

ALASKA LEGISLATURE SPECIAL COMMITTEE/SUBJECT FILE 8672

1858 SCOMM 75: MARICULTURE (FISH FARMING), 1987-1990

75

1 LAS 4068 and LAS 4069 were identified as replacing the
2 November 18 application and forwarded (R. 45) to the Office of
3 Management and Budget, Division of Governmental Coordination
4 (DGC), the agency statutorily assigned responsibility for
5 determining whether WAI's proposed activities were consistent
6 with the Alaska Coastal Management Program (ACMP) (R. 112).

7 On June 2, 1986 DGC narrowed the scope of WAI's
8 project proposal and limited the consistency review to the water
9 appropriation issue based on 6 AAC 50.060. This action was
10 taken at the request of WAI in order to expedite decision-making
11 by Alaska. (R. 110).

12 At this point Alaska was required to determine
13 pursuant to AS 46.15.090 among four competing applications for
14 use of a limited water resource. Two of the four competing use
15 applications for a permit to appropriate water pertained to use
16 of water in a hatchery. For biological as well as water
17 availability considerations, the Warm Springs Bay site could
18 only support one such proposed facility. Accordingly, DNR
19 needed to assess which of the two hatchery development proposals
20 would be authorized and permitted to operate by the Alaska
21 Department of Fish and Game.

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25 (Footnote Continued)

26 Baranof River or Baranof Lake are outlined in attached
Appendix A.

1 In assessing the "ability to operate" and use water,
2 DNR turned to the Alaska Department of Fish and Game for facts
3 on the hatchery siting and permitting process.

4 On June 12, 1986 Alaska, through DNR made a decision
5 denying WAI's application for a water rights permit as not in
6 the public interest and because WAI did not have an ability to
7 operate a hatchery and use water (R. 85-86). WAI then appealed
8 to the DNR commissioner who decided against WAI on October 14,
9 1986 (R. 107-109). The DNR commissioner found that Alaska
10 should not issue a permit for water rights as the proposed
11 appropriation was not in the public interest.
12

13 B. PROCEEDINGS BELOW

14 The decision on October 14, 1986 by the DNR
15 commissioner (R. 107-113) was based on the materials submitted
16 by WAI contained in LAS 4068, various materials and comments
17 supplied by other agencies of Alaska and a legal brief supplied
18 by WAI on August 11, 1986 (R. 89-100). The decision by the DNR
19 commissioner was a final agency action. An appeal of the
20 commissioner's decision was made on November 17, 1986 in
21 conformity with applicable appellate rules.
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ARGUMENT

I. INTRODUCTION AND SUMMARY

The Alaska Water Use Act contained in AS 46.15.010-.270 places an affirmative duty on the DNR to review proposals to appropriate water. Alaska, through the DNR is required by statute to review and evaluate requests for appropriation of water based on specific criteria and standards set out in AS 46.15.080. Alaska is given broad discretion to review requests for appropriation of water in order to protect the public interest.

During the course of this dispute, WAI has demonstrated a consistent misapprehension of the standards and procedures for obtaining a right to appropriate water. WAI has submitted vague applications to Alaska for permits to appropriate various amounts of water ranging from 200 cubic feet per second (cfs) in some instances to 1000 cfs. (See generally, Appendix A.) These applications for water rights permits to appropriate water were based on nebulous proposals to engage in various activities ranging from development of hydroelectric projects, water consumption for humans, an appropriation for a fish hatchery, and for "fish farming."

As will be discussed later, Alaska properly denied WAI's request for a permit to appropriate water for use in a hatchery. But before turning to the statutory authority which allows Alaska to deny WAI's application permit to appropriate

1 water, the standard review and other legal matters, a few
2 general comments are in order.

3 This case is not related to the current debate about
4 aquaculture or mariculture in the Alaska Legislature. Nor does
5 this controversy pit existing Alaska fishermen against a new
6 marine industry. This case centers on a determination by the
7 DNR commissioner that the application by WAI to obtain a permit
8 to appropriate water did not meet the public interest.

9 Also, this case does not represent an attempt by any
10 of the agencies of the State of Alaska or officers or agents of
11 the state to prevent the principle individuals involved in WAI
12 from engaging in legitimate economic activity. The common
13 thread running throughout WAI's opening brief in this case is
14 the suggestion or perhaps inference that the Alaska Department
15 of Fish and Game harbors a grudge against the principle
16 individuals involved with WAI.

17 This dispute transcends personalities -- whether for
18 the State of Alaska or WAI. The decision by the DNR
19 commissioner was based on the relevant facts contained in the
20 appropriate case file as submitted, reviewed, and briefed by
21 WAI. The decision by the DNR commissioner properly reflected
22 the standards and criteria set out in the statute at
23 AS 46.15.080 and must be affirmed.

24
25 II. STANDARD OF REVIEW
26

1 There are two standards under which the Alaska Supreme
2 Court has reviewed agency interpretations of statutory terms --
3 the reasonable basis standard and the independent judgment
4 standard. Matanuska-Susitna Borough v. Hammond, 726 P.2d 166,
5 175 (Alaska 1986). The type of issues presented for decision in
6 a particular case determines which test the decision maker must
7 apply.

8 Questions of law and fact which involve the particular
9 knowledge and expertise of the agency must be reviewed under the
10 reasonable basis test. See generally, State, Alcoholic Beverage
11 Control Board v. Decker, 700 P.2d 483, 486 (Alaska 1985); Storrs
12 v. State Medical Board, 664 P.2d 547, 554 (Alaska 1983).

13 The reasonable basis test must be used to review
14 agency decisions which involve "administrative expertise as to
15 either complex subject matter or fundamental policy." Alaska
16 Public Utilities v. Chugach Electric Association, 580 P.2d 687,
17 694 (Alaska 1978), overruled on other grounds in City and
18 Borough of Juneau v. Thibodeau, 595 P.2d 626, 629 (Alaska 1979).

19 As the Alaska Supreme Court stated in United States v.
20 RCA Alaska Communications, Inc., 597 P.2d 489, 507 (Alaska
21 1978):

22 This [reasonable basis] standard is invoked in
23 cases where the agency action involves either
24 questions of fundamental policy formulation or an
25 assessment of technical data related to complex
26 subject matter which requires the particularized
knowledge and experience of the administrative
personnel for their determination.

1 See also, Alaska Public Utilities Commission v. Greater
2 Anchorage Borough, 534 P.2d 549, 558-59 (Alaska 1975).

3 The reasonable basis test is particularly appropriate
4 where the agency decision involves "agency expertise in a mixed
5 law and facts setting." Jager v. State, 537 P.2d 1100, 1107
6 (Alaska 1975). A reviewing court should set aside an agency's
7 determination, findings, and conclusions only upon a showing
8 that either they are not supported by substantial evidence on
9 the record as a whole or that they have no reasonable basis in
10 law. City of Fairbanks v. Public Utilities Commission, 611 P.2d
11 493, 495 (Alaska 1983).

12 Under Alaska law, the issues presented in the context
13 of an application for a permit to appropriate water require
14 application of the reasonable basis test. The reasonable basis
15 test requires judicial deference to an administrative
16 determination if the determination has a reasonable basis in law
17 and fact. Storrs, 664 P.2d at 554. Under the reasonable basis
18 test the reviewing court considers factors of agency expertise,
19 policy, and efficiency in reviewing the agency decision. Id.;
20 RCA Communications, 597 P.2d at 506.

21 The reasonable basis test is similar to the standard
22 of "unreasonable, arbitrary and capricious action" under which
23 actions committed to agency discretion are traditionally
24 reviewed. Storrs, 664 P.2d at 554-55; Jager, 537 P.2d at 1107.
25 The reasonable basis test constitutes the appropriate standard
26 for review in this controversy. All of the relevant factual and

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1 legal issues raised in this appeal involve the specialized
2 knowledge and experience of the agencies of the State of Alaska,
3 particularly DNR. The entire permit review process and the
4 decision ultimately made by the DNR commissioner required that
5 agency to apply its administrative expertise to a complex
6 subject matter which also involves fundamental policy
7 considerations. The decision to deny WAI's permit to
8 appropriate water involved an assessment of technical
9 information related to the feasibility of a complex subject
10 matter requiring the particularized knowledge and experience of
11 DNR personnel. Interpretation of the state Water Use Act
12 contained in AS 46.15 and the application of that law to the
13 natural resources in Alaska requires application of agency
14 expertise in a mixed law and fact setting. As the Alaska
15 Supreme Court noted in Chugach Electric, 580 P.2d at 694, "[I]t
16 is difficult, in fact, to conceive of a situation where the
17 reasonable basis test is more appropriate."

18 WAI's unsupported argument that Alaska's refusal to
19 approve the water appropriation permit was arbitrary and
20 capricious (Appellant's Opening Brief at 1) is incorrect and
21 without merit. Alaska decided that WAI's proposal was not in
22 the public interest after properly and thoroughly evaluating the
23 proposal compared to the criteria contained in AS 46.15.080.
24 Alaska, through DNR rendered a final agency decision on
25 October 14, 1986 in conformity with constitutional due process
26 requirements required by the Alaska Supreme Court. See

1 generally, Ship Creek Hyd. Syn. v. State, 685 P.2d 715, 717-18
2 (Alaska 1984). The findings of fact and conclusions of law
3 adopted by DNR were not arbitrary, unreasonable, nor an abuse of
4 discretion. Alaska Conservation Council, Inc. v. State, 665
5 P.2d 544, 548 (Alaska 1983). The review of WAI's proposed water
6 allocation permit did not pass beyond the lowest limit of
7 reasonableness to become capricious, arbitrary or confiscatory.
8 See generally, K&L Distributors, Inc. v. Murkowski, 486 P.2d
9 351, 358 (Alaska 1971).

10
11 III. DNR HAD A REASONABLE BASIS FOR REFUSING TO APPROVE
12 APPELLANT'S REQUEST FOR A PERMIT TO APPROPRIATE WATER

13
14 WAI argues that it is in a position to immediately
15 begin construction of improvements which will enable it to
16 beneficially use the water for which it has applied (Appellant's
17 Brief at 7). Finally, WAI states that it is "entitled by law to
18 receive a water use permit" (Appellant's Opening Brief at 7).

19 WAI is not entitled as a matter of law to receive a
20 permit to appropriate water. The commissioner may only issue a
21 permit based on a finding that

- 22 (1) rights of a prior appropriator will not
23 be unduly affected;
24 (2) the proposed means of diversion or
25 construction are adequate;
26 (3) the proposed use of water is beneficial;
and
(4) the proposed appropriation is in the
public interest.

1 AS 46.15.080(a). While the rights of prior appropriators are
2 not an issue in this particular situation, the remaining
3 criteria in AS 46.15.080(a) have or could have a direct bearing
4 on WAI's ability to obtain a permit to appropriate water. 2/
5

6 The DNR commissioner is given broad discretion in
7 determining what constitutes the public interest. When
8 determining the public interest, the commissioner is required to
9 consider:

10 (b) In determining the public interest, the
11 commissioner shall consider

12 (1) the benefit to the applicant
13 resulting from the proposed appropriation;

14 (2) the effect of the economic
15 activity resulting from the proposed ap-
16 propriation;

17 (3) the effect on fish and game
18 resources and on public recreational op-
19 portunities;

20 (4) the effect on public health;

21 (5) the effect of loss of alternate
22 uses of water that might be made within a
23 reasonable time if not precluded or hindered by
24 the proposed appropriation;

25 (6) harm to other persons resulting
26 from the proposed appropriation;

(7) the intent and ability of the ap-
plicant to complete the appropriation; and

(8) the effect upon access to
navigable or public waters.

