, but as a condition of obtaining the lease or permit the person must agree that during the term of the lease or permit the person will not change the use of the site.

* Sec. 25. This Act takes effect immediately under AS 01.10.070(c).

5-1806N
Hein
3/28/88

Original sponsor: Resources Committee

IN THE SENATE BY THE RESOURCES COMMITTEE

CS FOR SENATE BILL NO. 482 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - SECOND SESSION

A BILL if Arliss moratorium does not pass only

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of Pacific salmon in saltwater; and providing for an effective date."

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

* Section 1. FINDINGS AND POLICY. (a) The legislature finds that

(1) aquatic farming in the state would

(A) provide a consistent source of quality food;

(B) provide new jobs;

(C) increase state exports;

(D) create new business opportunities; and

(E) increase the stability and diversity of the state's economy; and

(2) development of aquatic farming in the state would increase the availability of fresh seafood to Alaskans and would strengthen the competitiveness of Alaska seafood in the world marketplace by broadening the diversity of products and providing year-round supplies of premium quality seafood.

(b) It is the policy of the state

(1) to encourage the establishment and responsible growth of an aquatic farming industry in the state; and (1) BE MADE in Full Consid

F.Z (2) that allocation of aquatic farming sites ~~must be compatible~~ with established and ongoing activities in an area.

* Sec. 2. AS 16.40 is amended by adding new sections to read:

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ARTICLE 2. AQUATIC FARMING.

Sec. 16.40.100. AQUATIC FARM AND HATCHERY PERMITS. (a) A person may not, without a permit from the commissioner, construct or operate

(1) an aquatic farm; or

(2) a hatchery for the purpose of supplying aquatic plants or aquatic animals to an aquatic farm.

(b) A permit issued under this section authorizes the permittee, subject to the conditions of AS 03.05 and AS 16.40.100 - 16.40.199, to acquire, purchase, offer to purchase, transfer, possess, sell, and offer to sell stock and aquatic farm products that are used or reared at the hatchery or aquatic farm. A hatchery that holds a permit under this section may sell or offer to sell bivalve shellfish spat to an aquatic farm or related hatchery outside of the state.

(c) The commissioner may attach conditions to a permit issued under this section that are necessary to protect the natural stock.

(d) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for the farming of, or hatchery operations involving, Pacific salmon in saltwater or Atlantic salmon.

(e) The commissioner may issue a permit under this section for the freshwater farming of, or freshwater hatchery operations involving, finfish other than Atlantic salmon only in a privately owned freshwater ~~body~~ that has no outlet to state ~~a state-owned body of~~ water.

Sec. 16.40.105. CRITERIA FOR ISSUANCE OF PERMITS. The commissioner shall issue permits under AS 16.40.100 on the basis of the following criteria:

(1) the physical and biological characteristics of the proposed farm or hatchery location must be suitable for the farming of the aquatic animal or aquatic plant proposed;

(2) the proposed farm may not unreasonably ~~or adversely~~ significantly affect management of natural stocks, and must not require alterations in traditional fisheries or other existing uses of fish and wildlife resources;

(3) the proposed farm may not significantly affect fisheries, wildlife, or their habitats in an adverse manner; and

(4) the proposed farm plans and staffing plans must demonstrate technical and operational feasibility.

Sec. 16.40.110. PERMIT APPLICATION, RENEWAL, AND TRANSFER. (a) An applicant for an aquatic farming or hatchery permit required under AS 16.40.100 shall apply on a form prescribed by the commissioner. An application for a permit must include a plan for the development and operation of the aquatic farm or hatchery, which must be approved by the commissioner before the permit is issued.

(b) An application for renewal or transfer of a permit must be accompanied by fees required by the commissioner, a report of the disease history of the farm or hatchery covered by the permit, and evidence that satisfies the commissioner that the applicant has complied with the development plan required under (a) of this section. The commissioner may require a health inspection of the farm or hatchery as a condition of renewal. The department may conduct the inspection or contract with a disease diagnostician to conduct the inspection.

(c) A person to whom a permit is transferred may use the permit only for the purposes for which the permit was authorized to be used by the transferor, and subject to the same conditions and limitations.

Sec. 16.40.120. AQUATIC FARM STOCK ACQUISITION PERMITS. (a) A person may not acquire aquatic plants or aquatic animals from wild stock in the state for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100 unless the person holds an acquisition permit from the commissioner.

(b) An acquisition permit authorizes the permit holder to acquire the species and quantities of wild stock in the state specified in the permit for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100, or Sources out of STATE. The Dept of Fish & Game F.F

(c) The commissioner shall specify the expiration date of an acquisition permit and may attach conditions to an acquisition permit, including conditions relating to the time, place, and manner of harvest. Size, gear, place, time, licensing, and other limitations applicable to sport, commercial, or subsistence harvest of aquatic plants and aquatic animals do not apply to a harvest with a permit issued under this section. The commissioner of fish and game shall issue or deny a permit within 30 days after receiving an application.

(d) The commissioner shall deny or restrict a permit under this section upon finding that the proposed harvest will impair sustained yield of the species. The commissioner may deny or restrict a permit under this section upon finding that the proposed harvest will unreasonably disrupt established uses of the resources by commercial, sport, personal use, or subsistence users. The commissioner shall forward to the Board of Fisheries for action permit applications for species that support commercial fisheries subject to limited entry under AS 16.43. A denial of the permit by the commissioner must contain the factual basis for the findings. F.Z.

(e) The Board of Fisheries may adopt regulations for the conservation, maintenance, and management of species for which an

acquisition permit is required.

(f) Except as provided in (d) of this section, the commissioner shall issue a permit if

(1) wild stock is necessary to meet the initial needs of farm or hatchery stock;

(2) there are technological limitations on the propagation of cultured stock for the species sought;

(3) wild stock sought is not fully utilized by commercial, sport, personal use, or subsistence fisheries; or

(4) wild stock is needed to maintain the gene pool of a hatchery or aquatic farm.

(g) Aquatic plants and aquatic animals acquired under a permit issued under this section become the property of the permit holder and are no longer a public or common resource.

Sec. 16.40.130. IMPORTATION OF AQUATIC PLANTS OR AQUATIC ANIMALS FOR STOCK. A person may not import into the state an aquatic plant or aquatic animal for the purpose of supplying stock to an aquatic farm or hatchery unless authorized by a regulation of the Board of Fisheries.

Sec. 16.40.140. LIMITATION ON SALE, TRANSFER OF STOCK, AND PRODUCTS. (a) A private hatchery required to have a permit under AS 16.40.100 may sell or transfer stock from the hatchery only to an aquatic farm or other hatchery that has a permit issued under AS 16.40.100, except that bi-valve shellfish spat may also be sold or offered for sale to an aquatic farm or related hatchery outside of the state.

(b) Stock may not be transferred to or from an aquatic farm or hatchery required to have a permit under AS 16.40.100 without prior notice of the transfer to the commissioner. A notice of transfer shall be submitted at least ~~30~~ 45 days before the proposed date of transfer.

(c) A notice of transfer must be accompanied by a report of a health inspection of the stock. The department shall conduct the inspection or contract with a disease diagnostician to conduct the inspection. The cost of inspection shall be borne by the department.

(d) The department may restrict or disapprove a transfer of stock if it finds that the transfer would present a risk of spreading disease.

(e) A person may not sell, transfer, or offer to sell or transfer, or knowingly purchase or receive, an aquatic farm product grown or propagated in the state unless the product was grown or propagated on a farm with a permit issued under AS 16.40.100. The permit must be in effect at the time of the sale, transfer, purchase, receipt, or offer.

Sec. 16.40.150. DISEASE CONTROL AND INSPECTION. (a) The department shall order the quarantine or the destruction and disposal of diseased hatchery stock or of aquatic farm products when necessary to protect wild stock. A holder of a permit issued under AS 16.40.100 shall report to the department an outbreak or incidence of disease among stock or aquatic farm products of the permit holder within 48 hours after discovering the outbreak or incidence.

(b) A holder of a permit issued under AS 16.40.100 shall allow the department to inspect the permit holder's farm or hatchery during operating hours and upon reasonable notice. The cost of inspection shall be borne by the department.

(c) The department shall develop a disease management and control program for aquatic farms and hatcheries.

(d) The department may enter into an agreement with a state or federal agency or a private, state-certified provider to provide services under (b) and (c) of this section, or inspections under

AS 16.40.110(b).

Sec. 16.40.160. REGULATIONS. The commissioner may adopt regulations necessary to implement AS 16.40.100 - 16.40.199.

Sec. 16.40.170. PENALTY. A person who violates a provision of AS 16.40.100 - 16.40.199, a regulation adopted under AS 16.40.100 - 16.40.199, or a term or condition of a permit issued under AS 16.40.-100 - 16.40.199, is guilty of a class B misdemeanor.

Sec. 16.40.199. DEFINITIONS. In AS 16.40.100 - 16.40.199

(1) "aquatic animal" means shellfish or finfish;

(2) "aquatic farm" means a facility that grows, farms, or cultivates aquatic farm products in captivity or under positive control;

(3) "aquatic farm product" means an aquatic plant or aquatic animal, or part of an aquatic plant or aquatic animal, that is propagated, farmed, or cultivated in an aquatic farm and sold or offered for sale;

(4) "aquatic plant" means a plant indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(5) "commissioner" means the commissioner of fish and game;

(6) "hatchery" means a facility for the artificial propagation of stock, including rearing of juvenile aquatic plants or aquatic animals;

(7) "positive control" means, for mobile species, enclosed within a natural or artificial escape-proof barrier; for species with limited or no mobility, such as a bivalve or an aquatic plant, "positive control" also includes managed cultivation in unenclosed water;

(8) "shellfish" means a species of crustacean, mollusk, or other invertebrate, in any stage of its life cycle, that is indigenous

to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(9) "stock" means live aquatic plants or aquatic animals acquired, collected, possessed, or intended for use by a hatchery or aquatic farm for the purpose of further growth or propagation.

