

ALASKA LEGISLATURE SPECIAL COMMITTEE/SUBJECT FILE 8672

1861 SCOMM 75: MARICULTURE (FISH FARMING), 1987-1990

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these permits plus makes a determination of consistency with the Alaska Coastal Management Plan. Applicants are burdened with completing redundant application information while agencies have difficulty acquiring the necessary information to make good permitting decisions.

The issues of competing uses (Issues 2, 3, 4, 5 and 6) can only be resolved in the public's best interest if all available information is used in making the decision. To ensure that all available information is applied to the permitting/leasing decision, it is proposed that a coordinated permitting/leasing process be developed so that all potentially competing interests and all affected agencies be given a chance to review, comment on and make decisions on a proposal at the same time. A coordinated process like the "Tri-agency Permit" used for mining could have the added advantage of making both the applicant's and the agencies' task simpler and more efficient, thus encouraging the development of the mariculture industry without foreclosing other valuable uses of state tide and submerged lands.

This process would have to include all of the agencies involved in reviewing and permitting mariculture activities and upland owners and be coordinated with other permitting procedures such as the ACMP consistency review process.

Proposed guidelines for mariculture permitting and leasing

- V. Coordinated Permitting. The Department of Natural Resources will support development of a coordinated permitting/leasing process with other agencies if it will meet the following objectives: 1) the process will lessen the application complexity for prospective mariculturists; 2) the process will provide for better agency decision making; and 3) each agency maintains its' own decision making authority.
- W. Public Notice for Mariculture Facilities. Public notice of a proposed permit or lease for mariculture facilities will be given under AS 38.05.945 or its equivalent. Permits will be treated as a lease for public notice purposes, including notification in a local newspaper. However, joint DNR notification with the DEC/DGC public notice is encouraged if practical. Copies of the public notice should be sent to adjacent upland land owners such as U.S. Forest Service and native corporations and other mariculturists within affected waters and communities (such as the postmaster) of 25 people or more within 6 miles of the proposed activity. If it is known, the public notice should mention that the proposed activity may impact resource development, commercial fishing, or recreation use and anchorages in the vicinity.
- X. Development Plans. A development plan will be required before a lease or permit application for mariculture facilities is approved. The preferred approach is for the application and development plan requirements to serve (at the

minimum) as the basis for DNR, ADF&G, DEC, ACMP, and upland owner review approval.

The application and development plan will require the applicant to provide the following information. The application form will give the applicant policy guidance on several issues. Any changes to the development plan after authorization is given will be submitted to the Regional Manager for a determination if project review will be reinitiated.

1. Describe the species to be raised. A permit or lease will be issued for a specified species. Raising a different species will require a new permit or lease.
2. Describe the size and type and map the location of all floating and shore-based mariculture facilities needed over the life of the project. The map should include the general location of the facility on a 1:63,360 or equivalent map. The development plan map should be of a size and scale that will readily indicate the location and size of all facilities with reasonable proportion and scale and relation to the shoreline.

Facilities such as rafts or pens should be indicated with size, location, and configuration. Fresh water sources and access to roads or markets should also be shown. The map will also indicate mean high water, mean lower low water, depths below the facilities, and water circulation patterns. Except where specifically allowed, facilities may not ground at mean lower low water. All facilities will be reviewed and authorized at one time.

Other plan guidelines and the Alaska Coastal Management Plan Standards should be used for guidance in designing an acceptable development plan.

3. Describe the size and map the location of areas to be used for temporary storage of equipment, supplies or shellfish pending paralytic shellfish poisoning test results and shipping. Because they are less biologically productive than saltmarshes and tideflats, gravel and sand beaches are generally the preferred sites for on-shore storage of shellfish while waiting for PSP test results and shipment.
4. Describe the method of anchoring floating mariculture facilities. Anchoring must be adequate to keep the facility from breaking loose and creating a hazard to other users or habitats. When siting mariculture facilities, public access will be maintained to and along public tidelands. Shoreties will not be used for anchoring mariculture facilities in significant

recreation or personal use areas or where public access or navigation would be adversely impacted unless doing so decreases the conflict between the mariculture facility and public access.

5. Describe the size and map the location of caretaker facilities. If floating or upland facilities are not shown, the method of housing persons responsible for caretaking and operating the facility must be described.
 6. Describe methods of wastewater treatment and disposal. (Only include if this is a cooperative process. DEC will want to insert standards here.)
 7. Describe methods of solid waste disposal. (Ibid)
 8. Describe the method of fuel storage.
 9. A schedule of development should be outlined for all facilities. Significant stages of development should be projected such as when the first young will be placed for growing and the first anticipated date of marketing the product.
 10. For fin fish operations producing more than 20,000 pound annually a site characterization survey should be submitted that includes: 1) a bathymetric survey of depth, range, and distribution of water and marine life (including predators); 2) a hydrographic survey of ebb and flood currents, temperatures, salinity, potential or existing sources of pollution, and level of storm protection; and 3) a diver survey of the biological resources during April to September including the level of plankton.
- Y. Coast Guard Approval. Permits or leases will not be given until the U.S. Coast Guard has certified that the proposed facility will not be a significant navigational hazard.

APPENDIX D

COMPILATION OF PROPOSED GOALS AND GUIDELINES FOR MARICULTURE

Proposed Goals for Mariculture

- GOAL #1 Economic Opportunities and Community Development. Opportunities to increase income and diversify the state's economy through the use of state tide and submerged lands for mariculture.
- GOAL #2 Optimum Use of Areas. The optimum use of the most suitable mariculture areas.

Proposed Guidelines for Mariculture

- A. Mariculture and Competing Uses. Mariculture is encouraged on all state tidelands where there is not a significant competing use. The siting of mariculture facilities is discouraged on all tidelands designated for log transfer or storage, mineral transfer or access, or other commercial activities. These areas will be available for mariculture (a) if the land manager determines that it is possible to site, design, and operate the two or more uses compatibly in the area, or (b) there is no feasible and prudent alternative for mariculture while one exists for the competing use. In no case will mariculture be allowed to foreclose access to mineral, timber, or developed recreation resources unless feasible or prudent alternative assess exists. In some cases it may be in the public interest to concentrate uses in one bay, (i.e. pen-reared salmon and timber transfer) rather than allowing the proliferation of uses in many bays.
- B. Separation Between Facilities. Mariculture operations will be sited to avoid the risk of disease transmission and competition for food from existing mariculture developments. Permitted mariculturists that may be affected by a proposed operation should be notified and given an opportunity to comment. Generally, a two mile separation should exist between finfish operations. Other types of mariculture, such as shellfish may be more closely grouped together.
- C. Coordination with the Upland Manager. The department will try to coordinate its management of the tidelands with the needs of the upland owner. While the department can neither put a moratorium on permitting mariculture facilities adjacent to private or federal uplands nor close those areas to mariculture, it will endeavor to coordinate its tideland management with the upland needs. On the other had, upland owners are encouraged to locate areas where mariculture (including upland facilities) should be encouraged and to

communicate their conclusions to the department and to the mariculture industry.

- D. Upland Owner Objections. An application for mariculture facilities adjacent to private or federal land will be approved if the application meets the other guidelines of this plan, and either the applicant has the approval of the upland owner or the department receives no objection from the upland owner. If the upland owner does object and suggests a feasible alternative site (one that is both physically suitable, meets both the guidelines of this plan and other permit requirements, and has the approval of that upland owner), the department will uphold the upland owner's objection. If the objection is not accompanied by the suggestion of a feasible alternative site, the department will adjudicate the permit or lease application considering at least the following:
- (1) the feasibility of using site design and/or operating stipulations to minimize or eliminate the objection;
 - (2) the presence or absence of feasible alternative sites where there would be no conflict between upland management and mariculture facilities; and
 - (3) the cost to the public or the upland owner of approving the facility.
- E. Permission of Upland Owner. Permits/leases will not be granted for applications that show support facilities, including shoreties, on the adjacent uplands unless there is a demonstrable agreement between the applicant and the upland owner. The term of the lease/permit will not be longer than the term of the agreement between the applicant and the upland owner. If the applicant has not made arrangements for the use of the adjacent uplands, the application must show how all necessary housing, warehousing, processing and other associated uses will be accommodated on the tidelands.
- F. Consistency with State Upland Management. Mariculture facilities adjacent to state uplands will be consistent with the upland management intent.
- G. Use of Anchorages and Recreation Areas. Mariculture is discouraged from designated or other important anchorages, campsites, or high use recreation areas where the land manager finds that mariculture will significantly diminish the remote, secluded nature of the anchorage or would significantly diminish its capacity. These areas are delineated in the management intent discussions or on the maps in Chapter 3 of the plans.

- H. (Prince William Sound only) Developed Recreation Facilities. Mariculture is not allowed adjacent to designated recreation sites or developed recreation facilities unless the facility manager or the land manager determines that the two uses can be made compatible by design, siting, or operating guidelines.
- I. Mariculture Caretaker Facilities. Floating caretaker facilities for mariculture operations are encouraged in areas where there is no significant competing use. Floating caretaker facilities for mariculture operations will not be allowed in designated recreation or personal use areas unless the regional manager determines that there is no feasible or prudent alternative. The determination will be made available for public comment.
- J. Access to trails and other public access points. Mariculture will not foreclose public access to important clamming areas, trails, public beaches or other similar public resources.
- K. (Prince of Wales only) Siting in Certain Habitats. Mariculture facilities should not be sited on or within 300 feet of extensive kelp or eelgrass beds; seaweed harvest areas; or shellfish concentration areas (as identified in the ADF&G Regional Guides or determined by ADF&G) unless the manager determines after consultation with ADF&G that there is no feasible and prudent alternative.
- L. Siting Near Anadromous Fish Streams. Mariculture facilities will not be sited within 300' of the mouth of a catalogued anadromous fish stream at Mean Lower Low Water without the approval of ADF&G.
- M. (Prince of Wales only) Siting Near Marine Mammals and Seabirds. Mariculture facilities will be at least one-half mile from marine mammal and seabird concentration areas (as identified in the ADF&G Regional Guides or determined by ADF&G).
- N. Designing to Prevent Marine Mammal Entanglement. Mariculture facilities should be designed to prevent entanglement of marine mammals.
- O. Dissolved Oxygen Depletion. Pens will not be sited where respiration and biochemical oxygen demand will significantly depress dissolved oxygen concentrations or where nutrient input attributable to net-pen culture will affect the frequency, extent, intensity or duration of phytoplankton blooms.
- P. Tri-n-butyltin. Tri-n-butyltin should not be used as an antifouling agent on nets.

- Q. Water Circulation. In order to maintain water circulation and flushing action which disperses pollutants, net-pens should occupy no more than one-third the water column depth.
- R. Storage of Petroleum Products. Petroleum products will be stored in a manner that will prevent spillage onto the tidelands or aquatic waters.
- S. Highest Economic Benefits. Where there are conflicts between floathomes and other uses, the department generally will decide in favor of the applicant with the greatest economic benefit to the state. Except for areas designated for floathome settlement, competing applications between floathomes and mariculture will favor economically viable mariculture unless the regional manager determines it is in the state's interest to permit the floathome or there are more reasonable and prudent alternatives for the mariculturist. Where a floathome is already permitted at a site proposal for a mariculture facility, the regional manager will determine if there are feasible and prudent alternatives for the mariculture operation and weigh the impacts on the permitted floathome resident. Unpermitted floathomes will not be given any standing in the permit adjudication process. This guideline also applies to floating caretaker facilities for mariculture.
- T. Performance Standards. The Regional Manager will attach reasonable performance standards to the permit or lease for project development and operation. The performance standards are to ensure the permitted area is used for the approved activity, the proposal is economically viable, and the permit is not held for speculation or removal of a land base from competition. In all cases the approved development plan must be adhered to. If the performance standards are not met, the permit or lease may be cancelled.
- U. Clean-up Bonds. A clean-up bond may be required to protect existing resources for future use.
- V. Coordinated Permitting. The Department of Natural Resources will support development of a coordinated permitting/leasing process with other agencies if it will meet the following objectives: 1) the process will lessen the application complexity for prospective mariculturists; 2) the process will provide for better agency decision making; and 3) each agency maintains its' own decision making authority.
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APR 21 1987

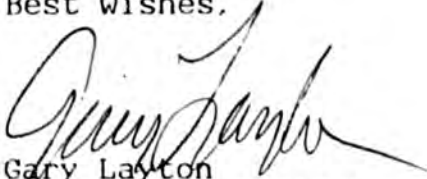
April 14, 1987

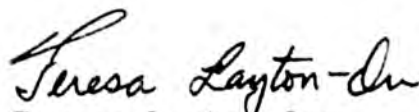
Senators Coghill; Sturgulewski; Zharoff
Pouch V
Juneau, AK 99811

Dear Senator,

This letter is to express our appreciation of your sponsorship and advocacy of SB106, the Mariculture Bill. We feel that mariculture development in Alaska is a needed and appropriate addition to the state's economy and poses no threat to established fisheries. Please feel confident that you will continue to have our support.

Best wishes.


Gary Layton
1803 Branigan Circle
Kenai, AK 99611


Teresa Layton-Orr

Tina Ortman
P.O. Box 442
Talkeetna, AK 99676
(907) 733-2565

April 15, 1987

APR 21 1987

Jack Coghill
P.O. Box V
Juneau, AK 99811

Dear Mr. Coghill,

I am writing to voice my approval of Aquaculture. It is surprising to me that anyone would oppose developing our marine resources to their fullest. It would be like having a fertile, tilled garden plot but not planting any seeds. The fishermen who are opposed to aquaculture are like "the dinosaurs picketing the emergence of mammals". Aquaculture is the future, let's get started on it now.

Thank-you for your attention.

Kind regards,

Tina Ortman

Tina Ortman

the **LODE STAR**

Charting the course of fisheries development today.

Alaska Fisheries

Development Foundation, Inc.

Volume V, No. 1 Winter 1986/87

News to Use

It may be Spring where you are, but here the ground is still frozen hard as a ship's plank, and so we call this the Winter issue. (In Alaska, everyone but the pussy willows knows better than to be optimistic in March.)

New executive director joins AFDF April 1

Mel Monsen, former consultant to the Bering Sea Fishermen's Association and legislative specialist on fisheries issues, was named executive director of AFDF at the board of directors meeting March 23 in Anchorage.

Monsen brings to AFDF broad experience in the natural resource industries in Alaska, and has worked with many segments of Alaska's seafood industry.

Monsen begins his duties on April 1. The AFDF board, staff and membership welcome Monsen to his post.

AFDF welcomed five new associate members this year. They are:

Fletcher Fishing, Ltd.
Bellevue, WA

Roquette Corporation
Gurnee, Ill.

Nobel Insurance, Ltd.
Dallas, Texas

Pacific Rim Fishery Projects
Danville, CA

Specialty Foods, Inc.
Richmond, CA

New surimi product contest

AFDF will sponsor a Prototype Development Contest this spring as part of our effort to diversify the market for Alaska's surimi. The foundation will invite proposals to create a prototype surimi product that is a non-analogue, non-substitute, stand-alone item that demonstrates the unique advantages of surimi.

AFDF will seek proposals from food technologists, engineers, and surimi consultants who can provide a development plan and product concept that will significantly enhance consumption of surimi-based foods beyond current market niches. To the selected applicants, AFDF will provide cooperation and limited financial assistance for product development and market evaluation.

AFDF will issue a request for proposals in April. If you are interested, please contact AFDF.

Kodiak is on top of bottomfish

By Krus Holmes

Probably several metric tons of paperwork have been generated to explore and explain fisheries development in Alaska, but no one has explained it better than Al Burch, when he told the Kodiak Daily Mirror in November, "Last year at this time I had boats looking for markets. This year the markets are crying for boats."

Al Burch is executive director of the Alaska Dragger's Association, a groundfish harvesters' group whose boats suddenly are in hot demand after several years of slow going since the decline of shrimp and crab resources in the late 1970s.

Burch's statement illustrates what fisheries development really means: a lively boat harbor, a string of active shoreside plants, reliable markets for fish. Employment, commerce, jobs. The groundfish industry has come alive in Alaska, and Kodiak is the state's shining example. In a town virtually still during the winter months even two years ago, now ten processors are handling groundfish, three of them processing more than 400,000 pounds per day.

"All the plants in Kodiak were virtually idle between September and April before this year," said Chris Blackburn, director of Kodiak's Groundfish Data Bank. "In 1987, three plants will operate year-round, processing surimi September till March, and pollock fillets year-round. Next year, it's expected that all eight plants will operate year-round."