AS 46.15.080(b). On October 14, 1986 the DNR commissioner
denied WAI's appeal of the findings by the director of the

2/ Alaska did not have an opportunity to review the means or
construction plans for the proposed appropriation under
AS 46.15.080(a)(2) because it found the proposed permit was not
beneficial or in the public interest.

1 Division of Land and Water Mangement (R. 107-113). The decision
2 contains a reasoned discussion outlining why granting a permit
3 to appropriate water to WAI would not benefit the public
4 interest. The DNR commissioner concluded "WAI will be unable to
5 complete the appropriation" (R. 108). This conclusion was based
6 on legitimate and documented statements from the Alaska
7 Department of Fish and Game pertaining to that agency's
8 statutory authority. Thus, the DNR commissioner correctly
9 considered and found that WAI did not have the ability to
10 complete the appropriation based on AS 46.15.080(b)(7).

11 The DNR commissioner, having solicited comments from
12 other agencies of the State of Alaska in accordance with
13 AS 46.15.020(b)(3), concurred with the Alaska Department of Fish
14 and Game that the "best use of the site on Baranof Island '...
15 is fisheries enhancement for contribution to the common-property
16 fishery'" (R. 108). The DNR commissioner went on to point out
17 that "the Baranof Island site is categorized in the regional
18 salmon plan" as a premier site for the production of salmon for
19 the common-property fishery. (R. 108).

20 Accordingly, the DNR commissioner justifiably
21 ascertained that the public interest might be negatively
22 impacted based on the factors set out in AS 46.15.080(b) if WAI
23 was given a permit to appropriate water. These factors require
24 the DNR commissioner to gauge the effect of loss of alternate
25 uses of water that might be made within a reasonable time if not
26 precluded or hindered by the proposed appropriation as well as

1 harm to others resulting from the proposed appropriation. See
2 generally, AS 46.15.080(b)(5) and (6). Based on clear
3 statements of intent by the State of Alaska to develop hatchery
4 facilities at Warm Springs Bay on Baranof Island for the
5 common-property fishery (R. 106) the DNR commissioner was
6 certainly justified in denying WAI's water allocation permit.
7 See also, AS 46.15.145(a)(1). Any other course of action would
8 have created a strong likelihood that the public would be
9 substantially inhibited from designing and constructing a
10 facility calculated to maximize benefits to the common use
11 fishery -- a project the State of Alaska intends to develop (See
12 Affidavit of Steve Pennoyer). See also, Alaska Const. art.
13 VIII, sec. 3.

14 Because it failed to secure a private nonprofit
15 hatchery permit, WAI concedes that it cannot complete an
16 appropriation of water for purposes of hatching and rearing fish
17 to be released into the common-property fishery without the
18 permission of the State of Alaska. And, WAI acknowledges that
19 such permission is not likely to be forthcoming. (Appellant's
20 Brief at 7). However, WAI argues that it does not need to seek
21 authorization from the State of Alaska to engage in fish farming
22 activities. WAI suggests without support that it has an ability
23 to obtain young fish commercially and to transport, hold, feed,
24 and rear them in captive salt water net pens for commercial
25 harvest.
26

1 The critical flaw in WAI's argument lies in the fact
2 that pen rearing slamon in a "fish farm" uses only salt water.
3 WAI's application (LAS 4068) contemplates the use of water in a
4 hatchery facility to propagate and then supply salmon smolts to
5 a salmon ranching operation or a salmon farming operation in
6 Warm Springs Bay.

7 A salmon farming operation possibly requires a small
8 amount of incidental fresh water but certainly not the 200 cfs
9 contemplated in WAI's LAS 4068 application. The continued
10 propagation of salmon in a hatchery facility involves
11 impregnating, hatching, and rearing eggs to smolt size and
12 certainly requires large volumes of fresh water. WAI's argument
13 that it may engage in "ocean farming" is not germane to the
14 question of their ability to appropriate and use water in a
15 hatchery facility.

16 WAI may not successfully argue conflicting positions.
17 If they seek fresh water for propagation of fish then WAI needs
18 a hatchery permit. Currently the only legal way to operate a
19 fish hatchery in Alaska is under the private nonprofit hatchery
20 program or as a public facility. WAI has stated it "does not
21 contest the fact that an Alaska Department of Fish and Game
22 permit is required to operate a fish hatchery (R. 94).

23 WAI, rather than supporting its only contention that
24 "DNR acted contrary to the statutes and applicable
25 administrative regulations when it denied the water use permit"
26

1 (Appellant's Opening Brief at 5) devotes most of its brief to a
2 discussion on the legality of fish farming and other aquaculture
3 ventures. For purposes of the decision now pending before this
4 court these matters are irrelevant.

5 The right to appropriate water can be acquired only as
6 provided in AS 46.15.040. WAI argues that it is the owner of
7 patented tidelands and an easement for a pipeline to the Baranof
8 River and that necessary water is available for appropriation
9 (Appellant's Brief at 14). WAI then suggests that it has done
10 everything which it is able to do and which can be legally
11 required of it at this time and implies that somehow it has a
12 right to the desired water. This is wrong. A right to
13 appropriate water shall be obtained by first making application
14 to the DNR commissioner for a permit to appropriate.
15 AS 46.15.040(b). WAI applied to appropriate water and was
16 denied by DNR.

17 The DNR decision denying WAI's permit to appropriate
18 water was not arbitrary, unreasonable, or an abuse of
19 discretion. Administrative action is accorded a presumption of
20 validity, and the appellant bears the burden of demonstrating
21 its invalidity. Alaska International Industries, Inc. v.
22 Musarra, 602 P.2d 1240, 1244 (Alaska 1979). The DNR
23 commissioner found that WAI's water use application was not
24 beneficial or in the public interest and that WAI did not have
25 the ability to complete the appropriation. To grant an
26 application for a permit to appropriate water in these

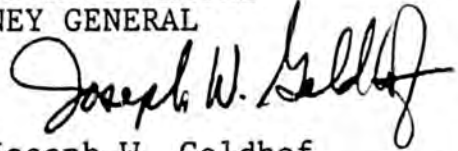
1 circumstances would have resulted in the loss of alternate uses
2 of water more beneficial to the public; possibly lead to
3 negative impacts on important fish resources and caused harm to
4 other persons. This decision and these matters are soundly
5 committed to DNR's discretion. The decision was properly made
6 in light of DNR's statutory duty.
7

8 CONCLUSION

9 Alaska believes the decision by the DNR commissioner
10 is correct as a matter of fact and law and must be affirmed by
11 this court.

12 DATED: April 15, 1987
13

14 GRACE BERG SCHAIBLE
15 ATTORNEY GENERAL

16 By: 

17 Joseph W. Geldhof
18 Assistant Attorney General
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1 IN THE SUPERIOR COURT FOR THE STATE OF ALASKA
2 FIRST JUDICIAL DISTRICT AT JUNEAU

3 WILDERNESS ACQUISITIONS, INC.,)
4 an Alaska corporation,)

5 Appellant,)

6 v.)

No. 1 JU 86-2429 Civ.

7 ALASKA DEPARTMENT OF NATURAL)
8 RESOURCES,)

9 Appellee.)
10

AFFIDAVIT OF STEVEN PENNOYER

11 STATE OF ALASKA)
12 : ss.
13 FIRST JUDICIAL DISTRICT)

14 STEVEN PENNOYER, being first duly sworn upon oath,
15 deposes and says:

16 1. Currently I am the Deputy Commissioner for the
17 Alaska Department of Fish and Game. My mailing address at work
18 is P.O. Box 3-2000, Juneau, Alaska 99802. My work phone number
19 is (907) 465-4100.

20 2. In my capacity as deputy commissioner for the
21 Alaska Department of Fish and Game I am generally familiar with
22 the proposal by Wilderness Acquisitions, Inc. to develop some
23 type of aquaculture facility in Warm Springs Bay on Baranof
24 Island and for a water allocation permit which is now the
25 subject of controversy in superior court case number 1JU-86-2429
26 Civil.

1 3. I am generally familiar with the Warm Springs Bay
2 location, particularly with respect to its potential as a
3 hatchery site or for development as an aquaculture facility
4 including possibly salmon pen rearing. I know the term "world
5 class" is currently in vogue and often applied to proposed sites
6 and various proposed activities in Alaska. In fact, the Warm
7 Springs Bay has been described as having "world class" potential
8 as a hatchery site or for aquaculture development.

9 4. I am mindful that terms like "world class" are
10 often used indiscriminately, however, I can say that Warm
11 Springs Bay is one of the best possible sites for a public
12 hatchery or private nonprofit hatchery. The Alaska Department
13 of Fish and Game has every intention of proceeding as rapidly as
14 possible to develop a facility at Warm Springs Bay for purposes
15 of releasing fin fish into the common-property fishery. In my
16 estimation, it is absolutely essential to develop this location
17 in a manner which maximizes availability of fisheries resources
18 for the public.

19 5. Warm Springs Bay hatchery potential has figured
20 prominently in comprehensive fisheries enhancement planning for
21 southeastern Alaska between the public and the Alaska Department
22 of Fish and Game for many years. The development of a private
23 hatchery or an ill-conceived aquaculture facility at this site
24 has serious potential for reducing benefits to the public and
25
26

1 may, depending on the actual activity, cause a negative effect
2 on existing fisheries resources.

3 Further your affiant saith naught.
4

5
6
7 SUBSCRIBED AND SWORN TO before me this ____ day of
8 April, 1987.
9

10
11 Notary Public, State of Alaska
My commission expires: ____
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ATTORNEY GENERAL, STATE OF ALASKA
STATE CAPITOL
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BARANOF RIVER APPROPRIATIONS

DATE OF APPLICATION	DNR FILE #/STATUS	NAME	AMOUNT (CFS)	USE
11-2-67	40815 - Cert.	W.A. Inc.	1.0	Hydro/domestic (yearround)
11-18-80	101729- Permit	W.A. Inc.	1.59	Hydro (yearround)
8-13-85	3661 - Permit	Bahovec	2.7	Hydro (May 1 - Oct 30)
8-13-85	6356 - Apln	Bahovec	2.7	Hydro (Nov 1 - April 30)

BARANOF LAKE APPROPRIATIONS

5-24-78	100191 - Closed	ADF&G	104.0	Hatchery/Hydro (yearround)
12-20-85	4068 - On Appeal	W.A. Inc.	200.0	Hatchery (yearround)
12-20-85	4069 - Apln	W.A. Inc.	200.0	Hydro (yearround)
1-14-86	4553 - Apln	ADF&G	110.0	Hatchery/Hydro (yearround)
6-23-86	7343 - Apln	W.A. Inc.	1000.0 42000 GPD	Power Utility (yearround) Pub. Water Supply "

SCOMM

750.2



Senate Rules Committee

Senator Richard L. (Dick) Eliason, Chairman

Greg
2664

- ATA ✓ 586-9400
- ✓UFA ✓
- ✓AMA ✓
- Date Young - 789-0740
- USAG - Gervon Bruce
- ~~John Reabow Somers~~
- SEACL(586 6942) ✓
- Sommerville
- Linda Freed
Planning Dir
Kodiak
- Paul Fuhs,

~~463~~

- ① identify issues to be pursued during the interim.
- ② Determine whether the committees will work on a joint C.S. covering basic issues in common to all forms of aquatic farming. Fully develop shellfish, plants, ~~fish~~ ^{fresh-water} trout.
- ③ Discuss whether the committees will work on development of a range of options for salmon farming.
- ④ Provide administration ^{& Legislative staff} with direction for work during coming months.
- ⑤ schedule for subsequent events and contact numbers for membership
- ⑥ ~~chair~~ designate ~~chair~~ coordinator to make things happen.

~~Education & information.~~

- ③ Discuss other forms of salt water fin fish farming, such as black cod, halibut, ~~etc.~~ steelhead.