* Sec. 3. AS 03.05.011(a) is amended to read:

(a) To carry out the requirements of this title, the commissioner of environmental conservation may issue orders, regulations, permits, quarantines, and embargoes relating to

(1) examination and inspection of premises containing products, articles, and commodities carrying pests;

(2) establishment of quarantines for eradication of pests;

(3) establishment of standards and labeling requirements pertaining to the sale of meat, fish, and poultry;

(4) tests and analyses which may be made and hearings which may be held to determine whether the commissioner will issue a stop order or quarantine;

(5) cooperation with federal and other state agencies;

(6) regulation of fur farming; for purposes of this paragraph, "fur farming" means the raising of and caring for animals for the purpose of marketing their fur, or animals themselves for breeding stock;

(7) examination and inspection of meat, fish, and poultry advertised for sale or sold to the public;

(8) enforcement of quality assurance plans developed in cooperation with appropriate industry representatives;

(9) establishment of standards and conditions for the operation and siting of aquatic farms and related hatcheries, including

(A) restrictions on the use of chemicals; and

(B) requirements to protect the public from contaminated aquatic farm products that pose a risk to health;

(10) monitoring aquatic farms and aquatic farm products to ensure compliance with this chapter and with the requirements of the national shellfish sanitation program manual of operations published by the Food and Drug Administration.

* Sec. 4. AS 03.05.020(a) is amended to read:

(a) The commissioner shall

(1) require routine inspection of food animals, fish, poultry and derivative food products, to protect the public against fraud, disease and spoilage, and in this connection adopt uniform regulations establishing standards of identity and composition of these food products and minimum standards of sanitation and handling methods as to all phases of slaughtering, processing, storing, transporting, displaying and selling of these food products;

(2) issue orders or cause the orders to be issued by an authorized veterinarian prohibiting transportation and sale of food products intended for human consumption which do not meet the minimum requirements established under (1) of this subsection, and limiting their use and disposal in conformity with protection of the public;

(3) adopt a schedule of fees or charges, and credit provisions, for services rendered by state veterinarians to farmers and others at their request in caring for livestock and poultry, and all the fees shall be transmitted to the commissioner for deposit in the state treasury;

(4) designate points of entry for admission of livestock or poultry into the state, and arrange inspection at those points with or without collaboration and assistance of the federal government, and

bar entry of stock or poultry not shipped under a valid permit or not free from contagious or infectious disease;

(5) adopt, repeal, and amend regulations consistent with existing law for

(A) the labeling and grading of milk and milk products and standards of cleanliness and sanitation, to at least the minimum of current recommendations of the United States Public Health Service, for the operation of dairies selling, or offering for sale, milk or milk products;

(B) the production and sale of ice cream and allied frozen desserts;

(C) the production and sale of imitation milk and imitation milk products;

(D) the labeling of aquatic farm products as aquatic farm products.

* Sec. 5. AS 03.05.040(a) is amended to read:

(a) On any business day during the usual hours of business the commissioner or an authorized inspector may, for the purpose of inspecting agricultural, [OR] fisheries, or aquatic farm products or aquatic farm sites subject to regulation, enter a storehouse, warehouse, cold storage plant, packing house, slaughterhouse, retail store or other building or place where those products are kept, stored, processed or sold.

* Sec. 6. AS 03.05.100 is amended to read:

Sec. 03.05.100. DEFINITIONS. In this chapter,

(1) "agricultural products" does not include fish or fisheries products;

(2) "aquatic farm" and "aquatic farm product" have the meanings given in AS 16.40.199;

(3) "fish or fisheries products" means any aquatic animal including amphibians, or aquatic plants or parts of those plants, animals or amphibians that are usable as human food.

* Sec. 7. AS 16.05.050 is amended by adding a new paragraph to read:

(17) to permit and regulate aquatic farming in the state in a manner that ensures the protection of the state's fish and game resources and improves the economy, health, and well-being of the citizens of the state;

* Sec. 8. AS 16.05.251 is amended by adding a new subsection to read:

(f) Except as expressly provided in AS 16.40.120(d) and 16.40.-130, the Board of Fisheries may not adopt regulations or take action regarding the issuance, denial, or conditioning of a permit under AS 16.40.100 or 16.40.120, the construction or operation of a farm or hatchery required to have a permit under AS 16.40.100, or a harvest with a permit issued under AS 16.40.120. Regulations or orders adopted by the Board of Fisheries under this section do not apply to a harvest with a permit issued under AS 16.40.120.

* Sec. 9. AS 16.05.330(a) is amended to read:

(a) Except as otherwise permitted in this chapter, a person may not engage in sport fishing, including the taking of razor clams; in hunting, trapping, or fur dealing; in the farming of [FISH,] fur [,] or game; or in taxidermy, without having the appropriate license or tag in actual possession.

* Sec. 10. AS 16.05.930 is amended by adding a new subsection to read:

(g) AS 16.05.330 - 16.05.720 do not apply to an activity authorized by a permit issued under AS 16.40.100 or 16.40.120, or to a person or vessel employed in an activity authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 11. AS 16.05.940(14) is amended to read:

(14) "[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 game [THEIR] products, and "captivity" means having the [FISH OR] game under positive control, as in a pen [, POND,] or an area of land that [OR WATER WHICH] is completely enclosed by a generally escape-proof barrier;

* Sec. 12. AS 16.10 is amended by adding a new section to read:

Sec. 16.10.269. LIMITATIONS. AS 16.10.265 - 16.10.267 do not apply to the purchase or sale of aquatic farm products from a holder of a permit issued under AS 16.40.100 or stock from a holder of a permit issued under AS 16.40.120.

* Sec. 13. AS 16.10.400 is amended by adding a new subsection to read:

(h) AS 16.10.400 - 16.10.475 do not apply to the construction or operation of a private hatchery that has a permit issued under AS 16.40.100.

* Sec. 14. AS 16.43.140 is amended by adding a new subsection to read:

(d) This chapter does not apply to activities authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 15. AS 16.51.180(5) is amended to read:

(5) "seafood" means finfish, shellfish, and fish by-products, including but not limited to salmon, halibut, herring, flounder, crab, clam, cod, shrimp, and pollock, but does not include aquatic farm products as defined in AS 16.40.199;

* Sec. 16. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.083. AQUATIC FARMING AND HATCHERY SITE LEASES. (a) The commissioner may offer to the public for lease a site that has been developed for aquatic farming or related hatchery operations under a permit issued under AS 38.05.856. Before offering the site to the public, the commissioner shall offer the site to the permittee.

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(b) A site shall be leased under this section for not less than the appraised fair market value of the lease. The value of the lease shall be reappraised every five years.

(c) A lease under this section may be assigned, but if the assignee changes the use of the site the lease reverts to the state.

(d) Before entering into a lease under this section, the commissioner shall require the lessee to post a performance bond or provide other security to cover the costs to the department of restoring the leased site in the event the lessee abandons the site.

* Sec. 17. AS 38.05 is amended by adding new sections to read:

Sec. 38.05.855. IDENTIFICATION OF SITES FOR AQUATIC FARMS AND HATCHERIES. (a) The commissioner shall identify districts in the state within which sites may be selected for the establishment and operation of aquatic farms and related hatcheries required to have a permit under AS 16.40.100.

(b) The commissioner shall schedule a 60-day period during which a person may submit a ~~preliminary~~ application that identifies a site in a district for which the person wishes to be issued a permit under AS 38.05.856.

(c) Based on ~~preliminary~~ applications received under (b) of this section, and after consultation with the commissioner of fish and game and the commissioner of environmental conservation, the commissioner shall make a preliminary written finding under AS 38.05.035(e) that proposes sites in each district for which permits may be issued under AS 38.05.856.

(d) After notice is given under AS 38.05.945 and a hearing is held under AS 38.05.946(b), the commissioner shall issue a final written finding under AS 38.05.035(e) that identifies sites in each district for which permits shall be issued under AS 38.05.856 and that

specifies conditions and limitations for the development of each site.

Sec. 38.05.856. TIDELAND AND LAND USE PERMITS FOR AQUATIC FARMING. (a) The commissioner may issue a tideland or land use permit for the establishment and operation of an aquatic farm and related hatchery operations. A permit under this section is valid for three years after the date of issuance. The permit may not be transferred.

(b) The commissioner may not issue a permit under this section for tideland or land that borders a federally designated wilderness area that was designated before the effective date of this Act.

(c) Before renewing a permit under this section, the commissioner shall allow interested persons to submit written and oral testimony concerning the renewal to the commissioner within 30 days after the date of the notice. The commissioner ~~shall~~ may hold a hearing to take testimony.

(d) Before issuing or renewing a permit under this section, the commissioner shall consider all relevant testimony submitted under this section or AS 38.05.946(b). The commissioner may deny the application for issuance or renewal for good cause, but shall provide the applicant with written findings that explain the reason for the denial.

(e) Before issuing or renewing a permit under this section, the commissioner shall require the permittee to post a performance bond or provide other security to cover the costs to the department of restoring the permitted site in the event the permittee abandons the site.

(f) The commissioner shall adopt regulations establishing criteria for the approval or denial of permits under this section and for limiting the number of sites for which permits may be issued in an area in order to protect the environment and natural resources of the area. The regulations must provide for the consideration of upland

management policies and whether the proposed use of a site is compatible with the traditional and existing uses of the area in which the site is located.