A number of factors have converged to improve the seafood scene in Kodiak:

- Cod prices vaulted 75% in one year, as high as \$3.50/lb. for fresh and \$2.50/lb. for frozen fillets FOB Boston. The Seafood Leader 1987 Buyer's Guide said higher prices were "more a function of demand than a lack of production."

They predicted prices would not drop below \$2/lb. in the future.

- Pollock prices stretched from \$1.45/lb. to \$1.85/lb. for shatterpack, and pollock nuggets entered the fast-food business for the first time in 1986. Pollock has become increasingly acceptable on the world market as a high-quality substitute for cod, and pollock supplies are expected to remain tight.

- Alaska Pacific Seafoods, Kodiak's only surimi plant, doubled its surimi production capacity in late 1986, signalling that shore-based surimi processing in Alaska can be an extremely profitable venture.

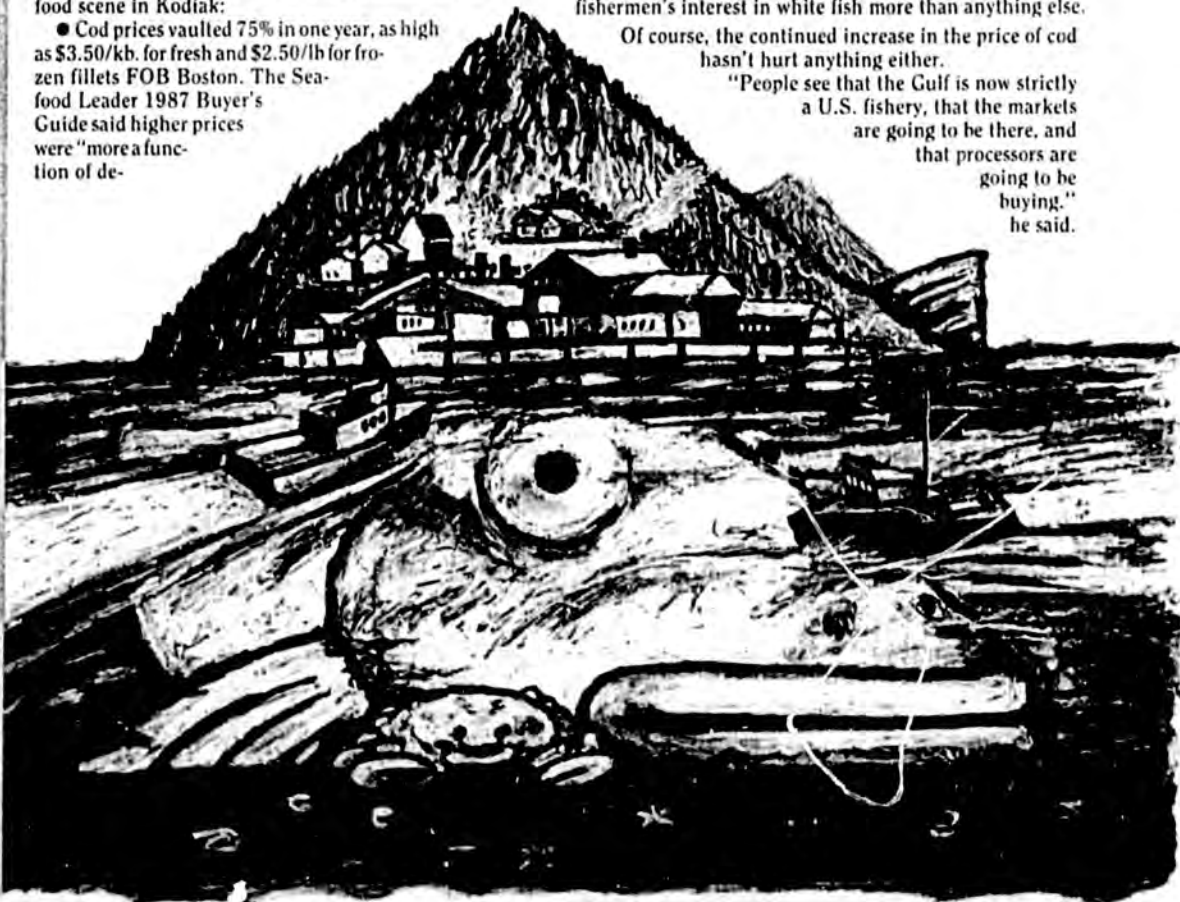
- National Marine Fisheries Service issued a report in late 1986 following a survey of Alaskan processors which predicted that Kodiak could process 45,000 metric tons of groundfish in 1987. The Kodiak Borough countered with 82,000 metric tons. Either way, it became clear by late 1986 that foreign and joint venture fishing were over in the Gulf of Alaska.

- Equally convinced was the North Pacific Fishery Management Council (NPFMC), which in December ended all foreign fishing and severely limited joint venture fishing in the Gulf of Alaska for 1987, reserving 190,000 metric tons of groundfish for domestic processing.

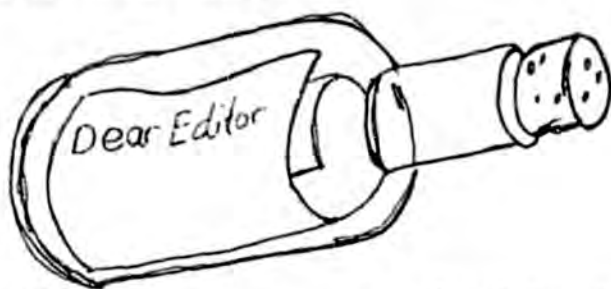
Kodiak fishermen and processors may have been lined up at the starting gate before this year's white fish season, but many say it was the NPFMC that pulled the trigger on the starting gun. Chris Bublitz of the Kodiak Marine Advisory Program said, "Their decision to reserve the Gulf for the domestic industry, I think, sparked the fishermen's interest in white fish more than anything else."

Of course, the continued increase in the price of cod hasn't hurt anything either.

"People see that the Gulf is now strictly a U.S. fishery, that the markets are going to be there, and that processors are going to be buying," he said.



LETTER TO THE EDITOR:



Dear Editor:

I was appalled to see your article entitled, "A New Twist on Surimi Testing," in which you reported that the NFI Surimi Technical Committee agreed to select torsion tests as a standard method.

As I correctly understood at the meeting, the Committee agreed to re-examine three methods, namely: punch, torsion and compression tests, for their appropriateness as a standard technique in evaluating the quality of surimi. Currently, data are being compiled to assess the performance of each method at various research laboratories. However, without having a sample preparation procedure standardized, I don't see how accurately the comparison can be made. It was a general consensus that the standardization of the testing method should be done in conjunction with the sample preparation procedure.

In searching for the most appropriate method, one must define what is the most important quality index to be

measured in evaluating surimi. The binding property of the surimi gel, specifically cohesiveness, has been used as a primary quality index. It can be measured only by breaking a gel, either twisting (torsion), bending/folding (no procedure reported for bending/folding test is done manually), compression, or punch test. The first three allow the entire sample to undergo a breaking process, while in punching only the local portion is subjected to breakage. Both torsion and bending tests would require extra care in getting a specimen of precise geometry as well as in setting and handling during testing. As for a punch test, because of its local breakage with a probe point having a 5mm-diameter head, the result may not correctly reflect the property of the whole sample body unless the sample is uniform in structure.

Breaking force and extent of deformation are used in measuring the gel cohesiveness, where stress is force/area and strain is deformation/sample

length. Strain is generally not as sensitive as stress when the gel sample is highly elastic and firm as in the case of a surimi gel according to our results as well as others from both compression and torsion tests.

Rigidity, on the other hand, is a ratio of stress to strain and remains relatively unchanged if strain changes proportionally with stress, even if substantial changes occurred in gel properties as a result of treatment. Therefore, this can be best used when comparison of surimi made from different species or different types of protein gel is made, but generally not for the quality changes due to freshness, handling, formulation, etc.

Another important factor in selecting a testing method is how sensitive, simple and reproducible the method is. Torsion test generates stress and strain; compression test yields stress, strain, non-failure stress (firmness) and expressible moisture; and punch test results in punch force and deformation (not strain). Regarding the sample preparation and testing procedure, torsion requires laborious sample preparation and an imprecise preparation will result in erroneous results.

It does not appear to be an absolute necessity for the test to generate stress and strain data unless these values have to be plugged into some type of formula to be used in evaluating the gel quality. Of more importance is whether that particular method is able to provide sensitive and discriminative results in a consistent manner.

What disappointed me and many other members of the meeting was that these facts were never made clear to the committee members. The impression the committee had was that the torsion test is the only testing method which can perform all necessary analysis, as reported in *The Lodestar*. It is a matter of principle that prior to selection of any official method, the proposed method should be opened to the scientific community for their review and careful examination until a uniform consensus is reached. Regrettably, this did not happen even after it was repeatedly suggested. Otherwise, I am sure, this whole confusion would not have occurred in the first place.

At this point in time, the choice should be left up to the individuals. In view of our relative unfamiliarity with the surimi testing methodology, we should take the necessary time to obtain sufficient information and results for each method so that a discernible decision can be made.

Chong M. Lee

Associate professor
University of Rhode Island

Editor's note: Roy Martin, head of the Surimi Technical Committee at National Fisheries Institute, said the committee is still considering the surimi testing issue. Martin preferred not to respond to Dr. Lee's letter until the committee meets again. At press time, no meeting had been scheduled, though one was expected in late April.

The editor's turn

Off the Cuff



By Kris Holmes
Lodestar Editor

About a year ago, Chris Mitchell leaned up against my door post and asked a question I've been thinking about ever since. "What's everybody going to do when this is all over?" he asked. "Surimi has been a big, fun, exciting job—and hard work, too—but what will capture our interest as much after this?"

Now AFDF is heading into a new year, and a new roster of projects, and our former director's question is still with me. Sure, there's much to do in the Alaskan seafood industry. But what will capture our creativity? What will pop our corks, the way the surimi project did?

For the foundation there are many things ahead, some of them exciting, some of them tedious, all of them equally important. But AFDF only does what industry can't. It's your creativity—the industry's—that directs us.

What's next for the industry? We think it's mariculture. AFDF is restrained by funding limitations from addressing mariculture. But the industry is restrained only by the limits of its creativity, and mariculture certainly seems to have ignited the industry's collective imagination.

Farmed salmon will comprise 14% of the Pacific salmon catch and 92% of the Atlantic salmon catch in 1990, and will dominate world trading in fresh and frozen premium products, according to Quick Frozen Foods International. One seafood processor has said mariculture is no longer promising, but is rapidly becoming a necessity.

Norway, Japan, Canada, Chile and New Zealand now lead in world production of farmed seafood. But in the Pacific, eyes are turning toward Alaska. The Alaska legislature now is considering a bill that would establish regulations for an Alaskan mariculture industry. The bill was spawned by the Alaska Mariculture Association (AMA), a newly-formed group of advocates for salmon, mussel, oyster, kelp and scallop farming, who say that Alaska's salmon industry will see fierce competition from salmon farming operations in the future, whether Alaska gets involved in mariculture or not. AMA advocates opening legal barriers to salmon farming—barriers which are not explicitly outlined but rather are implied in current Alaska Department of Fish & Game statutes. (According to an aquaculture report by the House Research Agency, the Attorney General of Alaska has stated that, since fish farming is not explicitly allowed in current statutes, "you cannot do it.") Other laws more specifically prohibit the collection of fish fry for scientific or propagative purposes. Hatchery owners are also prohibited from selling eggs or fry except to other hatcheries or to Fish & Game.

The House Research Agency report illustrated the economic benefits to producing premium farmed salmon by quoting Norway's \$180 million earnings in 1985 for 5% of the world's salmon production. By comparison, Alaska earned just more than twice that—\$370 million—for 45% of the world's salmon catch.

Curt Kerns, author of "World Sal-

mon Farming," a Marine Advisory bulletin, compared the benefits of salmon farming to poultry farming. "When reliable mass-production techniques for chickens, turkeys, and ducks were developed in the 1940s and 1950s, consumers responded by buying poultry in vast quantities," the booklet said.

Still, there is much debate over what role mariculture will play in Alaska's future. Some fear the entry of Alaskan farmed salmon onto the market would bring wild salmon prices down. John Enge of the Commercial Fishing and Agriculture Bank said that the investment capital to build an infrastructure would more than likely come from overseas. "No little fisherman is going to be able to shell out the millions of dollars it will take to build the infrastructure," he said.

Enge predicted that by the time Alaskan farmed salmon come onto the market, there will be a glut of farmed salmon anyway. "The biggest problem is that Norwegian salmon is being sold in the same markets with our wild salmon. It's even being called Alaska salmon," he said.

Still, some small fishermen are apprehensive. One seiner from Southeast Alaska said the advent of mariculture would turn small boat fishermen like him into anachronisms.

There doesn't seem to be much question that mariculture will play a powerful role in Alaska's seafood future. If Alaskans take the lead, it could become an important limb of the state's seafood economy. If not, farmed products will become formidable com-

petitors to Alaska's products on the world market.

Since we at AFDF probably won't be involved, this is our opportunity to encourage the industry to apply its pluck and passion to an idea whose time has come.

For more information:

● *Aquaculture in Alaska*, a 103-page report, House Research Agency, P.O. Box Y, Juneau, 99811.

● *World Salmon Farming: An Overview with Emphasis on Possibilities and Problems in Alaska*, by Curt Kerns, Alaska Sea Grant College Program, Univ. of Alaska, 590 University Ave., Suite 102, Fairbanks, AK 99809.

● *The Marketing Relationship Between Pacific and Pen-Reared Salmon: A Survey of U.S. Seafood Wholesalers*, by Ronald V. Rogness, and B.H. Lin, Alaska Sea Grant College Program, Univ. of Alaska, 590 University Ave., Suite 102, Fairbanks, AK 99809.

● *Mariculture in Alaska, and Straight Talk About Mariculture Development in Alaska*, Alaska Mariculture Association, Rodger Painter, executive director, P.O. Box 020704, Juneau, AK 99802. (907) 463-3600.

"For any product to be successful it has to pass the 'I'll be damned!' test. Potential buyers must say, 'Well, I'll be damned!' when they see it for the first time."

—Wilson Harrell
Inc. January 1987



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Mail Stop 3100
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ALASKA STATE LEGISLATURE
HOUSE OF REPRESENTATIVES
RESEARCH AGENCY

MARECULTURE

Ben has

not released

This, as of
my last talk
w/ Katrie
(Don't distribute)

April 13, 1987

MEMORANDUM

TO: Representative Ben Grussendorf

ATTN: Kate Tesar

FROM: Brad Pierce *BP*
Legislative Analyst

RE: Farmed Salmon Production: Impact on the Alaska Salmon Fishing Industry
Research Request 87.234

You requested this agency to provide information on several questions concerning a proposed salmon farming industry in Alaska. In consultation with your office, we have divided these questions into two discrete research topics: 1) the economic impacts of salmon farming on the existing fishing industry; and 2) options for regulating entry, the permitting process and structure of a salmon farming industry in Alaska. We anticipate further questions will arise from the current debate over aquatic farming legislation (HB 108 and SB 106) in legislative committees, which we will attempt to answer in future memorandums upon request. This is the first installment of the series.

In this memorandum, we examine available data on the economic impact of farmed salmon production on the existing Alaska salmon fishing industry. Specifically, you requested that we attempt to quantify how the market effects of increases in world farmed salmon production will affect Alaska fishermen in terms of their gross incomes and capital investments. You asked that we quantify these impacts by area and gear type. Additionally, we have posed the logical corollary to your question, i.e., what can fishermen do to mitigate these impacts. We attempt to answer this question in light of what we have learned about the successful integration of salmon farming with traditional salmon fisheries in other countries.

Much of the information contained in this memorandum is an expansion on material presented in "Aquaculture in Alaska" (House Research Agency Report 87-B, February 1987). This report should be referred to for a more complete background discussion of worldwide trends in farmed salmon production, the dynamics of premium salmon markets and their implications for Alaska.

Economic Models of Salmon Markets

In this section, we describe the difficulties of using current economic models to quantify the complex interactions of world salmon markets. We briefly discuss the factors that affect the assumptions we have used to estimate the economic impact of farmed production on traditional fisheries offered in the next section.

The state of the art in economic models purporting to simulate the interactions of worldwide salmon markets is dismal. Key measures of price/volume relationships (cross price elasticities) for various species and products as well as the relationships between market segments differ widely among models. The market effects of farmed production are particularly difficult to sort out because farmed salmon products have become a major factor in premium markets only during the past five years. This means that estimates of the market impacts of farmed salmon production have to be made from an inadequate data base. Production of farmed salmon is expected to triple, from about 44,000 metric tons (mt) in 1985 to nearly 143,000 mt in 1990.¹ Thus forecasts of price/volume relationships have to be made from volume figures that are three times higher than those in the historical data base. In statistical terms, this causes the confidence intervals around projections of the market effects of farmed salmon products to be very broad (i.e., the accuracy of such forecasts is highly questionable).