Robert H. Blake

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463-3124

5/19/87

In Cordova
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Sen. Richard Ellison;
Alaska State Senate
Juneau, Alaska

Dear Dick;

I apologize for not being present at the Joint Committee Interim Committee on Marine Fisheries organizational meeting. Kate Graham, the exec director of the UFA is currently attending meetings in Washington DC, therefore he cannot be present also.

In conjunction with Roger Painter (CAMA) I delivered a outline sketch of how we would like to line out the committee's involvement around the middle of August. I stated so long and interfered with an original the meeting because it was certainly my intention to be there for it. As you know I make my mainstay living by fishing and with the major processors paying \$2.15/lb for both reds & kings on the Copper River I must succumb to financially practical aspects of my life.

I feel that the committee will be fair and practical in setting up goals and direction during this first meeting and am looking forward to being a very active participant this fall & winter.

Thank you
Sincerely
Bob
Blake

Mariculture file

May 1, 1987

Subcommittee-Senate Resource Committee

Senator Richard Eiliason:

We feel it is imperative that you do not allow House Bill 108 and Senate Bill 106 to pass, unless they are ammended for shellfish and plant mariculture only. This bill would only benifit a few people, mostly non Alaskakans, at the expense of Alaskan people. We strongly oppose this type of fish farming in Alaska.

We would hope you would better spend your time promoting State hatcheries, nonprofit aquaculture and wild natural Alaska salmon for the benifit of the vast majority of Alaskans.

Please review throughly in reference to mining or logging, which would adversely affect any salmon spawning streams and fisheries. Thank you.

Sincerely,

Antonina Hosick (37yr. resident)
Hugh C. Hosick (65yr. resident)

Hugh and Toni Hosick
Box 1060
Cordova, Alaska 99574

ALASKA STATE LEGISLATURE - SENATE

SENATOR RICHARD P. 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 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

STEVE COWPER
GOVERNOR



STATE OF ALASKA
OFFICE OF THE GOVERNOR
JUNEAU

May 12, 1987

The Honorable Jack Coghill
Chairman
Senate Resources Committee
Alaska State Legislature
P.O. Box V
Juneau, AK 99811

Dear Jack,

The prospect of mariculture development is generating considerable interest in Alaska this year. I believe that a mariculture industry can provide substantial economic benefits to our coastal communities and help diversify our economy. However, such an industry must be developed in an orderly fashion which provides the maximum benefit to Alaskans while ensuring protection for our existing fisheries resources, other resource users, and the environment. I have outlined for you the principles I believe must be satisfied to meet these goals. I believe that these principles and the other broad public policy questions that were raised during the public hearings process should be addressed.

I have already directed the state agencies to begin working on the technical issues affecting mariculture development. I believe that it would be beneficial to form a joint interim committee consisting of the Legislature, the administration, and the affected interest groups to resolve the conflicts surrounding mariculture development.

Mariculture holds promise for Alaska, but we must not repeat the mistakes made elsewhere. The development of a mariculture industry in Alaska must not be done piecemeal. We cannot allow a situation to develop here or proceed in the same way that occurred in British Columbia.

I appreciate your support and efforts in helping to resolve these issues.

Sincerely,


Steve Cowper
Governor

R. Painter and Bob Blake presented this list of suggested topics for mariculture meeting May 20.

- 1.) Identify issues to be pursued during the interim
- 2.) Determine whether the committees will work on a joint CS covering basic issues in common to all forms of aquatic farming. Fully develop shellfish, plants and fresh-water trout
- 3.) Discuss other forms of saltwater finfish farming such as black cod, halibut, steelhead
- 4.) Discuss whether the committees will work on development of a range of options for salmon farming
- 5.) Provide administration and legislative staff with direction for work during coming months
- 6.) Schedule for subsequent events and contact numbers for membership
- 7.) Designate coordinator to make things happen

To: Representative Sund
From: Nevette Bowen
Staff
Date: April 27, 1987
Subj: Mariculture - Interim Task Force
Moritorium

After reviewing the mariculture proposal over the past few weeks, it is apparent that the public policy issues need to be clarified and technical concerns clearly identified and addressed.

As we have discussed, the mariculture industry must be developed in a responsible manner to ensure that the resource is equitably distributed with appropriate environmental safeguards and monitoring. Alaska must avoid encouraging a haphazard mariculture industry with inadequate government oversight that creates land-use problems, causes pollution and displaces an existing fishery.

As I understand it, you would like to see the Legislature take the following action over the interim.

1. Prepare a committee report outlining the issues made available to us in various research documents and through public testimony.
2. Pass a legislative moratorium on all mariculture-related permits until a time certain. Grandfather in existing permit holders.
3. Establish a working group of approximately six - eight people supported by one or two full-time research staff to work through the issue and policy concerns and return to the legislature with specific policy recommendations for enabling legislation and regulations.

You have suggested that the make-up of such a task force include members from the House and Senate, members from the executive branch and several public members.

Under your proposed idea, the first meeting of the working group would be to discuss a scoping document compiled by committee reports and issues identified in other research. Additional concerns would be included at this time. In short, all the potential problems and public policy concerns would be outlined and identified. The working group would then proceed to address the issues by categorizing them into 4 or 5 major groups. Sub task forces would be established with agency resource people available to provide assistance.

The final recommendations from the task force would provide specific policy alternatives, draft legislation and regulations and the associated fiscal impact.

I have prepared a rough example of major categories of concern for your review:

I. Land Use Conflicts/Siting Problems/Public Hearing Process

A. How can siting decisions consider mariculture proposals on an equal basis with all other commercial and noncommercial uses? What should the process be? Who decides? Should there be a priority of use system?

1. Where in the process should public participation occur and to what extent?

B. How many mariculture sites should there be? Where?

1. How should sites be distributed among potential mariculture applicants? (This will be partially resolved by natural environmental constraints and siting criteria).
2. How should sites be distributed among similar mariculture applicants? e.g. oyster

C. What type of system should be developed so that cumulative land-use impacts can be considered in a comprehensive manner?

D. What "fit, willing and able" provisions need to be implemented to prevent speculation and give the state a stronger right of refusal and authority to revoke permits from noncompliant permit holders?

E. If a permit holder folds an operation, what happens to that site? Is it withdrawn? Can the permit be transferred?

II. Market - Economic Impact

- A. What are the potential economic benefits for Alaskans?
- B. Will pen rearing of salmon displace existing fisheries in Alaska? If so, to what extent? What would be the effect on the state's economy?
 - 1. Should production limits be considered as tool to avoid negative impacts on existing fisheries?
- C. Will the program place the current nonprofit aquaculture program at risk?
 - 1. A good site for a hatchery might also be a good mariculture site. How will these decisions be made? Who will make them. What is the state's priority policy on private non-profit vs private for profit?
- D. What is the cost of rechannelling Fish And Game budget resources? Studies show we have a high value fishery due to state financial commitment. Will this lower the value of the fisheries?
 - 1. Will financial resources be deflected from wild and hatchery programs?
- E. What is the impact and cost of rechannelling funds from other resource agencies?
- F. How valid is the concern that the world market will be glutted by salmon by the time Alaska is ready to get into the industry? What would be the effect on Alaska's new mariculture operations? Would they still be economically feasible?
- G. What support industries will be needed to provide feed and supplies to fish farms? Will Alaskans be able to participate in these support industries? What would operations have to pay for these supplies? (See transportation questions).
- H. What will the transportation needs be? Since many operations will be in remote locations, and since the product must reach the market quickly, will new transportation need to be developed?
- I. One of the high costs to operators will be transport of supplies to the remote sites? The product must then be priced higher to break even? Will this make our product less competitive?

III Government Involvement

- A. How much state commitment are we willing to make to responsibly protect the environment and ensure that the resource is equitably distributed?
 - 1. What should the state policy be regarding the number and size of mariculture operations?
 - a. Small locally owned and operated
 - b. Co-ops
 - c. Large corporation
 - d. Foreign and Outside ownership and investment
 - e. Combination of all of the above
 - 2. What are the fiscal impacts to the state based on different policy alternatives? What are the costs and benefits?
- 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. To what extent should the industry be required to pay for the use of the public resources and the resulting effects 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 to encourage 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). Will this create an extra hardship on small, locally-owned operations?

- 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). 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? What tax structure would be reasonable-that wouldn't hurt fledgling operations while still compensating the state.
- K. Because there are a limited number of adequate sites, are we creating a new form of limited entry fishing?
- L. The state is already providing some research & development? How much does this now cost us? How much more will the state have to provide to have a successful mariculture program? How much will it cost?

IV. Genetics/ Disease/ Environmental Concerns

- A. What are the long term and short term environmental impacts of mariculture operations.. How can the negative impacts be minimized or avoided?
- B. What siting and regulatory controls are necessary to avoid the potential problem of the accumulation of fish wastes and fish food?
- C. What provisions are necessary to prevent and control disease?
- D. Are there potential disease and genetic threats to wild stocks? What is the potential for escape given the unique weather conditions and predator situation in Alaska? What would the impact on wild stocks be if large numbers escape?
- E. What type of oversight should exist to monitor site selection and water quality, conduct health inspections and control any problems with disease.
- F. Given the potential genetic, disease and environmental considerations in various policy options, is it in the best interest of the state to proceed in developing fish farming, shellfish farming or kelp farming?
- G. Should a mandatory environmental monitoring system be required at each site?

Kodiak

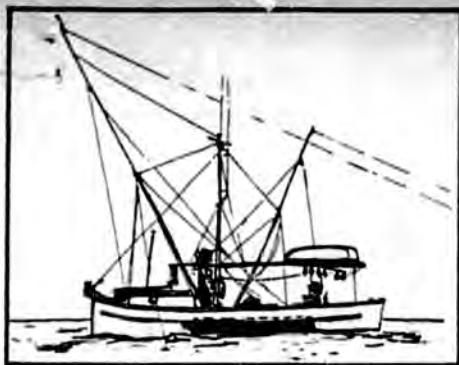
- ① DAVE SHRADER
- ② Ed Jack - old HARBOR people = DISGRACE
DONE BY INTRODUCING SALMON & SHELLFISH
TOGETHER = DEVELOPMENT PLAN FOR APPLICANTS
- ③ DAVE HERRNSTEEN - SHELL FISH PERSON =
GROUND PREEMPTION -
- ④ TOM LOEW - SCALLOP RESEARCH PROJECT -
ANY BILL WHICH WOULD CUT RED TAPE -
GO FORWARD WITH SHELLFISH = ADF&G FORMER
EMPLOYEE - COST MAY BE EXCESSIVE FOR SMALL
BUSINESS OPERATION =
- ⑤ TOM DOOLEY - 24 years fishing in Kodiak -
BIG MONEY TAKE OVER, LITTLE GUY IN VILLAGE
DEALT OUT -
- ⑥ BILL OSBORNE - MARICULTURE ASSN. -
RURAL ALASKA ? SCALLOP NEED IN STATE
PERMIT - ENVIRONMENTAL EFFECT OF SALMON
FARMING ^{U OF} WASHINGTON STATE -

THE ENVIRONMENTAL EFFECTS OF FLOATING MARICULTURE

(7) DONALD WESTON AUG. 1986

(8) NICK TROXELL = PERMIT PROCESS =
COMPREHENSIVE PLAN = LOCAL COMMUNITY
PLANNING EFFORT - APPLICATION PAPERS MUST
BE SCRUTINIZED CLOSELY - CLEAN UP BOND -
SPLIT OUT FIN FROM SHELLFISH - Pilot projects
TO GO FORWARD - HOUSE RESEARCH REPORT (?)

