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5481 SRES SB 482 (file 1) - (file 2)

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STATE OF ALASKA
DEPT. OF ENVIRONMENTAL CONSERVATION

STEVE COWPER, GOVERNOR

OFFICE OF THE COMMISSIONER
P.O. BOX O, JUNEAU, ALASKA 99811-1800 (907) 465-2600

March 16, 1988

Senator Dick Eliason
Alaska State Senate
PO Box V
Juneau, AK 99811

Dear Senator Eliason:

We have reviewed SB 482. We believe that the bill outlines a workable approach to mariculture and is cognizant of all the issues involved. We appreciate the work that you and your staff have done with the state agencies involved in this issue. We have a few comments on the bill.

We support the approach that the bill takes to use the existing permit coordination procedure for review of proposals for mariculture. We believe that this is the most cost effective and efficient approach and that it is superior to creating a new permitting structure.

We agree that it is important to us to clarify agency authorities and give each agency the appropriate legal authority to properly manage mariculture development. Our comments are intended to remove any ambiguity about agency roles and to ensure that we have adequate authority to address this new type of enterprise.

Section 1, page 1, lines 19 to 23 is workable as long as it is interpreted to mean that the sale or transfer of aquatic farm products is subject to the requirements of AS 03.05, even after a permit from the Department of Fish and Game (DFG) is received under AS 16.40.100. AS 03.05 includes the Department of Environmental Conservation (DEC) requirements for seafood product sanitation and labeling. These requirements apply at the time that product is transferred and sold. We understand that this is

your intent.

In Section 1, page 1, lines 24 to 27, we would suggest that the references to DEC be deleted. We would address public health concerns under our authorities. This section would then read:

> (c) The commissioner may attach conditions to a permit issued under this section that are necessary to protect natural stock.

In Section 1, page 2, lines 6 - 7, we would suggest the following revised wording:

> (1) the biological and environmental capability of the site for the proposed aquatic farm or hatchery to support the proposed operation;

This would clarify that the purpose of the review by DFG is to ensure that the site is capable of supporting the use for which it is proposed. Other environmental issues would be considered as part of DEC's review and permitting process.

In Section 2, page 7, lines 26 to 29, and page 8, line 1, we would suggest a slight revision to the proposed wording to read as follows:

> (9) establishment of standards and conditions of operation and siting of aquatic farms including but not limited to
>
> > (A) restrictions on the use of chemicals; and
> > (B) requirements to protect the public from contaminants that pose a risk to health in aquatic farm products.

We would also suggest moving the current section AS 03.05.020(a)(6) into AS 03.05.011(a) as a new section (10) and rewording it to say:

> (10) monitor aquatic farms and farm products to ensure compliance with this chapter and the requirements of the national shellfish sanitation program manual of operations published by the Food and Drug Administration.

We appreciate the opportunity to comment.

Sincerely,

Amy D Kelso /fn

Dennis D. Kelso
Commissioner

cc: Senator Coghill, Chairman, Senate Resources Committee

STATE OF ALASKA

JAY S. HAMMOND, GOVERNOR

DEPARTMENT OF FISH AND GAME

OFFICE OF THE COMMISSIONER

P.O. BOX 3-2000
JUNEAU, ALASKA 99802
PHONE: (907) 465-4100

November 12, 1982

Mr. James L. McCormack
Project Manager, Ice Palace Farms
3321 Seppala Drive
Anchorage, Alaska 99503

Dear Mr. McCormack:

This letter is in response to yours of October 12, 1982, to Commissioner Skoog, regarding your interest in a commercial marine net-pen farm for coho salmon in Southeast Alaska. We are enclosing the $100.00 check you submitted since we will be unable to issue a permit for your proposed operation.

In explanation, as stated in your letter, it is correct that State of Alaska law does not allow conduct of salmon ranching for a profit, only on a nonprofit basis. From the text of your letter, you appear to have received insufficient information about the legality of hatching and rearing stock coho for commercial purposes. The Alaska Department of Revenue does have available a Fish Farming License, which allows for the rearing of fingerlings, fry, or smolt to commercial marketing size, but this license does not allow the operator to incubate and hatch eggs. That can only be done in the private sector under a Private Nonprofit (PNP) Hatchery Permit, which cannot be secured for profit-making purposes. It would be for such a permit that a $100.00 fee would be appropriate.

Functions under the fish farming license may only be conducted in a land-locked situation, so that would rule out net-pen rearing of coho in a bay, as is indicated in your proposal.

If you can define a land-locked location for fish farming and can determine a source of coho fry or smolt, it would be necessary for you to secure a Fish Transport Permit from Dave Daisy at the Anchorage Office, in order to assure that the source of stock is disease-free before you would be allowed to transport fish.

Finally, it would be necessary that you secure information on health inspection requirements for preparing for market and actual marketing of any fish produced. For information in that regard, please contact the following:

Alaska Department of Environmental Conservation
Anchorage Regional Office
P.O. Box 1328

Anchorage Alaska 99510
Attn: George Hart
Telephone: 907-745-3236

Also, I am enclosing for your use copies of application forms and background information for fish, game and/or fur farm licenses. The above references and enclosed information should give you the materials necessary to pursue a fish farm license, if you desire.

Should you have further questions, please contact me or Jerry L. Madden at the follcwing address:

Alaska Department of Fish and Game
P.O. Box 3-2000
Juneau, Alaska 99802

Thank you for your interest in the Alaska salmon industry.

Sincerely,

Don W. Collinsworth

Don W. Collinsworth
Deputy Commissioner
Resource Management

Enclosures

cc: Dave Daisy

United States Department of Agriculture
Forest Service
Stikine Area, Tongass National Forest
Box 309, Petersburg, Alaska 99833

Reply to: 2720

Date: August 6, 1982

Mr. James L. McCormack
Project Manager
T. Ferguson Construction, Inc.
3321 Seppala Drive
Anchorage, AK 99503

Dear Mr. McCormack:

I have read your proposal for a net pen farm to be located in Washington Bay.

I will try to assist you by listing some of the things that must happen before your project can proceed as you have described it.

You must obtain approval from the Alaska Department of Fish and Game. We would follow their lead in this matter; therefore, this is the first step you must take. You need to obtain a State tidelands permit, a Corps of Engineer's permit, and a license or waiver from the Federal Energy Regulatory Commission; to mail application to the Forest Service for a special land use permit; and to prepare (or have prepared) an environmental assessment document to be approved by the Forest Service before a permit can be issued. Detailed engineering plans and drawings are also required by us and others. Unless you are one and the same, another party from Kake was also interested in developing a fish farm in Washington Bay. If this is the case, agreement between the parties would have to be reached before we could consider a permit application.

Twenty percent of the total project cost is not an unreasonable estimate of dollars needed to be spent just to get to the construction stage for a project of this type.

A fee is charged for the special use permit, payable each year. A decision would have to be made on whether or not to require a performance bond. Land on the National Forest is not available for sale.

You also must show that the National Forest is the only land suitable for your use. State and private land is available throughout southeast Alaska.

I am not trying to discourage you; I am simply trying to point out what we all must live with these days. Good luck.

Sincerely,

JOHN M. HUGHES
Forest Supervisor

FS-6200-11b (7/81)

DR-206

STATE OF ALASKA
DEPARTMENT OF REVENUE - JUNEAU
FISH, GAME AND FUR-FARM LICENSE

No. 174 FISH FARM

EXPIRES DEC. 31, 1988

T Wayne O.D. Ferguson, SR.
(NAME)

2495 Crataegus Ave.
(ADDRESS)

Anchorage AK 99508

Location of farm [illegible]

is licensed to possess commercially fish, game and fur-bearing animals legally acquired and to buy, sell and transport such animals during the year ending December 31, 1988, subject to the regulations of the Alaska Department of Fish and Game.

Issued at Juneau, Alaska 12/22/1986

Linda Jacobs
(ISSUING OFFICER)

(INVALID WITHOUT SIGNATURE OF LICENSEE)

NOTE

THIS LICENSE IS VALID ONLY IN ACCORDANCE WITH A PERMIT TO HOLD LIVE FISH OR GAME ISSUED TO THE LICENSEE BY THE COMMISSIONER OF THE DEPARTMENT OF FISH AND GAME.

Alaska Department of Revenue
Public Services Division
Fish & Game Licensing Section

1111 W. 8th. St., Rm. # 108
Juneau, AK 99801
Phone # (907) 465-2376

Dear Licensee:

Enclosed you will find your 1987 Fish and Game License. Please check the license to see that all of the information is correct. If not, please return it to our office so that we may make the necessary changes. Also, in order for this license to be valid it must be signed by you. If you have any further questions please contact us at the office shown above. Thank you. We hope you enjoy your visit to Alaska.

3430F

Chronology of Fish Farm Development
Ferguson Family

T. Ferguson Construction is a small family owned and operated firm. All four family members are Alaskan Natives and were born and raised in Southeast Alaska.

1978 - 1979 Ferguson's interest in fish farming began in the summer of 1978 with the contraction of a fish weir at Auke Creek, Juneau, Alaska for the NOAA. We started to study the feasibility of raising salmon in upland ponds with help from the Northwest and Alaska Fisheries Center and study programs from the University of Washington.

1980 - 1981 A search for a site with the ideal condition to raise salmon was initiated. Several private individuals and public agencies were contacted to investigate the possibilities of leasing or purchasing their land holdings.

1982 - 1983 Family members visited and studied sites in Washington State, British Colombia, Canada, and Maui, Hawaii. In addition visits were made to government facilities in Washington State and British Colombia. Contacts were made with Jon Lindberg a noted consultant in the industry.

1984 Land was located for the proposed site on the west coast of Prince of Wales Island, in Copper Harbor. In December the land was secured with the help of the Farmers Home Administration under their Agriculture Loan Program.

1985 In the spring of this year surveying was begun and permits were applied for from the state and federal agencies as applicable. In addition clearing and leveling were begun. Visits to several sites in Washington State both private and public were conducted.

1986 Clearing and leveling was continued through the year and planning for the purchase of materials and equipment was begun. Permits applied for in previous years were granted and plans for docks and other tidelands activities were started. Attended a seminar in Seattle on fish farming put on by the Trade Commission of Norway.

1987 A Fish Farm License was acquired and plans to begin construction were made for the Spring of the following year. Negotiations for the acquisition of brood stock began. Attended a seminar in Juneau on fish farming hosted by the Trade Commission of Norway.

To date the Ferguson Family has invested 10 years and approximately $500,000 in personal capital into this project in addition to the long term debt on the property. If the present legislation is passed without some provision for upland farming of salmon in salt water ponds on private land it will strike a crippling if not fatal blow to the family business and negate all the work and capital invested in the project.

February 20, 1988

Our family began investigating the feasibility of fish farming in Southeast Alaska well over 10 years ago. All four family members are native Alaskans, born and raised in Southeast Alaska. We moved to the Anchorage area 12 years ago and soon after began a feasibility study. Three years ago we purchased a large parcel of land in Copper Harbor near Hydaburg on Prince of Wales Island specifically for developing a fish farm.

In 1986 we obtained a Corps of Engineer's permit for the waterfront construction and a Fish Farm License from the Department of Fish and Game, which expires at the end of 1988.

A good deal of the property was cleared in 1986 and 1987. We have invested well over $500,000 in this venture.

Our operating plan is to raise salmon, and other fish, in upland tanks. Salt water will be withdrawn from the inlet as needed and all discharge water will be filtered and treated prior to discharge. The market for pen raised fresh salmon is largely in the off season when fresh caught natural slamon are not available in sufficient quantity.

Because we will have an upland farm, we believe that our operation does not present any threat to the salmon fishing industry. We urge you in this session of the legislature to either not extend the moratorium on fin fish farm permits or make a provision for several demonstration projects that are upland such as ours. Even though we have a fish farming license, we cannot commence operations without the oth permits which are required such as a permit to approriate water.

Our economic studies indicate that the development of a fish farm such as ours will actually bring economic benefit to the commercail fisherman through market developme and broadening the amortization of the fresh fish handling and marketing infrastruct

Thank you.

Thorne W. Ferguson, Jr.
3321 Seppala Drive
Anchorage, Alaska 99517

STATE OF ALASKA

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

STEVE COWPER, GOVERNOR

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

March 9, 1988

The Honorable Jack Coghill, Chair
Senate Resource Committee
Alaska State Legislature
P.O. Box V
Juneau, Alaska 99811

Dear Senator Coghill:

Subject: Senate Bill 482, an act relating to the farming of aquatic plants and aquatic animals, and prohibiting the aquatic farming of finfish in saltwater.

Position: The Department of Natural Resources' comments address the technical provisions of this bill, pursuant to the policies outlined in the Governor's position paper issued in March, 1988.

Background: As outlined in a position paper last March, it has been the Governor's policy to promote responsible growth in the shellfish industry. The Governor's Mariculture Task Force has been working for nearly a year to coordinate the permitting of shellfish applications. The agencies involved have prepared a tri-agency application form to simplify the confusing application process, the Department of Fish and Game has developed a new permit for shellfish, and the Department of Natural Resources has been working on a plan to address the cumulative impacts of the mariculture industry and on the tideland permit process.

For the most part, the directives of SB 482 do not appear to conflict with the work completed by the task force; however, the department recommends several changes in order for the efforts to be consistent:

(1) Up to three year rather than five year tideland permits. At the recommendation of the Governor's Mariculture Task Force, the Department of Fish and Game is in the final stages of preparing a three-year Shellfish Permit. The three-year term is used by the Corps of Engineers in permitting tideland activities. The Department of Natural Resources has been planning to use the three-year term as well in granting tideland permits for shellfish. (For a project that is experimental, a one or two year permit may be desirable.) If our permit terms could match, confusion to the applicant would be reduced, and agency permit coordination would be simplified.

(2) A valuation statement should be sufficient to determine the fair market value of a permit. The department supports the change requiring not less than fair market value to be charged for permits. Appraisals are expensive, however, so we have devised a short cut. An appraiser (or an appraiser's apprentice) completes a valuation statement. It is similar to a full appraisal, but not as thorough. If the applicant does not feel the rental determined in this manner is fair, then he/she can hire a certified appraiser and the department will accept the new number. A full appraisal will be required prior to granting a lease, as now required by statute.

(3) The notice requirements should be integrated into the process that the department is adopting to address cumulative impacts. The notice described in the bill will be cumbersome for the applicant, and will not always produce the desired result: that the people affected have the opportunity to comment on the project. While the specifics of the system have not yet been defined, the department is proposing a means of addressing cumulative impacts of the mariculture industry that entail opening districts for application, holding an agency meeting to screen out unreasonable applications, and then holding a hearing (within the affected area if funding is available) to obtain public comment.

(4) The addition of policy direction to guide the agencies in promulgating regulations and adjudicating permits. The bill clearly states that finfish farming in saltwater is not legal, and it regulates the farming of shellfish and sea vegetables, but it is unclear what the state's policy is toward shellfish and vegetables. It has been the Governor's policy to encourage the establishment and responsible growth of these industries in the state. Is that the legislative intent as well?

Recommendations: The department recommends the following specific changes in the bill:

(1) Section 16 (Sec. 38.05.856 (b)). A permit under this section should be valid for up to three years.