* Sec. 18. AS 38.05.945(a) is amended to read:

(a) This section establishes the requirements for notice given by the department for the following actions:

(1) classification or reclassification of state land under AS 38.05.300 and the closing of land to mineral leasing or entry under AS 38.05.185;

(2) zoning of land under applicable law;

(3) a decision under AS 38.05.035(e) regarding the sale, lease, or disposal of an interest in state land or resources; [AND]

(4) a competitive disposal of an interest in state land or resources after final decision under AS 38.05.035(e);

(5) a public hearing under AS 38.05.856(c);

(6) a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries.

* Sec. 19. AS 38.05.945 is amended by adding a new subsection to read:

(g) Notice at least 30 days before action under (a)(5) or (6) shall be given to appropriate

(1) regional fish and game councils established under AS 16.05.260; and

(2) coastal resource service areas organized under AS 46.40.110 - 46.40.210.

* Sec. 20. AS 38.05.946 is amended by adding a new subsection to read:

(b) The commissioner shall hold a public hearing in each district identified under AS 38.05.855 within 30 days after giving notice of a preliminary finding under AS 38.05.035(e) and 38.05.855(c) concerning sites for aquatic farms and related hatcheries.

* Sec. 21. AS 16.05.340(a)(14) is repealed.

* Sec. 22. Except as provided in sec. 24 of this Act, the commissioner of fish and game may not issue a permit under AS 16.40.100 or 16.40.120, enacted by sec. 2 of this Act, until regulations have been adopted under AS 16.40.160, enacted by sec. 2 of this Act.

* Sec. 23. Except as provided in sec. 24 of this Act, the commissioner of natural resources may not enter into a lease under AS 38.05.083 or issue a permit under AS 38.05.856, enacted by secs. 16 and 17 of this Act, until the commissioner adopts regulations necessary for the implementation of AS 38.05.083 and 38.05.856.

* Sec. 24. Notwithstanding any other provisions of law, a person who is lawfully operating an aquatic farm or related hatchery in the state on the effective date of this Act is entitled to continue lawful operations at the existing site. The person may obtain an initial lease or permit for the person's existing operations under AS 38.05.083 or 38.05.856, enacted by secs. 16 and 17 of this Act, but as a condition of obtaining the lease or permit the person must agree that during the term of the lease or permit the person will not change the use of the site.

* Sec. 25. This Act takes effect immediately under AS 01.10.070(c).

5-1806N

Hein
4/14/88

Original sponsor: Resources Committee

IN THE SENATE BY THE RESOURCES COMMITTEE

CS FOR SENATE BILL NO. 482 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of Pacific salmon in saltwater; and providing for an effective date."

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

* Section 1. FINDINGS AND POLICY. (a) The legislature finds that

(1) aquatic farming in the state would

(A) provide a consistent source of quality food;

(B) provide new jobs;

(C) increase state exports;

(D) create new business opportunities; and

(E) increase the stability and diversity of the state's economy; and

(2) development of aquatic farming in the state would increase the availability of fresh seafood to Alaskans and would strengthen the competitiveness of Alaska seafood in the world marketplace by broadening the diversity of products and providing year-round supplies of premium quality seafood.

(b) It is the policy of the state

(1) to encourage the establishment and responsible growth of an aquatic farming industry in the state; and

(2) that allocation of aquatic farming sites be made with full consideration of established and ongoing activities in an area.

* Sec. 2. AS 16.40 is amended by adding new sections to read:

ARTICLE 2. AQUATIC FARMING.

Sec. 16.40.100. AQUATIC FARM AND HATCHERY PERMITS. (a) A person may not, without a permit from the commissioner, construct or operate

(1) an aquatic farm; or

(2) a hatchery for the purpose of supplying aquatic plants or aquatic animals to an aquatic farm.

(b) A permit issued under this section authorizes the permittee, subject to the conditions of AS 03.05 and AS 16.40.100 - 16.40.199, to acquire, purchase, offer to purchase, transfer, possess, sell, and offer to sell stock and aquatic farm products that are used or reared at the hatchery or aquatic farm. A hatchery that holds a permit under this section may sell or offer to sell bivalve shellfish spat to an aquatic farm or related hatchery outside of the state.

(c) The commissioner may attach conditions to a permit issued under this section that are necessary to protect the natural stock.

(d) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for the farming of, or hatchery operations involving, Pacific salmon in saltwater or Atlantic salmon.

(e) The commissioner may issue a permit under this section for the freshwater farming of, or freshwater hatchery operations involving, finfish other than Atlantic salmon only in a privately owned freshwater body that has no outlet to state water.

Sec. 16.40.105. CRITERIA FOR ISSUANCE OF PERMITS. The commissioner shall issue permits under AS 16.40.100 on the basis of the following criteria:

(1) the physical and biological characteristics of the proposed farm or hatchery location must be suitable for the farming of

the aquatic animal or aquatic plant proposed;

(2) the proposed farm may not unreasonably affect management of natural stocks, and must not require significant alterations in traditional fisheries or other existing uses of fish and wildlife resources;

(3) the proposed farm may not significantly affect fisheries, wildlife, or their habitats in an adverse manner; and

(4) the proposed farm plans and staffing plans must demonstrate technical and operational feasibility.

Sec. 16.40.110. PERMIT APPLICATION, RENEWAL, AND TRANSFER. (a) An applicant for an aquatic farming or hatchery permit required under AS 16.40.100 shall apply on a form prescribed by the commissioner. An application for a permit must include a plan for the development and operation of the aquatic farm or hatchery, which must be approved by the commissioner before the permit is issued.

(b) An application for renewal or transfer of a permit must be accompanied by fees required by the commissioner, a report of the disease history of the farm or hatchery covered by the permit, and evidence that satisfies the commissioner that the applicant has complied with the development plan required under (a) of this section. The commissioner may require a health inspection of the farm or hatchery as a condition of renewal. The department may conduct the inspection or contract with a disease diagnostician to conduct the inspection.

(c) A person to whom a permit is transferred may use the permit only for the purposes for which the permit was authorized to be used by the transferor, and subject to the same conditions and limitations.

Sec. 16.40.120. AQUATIC STOCK ACQUISITION PERMITS. (a) A person may not acquire aquatic plants or aquatic animals from wild

stock in the state for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100 unless the person holds an acquisition permit from the commissioner.

(b) An acquisition permit authorizes the permit holder to acquire the species and quantities of wild stock in the state specified in the permit for the purposes of supplying stock to

(1) an aquatic farm or hatchery required to have a permit under AS 16.40.100;

(2) the department; or

(3) sources outside of the state.

(c) The commissioner shall specify the expiration date of an acquisition permit and may attach conditions to an acquisition permit, including conditions relating to the time, place, and manner of harvest. Size, gear, place, time, licensing, and other limitations applicable to sport, commercial, or subsistence harvest of aquatic plants and aquatic animals do not apply to a harvest with a permit issued under this section. The commissioner of fish and game shall issue or deny a permit within 30 days after receiving an application.

(d) The commissioner shall deny or restrict a permit under this section upon finding that the proposed harvest will impair sustained yield of the species. The commissioner may deny or restrict a permit under this section upon finding that the proposed harvest will unreasonably disrupt established uses of the resources by commercial, sport, personal use, or subsistence users. The commissioner shall forward to the Board of Fisheries for action permit applications for species that support commercial fisheries subject to limited entry under AS 16.43. A denial of the permit by the commissioner must contain the factual basis for the findings.

(e) The Board of Fisheries may adopt regulations for the

conservation, maintenance, and management of species for which an acquisition permit is required.

(f) Except as provided in (d) of this section, the commissioner shall issue a permit if

(1) wild stock is necessary to meet the initial needs of farm or hatchery stock;

(2) there are technological limitations on the propagation of cultured stock for the species sought;

(3) wild stock sought is not fully utilized by commercial, sport, personal use, or subsistence fisheries; or

(4) wild stock is needed to maintain the gene pool of a hatchery or aquatic farm.

(g) Aquatic plants and aquatic animals acquired under a permit issued under this section become the property of the permit holder and are no longer a public or common resource.

Sec. 16.40.130. IMPORTATION OF AQUATIC PLANTS OR AQUATIC ANIMALS FOR STOCK. A person may not import into the state an aquatic plant or aquatic animal for the purpose of supplying stock to an aquatic farm or hatchery unless authorized by a regulation of the Board of Fisheries.

Sec. 16.40.140. LIMITATION ON SALE, TRANSFER OF STOCK, AND PRODUCTS. (a) A private hatchery required to have a permit under AS 16.40.100 may sell or transfer stock from the hatchery only to an aquatic farm or other hatchery that has a permit issued under AS 16.40.100, except that bivalve shellfish spat may also be sold or offered for sale to an aquatic farm or related hatchery outside of the state.

(b) Stock may not be transferred to or from an aquatic farm or hatchery required to have a permit under AS 16.40.100 without prior notice of the transfer to the commissioner. A notice of transfer

shall be submitted at least 45 days before the proposed date of transfer.

(c) A notice of transfer must be accompanied by a report of a health inspection of the stock. The department shall conduct the inspection or contract with a disease diagnostician to conduct the inspection. The cost of inspection shall be borne by the department.

(d) The department may restrict or disapprove a transfer of stock if it finds that the transfer would present a risk of spreading disease.

(e) A person may not sell, transfer, or offer to sell or transfer, or knowingly purchase or receive, an aquatic farm product grown or propagated in the state unless the product was grown or propagated on a farm with a permit issued under AS 16.40.100. The permit must be in effect at the time of the sale, transfer, purchase, receipt, or offer.

Sec. 16.40.150. DISEASE CONTROL AND INSPECTION. (a) The department shall order the quarantine or the destruction and disposal of diseased hatchery stock or of aquatic farm products when necessary to protect wild stock. A holder of a permit issued under AS 16.40.100 shall report to the department an outbreak or incidence of disease among stock or aquatic farm products of the permit holder within 48 hours after discovering the outbreak or incidence.

