

S B

195

Re: Mrs. Andy's Coho Ranch
1132 Lakeview Terrace
Fairbanks, Alaska 99701
(907) 456-4598

Andy and Pamela (Rahoi) Wescott have been Alaskan residents since 1966 and 1953, respectively. They are in the process of raising coho (silver salmon) to a 3-5 pound stage to sell commercially. The coho are raised in tanks in a heated building with a completed market sale at 18-24 months.

Mrs. Andy's uses a 99% recycling water system that collects wastes and returns clean, originated water into the tanks. One-half gallon of water is added per 1,000 gallons to keep the water temperature at 55 degrees F.

Mrs. Andy's received their first coho June 1, 1988. As of December 27, 1988 they were 6 inches to a whopping 16 1/4 inches.

The coho are fed an Oregon pellet that is prepared in Washington.

Mrs. Andy's has had 0 deaths due to disease. Some jumped retaining nets and we had a system failure that we have now improved upon.

Andy and Pamela hope to receive financing to grow another 200,000 coho and 2,000 Arctic Char which we will receive April, 1989. Once we have these 200,000 coho and Arctic Char, we estimate they will create 40 jobs which include biologists, fish culturists, office clerks, manager, processors, packers, delivery truck drivers and airline and truck transport personnel.

After this initial step of 200,000 coho and 2,000 Char we hope to hatch our own and increase, as the demand for coho increases, to 1,000,000 coho per year. Arctic Char is a new market and it also looks very promising. We also hope to create our own fish food, fish fertilizer and a gourmet cat food which will add more jobs and income to the State.

With other plants on line over the State we estimate that for each 200,000 fish it will require approximately 40 employees.

We have had tremendous amounts of help from the FRED Division, particularly Dave Parks at the Clear Hatchery, Mike Kaill in Juneau, Tom Kron in Anchorage and Brian Allee in Juneau.

Senators Fahrenkamp and Sturgelewski have also been extremely helpful and Mrs. Andy's would like to thank them.

Also supportive of Mrs. Andy's is the Fairbanks Chamber of Commerce, the local news media and the Fairbanks Convention Bureau.

March 1989

Mrs. Andy's Coho Ranch has put a third of the silver salmon into their private lake because the project was going so well, there was no need to support the extra fish. The ones remaining are growing and are now larger than pan size. Pan selling price now is \$2.58 a fish. (No fish will be sold from this project.)

NO SMALL FRY

Andy Wescott has big dreams for Coho Ranch

By KELLY BOSTIAN
Staff Writer

This week, a long-standing debate over finfish and mariculture again rises in Juneau, while reports of a new disease surfacing in coastal mariculture operations in Washington strikes fear into biologists and aquaculturists.

Meanwhile, back at the ranch, Andy Wescott, small-time Interior fish farmer, keeps dreaming big and hopes that Mrs. Andy's Coho Ranch won't go belly up.

Wescott lives at Lakeview Terrace, just outside Fairbanks to the south. He is the only licensed finfish farm operator in the state. Two years ago, a moratorium was placed on aquaculture to allow the state to look into the risks of developing such an industry.

Wescott has been an exception because his small operation is enclosed, as opposed to the net pens in open water ocean hatcheries. He uses well water that is recirculated through two 1,200-gallon tanks in his garage.

"It's really just kind of a big aquarium," he said. Wescott and his wife, Pamela, enjoy working with the fish and grow somewhat attached to them, he said. He had about 1,200 fish in the tanks until last weekend, when he dumped about 1000 in the lake outside his home. They were part of an experiment and helped prove his system works.

The remaining 200 or so coho salmon will be used to see how large he can make them in a short period of time. He hopes they'll grow to 3 to 5 pounds in four to eight months.

An enjoyable endeavor

He spends his mornings in the garage with the hum of oxygen pumps and heaters, feeding the fish, watching them for signs of change, checking equipment.

The Wescotts also own the Little Eldorado Gold Camp, a tourist attraction off 1 Mile Elliott Highway. "That's basically 120 days of hard work, but what do you do the rest of the time?" he said.

They started their fish farm operation during a time of high in-

terest in pure beef and pure chicken products without steroids. They looked into different fresh products, read about fish farms in Canada, and decided to try it on their own.

"We just kind of put two and two together," he said. "Fish farming has worked well all over the world and there's no reason why it can't work here."

Despite his status as the only operation in the state, Wescott has had a hard time getting a backer. He wants to go big, real big. But he can't do that without money.

Politics, he said, is a big part of what is holding him back.

Politics in fish

The introduction of SB 195, on Monday, promises to spark renewed debate over the mariculture industry in Alaska, and Wescott is in the middle of it.

The bill, sponsored by the Senate Resources Committee, would authorize all forms of finfish farming under a permit system after the moratorium expires July 1, 1990, according to Sen. Bettye Fahrenkamp, D-Fairbanks, committee chairwoman.

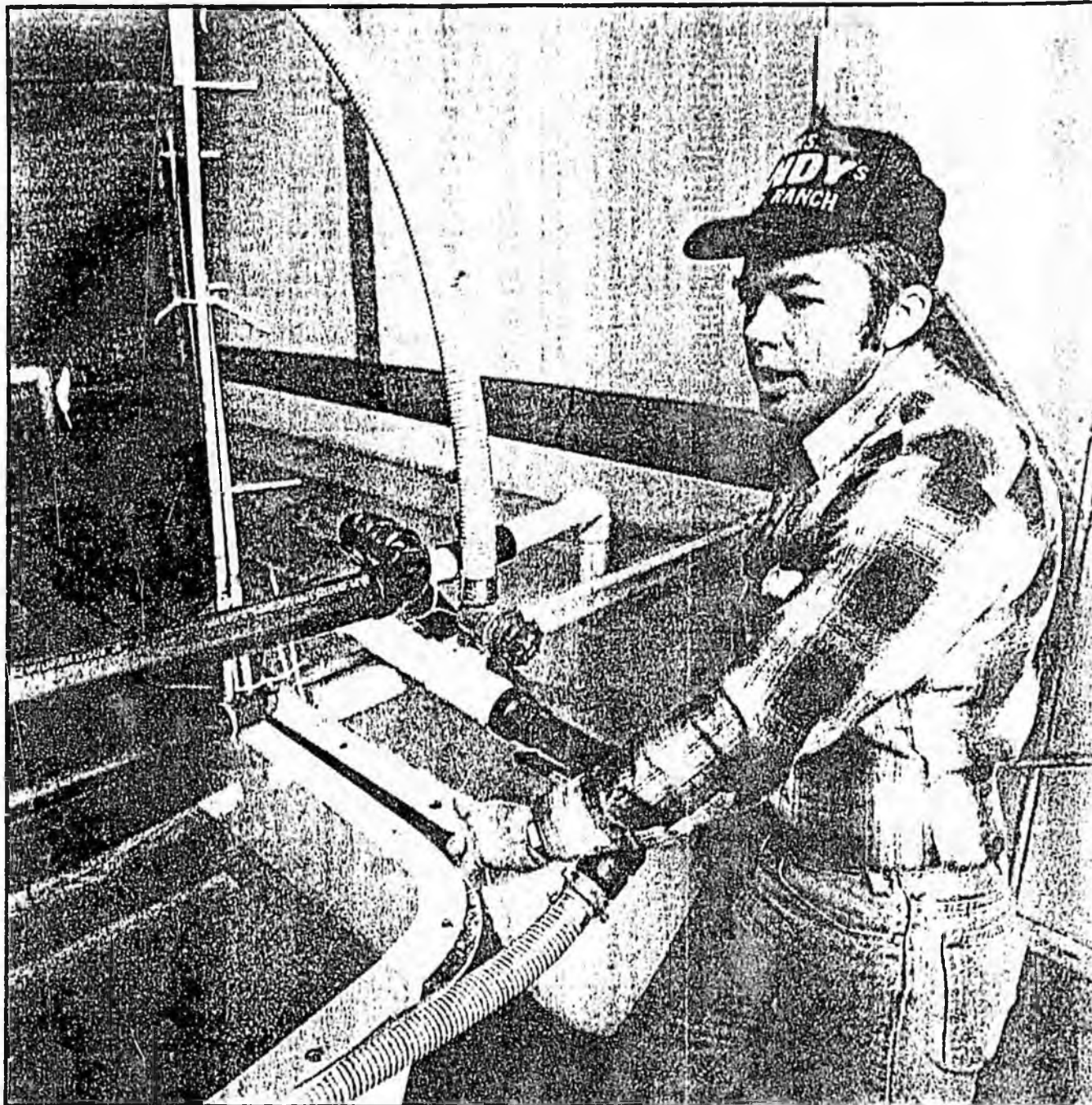
Diseases such as the outbreak in Washington this week are what people who oppose development of mariculture fear most. The Washington virus led two hatcheries to destroy 3.8 million fish and eggs, about one percent of the entire Washington state hatchery production, according to the Associated Press.