There is no doubt that the year-round availability of large volumes of high-quality fresh farmed fish has brought about a dramatic transformation in domestic premium salmon markets, but landings of wild fish in Alaska have been at or near record levels for the past seven years as well. As a whole, the U.S. seafood market is rapidly expanding and much of the growth in demand for seafood products is being met by imports. To date, the most successfully specified economic models of farmed salmon markets simply treat growth in the present period as a function of growth in the previous period.²

The growth in farmed salmon consumption in domestic markets has largely been in fresh products--mainly adult Atlantic salmon and pan-sized Pacific salmon and trout in the catering sector (hotels, restaurants and institutions), specialty fish shops, and, to a lesser extent, retail stores. Farmed salmon producers thus far have had little trouble selling all of the fresh fish they can produce to U.S. consumers at premium prices. Geographically, domestic market penetration of fresh farmed salmon has been very shallow and largely confined to the Northeast and West Coast.

¹Curt Kerns, "World Salmon Farming: An Overview with Emphasis on Possibilities and Problems in Alaska," University of Alaska, Juneau, Marine Advisory Bulletin Number 26, April 1986, p. 26.

²Patricia Lavin Riely, "An Economic Analysis Of the Market for Atlantic Salmon Aquaculture," Ph.D Dissertation, University of Rhode Island, August 1986.

Figure 1 shows the percentage of U.S. imports of Norwegian salmon for the 1981 - 1984 period by region. We do not have corresponding data for farmed Pacific salmon in domestic markets (North American farmed Pacific salmon production was less than 10 percent of the volume of Norwegian production over this period), but Figure 1 implies that there is a huge market in the heart of the U.S. that is only beginning to be penetrated.

Thus far there appears to be little competition between wild fish harvested in Alaska, which are generally marketed in frozen form (about 97 percent of the harvest of premium species in Alaska is marketed in frozen form and three percent fresh) and fresh farmed fish. However, European producers expect farmed salmon to dominate both fresh and frozen premium markets by 1990, while wild commercial landings of chinook, coho and sockeye are expected to remain fairly stagnant. The next major challenge for producers of farmed salmon will be to penetrate further into the mass retail segment of fresh and frozen fish markets and win acceptance with the great bulk of consumers. The key here will be lower prices. Frozen markets, particularly retail stores and family-type restaurants, are where fishermen in Alaska will experience the greatest amount of competition from farmed salmon production.

We do not know when premium salmon markets will become saturated and real price competition between wild and farmed fish will occur. To date, substitution effects (measured as cross price elasticities) are not observable in the data. We guess that competition between farmed and wild salmon will intensify in the early to mid-1990s and are using 1990 as a conservative benchmark for our analysis.

There are several efforts currently under way to model the economic impact of farmed salmon production. The Office of Commercial Fisheries Development is working on a species-specific demand model that will be of some use in this area. According to Paul Engleman, the economist in charge of this project, his model will suffer from the shortcomings described above but will allow various scenarios to be tested. Our judgment is that we are several years and several hundred thousand dollars away from a reasonably accurate economic model of salmon markets that can reliably quantify impacts of farmed salmon production. With these caveats in mind, we proceed to make some heroic assumptions and attempt to answer your question in the next section.

FIGURE 1



Percentage of U.S. Imports of Norwegian Salmon 1981 - 1984 by region:

I: Northeast	76%
II: West Coast	23%
III: Rest of Country	1%

Source: "An Economic Analysis of the Market for Atlantic Salmon Aquaculture," page 55.

The Economic Loss to Alaska Salmon Fishermen from Farmed Salmon

Robert Logan, Assistant Professor of Economics in the School of Management at the University of Alaska-Fairbanks provided this agency with some preliminary information from his study, "Salmon Farming in Alaska: Economic Feasibility and Socioeconomic Impacts" (work in progress). In this project, Dr. Logan has surveyed current econometric models of salmon markets and applied the range of demand elasticities calculated by these models to an assumed 100,000 mt increase in world farmed salmon production by 1990. An assumed 20,000 mt Alaska salmon farming industry is added incrementally to world production to gauge the impact of a salmon farming industry in Alaska relative to the impact of worldwide salmon farming.³

In both his best and worst case scenarios, Dr. Logan assumes no increase in demand for salmon through 1990, a constant wild harvest and that farmed salmon does not occupy a separate market niche from wild fish. As he puts it, "both scenarios are under the most pessimistic view one could possibly take", i.e., he is weighting his analysis to show the greatest possible economic damage to the fishing industry.⁴ Below we list the results of his worst and best case scenarios:

The Impact of World and Alaskan Salmon Farming on Revenues to the Traditional Wild Fisheries in 1990 (Thousands \$)

<u>Farmed Production Competes With</u>	<u>Elasticity</u>	<u>Impact of World Production</u>	<u>Impact of Incremental Alaska Production</u>
King, Coho, Red	-3.94	-\$36,398	-\$4,720
	-9.68	-\$14,950	-\$1,974
All Species	-3.94	-\$13,115	-\$1,671
	-9.68	-\$ 5,138	-\$ 678

The elasticities assumed above mean that for every one percent increase in production of farmed salmon, the price of wild salmon drops by 1/3.9 or .25 percent (worst case) or 1/9.7 = .1 percent (best case). The effects of increases in the demand for farmed salmon are much greater when it is assumed to compete directly with premium species than when it is assumed to

³A 20,000 mt Alaska salmon farming industry was first postulated in "Aquaculture: Opportunities and Constraints in Cultured Salmon Production", Lindgren, et al, (VBB/Sweco and Nordic Alaska, Aug. 30, 1985, page 121). The 20,000 mt figure is an arbitrary number based on a rough estimation of the potential size of the domestic fresh salmon market.

⁴Bob Logan, personal communication, April 1987.

compete with all species. In every case, the market effects of world farmed salmon production are overwhelmingly larger than the Alaska farmed salmon production increment. Virtually everyone we have contacted who is involved in studying the economic impacts of salmon farming agrees with this assessment.

Note that Dr. Logan's assumptions are heavily weighted against salmon farming. A 20,000 mt salmon farming industry in Alaska would be impossible to attain by 1990, even if enabling legislation were passed this session. In addition, domestic consumption of salmon has increased from .1 pounds per capita in 1980 to .4 pounds in 1984 and is expected to continue to increase into the future. Thus demand is actually increasing, while the scenarios have assumed it is constant.

The domestic market has been able to absorb enormous increases in farmed salmon imports (fresh salmon imports increased from 1.1 million pounds in 1982 to 13.8 million pounds in 1985) without corresponding decreases in the price of farmed or wild fish.⁵ The data suggest that we are in a young domestic market with a great deal of room for growth in sales of fresh fish before farmed salmon production begins to spill over into markets for frozen products and seriously competes with wild production. Until this occurs, prices for farmed and wild fish will continue to behave independently.

We have taken Dr. Logan's worst case (\$41 million loss) and best case (\$5.8 million loss) scenarios and applied them to the four major gear types and four major regions of Alaska's salmon fisheries. Note that the Alaska salmon farming increment assumed in this analysis accounts for about 13 percent of the total loss in revenues. We have assumed that farmed salmon would compete most directly with wild chinook and cohos in domestic markets. Further, we have spread the revenue loss to traditional fisheries by the average percentage of the total value of the combined chinook and coho catch in each region and gear type over the past five years. The other premium Alaskan species, sockeye, is primarily sold to Japan and farmed salmon imports are not likely to be much of a factor in this market.

Our area and gear type analysis of Dr. Logan's scenarios is presented in Table 1. Appendix A contains a map of Alaska's commercial fisheries regions and areas as well as a series of tables showing the commercial chinook and coho salmon catch by region and gear type for the 1981 - 1985 period we used to construct Table 1. As indicated in Table 1, we estimate that the greatest economic loss from farmed salmon production under either scenario would occur in Southeast, followed by the Central, Arctic-Yukon-Kuskokwim and Western regions of the state. By gear type, the greatest revenue loss would occur to trollers in Southeast and the least by seiners in the Central region.

⁵"An Economic Analysis of the Market for Atlantic Salmon Aquaculture," p. 45.

TABLE 1
AVERAGE DISTRIBUTION OF THE CHINOOK AND COHO CATCH AND THE IMPACT OF FARMED SALMON
ON THE ALASKA COMMERCIAL SALMON FISHING INDUSTRY BY 1990 BY REGION AND GEAR TYPE
(Volume and Value Data are in Thousands)

Gear Type	Southeastern		Central		AYK		Western		State Total	
	Pounds	Value	Pounds		Pounds	Value	Pounds	Value	Pounds	Value
1981-1985 AVERAGE GEAR TYPE										
PERCENT OF AREA TOTAL*										
Seine	15.8%	9.8%	1.1%				65.1%	64.2%	14.8%	11.0%
Drift Gillnet	10.0%	5.9%	79.1%				16.4%	17.7%	32.9%	27.8%
Set Gillnet	7.7%	4.0%	19.4%	17.7%	100.0%	100.0%	18.5%	18.1%	27.6%	22.0%
Troll	66.8%	80.3%							24.8%	39.1%
1981-1985 AVERAGE REGION										
PERCENT OF STATEWIDE TOTAL										
	37.2%	48.7%	34.1%	28.8%	15.8%	13.3%	12.9%	9.3%		
WORST CASE SCENARIO										
Economic Impact of \$41 Million Market Loss										
Seine	\$1,909		\$115		\$0		\$2,388		\$4,412	
Drift Gillnet	\$1,149		\$9,366		\$0		\$658		\$11,174	
Set Gillnet	\$779		\$2,039		\$5,320		\$673		\$8,812	
Troll	\$15,642		\$0		\$0		\$0		\$15,642	
									\$0	
REGION LOSS	\$19,480		\$11,520		\$5,320		\$3,720		\$40,040	
BEST CASE SCENARIO										
Economic Impact of \$5.8 Million Market Loss										
Seine	\$277		\$17		\$0		\$346		\$640	
Drift Gillnet	\$167		\$1,358		\$0		\$95		\$1,620	
Set Gillnet	\$113		\$296		\$771		\$98		\$1,278	
Troll	\$2,268		\$0		\$0		\$0		\$2,268	
									\$0	
REGION LOSS	\$2,825		\$1,670		\$771		\$539		\$5,806	

*Based on the 1981-85 average Chinook and Coho catch.

Note components do not add to total due to rounding.

Prepared by the House Research Agency, April 1987 (87-234; 860330-06).

Note that we have referred only to costs to the existing fishing industry above. Against the \$5.8 million - \$41 million loss in revenue to the traditional salmon fishing industry, we should measure the \$132 million in gross sales a 20,000 mt salmon farming industry is expected to produce.⁶ It is precisely those areas of the state, i.e., the Southeast and Central regions, that will experience the greatest economic loss from worldwide (and Alaska) salmon farming which stand to benefit the most from an Alaska salmon farming industry. This is because of their geography, climate, fisheries infrastructure and access to transportation links to domestic markets.

Impact on Fishermen's Capital Investments

There is very little reliable information on the financial status of individual Alaska salmon fishermen. The Commercial Fisheries Entry Commission (CFEC) conducts periodic surveys of limited entry permit holders to estimate net returns for various fisheries (a fishery is defined as a particular license for a specific gear type in a particular area). These data are used to gauge the overall economic health of the fishery. In recent years, these surveys have been targeted on fisheries that might be candidates for a buyback program as authorized in AS 16.43.290-330.

There is a great diversity among salmon fishermen of all gear types. Some rely on a single fishery as their sole source of income, while many participate in several fisheries. There are large numbers of part-time fishermen who hold down other jobs in the off-season. In some of the more remote areas of the state, the commercial salmon fisheries provide the basis for the cash economy and income to support a subsistence lifestyle. In other fisheries, participants are nonresidents. Each fishery has a different purpose, for which the surveys attempt to compensate in their net returns. Thus, while the CFEC surveys are an important source of information about individual fisheries, they cannot tell us how an individual fisherman's livelihood depends on a particular fishery.

We do not know what effect a decrease in revenue for the salmon fisheries calculated in Table 1 will have in terms of marginal fishermen being forced out of business or defaulting on State gear and/or permit loans. Table 2 lists the individual fisheries that comprise the gear type and region data presented in Table 1. We show the average earnings per permit fished for the 1977 - 1985 period and average permit price for 1986. A more complete breakdown of Alaska's salmon fisheries data is provided in Appendix B which lists: permits issued, permits fished, total gross earnings and average earnings per permit for the 1977 - 1985 period; 1986 limited entry permits issued by resident vs. nonresident and permanent or interim use status; and average permit prices for the 1978 - 1986 period.

⁶"Aquaculture: Opportunities and Constraints in Cultured Salmon Production," p. 124.

Table 2

REGION	FISHERY	AVERAGE GROSS EARNINGS PER PERMIT FISHED 1977-85	AVERAGE 1986 PERMIT PRICE
Southeast	Purse Seine	\$ 89,833	\$ 36,059
	Drift Gillnet	25,056	44,849
	Power Troll	21,722	15,383
	Hand Troll	3,022	5,297
	Yakutat Setnet	15,644	26,857
Central	PWS Purse Seine	79,622	98,841
	PWS Drift Gillnet	25,633	61,606
	PWS Setnet	10,022	59,917
	CI Purse Seine	41,667	60,000
	CI Drift Gillnet	26,167	64,962
	CI Setnet	16,022	18,191
	BB Drift Gillnet	49,500	124,605
	BB Setnet	14,711	33,054
AYK	Kuskokwim Gillnet	4,967	10,133
	Lower Yukon Gillnet	8,189	22,455
	Upper Yukon Gillnet	4,178	7,667
	Upper Yukon Fishwheel	5,244	13,500
	Kotzebue Gillnet	8,273	10,819
	Norton Sound Gillnet	4,944	10,167
Western	Kodiak Purse Seine	57,667	37,036
	Kodiak Beach Seine	15,078	20,000
	Kodiak Setnet	24,544	61,792
	Chignik Purse Seine	150,878	315,667
	P/A Purse Seine	135,533	236,250
	P/A Drift Gillnet	67,844	197,000
	P/A Setnet	37,344	56,357

Note: PWS = Prince William Sound, CI = Cook Inlet, BB = Bristol Bay,
 AYK = Arctic-Yukon-Kuskokwim, P/A = Peninsula-Aleutians.

Source: Commercial Fisheries Entry Commission.

Comparing the data presented in Table 1 with Table 2, it is clear that some of the fisheries which will be affected the most by salmon farming also have low average gross revenues (less than \$30,000). These are: Southeast trollers (hand and power); Cook Inlet and Prince William Sound drift gillnetters; Cook Inlet, Prince William Sound and Bristol Bay setnetters; and Arctic-Yukon-Kuskokwim gillnetters. It is likely that participants in these fisheries will experience even lower revenues and consequently lower permit values in the 1990s due to competition from farmed salmon in their markets.

In most salmon fisheries there is a relatively small percentage of high-liners who consistently catch a large proportion of the total volume landed. Generally there is a somewhat larger proportion of marginal fishermen who consistently have gross revenues that are lower than the average for the fishery. Permit holders in the fisheries cited above who fit into this marginal category should be concerned about the long-term viability of their fishing investment. This is particularly true for those fisheries that have a relatively high cost, (i.e., trollers and drift gillnetters).

Options for Mitigating the Impacts of Farmed Salmon

As we have shown in previous sections, there is no way that fishermen in Alaska can be protected from the economic impacts of worldwide farmed salmon production in the marketplace. Even an improbably large (20,000 mt) Alaska salmon farming industry will have a small negative effect on fishermen's gross revenues compared to worldwide farmed production. Eventually, fishermen in Alaska will have to come to terms with the reality of the marketplace in the 1990s. What then can fishermen and their elected officials in the legislature do to mitigate the impacts of farmed salmon on their markets? In this section, we offer two options for dealing with the situation--a buyback program and/or marketing farmed fish to supplement fishermen's wild catch.

For those fisheries identified in the previous section which have low average gross revenues and will be most affected by farmed salmon production, a permit buyback program may be an attractive option. Alaska Statute 16.43.010(b) allows the Commercial Fisheries Entry Commission (CFEC) to tax up to seven percent of the gross value of annual landings for each permit in a given fishery to be put in a buyback fund. This fund could then be used to buy back permits of marginal fishermen. Other participants in the fishery would benefit from decreased competition and by being able to spread their costs over larger catches, which would presumably increase their net revenues.