(b) A holder of a permit issued under AS 16.40.100 shall allow the department to inspect the permit holder's farm or hatchery during operating hours and upon reasonable notice. The cost of inspection shall be borne by the department.

(c) The department shall develop a disease management and control program for aquatic farms and hatcheries.

(d) The department may enter into an agreement with a state or

federal agency or a private, state-certified provider to provide services under (b) and (c) of this section, or inspections under AS 16.-40.110(b).

Sec. 16.40.160. REGULATIONS. The commissioner may adopt regulations necessary to implement AS 16.40.100 - 16.40.199.

Sec. 16.40.170. PENALTY. A person who violates a provision of AS 16.40.100 - 16.40.199, a regulation adopted under AS 16.40.100 - 16.40.199, or a term or condition of a permit issued under AS 16.40.-100 - 16.40.199, is guilty of a class B misdemeanor.

Sec. 16.40.199. DEFINITIONS. In AS 16.40.100 - 16.40.199

(1) "aquatic animal" means shellfish or finfish;

(2) "aquatic farm" means a facility that grows, farms, or cultivates aquatic farm products in captivity or under positive control;

(3) "aquatic farm product" means an aquatic plant or aquatic animal, or part of an aquatic plant or aquatic animal, that is propagated, farmed, or cultivated in an aquatic farm and sold or offered for sale;

(4) "aquatic plant" means a plant indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(5) "commissioner" means the commissioner of fish and game;

(6) "hatchery" means a facility for the artificial propagation of stock, including rearing of juvenile aquatic plants or aquatic animals;

(7) "positive control" means, for mobile species, enclosed within a natural or artificial escape-proof barrier; for species with limited or no mobility, such as a bivalve or an aquatic plant, "positive control" also includes managed cultivation in unenclosed water;

(8) "shellfish" means a species of crustacean, mollusk, or other invertebrate, in any stage of its life cycle, that is indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(9) "stock" means live aquatic plants or aquatic animals acquired, collected, possessed, or intended for use by a hatchery or aquatic farm for the purpose of further growth or propagation.

* Sec. 3. AS 03.05.011(a) is amended to read:

(a) To carry out the requirements of this title, the commissioner of environmental conservation may issue orders, regulations, permits, quarantines, and embargoes relating to

(1) examination and inspection of premises containing products, articles, and commodities carrying pests;

(2) establishment of quarantines for eradication of pests;

(3) establishment of standards and labeling requirements pertaining to the sale of meat, fish, and poultry;

(4) tests and analyses which may be made and hearings which may be held to determine whether the commissioner will issue a stop order or quarantine;

(5) cooperation with federal and other state agencies;

(6) regulation of fur farming; for purposes of this paragraph, "fur farming" means the raising of and caring for animals for the purpose of marketing their fur, or animals themselves for breeding stock;

(7) examination and inspection of meat, fish, and poultry advertised for sale or sold to the public;

(8) enforcement of quality assurance plans developed in cooperation with appropriate industry representatives;

(9) establishment of standards and conditions for the

operation and siting of aquatic farms and related hatcheries, including

(A) restrictions on the use of chemicals; and

(B) requirements to protect the public from contaminated aquatic farm products that pose a risk to health;

(10) monitoring aquatic farms and aquatic farm products to ensure compliance with this chapter and with the requirements of the national shellfish sanitation program manual of operations published by the Food and Drug Administration.

* Sec. 4. AS 03.05.020(a) is amended to read:

(a) The commissioner shall

(1) require routine inspection of food animals, fish, poultry and derivative food products, to protect the public against fraud, disease and spoilage, and in this connection adopt uniform regulations establishing standards of identity and composition of these food products and minimum standards of sanitation and handling methods as to all phases of slaughtering, processing, storing, transporting, displaying and selling of these food products;

(2) issue orders or cause the orders to be issued by an authorized veterinarian prohibiting transportation and sale of food products intended for human consumption which do not meet the minimum requirements established under (1) of this subsection, and limiting their use and disposal in conformity with protection of the public;

(3) adopt a schedule of fees or charges, and credit provisions, for services rendered by state veterinarians to farmers and others at their request in caring for livestock and poultry, and all the fees shall be transmitted to the commissioner for deposit in the state treasury;

(4) designate points of entry for admission of livestock or

poultry into the state, and arrange inspection at those points with or without collaboration and assistance of the federal government, and bar entry of stock or poultry not shipped under a valid permit or not free from contagious or infectious disease;

(5) adopt, repeal, and amend regulations consistent with existing law for

(A) the labeling and grading of milk and milk products and standards of cleanliness and sanitation, to at least the minimum of current recommendations of the United States Public Health Service, for the operation of dairies selling, or offering for sale, milk or milk products;

(B) the production and sale of ice cream and allied frozen desserts;

(C) the production and sale of imitation milk and imitation milk products;

(D) the labeling of aquatic farm products as aquatic farm products.

* Sec. 5. AS 03.05.040(a) is amended to read:

(a) On any business day during the usual hours of business the commissioner or an authorized inspector may, for the purpose of inspecting agricultural, [OR] fisheries, or aquatic farm products or aquatic farm sites subject to regulation, enter a storehouse, warehouse, cold storage plant, packing house, slaughterhouse, etail store or other building or place where those products are kept, stored, processed or sold.

* Sec. 6. AS 03.05.100 is amended to read:

Sec. 03.05.100. DEFINITIONS. In this chapter,

(1) "agricultural products" does not include fish or fisheries products;

(2) "aquatic farm" and "aquatic farm product" have the meanings given in AS 16.40.199;

(3) "fish or fisheries products" means any aquatic animal, including amphibians, or aquatic plants or parts of those plants, animals or amphibians that are usable as human food.

* Sec. 7. AS 16.05.050 is amended by adding a new paragraph to read:

(17) to permit and regulate aquatic farming in the state in a manner that ensures the protection of the state's fish and game resources and improves the economy, health, and well-being of the citizens of the state;

* Sec. 8. AS 16.05.251 is amended by adding a new subsection to read:

(f) Except as expressly provided in AS 16.40.120(d) and 16.40.-130, the Board of Fisheries may not adopt regulations or take action regarding the issuance, denial, or conditioning of a permit under AS 16.40.100 or 16.40.120, the construction or operation of a farm or hatchery required to have a permit under AS 16.40.100, or a harvest with a permit issued under AS 16.40.120. Regulations or orders adopted by the Board of Fisheries under this section do not apply to a harvest with a permit issued under AS 16.40.120.

* Sec. 9. AS 16.05.330(a) is amended to read:

(a) Except as otherwise permitted in this chapter, a person may not engage in sport fishing, including the taking of razor clams; in hunting, trapping, or fur dealing; in the farming of [FISH,] fur [,] or game; or in taxidermy, without having the appropriate license or tag in actual possession.

* Sec. 10. AS 16.05.930 is amended by adding a new subsection to read:

(g) AS 16.05.330 - 16.05.720 do not apply to an activity authorized by a permit issued under AS 16.40.100 or 16.40.120, or to a person or vessel employed in an activity authorized by a permit issued

under AS 16.40.100 or 16.40.120.

* Sec. 11. AS 16.05.940(14) is amended to read:

(14) "[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 game [THEIR] products, and "captivity" means having the [FISH OR] game under positive control, as in a pen [, POND,] or an area of land that [OR WATER WHICH] is completely enclosed by a generally escape-proof barrier;

* Sec. 12. AS 16.10 is amended by adding a new section to read:

Sec. 16.10.269. LIMITATIONS. AS 16.10.265 - 16.10.267 do not apply to the purchase or sale of aquatic farm products from a holder of a permit issued under AS 16.40.100 or stock from a holder of a permit issued under AS 16.40.120.

* Sec. 13. AS 16.10.400 is amended by adding a new subsection to read:

(h) AS 16.10.400 - 16.10.475 do not apply to the construction or operation of a private hatchery that has a permit issued under AS 16.40.100.

* Sec. 14. AS 16.43.140 is amended by adding a new subsection to read:

(d) This chapter does not apply to activities authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 15. AS 16.51.180(5) is amended to read:

(5) "seafood" means finfish, shellfish, and fish by-products, including but not limited to salmon, halibut, herring, flounder, crab, clam, cod, shrimp, and pollock, but does not include aquatic farm products as defined in AS 16.40.199;

* Sec. 16. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.083. AQUATIC FARMING AND HATCHERY SITE LEASES. (a) The commissioner may offer to the public for lease a site that has been developed for aquatic farming or related hatchery operations

under a permit issued under AS 38.05.856. Before offering the site to the public, the commissioner shall offer the site to the permittee.

(b) A site shall be leased under this section for not less than the appraised fair market value of the lease. The value of the lease shall be reappraised every five years.

(c) A lease under this section may be assigned, but if the assignee changes the use of the site the lease reverts to the state.

(d) Before entering into a lease under this section, the commissioner shall require the lessee to post a performance bond or provide other security to cover the costs to the department of restoring the leased site in the event the lessee abandons the site.

* Sec. 17. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.856. TIDELAND AND LAND USE PERMITS FOR AQUATIC FARMING. (a) The commissioner may issue a tideland or land use permit for the establishment and operation of an aquatic farm and related hatchery operations. A permit under this section is valid for three years after the date of issuance. The permit may not be transferred.

(b) Before issuing or renewing a permit under this section, the commissioner shall allow interested persons to submit written or oral testimony concerning the renewal to the commissioner within 30 days after the date of the notice. The commissioner may hold a hearing to take testimony.

(c) Before issuing or renewing a permit under this section, the commissioner shall consider all relevant testimony submitted under this section. The commissioner may deny the application for issuance or renewal for good cause, but shall provide the applicant with written findings that explain the reason for the denial.