(9) MATTHEW DICK - NEED PERMIT PROCESS FOR SHELL
FISH - SEPERATE SHELL FISH FROM FIN FISH -



Alaska Trollers Association

REPRESENTING ALASKA POWER TROLLERS

130 Seward St., No. 213
Juneau, Alaska 99801
(907) 586-9400

Senator John B. Coghill, Chairman
Senate Resources Committee
Alaska State Legislature
Juneau, Alaska

Dear Senator Coghill:

Due to the amount of testimony presented to your committee, many local Juneau residents did not receive the opportunity to testify on the issue of mariculture. I am, therefore, submitting written testimony on the various subjects important for your deliberation. I have included a critical piece of testimony by Dr. Arthur H. Whiteley, made available to me by the United Fisherman of Alaska. Dr. Whiteley's testimony was presented to the Pacific Fisheries Legislative Task Force. It contains crucial information to aid you in your deliberation of the Mariculture Bill (HB108 and SB106).

I have previously testified as to my acute concern over the issue of disease in respect to salmon net pen farming and its effects on wild stock populations. Though the proponents of mariculture have tried to ridicule the problem of disease, mostly portraying it as the "Boogie Man" syndrome. I, myself a marine biologist, was pleased to find a specialist of Dr. Whiteley's stature who had expounded specifically on this topic of pathogens and salmon net pen cultures.

The key issue to understand in respect to net pen rearing of salmon is the eutrophication of the environment in and around the net pen. The result is a nutrient-rich medium where pathogens can proliferate. Growth of pathogenic populations is normally limited in the natural environment by the availability of nutrients. Sites which contain nutrients are diffuse in the natural environment and are normally not an attractant for fish, so exposure rates are low. Net pens, on the other hand, supply the ingredients needed to spread disease: a nutrient medium for pathogenic growth, attractants (fish attract other fish and unconsumed feed will keep wild fish and invertebrates in proximity to the pens), and exposure time.

Dr. Whiteley clearly demonstrates the need for caution and concern in respect to salmon farming. In Alaska, the gamble is against a few menial jobs in tending salmon farms - with the bulk of the monetary benefits accruing to out-of-State or out-of-country residents - versus our enormous wild stock salmon, and possibly shellfish, industries which support much of our economy.

Respectfully submitted,

Earl E. Krygier
Executive Director

TESTIMONY OF EARL E. KRYGIER (Alaska Trollers Association)

PREPARED BUT NOT GIVEN, FOR THE HOUSE RESOURCES COMMITTEE on
4/2/87

I've heard some promoters of aquaculture intimate that all you hear in fishermen's testimony is "emotionalism", and that they're obstructionists concerning this mariculture bill. Well, you can bet their testimony is emotionally charged - they have their livelihood at stake! But, "emotionalism" indicates a lack of substance, and if you just replay the tapes from Petersburg and elsewhere, you'll hear some real substance in the issues they raise. As a member of the past Governor's AdHoc Mariculture Committee, and as a representative of the fishing industry, I want you to clearly understand that fishermen have some very strong concerns with this bill. They are not against all forms of aquaculture, only against pen rearing of salmon. Fishermen believe the culture of shellfish and aquatic plants may offer beneficial opportunities to the economy and develop as true Alaskan industries, attracting local people and local interests, while they view the farming of fin fish to be attractive mostly to non-Alaskan corporate or foreign investment; possibly through the use of an Alaskan "front man" who supplies the tideland title to the farm. This is critical to fishing fleets like those I represent, where 87% of the Hand & Power Troll fleet are Alaskan residents. It is important to remember that the real benefit to rural Alaska is access and utilization of wild stocks. It is the

presence of wild stocks which maintains the existence of rural communities in Alaska. Anything which is done to reduce access or harm these stocks cannot be considered a boon to rural Alaska. The fishing community's opposition may yet change to support once this bill is written to address the fishing industry concerns.

As one of the present opponents of HB108 and SB106, I'd like to draw a little comparison of this legislation and another piece of legislation before you this session, SJR24, "Relating to the establishment of a domestic fishery zone for Unalaska". You heard Mr. Paul Fuhs' mariculture testimony, and though we believe he is sincere in his aspirations, we feel he has been misled as to the benefits and social-economic costs to Alaska. As you know, Mr. Fuhs is the Mayor of Unalaska, and the initiator of SJR24. He is also President of the Alaska Mariculture Association, a strong promoter of the aquaculture bill before you. In one bill Mr. Fuhs is trying to protect local residents from outside non-resident large corporation interests. Yet, his support of the fish farming portion of the aquaculture bill makes him a promoter of these same interests. In SJR24, Mr. Fuhs is trying to promote small local fishermen and processors and keep foreign nationals from benefiting. Our stance against fish farming does this same thing. On one hand, Mr. Fuhs promotes domestic rather than foreign utilization of a finite resource. Yet, his own testimony before the House Labor & Commerce Committee indicates that only foreign capital for salmon farming is presently available, which we feel is contradictory to the ideas he promotes in his exclusive fishing area proposal. Additionally, Mr. Fuhs recently

testified before Congress on the issue of reflagging of foreign processors. Again Mr. Fuhs used an argument contradictory to what he uses on the mariculture issue when he said: "this type of legislation attracts non-Alaskan financing which hurts the local economy". You can't have it both ways, if an argument is meaningful - it must be consistent. We would hope Mr. Fuhs and other Alaskans come to understand these contradictions.

Quite frankly, this bill leaves fishermen in a position where they do not believe that any aquaculture should occur until State policy is developed so that decisions can resolve the following critical issues which conflict with existing use and/or State policy:

- 1) This Bill defines a new State policy concerning the private use of public lands. You, the Legislature, must clearly define this policy for the bureaucracy, so that they can manage the resource. Bureaucrats must have a clear yard stick on who has priority claim rights for the coastal lands, bays, or protected harbors in Alaska. What policy will define site selection? First come, first serve? Or do we require prequalification by "fit, willing, and able" criteria. Certainly the prime sites will have more than one applicant. How will it be adjudicated? How do you stop speculative applicants?

- 2) We need a comprehensive plan, one which will include public input into this process. Since aquatic plants, shellfish and fin fish require the same sites as log storage sites, public use areas, commercial fishing, safe harbors, and PNP or FRED's ocean ranching hatcheries, there should be a moratorium on all further

aquaculture development until pre-site selection and inventories, with adequate prioritization, can be made.

3) What policy on Alaskan ownership? Should we address participation under the restrictions of Alaskan ownership, utilizing the tenets developed in the court-tested, nationally-implemented, "Jones Act" relating to fishing vessels? This act excludes "front men".

4) A policy decision as to which governmental agency will become the lead is critical. Most statute changes in HB108 relate to Title 16, which is Fish & Game. If all the protections under Title 16 must be modified to allow another agency, with no expertise in this area, to take the lead, what's the point? Safeguards are with Fish & Game and the Board of Fish - let's keep it that way!

5) It is essential that the Board of Fish be involved so that they can adjudicate such policy and allocation decisions as to priority rights to eggs, spat, and larvae. (ie. if eggs are needed by both PNP and a fish farmer, who gets them?) This bill suggests some very strong precedents of private access priority to wild stock and hatchery eggs. Is it really in the State's best interest that mariculture egg demand have priority? Such priority demands that fisherman forego harvest to put fish & eggs in the hatchery. This is an allocation of enhanced fish, and the Board of Fish is already addressing this issue.

6) What level of investment does the State plan to make? There are two models of pen rearing of salmon available; one from Norway and one from British Columbia. Each is reflective of the

amount of governmental support afforded these industries. Norway's model developed a plan, has strict regulations, controlled growth, advantages for the rural economy, but with large government subsidy and strong governmental controls. On the other hand, the B.C. model shows a lack of planning which unleashed a gold rush mentality, leading to a carnival-like atmosphere where land speculation, a lack of regard for long term commitment, and outside investment abounds. Few good impacts to the existing local economy are evident. If the State, because of reduced revenues, does not take an active part financially in the birth of this industry, then outside investors will expect return on investments to accrue principally to them. By relinquishing State control, we are giving away State resources (land, water and dollars for management) in a manner which won't clearly benefit the people of Alaska.

Of course, we feel the analogy of the Delta barley farms is pertinent if the State does become involved. Just as the barley farmers can raise barley, Alaska can pen rear fish, but can we raise them long-term without subsidies? Certainly this creates a quandary. I believe that Alaska needs to promote what we have, not copy others, but learn to do what we are doing better (- ie. more wild fish promotion, better quality, etc.).

Now I'd like to switch tacks and take a few moments to respond to some "expert testimony" before this Committee last week. Mr. Bill Paulick, of the Department of Commerce and Economic Development, made some remarks which we found very disconcerting. During that hearing, the question was raised about the promise of Governor Sheffield's Ad Hoc Committee on Mariculture - "that a detailed socio-economic study of salmon pen rearing, including careful analysis of effects on existing Alaska industry, would be performed prior to State promotion of pen rearing." Mr. Paulick told you that Commerce (as the lead agency on that Ad Hoc Committee) had decided that further study of the mariculture issue was not required because of the extensive literature already developed on this subject. He cited the existence of a number of reports including that done by the House Research Agency, and the Sea Grant market study authored by Ron Rogness. He further stated that the monies - \$50,000+ - appropriated to Commerce to deal with mariculture, had largely been used to fund what he described as "a road show" for "educating the public" on mariculture.

Let's start with the "road show". That's a pretty accurate description, because, in fact, this effort was a sales blitz. The public education aspect was rather like Proctor and Gamble "educating the public" about its latest laundry soap. The show is unabashedly pro-mariculture, including the pen rearing of salmon. It most certainly was not balanced by the concerns raised by those of us who could be seriously negatively impacted by pen rearing. The Alaska Trollers Association and the hundreds of fishermen we represent wish to register our extremely strong objection to a State agency actively

promoting developments which are the subject of great controversy, particularly when that agency knew full well that the issue would soon be a matter of extensive Legislative hearings. We recognize that Commerce sees itself as an advocacy agency, but such a stance is inappropriate when the Department is charged with balancing the pros and cons of a complex issue.

Next, we'd like to deal with Mr. Paulick's assertion that adequate studies have been performed. As you heard last week, numerous complex issues - from permitting to marketing to ensuring effective Alaskan participation - still cloud the mariculture picture. Mr. Paulick admitted that the promised socio-economic impact study had not been performed. Instead, we are asked to accept his assertion that existing literature is adequate, despite the fact that many important questions remain unanswered. And, what about those existing studies? Should we, the fishermen of Alaska, and the legislature trust the future of aquaculture policy to their bland assurances?

One much cited report is that by Ron Rogness and Biing-Hwan Lin titled The Marketing Relationship Between Pacific and Pen-Raised Salmon: A Survey of U.S. Seafood Wholesalers. In his testimony to you last week, Mr. Rogness stated that his other econometric study of the European market had numerous "weaknesses" and that the "results were not meaningful". Well, this study isn't any better in our view. We took this study to a well known Northwest consulting firm who has won national awards for their survey techniques and survey response rates. I have a five page synopsis of their analysis which I will

submit to this Committee in the next few days. In a nutshell, this paper has made simple computational errors and used inadequate survey techniques which result in highly questionable interpretation. For example, the author claims a 24% response rate, when, in fact, it was nearer 13% when computational errors were corrected. The actual effective response rate was closer to 7%, a sample size far below that which is acceptable for statistical analysis. The report stated that budget restraints did not allow follow-up letters. Yet, these follow-ups are critical in survey studies such as these, since they yield a "non-respondent analysis" which is critical to interpret results. The high non-response rate virtually insures that a non-response bias is "built into" the results. The most important survey question (No. 4) did not ask the critical question "had they ever sold Pacific salmon?" How buyers and sellers view substitution is dependent on this "missed" factor.