There is little if any chance of such an outbreak originating in a project like Wescott's. "It's isolated from any running water," he said. "If we have a disease outbreak, you just shut the whole thing down and that's it. My fish would have to travel through seven miles of sewer pipe before they come in contact with any other fish."

Wescott, who will testify before the resources committee Monday, thinks news of the Washington outbreak will hurt SB 195. No matter what the outcome, however, he will have his say in Juneau and that can't hurt.

Education is a key

"I think we'll see another mora-



FROM LITTLE ACORNS—Andy Wescott discusses politics, fish and economics at Mrs. Andy's Coho Ranch.

torium, which will mean I'll be the only operation for another couple of years," he said. "I was hoping it would go through. It would help me more if it went through, but it's not going to hurt me if it doesn't."

"People in Juneau don't understand what I'm doing. So what I have to do is educate them and help them understand the difference between net pen farming in the ocean and tank farming in the Interior. The big thing is that we're pioneering something here that could make a big difference in the economy of the Interior."

While in Juneau, he also will speak to the Alaska Board of Fisheries. What's held Wescott back more than anything, he said, is his inability to tell potential supporters that he has a guaranteed supply of new eggs each year. The

board annually decides whether Wescott can take eggs or not.

He hopes that next week he will get the go-ahead to take eggs. "I'm quite sure they'll give me everything I need," he said. "It will be controlled, but we'll probably come out with a law that says my project can take eggs for as long as it exists. Then, it's just a matter of how many and what species each year."

Wescott also hopes his testimony in Juneau will help him gain public awareness and help with his bid for an \$300,000 grant from the Alaska Science and Technology Foundation.

Dreaming big

He has 200,000 coho salmon fry waiting for him at the Alaska Department of Fish and Game hatchery at Clear. Clear hatchery per-

a two-tank fish farm he has in his garage. He has visions of one day producing 5 million pounds of fish a season.

Mike Helton/News Miner

sonnel have been giving him some technical assistance and he has learned quite a lot from helping them with egg-take and spawning operations at their weir, he said.

If he doesn't get the money the hatchery will keep the coho and mix them in with stocking programs.

It would take \$800,000, he estimates, to get that initial batch to market. Then the operation would be off and running. "We would get about 600,000 pounds of fish," he said. "Selling at \$5.40 a pound, and costing \$2.40 a pound to raise, anyone who knows simple math can see the profit margin."

With the grant money, Wescott would employ 12 people in construction and operation phases of the project, he said. Eventually, he could produce up to 5 million

pounds of fish a season and employ up to 40 Fairbankians.

He's looking to compete in a market with hatcheries in Norway and Idaho, which now are selling their products in Alaska grocery stores. He also talked to a dealer in Korea, who said he could take as much as 10,000 pounds of fresh fish a week. "It could be a great export product for Fairbanks," Wescott said.

Until he finds a backer, Wescott said, the grant is probably his only chance for success.

He has talked to major seafood companies to see if they would back him, but has made no progress. "What they tell me is, 'Andy, you're the only game in town. But right now it's easier to go sign on name in Canada and go to work, go to Washington or Idaho and be a farm.' They don't really offer me the why for nots," he said.

STATE OF ALASKA
THE LEGISLATURE

POUCH Y - STATE CAPITOL
JUNEAU, ALASKA 99811
907-465-3800

LEGISLATIVE AFFAIRS AGENCY

MEMORANDUM

March 9, 1989

SUBJECT: Sectional summary of SB 195; An Act relating to commercial finfish farming and aquatic farm and hatchery permits

TO: Senator Bettye Fahrenkamp

FROM: George Utermohle *GU*
Legislative Counsel

This memorandum is a sectional summary of SB 195, as requested by Tom Moyer of your staff.

Please note that a summary or analysis of a bill is not an authoritative interpretation of the bill. The bill itself is the best statement of its contents.

Section 1 of the bill amends the definition of "fish and game farming" in AS 16.05.940 by deleting references to fish, as a result only the term "game farming" would be defined.

Section 2 of the bill amends the conditions attached to private nonprofit hatchery permits under AS 16.10.420.

A private nonprofit hatchery operator may resell salmon eggs or fry to a person who has a permit to operate an aquatic farm or hatchery under AS 16.40.100.

A private nonprofit hatchery operator may sell surplus eggs from salmon returning to the hatchery to aquatic farms and hatcheries.

Section 3 of the bill amends AS 16.10.450(a) in order to allow the operator of a private nonprofit hatchery to sell salmon eggs to an aquatic farm or hatchery. The operator of the private nonprofit hatchery must then use the proceeds from the transaction for the operation of the hatchery and for fisheries activities of the regional association.

Section 4 of the bill amends AS 16.40.100(a) in order to allow a person to construct or operate a hatchery to supply finfish to an aquatic farm if the person obtains a permit from the commissioner of fish and game.

Section 5 of the bill repeals and reenacts AS 16.40.100(b) in order to allow a person who has an aquatic farm or hatchery permit to buy and sell stock and aquatic farm products used or raised at the aquatic farm or hatchery. The current restrictions relating to whom an aquatic farm or hatchery may sell shellfish stock is deleted.

Section 6 of the bill amends AS 16.40.100(c) in order to allow the commissioner of fish and game to attach conditions to aquatic farm and hatchery permits that relate to standards for treatment of discharge water from an aquatic farm or hatchery.

Sections 7 - 11 of the bill amend certain sections of AS 16.40 in order that finfish are treated the same as aquatic plants and shellfish for the purposes of permits issued under AS 16.40.100 - 16.40.199.

Section 12 of the bill amend AS 16.40.140(a) in order that a private hatchery may sell or transfer stock to the Department of Fish and Game and to a private nonprofit hatchery as well as to aquatic farms and hatcheries under AS 16.40.100 - 16.40.199. This subsection is also amended to allow a hatchery under AS 16.40.100 - 16.40.199 to sell finfish to an aquatic farm or related hatchery outside of the state.

Sections 13 - 15 of the bill amend the definition of "aquatic farm product", "hatchery", and "stock" by adding finfish to the list of organisms included within each definition.

Section 16 of the bill is the effective date section. This bill takes effect on July 1, 1990, which is the termination date of the current moratorium on finfish farming.

GU:kb
wkk2/118



Penco Ak

3620 PENLAND PARKWAY
ANCHORAGE, ALASKA 99508

January 26, 1989

Senator Bettye Fahrenkamp
Chairman,
Senate Natural Resources Committee
Box V
Juneau, AK 99811

Dear Bettye;

As we mentioned to you on the phone we would like to do a demonstration project on growing salmon in saltwater pens here in southcentral Alaska. We have done a lot of research on salmon farming and believe it has enormous potential for the state. The only way to really know how well fish farming will do here is to try it and see. One or more demonstration projects around the state would provide a lot of good information without harming anything. We believe it is appropriate for the private sector to take the risk and demonstrate the potential of this technology.

Our interest is in testing the feasibility of pen rearing salmon in southcentral. Our research has found that the Seward area is well suited for this test. We plan to obtain the smolt from the state, paying a reasonable fee for them. We are looking at a production level of 100 to 150 metric tons per year, with the project lasting through two harvest cycles. After the fish are harvested from the second cycle, the project would be shut down and all equipment removed from the water.

We would be willing to make all information collected from the project available to the State. We would also be willing to assist the State, to the extent possible, in collecting data that it feels would be needed to better analyze the project. To cover the cost to the State for permitting, oversight, analysis, etc. on this project, we would be willing to prepay the raw fish tax on the estimated production from the project. This would amount to somewhere around \$70,000. We would also be willing to post a bond, say around \$25,000, to guarantee that all equipment is removed and the area cleaned up after the project is over.

We have prepared a preliminary financial analysis on the project and would be happy to send you a copy if you are

interested. It is our desire to have the benefits of this project accrue to Alaskans as much as possible. We hope to raise the necessary funding for the project in state. We plan to buy as much of the equipment as possible from Alaskan businesses. The fish feed we plan to use (about 40% of the total cost of the project) will be manufactured in state and, since the project will offer year round employment, we will be employing Alaska residents.