(d) Before issuing or renewing a permit under this section, the commissioner shall require the permittee to post a performance bond or

provide other security to cover the costs to the department of restoring the permitted site in the event the permittee abandons the site.

(e) The commissioner shall adopt regulations establishing criteria for the approval or denial of permits under this section and for limiting the number of sites for which permits may be issued in an area in order to protect the environment and natural resources of the area. The regulations must provide for the consideration of upland management policies and whether the proposed use of a site is compatible with the traditional and existing uses of the area in which the site is located.

* Sec. 18. AS 38.05.945(a) is amended to read:

(a) This section establishes the requirements for notice given by the department for the following actions:

(1) classification or reclassification of state land under AS 38.05.300 and the closing of land to mineral leasing or entry under AS 38.05.185;

(2) zoning of land under applicable law;

(3) a decision under AS 38.05.035(e) regarding the sale, lease, or disposal of an interest in state land or resources; [AND]

(4) a competitive disposal of an interest in state land or resources after final decision under AS 38.05.035(e)[.]; or

(5) a public hearing under AS 38.05.856(b).

* Sec. 19. AS 38.05.945 is amended by adding a new subsection to read:

(g) Notice at least 30 days before action under (a)(5) or (6) shall be given to appropriate

(1) regional fish and game councils established under AS 16.05.260; and

(2) coastal resource service areas organized under AS 46.40.110 - 46.40.210.

* Sec. 20. AS 16.05.340(a)(14) is repealed.

* Sec. 21. Notwithstanding any other provisions of law, a person who is lawfully operating an aquatic farm or related hatchery in the state on the effective date of this Act is entitled to continue lawful operations at the existing site. The person may obtain an initial lease or permit for the person's existing operations under AS 38.05.083 or 38.05.856, enacted by secs. 16 and 17 of this Act, but as a condition of obtaining the lease or permit the person must agree that during the term of the lease or permit the person will not change the use of the site.

* Sec. 22. LAND MANAGEMENT REPORT REQUIRED. The commissioner of natural resources shall submit to the legislature not later than January 30, 1989, a report detailing the department's implementation of AS 38.05.083 and 38.05.856, enacted by secs. 16 and 17 of this Act. The report must include

(1) the number of applications received under AS 38.05.083 and 38.05.856, and the number of leases and permits issued, according to type of aquatic farm product;

(2) the restrictions attached to permits and leases;

(3) a discussion of the system the department implements for issuing leases and tideland and land use permits;

(4) the level of public involvement in the issuance process; and

(5) a discussion of how the program is working, and the department's plans for modifications of the program.

* Sec. 23. This Act takes effect immediately under AS 01.10.070(c).

5-1806L
Hein
3/8/88

Original sponsor: Resources Committee

IN THE SENATE BY THE RESOURCES COMMITTEE

CS FOR SENATE BILL NO. 482 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of finfish in saltwater; and providing for an effective date."

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

* Section. 1. AS 16.40 is amended by adding new sections to read:

ARTICLE 2. AQUATIC FARMING.

Sec. 16.40.100. AQUATIC FARM AND HATCHERY PERMITS. (a) A person may not, without a permit from the commissioner, construct or operate

(1) an aquatic farm; or

(2) a hatchery for the purpose of supplying aquatic plants or aquatic animals to an aquatic farm.

(b) A permit issued under this section authorizes the permittee, subject to the conditions of AS 03.05.011 and AS 16.40.100 - 16.40.-199, to acquire, purchase, offer to purchase, transfer, possess, sell, and offer to sell stock and aquatic farm products that are used or reared at the hatchery or aquatic farm.

(c) The commissioner, with the concurrence of the commissioner of environmental conservation, may attach conditions to a permit issued under this section that are necessary to protect the public health or natural stock.

(d) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for the farming of, or

hatchery operations involving, finfish in saltwater.

Sec. 16.40.105. CRITERIA FOR ISSUANCE OF PERMITS. The commissioner shall issue permits under AS 16.40.100 on the basis of the following criteria:

(1) the biological and environmental suitability of the site for the proposed aquatic farm or hatchery;

(2) the ability of the permit applicant to establish and operate the aquatic farm or hatchery without

(A) adversely affecting the department's management of wild stocks;

(B) requiring alterations in traditional fisheries and other existing uses of fish and wildlife resources; or

(C) adversely affecting wild stocks of fish or wildlife, or their habitats.

Sec. 16.40.110. PERMIT APPLICATION, RENEWAL, AND TRANSFER. (a) An applicant for an aquatic farming or hatchery permit required under AS 16.40.100 shall apply on a form prescribed by the commissioner. An application for a permit must include a plan for the development and operation of the aquatic farm or hatchery, which must be approved by the commissioner before the permit is issued.

(b) An application for renewal or transfer of a permit must be accompanied by fees required by the commissioner, a report of the disease history of the farm or hatchery covered by the permit, and evidence that satisfies the commissioner that the applicant has complied with the development plan required under (a) of this section. The commissioner may require a health inspection of the farm or hatchery as a condition of renewal. The department may conduct the inspection or contract with a disease diagnostician to conduct the inspection.

(c) A person to whom a permit is transferred may use the permit only for the purposes for which the permit was authorized to be used by the transferor, and subject to the same conditions and limitations.

Sec. 16.40.120. AQUATIC FARM STOCK ACQUISITION PERMITS. (a) A person may not acquire aquatic plants or aquatic animals from wild stock in the state for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100 unless the person holds an acquisition permit from the commissioner.

(b) An acquisition permit authorizes the permit holder to acquire the species and quantities of wild stock in the state specified in the permit for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100.

(c) The commissioner shall specify the expiration date of an acquisition permit and may attach conditions to an acquisition permit, including conditions relating to the time, place, and manner of harvest. Size, gear, place, time, licensing, and other limitations applicable to sport, commercial, or subsistence harvest of aquatic plants and aquatic animals do not apply to a harvest with a permit issued under this section. The commissioner of fish and game shall issue or deny a permit within 30 days after receiving an application.

(d) The commissioner shall deny or restrict a permit under this section upon finding that the proposed harvest will impair sustained yield of the species. The commissioner may deny or restrict a permit under this section upon finding that the proposed harvest will disrupt established uses of the resources by commercial, sport, personal use, or subsistence users. The commissioner shall forward to the Board of Fisheries for action permit applications for species that support commercial fisheries subject to limited entry under AS 16.43. A denial of the permit by the commissioner must contain the factual

basis for the findings.

(e) The Board of Fisheries may adopt regulations for the conservation, maintenance, and management of species for which an aquisition permit is required.

(f) Except as provided in (d) of this section, the commissioner shall issue a permit if

(1) wild stock is necessary to meet the initial needs of farm or hatchery stock;

(2) there are technological limitations on the propagation of cultured stock for the species sought;

(3) wild stock sought is not fully utilized by commercial, sport, personal use, or subsistence fisheries; or

(4) wild stock is needed to maintain the gene pool of a hatchery or aquatic farm.

(g) Aquatic plants and aquatic animals acquired under a permit issued under this section become the property of the permit holder and are no longer a public or common resource.

Sec. 16.40.130. IMPORTATION OF AQUATIC PLANTS OR AQUATIC ANIMALS FOR STOCK. A person may not import into the state an aquatic plant or aquatic animal for the purpose of supplying stock to an aquatic farm or hatchery unless authorized by a regulation of the Board of Fisheries.

Sec. 16.40.140. LIMITATION ON SALE, TRANSFER OF STOCK, AND PRODUCTS. (a) A private hatchery required to have a permit under AS 16.40.100 may sell or transfer stock from the hatchery only to an aquatic farm or other hatchery that has a permit issued under AS 16.40.100.

(b) Stock may not be transferred to or from an aquatic farm or hatchery required to have a permit under AS 16.40.100 without prior

notice of the transfer to the commissioner. A notice of transfer shall be submitted at least 30 days before the proposed date of transfer.

(c) A notice of transfer must be accompanied by a report of a health inspection of the stock. The department shall conduct the inspection or contract witn a disease diagnostician to conduct the inspection. The cost of inspection shall be borne by the department.

(d) The department may restrict or disapprove a transfer of stock if it finds that the transfer would present a risk of spreading disease.

(e) A person may not sell, transfer, or offer to sell or transfer, or knowingly purchase or receive, an aquatic farm product grown or propagated in the state unless the product was grown or propagated on a farm with a permit issued under AS 16.40.100. The permit must be in effect at the time of the sale, transfer, purchase, receipt, or offer.

Sec. 16.40.150. DISEASE CONTROL AND INSPECTION. (a) The department shall order the quarantine or the destruction and disposal of diseased hatchery stock or of aquatic farm products when necessary to protect wild stock. A holder of a permit issued under AS 16.40.100 shall report to the department an outbreak or incidence of disease among stock or aquatic farm products of the permit holder.

(b) A holder of a permit issued under AS 16.40.100 shall allow the department to inspect the permit holder's farm or hatchery during operating hours and upon reasonable notice. The cost of inspection shall be borne by the department.

(c) The department shall develop a disease management and control program for aquatic farms and hatcheries.

(d) The department may enter into an agreement with a state or

federal agency or a private, state-certified provider to provide services under (b) and (c) of this section, or inspections under AS 16.40.110(b).

Sec. 16.40.160. REGULATIONS. The commissioner may adopt regulations necessary to implement AS 16.40.100 - 16.40.199.

Sec. 16.40.170. PENALTY. A person who violates a provision of AS 16.40.100 - 16.40.199, a regulation adopted under AS 16.40.100 - 16.40.199, or a term or condition of a permit issued under AS 16.40.100 - 16.40.199, is guilty of a class B misdemeanor.