(2) Section 16 (Sec. 38.05.856 (a)). The value of a permit should be assessed prior to issuance or renewal. A valuation statement is acceptable for determining fair market value of a permit.

(3) Section 16 (Sec. 38.05.856 (c)). Before issuing or renewing a permit under this section, at a minimum, notice must be given as specified in AS 38.05.945. Written testimony may be submitted for 30 days after the notice, and the commissioner may hold a hearing in the affected area if necessary.

(4) Section 1. A statement should be added to make it clear that the policy of the state is to encourage the establishment and responsible growth of the shellfish and sea vegetable farming industries.

If I may provide additional information, do not hesitate to contact me.

Sincerely,

Dennie Gorsuch

for Judith M. Brady
Commissioner

cc: Members of the Committee
Bill Sponsors
Rod Swope
Bob Evans

bcc: Division Directors

SENATOR FRED F. ZHAROFF
ALASKA STATE LEGISLATURE

P.O. BOX 405, KODIAK, ALASKA 99615 (907) 486-5259
DURING SESSION:
P.O. BOX V, JUNEAU, ALASKA 99811 • (907) 465-3473 • 465-3474

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

MEMORANDUM

TO: Senator Richard Eliason

FROM: Senator Fred F. Zharoff

DATE: March 22, 1988

RE: Proposed amendments for CSSB 482

In committee last week, I expressed my concern that the mariculture bill we finally pass contain provisions that would allow the individuals interested in shellfish farming in my district to proceed with their plans. These individuals should be governed by regulations and guidelines that protect the public interest without subjecting the mariculturists to excessive or cumbersome restrictions.

Below are my proposed amendments to CSSB 482 that will take care of my concerns in regard to shellfish farming, and also be of benefit to shellfish and sea vegetable farmers throughout the state.

1. Add a balanced Findings and Policy section to explain the legislature's intention behind this legislation.

On page 1, line 15, add new section:

> FINDINGS AND POLICY. (a) The legislature finds that
>
> (1) aquatic farming in the state would provice a consistent source of quality food, provide new jobs, increase state exports, create new business opportunities, and increase the stability and diversity of the state's economy; and
>
> (2) development of aquatic farming in the state would increase the availability of fresh seafood to Alaskans and would strengthen the competitiveness of Alaska seafood in the world marketplace by broadening the diversity of products and providing year-round supplies of premium quality seafood.
>
> (b) It is the policy of the state
>
> (1) to encourage the establishment and responsible growth of an aquatic farming industry in the state; and
>
> (2) that allocation of aquatic farming sites be compatible with established and ongoing beneficial activities in an area.

2. Remove language in the permit issuance section that is too restrictive. I am concerned that with the present language, permits may be denied where there is any degree of adverse impact.

On page 2, lines 15-25, delete language and replace with the following.

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

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

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

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

3. Allow aquatic farmers and hatchery operators to sell shellfish spat and other products to the Alaska Department of Fish and Game and to aquatic farms and hatcheries outside the state. This would open up markets for Alaskan aquatic farmers and still protect the state's interest. Fish and Game also would have access to the stock needed for common property seeding operations, enhancement or research projects.

On page 3, line 23, at the end of the sentence add:

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

On page 5, line 4, at the end of the sentence add:

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

4. Make clear that while releases of aquatic farm stocks are prohibited, the state can enter into agreements with private hatcheries for reseeding programs or enhancement purposes.

On page 5, line 28, insert new section:

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

5. Give aquatic farmers a definite timeframe in which they must report disease outbreaks.

On page 6, line 4, add new language at the end of sentence:

....within 48 hours after discovering the outbreak or incidence.

6. Remove language which limits sea vegetable product forms.

On page 6, line 29 and page 7, line 1 delete:

....FOR THE PURPOSE OF CONSUMPTION, OR KELP THAT IS CULTIVATED FOR USE

IN DYES.

7. Allow the industry to go forward while the final regulations are being developed. The Department of Fish and Game will soon implement its Shellfish Farm Permit regulations. The Department of Natural Resources already has regulations in place for handling use of the tidelands. There will be no free-for-alls or "gold rushes". The mariculture industry should not have a moratorium imposed on it while the agencies take an indefinite period of time to write and develop their regulations.

On page 14, delete lines 1-9 (Sec. 19 and Sec. 20).

8. Allow existing aquatic farmers to expand into other species of shellfish and/or increase production. People who have invested in this industry should be allowed to respond to opportunities and make their farms economically viable, subject to lease or permit terms negotiation -- on an individual basis -- with the Department of Natural Resources.

On page 14, lines 15-18 delete:

> ...., BUT AS A CONDITION OF OBTAINING THE LEASE OR PERMIT THE PERSON MUST AGREE THAT DURING THE TERM OF THE LEASE OR PERMIT THE PERSON WILL NOT EXPAND OPERATIONS BEYOND THE SCOPE ALLOWED UNDER THE EXISTING PERMIT.

With the above amendments, SB 482 not only establishes state policy on salmon and finfish farming, but provides positive encouragement for the shellfish and sea vegetable farming industries.

I also have some concerns regarding the tidelands permits and leases, but feel it would be best to hold off raising them until we have finished our discussion of the various siting options.

STATE OF ALASKA

STEVE COWPER, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

OFFICE OF THE COMMISSIONER

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

March 9, 1988

The Honorable Jack Coghill, Chair
Senate Resource Committee
Alaska State Legislature
P.O. Box V
Juneau, Alaska 99811

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If I may provide additional information, do not hesitate to contact me.

Sincerely,

Jennie Gorsuch

for Judith M. Brady
Commissioner

cc: Members of the Committee
Bill Sponsors
Rod Swope
Bob Evans

bcc: Division Directors

MARICULTURE AND LAND USE MANAGEMENT

Land use management may be the most critical decision made by the Senate Resources Committee on SB 482, as it will affect all forms of mariculture and could determine the viability of even existing shellfish farmers.

The Alaska Mariculture Association (AMA) strongly questions why the committee is considering such a restrictive approach to mariculture development. The land use management provisions in the legislation are far more restrictive than any regulations currently imposed on any industry in Alaska. The amendments favored by Senator Eliason would make the situation substantially worse, and we believe will ensure that not only will the potential of mariculture never be acheived but existing farmers could be pushed right out of business.

The rationale for such restrictions should be questioned, and the committee should consider the implications of these kinds of approaches on other industries. The site selection process, tidelands rental fees, and other restrictive provisions of SB 482 could set some dangerous precedents.

Stop for a minute and apply the land use options proposed to other industries.

How do you think the timber and placer mining industries would view imposition of the culmulative impact provisions (page 13, lines 22-26, 3/16/88 work draft)?

What would the impact be on the oil industry if commercial fishing, hunting, recreation, trapping and other traditional uses were made priority uses, such as is proposed in Senator Eliason's paper entitled, "Important Aspects in all Land Options."?

How would commercial fishermen react to DNR beginning to require tideland permits with "fair market" rental values of $250-450 per acre for crab pot storage areas? (There currently are no permits issued for crab pot storage areas, although some pots are not moved literally for years and technically anything located in one spot for more than three consecutive months requires a permit. This includes boats anchored in isolated areas.)

Mariculture is not inherently different than many other uses of state tidelands now allowed that would not be affected by this legislation. Why should it be treated differently?

The following points are critical:

Cost of temporary tidelands use permits--SB 482 requires DNR to charge a "fair market" rental fee for tidelands permits. DNR estimates this would cost existing oyster farmers between $250-450 per acre, compared to the existing flat fee of $50 per acre now charged all tideland permit holders. What will this do to an oyster farmer grossing $20,000 per year? Does DNR view this as a precedent to apply to other tidelands permits? If not, why should mariculture permits be valued differently? If the goal is to promote the development of small scale "mom and pop" businesses this is not the way to accomlish that objective.

Tidelands adjacent to wilderness and other special use areas--Senator Eliason apparently favors a complete prohibition on

mariculture in tidelands adjacent to wilderness and other special use areas such as refuges, critical habitat areas, marine sanctuaries etc. Existing statutes contain a provision giving upland owners a preference in the use of adjoining tidelands. If someone were to propose placing a raft in state tidelands immediately adjacent to a wilderness area, DNR is required by law to seek comments from the upland owner (USFS, U.S. Park Service, etc.). If the agency says that a mariculture facility would not be compatible with the management plan for the area, DNR would be required to develop a "best interests of the state" finding to override this objection.

This appears to offer strong protections. As Senator Zharoff pointed out most of Kodiak Island in located within a federal refuge system and could be off limits to mariculture under Senator Eliason's suggestion. Envision the huge amounts of wilderness areas, state and federal parks, refuges, critical habitat areas, and other special use areas where mariculture would be prohibited. Does this make sense if the managers find mariculture to be a compatible use? Again, consider the precedents this approach would set.

Priorities for traditional uses--Remember the major battles over making subsistence a priority use? Just think of the effect of making traditional activities, such as commercial fishing, hunting, trapping, recreation, priority uses over mariculture? There would be virtually no way a farmer could obtain a site.

Under the current coastal management process, new uses of the tidelands and submerged lands must be found to be consistent with state and local coastal management plans. These plans generally offer strong protections for traditional uses, and the emphasis throughout the process is upon ensuring new activites are found to be compatible with traditional uses.

Culmulative impact requirments--The issue of culmulative impacts of mariculture has been greatly overplayed. The facts are that of about 2,100 tidelands leases and permits, there are roughly 50 mariculture permits. No aquatic farmers have long term leases. These figures simply do not justify the imposition of culmulative impact requirements. This would be a dangerous precedent for other natural resource industries. Ponder the probable impacts of these requirements on logging, mining, tourism, fishing and other industries.

DNR favors dealing with this issue through policy, and shares our concern for putting these requirements in statute. Such laws are like waving red flags before the environmental community as an invitation to sue. These kinds of requirements generally are utilized to stymie economic growth, and could strangle the mariculture industry's potential for long term growth. If such limitations are imposed, it would be more appropriate to approach them in more flexible policies and not through rigid statutes.

Permit moratorium--Sections 19-20 of the bill prohibit ADFG and DNR from issuing new mariculture permits or leases until the regulations necessary to implement SB 482 become effective. This could take up to a year to accomplish, if recent experience with writing new shellfish farming regulations is any indication. ADFG

began working on the new regulations last summer and they will not become effective until mid-April.

Why should shellfish farmers have to wait for regulations to implement SB 482 when they will be subject to a new set of comprehensive regulations? DNR has testified that the department does not anticipate a dramatic increase in the rate of growth in shellfish farming as a result of the passage of mariculture legislation. Remember there are only 50 permits out there right now.

There has never been application submitted for farming of aquatic plants, and it is unlikely many will be received in the near future. As for finfish, if the 3/16/88 finfish provisions are adopted, there are likely to be a small number of pilot projects proposed for arctic char or, perhaps, black cod. Finfish could be handled by interim policies based upon the shellfish farming regulations scheduled to take effect next month.

The four management options--Senator Eliason has outlined for approaches to land use management under SB 482. All four represent a major departure from the current process in which all tideland permits are issued, and mariculture operators would be subject to much stricter regulations than any other tidelands users.

Option 1 is an extremely cumbersome process patterned after the state's oil and gas leasing program that would be an onerous burden on smaller operators. Sites would be selected through a call for nominations process, much consulting between agencies is required, two public hearing would have to be held, proposed sites would be knocked out based upon public comments, and permits would be awarded on a lottery basis. This approach will require a large fiscal note and will discourage participation by small scale famrers, particularly from rural communities.

Option 2 is a somewhat simpler version of option 1, but is nearly as unacceptable to farmers. It would be like asking farmers if they want second or third degree burns. This approach would open up the permitting process only 60 days per year, but would allow individuals to make appl;ications for specific sites. The agencies would narrow down the proposed sites, ghold public hearings, and again whittle back proposed sites.

Option 3 would require extensive public notice and a public hearing on each mariculture site application. This is an improvement, but a public hearing on each permit application will be expensive for the state and burdensome to the applicant.

Option 4 was proposed by AMA as a compromise approach. This would require extensive public notice, but mandate a public hearing only in those situations where DNR determines significant land use conflicts may be created.

SB

482

- file 2 -

Governor's Statement on
Mariculture
Senate Resources Committee
March 9, 1988

Governor Cowper has not taken a position on any specific piece of legislation. However, the Governor has determined that he does not support legislation authorizing salmon farming in saltwater at this time.

The Governor is strongly supportive of legislation which serves to clarify the legal status of mariculture and which opens the door for new economic initiatives through shellfish and sea vegetable farming.

The Governor believes that legislation must rely on existing agency roles and should enhance or supplement existing agency authorities to accommodate this emerging industry. For example, legislation should include appropriate measures to provide adequate levels of disease and genetics controls, inspection requirements, product quality and wholesomeness, and resolve user conflicts for use of our tidelands.

Generally, SB 482 fits many of these criteria. However, the respective agencies will be working with you to resolve any technical issues.

Interagency Mariculture Workgroup
Report on Activities Over the Legislative Interim

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MEMORANDUM State of Alaska

TO: Fisheries Cabinet

DATE: January 12, 1988

FILE NO:

TELEPHONE NO: 465-4100

FROM: Interagency Mariculture Workgroup

SUBJECT: Report on Activities Conducted During the Legislative Interim

The Interagency Mariculture Workgroup is pleased to present to you this report on our activities conducted over the legislative interim. The products contained in this report are in response to the tasks the Cabinet outlined last May. In the report you will find eight issue papers on a variety of biological, land-use, water quality and product quality issues which are central to the mariculture debate. Other products include a matrix summarizing how four other areas address these subjects, a description of the on-going socioeconomic studies, and the uniform shellfish permitting system we developed. Additional information is contained in the appendices.

Background

Last legislative session, the issue of authorizing expanded mariculture in Alaska received considerable attention. In particular, the prospect of pen-rearing salmon in Alaska became one of the hottest topics in the state. The market success of the Norwegian salmon farming industry, and the growth worldwide in fish farming generally have spurred interest in all forms of mariculture in Alaska. During last year's session of the Alaska State Legislature, bills were introduced to legalize expanded mariculture activities, including salmon pen-rearing. Senate Bill 106 and House Bill 108 would "encourage the establishment and growth of an aquatic farming industry" in Alaska. The bills would establish a permit system which would be administered by the Department of Commerce and Economic Development for aquatic farms and private-for-profit hatcheries.

In response to this action in the Legislature, Governor Cowper directed the Fisheries Cabinet to review the mariculture issue and prepare a recommendation to him. The Cabinet, after careful consideration, prepared for the Governor a set of criteria for judging any authorizing legislation. The Governor approved these criteria, which were then presented to the Legislature.

Late in the session it became apparent that authorizing legislation was not going to pass. All parties became concerned that the questionable legal status of pen-rearing

salmon could lead to speculation on tidelands sites and a "gold rush" mentality similar to the situation which developed in British Columbia. The resulting confusion and inevitable litigation would not be to anyone's advantage, so a carefully crafted moratorium bill was introduced and passed in the waning hours of the session. This bill, Senate Bill 297, placed a moratorium which expires July 1, 1988 on issuing permits for most finfish farming. It also authorized shellfish farming and limited finfish farming in fresh water.