Another study which has received a lot of attention is the House Research Agency report entitled Aquaculture in Alaska. This report really gives us heartburn! While it purports to be unbiased and objective. In fact, it relies very heavily on input from pen rearing proponents, and is riddled with slams against the fishing industry. Indeed, Rodger Painter, the Executive Director of the Alaska Mariculture Association is even quoted as a "fishery industry observer" who doesn't think pen rearing of salmon will negatively impact existing industry. What a farce! What really irks us is that our very real concerns were not addressed. In fact, the researcher responsible for preparation of this report never even solicited the

Alaska Trollers Association's views, despite the fact that his office is literally just four doors down the hall from ours! Possible negative impacts of pen rearing of salmon were summarily dismissed in a single page of the most cursory analysis.

This report states that the State of Alaska is unbiased in its analysis of aquaculture. Yet, on page 103 of the report is a long list of State (or quasi-State) agencies which worked with the Alaska Mariculture Association in mariculture policy development. Many of these agencies are noted for the strong pro-pen rearing advocacy positions of key personnel. For example, former director of FRED, Stan Moberly; former director of the Office of Commercial Fisheries Development, DCED Greg Baker; Kurt Kerns of the Sea Grant/Marine Advisory Program; and Ole Mathisen, UAJ. Are all strong proponents of salmon farming.

It's reports such as these which Mr. Paulick cites as adequate socio-economic analysis on which it is suggested you can rely on for the formulation of policy on this highly controversial issue. The fishing industry does not consider these reports to fulfill the promise made to us last year. They do not constitute fair, unbiased analysis of the range of issues with which we are confronted. We urge you not to take legislative action on this bill until policy is drafted and concerns are met.

TESTIMONY OF ALASKA TROLLERS ASSOCIATION REGARDING
FISCAL NOTES ATTACHED TO HB 108 and SB 106 - APRIL 6, 1987

You have heard quite a number of comments regarding the fiscal notes attached to these companion mariculture measures - HB 108 and SB 106. We think much of the criticism is justified. At one point during the testimony last week it was asserted that permit and other user fees on mariculture licensees could be expected to largely defray the costs of regulating the new industry. We think this is extremely unlikely. Even a simplistic analysis of the existing fiscal notes indicates FY88 - FY92 program costs of some \$2.245 million against expected receipts of just \$247,000 - leaving a shortfall of some \$2 million over five years. Moreover, these cost estimates are optimistically low.

The Department of Environmental Conservation has already retrenched from its original \$0.00 fiscal note. Doug Donegon of DEC indicated that after listening to extensive testimony he would have to rethink their entire approach to the issue of regulating a new mariculture industry. Given the responsibilities of his agency I believe it is only prudent to expect a fairly significant fiscal note from DEC, which would add to the cost side of the fiscal estimates just cited.

The Department of Fish and Game submitted a fiscal note dealing with only one of its divisions - Fisheries Rehabilitation Enhancement and Development. While FRED will surely bear the brunt of responsibilities for mariculture within ADF&G, we think it is unrealistic to believe that additional costs will not be incurred in other areas too. Increased burdens for the Habitat Division come to mind most immediately. One criticism we have of FRED's fiscal note is that it anticipates 100 permit applications in FY88, resulting in 20 operational farms by 1992, but does not project an ongoing stream of applications in years subsequent to FY88. Still, FRED's projections work out to \$11,900 per application, or \$59,500 per successful farm over 5 years. Quite obviously, recovery of such costs through permit fees is unrealistic in the extreme, as the financial burden on applicants would be excessive. This is particularly so since at least some of these cost would be ongoing beyond the FY92 projection limit of the fiscal notes.

The Department of Natural Resources fiscal note also indicates a significant shortfall, although given the language of their note it is impossible to indicate per permit costs over the five year projection period. In gross terms DNR posits some \$989,400 in administrative costs against \$147,000 in revenues for an \$842,400 shortfall over the period.

Commerce and Economic Development's fiscal note is the most optimistic of all, projecting an actual surplus of revenues over costs of \$33,900 from FY88 through FY92. However, we believe that DCED's cost estimates are seriously flawed. As written these two bills would establish DCED as the lead agency for development of this industry in Alaska. As such

the cost estimates are hopelessly out of whack. It seems fairly clear to us that actual lead agency responsibility must ultimately rest with one of the agencies having the greatest regulatory responsibility. It appears that DCED envisions its role actually diminishing from its current "road show" responsibilities even as the industry grows! In our view this reflects a very unrealistic view of the complex set of issues that establishment of a new, technologically sophisticated industry would pose in such a large, diverse and difficult development environment as Alaska. Even the simplest of coordinative roles will impose a greater burden on DCED than that projected in its fiscal note. As "lead agency" precisely what sort of services does Commerce see itself providing - either to the public or other agencies - for a mere \$16,100 in 1992?

One of the most disconcerting things about these fiscal notes is that they are all based on entirely different assumptions about the number of potential applicants.

Commerce projects a straightline increase of 50 new permit applications per year through 1992. They apparently don't think any of those permits applications will be denied and/or abandoned, as revenues at the rate of \$100 per permit are projected through the entire period of the fiscal note, with a projected 300 active permits in FY 92.

Fish and Game calls for 100 permit applications in FY 88 resulting in 20 operational farms in FY 92. There is no mention of expected new permit applications subsequent to FY 88. Are we to assume that the projected costs through FY 92 are based solely on tracking those initial 100 applications through the period? If so can we expect an

additional increment of 100 new applications to be received in FY 89, and each year thereafter, with a similar additional cost increments over each subsequent five year period?

Natural Resources's fiscal note suffers from a similar discontinuity, as they too provide an estimate of the number of applications - some 70 - only in the first fiscal year of the projection period. How many additional applications do they expect through FY 92? What effect will those new applications have on their fiscal note?

This whole issue raises questions about lead agency responsibility once again. It seems only reasonable for the Administration to have come into these Legislative hearings with a set of agency fiscal notes based on a set of common assumptions. First year estimates of permit applications vary from 50, to 70, to 100. No two agency estimates are the same. Projections in subsequent years are completely muddled. The proper approach on this would be to develop a set of mutually agreed upon assumptions upon which every Department would base its fiscal projections. These assumptions should include low, mid and high range estimates of the number of permit applications and ultimate number of operators. Further, a careful analysis of all State government agencies expected to be involved in the regulatory processes of this new industry should have been completed well in advance. Each should have been provided with the basic assumptions and been directed to complete a timely and complete fiscal note. To us, that's what lead agency responsibility is all about. Unfortunately, Commerce's "road show" doesn't seem to have included much in the way of inter-agency coordination, and their projected fiscal note indicates no planning to take on that role.

Clearly, a great deal more fiscal analysis is required before the State leaps into this mariculture business. We need fiscal analyses from all effected agencies. We need analyses based on a set of clear, consistent assumptions about industry growth and regulatory requirements. Finally, we need some cogent analysis of the impacts of these new budgetary inputs on the conduct of vital existing management programs. This last point is absolutely crucial given sharply declining State revenues and already severely curtailed budgets in key resource management agencies. As so many others have already testified, the Alaska Trollers Association strongly believes that the State's limited funds would be far better spent in strengthening our existing fisheries.



**Alaska
Trollers
Association**

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**Additional Testimony by the Alaska Trollers Association
to House Resources Committee 4/2/87**

**Discussion Of The Points Of Concern for CS For HB108 (L&C)
An Act Relating to Aquatic Farming**

Page 1, Lines 11 & 12: "Create new commercial fishing" - obviously, this is a mistake.

Page 1, Lines 19 thru 22: I do not believe that this a quid pro quo. That is, adding products from mariculture does not necessarily lead to a strengthening of Alaska's competitiveness on the seafood marketplace.

Page 1, Lines 23 & 24: Item 5 ignores the cost to government, especially in relation to the like similarity of Delta barley farmers and finfish farmers.

Page 2, Line 2: "Traditional high value industries" - this does not necessarily make sense in the context of item #3.

Page 2, Line 9: "Commissioner" - this relates to the Commissioner of Commerce & Economic Development, yet nearly all of the amended Alaska Statutes deal with Title 16 which is Fish & Game. Therefore, it only seems logical that the Commissioner of Fish & Game should be the "Commissioner".

Page 2, Line 16: "Sell stock" - these farms may pose a problem here, as far as how the State of Alaska keeps control of genetics and disease.

Page 2, Line 20: "May" - this is why Commerce & Economic Development should not be the lead agency. The word should be "shall" since the health of the wild stock are at stake.

Page 2, Line 29 and Page 3, Line 1: Indicates that an "inspection" by the Department of Fish & Game must occur. This is certainly an increase in the amount of fiscal note which should be addressed.

Page 3, Line 20: After the word "manner", it should include "and amount".

Page 3, Lines 24-28: Indicates that the Commissioner of Fish & Game "shall issue or deny a permit with within 30 days after receiving an application". Whether this time limit will require an additional staff member to handle this, may relate to an increased fiscal note.

Page 3, Line 29 thru Page 4, Line 7: Line 29 should read "shall" instead of "may", and Line 2, "substantially impair sustained yield" relates to the "shall". This section gives priority of wild stocks to fish farmers. Permits should be issued only if there is a demonstratable surplus. The sentence on Lines 3 & 4 indicates that the "decision of the Commissioner of Fish & Game must contain the factual basis for the findings". Whether this is always possible, or how "factual" the findings must be (ie the case of coho salmon), is difficult to say. Therefore, whether or not a denial of a permit is possible in all instances, even when it should occur, must be worked out and cleaned up. Lines 4 thru 7 indicates that again the priority rights go to fish farmers, not to the escapement. Not only that, but it appears that the Department of Fish & Game must manage the commercial fishery in such a manner as to give priority to the fish farmers in their needs for stock and inventory. That is, they must manage all fisheries (and I would guess subsistence also) to provide brood stocks for the fish farmers. This is crazy! Such a request is an allocation issue and should be relegated to the Board of Fish.

Page 4, Line 9: "Shall issue a permit" - it goes on to indicate that there should be no restrictions on egg take or on demand when fish farmers are involved. Substitute the word "may".

Page 4, Line 10, Item #1: Seems to me to be in direct conflict to chinook rebuilding under the U.S./Canada Salmon Treaty.

Page 4, Lines 12 & 13, Item #2: I'm unsure what this means at this time.

Page 4, Lines 14 & 15, Item #3: Seems to indicate that if a hatchery or wild stock needs to maintain a genetic pool, it will also be in a priority, since they "shall" issue a permit. Could be a problem.

Page 4, Lines 16 & 17, Item #4: May be trying to exclude the priority, but it is unclear. It probably should indicate commercial, sport, subsistence, and personal use harvest of the "species sought", etc.

Page 4, Line 21, Item h: "shall" should be "may". Otherwise, you are legislatively determining allocation of enhanced and wild stocks for consistency. Such allocation is best relegated to the Board of Fish where full public review can occur.

Page 5, Line 9 thru 11: "a report of a health inspection of the stock --- shall be conducted by the Department of Fish & Game". This is another fiscal note which the Department has to be aware of.

Page 5, Line 13, Item d: "may" should be "shall" restrict or disapprove a transfer of stock if it finds that the transfer would present a risk of spreading disease, and if it would impair production needs.

Page 5, Line 17 thru 19: This is unclear as to whose hatchery we are talking about; the whole sentence is rather vague.

Page 5, Line 27: Should read not only "intentionally", but "shall not be released into public waters".

Page 6, Lines 6 thru 8: "shall report" and add "or lose permit", after "holder".

Page 6, Line 9 thru 11, Item d: "upon reasonable notice" indicates that a spot-check to see if the farmer is actually in compliance will not be possible since you're going to notify them of your inspection. The additional item there is "the cost of inspection shall be borne by the Department of Fish & Game", and should be included in the fiscal note.