It appears that the present moratorium will need to be amended to allow for such a demonstration project or projects. In addition, we believe the legislation should contain the following:

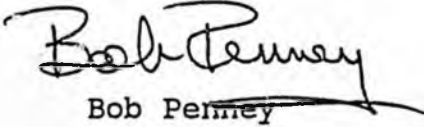
- * If there must be limits on the amount of production allowed from a demonstration project, make it no less than 200 metric tons per year. A project would have to be large enough to pay for itself and offer enough potential profits for investors to be willing to take the risk. It would also need to be this large in order to give a reasonable indication of how a full scale farming operation would work.
- * Project duration should be no less than two harvest cycles to allow adequate evaluation of the potential.
- * Allow the smolts to be purchased at a reasonable fee from PNP hatcheries or from State hatcheries.
- * Permittee would be free to use any salmon species desired for the project.
- * Keep the permitting process as short as possible; hopefully no longer than 60 days. Our plan is to get the legislation approved this session, and to put smolt in the pens in the spring of 1990. To accomplish that we would need the necessary permits in hand by September, 1989 so that we can make a commitment on purchasing the smolt. Since this is a demonstration project of short duration, it doesn't appear that an extensive permitting process would be necessary.
- * If necessary, we would be willing to have a bonding requirement, at a reasonable dollar figure, and prepayment of the raw fish tax on estimated production included in the bill.

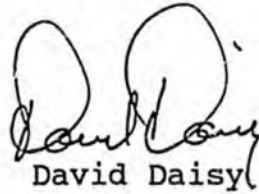
Bettye, we would really appreciate your committee's decision to get involved with such a project. Both of us are willing to come to Juneau or do whatever else you think would be helpful to get this legislation passed this session. Please let us know what you think the potential is for getting this through the legislature this session, and what we can do to help.

Our state will make a serious mistake if we don't at least explore the operational feasibility of fish farming. It appears that Norway, Scotland, Canada, Chile, New Zealand and Washington state are already up to speed and seriously competing with Alaska's salmon resource. If fish farming can be established here to compete with them, we would eventually have a situation that would help the sale of both the wild and farm reared fish. We could cover the entire spectrum of the market.

We are willing to take the financial risk, all we ask is that the legislature give us the right to try.

Sincerely,


Bob Penney


David Daisy

March 16, 1989

Senator Bettye Fahrenkamp
P.O. Box V
Juneau, AK 99811

Dear Senator Fahrenkamp,

Thank you for the opportunity to comment on the future of mariculture in Alaska, and specifically on fish farming.

I and members of my family are all native born Alaskans and were raised in Southeast Alaska. We have been in the construction business for many years and closely associated with the timber industry. Our business has headquartered out of Anchorage for the past twelve years.

As I and my family look to Alaska's future and seek to expand our business interest into areas compatible with what Alaska offers naturally and what we think we know how to do or could learn to do, two areas that we consider most appropriate are mariculture and tourism. Looking at Alaska's natural assets and the existing successful seafood industry, leads us to conclude that farming aquatic plants and animals makes sense. The experience of other countries confirms these observations.

Assuming that Alaska would eventually diversify its existing seafood industry beyond gathering and hunting activities, we began to investigate the feasibility of fish farming about ten years ago. Along with our construction activities, primarily in Southeast Alaska, we collected information and gradually narrowed our options to a specific site which we purchased four years ago. In 1984, with the assistance of the Farmers Home Administration under their Agriculture Loan Program, we purchased a large parcel of land in Copper Harbor near Hydaburg on Prince of Wales Island. We purchased this land specifically to develop it for a fish farm.

We began acquiring the necessary permits for the farm in 1986. After surveying, the building site was cleared and leveled. Construction was scheduled to begin in the Spring of 1988. We were aware that initially only "land locked" farming would be allowed and that the initial species would be trout. These were the conditions of our permit from the Department of Revenue (Fish and Game Licensing) which will expire at the end of 1990.

Before construction could begin, a one year moratorium was imposed by the Legislature to allow a study of the issue(s). However no action was taken and no studies were conducted. This was followed by a two year moratorium, again to "study" the issue(s). Almost two years have passed since the first moratorium and still no studies have been conducted or commissions have been set up.

The Ferguson family is finding it exceeding difficult to continue with its plans under the moratorium. The "signals" seem clear that the State does not want fish farming. Imposing moratoriums so that studies can be conducted is logic that a business man can understand, however when no studies are conducted and the moratorium is extended, the signals seem clear that Alaska either cannot make up its mind what to do and is unwilling to provide the resources and direction so that meaningful studies can help resolve the issue.

We have been and are still willing to work with the State government to conduct studies and demonstrations that will lead to sensible regulations. The State has proven by its own aquaculture program that modern day, state-of-the-art fish culture technology, and proper attention paid to genetics and disease guidelines will lead to successful programs. Just this past summer, the fish returning to Prince William Sound hatcheries contributed an additional \$32 million to the commercial salmon fishery. These "hatchery" fish comprised 46% of the total salmon return to the Sound and turned what would have been an average year into a record breaker. In fact the hatchery contribution alone, this last year in the Sound, exceeded the total value of the entire 1986 salmon run for the region.

We want to work with the government to develop the proper guidelines and regulations that will allow mariculture endeavors the same measure of success that the State's and Private Nonprofit Program has enjoyed. We need a favorable business climate, we need regulations that make sense and that will give this new seafood endeavor a chance to mesh with the existing seafood industry. This is part of the reason for selecting the site we did, south of Hydaburg. Hydaburg has a trained labor force for hire in the off season that knows the fish processing business. Hydaburg has a cold storage and transportation infrastructure that already is developed working with seafood products.

In our discussions with the Department of Fish and Game and the Department of Natural Resources, we find agencies willing to be helpful to the extent that their resources and rules will allow. But without specific direction and resources from the Legislature, these agencies cannot enter into new studies and cooperative projects with us. We are willing to work with you to find the answers. We are not requesting financial assistance from the State. We do request that you provide the resources and the specific direction to the State agencies so that they will have clear direction as to what you want accomplished. We want to work with Alaskan stocks, using Alaskan technology developed by the State and Federal Agencies and the University. It is our intent to provide jobs for Alaskans and to use the existing seafood infrastructure to the extent possible. We want proper and reasonable guidelines. What we need most of all is your clear direction. If you want mariculture, if you want fish farming and if you want to create a climate for success and to mesh this budding industry with Alaska's existing seafood industry, then provide specific and clear direction with adequate resources to the agencies charged with the responsibility.

Financially we cannot continue to hang on year by year, from moratorium to moratorium.

Thank you for the opportunity to express my views.

Sincerely yours,



Thorne W. Ferguson
2245 Crataegus Avenue
Anchorage, Alaska 99508



**STATE OF ALASKA
OFFICE OF THE GOVERNOR
BILL ANALYSIS**

DEPARTMENT Fish and Game	DIVISION FRED	BILL NUMBER SB 195	SPONSOR Resources and Finance
SHORT TITLE OF BILL Commercial finfish farming and aquatic farm and hatchery permits			
DEPARTMENT POSITION Neutral if amended.			
PREPARED BY Brian J. Allee	DATE 3/16/89	COMMISSIONER'S SIGNATURE <i>[Signature]</i>	DATE 3/16/89

SUMMARY

OTHER AGENCIES AFFECTED BY BILL Dept. of Environmental Conservation, Dept. of Natural Resources, Dept. of Commerce & Economic Deve., OMB, Div. of Governmental Coord.	CONSTITUENT GROUPS AFFECTED BY BILL Commercial fishermen, sport fishermen, PNP hatchery operators, Regional Aquaculture Associations, Recreational Interests, Upland owners and Managers
ORGANIZATIONAL SUPPORT FOR BILL Potential private for profit fish farmers	ORGANIZATIONAL OPPOSITION TO BILL

FISCAL IMPACT: NONE FISCAL NOTE ATTACHED

BACKGROUND/LEGISLATIVE INTENT
SEE ATTACHED

ANALYSIS OF BILL/PROGRAM EFFECTS
SEE ATTACHED

AMENDMENTS PROPOSED

PLEASE ATTACH A SEPARATE SHEET FOR ADDITIONAL COMMENTS OR ANALYSIS.

SB 195 Bill Analysis

BACKGROUND/LEGISLATIVE INTENT

Senate Bill 297, which became law during the 1987 legislative session, placed a moratorium until July 1, 1988 on authorizations for commercial finfish farming and also provided the Commissioner of ADF&G with the authority to issue permits for the collection of bivalve spat for use in connection with an aquatic farm. In response to this, the Commissioner, under a delegation from the Board of Fisheries, developed regulatory amendments to 5 AAC 41.001-41.100 (regulations governing the transportation, possession, and release of live fish) to establish a permitting system for commercial shellfish farming.

Aquatic farming legislation passed during last years' session (Chapter 145, SLA 1988) provided for the farming of shellfish, shellfish hatcheries, and the farming of aquatic plants as part of a statewide mariculture program. The legislation also extended the moratorium on finfish farming until July 1, 1990. In response to this, the department has drafted a new set of regulatory amendments for aquatic plant farming which are currently out for public review. These draft amendments are designed to incorporate changes into the shellfish farming section of the current regulations necessary for the farming of aquatic plants.