The CFEC staff have prepared an extensive analysis of legislative changes necessary to make the existing buyback statutes workable and have drafted legislation to implement these changes. The CFEC is not an advocacy agency however, and will only offer support to fishing groups if they formally apply to institute a buyback program in their fishery. Thus far, several fishermen's groups have expressed informal interest in a buyback program. However, no group has formally applied and no legislator has offered to sponsor a bill to clean up the statutes. It is probable that by the time participants in the fisheries cited above begin to experience the effects of price competition with farmed salmon in the 1990s in the forms of lower gross revenues and declining permit prices, they will be unwilling to subject themselves to a buyback tax.

7 Ben Muse and Kurt Schelle, "Investments in Fleet Reductions: Suggestions for Revisions of Alaska's Buyback Statute," CFEC Policy Discussion Draft 86-2, June 17, 1986.

Another option for dealing with the market effects of farmed salmon production is for fishermen to produce farmed fish themselves and market them to supplement their wild harvest. There are several ways of accomplishing this. Individual fishermen could run family farming operations in addition to their fishing business or could enter into partnerships with other fishermen or entrepreneurs. One of the most promising ideas would be for fishermen to participate in salmon farming through their marketing cooperatives. Operations such as the Seafood Producers Cooperative in Sitka or the Copper River Fishermen's Cooperative in Cordova are excellent candidates for this type of enterprise. It is also possible for cooperatives in regions where salmon farming is impractical (e.g., AYK) to operate farms or contract with farmers in other regions such as Prince William Sound or Southeast.

We have previously documented how foreign domestic producers of farmed salmon are attempting to shorten the chain of distribution from producer to consumer by entering into direct contracts with hotels, supermarket chains, restaurants, etc., thereby absorbing the margins of middlemen.⁸ We have described how the Prince Rupert Fisherman's Cooperative has incorporated salmon farming into its long-range competitive strategy.⁹

A fishermen's cooperative with a fairly substantial pen-reared production capacity could lock in a position in growing domestic fresh fish markets by offering year-round, long-term, fixed-price contracts and selling farmed fish in the winter to supplement their members' wild fish in season. More importantly, members of the cooperative could also lock in a price for a substantial portion of their wild catch and not be subject to volatile price fluctuations during the season. This would take some of the risk out of their business decisions. Earnings from their stock in the salmon farm could be used to help make boat, permit and gear payments. On years with poor natural runs, income from the farm could offset losses in the wild fishery. This is a natural extension of the goals of Alaska's salmon enhancement programs.

If, as we have predicted, farmed salmon becomes a close substitute for wild fish in the 1990s, then all of the premium species will become increasingly interchangeable commodities in world markets. It follows then that fishermen should adopt some of the same methods that farmers have used to protect themselves from volatile swings in commodity prices. By investing in salmon farming and attempting to lock in prices and margins in fresh markets--in effect taking out futures contracts--cooperatives could offer security to their members that they could not achieve individually.

⁸"Aquaculture in Alaska," p. 64.

⁹Ibid., p. 69.

Most cooperatives pay their fishermen a nominal price for their catch and retain some of the margin they receive from sales to help with cash flow during the season. They pay their members a settlement from these retained earnings (based on the member's sales of fish to the cooperative net of operating costs) when the season is over. One method of financing a salmon farming investment that is open to cooperatives would be to use these retained earnings to invest in farming capacity (thereby improving the cooperative's long-term marketing position) instead of paying a settlement. This would be a relatively painless way for members to invest.

* * *

We have attempted to answer your questions to the best of our ability in a nontechnical manner, given the current level of understanding of the workings of salmon markets. There is a great deal of emotionalism in the debate over salmon farming in Alaska at the moment. The mechanical models we have used in this memorandum can add a measure of rationality to the debate but they cannot provide an authoritative description of the future. We caution that the impact numbers given in this analysis are meant to be illustrative and not definitive. We have had to make many simplifying assumptions (which we have identified) that do not reflect present reality. The important point, however, is how well these assumptions will fit the market reality faced by Alaska fishermen in the 1990s. We think we have come close to describing it.

We have asked CFEC staff for a series of printouts of the distribution of the value of the chinook and coho catch by permit to gauge the number of highliners and marginal fishermen in each fishery. We will send this information on to your office when we receive it. We will also send a copy of Dr. Logan's paper when it is released. Please call if you have further questions.

Attachments

APPENDIX A

MAP OF ALASKA COMMERCIAL FISHERIES REGIONS AND AREAS
ALASKA COMMERCIAL CHINOOK AND COHO SALMON CATCH
BY REGION AND GEAR TYPE 1981 - 1985



ALASKA COMMERCIAL FISHERIES REGIONS AND AREAS

REGION I: SOUTHEASTERN: Dixon Entrance to Cape Suckling

- Areas: A. Juneau & Yakutat
 B. Ketchikan
 C. Petersburg
 D. Sitka

REGION II: CENTRAL: State Third Judicial Division Northern Boundary to Cape Suckling to Cape Douglas to Cape Menshikof to Cape Newenham

- Areas: E. Prince William Sound
 H. Cook Inlet
 T. Bristol Bay (salmon and herring catch; all fish and shellfish production)

REGION III: ARCTIC-YUKON-KUSKOKWIM (AYK): North of State Third Judicial Division Northern Boundary which ends at the west at Cape Newenham including Nunivak, St. Matthew, and St. Lawrence Islands

- Areas: W. Kuskokwim
 X. Kotzebue
 Y. Yukon
 Z. Norton Sound

REGION IV: WESTERN: Cape Douglas to Unimak Pass to Cape Newenham including Kodiak and Aleutian Islands

- Areas: K. Kodiak
 L. Chignik
 M. Alaska Peninsula
 O. Dutch Harbor
 Q. Bering Sea
 R. Adak & W. Aleutians
 T. Bristol Bay (fish other than salmon and herring catch; and shellfish catch)

TABLE 1
ALASKA COMMERCIAL CHINOOK AND COHO SALMON CATCH BY REGION AND GEAR TYPE 1985
(Volume and Value Data are in Thousands)

Gear Type	Southeastern		Central		AYK		Western		State Total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
CHINOOK										
Seine	382	\$ 667	12	\$ 4			258	\$ 310	652	\$ 981
Drift Gillnet	98	106	3,061	3,783			288	273	3,447	4,162
Set Gillnet	21	25	1,019	1,161	4,556	\$5,834	184	177	5,780	7,197
Troll	3,493	8,363							3,493	8,363
TOTAL CHINOOK	3,994	\$ 9,161	4,092	\$ 4,948	4,556	\$5,834	730	\$ 760	13,372	\$20,703
COHO										
Seine	3,276	2,458	197	86			5,124	3,966	8,597	6,510
Drift Gillnet	3,017	2,347	13,565	11,498			735	611	17,317	14,456
Set Gillnet	2,056	1,305	2,720	2,118	3,367	1,736	1,091	888	9,234	6,047
Troll	11,614	15,926							11,614	15,296
TOTAL COHO	19,963	\$21,406	16,482	\$13,702	3,367	\$1,736	6,950	\$5,465	46,762	\$42,309
TOTAL CHINOOK AND COHO	23,957	\$30,567	20,574	\$18,650	7,923	\$7,570	7,680	\$6,225	60,134	\$63,012
GEAR TYPE PERCENT OF AREA TOTAL										
Seine	15.3%	10.2%	1.0%	0.5%			70.1%	68.7%	15.4%	11.9
Drift Gillnet	13.0%	8.0%	80.8%	81.9%			13.3%	14.2%	34.5%	29.5
Set Gillnet	8.7%	4.4%	18.2%	17.6%	100.0%	100.0%	16.6%	17.1%	25.0%	21.0
Troll	63.1%	77.4%							25.1%	37.5
AREA % OF STATEWIDE TOTAL	39.8%	48.5%	34.2%	29.6%	13.2%	12.0%	12.8%	9.9%		

Note that statewide totals in these tables do not exactly correspond to ADF&G totals, due to rounding.

Source: "Alaska 1985 Catch and Production: Commercial Fisheries Statistics," Statistical Leaflet No. 38," Alaska Department of Fish and Game, Division of Commercial Fisheries, December 1986.

Prepared by the House Research Agency, April 1987 (87-234A; 860330-03).

TABLE 2
ALASKA COMMERCIAL CHINOOK AND COHO SALMON CATCH BY REGION AND GEAR TYPE 1984
(Volume and Value Data are in Thousands)

Gear Type	Southeastern		Central		AYK		Western		State Total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
CHINOOK										
Seine	391	\$ 867	2	\$ 2			319	\$ 334	712	\$ 1,203
Drift Gillnet	82	87	2,965	3,510			343	359	3,390	3,956
Set Gillnet	20	21	527	553	3,790	\$4,891	165	172	4,502	5,637
Troll	3,842	10,882	1	1					3,843	10,883
TOTAL CHINOOK	4,335	\$11,857	3,495	\$ 4,066	3,790	\$4,891	827	\$ 865	12,447	\$21,679
COHO										
Seine	3,009	2,812	275	222			4,713	3,384	7,997	6,418
Drift Gillnet	1,878	1,999	10,814	9,774			1,205	866	13,897	12,639
Set Gillnet	1,827	1,502	2,683	1,865	7,451	4,608	1,145	851	13,106	8,826
Troll	9,169	14,592							9,169	14,592
TOTAL COHO	15,883	\$20,905	13,772	\$11,861	7,451	\$4,608	7,063	\$5,101	44,169	\$42,475
TOTAL CHINOOK AND COHO	20,218	\$32,762	17,267	\$15,927	11,241	\$9,499	7,890	\$5,966	56,616	\$64,154
GEAR TYPE PERCENT OF AREA TOTAL										
Seine	16.8%	11.2%	1.6%	1.4%			63.8%	62.3%	15.4%	11.9%
Drift Gillnet	9.7%	6.4%	79.8%	83.4%			19.6%	20.5%	30.5%	25.9%
Set Gillnet	9.1%	4.6%	18.6%	15.2%	100.0%	100.0%	16.6%	17.1%	31.1%	22.5%
Troll	64.4%	77.8%							23.0%	39.7%
AREA % OF STATEWIDE TOTAL	35.7%	51.1%	30.5%	24.8%	19.9%	14.8%	13.9%	9.3%		

Note that statewide totals in these tables do not exactly correspond to ADF&G totals, due to rounding.

Source: "Alaska 1984 Catch and Production: Commercial Fisheries Statistics," Statistical Leaflet No. 37,
Alaska Department of Fish and Game, Division of Commercial Fisheries, April 1986.

Prepared by the House Research Agency, April 1987 (87-234B; 860330-03).

TABLE 3
ALASKA COMMERCIAL CHINOOK AND COHO SALMON CATCH BY REGION AND GEAR TYPE 1983
(Volume and Value Data are in Thousands)

Gear Type	Southeastern		Central		AYK		Western		State Total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
CHINOOK										
Seine	218	\$ 235	7	\$ 6			472	\$ 354	697	\$ 595
Drift Gillnet	45	34	5,081	4,049			423	321	5,549	4,404
Set Gillnet	16	10	1,076	919	3,724	\$3,937	231	174	5,047	5,040
Troll	4,344	8,166							4,344	8,166
TOTAL CHINOOK	4,623	\$ 8,445	6,164	\$4,974	3,724	\$3,937	1,126	\$ 849	15,637	\$18,205
COHO										
Seine	2,492	934	141	70			2,478	1,268	5,111	2,272
Drift Gillnet	1,802	950	6,111	3,413			234	126	8,147	4,489
Set Gillnet	778	454	1,719	778	1,748	695	747	330	4,992	2,257
Troll	8,537	7,137	1	4					8,538	7,141
TOTAL COHO	13,609	\$ 9,475	7,972	4,265	1,748	\$ 695	3,459	\$1,724	26,788	\$16,159
TOTAL CHINOOK AND COHO	18,232	\$17,920	14,136	\$9,239	5,472	\$4,632	4,585	\$2,573	42,425	\$34,364
GEAR TYPE PERCENT OF AREA TOTAL										
Seine	14.9%	6.5%	1.0%	8.0%			64.3%	63.0%	13.7%	8.3
Drift Gillnet	10.1%	5.5%	79.2%	80.8%			14.3%	17.4%	32.3%	25.9
Set Gillnet	4.4%	2.6%	19.8%	18.4%	100.0%	100.0%	21.3%	19.6%	23.7%	21.2
Troll	70.7%	85.4%							30.4%	44.5
AREA % OF STATEWIDE TOTAL	43.0%	52.1%	33.3%	26.9%	12.9%	13.5%	10.8%	7.5%		

Note that statewide totals in these tables do not exactly correspond to ADF&G totals, due to rounding.

Source: "Alaska 1983 Catch and Production: Commercial Fisheries Statistics," Statistical Leaflet No. 36,"
Alaska Department of Fish and Game, Division of Commercial Fisheries, December 1984.

Prepared by the House Research Agency, April 1987 (87-234C; 860330-03).

TABLE 4
ALASKA COMMERCIAL CHINOOK AND COHO SALMON CATCH BY REGION AND GEAR TYPE
(Volume and Value Data are in Thousands)

Gear Type	Southeastern		Central		AYK		Western		State Total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
CHINOOK										
Seine	477	\$ 1,021	4	\$ 5			207	\$ 243	688	\$ 1,269
Drift Gillnet	139	187	5,979	7,560			394	420	6,512	8,167
Set Gillnet	27	40	992	1,240	4,341	\$4,765	259	303	5,619	6,348
Troll	4,005	11,208							4,005	11,208
TOTAL CHINOOK	4,648	\$12,456	6,975	\$ 8,805	4,341	\$4,765	860	\$ 966	16,824	\$26,992
COHO										
Seine	3,028	2,605	578	412			6,777	5,159	10,383	8,176
Drift Gillnet	1,752	1,417	12,145	9,497			1,213	895	15,110	11,809
Set Gillnet	1,388	787	3,950	2,887	5,008	2,693	1,382	904	11,728	7,271
Troll	9,145	12,723	5	4					9,150	12,727
TOTAL COHO	15,313	\$17,532	16,678	\$12,800	5,008	\$2,693	9,372	\$6,958	46,371	\$39,983
TOTAL CHINOOK AND COHO	19,961	\$29,988	23,653	\$21,605	9,349	\$7,458	10,232	\$7,924	63,195	\$66,975
GEAR TYPE PERCENT OF AREA TOTAL										
Seine	17.6%	12.1%	2.5%	1.9%			68.3%	68.2%	17.5%	14.1%
Drift Gillnet	9.5%	5.3%	76.6%	78.9%			15.7%	16.6%	34.2%	29.8%
Set Gillnet	7.1%	2.8%	20.9%	19.1%	100.0%	100.0%	16.0%	15.2%	27.4%	20.3%
Troll	65.9%	79.8%							20.8%	35.7%
AREA % OF STATEWIDE TOTAL	31.6%	44.8%	37.4%	32.3%	14.8%	11.1%	16.2%	11.8%		

Note that statewide totals in these tables do not exactly correspond to ADF&G totals, due to rounding.

Source: "Alaska 1982 Catch and Production: Commercial Fisheries Statistics," Statistical Leaflet No. 35,"
Alaska Department of Fish and Game, Division of Commercial Fisheries, July 1984.

Prepared by the House Research Agency, April 1987 (87-234D; 860330-03).

TABLE 5
ALASKA COMMERCIAL CHINOOK AND COHO SALMON CATCH BY REGION AND GEAR TYPE 1981
(Volume and Value Data are in Thousands)

Gear Type	Southeastern		Central		AYK		Western		State total	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
CHINOOK										
Seine	166	\$ 326	8	\$ 11			203	\$ 278	377	\$ 615
Drift Gillnet	61	73	4,647	5,874			244	286	4,952	6,233
Set Gillnet	46	73	613	808	5,379	\$5,834	171	218	6,209	6,933
Troll	4,124	9,884							4,124	9,884
TOTAL CHINOOK	4,397	\$10,356	5,268	\$ 6,693	5,379	\$5,834	618	\$ 782	15,662	\$23,665
COHO										
Seine	1,987	1,702	53	44			2,515	1,925	4,555	3,671
Drift Gillnet	1,059	870	7,048	5,793			632	455	8,739	7,118
Set Gillnet	1,321	1,127	2,252	1,801	2,169	1,348	841	595	6,583	4,871
Troll	6,149	8,181	3	3					6,152	8,184
TOTAL COHO	10,516	\$11,880	9,356	\$ 7,641	2,169	\$1,348	3,988	\$2,975	26,029	\$23,844
TOTAL CHINOOK AND COHO	14,913	\$22,236	14,624	\$14,334	7,548	\$7,182	4,606	\$3,757	41,691	\$47,509
GEAR TYPE PERCENT OF AREA TOTAL										
Seine	14.4%	9.1%	0.4%	0.4%			59.0%	58.6%	11.8%	9.0
Drift Gillnet	7.5%	4.2%	80.0%	81.4%			19.0%	19.7%	32.8%	28.1
Set Gillnet	9.2%	5.4%	19.6%	18.2%	100.0%	100.0%	22.0%	21.6%	30.7%	24.8
Troll	68.9%	81.2%							24.6%	38.0

AREA % OF STATEWIDE TOTAL 35.8% 46.8% 35.1% 30.2% 18.1% 15.1% 11.0% 7.9%

Note that statewide totals in these tables do not exactly correspond to ADF&G totals, due to rounding.