Page 6, Lines 13 & 14: "the Department of Fish & Game shall develop a disease management and control program for aquatic farms and hatcheries". This is certainly an addition in the fiscal note. Additionally, this Section reinforces the relevance of having Fish & Gam be the lead agency.

Page 6, Lines 19 thru 25: "commissioner" (of Commerce & Economic Development) shall submit a report to the legislature, which will, in part, discuss the affect of the salmon farming industry on the commercial fishing industry, with recommendations to the legislature. Such effects on the commercial fishing industry have not been discussed to date (ie the socio-economic impacts), and this has mostly been due to the lack of funds. This certainly must be included in the fiscal note, and I believe is not reflective of the present proportion of the fiscal note.

Page 6, Line 26: "the commissioner shall adopt regulations necessary to implement this chapter and to effect state policy concerning aquatic farming". The Department of Commerce & Economic Development, Fishery Development Section, is not, I don't believe, a regulatory body, though maybe they are.

Page 7, Lines 2 & 3: "guilty of a class B misdemeanor" - this certainly has to be more than a small "misdemeanor". We need to check this along with other types of infractions under the State law.

Page 7, Line 9: "fish parts that are propagated ---" - this is unclear; this is probably fish or shellfish which are propagated.

Page 7, Line 11: There again they are talking about the "commissioner", and, again, since the amendments are all amendments to Title 16, this should be the Commissioner of Fish & Game.

Page 7, Line 16: "fish" - We believe all reference to "fish" should be struck from this Bill.

Page 7, Lines 25 thru 29, Section a: amends AS 08.01.065(a) to include aquatic farms certainly must have a fiscal note to it when you refer to all the fees that are involved. The bureaucracy to institute and collect fees is not inexpensive.

Page 8, Lines 2 and 10: Because of the allocation issues, the Board of Fisheries overview must remain. Delete Lines 2 thru 10.

Page 8, Line 14: Should read <SHELLFISH, AND AQUATIC PLANTS>. "FISH" should not be included.

Page 8, Line 18: Same as above

Page 8, Line 23: Same as above

Page 9, Lines 2 thru 5: Same as above

Page 9, Line 14: "user group" - we're now including aquatic farms under Title 16.10.380(b)? If it is a "user group", then why are they trying to exclude it from Board of Fish activities??!!

Page 9, Line 22 thru Page 11: First, we believe that all reference to finfish or salmon in this Bill should be deleted. Notwithstanding, all of the issues starting on Page 9, Lines 22 thru 29, and Page 10, Lines 1 thru 24, require the Department to do and monitor many things that certainly must be included in the fiscal note, and must be checked as to their impact.

Page 10, Line 20: We need to check on what was <REPEALED>; did they repeal it, or had it been already repealed?

Page 11, Line 7: "must <SHALL>" - how does this actually occur in Alaska Statute 08.06.010?

Page 11, Lines 10 thru 12: We'll need to take a look at AS 16.43.140 and determine what the "amended" does here.

Page 11, Lines 13 thru 18: We'll have to take a look at AS 16.51.180(5) and see what the "amendment" does.

ASMI-GRAM

Vol. 3, No. 2

March, 1987

ASMI seeks federal dollars to market Alaska fish overseas

The Alaska Seafood Marketing Institute has applied for \$3.5 million in aid from a federal agency to be used in marketing frozen salmon, herring and pollock overseas.

In February ASMI submitted a proposal for federal assistance from the Foreign Agricultural Service (FAS). The agency controls disbursement of Targeted Export Assistance (TEA) grants to American businesses facing unfair foreign trade competition.

According to Merry Tuten, executive director of the Juneau-based state-private industry seafood marketing agency, ASMI is seeking federal funds to mount a marketing, promotion and advertising campaign to help Alaska salmon compete against Norwegian pen-reared salmon. The campaign also will focus on improving sales of herring and will serve as the forerunner for a promotion effort for Alaska pollock in Japan.

Tuten estimates that Alaska could sell \$36.2 million more fish overseas this year if ASMI receives the grant. In 1985, American fish exports totaled more than \$1 billion — Alaska accounts for 90 percent of the U.S. salmon catch, 87 percent of its Pacific herring catch and 100 percent of its pollock production.

~~Tuten said Alaska in recent years has watched its share of the foreign market in both Europe and Japan erode and depression. Norwegian salmon is the main competitor. The Norwegian Ministry of Fisheries funded \$175 million in 1985 to support fish farms. In 1985 Alaska salmon was America's leading fish~~

export as 358 million pounds of salmon, valued at \$614 million, headed overseas.

But Norwegian pen-reared salmon is mounting a major assault on Alaska's market share. In 1975 Norway raised just 1.9 million pounds of salmon. By 1985 it had reached 74 million pounds worth \$186 million. ~~Worse yet, estimates are that unless Alaska undertakes a strong program to counter Norwegian sales efforts, Norway could capture the lion's share of the European market by 1990 — estimates being that Norway will capture 76 percent of sales in France — Alaska's best current customer for frozen salmon — and potentially 90 percent of the market in Great Britain.~~

According to the U.S. Department of Commerce, in 1983 the U.S. was the leading supplier of fresh salmon to Japan selling 1,275 tons of fresh fish to the country or 94 percent of its total imports. ~~In 1985 Norway replaced the United States as the leading fresh fish supplier in Japan.~~

"The threat to our markets is very serious. We really need to mount an aggressive campaign this summer and fall to stem the tide. Otherwise we could find ourselves increasingly shut out of major markets for Alaska seafood products," Tuten said.

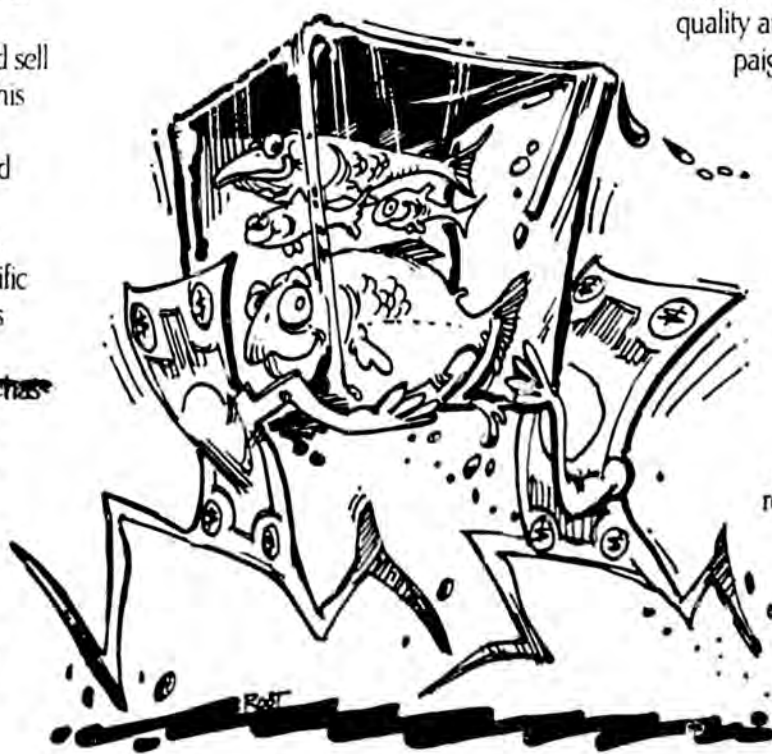
Noting that Alaska products already face a host of unfair trading handicaps, Tuten said ASMI wants to spend \$2.5 million in Western Europe and about \$1 million in Japan.

In Europe, the campaign will stress that Alaskan salmon are wild and natural with superior taste, of healthier quality and a deeper color — the campaign is specifically designed to

discount an attitude in Belgium that Alaska salmon are more red-pink in color because of artificial dyes. The campaign will stress that Alaska salmon have more natural color than the yellowish, paler pen-reared varieties.

The campaign also will include hiring merchandising representatives for Europe, running retail trade and consumer advertising, trade events, printing point-of-sale materials, providing

continued on page 2



Some relationships between pathogenic bacteria and
salmon net pen culture

Pacific Fisheries Legislative Task Force, State Capitol, Olympia,
Feb. 7, 1987

Dr. Arthur H. Whiteley, Professor, Department of Zoology,
University of Washington

I intend in these few minutes to comment on one aspect
only of pen rearing of salmon - the relationship to pathogenic
bacteria and other agents of disease.

The growth of bacterial populations in a natural environment is limited by the availability of nutrients. In a typical, natural marine environment the bacterial populations are relatively sparse. Given appropriate nutrients, either in the form of dissolved materials or sediments, the opportunity for growth in these populations will be much enhanced. It is generally agreed that salmon pen culture contributes substantially to the eutrophication of the environment of the pen - both in terms of soluble and finely suspended material, and in terms of larger particles that form heavy sediments on the bottom. In this way, the pens enrich the local environment for bacterial growth. Those bacteria already present in the water and substratum can increase. Any brought in with the introduced fish can increase as well. A variety of diseases can thereby be fostered by the pens. Some of these are of bacterial origin, some are viral, and some are due to organisms such as fish lice, parasitic worms, etc. The enhancement of the bacteria by nutritional enrichment works to the disadvantage of the penned fish. They are already stressed by the conditions in which they grow. They are therefore susceptible to bacterial invasion. Notably *Vibrio anguillarum* and *Renibacterium salmonarum* infect the penned fish and often kill them, and other vibrios and aeromonads are of major importance as salmon pathogens. *Vibrio anguillarum* produces disease in penned salmon in this State and in British Columbia. It also is ubiquitous in Norwegian waters, and is responsible for many of their fish farm diseases. With the advent of intensive fish farming in Norway, a new disease, the "hitra" disease, has appeared and now is responsible for 80% of the disease problems in the Norwegian fish farms. Its cause is uncertain, but vibrio species occur in connection with the disease

outbreaks (Håstein, 1986).

A significant question is whether these infections affect wild fish. Weston (1986) concludes that the evidence argues against such transmission. Others point out the difficulty of making such a determination because of the mobility of the wild fish and other complexities associated with working in a submerged, marine environment (Trust, 1986; Johnson, 1989; Staley, pers. com.). It takes only a few minutes exposure for a fish - penned or wild - to become infected. Often the route of transmission is through the gills. The infected fish often die, but if they survive, they frequently become carriers of the pathogenic organism. Both viruses and bacteria can be shed through the feces of the fish, thus spreading the focus of contamination in the natural environment. Moreover, in certain cases (*Renibacterium*) the bacteria can be passed from a female to her eggs, where it associates with the yolk, and transmits the disease to her offspring (Trust, 1986). It is too early to conclude that there is no transmission from a pen to the general environment and to the wild fish there. On the contrary, it is the opinion of microbial ecologists that an infected fish pen would in all likelihood serve as a focus for the infection of fish in the environment, and from them for the transmission of disease to their offspring (Staley, pers. com.)

In addition to pathogenic bacteria, the stressed salmon can serve as a focus for a number of serious viruses. These, too, may enter their host through the gills, and can be transmitted to other fish and to next generations (Trust, 1986). It is expected that they will be locally enhanced by the concentrations of wastes associated with fish pens (Staley, pers. com.), and this enhancement poses problems for the penned fish, and for wild fish as well. The danger that such viruses can be transmitted to wild fish is recognized by laws that prevent introduction of salmonids from the Columbia River system, which is infected by viruses, into any other river system in this State.