The Fisheries Cabinet met on May 19, 1987 to develop a plan of action for addressing the mariculture issue over the legislative interim. At that time the Cabinet identified two general tasks which needed to be performed.

First, the administration needed to develop a uniform approach to permitting shellfish mariculture. This has been done. The staff workgroup reviewed existing authorities and permitting procedures, and developed the consolidated permit application form to establish a uniform application process. In conjunction with this, the Department of Fish and Game prepared regulations authorizing a shellfish farm permit, and a Fish Transport Permit for holding and transporting shellfish for commercial farming purposes. This cleared the way to allow expanded shellfish mariculture activities.

The second task identified by the Cabinet was to systematically address the issues raised during the legislative hearings. Senator Eliason and Representative Herrmann presented us additional questions which needed to be addressed as well. The issue papers, matrix, and the socioeconomic studies are the products we prepared to address this task.

The issues papers are designed to briefly discuss and summarize a number of biological, land-use, product quality, and water quality issues which are central to the mariculture debate. The matrix briefly summarizes how British Columbia, Maine, California, and Washington address many of these same issues. The socioeconomic studies, which are in progress, will address the questions regarding markets and cost of production.

Also included in the appendices are copies of SB 297, the issues lists from Senator Eliason and Representative Herrmann, a list of the staff on the workgroup, and Governor Cowper's Position on Mariculture.

LAND USE
Department of Natural Resources

ISSUE:

How will the state encourage the development of tide and submerged lands through mariculture while at the same time minimize conflicts with existing uses?

DISCUSSION:

Mariculture is a new and expanding industry in Alaska, and may become a significant long-term use of tide and submerged lands. Currently, mariculture activities are being permitted on a case-by-case basis with little or no comprehensive planning. Notable exceptions include the Prince William Sound Area Plan and the Prince of Wales Island Plan. The state needs a comprehensive approach to planning for mariculture activities in order to ensure the stable growth of this new industry and to minimize conflicts with existing uses. Such an approach should provide guidance to minimize conflicts on individual proposals and address the potential cumulative impact of numerous mariculture developments taking place over time.

Some of the potential land use problems associated with mariculture include: displacement of public uses such as recreation and subsistence; conflicts with other commercial uses of tide and submerged lands; land speculation; impacts on adjacent land holders; and cumulative impacts over time from the incremental expansion of mariculture activities.

Displacement of Public Uses such as Recreation and Subsistence

Mariculture sites may block or inhibit public access to important recreation and subsistence use areas. The expectation and desire for seclusion when recreating in rural Alaska is highly valued by residents and visitors. If the sense of seclusion is lost, an important part of the aesthetics of many bays is lost, and the recreational experience is less valuable. A mariculture facility, particularly with caretaker facilities located in a smaller cove, will essentially eliminate that sense of seclusion for recreational users other than the permit holder. In essence, the tendency will be for traditional recreational users of the cove to try to find other secluded and aesthetically pleasing areas.

Subsistence is an important activity in most of the areas where mariculture may occur. Conflicts between mariculturists and subsistence users could occur as more and more facilities are developed over time. This could entail

direct competition for subsistence resources as new residents enter rural areas, or loss of subsistence opportunities if mariculture facilities are placed in important subsistence resource areas. Siting criteria can minimize most of these problems.

And finally, the mariculturist may not want any intrusions into his or her area. There could be concerns over pollution, theft, damage, interference, or just the loss of privacy. This could lead to conflicts between the farmer and other users, in the end excluding other uses of the coastal area.

Conflicts with Other Commercial Uses of the Tide and Submerged Land

The best sites for mariculture facilities may often be the best sites for other uses such as mineral or timber transfer and support facilities, log storage, commercial fishing grounds or anchorages, or commercial recreation development. Although mariculture is a new industry in Alaska, experiences in British Columbia and Washington have demonstrated there can be conflicts with other uses. The potential for such conflicts has already surfaced in Kodiak, Prince William Sound, and Southeast.

Besides the need for space, water quality standards for mariculture may preclude the use of favored sites for other commercial or industrial facilities. Forcing more stringent mitigation measures or alternative siting for timber or mineral transfer or tailings disposal could reduce or eliminate the economic viability of the resource extraction industry in a given area.

Conversely, mineral or timber transfer [illegible] storage, and floating camps associated with resource [illegible]opment activities may limit the space available or degrade water quality for mariculture facilities, thus making mariculture development more difficult and less likely.

Land Speculation

British Columbia experienced a dramatic rush for Section 10 permits prior to 1986. These permits allow the holder to enter and occupy a site to conduct research for up to one year. It appears that these permits were being issued for large areas of land with little regard for potential impacts to the public. This created a gold rush image which resulted in a great deal of public concern, and subsequently a moratorium was imposed. Alaska does not have an investigative permit similar to the Section 10 permit but we could experience land speculation in other forms, most notably by applying for tidelands and leases to tie-up a site.

Land speculation in this case is described as obtaining land use rights with the intent of not using the land for the proposed use but selling those rights for a profit. This problem is not unique to mariculture and it can occur in any use of state land. Speculation can be greatly reduced by close monitoring of development schedules and writing conditions in the land use document that would allow the state to revoke that document if the development is not proceeding as proposed.

Impacts on Adjacent Land Owners

Mariculture can impact adjacent land owners in a variety of ways: loss of tidelands access or boat moorage, loss of view, noise and loss of privacy, loss of habitat or water quality. This has been a significant issue in Washington and British Columbia, and may become a matter of concern in Alaska as well.

The adjacent land owner has a number of ways to influence the siting of mariculture facilities. They can participate in development of state land use plans, coastal zone management plans, and local comprehensive plans. The adjacent owner or owners are notified by mail of pending applications and are given an opportunity to comment on the project. A 30-day public notice pursuant to AS 38.05.945 is required for leases and the local government or regional native corporation is also notified if the project is within their boundaries. The local government or regional native corporation may hold public hearings if necessary. The Department of Natural Resources reviews all of these comments and weighs the use and enjoyment of the adjacent owner against what is considered to be the state's best interest. These determinations are made on a case-by-case basis and may or may not include consideration of cumulative impacts.

Cumulative Effects of Expanding Tidelands Use

The vast majority of the tide and submerged lands in Alaska are owned and managed by the State of Alaska. The remainder is owned by the federal government or by individuals and first class cities that acquired the land pursuant to AS 38.05.820.

The State of Alaska allows the development of its tide and submerged lands by granting leases and permits. The sale of tide and submerged land to a private entity is presently not legal. AS 38.05.045 excludes tide and submerged land from the public land that can be sold.

Tideland permits may be issued for a term not to exceed 5 years (11 AAC 62.720). This permit allows the use of tide and submerged lands for mariculture but does not provide the

security of a lease and does not constitute a preference to a lease.

Leases for tide and submerged land are issued in two ways, by public auction or negotiation. Leases may be negotiated for a term up to 55 years to an adjacent upland owner or upland lessee if the lease is for water transportation or another water-dependent purpose (AS 38.05.075(c)). Leases may also be negotiated for a period of no more than 10 years if the appraised value of the transaction is $5000.00 a year or less (AS 38.05.070(b)). All other tideland leases are offered at public auction and anyone may bid on the lease parcel (AS 38.05.075(a)). The procedures for processing a tideland lease in each case is the same with the exception of the negotiated leases which do not have a public auction prior to the issuance of the lease.

For most of coastal Alaska, mariculture facilities will be permitted on an individual basis. The impact from one or two farms may be minimal, but the cumulative effects of numerous farms on existing uses may be dramatic. Under current statutes, management and area plans provide a process for resolving use conflicts on a regional basis, and the best interest finding required under AS 38.05.035(e) provides a mechanism for resolving conflicts on individual permits/leases. Although a regional perspective is preferred, the cost of management and area plans prohibits their use as a routine method of sorting out problems and resolving conflicts. This lack of a regional perspective could lead to significant conflicts over time and is one of the major problems with the existing system.

In developing statewide guidelines, Alaska should evaluate what British Columbia experienced during its initiation to finfish aquaculture. They had an immediate need for coastal planning because they were seeing a loss of access, a loss of anchorages, impacts on upland owners, and impacts on recreation and tourism. British Columbia placed a moratorium on leases and licenses for finfish farming and began an inquiry into finfish aquaculture and its impacts. The inquiry was completed in 1986 and many of their recommendations could be applied to Alaska. Some of the recommendations that apply to land use in Alaska are as follows:

1. The government should develop an aquaculture policy which clarifies direction, agency roles, and the responsibilities of both government and the private sector for the industry. The inquiry indicated that a clear policy would alleviate public concerns over lack of controls and lack of protection of the public resource. It would also serve to offset creation of the image of an uncontrolled land rush, which has

generated misunderstanding and suspicion about government objectives.

2. Initiate land use studies that would identify sites of high value for other important coastal interests. Use these studies to direct aquaculture away from major resource and user conflict areas.

3. Local governments should be encouraged to develop or revise local zoning laws to address mariculture within their boundaries. This would also involve modifications of local coastal zone management plans.

4. The land management agencies should review their practices involving advertising and notification for proposed aquaculture facilities. This includes notification to local governments. The inquiry recommended a 60-day review period.

5. The land management agencies should require a commitment bond to reduce speculation and a clean-up bond in the event of abandonment.

6. The aquaculture industry should be encouraged to institute a program to provide anchorage, access, and emergency assistance to other coastal users.

7. Establish a minimum distance separation guideline for farms as a means of reducing impacts on upland owners and other resource users.

Fees

Current statutes and regulations provide only two methods to collect fees for use of state land. AS 38.05.085 provides for a percentage of the fair market value as determined by appraisal. The parcel is not reappraised for 25 years. There are fees attached to permits which may be set by the regions. These fees may not provide a fair return to the state for the use of its resources. Options to consider for legislation may include: 1) a percentage of gross receipts; 2) revise lease terms to require reappraisal every five years (private sector norm).

Preference

Current statutes provide only a preference for adjacent owners. Any preference for Alaskan's would require a change in statutes.

Other statutory changes might include a lottery for new sites or a negotiated lease as well as the high bid method currently available.

SUMMARY:

It appears that most land use problems associated with mariculture can be resolved through state land use plans and the permit review process. The most comprehensive procedure to determine areas of public use is to develop state land use plans, such as the Prince of Wales Island Area Plan and the Prince William Sound Area Plan. Developing comprehensive area plans is desirable but time consuming (2-3 years) and expensive. A streamlined process needs to be developed and implemented which evaluates land-use issues, including the cumulative effect of multiple mariculture operations. Such a process should include provisions for strong local participation and be designed to meet the needs of reconciling land-use conflicts in a timely manner.

While the land use plans address siting considerations they do not resolve current statutory restrictions such as: how fees are charged; should and can Alaskans be allowed a preference to lease tide and submerged land.

WATER QUALITY
Department of Environmental Conservation
Division of Environmental Quality

ISSUE:

Ensure that high water quality is maintained during mariculture operations and that measures are taken so that preexisting uses and activities can continue without adversely affecting mariculture activities.

DISCUSSION:

Mariculture requires clean water. Water quality in areas surrounding the culture facility, however, can be affected by both the mariculture activity itself and by other nearby uses or activities. The state needs to ensure that water quality is adequate for mariculture, that high water quality is maintained during culture operations, and that measures are taken so that preexisting permitted uses and activities can continue.

Two key water quality issues associated with mariculture are:

1. Changes in water quality caused by mariculture operations; and
2. Potential siting conflicts with other uses or activities.

1. Changes to water quality from mariculture operations

Mariculture facilities can have significant impacts on local water quality and habitats if not properly sited, operated, and monitored. The impacts on water quality can be in three areas: 1) the creation of water quality and environmental conditions unfavorable for the growth and survival of cultured species; 2) a reduction of water circulation near culture facilities; and 3) the introduction of toxic or deleterious substances to the water.

One of the major concerns with mariculture operations is the unfavorable changes in water quality and environmental conditions that may develop during normal facility operations. Specific changes that may occur include:

a) increased concentrations of particulates and organic matter (feed and fecal material) as byproducts of the culturing activity which accumulate as organic-rich deposits beneath culture facilities;

b) increase in fecal coliform bacteria and ammonia due to increased production of waste; and

c) decrease in dissolved oxygen due to increased oxygen demand by the cultured organisms and the bacteria that feed on their waste.

DEC has developed water quality criteria applicable to aquaculture operations (18 AAC 70.020). These criteria specify standards that must be met and maintained for aquaculture activities to take place. Specific criteria concern: fecal coliform bacteria, dissolved gas, pH, turbidity, temperature, dissolved inorganic substances, and sediments, among others. Mariculture operations, however, generate substantial amounts of waste products, unconsumed food and other debris which can settle, accumulate and affect nearby water quality and the benthic substrate.

The amount of organic matter which is produced and can subsequently accumulate below culture facilities is dependent upon several factors including the size of the mariculture facility, its production level, and environmental factors such as water depth, current velocity, flushing, and bottom topography at the facility site. This accumulation of wastes and sediments can also induce chemical and biological changes in the natural bottom habitat and water column.

An extensive accumulation of waste would stimulate the bacterial decomposition process. The biochemical oxygen demand (BOD) of this accumulated material can deplete dissolved oxygen in the water column, causing stress for the cultured organisms. Salmonids, for example, have a high dissolved oxygen requirement, 5.0 - 7.0 mg/l, which must be maintained in a crowded culture situation. Water quality criteria for aquaculture also specify that dissolved oxygen concentrations may not be less than 4.0 mg/l at any point beneath the water surface, and not greater than 17.0 mg/l in any location.

Another possible problem resulting from the deposition of excess food and feces is a change in the benthic macroinvertebrate community. Species unable to tolerate organic enrichment may disappear, and other more tolerant species become dominant. These changes may persist for the duration of the culture activity and for at least several years following its cessation.

Most, if not all of the unfavorable changes in water quality and environmental conditions can be avoided by properly siting mariculture facilities. Water quality problems would be anticipated only in areas of limited flushing or intensive culturing activity. Field studies rarely have shown organic deposition or dissolved oxygen to be a problem around culture facilities in well-flushed areas.

The second concern is that the culturing structure itself may reduce water circulation in the local area, particularly in the down-current direction. A number of variables can affect this flow reduction including flow rate, density of water, enclosure size and shape, degree of fouling, mesh type and material, and stocking density. This reduced circulation can also reduce dilution and dispersal of waste products from the culture facility. A reduction of this sort in water circulation, combined with an increased level of nutrients in the water from excess feed and feces, can promote phytoplankton blooms. This may be a particular problem in water bodies with naturally low levels of nutrients which normally result in nutrient-limited phytoplankton production. Some types of dinoflagellate blooms are associated with paralytic shellfish poisoning (PSP) and may pose a health hazard to humans who consume shellfish. Other dinoflagellate blooms can directly affect fish health and growth rates. These and other phytoplankton blooms also compete with cultured organisms for available dissolved oxygen, which could exacerbate problems of low oxygen stress. These water quality problems would be most likely to occur in areas of inadequate flushing or intensive culturing activity.