Senate Bill 195 proposes amendments to private nonprofit hatchery program statutes (AS 16.10.420, AS 16.10.450) and statutes created by the implementation of Chapter 145, SLA 1988 (AS 16.40.100 --AS 16.40.199) for aquatic farm and hatchery permits related to shellfish and aquatic plants.

ANALYSIS OF BILL/PROGRAM EFFECTS

Importation

As currently drafted, the provisions in SB 195 concerning the importation of Atlantic salmon and other finfish lack the strict prohibition necessary to ensure that finfish farming can proceed in a way that is prudent from a disease and genetics standpoint.

On page 5, lines 4-7 the bill provides that "A person may not import into the state an aquatic plant, finfish, or shellfish for the purposes of supplying stock to an aquatic farm or hatchery unless authorized by a regulation of the Board of Fisheries." (Emphasis added.)

This language implies that under certain circumstances there might be a reason to allow the importation of Atlantic salmon or other finfish species from outside the State of Alaska.

The Alaska Department of Fish and Game (ADF&G) has the expertise

and ability to manage finfish farming if the correct restrictions are in place and the genetics and disease policies are followed.

SB 195 could meet these standards if the phrase "unless authorized by a regulation of the Board of Fisheries" was deleted as it is currently applied to finfish.

Definition

Page 1, Section 1. Fish would be eliminated from the current definition of fish or game farming under Title 16 definitions. This definition has been subject to various interpretations from members of the public, ADF&G, and the Attorney General's Office in the past. This change may reduce the amount of confusion which has occurred.

Policy Issues

Page 1, Section 2. The amendments to AS 16.10.420 would allow PNP hatchery operators to sell eggs, fry or smolt to private fish farming ventures. The concept of Private Nonprofit (PNP) hatchery operators selling stock to private fish farming ventures is a new one which is not consistent with the regulations which implement the program or with the intent (legislative) of the PNP program, which is to provide fish to the common property fishery. Currently, 29 PNP hatchery permits have been issued by ADF&G and 22 are in operation. These hatcheries were developed and now operate as users of a public resource for a common good. For the same reason, the current ADF&G policy is to not allow the export of eggs, fry or smolt out of the State of Alaska for propogative purposes.

Since the common property fishery harvest is regulated by the Alaska Board of Fisheries, it follows that availability of eggs, fry or smolt is part of the allocation process. The Legislature would need to clarify this public policy issue of resource allocation between private for profit and common property fisheries.

Disease Control and Genetics

ADF&G would require that the disease and genetics policies as currently applied to the ocean ranching program be applied to the proposed finfish farming program.

Page 3, Section 6. Disease control standards are clearly an ADF&G responsibility, but water discharge and pollution of fish and wildlife habitats are currently DEC responsibilities. ADF&G can recommend water effluent disinfection standards for each location. AS 16.40.100 (c) requires further detail to clarify agency responsibilities.

General

Sections 4 through 16 merely insert the concept of finfish into the aquatic farming statutes from the 1988 aquatic farming legislation (Chapter 145, SLA 1988).

Proper siting of these facilities should be done in a manner that will protect fisheries and wildlife habitats from adverse impacts.

This bill, if passed, would require an additional set of amendments to the ADF&G regulations in existence for shellfish farming and currently out for public review for aquatic plant farming. The development of comprehensive regulations and a permitting system for finfish farms would require at least six months of staff time.

Fiscal impacts will be outlined in a draft fiscal note and provided at a later date as suggested.

Cowper Administration Position on Mariculture

Mariculture may provide substantial economic benefits to our coastal communities and help diversify and stabilize our economy if it is developed in an orderly fashion which provides the maximum benefit to Alaskans while ensuring protection for our fisheries resources, other resource users and the environment. In order to accomplish these objectives, any legislation authorizing a mariculture industry must satisfy the following principles:

1. The mariculture industry must benefit Alaskans.

The mariculture industry must be developed in a manner which does not result in unfair competition with existing fisheries or cause undue economic displacement in our coastal communities. Legislation should, to the extent possible under the law, provide for local hire at mariculture facilities and give preferential access to mariculture permits and mariculture related tidelands leases to Alaskans.

2. The mariculture industry must pay for itself and the state should get a fair return for the use of state resources.

Legislation should contain provisions for recovering administrative and other state costs associated with managing the industry. The legislation should also ensure that the state gets a fair return for the use of tidelands and other resources.

3. The development of the mariculture industry in Alaska should be done in an orderly fashion which encourages a stable, dependable industry.

Legislation should provide general criteria which will lead to the development of a regulatory program which discourages speculation on permits and tidelands leases, encourages sound financial planning, and provides for a diverse industry ranging from "Mom and Pop" ventures to larger corporate operations.

4. The mariculture industry must meet all state and federal requirements for human health, product quality and sanitation.

Legislation should ensure that mariculture facilities meet all state and federal requirements for human health, safety, and sanitation. Legislation should also require that mariculture products meet or exceed

all state and federal product quality and human health standards, and provide the means to ensure that state

regulators can protect human health and product quality.

5. Mariculture activities must be managed to ensure protection of the biological integrity of natural plant and animal stocks.

Legislation must address the issues of pathological and genetic protections for natural sea vegetable and fish stocks.

6. Mariculture activities must be managed in a manner which ensures adequate environmental safeguards and habitat protection.

Legislation must ensure that mariculture facilities are sited, designed and operated to protect air and water quality, to provide for proper disposal of wastes, and to minimize adverse effects to important fish and wildlife habitat.

7. Mariculture facilities must be sited to minimize land-use conflicts, maintain navigation and ensure access to upland areas.

Legislation should provide guidance for siting facilities to minimize conflicts with other tidelands users, reducing visual and aesthetic impacts, maintaining navigation and ensuring access across state tidelands.

8. Broodstock acquisition for mariculture purposes should be carefully regulated, especially for species subject to limited entry fisheries.

Legislation should contain provisions limiting the acquisition of broodstock for species subject to limited entry fisheries. Legislation should grant the Department of Fish and Game the authority to regulate the acquisition, transport, and propagation of mariculture broodstock, and provide the Board of Fisheries the ability to resolve allocation decisions regarding broodstock acquisition if necessary.

Interagency Mariculture Workgroup
Report on Activities Over the Legislative Interim

TABLE OF CONTENTS

- I. Cover Letter
- II. Issue Papers
 - 1. Land Use
 - 2. Water Quality
 - 3. Disease
 - 4. Genetics
 - 5. Broodstock
 - 6. Habitat Protection
 - 7. Predation
 - 8. Product Wholesomeness
- III. Matrix: Summary of Mariculture Requirements for
British Columbia, Maine, California, and
Washington
- IV. Shellfish Mariculture Permitting
 - 1. Consolidated Application
 - 2. ADF&G Regulations
- V. Department of Commerce and Economic Development
Socioeconomic Studies
- VI. Appendices
 - 1. SB 297
 - 2. Mariculture issues from Senator Eliason and
Representative Herrmann
 - 3. Mariculture Workgroup Staff
 - 4. Cowper Administration Position on Mariculture

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 issue 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, log storage, and floating camps associated with resource development 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 actually 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 at least 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 degradation 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 areas 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(1)(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.