Source: "Alaska 1981 Catch and Production: Commercial Fisheries Statistics," Statistical Leaflet No. 34,"
Alaska Department of Fish and Game, Division of Commercial Fisheries, January 1984.

Prepared by the House Research Agency, April 1987 (87-234E; 860330-03).

APPENDIX B

ALASKA SALMON FISHERIES BY GEAR TYPE 1977 - 1985
Permits Issued, Permits Fished,
Total Gross Earnings, Average Gross Earnings Per Permit,
Residency and Status of Permit Holders, and
Average Permit Prices

S01A 3/11/87

Commercial Fisheries Entry Commission

SOUTHEAST SALMON PURSE SEINE

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	420	368	\$ 52,058,700	\$ 141,500
1984	422	382	35,027,600	91,700
1983	421	337	33,294,700	98,800
1982	421	369	28,068,300	76,100
1981	418	364	36,763,100	101,000
1980	417	334	29,460,800	88,200
1979	418	319	19,636,200	61,600
1978	420	376	27,675,000	73,600
1977	414	325	24,704,300	76,000

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	180	1	181
Non-residents	229	3	232
Unpaid	7	0	7
Total	416	4	420

Average Permit Prices

1986 \$ 36,059	1983 \$ 38,531	1980 \$ 39,778
1985 \$ 37,907	1982 \$ 40,636	1979 \$ 39,917
1984 \$ 40,884	1981 \$ 40,435	1978 \$ 30,929

S03A 3/11/87

Commercial Fisheries Entry Commission

SOUTHEAST SALMON DRIFT GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	485	446	\$ 16,980,300	\$ 38,100
1984	481	436	13,462,900	30,900
1983	480	431	7,588,600	17,600
1982	486	431	10,424,400	24,200
1981	487	447	9,393,100	21,000
1980	489	445	9,385,900	21,100
1979	491	447	11,355,500	25,400
1978	491	473	9,566,100	20,200
1977	474	437	11,797,400	27,000

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	327	16	343
Non-residents	139	4	143
Unpaid	2	0	0
Total	468	20	488

Average Permit Prices

1986 \$ 44,849	1983 \$ 34,653	1980 \$ 41,250
1985 \$ 36,245	1982 \$ 38,650	1979 \$ 41,763
1984 \$ 34,615	1981 \$ 43,898	1978 \$ 34,604

S15B 3/11/87

Commercial Fisheries Entry Commission

SOUTHEAST SALMON POWER TROLL

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	962	830	\$ 21,072,200	\$ 25,400
1984	963	795	22,655,800	28,500
1983	968	810	13,485,600	16,600
1982	968	809	20,348,200	25,200
1981	970	792	16,226,600	20,500
1980	974	841	13,216,800	15,700
1979	979	814	21,315,800	26,200
1978	976	816	17,478,700	21,400
1977	970	750	12,035,800	16,000

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	730	12	742
Non-residents	208	3	211
Unpaid	4	0	4
Total	942	15	957

Average Permit Prices

1986 \$ 25,383	1983 \$ 20,878	1980 \$ 33,596
1985 \$ 21,530	1982 \$ 21,630	1979 \$ 26,680
1984 \$ 19,624	1981 \$ 28,938	1978 \$ 15,457

S05B 3/11/87

Commercial Fisheries Entry Commission

SOUTHEAST SALMON HAND TROLL

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	2,030	901	\$ 3,923,900	\$ 4,400
1984	2,147	856	3,925,800	4,600
1983	2,150	939	2,484,300	2,600
1982	1,905	1,066	4,064,100	3,800
1981	2,048	1,147	3,416,800	3,000
1980	2,436	1,667	3,158,500	1,900
1979	3,700	2,205	6,408,500	2,900
1978	3,922	2,622	5,659,400	2,200
1977	2,951	1,834	3,311,400	1,800

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	1,601	16	1,617
Non-residents	120	2	122
Unpaid	246	0	246
Total	1,967	18	1,985

Average Permit Prices

1986	\$ 5,297	1983	\$ 4,948
1985	\$ 5,109	1982	\$ 3,828
1984	\$ 4,732		

S04D 3/11/87

Commercial Fisheries Entry Commission

YAKUTAT SALMON SETNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	164	148	\$ 2,776,800	\$ 18,800
1984	164	140	2,305,100	16,500
1983	165	145	1,200,100	8,300
1982	164	147	2,219,900	15,100
1981	167	158	2,630,000	16,600
1980	167	158	2,268,300	14,400
1979	167	155	3,020,600	19,500
1978	164	155	2,578,300	16,600
1977	159	143	2,150,000	15,000

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	142	0	142
Non-residents	21	0	21
Unpaid	1	0	1
Total	164	0	164

Average Permit Prices

1986 \$ 26,857	1983 \$ 27,250	1980 \$ 32,500
1985 \$ 25,862	1982 \$ 32,792	1979 ***
1984 \$ 23,750	1981 \$ 26,682	1978 \$ 10,480

S01E 3/11/87

Commercial Fisheries Entry Commission

PRINCE WILLIAM SOUND SALMON PURSE SEINE

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	271	264	\$ 23,034,200	\$ 87,300
1984	269	261	21,811,200	83,600
1983	270	265	12,057,800	45,500
1982	270	258	19,044,200	73,800
1981	270	268	44,925,100	167,600
1980	270	237	19,947,000	84,200
1979	268	243	26,680,400	109,800
1978	272	203	5,023,900	24,700
1977	273	232	9,303,600	40,100

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	185	8	193
Non-residents	69	1	70
Unpaid	8	0	8
Total	262	9	271

Average Permit Prices

1986 \$ 98,841	1983 \$ 143,186	1980 \$ 38,259
1985 \$ 109,625	1982 \$ 97,587	1979 \$ 33,846
1984 \$ 131,695	1981 \$ 74,250	1978 \$ 24,272

S03E 3/11/87

Commercial Fisheries Entry Commission

PRINCE WILLIAM SOUND SALMON DRIFT GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	544	530	\$ 23,903,800	\$ 45,100
1984	543	522	18,056,000	34,600
1983	543	528	9,743,600	18,500
1982	543	524	22,388,600	42,700
1981	546	479	11,462,700	23,900
1980	545	393	4,818,300	12,300
1979	549	505	7,945,900	15,700
1978	544	514	8,907,600	17,300
1977	532	497	10,233,800	20,600

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	384	8	392
Non-residents	149	0	149
Unpaid	3	0	3
Total	536	8	544

Average Permit Prices

1986 \$ 61,606	1983 \$ 61,760	1980 \$ 27,810
1985 \$ 55,991	1982 \$ 46,337	1979 \$ 35,632
1984 \$ 53,544	1981 \$ 32,836	1978 \$ 27,742

S04E 3/11/87

Commercial Fisheries Entry Commission

PRINCE WILLIAM SOUND SALMON SETNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	30	20	\$ 71,400	\$ 3,600
1984	30	19	430,600	22,700
1983	30	17	150,300	8,800
1982	30	5	23,200	4,600
1981	31	3	19,000	6,300
1980	30	11	54,800	5,000
1979	30	7	88,900	12,700
1978	28	2	32,400	16,200
1977	29	14	143,700	10,300

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	26	0	26
Non-residents	1	0	1
Unpaid	3	0	3
Total	30	0	30

Average Permit Prices

1986 \$ 59,917	1983 \$ 24,167	1980 ***
1985 \$ 32,375	1982 \$ 19,400	1979 ***
1984 \$ 31,250	1981 ***	1978 ***

S01H 3/11/87

Commercial Fisheries Entry Commission

COOK INLET SALMON PURSE SEINE

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	81	50	\$ 2,276,700	\$ 45,500
1984	81	54	1,847,200	34,200
1983	83	70	1,692,500	24,200
1982	84	63	1,784,200	28,300
1981	85	82	6,882,500	83,900
1980	84	71	1,434,600	20,200
1979	84	77	5,774,100	75,000
1978	83	65	1,413,000	21,700
1977	82	61	2,563,300	42,000

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	76	1	77
Non-residents	1	0	1
Unpaid	5	0	5
Total	82	1	83

Average Permit Prices

1986	\$ 60,000	1983	\$ 90,000	1980	\$ 82,785
1985	\$ 58,375	1982	\$ 84,267	1979	***
1984	***	1981	\$ 83,714	1978	\$ 40,000

S03H 3/11/87

Commercial Fisheries Entry Commission

COOK INLET SALMON DRIFT GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	591	583	\$ 18,749,400	\$ 32,200
1984	588	574	10,273,300	17,900
1983	587	579	19,539,600	33,700
1982	591	577	24,514,600	42,500
1981	598	584	10,227,400	17,500
1980	597	553	6,891,600	12,500
1979	599	590	8,927,100	15,100
1978	591	578	22,006,200	38,100
1977	575	529	13,755,200	26,000

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	396	22	418
Non-residents	162	7	169
Unpaid	1	0	0
Total	559	29	588

Average Permit Prices

1986 \$ 64,962	1983 \$ 69,919	1980 \$ 67,224
1985 \$ 62,605	1982 \$ 58,176	1979 \$ 82,636
1984 \$ 67,962	1981 \$ 67,629	1978 \$ 36,825

S04H 3/11/87

Commercial Fisheries Entry Commission

COOK INLET SALMON SETNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	745	623	\$ 16,981,600	\$ 27,300
1984	744	616	6,893,600	11,200
1983	745	625	10,120,900	16,200
1982	748	602	12,203,200	20,300
1981	747	599	8,830,500	14,700
1980	747	592	6,168,200	10,400
1979	749	609	6,187,700	10,200
1978	747	604	11,445,800	19,000
1977	733	546	8,116,600	14,900

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	663	0	663
Non-residents	75	0	75
Unpaid	5	0	5
Total	743	0	743

Average Permit Prices

1986 \$ 18,191	1983 \$ 18,340	1980 \$ 18,362
1985 \$ 16,312	1982 \$ 17,200	1979 \$ 23,412
1984 \$ 17,881	1981 \$ 15,276	1978 \$ 9,824

S01K 3/11/87

Commercial Fisheries Entry Commission

KODIAK SALMON PURSE SEINE

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	384	270	\$ 15,601,300	\$ 57,800
1984	384	296	21,173,100	71,500
1983	383	342	10,338,600	30,200
1982	386	345	13,561,500	39,300
1981	387	325	25,952,200	79,900
1980	387	369	23,068,300	62,500
1979	387	362	18,544,100	51,200
1978	389	372	26,294,400	79,700
1977	378	336	15,766,400	46,900

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	277	5	282
Non-residents	79	0	79
Unpaid	24	0	24
Total	380	5	385

Average Permit Prices

1986 \$ 37,036	1983 \$ 69,903	1980 \$ 70,960
1985 \$ 46,337	1982 \$ 75,511	1979 \$ 66,045
1984 \$ 61,265	1981 \$ 69,605	1978 \$ 47,611

S02K 3/11/87

Commercial Fisheries Entry Commission

KODIAK SALMON BEACH SEINE

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	34	21	\$ 176,500	\$ 8,400
1984	35	25	308,500	12,300
1983	35	27	159,800	5,900
1982	35	30	331,200	11,000
1981	35	30	808,400	26,900
1980	35	33	771,700	23,400
1979	34	27	567,900	21,000
1978	34	29	428,400	14,800
1977	32	24	288,400	12,000

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	26	0	26
Non-residents	3	0	3
Unpaid	5	0	5
Total	34	0	34

Average Permit Prices

1986 \$ 20,000	1983 \$ 50,000	1980 \$ 41,375
1985 \$ 23,750	1982 ***	1979 \$ 36,500
1984 ***	1981 \$ 42,429	1978 ***

S04K 3/11/87

Commercial Fisheries Entry Commission

KODIAK SALMON SETNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	188	169	\$ 4,649,600	\$ 27,500
1984	188	168	4,460,800	26,600
1983	188	174	2,903,900	16,700
1982	187	170	4,911,200	28,900
1981	187	169	5,878,700	34,800
1980	187	168	3,564,200	21,200
1979	186	164	3,831,500	23,400
1978	188	160	3,633,800	22,700
1977	186	147	2,810,100	19,100

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	148	0	148
Non-residents	39	0	39
Unpaid	0	0	0
Total	187	0	187

Average Permit Prices

1986 \$ 61,792	1983 \$ 76,525	1980 \$ 38,750
1985 \$ 56,357	1982 \$ 39,817	1979 \$ 33,667
1984 \$ 57,200	1981 \$ 41,278	1978 \$ 19,800

S01L 3/11/87

Commercial Fisheries Entry Commission

CHIGNIK SALMON PURSE SEINE

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	101	100	\$ 8,948,100	\$ 89,500
1984	100	100	18,989,200	189,900
1983	100	100	11,405,500	114,100
1982	101	101	14,867,900	147,200
1981	102	102	21,733,900	213,100
1980	101	100	7,738,000	77,400
1979	101	101	15,890,300	157,300
1978	95	93	17,538,400	188,600
1977	91	88	15,912,300	180,800

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	77	10	87
Non-residents	13	0	13
Unpaid	0	0	0
Total	90	10	100

Average Permit Prices

1986 \$ 315,667	1983 ***	1980 ***
1985 \$ 321,233	1982 ***	1979 ***
1984 \$ 322,500	1981 ***	1978 ***

S01M 3/11/87

Commercial Fisheries Entry Commission

PENINSULA/ALEUTIANS SALMON PURSE SEINE

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	127	123	\$ 17,193,200	\$ 139,800
1984	126	121	23,343,600	192,900
1983	127	119	14,225,800	119,500
1982	127	116	18,253,500	157,400
1981	127	122	21,974,000	180,100
1980	125	122	18,409,200	150,900
1979	123	117	18,704,400	159,900
1978	123	110	9,824,800	89,300
1977	113	82	2,463,400	30,000

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	100	6	106
Non-residents	19	0	19
Unpaid	0	0	0
Total	119	6	125

Average Permit Prices

1986 \$ 236,250	1983 \$ 195,000	1980 \$ 102,500
1985 ***	1982 ***	1979 \$ 66,000
1984 \$ 243,333	1981 ***	1978 \$ ***

S03M 3/11/87

Commercial Fisheries Entry Commission

PENINSULA/ALEUTIANS SALMON DRIFT GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	165	157	\$ 16,335,000	\$ 104,000
1984	165	157	10,772,600	68,600
1983	166	156	12,235,700	78,400
1982	164	156	13,543,300	86,800
1981	164	152	12,983,600	85,400
1980	163	155	5,391,200	34,800
1979	161	146	13,045,200	89,400
1978	158	132	5,135,400	38,900
1977	156	111	2,700,900	24,300

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	93	5	98
Non-residents	63	3	66
Unpaid	1	0	0
Total	157	8	165

Average Permit Prices

1986 \$ 197,000	1983 \$ 157,700	1980 \$ 92,454
1985 \$ 175,176	1982 \$ 128,833	1979 \$ 60,625
1984 \$ 186,429	1981 \$ 123,500	1978 \$ 15,000

S04M 3/11/87

Commercial Fisheries Entry Commission

PENINSULA ALEUTIAN SALMON SETNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	113	102	\$ 4,754,900	\$ 46,600
1984	113	102	5,884,900	57,700
1983	114	94	3,456,600	36,800
1982	115	91	3,223,300	35,400
1981	115	87	4,966,700	57,100
1980	113	85	2,004,300	23,600
1979	113	80	3,774,100	47,200
1978	113	60	1,172,000	19,500
1977	108	56	681,900	12,200

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	89	1	90
Non-residents	19	0	19
Unpaid	5	0	5
Total	113	1	114

Average Permit Prices

1986 \$ 56,357	1983 \$ 55,420	1980 \$ 15,625
1985 \$ 50,313	1982 \$ 54,636	1979 ***
1984 \$ 50,374	1981 \$ 54,278	1978 ***