Sec. 16.40.199. DEFINITIONS. In AS 16.40.100 - 16.40.199

(1) "aquatic animal" means shellfish or freshwater finfish;

(2) "aquatic farm" means a facility that grows, farms, or cultivates aquatic farm products in captivity or under positive control;

(3) "aquatic farm product" means an aquatic plant or aquatic animal, or part of an aquatic plant or aquatic animal, that is propagated, farmed, or cultivated in an aquatic farm and sold or offered for sale for the purpose of consumption, or kelp that is cultivated for use in dyes;

(4) "aquatic plant" means a plant indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(5) "commissioner" means the commissioner of fish and game;

(6) "hatchery" means a facility for the artificial propagation of stock, including rearing of juvenile aquatic plants or aquatic animals;

(7) "positive control" means, for mobile species, enclosed within a natural or artificial escape-proof barrier; for species with limited or no mobility, such as a bivalve or an aquatic plant,

"positive control" also includes managed cultivation in unenclosed water;

(8) "shellfish" means a species of crustacean, mollusk, or other invertebrate, in any stage of its life cycle, that is indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(9) "stock" means live aquatic plants or aquatic animals acquired, collected, possessed, or intended for use by a hatchery or aquatic farm for the purpose of further growth or propagation.

* Sec. 2. AS 03.05.011(a) is amended to read:

(a) To carry out the requirements of this title, the commissioner of environmental conservation may issue orders, regulations, permits, quarantines, and embargoes relating to

(1) examination and inspection of premises containing products, articles, and commodities carrying pests;

(2) establishment of quarantines for eradication of pests;

(3) establishment of standards and labeling requirements pertaining to the sale of meat, fish, and poultry;

(4) tests and analyses which may be made and hearings which may be held to determine whether the commissioner will issue a stop order or quarantine;

(5) cooperation with federal and other state agencies;

(6) regulation of fur farming; for purposes of this paragraph, "fur farming" means the raising of and caring for animals for the purpose of marketing their fur, or animals themselves for breeding stock;

(7) examination and inspection of meat, fish, and poultry advertised for sale or sold to the public;

(8) enforcement of quality assurance plans developed in

cooperation with appropriate industry representatives;

(9) establishment of standards and conditions of operation for aquatic farms and related hatcheries, including

(A) restrictions on the use of chemicals; and

(B) requirements to protect the public from contaminants that pose a risk to health.

* Sec. 3. AS 03.05.020(a) is amended to read:

(a) The commissioner shall

(1) require routine inspection of food animals, fish, poultry and derivative food products, to protect the public against fraud, disease and spoilage, and in this connection adopt uniform regulations establishing standards of identity and composition of these food products and minimum standards of sanitation and handling methods as to all phases of slaughtering, processing, storing, transporting, displaying and selling of these food products;

(2) issue orders or cause the orders to be issued by an authorized veterinarian prohibiting transportation and sale of food products intended for human consumption which do not meet the minimum requirements established under (1) of this subsection, and limiting their use and disposal in conformity with protection of the public;

(3) adopt a schedule of fees or charges, and credit provisions, for services rendered by state veterinarians to farmers and others at their request in caring for livestock and poultry, and all the fees shall be transmitted to the commissioner for deposit in the state treasury;

(4) designate points of entry for admission of livestock or poultry into the state, and arrange inspection at those points with or without collaboration and assistance of the federal government, and bar entry of stock or poultry not shipped under a valid permit or not

free from contagious or infectious disease;

(5) adopt, repeal, and amend regulations consistent with existing law for

(A) the labeling and grading of milk and milk products and standards of cleanliness and sanitation, to at least the minimum of current recommendations of the United States Public Health Service, for the operation of dairies selling, or offering for sale, milk or milk products;

(B) the production and sale of ice cream and allied frozen desserts;

(C) the production and sale of imitation milk and imitation milk products;

(D) the labeling of aquatic farm products as aquatic farm products;

(6) monitor aquatic farms that hold permits under AS 16.-40.100 to ensure compliance with the requirements of the national shellfish sanitation program manual of operations published by the Food and Drug Administration.

* Sec. 4. AS 03.05.040(a) is amended to read:

(a) On any business day during the usual hours of business the commissioner or an authorized inspector may, for the purpose of inspecting agricultural, [OR] fisheries, or aquatic farm products or aquatic farm sites subject to regulation, enter a storehouse, warehouse, cold storage plant, packing house, slaughterhouse, retail store or other building or place where those products are kept, stored, processed or sold.

* Sec. 5. AS 03.05.100 is amended to read:

Sec. 03.05.100. DEFINITIONS. In this chapter,

(1) "agricultural products" does not include fish or

fisheries products;

(2) "aquatic farm" and "aquatic farm product" have the meanings given in AS 16.40.199;

(3) "fish or fisheries products" means any aquatic animal, including amphibians, or aquatic plants or parts of those plants, animals or amphibians that are usable as human food.

* Sec. 6. AS 16.05.050 is amended by adding a new paragraph to read:

(17) to permit and regulate aquatic farming in the state in a manner that ensures the protection of the state's fish and game resources and improves the economy, health, and well-being of the citizens of the state;

* Sec. 7. AS 16.05.251 is amended by adding a new subsection to read:

(f) Except as expressly provided in AS 16.40.120(d) and 16.40.-130, the Board of Fisheries may not adopt regulations or take action regarding the issuance, denial, or conditioning of a permit under AS 16.40.100 or 16.40.120, the construction or operation of a farm or hatchery required to have a permit under AS 16.40.100, or a harvest with a permit issued under AS 16.40.120. Regulations or orders adopted by the Board of Fisheries under this section do not apply to a harvest with a permit issued under AS 16.40.120.

* Sec. 8. AS 16.05.330(a) is amended to read:

(a) Except as otherwise permitted in this chapter, a person may not engage in sport fishing, including the taking of razor clams; in hunting, trapping, or fur dealing; in the farming of [FISH,] fur [,] or game; or in taxidermy, without having the appropriate license or tag in actual possession.

* Sec. 9. AS 16.05.930 is amended by adding a new subsection to read:

(g) AS 16.05.330 - 16.05.720 do not apply to an activity authorized by a permit issued under AS 16.40.100 or 16.40.120, or to a

person or vessel employed in an activity authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 10. AS 16.05.940(14) is amended to read:

(14) "[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 <u>game</u> [THEIR] products, and "captivity" means having the [FISH OR] game under positive control, as in a pen [, POND,] or an area of land <u>that</u> [OR WATER WHICH] is completely enclosed by a generally escape-proof barrier;

* Sec. 11. AS 16.10 is amended by adding a new section to read:

Sec. 16.10.269. LIMITATIONS. AS 16.10.265 - 16.10.267 do not apply to the purchase or sale of aquatic farm products from a holder of a permit issued under AS 16.40.100 or stock from a holder of a permit issued under AS 16.40.120.

* Sec. 12. AS 16.10.400 is amended by adding a new subsection to read:

(h) AS 16.10.400 - 16.10.475 do not apply to the construction or operation of a private hatchery that has a permit issued under AS 16.40.100.

* Sec. 13. AS 16.43.140 is amended by adding a new subsection to read:

(d) This chapter does not apply to activities authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 14. AS 16.51.180(5) is amended to read:

(5) "seafood" means finfish, shellfish, and fish by-products, including but not limited to salmon, halibut, herring, flounder, crab, clam, cod, shrimp, and pollock<u>, but does not include aquatic farm products as defined in AS 16.40.199</u>;

* Sec. 15. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.083. AQUATIC FARMING AND HATCHERY SITE LEASES. (a) The commissioner may offer to the public for lease a site that has

been developed for aquatic farming or related hatchery operations under a permit issued under AS 38.05.856. Before offering the site to the public, the commissioner shall offer the site to the permittee.

(b) A site shall be leased under this section for not less than the appraised fair market value of the lease. The value of the lease shall be reappraised every five years.

(c) A lease under this section may be assigned, but if the assignee changes the use of the site the lease reverts to the state.

(d) Before entering into a lease under this section, the commissioner shall require the lessee to post a performance bond or provide other security to cover the costs to the department of restoring the leased site in the event the lessee abandons the site.

* Sec. 16. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.856. TIDELAND AND LAND USE PERMITS FOR AQUATIC FARMING. (a) The commissioner may issue a tideland or land use permit for the establishment and operation of an aquatic farm and related hatchery operations for not less than the appraised fair market rental value of the site. The value shall be reappraised every five years.

(b) A permit under this section is valid for five years after the date of issuance. The permit may not be transferred.

(c) Before issuing or renewing a permit under this section, the commissioner shall (1) provide a copy of the application to newspapers, radio and television stations for public service announcement or (2) provide paid notice of the application once each week for three successive weeks in a newspaper or by radio. The notice required in this subsection must be in more than one language if the commissioner decides it is necessary. The notice must state that interested persons may submit written and oral testimony concerning the issuance or renewal to the commissioner within 30 days after the date of the

notice. The commissioner shall hold a hearing to take testimony.

(d) Before issuing or renewing a permit under this section, the commissioner shall consider all relevant testimony submitted. Based on the testimony or other good cause, the commissioner may deny the application for issuance or renewal, but must provide the applicant with written findings that explain the reason for the denial.

(e) Before issuing or renewing a permit under this section, the commissioner shall require the permittee to post a performance bond or provide other security to cover the costs to the department of restoring the permitted site in the event the permittee abandons the site.

(f) The commissioner shall adopt regulations establishing criteria for the approval or denial of permits under this section and for limiting the number of sites for which permits may be issued in an area in order to protect the environment and natural resources of the area.

* Sec. 17. AS 16.05.340(a)(14) is repealed.

* Sec. 18. Except as provided in sec. 20 of this Act, the commissioner of fish and game may not issue a permit under AS 16.40.100 or 16.40.120, enacted by sec. 1 of this Act, until regulations have been adopted under AS 16.40.160, enacted by sec. 1 of this Act.