<input checked="" type="radio"/> Issue addressed	<input type="radio"/> Issue not addressed	? Information not available	¹ Footnote
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	British Columbia	Maine	California	Washington
General				
Lead Agency	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Site Survey	<input checked="" type="radio"/> ¹	<input type="radio"/> ²	<input type="radio"/> ³	<input checked="" type="radio"/> ⁴
Public Notice/Hearings	<input checked="" type="radio"/>	<input checked="" type="radio"/> ⁵	<input checked="" type="radio"/> ⁶	<input checked="" type="radio"/>
Application Fees	<input checked="" type="radio"/> ⁷	?	<input checked="" type="radio"/> ⁸	<input checked="" type="radio"/> ⁹
Annual Report	<input checked="" type="radio"/> ¹⁰	?	<input checked="" type="radio"/> ¹¹	<input checked="" type="radio"/> ¹²
Land Use				
Size/Density of Farm	?	<input checked="" type="radio"/> ¹³	?	<input checked="" type="radio"/> ¹⁴
Land Use Planning Designation for Mariculture	?	?	?	<input checked="" type="radio"/>
Leases Issued for Mariculture	<input checked="" type="radio"/> ¹⁵	<input checked="" type="radio"/> ¹⁶	<input checked="" type="radio"/> ¹⁷	<input checked="" type="radio"/> ¹⁸
Land Use Preferences	?	<input checked="" type="radio"/> ¹⁹	?	<input checked="" type="radio"/> ²⁰
Conflict Resolution	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Clean-up/Performance Bonds	<input checked="" type="radio"/>	<input checked="" type="radio"/>	?	<input checked="" type="radio"/>
Land Rent	<input checked="" type="radio"/>	<input checked="" type="radio"/> ²¹	<input checked="" type="radio"/> ²²	<input checked="" type="radio"/> ²³
Survey Plat Required	?	?	<input checked="" type="radio"/> ²⁴	<input checked="" type="radio"/> ²⁵
Water Quality				
Separation of Facilities	<input checked="" type="radio"/> ²⁶	<input type="radio"/>	<input type="radio"/> ²⁷	<input checked="" type="radio"/> ²⁸
Waste Discharge	<input checked="" type="radio"/> ²⁹	<input type="radio"/>	<input checked="" type="radio"/> ³⁰	<input checked="" type="radio"/> ³¹
Water Quality Siting Criteria	<input checked="" type="radio"/> ³²	<input type="radio"/>	<input checked="" type="radio"/> ³³	<input checked="" type="radio"/> ³⁴
Water Quality Monitoring	<input checked="" type="radio"/> ³⁵	<input checked="" type="radio"/> ³⁶	<input checked="" type="radio"/> ³⁷	<input checked="" type="radio"/> ³⁸
Fish and Wildlife				
Broodstock Acquisition	<input checked="" type="radio"/> ³⁹	?	<input checked="" type="radio"/> ⁴⁰	?
Disease Controls	<input checked="" type="radio"/> ⁴¹	?	<input checked="" type="radio"/> ⁴²	<input checked="" type="radio"/> ⁴³
Genetic Controls	<input checked="" type="radio"/> ⁴⁴	?	<input checked="" type="radio"/> ⁴⁵	<input checked="" type="radio"/> ⁴⁶
Exotic Species	<input checked="" type="radio"/> ⁴⁷	?	<input checked="" type="radio"/> ⁴⁸	<input checked="" type="radio"/> ⁴⁹
Private For-Profit Hatcheries	<input checked="" type="radio"/> ⁵⁰	?	<input checked="" type="radio"/> ⁵¹	?
Protection of Existing Wild Stocks or Other Fish & Wildlife	<input checked="" type="radio"/> ⁵²	?	? ⁵³	<input checked="" type="radio"/> ⁵⁴
Measures to Protect Sensitive Habitats	<input checked="" type="radio"/> ⁵⁵	<input checked="" type="radio"/> ⁵⁶	<input checked="" type="radio"/> ⁵⁷	<input checked="" type="radio"/> ⁵⁸
Product Quality/Wholesomeness				
Site Certification and Evaluation	<input checked="" type="radio"/> ⁵⁹	? ⁶⁰	<input checked="" type="radio"/> ⁶¹	<input checked="" type="radio"/> ⁶²
Control and Monitoring of Chemicals and Additives	<input checked="" type="radio"/> ⁶³	?	? ⁶⁴	<input checked="" type="radio"/> ⁶⁵
Product Labeling	<input checked="" type="radio"/> ⁶⁶	?	<input checked="" type="radio"/> 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 type 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 susceptibility 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. Lessee 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 degradation 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 definite restrictions or general 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 oxytetracycline, sulfamerazine, and Romet 30. These should be used sparingly on a short-term basis (there did not appear to be minimum time and dosage requirements for this).

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

66. Fish crossing provincial lines must have proof of coming from registered facility. This is also true for exporting fish.
67. Department of Health Services, Food and Drug Branch sets requirements for proper packaging and labeling of fish and shellfish moved in commerce.
68. No information on labeling from information available.

STATE OF ALASKA

OFFICE OF THE GOVERNOR

DIVISION OF GOVERNMENTAL COORDINATION

STEVE COWPER, GOVERNOR

CENTRAL OFFICE

P.O. BOX AW
JUNEAU, ALASKA 99811-0165
PHONE: (907) 465-3562

SOUTHEAST REGIONAL OFFICE

431 NORTH FRANKLIN
P.O. BOX AW, SUITE 101
JUNEAU, ALASKA 99811-0165
PHONE: (907) 465-3562

SOUTHCENTRAL REGIONAL OFFICE

2600 DENALI STREET
SUITE 700
ANCHORAGE, ALASKA 99503-2798
PHONE: (907) 274-1581

NORTHERN REGIONAL OFFICE

675 SEVENTH AVENUE
STATION H
FAIRBANKS, ALASKA 99701-4596
PHONE: (907) 456-3084

Dear Applicant:

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

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

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

Additional Permits

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

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

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

You should contact DEC regarding area certification requirements so that you can be reasonably sure that your site will qualify. We recommend that you apply for growing area certification and a harvester's permit at least six months before you intend to harvest shellfish. To obtain more information on certification requirements 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 Regional 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 propagated
 - 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 P.O. 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 Commerce and Economic Development	Attn: Division of Business Development
Mailing Address P.O. Box D, Juneau, AK 99811	Attention Larry Merculieff

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

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 11.58.210
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 12/23/87
Typed or Printed Name of Authorized Representative J. D. Williams	Typed or Printed Name of Authorizing Official John D. Williams
Title [Signature]	Title Deputy Commissioner

13. REQUESTING AGENCY #8751	15. APPROVAL BY THE DEPARTMENT OF ADMINISTRATION [Signature]
Department/Division Division of Business Development	
Signature of Project Director [Signature]	Date 12/23/87
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.

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, Wurmman, 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 Economic Development and the Department of Fish and Game.

2. Collect and review general biophysical data 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 predator 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):

<u>Study team member</u>	<u>Per day</u>	<u>Per hour</u>
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	0881428
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 Commerce and Economic Development Attn: Division of Business Development

Mailing Address P.O. Box D, Juneau, Alaska 99811 Attention: Bonnie Jo Borchick

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

12. CONTRACTOR

Name of Firm The Sea Fare Group

Signature of Authorized Representative [Signature] Date 12/22/87

Typed or Printed Name of Authorized Representative Sandi McKenzie

Title President Employer I.D. No. (EIN) or SSN 91-1224431

13. REQUESTING AGENCY #8751

Department/Division DCED/Division of Business Development

Signature of Project Director [Signature] Date 12/29/87

Name of Project Director Larry Merculieff

Title Director

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.

Signature of Head of Contracting Agency or Designee [Signature] Date 12/30/87

Typed or Printed Name of Authorizing Official J. Anthony Smith

Title Commissioner

15. APPROVAL BY THE DEPARTMENT OF ADMINISTRATION

[Handwritten initials: M/C]

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

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 INFORMATION

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 describe 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 knowledgeable 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 discrepancies 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 possibilities 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 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 (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.

Jim

Original sponsors: Zharoff, Eliason
and Duncan

1 IN THE SENATE BY THE RESOURCES COMMITTEE
2 HOUSE CS FOR CS FOR SENATE BILL NO. 297 (Resources)
3 IN THE LEGISLATURE OF THE STATE OF ALASKA
4 FIFTEENTH LEGISLATURE - FIRST SESSION

5 A BILL
6 For an Act entitled: "An Act placing a moratorium until July 1, 1988, on
7 the issuance or granting of licenses, permits,
8 leases, or authorizations for commercial finfish
9 farming; providing for a bivalve spat collection
10 permit; and providing for an effective date."

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

12 * Section 1. FINFISH FARMING MORATORIUM. (a) Except as provided in
13 (b) of this section, the following licenses, permits, leases, or authoriza-
14 tions may not be issued or granted for the construction or operation of a
15 commercial finfish farm:

- 16 (1) authorization for use of an interim-use permit for the
17 experimental commercial taking of a fishery resource (AS 16.05.050(10));
18 (2) fish farming license (AS 16.05.340(a)(14));
19 (3) collection permit (AS 16.05.340(b));
20 (4) land use or tidelands permit (AS 38.05.035);
21 (5) a land lease (AS 38.05.070);
22 (6) fish transport permit (5 AAC 41.005);
23 (7) permit to appropriate water (11 AAC 93.120);
24 (8) temporary water use permit (11 AAC 93.210 - 11 AAC 93.220).

25 (b) A fish farming license and a fish transport permit may be issued
26 for commercial finfish farming in a privately owned freshwater body that
27 has no outlet to state water.

28 * Sec. 2. NO PREFERENCE INTENDED. A license, permit, lease, or au-
29 thorization described in sec. 1 of this Act that is issued or granted for a

1 purpose other than commercial finfish farming and that is in effect during
2 the period of the moratorium imposed by sec. 1 of this Act does not create
3 a right or preference with regard to the issuance, granting, or renewal of,
4 or conditions or limitations placed on, any license, permit, lease, or
5 authorization for aquatic farming after the period of the moratorium.