S03T 3/11/87

Commercial Fisheries Entry Commission

BRISTOL BAY SALMON DRIFT GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	1,834	1,813	\$ 109,146,000	\$ 60,200
1984	1,818	1,798	92,464,500	51,400
1983	1,821	1,792	127,270,400	71,000
1982	1,824	1,791	69,074,500	38,600
1981	1,827	1,781	112,245,800	63,000
1980	1,827	1,762	72,580,000	41,200
1979	1,800	1,711	121,576,400	71,100
1978	1,777	1,569	49,058,100	31,300
1977	1,728	1,355	23,980,500	17,700

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	981	78	1,059
Non-residents	758	17	775
Unpaid	4	0	4
Total	1,743	95	1,838

Average Permit Prices

1986 \$ 124,605	1983 \$ 98,923	1980 \$ 91,925
1985 \$ 117,983	1982 \$ 95,936	1979 \$ 64,588
1984 \$ 116,905	1981 \$ 84,327	1978 \$ 21,638

S04T 3/1/87

Commercial Fisheries Entry Commission

BRISTOL BAY SALMON SETNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	959	872	\$ 12,309,700	\$ 14,100
1984	962	866	11,107,800	12,800
1983	960	865	15,140,700	17,500
1982	957	859	10,349,200	12,000
1981	956	841	20,391,600	24,200
1980	947	804	11,501,400	14,300
1979	934	768	17,351,700	22,600
1978	910	650	6,224,900	9,600
1977	840	495	2,642,600	5,300

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	706	18	724
Non-residents	219	4	223
Unpaid	15	0	15
Total	940	22	962

Average Permit Prices

1986 \$ 33,054	1983 \$ 41,246	1980 \$ 32,014
1985 \$ 35,974	1982 \$ 37,394	1979 \$ 18,184
1984 \$ 41,533	1981 \$ 26,000	1978 \$ 8,507

S04W 3/11/87

Commercial Fisheries Entry Commission

KUSKOKWIM SALMON GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	834	777	\$ 3,371,000	\$ 4,300
1984	835	765	6,402,200	8,400
1983	835	757	2,481,900	3,300
1982	836	752	4,321,900	5,700
1981	827	773	3,636,800	4,700
1980	817	737	2,863,300	3,900
1979	816	745	4,357,900	5,800
1978	840	752	2,383,500	3,200
1977	836	707	3,852,900	5,400

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	818	4	822
Non-residents	2	0	2
Unpaid	9	0	9
Total	829	4	833

Average Permit Prices

1986 \$ 10,133	1983 \$ 10,222	1980 \$ 6,912
1985 \$ 10,043	1982 \$ 9,722	1979 \$ 6,420
1984 \$ 9,894	1981 \$ 8,339	1978 \$ 6,100

S04Y 3/11/87

Commercial Fisheries Entry Commission

LOWER YUKON SALMON GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	708	663	\$ 6,065,500	\$ 9,100
1984	708	673	5,125,300	7,600
1983	708	655	4,835,600	7,400
1982	710	664	5,328,400	8,000
1981	711	666	8,025,100	12,000
1980	709	650	4,927,100	7,600
1979	708	659	6,421,100	9,700
1978	699	642	4,122,200	6,400
1977	700	606	3,601,100	5,900

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	691	3	694
Non-residents	7	0	7
Unpaid	5	1	6
Total	703	4	707

Average Permit Prices

1986 \$ 22,455	1983 \$ 22,630	1980 \$ 9,060
1985 \$ 22,917	1982 \$ 13,250	1979 \$ 5,834
1984 \$ 28,441	1981 \$ 9,333	1978 \$ 6,700

S04P 3/11/87

Commercial Fisheries Entry Commission

UPPER YUKON SALMON GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	71	40	\$ 153,300	\$ 3,800
1984	73	39	159,200	4,100
1983	73	40	105,200	2,600
1982	76	45	180,000	4,000
1981	70	45	254,100	5,600
1980	71	49	151,100	3,100
1979	70	50	374,000	7,500
1978	71	47	190,800	4,100
1977	69	44	123,900	2,800

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	64	1	65
Non-residents	1	0	1
Unpaid	5	0	5
Total	70	1	71

Average Permit Prices

1986	\$ 7,667	1983	\$ 10,600	1980	***
1985	***	1982	\$ 8,366	1979	***
1984	***	1981	\$ 5,000	1978	***

S08P 3/11/87

Commercial Fisheries Entry Commission

UPPER YUKON SALMON FISHWHEEL

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	159	113	\$ 723,600	\$ 6,400
1984	159	96	433,900	4,500
1983	164	114	427,300	3,700
1982	166	111	721,100	6,500
1981	162	125	1,032,400	8,300
1980	163	127	782,600	6,200
1979	165	127	487,300	3,800
1978	158	137	701,700	5,100
1977	160	130	357,300	2,700

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	127	28	155
Non-residents	0	0	0
Unpaid	6	0	6
Total	133	28	161

Average Permit Prices

1986 \$ 13,500	1983 \$ 11,643	1980 \$ 9,320
1985 \$ 11,667	1982 \$ 10,500	1979 ***
1984 \$ 12,333	1981 \$ 10,893	1978 ***

S04X 3/11/87

Commercial Fisheries Entry Commission

KOTZEBUE SALMON GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	221	189	\$ 2,750,300	\$ 14,600
1984	221	179	1,110,300	6,200
1983	222	187	448,800	2,400
1982	223	198	2,134,900	10,800
1981	214	187	3,439,000	18,400
1980	201	172	1,613,900	9,400
1979	204	180	1,051,100	5,800
1978	233	206	379,200	1,800
1977	235	208	1,066,900	5,100

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	208	1	209
Non-residents	3	0	0
Unpaid	8	1	9
Total	219	2	221

Average Permit Prices

1986	\$ 10,819	1983	\$ 13,083	1980	***
1985	\$ 10,475	1982	\$ 9,591	1979	\$ 5,200
1984	***	1981	\$ 7,812	1978	***

S04Z 3/11/87

Commercial Fisheries Entry Commission

NORTON SOUND SALMON GILLNET

Year	Permits Issued	Permits Fished	Total Gross Earnings	Average Gross Earnings Per Permit
1985	205	155	\$ 818,500	\$ 5,300
1984	204	141	738,100	5,200
1983	203	168	945,300	5,600
1982	203	162	1,069,000	6,600
1981	200	167	761,500	4,600
1980	201	157	572,100	3,600
1979	200	172	878,400	5,100
1978	199	175	901,900	5,200
1977	210	166	545,700	3,300

1986 Permits Issued

	Permanent	Interim-use	Total
Resident	196	2	198
Non-residents	3	0	3
Unpaid	2	0	2
Total	201	2	203

Average Permit Prices

1986 \$ 10,167	1983 \$ 11,500	1980 \$ 7,833
1985 \$ 12,167	1982 \$ 10,100	1979 \$ 6,300
1984 \$ 13,150	1981 \$ 9,450	1978 \$ 4,350

Sentinel Staff Writer

None of the dozen or so Sitkans testifying at a legislative teleconference hearing at the Centennial Building Saturday recommended inauguration of salmon farming in Southeast Alaska.

The hearing was conducted by the State Senate Subcommittee on Fisheries. Taking testimony were senators Dick Eliason, R-Sitka, Fred F. Zharoff, D-Kodiak, and Jim Duncan, D-Juneau. Listening to the testimony from Juneau via teleconference hookup were Rep. Ben Grussendorf, D-Sitka, and aides.

A number of those testifying said they believed some space could be set aside for the pen-rearing of seafood other than salmon, such as shellfish or kelp.

Sitka has one of the highest "value-rated" fishing ports in the nation, said Sitka City Administrator Rick Anderson, cautioning against legislation that could put the local fishing industry at risk. Twenty-eight percent of the community's work force relies on the fishing industry, he said.

Even though 13 other nations already are involved in the mariculture industry, Anderson said Alaska is different in that it has a healthy existing industry and wild salmon stocks to protect.

"If it ain't broke, don't fix it," he said, summing up his views on the issue in Southeast Alaska.

On March 24 the Sitka City and Borough Assembly voted 6-0 to adopt a resolution urging the state to prohibit salmon farming.

A Sitka fisherman who gave testimony, Al Brookman Sr., said:

"These bills have been introduced by a consortium of unthinking people that have no regard of the more than 20,000 voters that make their living from fishing ocean-going wild salmon stocks in the clean, pure environment in the Gulf of Alaska and adjoining waters."

"If this monstrous bill is crammed down our throats, we will retaliate in every way possible."

Brookman and others claimed that large sums of foreign capital would be involved in setting up salmon farms in Alaska, and that few Alaskans would benefit.

This Year's Decision

The bill under consideration in the Senate (106) and its counterpart in the House (108) would provide for the stocking of aquaculture projects, and require inspections and quarantines in cases of diseased stocks. Under the bill, inspection costs would be borne by the state Department of Fish and Game.

The senators admitted the bill, which was based largely on information from the Alaska Mariculture Association, had flaws, and said even its sponsors have conceded that it is unlikely the bill will become law this year.

Even so, the hearings and testimony hold significance, Zharoff said, since the international salmon farming industry has grown so dramatically in recent years, with sales measured in the hundreds of millions of dollars.

The real question for Alaskans, Zharoff said, is whether Alaska should enter or ignore the salmon mariculture field.

"The intent of this bill is to get discussion going and people thinking about it," he said. "If we do get into it, what do we need to do?"

He warned Sitkans that an attorney general's opinion issued last month said Alaska has no laws or regulations that prohibit mariculture permits for any species from being issued as long as all requirements are met.

"We can only hold up permits so

If Alaskans choose to ignore mariculture opportunities, Zharoff said, then they should figure a way to "improve (wild) stocks so that they offer a reasonable lifestyle for fishermen in the 11 1/2 months of the year when they are not fishing."

Eliason has asked state agencies not to issue any salmon pen-rearing permits.

The state agencies maintain there is no legislation enabling mariculture projects, other than oysters, to begin.

Constitutionality?

Mark Jacobs Jr., a Sitka fisherman, said mariculture is prohibited by Article VIII, Section 15, of the state constitution: "No exclusive right or special privilege of fishery shall be created or authorized in the natural waters of the state."

He also pointed out that the Grand Camp of the Alaska Native Brotherhood unanimously passed a resolution last fall opposing salmon mariculture.

He said most Alaska Natives oppose the industry, even though Sealaska Inc., the regional Native corporation for Southeast, was instrumental in starting the Alaska Mariculture Association and has had representatives urge that the state loosen regulations to allow the industry to take off in Alaska.

Zharoff reported he had a Feb. 7 letter from Sealaska stating "salmon mariculture would be beneficial to Alaska."

Eliason said he received a letter in March from Byron Mallot, president of Sealaska, stating that the corporation's position on fish farming is neutral.

Jobs

Zharoff said he, too, had concerns about whether mariculture would offer jobs to Alaskans. He pointed out many fishermen from other parts of Alaska and the U.S. come to fish in waters off his district, creating few local jobs.

The few Alaskans employed would be at the low end of the pay scale, said George Eliason, the senator's son, representing the Alaska Trollers Association.

Jacobs, speaking on that point, said, "If you try to compete with foreign imports, you will have to start robbing

Continued on Page 8

Fisherman Oppose Farming of Salmon

Fishermen . . .

Continued from Page 1
the American wage earner."

Mariculture would not be a small business, said Bill Froust, chairman of Sitka Troll PAC and a member of the board of directors of the Alaska Trollers Association.

He quoted from a mariculture journal article which claimed that by 1990 the only surviving salmon mariculture projects would be ones producing 500 tons or more, and with startup capital costs of several million dollars.

Zharoff agreed with George Eliason that only the massive operations would be economically viable, and said: "That scares me — I'm not sure we're ready for that."

He added: "I want to keep it Alaska-controlled — and the only way to do that is to provide Alaskan money, and I don't think we can do that."

Demand for Fish

Zharoff pointed out in 1985 that the United States imported \$4.5 billion more fish than it exported, and that U.S. per capita fish consumption is expected to continue to increase. Meanwhile, he said, the production level of salmon has stayed about level in recent years and is not expected to increase dramatically.

If Alaska is to satisfy the trade deficit in fish, Zharoff said, the fish will have to come from some other source.

The Pike Place Market in Seattle and Carr's, the grocery chain in Anchorage, now sell fresh salmon from Norway on a daily basis, he said.

"There are a lot of people who can't tell the difference between a fresh pen-reared salmon and a fresh Alaskan king," he said.

Sen. Eliason said the presence of pen-reared salmon on the market may be used to Alaska's advantage and he suggested a trade campaign slogan: "Buy Alaskan Salmon — The Only Wild Salmon Left in the World."

"We are not scared of the competition," said Froust, adding Japan, a major market, continues to prefer fresh Alaskan salmon over pen-reared varieties. Fishermen are concerned that pen stocks might cause disease in wild salmon.

He referred to a University of Washington report that states wild fish can contract disease just by passing by a pen of infected salmon.

He described the potential for disease to existing stocks "too dangerous" to even consider mariculture.

He said that in 1983, 29 out of 40 pens of salmon in Norway had to be destroyed after a disease swept through the stocks. About 1 percent of penned salmon escape into the wild, he said.

Shellfish

Steve Laposki of Sitka, who owns an oyster-raising business south of Petersburg, said he believed it was in the best interest of the state to further study the ramifications of salmon farming on the existing fishing industry before setting "everyone loose on this modern-day bonanza."

He said he hoped the subcommittee would consider passing separate, and less controversial, legislation on mariculture of shellfish and kelp.

The shellfish mariculture industry could be controlled by Alaskans through small businesses, suggested Ray Rollande, a fisheries instructor at Sheldon Jackson College. He said he

was neutral on the subject of finfish mariculture, but expressed concern for the economics, pointing out foreign interests might manage the Alaska tidelands in a manner not suitable to Alaskans.

The Alaska Mariculture Association has expressed desire to see a whole bill on finfish and shellfish mariculture or nothing at all, said Duncan. Rollande expressed disappointment, after noting the shellfish growers have been working for years to have some clearcut regulations established.

Obstacles

Even though Alaska's clean waters and protected bays offer much potential for mariculture, senators Eliason and Zharoff pointed out many obstacles exist, such as the limited access to private or state land. Much of the uplands of Southeast Alaska bays are federal and designated for timber harvest or wilderness.

Also, the state has only one laboratory for the testing of paralytic shellfish poisoning — in Palmer — and Southeast shellfish farmers must send samples of all their stocks to that site. Results are not returned in a timely manner, the subcommittee was told.

Ann Lowe, a member of the Sitka Coastal Zone Management Plan Advisory Committee, said the group has decided that its policy will be to not oppose mariculture ventures, but to recommend that they be given lowest priority for use of bays after subsistence, recreation, log transfer sites, floathouses, fish scows and other uses.

"We want to leave the opportunity there," she said, speaking for the committee which is in the process of reviewing the Sitka plan and holding hearings in preparation for making a final recommendation to the assembly.

The committee will also recommend that mariculture applicants submit a 10-year plan, subject to public comment, and provide annual reports, she said.

Saturday's hearing was the fifth held by the subcommittee on Senate Bill 106. Other hearings were in Dillingham, Anchorage, Kodiak and Ketchikan.



Senators Listen

The Senate Subcommittee on Fisheries was in Sitka Saturday for a public hearing on maricul-

ture. From left are Sen. Fred Zharoff (D-Kodiak), Sen. Dick Eliason (R-Sitka) and Sen. Jim Duncan (D-Juneau). (Sentinel photo)

April 4, 1987

million ← My name is Rocky Stone. I am a Cordova resident. My partner, Robert Sullivan, and I have made our living in the Copper River-Prince William Sound fishery for 24 years. 85% of our income is recycled here in Alaska. Alaska harvests 130 million salmon yearly. It's fishing industry is the largest employer of persons in the state.

Those who think fish farming will be labor intensive should think twice. Norway now offers a robot feeder that can assess conditions of fish farms and administer the food, which means that one person and a computer are all that is needed most of the year.

In reports I've read, the Norwegians are faced with disease and genetic deterioration threats to their salmon. They have already invested 12 million dollars in a cryogenic gene bank and have imposed farm free zones near wild streams. A new disease, the "hitra" is responsible for 80% of salmon disease in Norway. This and market saturation are big problems for them. Findings now show that Norway's getting out of this, selling their technology to us, and we're being conned.

Now Norwegian companies, fleeing stringent guidelines of that country, are moving in with a vengeance to B.C. where no controls on farm size and ownership exist. Canada's calling for moratoriums and is worried about disease and the wiping out of her wild stock.

To quote a brief to the Gillespie Commission in B.C., "assurances of the fish farming industry are worthless. In the event of a genetic or disease catastrophe, the huge cost and lost fish production would be borne entirely by the public. It is impossible to put a dollar value on wild salmon resources, and yet this is what we risk in the absence of proper safeguards."