The third concern for water quality is that toxic or deleterious substances could be introduced during mariculture operations. The major problem substances include, but are not limited to, antibiotics, anti-fouling agents, and pathogens and parasites that could affect product quality and be transmitted to consumers. Chemical usage is highly regulated but also needs to be closely monitored. The accumulation of chemicals or pathogens in the cultured product must also be carefully monitored. Additional concerns regarding regulation of antibiotics, antifouling agents and shellfish pathogens are covered in the issue paper prepared by the Division of Environmental Health on the use of chemicals and additives.

Research has shown that properly sited and operated facilities will avoid many of the water quality problems described above. The state needs to develop siting criteria and guidelines to use in permitting these facilities. Specifically, criteria for tidal volumes, flushing action, currents, and water depth need to be developed. Certain of these criteria will need to be specific to the species being cultured, as environmental requirements may vary. It is also vital to have adequate information about the proposed facility during the permit review so that potential water quality problems can be avoided.

2. Potential siting conflicts with other uses or activities

The most suitable sites for mariculture facilities often are the most suitable sites for other water-dependent and water-related activities. Because mariculture facilities need clean water to operate, they may be incompatible with other activities in the surrounding area. Proper siting of the mariculture facility and subsequent monitoring of activities that occur around them are critical. A mariculture facility proposal may be submitted for an area which has historically been used for other activities, and these activities may not easily coexist. For example, some preexisting activities could have a discharge that would be detrimental to the cultured organisms. Non-point sources of pollution (e.g., sediment runoff from upland activities) may also affect water quality of embayments suitable for mariculture facility siting.

Another specific area of potential conflict with mariculture operations is the discharge for sewage from upland development, caretaker facilities associated with the mariculture project, and boat traffic. Shellfish are filter feeders and thus easily concentrate fecal coliform bacteria and heavy metals in their bodies. The National Seafood Sanitation Program has set strict standards for fecal coliform levels and heavy metal concentrations in shellfish. Currently, all shellfish growing areas in the state must be certified by DEC, Division of Environmental Health. In addition, all shellfish that will be marketed must also be certified by the Division of Environmental Health to ensure the the product is within safe limits. The State of Alaska Water Quality Standards also specify the levels of allowable fecal coliforms that are required by designated water use. These levels vary depending on the use under consideration. For example, in waters designated for industrial use, the allowable level of fecal coliforms (FC) is not to exceed 200 FC/100ml, based on a minimum of five samples taken over a period of 30 days. The allowable level of fecal coliforms for harvesting and consumption of raw mollusks or other aquatic life is 14 FC/100ml. Since all marine waters are classified to protect all uses, the most stringent use requirements prevail (e.g., 14 FC/100ml).

Siting conflicts arise when an area has historically been used for something other than mariculture and mixing zones have been established which allow fecal coliform or other water quality parameters to be above acceptable limits for an adjacent proposed mariculture operation. The determination before the department is whether to reduce the size of mixing zones for existing uses to allow mariculture facilities in the vicinity, or whether to find that the area is unsuitable for mariculture. DEC also needs to determine how long fecal coliforms persist in marine waters and the

size of contaminated areas. Information of this sort will give us an idea of the necessary separation distance between mariculture facilities and sewage discharges. It is essential information for the responsible permitting of mariculture facilities.

Summary

Mariculture requires clean water. Two key water quality issues associated with mariculture are changes in water quality caused by mariculture operations and potential siting conflicts with other uses and activities. The impacts on water quality can be in three areas: 1) the creation of water quality and environmental conditions unfavorable for the growth and survival of cultured species; 2) a reduction of water circulation near culture facilities; and 3) the introduction of toxic or deleterious substances to the water. Most, if not all of the unfavorable changes in water quality and environmental conditions can be avoided by properly siting and operating mariculture facilities. The state needs to develop siting guidelines to be used in permitting these facilities.

The most suitable sites for mariculture facilities often are the most suitable sites for other water-dependent and water-related activities. Because mariculture facilities need clean water to operate, they may be incompatible with other preexisting activities. The state needs to take measures to ensure that preexisting permitted uses and activities can continue.

DISEASE
Department of Fish and Game
Division of Fisheries, Rehabilitation,
and Development

ISSUE:

Protect native and hatchery stocks from potential disease arising from salmon farming operations.

DISCUSSION:

All populations of fishes, whether in saltwater or fresh, in the wild or in captivity, at some time contain disease agents such as bacteria, viruses, fungi, and invertebrate parasites. In Alaska, endemic disease agents are present throughout wild stocks and the marine environment. Many are opportunistic, causing disease primarily when the fish are crowded or stressed. However, it is extremely important to recognize that populations of fishes differ in the disease agents they carry, and that diseases newly introduced to fish populations can be very devastating.

To control disease in the ocean ranching program, Alaska set in place stringent regulations that govern the movement of salmon and their gametes within the state, and prohibited the import of any fish species or their gametes for aquaculture purposes. These regulations have applied for some 16 years and include requirements for thorough broodstock screening for disease agents, routine treatment of eggs to prevent disease outbreaks, annual inspections and strict reporting requirements, and the destruction of stocks if the state finds that this is necessary to control disease. The state's prohibition on importing species ensures that no new diseases are introduced into the state. For example, many chinook salmon stocks in Washington and Oregon carry IHN virus. Importing these fish could introduce new strains of IHN virus to indigenous stocks. Similarly, importing Atlantic salmon would bring the risk of importing exotic viral and bacterial diseases not found in Alaska. This could have serious impacts on the health of existing native and hatchery stocks, and must be avoided.

To maintain adequate protection of existing fishery resources, any future fish farming industry must be governed by the same fish health regulations currently governing Alaska's ocean ranching program. The species made available for farming should be from native or hatchery stocks having complete and acceptable disease histories. Prohibitions on importing species including Atlantic salmon must be maintained. This way, any diseases would be those already present in wild populations, not exotic diseases which could cause serious harm to the native stocks. All transport and possession of fishes and their gametes needs to be closely

controlled through Fish Transport Permits, and strict reporting and inspection requirements need to be enforced.

However, extending the Department of Fish and Game's fish health services to this new industry cannot be accomplished without the addition of new staff and monies to support these activities. Private sector fish health practitioners could pick up some of this additional workload. Such private practitioners would need to be certified by the state and monitored on a routine basis to ensure acceptable performance, but presently there are no private sector fish health practitioners currently operating in-state.

SUMMARY:

Assuming that imports of Atlantic salmon or other fish species to Alaska remain prohibited, that the state continues to meet its responsibilities in fish disease control, and that monies are provided for additional fish health services, this new industry can be accommodated without the threat of disease to existing native and hatchery stocks of fish.

GENETICS
Department of Fish and Game
Division of Fisheries Rehabilitation,
Enhancement, and Development

ISSUE:

Ensure that salmon farming does not impact the genetic integrity of existing natural and hatchery stocks of salmon and trout.

DISCUSSION:

Preserving the genetic diversity of Alaska's fishery resources has been recognized as an important fisheries management goal. This is especially true for the state's enormous salmon resources.

Alaska, in maintaining the health and perpetuity of its salmon resources, subscribes to the theory that identifiable units of salmon (populations, stocks, races) have through natural selection become adapted to the particular watershed that serves as home. This adaptation is preserved in the genetic make-up (gene pool) of the stock. State fisheries managers have sought to maintain stock diversity to ensure the long-term health of our salmon populations. Loss of stock diversity can occur through dilution brought about by interbreeding with other stocks. For these reasons, Alaska at the outset of its salmon ocean ranching program set in place stringent regulations that govern the movement of salmon and trout within the state and prohibited the import of salmon and trout for aquaculture purposes.

The Department of Fish and Game's genetics policy prohibits the importation of live salmonids (salmon family) into the state, and does not allow stocks to be transported between major geographic areas, such as Southeast, Kodiak Island, Prince William Sound, Cook Inlet, Bristol Bay, and AYK/Interior. The policy has been adopted in order to protect Alaska's diverse natural salmon and trout stocks.

Any new aquaculture venture, such as salmon farming, must be governed by the same policy, transport regulations, and statutes that have applied to the salmon ocean ranching program for the past 16 years. This is particularly true for provisions prohibiting the importation of exotic species, such as Atlantic salmon. Atlantic salmon are acutally a trout and are the ecological counterpart of Alaska's indigenous or native steelhead trout. Since these species have not evolved together and thereby have not developed mechanisms to avoid competition with steelhead

trout or other trout, there is a concern about negative impacts on Alaska's indigenous trout.

Therefore, the genetics policy advocates the use of locally adapted stocks of salmon and trout of natural or hatchery origin because this will maintain the state's genetic diversity. This is important in the event of escape or "leakage" through holes in nets or other damage. The magnitude of impact on natural stocks is a function of numbers of fish that escape and that survive to spawn. It is assumed that low levels (less than 5 percent) of escapees can be managed by properly designed net-pen rearing units. Impacts on natural stocks from salmon farming would be minimized because of the policy of using locally adapted stocks.

SUMMARY:

Assuming that imports of exotic species such as Atlantic salmon or other fishes remain prohibited, that current regulations and policies remain in place, and that "leakage" of fish from the pens is kept low, salmon farming can be accommodated without the threat of impact to the genetic integrity of native and hatchery stocks of salmon and trout.

Broodstock
Alaska Department of Fish and Game
Division of Fisheries, Rehabilitation,
Enhancement and Development

ISSUE:

Availability of salmon eggs, fry, and smolts for salmon farming.

DISCUSSION:

The current form of salmon aquaculture in Alaska is ocean ranching. In this system, adult salmon return to their point of release after undergoing and extensive marine migration and contribute to the commercial, sport, subsistence, and personal-use fishery. This ocean ranching program is made up of public and private nonprofit (PNP) freshwater hatcheries and estuarine, juvenile net-pen rearing facilities. Enabling legislation created the public system in 1971, and in 1974, legalized the PNP Program.

Ocean ranching is not only the most successful form of aquaculture in Alaska, it is the largest program in North America and about the third largest in the world being Japan and Russia. The combined public and PNP ocean ranching harvest to the common property fishery in 1987 was in excess of 16 million salmon; this is projected to grow to 34 million for and estimated gross value of approximately $78 million by 1993. In terms of evaluating the economic impact of the statewide ocean ranching program on the Alaskan economy, it represents $75 million in resident-only personal income and 2,030 jobs for alaskans. It is in the context of a successful and building ocean ranching program that we need to evaluate the availability of salmon smolts for the proposed salmon farming industry.

When salmon farming is initially legalized in Alaska, a major factor limiting development will be the availability of smolts for these saltwater farms. The current public and PNP ocean ranching program produces salmon smolts which, as adults, contribute to the common property fishery. Since the common property fishery harvest is regulated by the Alaska Board of Fisheries, it also follows that the availability of smolts is also part of the allocation process. The principle reason salmon smolts would be surplus to the common property fishery is that the present ocean ranching program is operating below capacity due to funding constraints. However, if the salmon smolts are determined by the Board of Fisheries to be surplus to the common property fishery, then they could be sold by the Commissioner. Under existing law, only the state through the Commissioner of the Department of Fish and Game (ADF&G) can sell eggs, fry, or smolts. The PNP hatcheries are

prohibited from selling eggs, fry, or smolt except to another PNP hatchery or to the state. therefore, a change in the law would be required in order to extend the sales opportunity to the private sector. Once the private for-profit salmon farming industry begins to evolve, there will be a demand to have private for-profit freshwater hatcheries to produce smolts for the mariculture industry. These will come from either eggs taken by permit from natural salmon stocks, or by purchase of eggs from public or PNP hatcheries, or eventually from private broodstock produced from the saltwater farming operations. The latter will represent the preferred source of eggs because of the need to develop domesticated broodstock. This will take ate lease one generation, 4-5 years for chinook salmon to provide eggs, but generally three generations to initiate change towards domestication. Therefore, in the interim, the availability of eggs for salmon farmers with freshwater hatcheries or smolts for those with only saltwater farms will need to be addressed.

On the one hand, sale of eggs or smolts could assist in the financial health of the salmon ocean ranching program which benefits the common property fishery. This dilemma represents the heart of the public policy debate; specifically, the allocation of resources from an established common property fishery to a proposed private for-profit industry. This issue clearly belongs in the legislative arena, but it needs to be resolved so that agencies such as ADF&G know how to allocate eggs, fry, or smolts to the potentially new salmon farming industry.

SUMMARY:

The availability of eggs, fry and smolts for the salmon farming industry is an allocation decision, and is central to the public policy debate regarding allocation of resources from the common property fishery to the private for-profit farmer. Under the current law, the Board of Fisheries would probably make the determination of whether or not eggs, fry, or smolts are surplus. If the Legislature legalizes salmon farming and the Board of Fisheries determines that a surplus exists, then eggs, fry or smolts could be sold to potential salmon farmers by the commissioner of ADF&G.

HABITAT PROTECTION
Department of Fish and Game
Division of Habitat

ISSUE:

Ensure protection of important habitat through proper siting and design of mariculture facilities.

DISCUSSION:

Floating mariculture operations can result in one or both of the following environmental effects: (1) accumulation of organic-rich sediments on the benthic substrate beneath the facility, and (2) changes in water quality.

Proper siting of mariculture facilities is essential if there is to be minimal environmental effect from a mariculture operation. If not properly sited, the accumulation of organic-rich sediments in the form of wastes, uneaten food, and shell debris below the facility can cause physical and chemical changes in the natural bottom sediments. Included in these changes are increased oxygen consumption within the sediment; and increased concentrations of total volatile solids, total organic carbon, sulfides, nitrogenous compounds, and phosphates.

Accumulation of such sediments and resultant oxygen depletion in the interstitial water can have effects upon the infaunal invertebrate community in the immediate area. Loss of species that are intolerant of organic enrichment often occurs in these areas. In addition, if such accumulation occurs in an area of extensive bottom vegetation such as eelgrass beds, important habitats can be lost. It should be noted, however, that wastes generated by the farming operation generally are not similar to city wastes which can contain detergents, heavy metals, and other contaminants. The wastes referred to here are purely organic in nature.

In order to prevent organic-rich sediments from building up on the benthic substrate and affecting infaunal invertebrates and important habitats, facilities should be sited in areas known to be well flushed in water with adequate depth. Facilities should not be sited in sensitive habitats such as eelgrass beds, herring spawning areas, or mouths of anadromous fish streams. Siting over eelgrass beds or other marine vegetation can result in degredation of these habitat types by sediment accumulation or possibly shading. Likewise, if these habitat types are providing substrate for herring spawn, additional impacts would result from their loss. The mouths and intertidal area of anadromous fish streams serve as feeding and marine

accumulation areas for outmigrating fry and smolts. Such areas should be avoided to minimize impacts to these sensitive areas and prevent possible disturbance to returning adults.

High concentrations of marine mammals and waterfowl can result in increased predation problems. In addition, disturbance to important wildlife could occur from increased human activity in the area. To minimize such problems, known concentration areas such as haulouts, nesting areas, and marine mammal or bird feeding areas should be avoided when possible.

SUMMARY:

Mariculture facilities could have a significant impact on important habitat areas if improperly designed and sited. These problems can be minimized by implementing proper siting and design criteria.