6 * Sec. 3. AS 16.05.340(b) is amended to read:

7 (b) The commissioner of fish and game may issue without cost a
8 permit to collect fish and game, including fur animals, subject to
9 limitations and provisions that are appropriate, for a scientific,
10 propagative, or educational purpose. The commissioner also may issue
11 a permit for the collection of bivalve spat for use in connection with
12 an aquatic farm. In addition, the commissioner shall issue a permit
13 for the collecting of wild fur animals for improving the genetic stock
14 of fur farm animals. Permits issued under this subsection shall be in
15 accordance with current sustained yield management practices for the
16 species of wild game for which the permit is requested. The annual
17 permit fee for an Alaska resident to collect wild fur animals for fur
18 farming purposes is the same as the fee for resident trappers.

19 * Sec. 4. Section 1 of this Act is repealed July 1, 1988.

20 * Sec. 5. This Act takes effect immediately under AS 01.10.070(c).

ALASKA STATE LEGISLATURE . SENATE
SENATOR RICHARD I. ELIASON

5373

RESOURCES COMMITTEE CHAIRMAN
ECONOMICS AND COMMERCE COMMITTEE VICE-CHAIRMAN
LEGISLATIVE COUNCIL
RESOURCES COMMITTEE
FISHERIES SUBCOMMITTEE CHAIRMAN



P.O. BOX 143
SITKA, ALASKA 99835
P.O. BOX V
JUNEAU, ALASKA 99811
(907) 465-4916

May 11, 1987

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

COMMISSIONER'S OFFICE
RECEIVED
MAY 12 1987

Dear Commissioner Collinsworth,

DEPARTMENT OF FISH AND GAME

Recently hearings on Senate Bill 106, an act relating to aquatic farming, were conducted by the Senate Resources Subcommittee on Fisheries at five different locations -- Dillingham, Kodiak, Anchorage, Ketchikan, and Sitka. The individuals testifying at the hearings raised many concerns which must be addressed fully prior to the Legislature taking any formal action on permitting aquatic farming in Alaska.

Some of the unanswered questions asked are as follows:

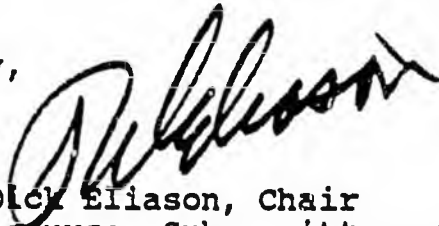
- 1) How will land use conflicts be resolved?
- 2) How can favoritism or the appearance of favoritism be avoided in the awarding of tide land permits?
- 3) What steps will be implemented to reduce tide land speculation?
- 4) What is the role of the non-profit hatcheries in the sea farming industry?
- 5) Will the role of a non-profit hatchery change if the hatchery chooses to rear pen salmon?
- 6) What will be the role of borough governments if a sea farm is within the borough's jurisdiction?
- 7) What will be the procedures in determining the monetary value for the tide land sites?

- 8) Will additional safeguards be established if the potential sea farm site is in a designated wilderness area?
- 9) How will the upland owners' concerns be resolved?
- 10) What exactly is known regarding any potential environmental danger in raising salmon in a concentrated area?

As these questions and other unresolved concerns regarding aquatic farming are reviewed and discussed during the interim by the Subcommittee on Fisheries, it will be most helpful if the various affected state agencies take an active role in the discussion. As chair of the interdepartmental work group on mariculture, the subcommittee looks forward to working with you and other members of the working group during the interim.

Commissioner Collinsworth, hopefully time will allow the subcommittee to meet with the agency representatives prior to adjournment in order to formalize plans for the next few months.

Sincerely,



Senator Dick Eliason, Chair
Senate Resources Subcommittee on Fisheries

cc: Senate Resources Committee Members
House Resources Committee Members

Suggested questions to be addressed
from the Office of Representative Herrmann

1 BIOLOGICAL CONSIDERATIONS

- 1) What is the potential disease and genetic threat to wild stocks?
- 2) How can these be controlled?
- 3) What type of oversight and supervision of mariculture operations is necessary to ensure that wild stocks are not threatened?
- 4) How should pens be stocked?
- 5) Who should regulate egg take?
- 6) Should Atlantic Salmon be allowed? and should other species be imported?
- 7) What are the potential effects on habitat for anadromous fish streams?

11 MARKET QUESTIONS

- 1) Is foreign marketing of pen-reared salmon currently effecting markets for Alaska's wild stocks?
- 2) If Alaska got into pen-rearing of salmon, would our pen-raised salmon be able to compete?
- 3) Could increased efforts at marketing the advantages of wild salmon give Alaska fishermen a competitive edge in certain markets over pen-reared salmon?
- 4) Would development of pen-reared salmon in Alaska displace fishermen? - If so, How many?
- 5) How valid is the statement that the world market will be glutted with salmon by the time Alaska is ready to get into the industry?

111 ECONOMIC FEASIBILITY & BENEFITS

- 1) What is the range of options for proceeding with mariculture operations?
 - A) What would be the economic costs and benefits if the state only permitted small operations? or only large operations? (How many jobs would be created? How much would they pay, How much revenue would be generated? How many people would be displaced? What would be the economic impacts to the state if the fishing industry experienced displacement? Would these operations be economically viable?
 - B) What would be the best way to proceed if the goal of the state was to maximize the revenues generated?

III. Government Involvement

- B. To what extent should the state be involved in necessary monitoring/oversight. What is the state required to do? (i.e. Federal NSSP requirements).
- C. To what extent should the state be involved in providing technical assistance in site selection and necessary environmental analysis?
 - 1. How much should the industry contribute to offset administrative costs?
- D. 2. To what extent should the industry be required to pay for the use of the public resources and the resulting externalities such as pollution and landscape alterations?
- E. What role should the state play in market development?
- F. Given the fiscal and technical policy impacts of the different options - should we proceed to encourage various mariculture operations, and if so, in what areas?
- G. What criteria should be established to determine a whether or not a permit applicant is "fit, willing and able".
 - 1. How do we avoid excluding small, locally owned operations?
 - 2. Should bonding be required to discourage speculation and protect the state in the case of failure? (Clean-up costs).
- H. How are permits going to be transferred? Who decides?
- I. To what extent should the state provide investment incentives? (State subsidization through loans, tax credits ect.) Several sources say that tax credit incentives are necessary to attract venture capital.
- J. How much should the industry pay for necessary regulation, monitoring and oversight?

- C) What would be the best way to proceed to create the most jobs and steady employment?
- D) What would be the best way to provide economic benefits to rural areas?
- E) What would be the best way to provide economic benefits to urban areas?
- F) What would be the best way to minimize the effects on fishermen who may be displaced
- G) What would be the comparative costs and benefits of not going ahead with mariculture but instead increasing marketing strategies so that wild salmon could compete?

1V LAND USE & SITING CONFLICTS

- 1) How should best interest findings be made?
- 2) What guidelines should be established to determine whether a site should be permitted if there are competing uses (some of which may not be permitted?)

V ENVIRONMENTAL IMPACTS

- 1) Water Quality
- 2) Land Use Impacts
- 3) Impacts on habitat for wild stocks

VI GOVERNMENT INVOLVEMENT

Will financial resources be diverted from other fisheries programs such as hatcheries, and economic development of other existing fisheries?

(See Attached)

5/20/87

INTERAGENCY WORKGROUP ON MARICULTURE

David Benton Department of Fish and Game	465-4100
Doug Donegan Department of Environmental Conservation	465-2609
Rick Focht Commercial Fisheries Entry Commission	465-4081
Kerry Howard Department of Environmental Conservation	465-2653
Mike Kaill Department of Fish and Game	465-4160
Amy Kruse Department of Environmental Conservation	789-3151
Diane Mayer Office of Management and Budget	465-3562
Bob Palmer Department of Natural Resources	465-3400
Paul Peyton Department of Commerce & Economic Development	465-2162
Rick Reed Department of Fish and Game	465-4290
Jim Wakefield Department of Labor	465-2700

POLLUTION ISN'T A SOUND POLICY

Should corporations use public waters for private profit?

By John de Yonge
P-I Columnist

Consider these things about floating fish farms:
■ A typical net-pen fish farming operation on Puget Sound produces pollutants "equivalent to untreated sewage from approximately 10,000 persons." That's what a state report says. The pollution comes from fish feces, urine and food pellets deposited in the water and on the bottom of the Sound.