These pathogens and related ones that will multiply in the accumulated fish wastes, can serve as a reservoir of infection of marine invertebrate organisms as well. This, too, is a difficult field of inquiry because of the nature of the environment and the mobility of some of the organisms, and most information is derived from study of captive invertebrates. It is believed,

however, that animals living in degraded environments (which I assume would include under-pen locales) can be seriously disabled by such bacteria. Bacteria that degrade chitin, including *Vibrio*, *Beneckea* and *Pseudomonas*, cause shell disease in a host of crustacea, including spiny lobsters, tanner crabs, king crabs, various shrimp, and others of economic importance (Johnson, 1983). The species of *Vibrio* bacteria that infect crabs and shrimp include those associated with salmon pens or are present in local waters: *V. anguillarum*, *V. parahaemolyticus*, *V. alginolyticus*. (Johnson, 1983). Laboratory experience indicates that animals kept in clean sea water are difficult to infect, but those in the presence of sewage sludge developed shell disease. In addition to causing shell diseases, bacteria invade shrimp, crabs and other crustacea and cause internal infections. Again, the total relation of these infections to stress, to polluted environments, to salmon pen sewage is not resolved (Johnson, 1983), but we believe this relationship needs analysis in relation to establishing fish pens in the vicinity of shrimp and crab populations.

There is a well documented literature demonstrating that molluscan embryos and larvae - some of commercial significance - are subject to serious infection by these same species of vibrio bacteria. Abalone embryos and Pacific oyster (*Crassostrea gigas*) embryos and veliger larvae in hatcheries suffer serious mortalities from vibriosis (Sparks, 1985; Jeffries, 1984; Tubiash and Elston, 1984). It would be prudent to determine carefully the potential damage that may be caused by juxtaposing salmon pens to oyster and abalone culture facilities, and to native bivalve beds.

It would be of interest, also, to determine if vibriosis similarly affects these same kinds of molluscan larvae and embryos in the natural plankton, thereby affecting natural populations. Beyond that, it is important to know if populations of these *Vibrio* species or other pathogens, enhanced by sewage or fish pen wastes, infect other forms of invertebrate larvae or adults. I am thinking of the sponges, sea urchins, starfish and the host of other invertebrates which, though not of direct commercial value, are absolutely fundamental to the ecosystems of these water and to their productivity. Their impairment would sound the death knell for these waters.

Some of these bacteria are pathogenic to man as well. Knowledge of the genus *Vibrio* is expanding rapidly. This genus, which includes *V. cholerae*, includes species that typically live in marine locales (Kelly et al., 1982). *V. anguillarum* appears not to infect humans. However, *V. vulnificus* and *V. parahaemolyticus* do infect humans. *V. vulnificus*, a recently recognized species, is a deadly pathogen that is carried in sea water. It is readily filtered and concentrated from sea water by oysters and clams and it is easily transmitted to humans when these bivalves are eaten. The results are often fatal. Other than through ingestion, humans can contract the disease through simple contact of sea water with open wounds or mucosal tissues. It is predominately a warm water organism, which suggests that our waters may be safe from it, but virulent strains of this species have been found in Oregon associated with fish, crabs and clams and in Japan associated with eels (Tison and Kelly, 1986; Kelly and McCormick, 1981; Tison and Kelly, 1984; Blake, Weaver and Hollis, 1980). A preliminary search for this species in the San Juan Islands has not revealed it, but its presence in warmer bays there, and in the Canadian Gulf Islands, or elsewhere in the Sound cannot yet be discounted (Kelly, pers. com.). *V. parahaemolyticus* is, by contrast, commonly found around the San Juan Islands and doubtless is ubiquitous here (Kelly, pers. com.). It causes acute gastroenteritis in humans (Tison and Kelly, 1984; Blake, Weaver and Hollis 1980). This form of gastroenteritis appears to be transmitted exclusively through food, usually seafood (Blake, Weaver and Hollis, 1980). It can be a very significant infectious agent: in Japan, over a 10 year span, 24% of reported cases of food poisoning were attributed to this bacterium.

V. parahaemolyticus, thus, is present here, is a known pathogen of humans, and is transmitted through filter feeders such as clams and oysters. *V. vulnificus* is found nearby, and with further searching may be found in the Sound and Gulf. Simple contact with infected sea water will lead to serious infection. The former species, and probably the latter as well, thrives in heavy, enriched sediments such as sewage sludge. It can also be expected to grow in salmon pen sludge (Staley, pers. com.; Kelly, pers. com.).

It has been argued by associates of the salmon pen aquaculture industry that human diseases associated with these vibrios have been rarely found in the Puget Sound region, and therefore no danger is posed by them. Thus fish pen aquaculture is justified. It is good that the base line now, before salmon pens are well established, is essentially zero. The water is relatively clean, now, and the populations of these pathogens are within tolerable limits, using customary screening methods for detecting these pathogens. But a further complication is introduced by a recent paper (Grimes, et al, 1986). They find that when such pathogens as I have been discussing are introduced into marine waters, they rather quickly lose their identity as measured by conventional culture methods. They enter into dormancy, but remain viable though not culturable by traditional methods. Failure to find them using these methods could lead to overlooking a substantial, but cryptic source of serious pathogens in the environment.

The important question, then, is not whether these organisms pose a present health threat, or ecological threat. The proper question is: can these organisms, and this ecosystem, and these humans tolerate the eutrophic burden that will be imposed by a full blown fish pen industry? It is our belief that there are many too many questions that need resolution, of a public health nature, and of an ecological nature, before we proceed further.

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SENATOR FRED F. ZHAROFF
ALASKA STATE LEGISLATURE

P.O. BOX 405, KODIAK, ALASKA 99615 (907) 486-5259

DURING SESSION:

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DISTRICT N

ALASKA PENINSULA • ALEUTIAN CHAIN • BRISTOL BAY • KODIAK ISLAND • LAKE CLARK/LAKE ILIAMNA • PRIBILOF ISLANDS • SHUMAGIN ISLANDS

TO: All Senators
FROM: Senator Fred F. Zharoff
DATE: May 12, 1987

One of the biggest questions to arise this session during all the discussion over the aquatic farming legislation (SB 106) is: What will be the impact of salmon farming on Alaska's traditional salmon markets?

Attached is a copy of a study that provides information on this important issue.

In brief, the researchers have concluded that the worldwide production of farmed salmon will have a significant impact on Alaska's salmon industry. At the same time, they calculate that Alaskan farmed salmon production -- if we choose to enter this industry -- would only have a marginal impact on the traditional salmon fishery. The main competitive challenge will come from Outside. Alaska can choose to react, or do nothing.

Alaska's policy on aquatic farming is a issue the legislature must address next year. I recommend this study as one more source of information to consider in evaluating the overall issue.

Salmon Farming in Alaska

Economic Feasibility and Socioeconomic Impacts

Robert R. Logan

John Weddleton

University of Alaska - Fairbanks

April 1987

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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

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 largely 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 <u>Total</u>	Farmed <u>Total</u>	Farmed+Wild <u>Total</u>	% of <u>Total</u>	Premium <u>Wild</u>	Premium <u>Total</u>	% of <u>Prem</u>
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.

Profitability in Alaska

1) Overview

Atlantic salmon farming has proved to be an exceptionally profitable venture for the Norwegians. This does not guarantee the same for Alaska for two reasons. The first is that the Alaskan costs of production are not known with precision, and the second is that the enormous expected increases in production are bound to bring these rates of return down to "normal" rates of return.

There has been at least one study on the feasibility of Atlantic salmon farming in Alaska. This was a study for the Seaalaska Corporation undertaken by the VBB/Sweco and Nordic Alaska companies. In a word, the answer appears to be "yes". No such detailed study has been performed for Pacific salmon farming in Alaska, but the important features of Alaskan production costs seem to be the same for the Pacifics. The above report indicated that the Chilean and Japanese experience demonstrates the cost comparability between the two species.²

However, the state's posture towards salmon farming in Alaska has yet to be determined, and this will be an important feature of the profitability picture. If the start-up phase is elongated through an extensive permitting and site selection procedure, or if operational costs are

² Phase II, p 102.

increased through overly stringent environmental regulations, then Alaska's producers will be at a competitive disadvantage vis - a - vis foreign and other domestic producers.

Assuming that this is not the case, it appears, in short, that Alaska has a transportation cost advantage over European producers sufficient to outweigh higher feed and labor costs. This is extremely important feature for the long run viability of a salmon farming industry in Alaska. For if this were not the case, world output increases over time could result in price decreases sufficient to destroy a fledgling farming industry in Alaska.

2) The Norwegian Experience

A survey conducted in 1983 indicated that salmon farms in Norway were earning up to 39% rate of return on sales, with the least profitable farms reporting just over 20% rate of return on sales.³ Since that time, it appears that profitability has increased, and rates of return in excess of 100% for particular farms is not unheard of.⁴ Table 2 indicates the cost and profitability statistics by size of farm.

The numbers would appear to indicate that there are no dramatic economies of scale in salmon farming. The optimal sized farms seem to be above 100 metric tons of production a

³ These figures are lower than those reported in "Aquaculture in Alaska" p. 64.

⁴ "Opportunities and Constraints ..." (Phase II) p 42.

year, but not more than 200 metric tons per year. (7-15 M³ enclosure). It should be noted that there were only 8 Norwegian farms in the latter category, of which 6 responded to the survey. Thus, further scale economies cannot be ruled out absolutely.

These results should calm the fears of those worried about gigantic corporations taking over the salmon farming industry. In looking at the man-year inputs, it would seem that even "shoestring" operations are making substantial profits. The most profitable farms (the medium sized farms) are quite often family-run operations.⁵

It is important to understand the demographics of the typical salmon farm in Norway in evaluating the Alaskan potential. According to Braaten (1985), the typical Norwegian fish farm has been a small private enterprise of low technological standard operated by family members without a great deal of education. The typical farm is outlined as:

- small in size (50 tons production level)
- low investment
- high operating costs
- simple technology
- small degree of automation
- labor intensive
- low attention to working conditions
- risk of self pollution
- risk of wreckage in open site conditions
- dependence on natural conditions.

This would reaffirm the capability for small operators to compete in this marketplace. More importantly, however,

⁵ Anderson, p 11.

it indicates that there is plenty of room for an Alaskan industry if it is developed in a more efficient manner. The technology available for salmon farming has changed dramatically through the 1980's, and this should give an advantage to start-up operations in Alaska. Farms taking advantage of automated feeding systems, pumps for cleaning nets, mechanical harvesting systems, etc. will maintain higher profit margins through greater efficiency.

It is now possible to get a technical degree in salmon farming in Norway.⁶ There is no reason why the community college system in Alaska cannot offer the same type of training to rural Alaska residents. Indeed, this is a good part of the mission of the community college system. Sound technical training will ensure the future profitability of this industry in Alaska. The educational training can take place while implemental issues are worked out in the state legislature.

⁶ Personal communication: Jesper Nielsen, Aalborg University Center

Survey Results for Norwegian Salmon Farms

Enclosure Size (M ³)	<3	3-5	5-7	7-15	15+
Kg./Year	28,305	53,930	102,816	139,351	229,779
Income:	651,025	1,424,348	2,330,631	4,157,675	7,071,259
(\$)	(100,778)	(220,487)	(360,779)	(643,602)	(1,094,622)
Costs:					
Var:	344,671	776,634	1,191,192	1,794,949	3,666,233
Fixed:	57,455	133,186	237,482	291,083	991,435
Int./					
Depr.,					
Other:	63,857	177,166	272,140	444,486	956,239
Total:	465,893	1,086,986	1,700,814	2,530,518	5,613,907
(\$)	(72,133)	(168,264)	(263,283)	(391,721)	(869,026)
Profit:	185,042	337,362	629,817	1,627,157	1,457,352
(\$)	(28,644)	(52,223)	(97,495)	(251,882)	(225,596)
Man- Years	1.17	2.10	3.20	5.20	11.20
ROR	28.4%	23.6%	27%	39%	20.6%

Table 2

Source: Reprinted (ROR calculated) from Anderson, p 13.
During survey period, average exchange \$1 = 6.46 NOK

3) Cost Estimates for Alaska

As indicated earlier, the VBB/Sweco and Nordic Alaska companies produced a feasibility study for Atlantic salmon farming in Alaska. The relevant results of that study are summarized in table 3. Table 4 offers a comparison across input costs with the Norwegian case.