PREDATION
Department of Fish and Game
Division of Habitat

ISSUE:

Minimizing Predation and Bear/Human Conflicts

DISCUSSION:

Predation is a common problem with mariculture operations. The list of predators includes all types of fish or shellfish-eating mammals, fish and birds. Generally, the most serious problems with predator control involve mammals and birds. In Alaska, these categories can be expected to include seals, sea lions, mink, marten, otters, and various birds. If shore-based facilities are involved, improperly disposed garbage and wastes will attract bears and result in confrontation problems.

The problem of predation can be reduced by installation of screening or netting, and attempting to avoid known concentration areas such as bird nesting areas, marine mammal haulouts, or heavily used bird or mammal feeding areas. The department will consider mariculture facilities to be "attractive nuisances" to predators and would not favor destruction of predators under 5 AAC 92.410(a) (2), defense of life or property. The Department of Fish and Game is working closely with the Department of Environmental Conservation and the U.S. Forest Service to address the problem of bears and garbage, and garbage and wastes at shore-based facilities must be disposed of properly.

SUMMARY:

Predation could be a significant problem at mariculture facilities, but with proper design and siting predation can be minimized or prevented altogether.

PRODUCT WHOLESOMENESS
Department of Environmental Conservation
Division of Environmental Health

ISSUE:

Ensure product wholesomeness through site certification and by regulating the use of chemicals in mariculture operations.

DISCUSSION:

Currently, Alaskan seafood products have a world-wide reputation for quality and wholesomeness. The state has invested considerable resources in this reputation, through DEC's seafood inspection program and Alaska Seafood Marketing Institute's promotional efforts. It is important to ensure the safety and wholesomeness of any seafood produced through a mariculture industry. The Department of Environmental Conservation believes that safe and wholesome mariculture products can be produced if the department is given the authority to regulate certain aspects of the industry.

The Department of Environmental Conservation needs additional authorities to develop standards and regulation for the certification of mariculture sites and for the control of chemicals used to treat the product or their environment.

Chemical Usage

Currently the use of chemicals in mariculture operations is regulated by the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA). The FDA regulates the use of medicines and food colorings, and the EPA controls the use of chemicals such as anti-fouling compounds and parasiticide.

These chemicals must be registered with the appropriate federal agency. The manufacturer for registration submits scientific data supporting claims for efficacy and safety and identifying any environmental hazards. If the regulating agency finds the data to be adequate, the agency issues a label for the product, including instructions for use and safety precautions.

The regulatory agencies have established, for some of these chemicals, required minimum time periods between the time when the chemicals are applied to food products and the time when the food product may be marketed. For some chemicals, there are restrictions on levels allowable in the tissues of

the product when it is sold. If label instructions for these chemicals are followed, use of these products should be safe and not present any harm to the consumer.

Chemical compounds are used as anesthetics to reduce trauma to the animals during handling; disinfectants are used to remove pathogens from gear and equipment; food colorings are used to alter the color of the animal's flesh; and antiseptics, antibacterials, viricides, fungicides, and parasiticide are used to control disease organisms.

The potential problem with the use of chemicals is ensuring that they are being applied according to the label instructions. Currently, the FDA and EPA are responsible for monitoring their use. However, both agencies have limited resources available for surveillance in Alaska. To maintain consumer confidence in the safety of mariculture products, the Department of Environmental Conservation needs specific authority to develop regulations to control the use of chemicals and authority to conduct inspections to confirm application according to label instructions. State regulations adopted pursuant to such statutory authority would refer to federal regulations so that federal labels would be accepted by the state. The purpose of monitoring would be to confirm that the chemicals were used properly. Regulations would likely include requirements for training and certification of applicators of these chemicals and requirements for record keeping and testing.

Site Certification

In order for any state's shellfish to be sold in interstate commerce, it is necessary for the state to have a shellfish site certification and processing inspection program that meets the requirements of the federal Food and Drug Administration. The Department of Environmental Conservation administers an Alaskan shellfish program which has been approved by the FDA. Under this program, all shellfish growing areas in Alaska must be certified, and harvesters and processors must be permitted by the Department of Environmental Conservation.

The Department of Environmental Conservation surveys growing areas for sources of pollution and extensively samples and tests the water quality to determine if it meets regulatory requirements. Sampling and testing is also conducted to determine levels of paralytic shellfish toxins.

If the site is acceptable, then it is certified by the Department of Environmental Conservation. Only shellfish from certified growing areas may enter commerce. The specific requirements for growing area water quality and site surveys are contained in the National Shellfish

Sanitation Programs Manuals which are referred to in Department of Environmental Conservation's regulations.

Legislation should give the Department of Environmental Conservation the authority to develop a certification and permitting program for other mariculture species similar to the one presently in place for shellfish. Mariculture sites should be surveyed and certified. The site certification program would ensure that Alaskan mariculture products were free from exposure to pollutants and contamination in the growing site. The site certification program would prevent mariculture products from being raised in areas which are subject to pollution.

Labeling

DEC is responsible for ensuring that seafood produced in Alaska is safe and wholesome. DEC also assists the Alaska Seafood Marketing Institute in developing programs to produce and promote quality products. It is important to ensure the safety and wholesomeness of any seafood produced through a mariculture industry. Current statutes and regulations would not require any differentiation in labeling between wild products and farmed products. It might be helpful to consumers to distinguish mariculture products from "wild" products. The Department of Environmental Conservation would enforce such requirements if they are instituted.

SUMMARY:

The production of safe and wholesome mariculture products and the preservation of Alaska's seafood product's reputation for quality can be maintained and enhanced by giving the the Department of Environmental Conservation's Division of Environmental Health the authority necessary to regulate the use of chemicals and insure that mariculture sites are free from contaminants which might affect public health.

Summary of Mariculture Requirements

(British Columbia, Maine, California, Washington)

The following chart is a compendium of information from four separate systems of implementing mariculture programs. For detailed information regarding actions taken by each program, please refer to the corresponding footnotes.

(Y) Issue addressed | [N] Issue not addressed | ? Information not available | [1] Footnote

	British Columbia	Maine	California	Washington
General				
Lead Agency	(Y)	(Y)	(Y)	(Y)
Site Survey	(Y)[1]	[N][2]	[N][3]	(Y)[4]
Public Notice/Hearings	(Y)	(Y)[5]	(Y)[6]	(Y)
Application Fees	(Y)[7]	?	(Y)[8]	(Y)[9]
Annual Report	(Y)[10]	?	(Y)[11]	(Y)[12]
Land Use				
Size/Density of Farm	?	(Y)[13]	?	(Y)[14]
Land Use Planning Designation for Mariculture	?	?	?	(Y)
Leases Issued for Mariculture	(Y)[15]	(Y)[16]	(Y)[17]	(Y)[18]
Land Use Preferences	?	(Y)[19]	?	(Y)[20]
Conflict Resolution	(Y)	(Y)	(Y)	(Y)
Clean-up/Performance Bonds	(Y)	(Y)	?	(Y)
Land Rent	(Y)	(Y)[21]	(Y)[22]	(Y)[23]
Survey Plat Required	?	?	(Y)[24]	(Y)[25]
Water Quality				
Separation of Facilities	(Y)[26]	[N]	[N][27]	(Y)[28]
Waste Discharge	(Y)[29]	[N]	(Y)[30]	(Y)[31]
Water Quality Siting Criteria	(Y)[32]	[N]	(Y)[33]	(Y)[34]
Water Quality Monitoring	(Y)[35]	(Y)[36]	(Y)[37]	(Y)[38]
Fish and Wildlife				
Broodstock Acquisition	(Y)[39]	?	(Y)[40]	?
Disease Controls	(Y)[41]	?	(Y)[42]	(Y)[43]
Genetic Controls	(Y)[44]	?	(Y)[45]	(Y)[46]
Exotic Species	(Y)[47]	?	(Y)[48]	(Y)[49]
Private For-Profit Hatcheries	(Y)[50]	?	(Y)[51]	?
Protection of Existing Wild Stocks or Other Fish & Wildlife	(Y)[52]	?	?[53]	(Y)[54]
Measures to Protect Sensitive Habitats	(Y)[55]	(Y)[56]	(Y)[57]	(Y)[58]
Product Quality/Wholesomeness				
Site Certification and Evaluation	(Y)[59]	?[60]	(Y)[61]	(Y)[62]
Control and Monitoring of Chemicals and Additives	(Y)[63]	?	?[64]	(Y)[65]
Product Labeling	(Y)[66]	?	(Y)[67]	?[68]

Mariculture Requirement Footnotes

General

1. Finfish: An environmental assessment of site suitability must be completed for every potential net pen site. Possible requirements, in addition to a site plan (location and boundaries), include: depth contours, current patterns, maps of sub-tidal vegetation, invertebrate studies and pre-installation water quality data. A SCUBA survey is required in areas where water depth is less than 20 meters to describe substrate, vegetation and faunal presence. In areas deemed "sensitive", may also require: seasonal assessment of oceanographic characteristics, identification of other effluent discharges in the same area, measurements of background water quality and sediment quality characteristics, vegetation mapping, and compilation of fisheries resources information.

   Other species: The culture of molluscs, crustaceans and marine plants may also have significant environmental impacts. Site survey information required may vary depending on the proposal. Department of Fisheries and Oceans (DFO) offices should be contacted. Information required may include certain of the survey elements required for finfish culture.

2. No requirements at present. Maine is in the process of developing standards for siting and other criteria for management of mariculture activities.

3. No standardized site survey requirements. The Sanitary Engineering Branch of the Department of Fish and Game studies and decides on the acceptability of all shellfish areas. Applicants are required to provide preliminary water quality data (no specifics listed) to evaluate the areas for pollution. Also, the application for the lease of state water bottoms for aquaculture must include, when available, high and low tide lines.

4. Finfish: Prior to permit application, an initial site characterization survey is required, Requirements vary by facility size (i.e. Class I = production capacity less than 25,000 lbs/year; Class II = production capacity greater than 25,000 lbs/year but less than 100,000 lbs/year; Class III = production capacity greater than 100,000 lbs/year). Requirements for all classes: recommended consultation with state and local authorities, bathymetric survey, hydrographic survey (i.e. current and velocity), and diver survey of biological resources done April thru September. Class III additional requirements: drogue tracking, vertical hydrographic profiling (as part of hydrographic survey), sediment chemistry sampling and benthic infauna sampling.

   Other species: Site survey requirements vary; are dependent upon local SEPA (State Environmental Policy Act) requirements.

5. Mandatory public hearings after 20 day notice in newspaper and trade journal.

6. Mandatory public hearings after 90 day notice in newspaper.

7. $25

8. $100

9. $25

10. Annual health report required by the Fish Transport Committee, Department of Fisheries and Oceans (DFO). Operational log with monthly or quarterly production figures required. Water quality monitoring report specified on a site-specific basis.

11. Yearly registration with the California Department of Fish and Game required.

12. Annual report must be submitted to the Department of Natural Resources which distributes it to other resource agencies. Facilities with less than 20,000 lbs/year production are exempt. Those with productions of 20,000 to 100,000 lbs/year must submit benthic dive survey only. Facilities with production greater than 100,000 lbs/year must submit complete report (benthic survey, water quality survey and hydrographic survey).

Land Use

13. 5 acres per lease with a maximum acreage of 200 acres per person.

14. Maximum of 40 acres per oyster farm, salmon farms are divided into Class I, Class II and Class III farms depending on the carrying capacity of the site. The class determines how many thousands of pounds can be produced at the site.

15. Lease or license of occupation issued, section 10 permit used for one year to allow site research.

16. Leases issued up to 10 years, negotiated if there is no competitive interest.

17. Leases issued for up to 25 years auctioned.

18. Leases issued for 5 to 10 years.

19. First to the state, second to riparian owner of the intertidal area within the lease area, third to fisherman who have traditionally fished in or near the lease, fourth to the riparian owner within 100 feet of the lease area.

20. To adjacent upland owner.

21. Based on tvpe of use.

22. Auction amount plus privilege tax charged for amount of product sold.

23. Fair market value plus value of existing edible shellfish within the lease.

24. Paper plat tied to existing upland monuments.

25. Paper plat tied to existing upland monuments.

Water Quality

26. Minimum distance between operation lease boundaries must be at least 5 km to minimize risk of disease transfer and minimize potential cumulative water quality impacts.

27. No spacing or size limits; many sites are contiguous. The size and location of allotments is decided by the Department of Fish and Game on a case-by-case basis as they work with the applicants.

28. No specific distance limits, however, may limit fish production due to local water conditions (i.e. they restrict production in areas with chronic water problems due to dissolved oxygen and nitrogen concentrations). Washington also limits maximum production to 1,000,000 lbs/year/square nautical mile.

29. The Ministry of Environment, Waste Management Branch, has draft regulations that exempt finfish farm effluent (feces and feed) from waste management permit requirements. Shellfish farms are also exempt. Sewage facilities associated with farm facilities are required to get a waste management permit for water discharge, although this permit requirement has not been strictly enforced. B.C.'s main waste concern at this time is dead fish and possible disease transmission from disposal in open water. They are hoping a multi-collection and disposal service can be arranged.

30. Regional Water Quality Boards (9 in state) issue water quality discharge permits - NPDES permits. Water quality discharge standards are the same as the federal standards.

31. A NPDES permit is required for the discharge of pollutants into surface waters of the state by a point source. Both aquaculture activities and processing operations require permits. For aquaculture, this includes "Concentrated Aquatic Animal Production Facilities" such as ponds, raceways, or similar structures which produce 20,000 pounds per year of cold water species or more, and which feed 5,000 pounds per month of feed or more, and which discharge at least 30 days per year. Permits for such facilities require sedimentation basins for cleaning wastewater and require monitoring of effluent quality. Also included are in-water aquaculture projects in which a discharge of pollutants is used to grow aquatic organisms. Washington has water quality and effluent standards that all discharges must meet. Also, any activity or action which would cause short-term violation of the State's Water Quality Standards requires a Water Quality Standards modification from the State Department of Ecology.

32. For finfish: Pens must be anchored in not less than 10 meters of water at zero tide. Minimum of 2 meters between bottom of pen and ocean floor. Net pens should be located in areas of good circulation and tidal flushing. No direct sewage discharge from living quarters on the lease site.

33. No preconceived rules or standards. Decisions are made on a case-by-case basis. The proposed area must have good flushing.

34. For finfish: Required minimum depth between pen bottom and ocean floor ranges from 20 to 60 feet, depending on the size of operations and local currents.

35. Monitoring of approved net pen operations may be required to provide information on substrate quality, water quality (distribution of dissolved and suspended solids, nutrients, pathogens, chemicals), accumulation patterns of organic deposits, alterations in vegetation distribution patterns, change in benthic structure or other site-specific information. Once a site has been in operation for some time, reporting requirements may be required if there is increased production, negative impact on the environment, or as part of a general coastwide aquaculture impact assessment program. Sample measures, replicates and frequency are specified on a site-specific basis.

36. The Department of Marine Resources may conduct an annual review of each aquaculture lease if the operation has been conducted in a manner injurious to marine organisms.