These same problems are going to plague us and farmers will be treating fish with hormones, antibiotics and chemicals. Already TBT, an anti-fouling agent, has been detected in penreared salmon on U.S. markets. This hardly speaks of quality and we don't need to be a part of it.

People are concerned about heart attacks and cancer. Witness the drastic decline in beef sales in the last 2 years. With some marketing expertise, we could rely on the consumer to refuse fish that's a health hazard too.

I read last week that by 1990, just 3 years from now, there will be 153,000 metric tons of farmed salmon on the market...23,000 tons in excess of the total world demand. With this in mind, we're crazy to be wasting money and time on fish farming.

With some marketing ingenuity, we can close this window of panic and open a door of opportunity. We could easily be in a position of having the only quality fish left in the world---Alaska WILD salmon.

Looking Into An Uncertain Future:

"Aquatic Farming" in Alaska

Aquatic "farming" in Alaska - the subject of debate in the state legislature this year - may not pose a threat to commercial fisheries markets, but the boom in worldwide pen-raised salmon presents a formidable long-range challenge to the fishing of wild Alaska salmon. These are the conclusions of two separate University of Alaska assessments of salmon farming.

A preliminary assessment by Dr. Robert L. Logan and John Weddleton of the University of Alaska's Economics Department in Fairbanks: "Any feasible short-run developments (in Alaska) are miniscule when compared to world salmon production. Our preliminary results suggest that any increases in the 10 to 30 thousand metric ton range can easily be absorbed by salmon markets without significant effects on market prices or on wild salmon sales," the two write. "... the same, salmon farming in Alaska will produce substantial net increases in employment and income."

The primary short-run displacement, if any, will be in fresh wild salmon market, they said. Given that this comprises only 3% of sales of Alaska Pacific salmon, "we expect minimal displacement in the short run."

However, long-term effects are more disturbing: "Farmed salmon production is rapidly expanding throughout the world, and is expected to more than double by 1990. Thus, there is no guarantee that today's prices will prevail throughout the 1990s and beyond. Indeed, preliminary results from this study indicate that if demand for salmon products does not increase between now and then, prices for salmon could fall from 4% to 13%. This would cause a displacement of marginal producers in the traditional fishery, whether Alaska pursues salmon farming or not," the two economists write.

"It would reduce the feasibility of salmon farming, especially in light of feed and labor costs in Alaska. We expect significant increases in demand over this period...but if displacement of the traditional fishery is going to occur, it does not matter whether Alaska pursues salmon farming or not. The only question is who will earn the income - Alaskans or foreigners."

Long-Range Threat

A second study of the market effects of pen-raised salmon, this one by Drs. Ronald V. Rogness and Biing-Hwan Lin of the U of A's School of Man-

agement, and released last September, predicts substantial growth in the imports and number of distributors of Atlantic pen-raised salmon. But because 97% of Alaskan salmon is marketed frozen or canned, growth in salmon farming will immediately affect only the small segment of Alaska fishermen marketing their product fresh. However, "the marketing relationship between Atlantic and Pacific salmon can change, especially when there is a glut in the supply of pen-raised Atlantic salmon."

The Norwegian Fresh Fish Marketing Association predicts their annual exports will reach 60,000 metric tons by 1990, up from 28,650 mt in 1985. At least 20,000 mt (44 million lbs.) of this will be imported into the U.S., if current ratios of Norwegian exports and U.S. fish imports continue; in addition, British Columbia salmon farmers say they will export 22 million lbs. of Atlantic and Pacific salmon to the U.S. by 1990; Chile, Scotland and New Zealand are also targeting increased exports of farm-raised fresh salmon to the U.S.

Alaska's total harvest (729 million lbs. in 1985) dwarfs these imports, but the market most immediately affected are those for troll-caught Alaskan chinook and coho, which totalled 19 million lbs. in 1985. The markets for these are mostly "white tablecloth" restaurants, into which pen-raised Atlantic salmon are now making significant inroads.

Marketing Survey

The U of A's surveys of U.S. fish distributors, however, show that farm-raised salmon have the long-range potential of being substituted for wild fresh or frozen salmon on a much wider scale. Here are some highlights:

- Of 62 distributors handling both pen-raised Atlantic and wild Pacific fresh salmon, 49 said the Atlantic variety could substitute for Pacific salmon. Analysis of questions relating to substitution indicate a consciousness of freshness in pen-raised salmon that is sometimes absent in wild salmon shipped from Alaska.

- Distributors surveyed reported they increased sales of pen-raised Atlantic salmon 14% in 1982-3, 22% in 1983-4, and 30% from 1984-5, indicating the markets for these imports are rapidly expanding.

(Cont'd Page 6)

Alaska News Summaries

AMCHITKA SUPER-RADAR BASE: The Navy is planning to base a \$92 million radar system using the "over the horizon" backscatter technology at Amchitka Island, in the Aleutians. Navy officials also plan making plans to spend \$80 million in construction for the Adak Naval Air Station.

ELMENDORF TO RECEIVE 8 COMMUNICATIONS AIRCRAFT: A recent navy decision to base 8 E-6 communications aircraft at Elmendorf Air Force Base, near Anchorage, will mean half of the Navy's 15 E-6's will be operating out of Alaska by 1990, according to Everett Pyatt, assistant secretary of the Navy. The decision will base an estimated 200 support personnel and crew members at Elmendorf.

FAIRBANKS OPTS FOR SALES TAX: The Fairbanks City Council voted 5-1 to begin a 3 percent sales tax and to leave property tax levels alone. Citizens testified on a proposal to either more than triple the property tax mill rate or to reinstate the sales tax. Fairbanks faces a \$5.2 million deficit by the end of this year if costs aren't cut or revenues raised.

ANCSA BILL SHOULD CLEAR SENATE: A bill amending several provisions of the 1971 Alaska Native Land Claims Settlement Act is headed for congressional approval, according to Alaska Senator Ted Stevens. The legislation will go to a conference committee between the House and Senate for approval, unlike last fall when the bill needed unanimous Senate consent. The proposed amendments would change the way corporations may issue stock and would modify some of the special provisions in the 1971 act. Stevens said there is roughly a three-way split among Alaskans who favor, oppose, or are undecided towards the amendments.

ALASKAN POTATO CHIP SELLS: Alaska Potato Chip, Inc. put its chips on the market recently, selling them to grocery stores in Anchorage, Wasilla and Palmer. A 10-ounce bag retails for \$2.99, about 6 cents less than other brands, says Daniel Bagley, general manager of the corporation. The potato chip factory, located in the Matanuska Valley, will soon operate 20 hours a day and employ a dozen people, according to Bagley. The company is presently importing potatoes from the Pacific Northwest but plans to test local potatoes for usage this summer. Alaskans can buy stock in the company for \$1 a share, Bagley said.

HELICOPTERS DENIED LANDING PERMITS: Helicopter companies seeking summertime landing permits to bring tourists to the Eagle River area of Chugach State Park have been denied because of strong public reaction against the idea, according to Neil Johannsen, state parks director. State park officials said they will consider pursuing bids for a more conditional concession permit.

15,000 MAY BENEFIT IF LEGISLATURE PASSES AHFC PROGRAM: A new home refinance program proposed by the Alaska Housing Finance Corp. could lower mortgage payments for up to 15,000 Alaska homeowners if approved by the state legislature. Passage would mean the AHFC could sell \$1 billion in bonds on New York and European financial markets this year. That sale would be largest run of bond sales in the agency's seven year history. Under the new AHFC refinance program, mortgage interest rates would be lowered to approximately 8.5%, about half of the 16% homeowners paid a few years ago. The proposed program would be available to people in financial difficulties, AHFC officials say. The AHFC is already looking at 2,000 foreclosures.

UNITED BANCORPORATION ALASKA REPORTS \$32.2 MILLION LOSS: The parent company of the United Bank Alaska reports losses of \$32.2 million for last year, a figure which is \$6.4 million more than losses reported previously in an unaudited statement. The increase is attributed to the bank enlarging its reserves in preparation for possible future delinquent loans.

FAIRBANKS HOLDS PROPERTY TAXES, BUDGET: The Fairbanks Borough Administration has proposed a budget that contains no mill rate increase for property taxes; funds schools at current levels and cuts about \$3.4 million from spending. The budget depends on the new 2% sales tax to raise about \$7.2 million in new revenue. The locally funded share of the borough budget will go from 58.2% to 69.6%, making up for lost state and federal funds.

DIVIDEND TO RISE AFTER FUND STOCK SALE: Profits from the February sale of about one-third of the Alaska Permanent Fund Corporation's \$1.8 billion stock portfolio are not the \$290 million board members were hoping for, but are enough to increase 1987 dividends to about \$723, according to corporation spokesman Jim Kelly. The \$221 million profits from the sale also edged the earnings reserve account above \$500 million. By the end of this fiscal year the fund is expected to earn \$1 billion.

MORE CRUISE SHIPS TO VISIT SOUTHCENTRAL ALASKA: The Anchorage Convention & Visitors Bureau expects a 30% increase of cruise ships docking this year in the southcentral cities of Whittier, Seward and Anchorage with three ships - Explorer Starship, the Sea Princess and the Royal Princess - voyaging in the area for the first time. A total of 72 visits are scheduled for the region from May through September. 15% of all visitors to Anchorage are cruise ship passengers, and the significant increase in passengers is good news for hotels and retailers.

ALASKA "FRESH FROZEN" SEAFOOD PROMOTION: Evans-Kraft advertising agency of Seattle has been promoting Alaska "fresh frozen" seafood since last year throughout the United States for the Alaska Seafood Marketing Institute. The facts that Americans are now consuming 14.6 pounds of seafood a year, up from 12.5 pounds three years ago, and that fish contain the widely publicized "omega-3" fatty acids which are believed to reduce cholesterol levels in the blood are strong points in the sales pitch. The greatest problem now encountered in the sales of Alaska frozen salmon is the competition from fresh pen-raised Norwegian salmon which is being sold throughout the United States with a particularly strong market on the east coast. Evans-Kraft marketers have the task of convincing retailers and consumers that "fresh frozen" - if frozen properly - is as good as any fresh fish.

MORE SALMON FOR BRISTOL BAY THAN FIRST FORECASTED: Alaska Dept. of Fish and Game has added 700,000 salmon to its original bleak forecast of a 43% declined Bristol Bay salmon run. Still, the harvest will only be fair at an estimated 9.3 million fish catch, but with current prices at least as strong as last year's at \$1.50 to \$1.65 per pound, the Bristol Bay fishery could top an \$86 million value. Naknek river, opened to fishing last year for the first time, may be opened even earlier this year to setnetters and driftnetters.

The Alaska Economic Report

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Fisheries:

ASMI: Domestic Success

Alaska Seafood Marketing Institute's campaign to promote sales of Alaska pollock in three Midwestern target cities scored some notable success and proved the point that frozen Alaska whitefish sales have considerable potential for expansion. ASMI did the project under a federal fisheries grant, unfortunately not continued this year.

Denver, Chicago and Minneapolis were selected as test targets because ASMI had experience and market demographics from salmon promotions in those cities. Newspaper ads and in-store promotions were used. All of Denver's supermarkets participated, as well as 72.5% of Chicago's and 97% of Minneapolis stores. ASMI knows that at least 326,455 lbs. of pollock fillets moved in those markets during the promotions, but the actual volume is far higher because distributors and food stores keep such data confidential.

One Alaska company, Arctic Alaska Seafoods, reports it sold \$1.5 million in pollock due to the promotion, and expects sales of \$2.5 million to those markets this year, a residual effect of the project.

Probably of more importance is that several major food retailers are now stocking frozen Alaska pollock year-around, which will lay the base for long-term demand growth. Also, valuable data for future marketing strategy was gained in the project. Whitefish sales can successfully be targeted to lower-income families with a stress on price and taste, for example.

ASMI Seeks USDA Money

ASMI wants a \$3.5 million loan from the United States Department of Agriculture to promote Alaska seafood overseas. After the 1982 botulism scare, Alaska has lost more than 50% of its fish market in Europe. \$2.5 million would be dedicated to the promotion of Alaska frozen salmon in France, Belgium and the United Kingdom; and \$1 million would promote Alaska herring and pollock in Japan. Reclaiming the European market won't be easy with the prevalence of Norwegian and Scottish salmon. Europeans have already grown accustomed to the light-colored Atlantic salmon and have voiced suspicion over the dark red Pacific salmon meat. The federal government should lend a sympathetic ear to ASMI's request; The Department of Commerce has recognized the U.S.' \$5 million seafood deficit and has employed marketing experts in both Belgium and Tokyo to promote U.S. seafood.

Pacific Salmon Fishing Quota

The Pacific Salmon Commission has recommended to the U.S. and Canadian governments that the 1987 fishing quotas be about the same as 1986, with the addition of hatchery kings in Alaska waters. The governments will set the actual seasons under advice of detailed recommendations of the salmon commission, which will be worked out in a meeting next June. The addition of Alaska hatchery salmon could mean up to 22,050 chinook for Alaska fishermen.

Domestic Processing Zone

On April 13, North Pacific Fisheries Management Council (NPFMC) will release a study of the proposed domestic processing priority zone around Unalaska and Dutch Harbor for public review. The proposed zone would exclude foreign processing vessels from 100 miles off the coast in an effort to increase domestic processing. Most fishermen deliver to floating foreign processors rather than make the trip back to shore. Public comment and testimony will be accepted at the next NPFMC meeting in May. NPFMC will then vote on the proposition, and pass it on to National Oceanic and Atmospheric Administration for approval. The proposal is highly favored, and in keeping with the targeted phase out of foreign vessels from U.S. waters by 1991. Many other areas will undoubtedly propose local domestic zones, if this proves successful.

More Black Cod Fishing

More fishermen than ever are fishing for black cod, because of especially strong prices. At the beginning of the season, April 7, processors were paying up to \$1.38 per pound, \$1.13 per pound more than last year's best price. The North Pacific Management Council expects the season to be shorter than last because of the increase of effort.

Aquatic Farming (Cont'd from Pg. 3)

- Twenty five distributors in the survey purchased Atlantic salmon independent of the availability of wild Pacific salmon, and 18 purchased it when Pacific salmon were out of season. Five purchased no Pacific salmon, and five for only certain markets.
- Distributors reported they liked pen-raised Atlantic salmon because of its year-around availability, freshness, consistency and more uniform size. Pacific salmon were preferred at times because of price and color, firmness and less fat.

Senator —

10-130 Million FISH

ROBIN SAMUELSON — ~~was~~ opposed

- ① CANT BEFORE THE HOUSE. NORWAY —
DEPLETED THEIR STOCK — SAME WITH JAPAN.
COMPETITION — #1 CONFLICT WITH LIVELIHOOD.
PROTECT DOMESTIC FISHERIES — EXCLUDE FROM
FISHERY — ALASKANS ONLY.
DISEASE SPREAD TO DOMESTIC STOCKS —
B.B. EXCLUDED FROM TAKING PART ~~IN~~
23% # FOR PINK. (BB)
- ② TOM TILDEN — 3 CHILDREN — INTO FISHERY
EVOLUTION IN FISHING INDUSTRY — $\frac{1}{4}$ - $\frac{1}{2}$ MILLION
START UP — BB CANNOT PARTICIPATE — RESIDENT
PARTICIPATE — STATE PROVIDE BUCKS FOR SMALL
OPERATIONS — CUTS IN INCOME TO FISHERMEN I
- ③ JOE CLARK — LIFE LONG COMMERCIAL FISHERMAN —
THREATENED — SUPPORTS WILD STOCKS — NO
POSITIVE EFFECTS IN BB. FUNDING CUTS ~~==~~
- ④ JOE MCGILL — NOT IN FAVOR — BUT GOING
TO HAPPEN — NOT A MA & PA OPERATION —
COST VERY HIGH TO RAISE — RESEARCH BEFORE
WE GET INTO IT — NEED MONEY INTO BUDGET —
- ⑤ HARVEY SAMUELSON — OPPOSE BILL BECAUSE
ALASKA HAS FOR INDIVIDUAL PROFIT — NO WAY
TO PRICE OR POLICE THE INDUSTRY — SELFISH
DEVELOPMENT AND FISHING PLANT — NEED TO
REGULATE STREAMS —
- ⑥ NORMAN STADEM — ANCHORAGE — UFA
BOARD MEMBER — OPPOSE PEN REMOVAL
SESSION — LACK INFO ON IMPACT —

NORMAN STADEN —

STUDIES NEED TO BE MADE — TOLLY
SHEETS ASKED TO COMPILE INFO —
IDENTIFY PROBLEM WITH INFO NOW
AVAILABLE — BILL TOO VAGUE — NEED
STATE CONTROL IE FISH BOARD — NEED
BUDGET PREPARED UP — COULD BE BENEFICIAL
MUST KNOW WHAT RESULTS WOULD BE



① JOHN DOYLE — UOFA — VIEWS OWN...
NEED BILL SUCH AS THIS — NEED PATH
TO FOLLOW — REGULATORY IMPEDIMENT — DAIRY
FARM ROUTINE — COMING ANYWAY — 17 IN
MAINE ~~HOW~~ HOW ABOUT ASHES CAPACITY

② NELS ANDERSON JR. WE DON'T UNDERSTAND
THE ISSUE AT THIS POINT — STATE SHOULD
EDUCATE YOUNG TO GO FORWARD WITH PLANNING —
NOT ONLY ISSUE IN BB — DECLINING REV.
CAUSE DISRUPTION IN NATIVE STOCKS —
FISHERY IMPACTS IF BILL ADOPTED — CONCERN
ON F&G BUDGET AND REINFORCEMENT —
EQUITY FOR BB IN PROGRAM ~~KIDS~~ KIDS WRESTLE
WITH THIS — PROTECT WHAT WE HAVE NOW

③ REIDAR SILBERG — BB 1962 — LAST
NATURAL STOCKS IN WORLD — DAM ILLIANA
POWER SYSTEM — 200 MILLION FOR EX-USE/
FISHERMAN —

④ MITCH KING — ASMA — COMPETITION FOR
BB — BB NOT ALL SUBM & HANDY —
10% OF GROUNDS TAKEN UP — WILD
STOCK SHOULD HAVE REMARKS — DO NOT REALLY
RECOGNIZE THE TRUE VALUE OF OUR WILD
STOCKS.