■ There are 13 commercial pens now operating over 69 acres of aquatic lands leased from the state. These 13 operations daily deposit to the bottom of Puget Sound nearly six times as much oxygen-demanding fecal matter and other wastes than does Metro's Renton Waste Water Treatment Plant, which serves 430,000 people. Materials that deplete oxygen can radically change or kill off the life forms in an unpolluted environment.

■ Siting 27 more fish farms, now delayed by opposition from upland property holders, environmentalists and county officials, would add a pollution load to Puget Sound equal to that from building four new cities the size of Everett.

■ The "... proper siting of 100 farms would not have significant impact on the aquatic environment." So says the state's just-issued environmental impact statement on floating net pens.

Those 100 fish farms would produce 55 metric tons of oxygen-demanding waste per day. That's 18 more tons a day than Metro's Renton and West Point treatment plants together produce from the sewage of 1 million people.

Analysis

The environmental impact statement was prepared by three private organizations that supply fish-farm companies with paid expert witnesses.

Under Gov. Booth Gardner, state policy is to hasten any increase of fish farming in the state's waters and to downplay environmental problems that aquaculture may bring.

The official evangelist is the Department of Agriculture's Dr. John Pitts, veterinarian and former Jefferson County commissioner who appears at meetings and hearings - in one case, as a paid witness for a net-pen applicant - to pooh-pooh environmental objections raised by net-pen opponents.

Opponents are not just those who own shoreline property, who howl against a net pen being erected in their aquatic front yard. They've been fired up by what the state's environmental impact statement confirms: A new, nearby fish farm can give view property a one-time, financial knock.

Opponents include environmentalists like David Ortmann of Friends of the Earth, who says: "Why should we be happy about fish farms that dump tons of fish poop every day into Puget Sound?"

They include commercial fishermen like the Puget Sound Gillnetters, who know something that has largely escaped the notice of sport anglers.

Atlantic salmon, not a salmon but a sea-run trout of the Atlantic seaboard, have escaped by the thousands from net pens here and in British Columbia. The B.C. government booms fish farms with a gusto exceeding even the ta-ra-ra-boom-de-ays from Gardner's men and from Brian Boyle, the separately elected head of the Department of Natural Resources, which manages shore bottoms and other public lands.

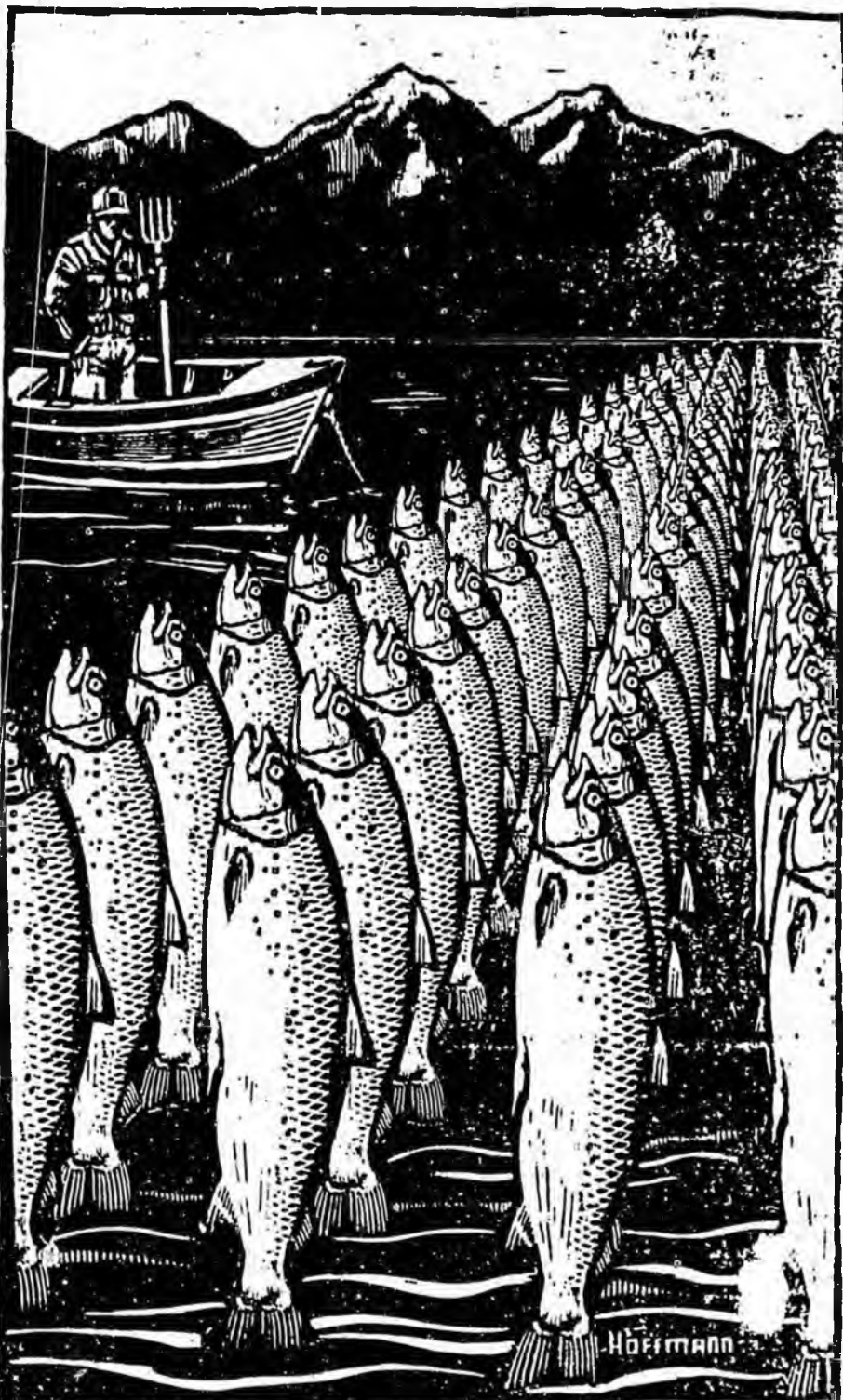
What's more, hundreds of thousands of Pacific salmon have also escaped from the pens, especially in British Columbia.

So what does that mean?

The state environmental impact statement points out that escaped exotic fish like the Atlantic salmon "could establish self-sustaining populations and compete with indigenous fish," such as steelhead trout.

That may not be far off. In the North Puget Sound last year, commercial and sports fishermen caught hundreds, probably thousands, of Atlantic salmon weighing up to 16 pounds.

More dangerous by far is that for the first time ever at least three sexually mature Atlantic salmon



can kill all fish in a pen in minutes.

In 1986 Commissioner of Public Lands Boyle limited new net pens to sites where the water is at least 40 feet deep at low tide, a mile away from other pens and with enough current to flush away food and fecal deposits. He also limited the surface area of new pens to two acres or less.

These requirements ended up in "Recommended Interim Guidelines" written for the departments of Agriculture, Ecology, Natural Resources and Fisheries, which share regulation of the fish-farm industry, with Agriculture and Pitts calling most of the shots.

With no force of law and offered to help county commissioners site pens under state law, the guidelines deliberately do not talk about navigation problems, use conflicts and, most important, esthetics.

operations at Port Angeles.

Both pen systems, clean, low in the water, quiet, full of fat, bright Pacific and Atlantic salmon, are barely noticeable in the working harbors that contain them.

But that's quite different than siting a pen in Frenchman's Cove on the west side of Hood Canal, as International Marine Farms Inc. proposes.

Or siting a pen, as Tailfin Inc. proposes in a main salmon and trout-fishing cove between East Point and Bells Beach on the west side of Whidbey Island, where from her home Margaret Johnston looks out across Saratoga Passage to Camano Island. She heads the Marine Environmental Consortium, made up of 20 citizen organizations that oppose fish and other floating farms.

Katz argues for having the state set standards for siting and operating net pens, to ensure that the pens do not harm the environment and to give fish net-pen operators a clear but flexible regulatory framework to live with. But Katz feels the industry getting a bad rap from people like Johnston, who says, simply don't want a net pen in their back yard.

"If the two sides could stop feuding and start talking about necessary standards, we could have a

If the two sides could stop feuding and start talking about necessary standards, we could

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So what does that mean? The state environmental impact statement points out that escaped exotic fish like the Atlantic salmon "could establish self-sustaining populations and compete with indigenous fish," such as steelhead trout.

That may not be far off. In the North Puget Sound last year, commercial and sports fisherman caught hundreds, probably thousands, of Atlantic salmon weighing up to 10 pounds.

More dangerous by far is that for the first time ever at least three sexually mature Atlantic salmon showed up miles from the sea in the Nooksack River last year, near Bellingham, and one in the Nisqually, near Olympia. Rumor has a fourth Atlantic netted in the Skagit River at Sedro-Woolley.

What's the worry about four fish, though they may be forerunners of thousands to come?