37. Operators are required to provide on-going water quality data as deemed necessary to evaluate the area and ensure year-round protection of the shellfish consumer. The amount of sampling required depends on the location and susceptability of harvest sites to pollution problems. At any time the state may obtain water samples.

38. Annual monitoring requirements vary by facility size. Class I = none; Class II = Benthic survey/diver survey; Class III = Annual summer monitoring to include benthic/diver survey, sediment chemistry, benthic infauna, water quality sampling, current velocity and direction.

Fish and Wildlife

39. Eggs obtained from surplus eggs at federal hatcheries or purchased from private hatcheries.

40. Broodstock purchased from commercial sources (commercial license holders or registered aquaculturists). If no commercial supply available, then broodstock can be collected from wild stocks under permit from the California Department of Fish and Game (CFG). The broodstock remains the property of the state, but the progeny belong to the applicant.

41. Eggs must be certified as disease free by the Department of Fisheries and Oceans (DFO). Fish Health Protection Regulations (DFO) apply.

42. Covered by Aquaculture Disease Control Regulations of the CFG.

43. Requires permit from the Washington Department of Fisheries (WDF) for transportation or import of live fish or viable sexual parts.

44. DFO and Provincial Ministry of Environment require approval for transport of eggs, smolts, or fish over 50km.

45. Any fish planting requires approval of the CFG.

46. Covered by fish transport permit (WDF).

47. All salmonid importation must comply with Federal-Provincial Policy for the importation of live salmonids into British Columbia.

48. All importation, transportation, and planting of fish is controlled by the CFG.

49. Covered by fish transport permit (WDF).

50. Must be licensed by DFO.

51. Controlled by CFG regulations.

52. Federal-Provincial importation policy for salmonids.

53. Importation, transportation, and planting of fish is controlled by the CFG.

54. Site location controlled by Interim Guidelines of the Department of Ecology. WDF and the Washington Department of Game review site locations.

55. Location approval by DFO. Detailed dive survey required. No finfish pens located within 1km radius of the mouth of anadromous fish streams. No net pens in "sensitive habitats" as defined by Sec. 31(5) of the Fisheries Act.

56. Applicant cannot unreasonably interfere with ingress and egress of riparian owners, navigation, fishing or other uses of the area (Department of Marine Resources regulation).

57. Leasee may not unreasonably impede public access to state waters, but may limit public access to the extent necessary to protect facility (CFG regulations). CFG reviews location of sites.

58. Interim guidelines do not allow siting over "habitats of special significance" (determined by WDF) in waters 75 feet or less in depth.

Product Quality and Wholesomeness

59. Siting criteria is considered one of the most important criteria for aquaculture development. Information may be required for current patterns, sub-tidal vegetation mapping, invertebrate studies, and water quality parameters.

    Net pens are restricted by distance from shellfish operations and from other lease operations. This restriction prevents contamination of shellfish or other fish from transfer of pathogenic organisms and chemicals.

60. No information on product quality or wholesomeness available from materials on hand.

61. Requires an actual on-site inspection by a representative before a permit is given. Aquaculture proposals are required to include a description of plans and maps showing locations of proposed harvesting areas. They also must include a description of type and location of any facilities to be used for handling, packaging, or string products within the state.

62. Applicants must have submitted a site assessment prior to the application process which included 1) a bathymetric survey 2) a hydrographic survey and 3) a dive survey of biological resources.

    Washington has also divided the coastline into "habitats of special significance" which identify 1) areas important to commercial or sport fisheries, 2) those of critical ecological importance and 3) those especially sensitive to degredation by culture activities.

63. They are looking into effects of anti-foulant and antibiotic use on net pen farms. Initial indications show that oysters accumulate chemicals that are used to treat nets with the result of reduced growth and poisonous flesh. No research available yet on accumulation in farm fish of anti-foulants. Because of this, distance restrictions are in place for proximity of net pens to shellfish and other fish farms. From literature, it does not appear that B.C. has any definate restrictions or federal guidelines regarding the use of chemicals or additives.

64. Use of chemicals was not mentioned in material available.

65. Applications for aquaculture must go through an environmental assessment by submitting an operations plan which includes chemical and anti-foulant use. Also as a guideline, Washington has determined that TBT should not be used as an anti-foulant agent. Use of other anti-foulants must be reviewed on a case-by-case basis and reported to the Washington Department of Ecology.

    Only antibiotics licensed by FDA are allowed to be used at the present time. This limits use to oxytetrecycline, sulfamerizine, and Romet 30. These should be used sparingly on a short-term basis (there did not appear to be minimum time and dosage requirements for this).

    Annual monitoring report includes types of antibiotics used and frequency of use over past year. Also includes types of anti-foulants used and frequency of net treatment.

66. Fish crossing provincial lines must have proof of coming from registered facility. This is also true for exporting fish.

67. Department of Health Services, Food and Drug Branch sets requirements for proper packaging and labeling of fish and shellfish moved in commerce.

68. No information on labeling from information available.

STATE OF ALASKA

OFFICE OF THE GOVERNOR

DIVISION OF GOVERNMENTAL COORDINATION

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Dear Applicant:

The Shellfish Farm Application is designed to help you obtain most of the authorizations you will need from the State of Alaska Departments of Natural Resources (DNR), Fish and Game (ADF&G), Environmental Conservation (DEC), and Division of Governmental Coordination (DGC) in order to begin your shellfish mariculture project. A Coastal Project Questionnaire, which is available from any of these agency offices, must also be submitted with your application to help determine which specific permits must be obtained prior to constructing your project.

Please read this application carefully. A fully completed application will help the state agencies to process your request promptly. Incomplete or incorrect information may result in requests for additional information, processing delays, or the application may be returned to you for resubmission. You will receive a notice and processing schedule for the state coastal zone consistency review from DGC when your application has been accepted for processing. Your permits will also be processed on this schedule.

If you need technical assistance in completing this application, please refer to the list of agency representatives provided at the back of this application packet. If you have questions about this application process, or you are not able to determine which agency can best answer your technical questions, contact the Division of Governmental Coordination in Juneau at 465-3562, in Anchorage at 274-1581, or in Fairbanks at 451-2818.

Additional Permits

In addition to the permits and approvals which you are applying for in this consolidated permit application, you will also need to separately apply for and obtain a Fish

Transport Permit from ADF&G to obtain and hold broodstock; and a Growing-Area Certification and a Harvester's Permit from DEC in order to sell your product. These permits are not covered by this application since they are required for later phases of your project.

A Fish Transport Permit is required by ADF&G in order to hold, transport, and raise live fish including shellfish. You will need this permit before you can obtain, hold, or begin raising your product. We encourage you to contact the Fisheries Rehabilitation, Enhancement and Development (FRED) Division in Juneau at 465-4160 or in Anchorage at 267-2157 as early as possible in order to apply for and obtain a Fish Transport Permit.

You should contact DEC regarding area certification requirements so that you can be reasonably sure that your site will qualify. We recommend that you apply for growing area certification and a harvester's permit at least six months before you intend to harvest shellfish. To obtain more information on certification requirement please contact DEC in Anchorage at 272-1561 or in Juneau at 465-2609 or 465-2696.

jbak87122401DMF

Consolidated Shellfish Farm Permit Application

General Instructions

1. Fill in the blanks on the form provided.

2. If additional space is needed to fully answer a particular question, attach additional pages marked with the corresponding number in the application.

3. Applications must be ***typed*** or ***printed*** clearly in ***ink***.

4. Applications must be signed by the applicant or an authorized representative.

5. The application should be forwarded to the appropriate regional office of the Office of Management and Budget's Division of Governmental Coordination for the region in which the farm is to be located (see attached map for regional boundaries).

Southeast Reginal Office
431 North Franklin Street
P.O. Box AW, Suite 101
Juneau, Alaska 99811-0165
(907) 465-3562

Southcentral Regional Office
2600 Denali Street
Suite 700
Anchorage, Ak 99503-2798
(907) 274-1581

Northern Regional Office
675 Seventh Avenue
Station H
Fairbanks, AK99701-4596
(907) 451-2818

6. ***Please note:*** This application is for a specific mariculture project. You will need to submit a new application if you change any of the following:

   A. The species to be propogated
   B. The size or design of your operation
   C. The location of your operation
   D. Request a long-term tidelands lease for a previously permitted site

PERMIT APPLICATION
State of Alaska Consolidated Shellfish Farm

APPLICANT INFORMATION

1. _____
Name

_____
Mailing Address

_____ _____ _____
City State Zip Code

_____
Phone

2. _____
Business Name (if applicable)

_____
Business Address

_____ _____ _____
City State Zip Code

_____
Phone

3. _____
Authorized Agent (if applicable)

_____
Address

_____ _____ _____
City State Zip Code

_____
Phone

PROJECT INFORMATION

1. Provide a brief description of the facility and your overall proposal. Include upland facilities as well as tide and submerged land facilities.

_____

_____

_____

2. What experience, expertise, and other resources do you have available for this project?

_____

_____

_____

PROJECT LOCATION

1. Is the Project on: (please mark with ✓)

State Land _____ Federal Land _____ Private Land _____ Municipal Land _____

2. Township _____ Range _____ Meridian _____ Section _____

3. Number of acres applied for:

Uplands _____ Tidelands _____

4. Provide the names and addresses of the landowners of adjacent uplands and tidelands.

Uplands	Tidelands
A _____	A _____
B _____	B _____
C _____	C _____

5. Attach topographic maps (U.S.G.S. Scale 1; 63360) and nautical charts to this application that show the site location and general area. Clearly indicate the site location on the charts and maps.

SITE PLAN & PHYSICAL DESCRIPTION

1. Provide a site plan drawn to scale (no less than 1" = 50') which shows the layout and location of the following:

   A. The rafts or other production facilities employed (please include size and number).
   B. Anchoring systems and shoreties.
   C. Docks, floathomes, or caretaker facilities, including source of freshwater for domestic use and processing water, wastewater disposal systems, and solid waste storage and disposal.
   D. Any freshwater discharges.
   E. Roads or air strips.
   F. Other upland or tideland facilities at the site associated with the farming operation.
   G. Fuel and chemical storage.
   H. Property lines referenced in #4 of the previous section.

2. On the site plan, draw lines and identify the tide level at the following stages:

   - Mean Lower Low Water (MLLW)
   - Mean Higher High Water (MHHW)
   - Mean High Water (MHW)

3. Diagram surface tidal current speed and direction at maximum tide flow on the site plan or nautical chart.

4. Water depth at the site of culture gear at MLLW would be: _____

SITE SUITABILITY

1. Physical and Biological Characteristics

   A. Have you conducted an on-site investigation? yes____ no____

   B. Provide any information you may have regarding tidal flushing, water temperature, salinity, and turbidity/sedimentation at the site. Include the dates these data were obtained.

   _____

   _____

   _____

   C. Describe the bottom type composition at the site (if more than one type, indicate percent).

   sand____ mud____ rock____ gravel____ eelgrass____

   other: _____

   _____

   _____

   D. Describe winter conditions at the site (temperatures, icing, storms, etc.).

   _____

   _____

   _____

E. Do anadromous fish (e.g. salmon) use any streams in the area for spawning? yes____ no ____

If yes, indicate which streams are used and label them as such on the site plan.

_____

_____

_____

F. Is the target species naturally present in the area? yes____ no____

If yes, describe abundance condition.

_____

_____

_____

G. Describe measures you would propose to control predation by marine mammals, seabirds, or other potential predators.

_____

_____

_____

WATER QUALITY

NOTE TO APPLICANT: Sewage or industrial discharge(s) may accumulate in, or harm the growth or consumptive use of your shellfish product. Oysters, mussels and scallops are filter feeders and may accumulate fecal coliform bacteria from sewage discharges. If a caretaker facility is located near the culturing operation there may be a risk of contamination. DEC will require that the wastewater treatment systems used on caretaker facilities meet Alaska State Water Quality Standards criteria for harvest or consumption of raw mollusks or other aquatic life.

A. Were there any sources of past pollution at the site, such as a shorebased seafood processor, industrial facility, or a town or village? yes____ no ____

If you answered yes to the above, identify:

- The type of previous use (i.e. mine, village, seafood processor) _____
- The last known date of use _____
- The distance from site of previous use to your project site _____

B. Are there any currently active sources of human or industrial pollution in the area? yes____ no____

If yes, please describe:

- The type of discharge(s) _____
- The location and distance from your site _____
- The name of the discharger(s), if known _____

C. If there is a caretaker facility proposed for the site, please identify:

- The sewage treatment method to be used _____
- The expected volume of seawater and greywater _____
- The location of the treated sewage's discharge point _____

CURRENT LAND USE STATUS

Describe the type and intensity of all present uses of the project site and the surrounding area (e.g. commercial development, mining, timber harvest or transfer, sheltered anchorage, subsistence, recreation, commercial fishing, sport fishing, or residential use, etc.).

_____

_____

_____

FARM OPERATION AND DEVELOPMENT

1. Species to be raised:

	Species	Annual Production Goal
A	_____	_____
B	_____	_____
C	_____	_____

2. Please provide a timetable showing approximate dates for installation of spat collection gear, placement of production facilities, date of first sale, and a schedule for reaching expected maximum production.

_____

_____

_____

3. Donor Stock

Have you submitted a Fish Transport Permit application to the Department of Fish and Game?
yes_____ no _____

If yes, date of application _____

Certification Statement

I certify that all of the information contained herein is true and complete to the best of my knowledge. I also understand that I must separately apply for and hold a Fish Transport Permit from the Department of Fish and Game in order to hold, transport, and raise shellfish, and a Growing Area Certification and a Harvesters Permit from the Department of Environmental Conservation in order to sell my product.

_____ _____

Signature of Applicant or Agent Date

TITLE 5.
FISH AND GAME
CHAPTER 41.
TRANSPORTATION, POSSESSION, AND RELEASE OF LIVE FISH

ARTICLE 1.
SCOPE OF REGULATIONS

5 AAC 41.001 is amended to read:

5 AAC 41.001. APPLICATION OF THIS CHAPTER. The provisions of this chapter govern the transportation, possession, or release of live fish transplanted for or cultivated for human consumption or sport fishing purposes, or as part of an aquaculture program for scientific, educational or propagative purposes, and the transportation and possession of shellfish for commercial purposes in conjunction with a shellfish farming operation.

(In effect before 1988; am __/__/88, Register __)

Authority: AS 16.05.251(a)

ARTICLE 3.
GENERAL PROVISIONS

5 AAC 41.100 is amended to read:

5 AAC 41.100. DEFINITIONS. In addition to the definitions set out in AS 01.10.060 and AS 16.05.940, in 5 AAC 41.001--5 AAC 41.100

(1) "completed application" means a form, series of forms, letters or other documents which provide all of the information necessary for the commissioner or his authorized designee to issue, condition or deny a permit;

(2) "department regional office" means the Alaska Department of Fish and Game, Fisheries Rehabilitation, Enhancement and Development Division offices located as follows:

Region I - Southeastern Region
Island Center Building
P. O. Box 2-
Douglas, Alaska 99824-0020

Region II - Central, Westward and
Arctic-Yukon-Kuskokwim Region
333 Raspberry Road
Anchorage, Alaska 99502

(3) "fish pathology section" means the Alaska Department of Fish and Game, Fisheries Rehabilitation, Enhancement and Development Division, Fish Pathology Section, located at 333 Raspberry Road, Anchorage, Alaska 99502, telephone (907) 344-0541;

(4) "ornamental fish" means a fish commonly known as "tropical fish," "aquarium fish," or "goldfish" which are imported, cultured, or sold in the state customarily for viewing in aquaria or for raising in artificial systems, and not customarily used for sport fishing or human consumption purposes;

(5) "permit" means a fish transport permit, including any amendment or condition issued or approved by the commissioner or his authorized designee, which has not been suspended, terminated or expired;

(6) "permittee" means the holder of a permit and includes anyone employed, contracted, or assigned by the person to whom the permit was issued.