* Sec. 19. Except as provided in sec. 20 of this Act, the commissioner of natural resources may not enter into a lease under AS 38.05.083 or issue a permit under AS 38.05.856, enacted by secs. 15 and 16 of this Act, until the commissioner adopts regulations necessary for the implementation of AS 38.05.083 and 38.05.856.

* Sec. 20. Notwithstanding any other provisions of law, a person who is lawfully operating an aquatic farm or related hatchery in the state on the effective date of this Act is entitled to continue lawful operations at the existing site. The person may obtain an initial lease or permit for the

person's existing operations under AS 38.05.083 or 38.05.856, enacted by secs. 15 and 16 of this Act, but as a condition of obtaining the lease or permit the person must agree that during the term of the lease or permit the person will not expand operations beyond the scope allowed under the existing permit.

* Sec. 21. This Act takes effect immediately under AS 01.10.070(c).

5-18061
Hein
3/14/88

Original sponsor: Resources Committee

IN THE SENATE BY THE RESOURCES COMMITTEE

CS FOR SENATE BILL NO. 482 (Resources)

IN THE LEGISLATURE OF THE STATE OF ALASKA

FIFTEENTH LEGISLATURE - SECOND SESSION

A BILL

For an Act entitled: "An Act relating to the farming of aquatic plants and aquatic animals; prohibiting the aquatic farming of certain finfish in saltwater; and providing for an effective date."

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

* Section. 1. AS 16.40 is amended by adding new sections to read:

ARTICLE 2. AQUATIC FARMING.

Sec. 16.40.100. AQUATIC FARM AND HATCHERY PERMITS. (a) A person may not, without a permit from the commissioner, construct or operate

(1) an aquatic farm; or

(2) a hatchery for the purpose of supplying aquatic plants or aquatic animals to an aquatic farm.

(b) A permit issued under this section authorizes the permittee, subject to the conditions of AS 03.05.011 and AS 16.40.100 - 16.40.-199, to acquire, purchase, offer to purchase, transfer, possess, sell, and offer to sell stock and aquatic farm products that are used or reared at the hatchery or aquatic farm.

(c) The commissioner, with the concurrence of the commissioner of environmental conservation, may attach conditions to a permit issued under this section that are necessary to protect the public health or natural stock.

(d) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for th· farming of, or

hatchery operations involving, the following species of Pacific salmon in a bay or estuary of the state: chinook, sockeye, coho, pink, and chum.

(e) Notwithstanding other provisions of law, the commissioner may not issue a permit under this section for the farming of, or hatchery operations involving, Atlantic salmon in saltwater.

Sec. 16.40.105. CRITERIA FOR ISSUANCE OF PERMITS. The commissioner shall issue permits under AS 16.40.100 on the basis of the following criteria:

(1) the biological and environmental suitability of the site for the proposed aquatic farm or hatchery;

(2) the ability of the permit applicant to establish and operate the aquatic farm or hatchery without

(A) adversely affecting the department's management of wild stocks;

(B) requiring alterations in traditional fisheries and other existing uses of fish and wildlife resources; or

(C) adversely affecting wild stocks of fish or wildlife, or their habitats.

Sec. 16.40.110. PERMIT APPLICATION, RENEWAL, AND TRANSFER. (a) An applicant for an aquatic farming or hatchery permit required under AS 16.40.100 shall apply on a form prescribed by the commissioner. An application for a permit must include a plan for the development and operation of the aquatic farm or hatchery, which must be approved by the commissioner before the permit is issued.

(b) An application for renewal or transfer of a permit must be accompanied by fees required by the commissioner, a report of the disease history of the farm or hatchery covered by the permit, and evidence that satisfies the commissioner that the applicant has

complied with the development plan required under (a) of this section. The commissioner may require a health inspection of the farm or hatchery as a condition of renewal. The department may conduct the inspection or contract with a disease diagnostician to conduct the inspection.

(c) A person to whom a permit is transferred may use the permit only for the purposes for which the permit was authorized to be used by the transferor, and subject to the same conditions and limitations.

Sec. 16.40.120. AQUATIC FARM STOCK ACQUISITION PERMITS. (a) A person may not acquire aquatic plants or aquatic animals from wild stock in the state for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100 unless the person holds an acquisition permit from the commissioner.

(b) An acquisition permit authorizes the permit holder to acquire the species and quantities of wild stock in the state specified in the permit for the purpose of supplying stock to an aquatic farm or hatchery required to have a permit under AS 16.40.100.

(c) The commissioner shall specify the expiration date of an acquisition permit and may attach conditions to an acquisition permit, including conditions relating to the time, place, and manner of harvest. Size, gear, place, time, licensing, and other limitations applicable to sport, commercial, or subsistence harvest of aquatic plants and aquatic animals do not apply to a harvest with a permit issued under this section. The commissioner of fish and game shall issue or deny a permit within 30 days after receiving an application.

(d) The commissioner shall deny or restrict a permit under this section upon finding that the proposed harvest will impair sustained yield of the species. The commissioner may deny or restrict a permit under this section upon finding that the proposed harvest will disrupt

established uses of the resources by commercial, sport, personal use, or subsistence users. The commissioner shall forward to the Board of Fisheries for action permit applications for species that support commercial fisheries subject to limited entry under AS 16.43. A denial of the permit by the commissioner must contain the factual basis for the findings.

(e) The Board of Fisheries may adopt regulations for the conservation, maintenance, and management of species for which an aquisition permit is required.

(f) Except as provided in (d) of this section, the commissioner shall issue a permit if

(1) wild stock is necessary to meet the initial needs of farm or hatchery stock;

(2) there are technological limitations on the propagation of cultured stock for the species sought;

(3) wild stock sought is not fully utilized by commercial, sport, personal use, or subsistence fisheries; or

(4) wild stock is needed to maintain the gene pool of a hatchery or aquatic farm.

(g) Aquatic plants and aquatic animals acquired under a permit issued under this section become the property of the permit holder and are no longer a public or common resource.

Sec. 16.40.130. IMPORTATION OF AQUATIC PLANTS OR AQUATIC ANIMALS FOR STOCK. A person may not import into the state an aquatic plant or aquatic animal for the purpose of supplying stock to an aquatic farm or hatchery unless authorized by a regulation of the Board of Fisheries.

Sec. 16.40.140. LIMITATION ON SALE, TRANSFER OF STOCK, AND PRODUCTS. (a) A private hatchery required to have a permit under

AS 16.40.100 may sell or transfer stock from the hatchery only to an aquatic farm or other hatchery that has a permit issued under AS 16.40.100.

(b) Stock may not be transferred to or from an aquatic farm or hatchery required to have a permit under AS 16.40.100 without prior notice of the transfer to the commissioner. A notice of transfer shall be submitted at least 30 days before the proposed date of transfer.

(c) A notice of transfer must be accompanied by a report of a health inspection of the stock. The department shall conduct the inspection or contract with a disease diagnostician to conduct the inspection. The cost of inspection shall be borne by the department.

(d) The department may restrict or disapprove a transfer of stock if it finds that the transfer would present a risk of spreading disease.

(e) A person may not sell, transfer, or offer to sell or transfer, or knowingly purchase or receive, an aquatic farm product grown or propagated in the state unless the product was grown or propagated on a farm with a permit issued under AS 16.40.100. The permit must be in effect at the time of the sale, transfer, purchase, receipt, or offer.

Sec. 16.40.150. DISEASE CONTROL AND INSPECTION. (a) The department shall order the quarantine or the destruction and disposal of diseased hatchery stock or of aquatic farm products when necessary to protect wild stock. A holder of a permit issued under AS 16.40.100 shall report to the department an outbreak or incidence of disease among stock or aquatic farm products of the permit holder.

(b) A holder of a permit issued under AS 16.40.100 shall allow the department to inspect the permit holder's farm or hatchery during

operating hours and upon reasonable notice. The cost of inspection shall be borne by the department.

(c) The department shall develop a disease management and control program for aquatic farms and hatcheries.

(d) The department may enter into an agreement with a state or federal agency or a private, state-certified provider to provide services under (b) and (c) of this section, or inspections under AS 16.40.110(b).

Sec. 16.40.160. REGULATIONS. The commissioner may adopt regulations necessary to implement AS 16.40.100 - 16.40.199.

Sec. 16.40.170. PENALTY. A person who violates a provision of AS 16.40.100 - 16.40.199, a regulation adopted under AS 16.40.100 - 16.40.199, or a term or condition of a permit issued under AS 16.40.100 - 16.40.199, is guilty of a class B misdemeanor.

Sec. 16.40.199. DEFINITIONS. In AS 16.40.100 - 16.40.199

(1) "aquatic animal" means shellfish or freshwater finfish;

(2) "aquatic farm" means a facility that grows, farms, or cultivates aquatic farm products in captivity or under positive control;

(3) "aquatic farm product" means an aquatic plant or aquatic animal, or part of an aquatic plant or aquatic animal, that is propagated, farmed, or cultivated in an aquatic farm and sold or offered for sale for the purpose of consumption, or kelp that is cultivated for use in dyes;

(4) "aquatic plant" means a plant indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(5) "commissioner" means the commissioner of fish and game;

(6) "hatchery" means a facility for the artificial

propagation of stock, including rearing of juvenile aquatic plants or aquatic animals;

(7) "positive control" means, for mobile species, enclosed within a natural or artificial escape-proof barrier; for species with limited or no mobility, such as a bivalve or an aquatic plant, "positive control" also includes managed cultivation in unenclosed water;

(8) "shellfish" means a species of crustacean, mollusk, or other invertebrate, in any stage of its life cycle, that is indigenous to state water or that is authorized to be imported into the state under a permit issued by the commissioner;

(9) "stock" means live aquatic plants or aquatic animals acquired, collected, possessed, or intended for use by a hatchery or aquatic farm for the purpose of further growth or propagation.