The environmental impact statement warns that accidental importation of "exotic" fish diseases associated with fish farms in Europe could devastate existing salmon and trout runs in state rivers.

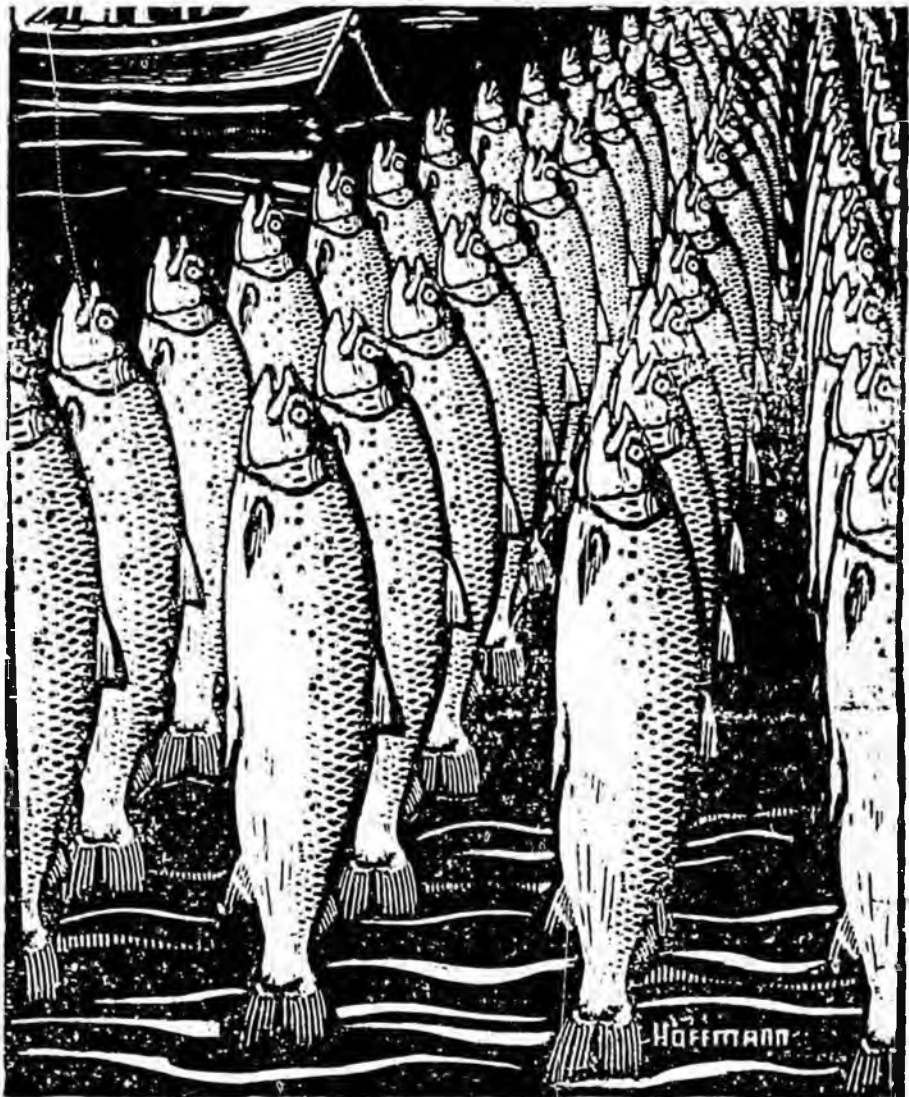
Just in the past two weeks the public has learned that such a disease, viral hemorrhagic septicemia or VHS, has shown up at two hatcheries in state waters. It is the first time ever that VHS has been found in North America.

VHS, state fish-disease experts say, has never been found to occur naturally in Atlantic salmon. They say that the chance that Atlantic salmon in pens here are the source of the disease is "virtually zero." The disease was found in chinook and coho salmon, species raised extensively at federal, state and tribal hatcheries and at commercial net-pen operations.

The impact statement does not dwell on what has happened in Norway, where other diseases associated with that country's extensive net-pen industry have ravaged wild Atlantic salmon runs in 32 rivers. The government was forced to poison some streams, set up a salmon sperm bank to preserve wild genes and consider banning any new net pen within 12 miles of a river mouth, an obvious rule not yet under consideration here.

Nor does the statement dwell on the possibility of migrating wild fish catching indigenous fish diseases from net pens here or of net-pen escapes spreading such diseases into our river systems.

Fish farmers themselves helped call state attention to fecal build-up beneath pens, a build-up that kills clams, oysters and other bottom dwellers and can release poisonous hydrogen sulfide gas, which



DUANE HOFFMANN

can kill all fish in a pen in minutes.

In 1986 Commissioner of Public Lands Boyle limited new net pens to sites where the water is at least 40 feet deep at low tide, a mile away from other pens and with enough current to flush away food and fecal deposits. He also limited the surface area of new pens to two acres or less.

These requirements ended up in "Recommended Interim Guidelines" written for the departments of Agriculture, Ecology, Natural Resources and Fisheries, which share regulation of the fish-farm industry, with Agriculture and Pitts calling most of the shots.

With no force of law and offered to help county commissioners site pens under state law, the guidelines deliberately do not talk about navigation problems, use conflicts and, most important, esthetics.

If the two sides could stop feuding and start talking about necessary standards, we could have a safe, considerable industry.

— Peter Katz, fish farmer

Commissioners have learned that, if they turn down a net-pen proposal, the applicant will seek a full rehearing before the state's Shorelines Hearings Board, with Pitts certain to show up to put the stamp of Gardner's administration on having the permit denied.

Dwain Colby, an Island County commissioner, put the matter thus in a 1987 letter: "While there may be legitimate reasons for denying a permit to locate a salmon net pen, local government has been placed in the position of being able to say 'yes' to such a proposal but not 'no'."

Under Gardner, the Department of Ecology has refused to require net pen operators to get pollution-discharge permits under the federal Clean Water Act.

The Sierra Club Legal Defense Fund has announced it will sue the U.S. Environmental Protection Agency if necessary to force EPA to force Ecology to force every net pen operator have such a permit.

The state's draft environmental impact statement declares that the major impacts of net pens can be cured by "proper farm siting to assure dispersion of wastes, flushing of the site and protection of sensitive areas."

It's a view that one can come to easily while listening to such eloquent fish farmers as Peter Katz, a marine architect running the Paradise Bay Co. net farm at Port Townsend, and John Forster, a Ph.D. in aquaculture running Sea Farm Washington's similar

operations at Port Angeles.

Both pen systems, clean, low in the water, quiet, full of fat, bright Pacific and Atlantic salmon, are barely noticeable in the working harbors that contain them.

But that's quite different than siting a pen in Frenchman's Cove on the west side of Hood Canal, as International Marine Farms Inc. proposes.

Or siting a pen, as Tailfin Inc. proposes, in a main salmon and trout-fishing cove between East Point and Bells Beach on the west side of Whidbey Island, where from her home Margaree Johnston looks out across Saratoga Passage to Camano Island. She heads the Marine Environmental Consortium, made up of 20 citizen organizations that oppose fish and other floating farms.

Katz argues for having the state set standards for siting and operating net pens, to ensure that the pens do not harm the environment and to give the net-pen operators a clear but flexible regulatory framework to live with. But Katz feels the industry is getting a bad rap from people like Johnston, who, he says, simply don't want a net pen in their aqueous front yard.

"If the two sides could stop feuding and start talking about necessary standards, we could have a safe, considerable industry..." he says. "But we're years away from that."

Forster, president of the Washington Fish Growers Association, dismisses esthetic revulsion as the main drive behind the opposition to what he characterizes as a clean, beneficial industry with vast prospects.

"It's more than esthetics. It's an intrusion into a life style that they don't like and they're using environmental problems as a smoke-screen. Because of that, the debate is dishonest at the moment, terribly dishonest."

Johnston, at a gathering in her home with other members of the Marine Environmental Consortium, characterizes such comments as unworthy.

"The net pen issue raises a fundamental issue of public policy that involves more than us, though the environmental questions are real and cannot be brushed aside by the industry or the state. The big question is: Should the public waters of Washington State be turned over to a few corporations for private profit?"

That's a proper question for us all to ask. It must be answered by political action. Gardner's administration has already answered: Yes.

To me it seems stupid to site more pens in pristine salt and fresh waters (yes, an application is pending in Eastern Washington) until we have better, more extensive scientific information about siting than what the draft environmental impact statement supplies.

Until we know if pens can be sited safely anywhere, we would be blind to commit ourselves to putting major sources of pollution in our upland waterways and in waterways we are trying to clean up.

The tragedy of Norway's rivers demonstrates that.