(In effect before 1988; am __/__/88, Register __)

Authority: AS 16.02.251(a)

5 AAC 41 is amended by adding a new article:

ARTICLE 4.
SHELLFISH FARMING

Section
200. Applicability of Regulations
210. Permit Required
220. Shellfish Farm Permit Application
230. Additional Information
240. Review and Determination
250. Permit Conditions
260. Inspection of a Farm
270. Annual Report
400. Definitions

5 AAC 41.200. APPLICABILITY OF REGULATIONS. The provisions of 5 AAC 41.200 -- 5 AAC 41.400 govern the permit application process for shellfish farm permits, and establish guidelines and procedures regarding the operation of permitted shellfish farms. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.210. PERMIT REQUIRED. A shellfish farm permit, issued by the commissioner, is required for the operation of a shellfish farm. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.220. SHELLFISH FARM PERMIT APPLICATION. An applicant must submit a consolidated shellfish farm permit application and coastal project questionnaire to the nearest office of the Office of Management and Budget, Division of Governmental Coordination for purposes of complying with the project consistency review of the Alaska Coastal Management Program as identified in 6 AAC 50.010-6 AAC 50.190. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.230. ADDITIONAL INFORMATION. If, after an application has been distributed to the department, and the department determines that information in the application is insufficient for an adequate evaluation of the proposed shellfish farm, the department will request additional information from the applicant. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.240. REVIEW AND DETERMINATION. (a) The commissioner will review the recommendations resulting from the department's review of the application before rendering a decision on an application.

(b) The commissioner will render a decision on the application within 5 days after a determination on project consistency with the Alaska Coastal Management Program has been issued by the Office of Management and Budget. The commissioner's decision will be based on the following considerations:

(1) the physical and biological characteristics of the proposed location must be suitable for a shellfish farming operation;

(2) the proposed farm may not unreasonably or adversely affect management of natural stocks, and must not

require significant alterations in traditional fisheries or other existing uses of fish and wildlife resources;

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

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

(c) An application for a shellfish farm permit which has been denied by the commissioner will, in the commissioner's discretion, be reconsidered if the applicant provides new or additional information that may have altered the original decision. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.250. PERMIT CONDITIONS. The commissioner will include conditions to the permit that are appropriate to ensure the shellfish farm does not significantly affect fisheries, wildlife or their habitats in an adverse manner. Permits will be issued for a period of three years. Permits may be renewed by submitting a request in writing to the commissioner. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.260. INSPECTION OF A FARM. A permit holder shall allow inspection of the shellfish farm by department inspectors at any time the farm is operating. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.270. ANNUAL REPORT. A person who holds a permit for a shellfish farm shall submit an annual report no later than December 15 to the department. The annual report form shall be distributed to permit holders by the department. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

5 AAC 41.400. DEFINITIONS. In 5 AAC 41.200 -- 5 AAC 41.400

(1) "commissioner" means the commissioner of the Department of Fish and Game or his designee;

(2) "department" means the Alaska Department of Fish and Game;

(3) "farm" means a specific location where shellfish are raised in captivity or under positive control as in a pen, pond, raft, bottom culture or an area of water completely enclosed by a generally escape-proof barrier for the purposes listed in 5 AAC 41.200 -- 5 AAC 41.280;

(4) "shellfish" means any species of crustacean, mollusk, or other invertebrates, in any stage of their life cycle, found in or introduced into the state, consistent with the definition of "fish" in AS 16.10.296. (Eff. / / , Reg.)

Authority: AS 16.05.020
AS 16.05.092
AS 16.05.251
AS 16.05.340(b)

DOC 0062r

MEMO -- January 12, 1988

TO: Fisheries Cabinet

FROM: Paul Peyton

RE: Aquaculture socioeconomic studies

Legislators and others considering proposed regulation of aquaculture activities in Alaska have asked for additional information concerning the social and economic impacts of the various possible forms of development in Alaska. Central to most of the discussion is whether salmon can be profitably farmed in Alaska and compete in the marketplace with wild salmon and farmed fish from other areas. If farm production was to be permitted, what are the potential impacts to the existing common property fishery? What sort of commitment, in terms of time and dollars, would be required of the State to manage and support salmon farming activities?

The DCED has entered into a $20,000 contract with the Sea Fare Group in Seattle to conduct a study of world salmon markets and evaluate the extent of market competition between wild and farmed salmon, including farmed salmon which potentially could be produced in Alaska. Principle investigator for this study will be Dr. James Anderson of the University of Rhode Island. Anderson is a recognized authority in the area and has authored several papers dealing with the market's response to increasing world supplies of farmed salmon. Market contacts, statistical research and report editing functions of the contract will be conducted by the Sea Fare Group which is a commercial consulting business operated by those people that put out the Seafood Leader magazine.

A second $20,000 contract has been undertaken with the DPA group of Vancouver, B.C. DPA will evaluate the relative costs of farmed salmon production in major producing regions around the world, develop a proforma cost of production model for the Alaska situation and assess the sensitivity of major cost factors to overall costs of production. DPA has done similar work for the Government of British Columbia and others and has identified specific sources for the necessary data.

Both contracts call for an interim or progress report to be submitted about February 1st and the final report during the first week of March.

A third phase of the project, that of developing a policy options matrix will be postponed at least until preliminary results from the two contracted studies are reported. At that time we may elect to select a limited number of issues for policy option development and conduct the required work in-house or through an RSA agreement with ISER. There is about $5,000 remaining in the project budget.

STATE OF ALASKA

STANDARD AGREEMENT FORM
FOR PROFESSIONAL SERVICES CONTRACT

1. Agency Contract Number	
2. ATN Number	88-0200
3. Service Code(s)	5950
4. Financial Coding	08751001
5. Agency Assigned Encumbrance Number	0881427
6. Vendor Number	7. AK Bus. Lic. #

This contract is between the State of Alaska,

8. Department of: Commerce and Economic Development — hereafter, the State, and

9. Contractor: The DPA Group, Inc. — hereafter, the Contractor

Mailing Address / Street or PO Box	City	State	Zip Code
601 West Cordova Street	Vancouver, B.C. (Canada)		V6B 1G1

10

ARTICLE 1. Appendices: Appendices referred to in this contract and attached to it are considered part of it.

ARTICLE 2. Performance of Services:

2.1. Appendix A (General Provisions), Articles 1 through 14, governs the performance of services under this contract.

2.2. Appendix B sets forth the liability and insurance provisions of this contract.

2.3. Appendix C sets forth the services to be performed by the contractor.

ARTICLE 3. Period of Performance: The period of performance this contract begins December 21, 19 87, and ends March 15, 19 88. Performance may be extended for additional periods by the written agreement of the parties.

ARTICLE 4. Consideration:

4.1. In full consideration of the Contractor's performance under this contract, the State shall pay the Contractor a sum not to exceed $ 20,000 (U.S.) in accordance with the provisions of Appendix D.

4.2. When billing the State, the Contractor shall refer to the ATN Number and send the billing to:

11. Department of	Attn: Division of
Commerce and Economic Development	Business Development
Mailing Address	**Attention**
P.O. Box D, Juneau, AK 99811	Larry Merculieff

NOTICE: This contract has no effect as an offer by the Contractor until it is approved by the Department of Administraton.

12. CONTRACTOR	14. APPROVAL BY THE STATE CONTRACTING AGENCY
	NOTICE! This certifies the availability of funds. I am aware that certifying false, inaccurate, or misleading documents constitutes an unsworn falsification punishable under AS 11.56.210
Name of Firm: The DPA Group, Inc.	Signature of Head of Contracting Agency or Designee: [signature] — Date: 12/29/87
Signature of Authorized Representative: [signature] — Date: [illegible]	Typed or Printed Name of Authorizing Official: John D. Williams
Typed or Printed Name of Authorized Representative: [illegible]	Title: Deputy Commissioner
Title: [illegible] — Employer I.D. No. (EIN) or SSN:	15. APPROVAL BY THE DEPARTMENT OF ADMINISTRATION
13. REQUESTING AGENCY #8751	
Department/Division: Division of Business Development	
Signature of Project Director: [signature] — Date: 12/23/87	
Typed or Printed Name of Project Director: Larry Merculieff	
Title: Director	

n/a

APPENDIX A
GENERAL PROVISIONS

Article 1. Definitions.

1.1. In this contract and appendices, "Project Director" means the person who signs this contract on behalf of the Requesting Agency and includes a successor or authorized representative.

1.2. "State Contracting Agency" means the Department for which this contract is to be performed and for which the Commissioner or Authorized Designee acted in signing this contract.

Article 2. Inspection and Reports.

2.1. The Department may inspect, in the manner and at reasonable times it considers appropriate, all the Contractor's facilities and activities under this contract.

2.2. The Contractor shall make progress and other reports in the manner and at the times the Department reasonably requires.

APPENDIX C
SERVICES TO BE PERFORMED

COST OF PRODUCTION MODEL FOR PEN-REARING
OF SALMON IN ALASKA AND CURRENTLY PRODUCING REGIONS
ATN No. 88-0200

This study will be conducted in two phases. In the first phase, The contractor will determine the relative costs of production in major pen-rearing regions. In the second phase, the contractor will develop a cost of production model for pen-rearing salmon in Alaska and assess the sensitivity of major cost factors to overall costs of production.

Phase I - Comparative Cost of Production Analysis

The steps to be undertaken by the contractor in Phase I are detailed as follows:

1. Discuss with representatives of the Department of Commerce and Economic Development to clarify the scope of the study.

2. Conduct a literature review of recent studies (to include Bjorndal, Salvanes, Ridley, Shaw, BIM, Anderson, Wurmann, Nasaka) on cost of production in the five major supply regions.

3. Develop profiles for B.C. and Chile from previous models developed by study team members to complete the comparison of costs of production.

4. From a literature review, determine the public support provided to the five major supply regions. The types of public support to be quantified will include the following:

   - final assistance;
   - research and development;
   - education; and
   - other services (for example, diagnostic and extension).

In addition, the type of tax structure established to pay for the support provided by governments in each country will be determined.

5. Prepare an interim report that summarizes the findings of Phase I (refer to reporting requirements in appendix D).

Phase II - Cost of Production Analysis for Alaska

The detailed steps that are to be undertaken by the contractor in Phase II are listed as follows:

1. Collect and analyze background information on likely general development areas. This activity will include a preliminary assessment of expected salmon farm development locations in the southeastern and southcentral areas, to guide the formulation of general biophysical assumptions for the production model. The assessment will include a brief examination of:

   - location of logistic centers;
   - transportation methods;
   - probable areas excluded based on pollution, major alternate user groups, proximity to river mouths, excessive exposure to wind, etc.;
   - location of existing potential smolt suppliers; and
   - location of possible new hatchery locations.

   These data will be collected in part during discussions with personnel in the Department of Commerce and Eocnomic Development and the Department or Fish and Game.

2. Collect and review general biophysical dats from selected development areas. This activity will include examination of:

   - marine and freshwater temperature data;
   - salinity data;
   - location of major streams entering saltwater;
   - phytoplankton data;
   - important marine mammal concentrations; and
   - location of major spawning streams and hatcheries.

   These data will be obtained through discussion with personnel in government agencies and review of published data and additional unpublished data provided by government personnel. Agencies to be contacted will include:

   - the Alaska Department of Fish and Game; and
   - the National Oceanic and Atmospheric Administration, National Fisheries Service (Auke Bay Laboratory, Alaska, and Northwest and Alaska Fisheries Centre, Seattle, Washington).

3. Collect and review recent salmon culture activities in Alaska. This activity will include a review of recent state hatchery production data, particularly for chinook and coho salmon, and experimental marine farming results within the state (e.g., Little Port Walter Research Station). These data will be obtained through discussion with personnel in the government agencies identified in Step 2. This information will be used together with the biophysical data (especially temperature) collected in Step 2 to develop growth projections.

4. Prepare production criteria and assumptions for site areas suitable for pen-rearing of salmon. The information analyzed in Step 1 will be used to identify:

- theoretical average monthly temperatures;
- expected growth rates based on the average temperatures;
- seasonal differences in feed conversion rates;
- average monthly feeding rates; and
- stocking densities.

Where possible, the data will indicate the range of values or conditions that could exist within the study area. In addition, the analysis will identify:

- the likelihood of problems with phytoplankton outbreaks and preditor populations; and
- expected smolt acquisition, transportation and acclimation requirements and problems.

5. Adapt the British Columbia growth models to Alaska by estimating the impact of differences in temperature and other factors between B.C. and Alaska on the likely growth of pen-reared salmon.

6. Estimate the cost of critical inputs for the selected areas for site development. The inputs would include the following:

   - capital costs (net cages, nets, etc.);
   - smolts;
   - fish feed;
   - labor; and
   - diagnostic services.

7. Conduct sensitivity analyses to establish break-even points for pen-rearing salmon in Alaska. This would include an assessment of the following scenarios:

   - production at small and large scales;
   - with and without fish feed production within the state;
   - with and without direct transport to market; and
   - with constant and changing prices.

8. Write and present to the Project Director a draft report of the study findings (refer to the reporting schedule in Appendix D). In addition, the contractor will supply the State with a computer diskette in JAVELIN format containing the cost of production model with supporting documentation. The draft report will also incorporate the findings of the interim report.

9. After review by the project director, make required changes, if any, to the report and to the cost of production model.

APPENDIX D
CONSIDERATION, REPORTING SCHEDULE AND GENERAL CONDITIONS

COST OF PRODUCTION MODEL FOR PEN-REARING
OF SALMON IN ALASKA AND CURRENTLY PRODUCING REGIONS
ATN No. 88-0200

REPORTING SCHEDULE: The contractor will submit an interim project report in writing to the Project Director which summarizes the findings of Phase I (Comparative cost of Production Analysis) by February 1, 1988.

A draft of the final project report containing all study findings, including those findings contained in the interim report, will be submitted in writing to the Project Director for review and approval by February 23, 1988. At the same time the contractor will submit a computer diskette containing the cost of production model with supporting documentation. The contractor will incorporate changes to the draft material suggested by the Project Director and submit ten copies of the approved final report and two copies of the production model diskette on or before March 4, 1988. This schedule allows three days for the Project Director to complete his review of the draft report.