* Sec. 2. AS 03.05.011(a) is amended to read:

(a) To carry out the requirements of this title, the commissioner of environmental conservation may issue orders, regulations, permits, quarantines, and embargoes relating to

(1) examination and inspection of premises containing products, articles, and commodities carrying pests;

(2) establishment of quarantines for eradication of pests;

(3) establishment of standards and labeling requirements pertaining to the sale of meat, fish, and poultry;

(4) tests and analyses which may be made and hearings which may be held to determine whether the commissioner will issue a stop order or quarantine;

(5) cooperation with federal and other state agencies;

(6) regulation of fur farming; for purposes of this paragraph, "fur farming" means the raising of and caring for animals for the purpose of marketing their fur, or animals themselves for breeding

stock;

(7) examination and inspection of meat, fish, and poultry advertised for sale or sold to the public;

(8) enforcement of quality assurance plans developed in cooperation with appropriate industry representatives;

(9) establishment of standards and conditions of operation for aquatic farms and related hatcheries, including

(A) restrictions on the use of chemicals; and

(B) requirements to protect the public from contaminants that pose a risk to health.

* Sec. 3. AS 03.05.020(a) is amended to read:

(a) The commissioner shall

(1) require routine inspection of food animals, fish, poultry and derivative food products, to protect the public against fraud, disease and spoilage, and in this connection adopt uniform regulations establishing standards of identity and composition of these food products and minimum standards of sanitation and handling methods as to all phases of slaughtering, processing, storing, transporting, displaying and selling of these food products;

(2) issue orders or cause the orders to be issued by an authorized veterinarian prohibiting transportation and sale of food products intended for human consumption which do not meet the minimum requirements established under (1) of this subsection, and limiting their use and disposal in conformity with protection of the public;

(3) adopt a schedule of fees or charges, and credit provisions, for services rendered by state veterinarians to farmers and others at their request in caring for livestock and poultry, and all the fees shall be transmitted to the commissioner for deposit in the state treasury;

(4) designate points of entry for admission of livestock or poultry into the state, and arrange inspection at those points with or without collaboration and assistance of the federal government, and bar entry of stock or poultry not shipped under a valid permit or not free from contagious or infectious disease;

(5) adopt, repeal, and amend regulations consistent with existing law for

(A) the labeling and grading of milk and milk products and standards of cleanliness and sanitation, to at least the minimum of current recommendations of the United States Public Health Service, for the operation of dairies selling, or offering for sale, milk or milk products;

(B) the production and sale of ice cream and allied frozen desserts;

(C) the production and sale of imitation milk and imitation milk products;

(D) the labeling of aquatic farm products as aquatic farm products;

(6) monitor aquatic farms that hold permits under AS 16.-40.100 to ensure compliance with the requirements of the national shellfish sanitation program manual of operations published by the Food and Drug Administration.

* Sec. 4. AS 03.05.040(a) is amended to read:

(a) On any business day during the usual hours of business the commissioner or an authorized inspector may, for the purpose of inspecting agricultural, [OR] fisheries, or aquatic farm products or aquatic farm sites subject to regulation, enter a storehouse, warehouse, cold storage plant, packing house, slaughterhouse, retail store or other building or place where those products are kept, stored,

processed or sold.

* Sec. 5. AS 03.05.100 is amended to read:

Sec. 03.05.100. DEFINITIONS. In this chapter,

(1) "agricultural products" does not include fish or fisheries products;

(2) "aquatic farm" and "aquatic farm product" have the meanings given in AS 16.40.199;

(3) "fish or fisheries products" means any aquatic animal, including amphibians, or aquatic plants or parts of those plants, animals or amphibians that are usable as human food.

* Sec. 6. AS 16.05.050 is amended by adding a new paragraph to read:

(17) to permit and regulate aquatic farming in the state in a manner that ensures the protection of the state's fish and game resources and improves the economy, health, and well-being of the citizens of the state;

* Sec. 7. AS 16.05.251 is amended by adding a new subsection to read:

(f) Except as expressly provided in AS 16.40.120(d) and 16.40.-130, the Board of Fisheries may not adopt regulations or take action regarding the issuance, denial, or conditioning of a permit under AS 16.40.100 or 16.40.120, the construction or operation of a farm or hatchery required to have a permit under AS 16.40.100, or a harvest with a permit issued under AS 16.40.120. Regulations or orders adopted by the Board of Fisheries under this section do not apply to a harvest with a permit issued under AS 16.40.120.

* Sec. 8. AS 16.05.330(a) is amended to read:

(a) Except as otherwise permitted in this chapter, a person may not engage in sport fishing, including the taking of razor clams; in hunting, trapping, or fur dealing; in the farming of [FISH,] fur [,] or game; or in taxidermy, without having the appropriate license or

tag in actual possession.

* Sec. 9. AS 16.05.930 is amended by adding a new subsection to read:

(g) AS 16.05.330 - 16.05.720 do not apply to an activity authorized by a permit issued under AS 16.40.100 or 16.40.120, or to a person or vessel employed in an activity authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 10. AS 16.05.940(14) is amended to read:

(14) "[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 game [THEIR] products, and "captivity" means having the [FISH OR] game under positive control, as in a pen [, POND,] or an area of land that [OR WATER WHICH] is completely enclosed by a generally escape-proof barrier;

* Sec. 11. AS 16.10 is amended by adding a new section to read:

Sec. 16.10.269. LIMITATIONS. AS 16.10.265 - 16.10.267 do not apply to the purchase or sale of aquatic farm products from a holder of a permit issued under AS 16.40.100 or stock from a holder of a permit issued under AS 16.40.120.

* Sec. 12. AS 16.10.400 is amended by adding a new subsection to read:

(h) AS 16.10.400 - 16.10.475 do not apply to the construction or operation of a private hatchery that has a permit issued under AS 16.40.100.

* Sec. 13. AS 16.43.140 is amended by adding a new subsection to read:

(d) This chapter does not apply to activities authorized by a permit issued under AS 16.40.100 or 16.40.120.

* Sec. 14. AS 16.51.180(5) is amended to read:

(5) "seafood" means finfish, shellfish, and fish by-products, including but not limited to salmon, halibut, herring, flounder, crab, clam, cod, shrimp, and pollock, but does not include aquatic

farm products as defined in AS 16.40.199;

* Sec. 15. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.083. AQUATIC FARMING AND HATCHERY SITE LEASES. (a) The commissioner may offer to the public for lease a site that has been developed for aquatic farming or related hatchery operations under a permit issued under AS 38.05.856. Before offering the site to the public, the commissioner shall offer the site to the permittee.

(b) A site shall be leased under this section for not less than the appraised fair market value of the lease. The value of the lease shall be reappraised every five years.

(c) A lease under this section may be assigned, but if the assignee changes the use of the site the lease reverts to the state.

(d) Before entering into a lease under this section, the commissioner shall require the lessee to post a performance bond or provide other security to cover the costs to the department of restoring the leased site in the event the lessee abandons the site.

* Sec. 16. AS 38.05 is amended by adding a new section to read:

Sec. 38.05.856. TIDELAND AND LAND USE PERMITS FOR AQUATIC FARMING. (a) The commissioner may issue a tideland or land use permit for the establishment and operation of an aquatic farm and related hatchery operations for not less than the appraised fair market rental value of the site. The value shall be reappraised every five years.

(b) A permit under this section is valid for five years after the date of issuance. The permit may not be transferred.

(c) Before issuing or renewing a permit under this section, the commissioner shall (1) provide a copy of the application to newspapers, radio and television stations for public service announcement or (2) provide paid notice of the application once each week for three successive weeks in a newspaper or by radio. The notice required in

this subsection must be in more than one language if the commissioner decides it is necessary. The notice must state that interested persons may submit written and oral testimony concerning the issuance or renewal to the commissioner within 30 days after the date of the notice. The commissioner shall hold a hearing to take testimony.

(d) Before issuing or renewing a permit under this section, the commissioner shall consider all relevant testimony submitted. Based on the testimony or other good cause, the commissioner may deny the application for issuance or renewal, but must provide the applicant with written findings that explain the reason for the denial.

(e) Before issuing or renewing a permit under this section, the commissioner shall require the permittee to post a performance bond or provide other security to cover the costs to the department of restoring the permitted site in the event the permittee abandons the site.

(f) The commissioner shall adopt regulations establishing criteria for the approval or denial of permits under this section and for limiting the number of sites for which permits may be issued in an area in order to protect the environment and natural resources of the area.

* Sec. 17. AS 16.05.340(a)(14) is repealed.

* Sec. 18. AS 16.40.100(d) is repealed five years after the effective date of this Act.

* Sec. 19. Except as provided in sec. 21 of this Act, the commissioner of fish and game may not issue a permit under AS 16.40.100 or 16.40.120, enacted by sec. 1 of this Act, until regulations have been adopted under AS 16.40.160, enacted by sec. 1 of this Act.

* Sec. 20. Except as provided in sec. 21 of this Act, the commissioner of natural resources may not enter into a lease under AS 38.05.083 or issue a permit under AS 38.05.856, enacted by secs. 15 and 16 of this Act, until

the commissioner adopts regulations necessary for the implementation of AS 38.05.083 and 38.05.856.

* Sec. 21. Notwithstanding any other provisions of law, a person who is lawfully operating an aquatic farm or related hatchery in the state on the effective date of this Act is entitled to continue lawful operations at the existing site. The person may obtain an initial lease or permit for the person's existing operations under AS 38.05.083 or 38.05.856, enacted by secs. 15 and 16 of this Act, but as a condition of obtaining the lease or permit the person must agree that during the term of the lease or permit the person will not expand operations beyond the scope allowed under the existing permit.

* Sec. 22. This Act takes effect immediately under AS 01.10.070(c).