Box 668
Wrangell, Alaska 99929
April 7, 1987

Gentlemen:

The following is a copy of my testimony given at the April 2, 1987 teleconference, which I want to share with you:

My name is Volney Smith, I, my wife and family have been commercial fishing for 16 years. We are members of the Seafood Producers Cooperative in Sitka, which has 250 members. I have been on the board of directors of this co-op for 4 years, and also on the marketing and quality control committees. I am very much aware of what good quality is, and where the world markets are for fresh and frozen salmon. I have been aware of Norwegian pen raised salmon for at least 3 years. I would like to shed some light on the origin of pen raised salmon. Norway used to have a large ocean going cod fishery as well as an Atlantic salmon fishery. They have overfished the cod on the Norwegian coasts, as well as the Atlantic salmon on the high seas. This latter being done mainly by the Danish drift gill-net fisheries.

Ten years ago the fishermen of this state voted themselves a 3% enhancement tax to start state hatchery programs. To date we haven't reached the maximum amount of high quality salmon and are still in the building mode. I must compliment not only the fishermen, but the state of Alaska as they now have probably the finest and most successful hatcheries in the world. As part of the fishing community, we have been catching some of these stocks as well as our natural stocks, which are worth millions of dollars to this state. At the beginning of our hatchery program, we decided not to have private (for) profit hatcheries, but to have just the opposite so as not to compete with the commercial salmon fisheries.

After learning of what has taken place in British Columbia this past year when the Norwegian government bought their way into the pen raised salmon business with 40 million dollars, I wonder what they are offering this fine state. Believe me, after listening to the biologist who testified yesterday, the so called "blue revolution" will not be what they say it will be. Anchorage should be well aware of what can happen in an oil glutted world market and should know what will happen if and when a world salmon glut happens. Vance Lipovsky predicts 1991 will be the first crash of the industry. Then the merger phase will begin and he expects to see bargain prices on both fish and fish farms within two years. He also states "in the next 3 or 4 years, B.C. will be the largest exporters of salmon to the U.S." In the March ASMI it states that in recent years Alaska has watched as it's share of the foreign

78
market in both Europe and Japan eroded under pressure from Norwegian farmed salmon. The Norwegian Ministry of Fisheries funded \$175 million dollars in 1985 to support fish farms. In 1985 Alaska salmon was America's leading fish export, valued at \$614 million. Norwegian pen raised salmon is mounting a major assault on Alaska's market share. In 1975 Norway raised 1.9 million pounds of salmon. By 1985 it reached 75 million pounds. If Alaska doesn't do something to counter the Norwegian sales efforts Norway will capture the lions share of the European market by 1990. According to the U.S. Dept. of Commerce, in 1983 the U.S. was the leading supplier of fresh salmon to Japan, selling over 1200 tons of fresh fish to that country, or 94% of its total imports. By 1985 Norway replaced the U.S. as the leading fresh fish supplier of Japan. The threat to our market is very serious. We need to mount an aggressive sales campaign this summer and fall to help stem the tide or we may find ourselves without major markets for Alaska products.

In 1985 U.F.A. stated that pen raised salmon was a rapid growing industry and that it was already having impacts on traditional markets with an even greater market penetration in the future. They requested the state of Alaska to perform a thorough study of the biological, economic, and sociological problems and potentials of pen rearing in Alaska. To date no such impartial study has been done.

The potential for disease contamination of wild stock has not been explored at all. In 1985 Norwegian fish farms were forced to destroy 2900 metric tons of farmed salmon due to contaminated stock, but since Norway doesn't have a natural viable salmon run no one knows what effects this might have had on a natural run. This is a serious concern to the commercial fishing industry as well as the sports fishery. Many proponents of pen rearing salmon are touting the industry as one which can be done by small as well as large operations. They present it as a boost to the economy of Alaska coastal villages and suggest "mom and pop" operations can be successful. In fact current evidence indicates this is far from the case. Because of the high cost of fish food, brood stock and establishment of adequate transportation facilities, in addition to the length of time it takes to produce the first saleable product it will be almost impossible to succeed much less compete with an already highly subsidized Norwegian or Canadian product.

In closing I would like to point out that by telling the fisherman he must sell his 3% hatchery fry to a pen raiser only to directly compete with his ocean caught would be a crime against all that he stands for. As for the mariculture bill before the legislature you must separate mariculture from pen raised salmon. There is possible merit in the raising of shellfish, aquatic plant life, and existing salmon programs to accent our existing communities.

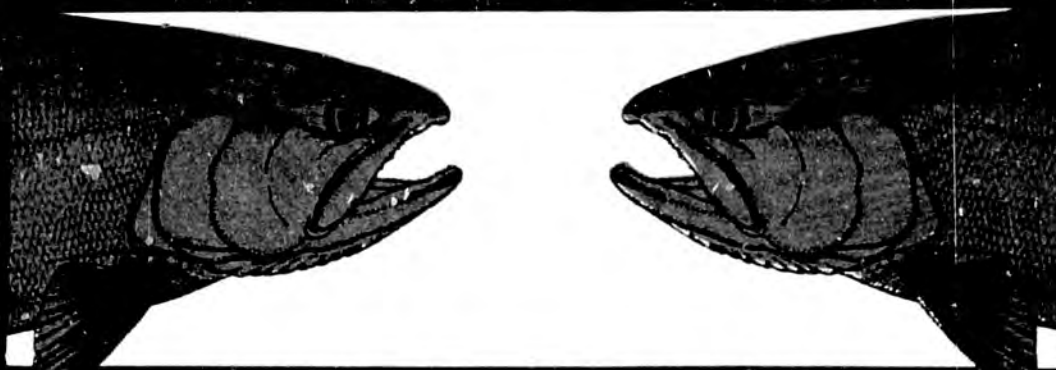
Madam chairman, members of the resource committee, and fellow listeners, this state has spent over 10 years and literally millions of dollars building, managing, and now hopefully promoting Alaska's natural wild salmon renewable resource. Nearly 45,000 people worked in last years 414 million dollar salmon harvest. As legislatures you should be looking at a possible state income tax for needed revenue. You should stand alongside of Alaska's leading employer and not allow pen raised salmon to undermine our most viable industry. At this time it would be extremely foolish for the State of Alaska to be lead blind folded down this path of pen raised salmon which is highly subsidized.

Thank you.

Sincerely,

Volney Smith

874-2497



**THE MARKETING RELATIONSHIP
BETWEEN
PACIFIC AND PEN-RAISED SALMON:
A SURVEY OF
U.S. SEAFOOD WHOLESALERS**

By Ronald V. Rogness
and
Biing-Hwan Lin

University
of
Alaska

Alaska Sea Grant
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590 University Ave., Suite 102
Fairbanks, AK 99709-1046

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CORRECTION

**THIS DOCUMENT
HAS BEEN REPHOTOGRAPHED
TO ASSURE LEGIBILITY**

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INTRODUCTION

The Pacific salmon industry has become increasingly concerned about U.S. imports of fresh Atlantic salmon (Atlantics) from Norway: a product that has built a very strong niche in U.S. salmon markets. Industry members and policy makers are uncertain about how these imports will affect wild Pacific salmon markets.

The worldwide trend in pen-raised Atlantic salmon production is one of rapid increase. Table 1 shows the Norwegian production of Atlantics in the last five years and their projected production in 1990.

Table 1. Norwegian production of pen-raised Atlantic salmon (mt)

<u>Year</u>	<u>Production</u>
1981	8,422 ¹
1982	10,266 ¹
1983	17,016 ¹
1984	22,300 ²
1985	28,650 ²
1990 (projected)	80,000

¹ U.S. Department of Commerce, NMFS (1983)

² Michael Gordon, 1986 personal communication.

The fish are produced primarily for export, and the United States is the largest importer. Figure 1 shows imports of Norwegian pen-raised Atlantics into the U.S. from 1982 through 1985. The graph shows a substantial increase in imports for each of the last four years.¹ Note the annual upward shift during the late summer and early fall. This is when Pacific salmon reach the markets and when the potential for substitution between the pen-raised Atlantics and the Pacifics is the greatest.

Future production estimates indicate that we can expect continued increases in imports of both pen-raised Atlantic and Pacific salmon. In all, 21,742 mt of pen-raised Norwegian Atlantics were exported in 1985, 6,460 mt of which were sent to the U.S.² The Norwegian Fresh Fish Marketing Association predicts that by 1990 their total annual exports will reach 60,000 mt. If the ratio of U.S. imports to total exports remains constant, we can expect approximately 20,000 mt (44 million lbs) of pen-raised Atlantics imported into the U.S. in 1990. In addition, British Columbian salmon

¹ Norwegian Export Committee for Fresh Fish. 1982-1985. Statistikk: Markeder Eksport av Fersk Fish og Skalldyr.

² Ibid. 1985

Monthly Exports of Fresh Norwegian Pen-Raised Atlantic Salmon to the United States

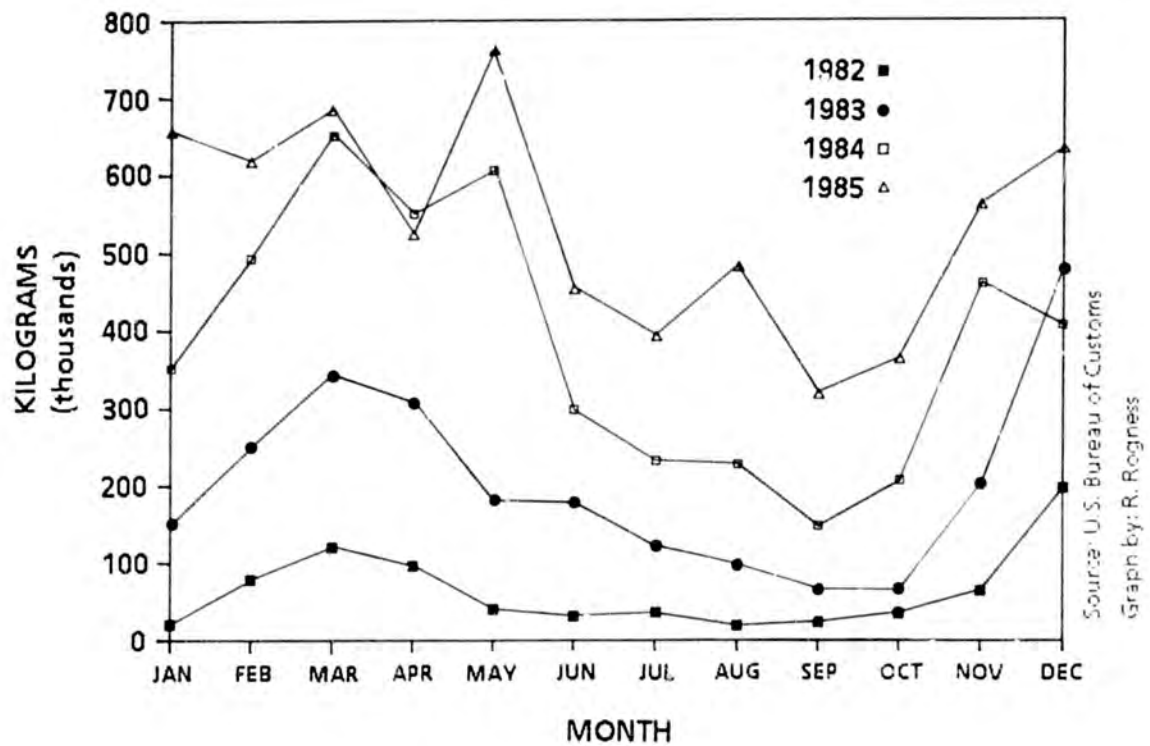


Figure 1.

farmers project they will export 22 million lbs (Atlantics and Pacifics) into the U.S. in 1990.³ Chile, Scotland and New Zealand are also anticipating major increases in their exports of pen-raised salmon to the U.S. as well. The total imports of pen-raised salmon into the U.S. will still fall substantially below the total wild Alaskan Pacific salmon harvest (729 million lbs in 1985). But these imports exceed recent Alaskan harvests of chinook and coho salmon (19 million lbs in 1985), thought to be the species most affected by increased imports of pen-raised Atlantics.⁴ These projected increases in imports highlight the importance of understanding how the fresh salmon market operates.

This report summarizes the results of a mail survey about marketing pen-raised salmon in the U.S. By conducting this survey we hoped to:

- * Obtain the seafood marketers' opinions of the substitutability between pen-raised and wild salmon in the U.S.
- * Understand the factors promoting pen-raised salmon marketing in the U.S.
- * Obtain the seafood marketers' assessments of the future marketing development of pen-raised salmon in the U.S.

This survey is part of an ongoing Alaska Sea Grant project, "Economic Impact of Farmed Salmon Upon the Alaskan Commercial Fishing Industry." In addition to this survey, an econometric analysis is being performed to estimate the cross-price elasticity between pen-raised Atlantic salmon and wild Pacific salmon, and other demand elasticities in the U.S. and European markets. Monthly data on salmon exports from the U.S., Canada and Norway from 1982 to 1985 are used in a market share approach. The econometric analysis should be completed in 1986. Because worldwide marketing of pen-raised Atlantic salmon is recent, the survey approach and the econometric study will produce complimentary results.

This survey was conducted jointly by the Alaska Sea Grant College Program and the School of Management at the University of Alaska, Fairbanks. On July 31, 1985 the Alaska Sea Grant College Program sent questionnaires to 925 seafood wholesalers and distributors listed in the Yellow Pages for Boston, New York, Chicago, Los Angeles, San Francisco and Seattle. It was impossible to determine from

³ Michael Gordon, March 3, 1986 personal communication

⁴ Alaska Department of Fish and Game. 1985. Preliminary 1985 harvest, by region, by species: 1985 ADF&G Salmon Season Summary.

Alaska Sea Grant College Program

PUBLICATION ANNOUNCEMENT

TITLE: "The Marketing Relationship Between Pacific and Pen-raised Salmon: A Survey of U.S. Seafood Wholesalers" AK-SG-86-03

AUTHOR: Ron V. Rogness and Bing-Hvan Lin

TOPIC AREA: Fisheries Resources: Economics

PAGES: 27 **FIGURES:** 1 **TABLES:** 1

PUBLISHED: September, 1986

PRICE: \$5.00 (plus 2.00 shipping per order)

ABSTRACT

The Pacific salmon industry has become increasingly concerned about U.S. imports of fresh Atlantic pen-raised salmon, a new product that has built a very strong niche in traditional U.S. salmon markets. In 1985, researchers conducted a survey of U.S. fish wholesalers to determine their attitudes on three areas: substitutability between pen-raised and wild salmon in the U.S., what factors are promoting pen-raised salmon marketing in the U.S., and their assessment of the future marketing development for pen-raised salmon in the U.S. This report contains the results of the survey returns, in which about 24 percent of those receiving surveys responded. The sample includes both firms that have sold Pacific salmon and those that have not.

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