CONSIDERATION: The contractor will submit an invoice for payment with the interim project report on or before February 1, 1988 which reflects all expenditures and services rendered for that period of the contract. A second and final invoice for payment will be submitted with the final project report on or before March 4, 1988 which reflects all expenditures and services rendered for the remaining period of the contract. Payments on both the interim and final invoices are subject to the limitations and conditions described below. All invoice amounts will be stated in U.S. dollars and all payments will be made in U.S. dollars.

Fees charged for services performed by the contractor's various study team members will not exceed the rates shown in the schedule below. (All amounts are in U.S. dollars):

Study team member	Per day	Per hour
D. Egan	$375	$47
J. Dale	200	25
M. Winsby	350	44
T. Bjorndal	520	65

Upon acceptance of the interim and final project reports and receipt of the accompanying invoices by the Project Director, the State will pay the contractor within 30 days. Failure of the contractor to comply with the reporting provisions of this contract will result in the State withholding payment until such compliance is obtained.

If the total amount due on the contractor's interim invoice exceeds $12,000 (U.S. dollars), the State will withhold payment of the excess until the final project report and model is received and accepted by the Project Director. Payment of any excess due on the interim invoice will be made at the same time as the final payment. Under no circumstances will the State be liable for total project costs in excess of $20,000 (U.S. dollars).

If the State cancels the project at any time during the course of this contract, the Contractor shall submit a final billing based on actual expenses incurred up to the termination date.

CONTRACT DISPUTES: All contract disputes will be subject to the provisions of Appendix A, Article 3 of the Standard Form For Professional Services Contract, unless other specifically identified statutes and/or legal requirements apply.

REQUESTS FOR CONTRACT EXTENSION: Requests to extend the ending date for contract performance must be submitted in writing at least 21 days prior to March 4, 1988. The written request should specify the reason why the contract extension is requested and the proposed date to which extension is needed. Upon receipt of the requested extension, the Project Director will send contract amendment forms to the contractor. Contract amendment forms must be signed by the Contractor's authorized agent and returned to the Project Director at least 10 days prior to expiration of the contract. Requests for contract amendments will not be considered if such requests are not received within the time frames specified. Because the value of this study to the State is highly dependent on having the required reports completed according to the schedule specified above, it is unlikely that the Project Director will approve an extension of the contract.

STATE OF ALASKA

STANDARD AGREEMENT FORM
FOR PROFESSIONAL SERVICES CONTRACT

1. Agency Contract Number	
2. ATN Number	88-0198
3. Service Code(s)	5950
4. Financial Coding	08751001
5. Agency Assigned Encumbrance Number	0881438
6. Vendor Number	7. AK Bus. Lic. #

This contract is between the State of Alaska,

8. Department of: Commerce and Economic Development — hereafter, the State, and

9. Contractor: The Sea Fare Group — hereafter, the Contractor

Mailing Address	Street or PO Box	City	State	Zip Code
3510 1st Avenue N.W.		Seattle	Washington	98107

10.

ARTICLE 1. Appendices: Appendices referred to in this contract and attached to it are considered part of it.

ARTICLE 2. Performance of Services:

2.1. Appendix A (General Provisions), Articles 1 through 14, governs the performance of services under this contract.

2.2. Appendix B sets forth the liability and insurance provisions of this contract.

2.3. Appendix C sets forth the services to be performed by the contractor.

ARTICLE 3. Period of Performance: The period of performance this contract begins December 24, 1987, and ends March 30, 1988. Performance may be extended for additional periods by the written agreement of the parties.

ARTICLE 4. Consideration:

4.1. In full consideration of the Contractor's performance under this contract, the State shall pay the Contractor a sum not to exceed $ 20,000 in accordance with the provisions of Appendix D.

4.2. When billing the State, the Contractor shall refer to the ATN Number and send the billing to:

11. Department of	Attn: Division of
Commerce and Economic Development	Business Development
Mailing Address	**Attention**
P.O. Box D, Juneau, Alaska 99811	Bonnie Jo Borchick

NOTICE: This contract has no effect as an offer by the Contractor until it is approved by the Department of Administraton.

12. CONTRACTOR		14. APPROVAL BY THE STATE CONTRACTING AGENCY	
		NOTICE! This certifies the availability of funds. I am aware that certifying false, inaccurate, or misleading documents constitutes an unsworn falsification punishable under AS 11.56.210	
Name of Firm: The Sea Fare Group		Signature of Head of Contracting Agency or Designee: J. Williams for	Date: 12/30/87
Signature of Authorized Representative: Sandi McKenzie	Date: 12/22/87	Typed or Printed Name of Authorizing Official: J. Anthony Smith	
Typed or Printed Name of Authorized Representative: Sandi McKenzie		Title: Commissioner	
Title: President	Employer I.D. No. (EIN) or SSN: 91-1224431	15. APPROVAL BY THE DEPARTMENT OF ADMINISTRATION	
13. REQUESTING AGENCY #87951			
Department/Division: DCED/Division of Business Development			
Signature of Project Director: S. Merculieff	Date: 12/29/87	N/A	
Typed or Printed Name of Project Director: Larry Merculieff			
Title: Director			

APPENDIX A
GENERAL PROVISIONS

Article 1. Definitions.

1.1. In this contract and appendices, "Project Director" means the person who signs this contract on behalf of the Requesting Agency and includes a successor or authorized representative.

1.2. "State Contracting Agency" means the Department for which this contract is to be performed and for which the Commissioner or Authorized Designee acted in signing this contract.

Article 2. Inspection and Reports.

2.1. The Department may inspect, in the manner and at reasonable times it considers appropriate, all the Contractor's facilities and activities under this contract.

2.2. The Contractor shall make progress and other reports in the manner and at the times the Department reasonably requires.

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APPENDIX C
SERVICES TO BE PERFORMED

WORLD MARKETS FOR SALMON -- PEN-REARED SALMON IMPACTS
ATN No. 88-198

The purpose of this project is to evaluate the extent of potential market competition between wild and farmed Alaska salmon, and between Alaska salmon and farmed salmon from other states and countries.

Questions such as the following are of key concern and will be addressed by the contractor:

- Will world markets be able to absorb farmed Alaskan salmon, from 1990 (when the potential first harvests of Alaskan pen-raised salmon would take place) onward at a price that will be profitable for the producers?

- Will the amount of farmed salmon projected for production worldwide in this time frame dampen current markets for Alaskan wild salmon, and if so, to what extent?

- Would the Alaskan pen-raised salmon be directly competitive with Alaskan wild salmon or simply a part of the farmed salmon supply?

TASK 1: BASELINE MARKET AND PRICE INFORAMTION

In-house files of recent and on-going studies of the contractor, Dr. James Anderson's sources and other existing information will form the basis of data for this task, however, some original data gathering will be performed. In particular, supermarket representatives and Japanese salmon buyers will be interviewed. Interviews will be conducted so that the data gathered is consistent with work performed by Dr. Anderson for New England food service groups.

The contractor will first outline the current distribution channels for farmed salmon and Alaskan wild production and describe the areas in which wild and farmed stocks may directly compete.

Next, historical prices will be examined for any trends relative to supply for both farmed and wild salmon. While average prices will be reported in this step, exceptions to the rule will be noted. Of particular interest are exceptions that reflect higher prices through unique marketing or product identification efforts, particularly where products are specifically identified as Alaskan.

A. Where are Alaska's King, Coho and Sockeye Salmon Marketed?

The contractor will present a thorough overview of the current market and marketing conditions for Alaskan king, coho and sockeye salmon. The overview will be specific as to species, product form, transportation modes, purchase arrangements, export assistance, tariff barriers, trade promotion activities and other information which will help to thoroughly discribe the existing markets for Alaska wild salmon.

A survey will be performed for major institutional and retail market sectors to delineate the geographic sales distribution, utilization of various product forms, seasonality of sales, and usual distribution channels.

B. Price Levels Over the Past 10 Years for King, Coho and Sockeye Salmon.

The contractor will present an accurate historical description of market price trends for Alaskan salmon. Government and private seafood price data sources will be analyzed to determine domestic and export price and volume of sales information by major product form. The contractor will include supply level (landings) figures and a comparison by product form.

C. Existing Markets for Farmed Salmon.

The contractor will present a thorough and quantitative overview of the major world supply sources and markets for farmed salmon. The overview will be specific as to species, product form, transportation modes, purchase arrangements, export assistance, tariff barriers, trade promotion activities and other information which will help to thoroughly describe existing market conditions. This will be drawn in part from the contractor's in-house studies of domestic and world salmon farming activities and markets, such as recent work by Anderson and Brooks analyzing buyer preferences for farmed and wild salmon in the northeast. The contractor will expand the analysis to include other countries and geographic regions of the United States as part of this task. Particular emphasis will be given to the market in Japan. Additional information will be obtained from interviews with trading companies and other firms and individuals active in and knowledgable about the salmon industry.

D. Price Levels of Pen-Reared Salmon Over the Past Five Years.

The contractor will describe and compare the prices and volumes of pen-reared salmon products over the past five years in all major world markets.

E. Effects of the Exchange Rate and Supply Changes on Market and Price Distribution.

Exchange rate information will be collected and correlated with import/export figures and the price levels of major salmon products over the last five years. The contractor will compare the fluctuating value of the dollar to the price and volume of salmon products traded on the world market.

TASK 2: MARKET FORECASTS

Because farmed salmon production could not occur in Alaska for several years, forecasts of future market conditions are important to investment decisions. Forecasts of expected demand levels and prices will be presented by the contractor. Using information collected in Task 1, the relationship between wild and farmed products stocks will be examined.

A. Volume of Farmed Salmon Expected to Enter the Marketplace Over the Next 10 Years.

The contractor will review recent studies of farmed salmon production trends and projections for the next ten years. Where discrepencies are evident, the contractor will provide an evaluation of the accuracy of the studies presented.

B. Future Markets and Price Level Expectations for Potential Alaskan Farmed Salmon.

The contractor will develop a matrix of market size and price forecasts to be used in evaluating the effects of production increases expected over the next ten years. The matrix will be derived from available econometric work, interviews with industry, academic and government experts and research completed in the tasks above. The contractor will project a range of possible volumes of farmed Alaska salmon, and predict the effects on major markets, including the an analysis of the most likely market niches these salmon could occupy and the price ranges available. An analysis of the effects of possible exchange rate changes will be included.

C. Analyze the Degree of Overlap or Competition Between Alaskan Wild Salmon, Potential Alaskan Farmed Salmon and Other Farmed Salmon in Major Markets

The contractor will predict the degree of market competition expected in the future between Alaska wild salmon and potential farmed salmon products. The analysis will compare projected

prices, availability, product forms and characteristics (fresh/frozen, size, color, method of harvest and etc.), of the major Alaskan wild salmon fisheries and farmed salmon harvests. The major marketing attributes that may cause substitution or differentiation of the types of salmon will be analyzed in the particular areas where there might be market overlap or competition.

The contractor will suggest the probable outcome of any future market overlaps which are identified. This work will identify Alaska salmon products that may not be competitive in the marketplace and the characteristics which make them noncompetitive, which products would have advantages in specific markets and the reasons, and will analyze the possiblities of undertaking effective marketing programs to improve sales and maximize prices.

APPENDIX D
CONSIDERATION, REPORTING SCHEDULE AND GENERAL CONDITIONS

WORLD MARKETS FOR SALMON -- PEN-REARED SALMON IMPACTS
ATN No. 88-198

REPORTING SCHEDULE: The contractor will submit an interim project report in writing to the Project Director which summarizes the results of work completed to date by February 5, 1988, as described in Appendix C..

A draft of the final project report containing all study findings, including those findings contained in the interim report, will be submitted in writing to the Project Director for review and approval by February 25, 1988. The contractor will incorporate changes to the draft material suggested by the Project director and submit ten copies including the unbound original (for further duplication) of the approved final report on or before March 4, 1988. This schedule allows three days for the Project Director to complete his review of the draft report.

CONSIDERATION: The contractor will submit an invoice for payment with the interim project report on or before February 5, 1988 which reflects all expenditures and services rendered for that period of the contract for review and approval by the Department. A second and final invoice for payment will be submitted with the final project report on or before March 4, 1988 which reflects all expenditures and services rendered for the remaining period of the contract. Payments on both the interim and final invoices are subject to the limitations and conditions described below.

Fees charged for services performed by the contractor's various study team members will not exceed the rates of $75 per hour. Upon acceptance of the interim and final project reports and receipt of the accompanying invoices by the Project Director, the State will pay the contractor within 30 days. Failure of the contractor to comply with the reporting provisions of this contract may result in the State withholding payment until such compliance is obtained.

If the total amount due on the contractor's interim invoice exceeds $12,000, the State will withhold payment of the excess until the final project report and model is recieved and accepted by the Project Director. Payment of any excess due on the interim invoice will be made at the same time as the final payment. Under no circumstances will the State be liable for total project costs in excess of $20,000 (twenty thousand dollars).

If the State cancels the project at any time during the course of this contract, the Contractor shall submit a final billing based on actual expenses incurred up to the termination date.

WORK PLAN: Work on the various segments of this contract will be shared by Dr. James L. Anderson and other individuals in The Sea Fare Group. The contractor will obtain written approval of the Project Manager, and if necessary an approved contract amendment, before any significant change is made in the following schedule:

TASK 1: BASELINE MARKET AND PRICE INFORMATION

Where are Alaska's king, coho and sockeye salmon marketed?

Sea Fare Group 90%
James L. Anderson 10%

Price levels over the past ten years for king, coho and sockeye salmon.

Sea Fare Group 98%
James L. Anderson 2%

Existing markets for farmed salmon

Sea Fare Group 70%
James L. Anderson 30%

Price levels of pen-reared salmon over the past five years

Sea Fare Group 98%
James L. Anderson 2%

Effects of the exchange rate and supply changes on market and price distribution.

James L. Anderson 100%

TASK 2: MARKET FORECASTS

Volume of farmed salmon expected to enter the market place over the next ten years.

Sea Fare Group 70%
James L. Anderson 30%

Future markets and price level expectations for potential Alaskan farmed salmon

James L. Anderson 100%

Analyse the degree of overlap or competition between Alaskan wild salmon, potential Alaskan farmed salmon and other farmed salmon in major markets.

James L. Anderson 100%

CONTRACT DISPUTES: All contract disputes will be subject to the provisions of Appendix A, Article 3 of the Standard Form For Professional Services Contract, unless other specifically identified statutes and/or legal requirements apply.

REQUESTS FOR CONTRACT EXTENSION: Requests to extend the ending date for contract performance must be submitted in writing at least 21 days prior to March 4, 1988. The written request should specify the reason why the contract extension is requested and the proposed date to which extension is needed. Upon receipt of the requested extension, the Project Director will send contract amendment forms to the contractor. Contract amendment forms must be signed by the Contractor's authorized agent and returned to the Project Director at least 10 days prior to expiration of the contract. Requests for contract amendments will not be considered if such requests are not received within the time frames specified. Because the value of this study to the State is highly dependent on having the required reports completed according to the schedule specified above, it is unlikely that the Project Director will approve an extension of the contract.

APPENDIX E

A) For the purposes of this work it is understood that unless specified all data sources are secondary sources.

B) Because of the tight schedule required by this contract, the final draft may be received chapter by chapter. Jim Anderson's original work may be part of the final draft.