As can be seen from the tables, Alaska appears to be at a disadvantage on the basis of feed and labor costs. However, the transportation cost differential to U.S. markets appears to be sufficient to overcome this problem. It should be noted, however, that Alaskan farms will be at a distinct disadvantage relative to farms in the Seattle/Vancouver area. As the capacity of this region is limited due to site constraints, however, this is not likely to be a major concern in the future.

A discussion of the feed cost figures for Alaska is probably in order. Many are aware that Alaskan hatcheries are currently using either OMP or ADP feeds, which cost over \$.50 and \$.70 a pound, respectively. These both translate into costs of well over \$1.00 per pound of fish produced, despite feed conversion ratios comparable to Atlantic salmon. Cost estimations for "Zero Chinook" at the Osprey Bay facility were projected to be \$1.67 per lb. of fish produced, in fact.⁷

⁷ Memo, July 19, 1985 from Bill Heard, Auke Bay Laboratory Salmon Program Manager, to Stan Moberly, Director Fred Division. Feed costs assumed \$1.61/kg. FOB Juneau, and 2:1 feed to flesh conversion ratio.

These are premium feed products, and adequate feed can be purchased at substantially lower costs. Alternative feed products from the Moore Clark company (Which supplies OMP to Alaskan hatcheries) can be purchased for \$.25 to \$.30 per lb., and Surimi plants are producing feed products at prices as low as \$.16/lb.⁸ Commercial feed products can be mixed with silage to reduce costs per pound further.

In addition, it is likely that a regional feed industry will develop in Alaska as in British Columbia. Alaska has an abundance of fish byproducts that can be used for fish feed. For example, currently 200 tons of Kodiak and Unalaska/Dutch Harbor fish meal is exported to Taiwan for mariculture endeavors.⁹ Alaska's Herring, (currently dumped into the ocean) Capelin, and Krill resources can be utilized as Capelin and Herring are in Norway today.

It appears that even a small salmon farming industry in Alaska will require feed output consistent with the development of a regional feed industry. An economically sound Norwegian dry fish food plant produces about 20,000 metric tons of feed per year, which requires about 5,000 to 10,000 metric tons of salmon production with the associated

8 Personal communication, Kelles Sewel, Sea Star co.

9 Paul Fuhs, President of Alaska Mariculture Assn. Statement before House mariculture committee, April 3, 1987.

hatchery facilities.¹⁰ At least one firm (Ewas) has considered building feed plants in Alaska.¹¹

4 Summary

With 4 - 6 lb. Atlantic salmon currently selling for \$3.75 - \$3.95 landed in the U.S., Alaskan Atlantic salmon farming certainly appears to be a lucrative investment. While there will be tremendous growth in production of farmed salmon, prices would have to fall by over 35% to make it unprofitable to produce and deliver Alaskan farmed products to U.S. markets, assuming that technological innovations do not reduce the cost per lb. over time. Note that prices have remained strong despite the record harvests of Pacific salmon and the already dramatic increases in supply.

While no direct cost data was cited with regard to the production of Pacific salmon, indirect evidence seems to suggest that the costs are comperable. As a final note, one could add that if the private sector were not so convinced of Alaska's salmon farming potential, then one would not see so much interest in the issue. Indeed, if one is to guage profit expectations by the number of permit applications in British Columbia, then salmon farming must be the next Klondike.

¹⁰ "Aquaculture in Alaska, p 79

¹¹ Personal communication, Kelles Sewel, Sea Star co.

Delivered cost to Houston/Los Angeles (\$/lb.)

Item	Urban		Rural/Remote	
	(\$)	(%)	(\$)	(%)
Feed	.80	29%	.85	29%
Labor	.69	25%	.69	24%
Smolt	.31	11%	.31	11%
Containers	.15	5%	.15	5%
Other	.15	5%	.15	5%
Debt Service	.10	4%	.10	4%
Transportation	<u>.58</u>	<u>21%</u>	<u>.64</u>	<u>22%</u>
Total	2.78	100%	2.89	100%

Table 3

Reprinted from "Opportunities and Constraints..."
(Executive Summary) p 52

Salmon Production costs in Norway, 1982

<u>Item:</u>	<u>Range</u>
Smolt	.27 - .31
Feed	.41 - .59
Salary	.13 - .33
Interest/Deprec.	.22 - .24
Other	.22 - .28
Transportation	<u>1.21</u>
Total	2.47 - 2.59

Table 4

Reprinted From "Opportunities and Constraints..."
(Executive Summary) p 53

Positive Economic Impacts From a Salmon Farming Industry

1) Introduction

This section will present estimates of final increases in sales, income, and employment under three alternative development scenarios. The first scenario is a rather modest development of 10,000 metric tons, the second is a level of 20,000 tons, while the third is an optimistic 30,000 metric ton per year scenario. In each case, the final effects of these sales at \$3.00/lb. is calculated.

The 20,000 metric ton scenario was considered in the House Research Agency report: "Aquaculture in Alaska". This was a level based on projections of market potential in the VBB/Sweco - Nordic Alaska report: "Opportunities and Constraints...". This was a conservative estimate, and the explosive growth in the market bears this out. Therefore, the 10,000 metric ton estimates may be viewed as a sort of worst case (or very near term) scenario, while the 30,000 metric ton estimates may be viewed as an optimistic look at or near the turn of the century.

As noted in previous sections, salmon farms come in all sizes. The economic impacts associated with various levels of development also vary with the size of farms that predominate the industry. Furthermore, the location of the typical farm (urban vs. rural) affects the type of infrastructure required to support the industry. Thus, within each level of development an assumption must be made

about sizes and locations of farms. This leaves a total of twelve cases to consider.

2) Methodology

Given a change in direct sales by some industry in an economy, input - output modelling may be used to determine the final impact of such an event on sales, employment, and income for all industries in that economy. Essentially, this technique involves keeping track of how a dollar of direct sales in one industry is respent in other industries.

A dollar of direct sales translates into a particular distribution of expenditures across input factors. In turn, a dollar of expenditures on any input requires expenditures on other inputs, and so forth. If one sums all these secondary effects, one has a final effect on economy wide sales that is an order of magnitude greater than the initial effect. This magnitude is called the type one multiplier.

Type one multipliers do not exhaust the final increase in economy wide demand. For an industry to increase its output requires that all input industries increase their production. This requires increases in the use of labor, and therefore increases in household income. The latter effect causes a second round increase in demand for goods and services. When this induced demand is included in the analysis, the resulting multiplier is called a type two multiplier. Type two effects are reported here.

The accuracy of such forecasts depend on many factors, but chief among them are the level of detail acheived by the

model, the absence of structural change during the period of forecast, the absence of capacity constraints, and the absence of inter-regional linkage effects.

The "Alaska Input-Output Model" was used for this analysis.¹² This model is the most detailed and up-to-date attempt at an input-output modelling of the Alaskan economy. The model was restructured to mimic the economy of southeast Alaska in order to more accurately capture the economic effects of a fisheries related industry.

Inter-regional linkage effects are much less of a problem in Alaska because of its isolation, and this is a plus. Structural change in the economy is likely to occur, however, unless the oil economy stabilizes. While in the short run there may be bottlenecks in the infrastructure required for a salmon farming industry, there are no fundamental capacity constraints. In summary, input-output modelling is not an unreasonable tool in this case.

It is fairly well known that employment and income multipliers are low for basic industries in Alaska - on the order of 1.5 for employment multipliers, for example. There are two reasons for this. Type one multipliers are low because many inputs are imported. Type two multipliers are hampered additionally because a good deal of the wage income is spent elsewhere due to the seasonality of employment. That is, the induced demand from increases in household income is typically very minor.

¹² For a more detailed discussion see ch IV.

One should anticipate better results for a fish farming industry on both counts. The inputs are simple, and a larger proportion of these can be purchased within the state relative to other basic industries (e.g. oil). Secondly, the employment is year round, and therefore a much higher fraction of the wage income will be spent within the state.

The expenditure data reported in the VBB/Sweco Nordic Alaska report "Opportunities and Constraints..." was used to proxy expenditures by fish farms in Alaska. Note most importantly that it was assumed feed was imported. A more detailed study would have analyzed the expenditures of a fish food industry and incorporated this into the model as well. As indicated earlier, it is most likely that a regional feed industry will develop in Alaska. This will result in significant understatement of employment, sales and income effects, all else the same.

3) A Summary of the Results

Tables 5 through 16 indicate the input - output results for the twelve cases considered. Direct sales levels included \$60, \$132, and \$190 million. The impact of a rural industry was compared with a more urban industry. Finally, the sizes of farms considered included 50 and 200 metric tons of annual output. (Recall that 200 metric tons is considered "medium sized")

The industries affected are listed vertically. The change in that particular industries sales, and the change in that industries employment are listed to the right. A

summary appears at the bottom of each table. In all cases, the results in terms of impacts are as expected (e.g. packaged fish, air transport).

Note that the total employment figures do not include the direct employment on the farm itself. The direct employment in the farming industry will be approximately 600, 1200, and 1800 for 10, 20, and 30 thousand metric ton production levels, respectively. Adding these figures to the employment numbers in each table will yield the final change in employment.

Note most importantly that the employment effects include all jobs created - part-time as well as full time. This is because the input-output model relies on "County Business Patterns" data, which shows employment totals in the same manner. We therefore do not present employment multipliers, as the interpretation is not so straightforward. All that is presented is the total number of jobs created. A breakdown by full and part-time positions would take much more time.

Table 17 summarizes these cases compactly, and includes both direct and indirect employment. It is most interesting to compare the results for the \$132 million direct sales case to those reported in VBB/Sweco - Nordic Alaska.¹³ That report utilized a fairly informal procedure, and resulted in total employment of 2,640. The results here suggest full time plus part time employment of around 4,200, payroll

¹³ See phase II, p 124.

of around \$87 million, and final sales of around \$339 million.

FINAL IMPACT OF SALMON FARMING:
\$60 MILLION DIRECT SALES, RURAL 200 METRIC TONS

INDUSTRY	CHANGE IN SALES	CHANGE IN EMPLOYMENT
3 AG, FOR & FISHERY SERVICES	7.158	145.2
6 MAINTAINENCE AND REPAIR CONSTRCTN	3.216	46.2
7 SALMON FARMING	60	0
9 FRESH OR FROZEN PACKAGED FISH	18.678	192.6
13 PRINTING AND PUBLISHING	3.072	38.4
17 WATER TRANSPORT	2.982	34.2
18 AIR TRANSPORT	14.034	208.8
20 ARRANGEMENT FOR PASSENGER TRANSPORT	0.48	19.2
21 COMMUNICATIONS	1.284	24
23 ELECTRIC UTILITIES	0.84	13.2
26 WHOLESALE TRADE	1.896	42.6
27 RETAIL TRADE	5.118	243
28 BANKING	3.126	89.4
31 INSURANCE CARRIERS	2.058	48.6
32 INSURANCE AGENTS	0.54	10.8
33 REAL ESTATE	6.072	29.4
34 HOTELS AND LODGING PLACES	0.342	15.6
51 LEGAL SERVICES	0.51	9.6
54 EATING AND DRINKING PLACES	2.7	123
56 AUTOT REPAIR AND SERVICES	0.846	8.4
64 MEDICAL SERVICES	1.122	24
TOTAL CHANGE IN SALES	156	
TOTAL INCOME CHANGE	38.46	
TOTAL EMPLOYMENT CHANGE	1366.2	

Table 5