

ALASKA LEGISLATURE SPECIAL COMMITTEE / SUBJECT
6.7 SCOMM 5A: AQUACULTURE POLICY STUDY G

ELECT

FILES

8672

GROUP

1978-1979

Memorandum
To: Wally Miller
From: William R. Wilkerson

May 2, 1979

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4. Fishing Vessel Construction Differential subsidy (U.S. Fishing Fleet Improvement Act-46 U.S.C. §§1401-13).
5. The Fishermen's Protective Act of 1967 (22 U.S.C. §§1971-79).
6. The Public Works and Economic Development Act of 1965 (42 U.S.C. §§3121, et seq.).
7. Small Business Administration Act (15 U.S.C. §§631 et seq.).
8. The Small Business Investment Act (15 U.S.C. §§1661 et seq.).
9. The Farm Credit Act of 1971 (12 U.S.C. §§2071 et seq.).
10. National Consumer Cooperative Bank Act (92 Stat. 499, August 20, 1978).
11. Fishery Cooperative Associations (15 U.S.C. §§521-22).

*See also Saltonstall-Kennedy Act above.

F. OTHER

A number of programs relating to export and import of fisheries products, federal purchase and distribution of fishery products, provision of product safety, quality and marketing of consumer products, and foreign investment in U.S. fisheries regulations, have been identified. These programs are not discussed herein because of their relative indirect impact on fisheries resource development.

Additionally, a number of federal programs have less obvious impact on fisheries resource development.

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Included are programs within the Bureau of Indian Affairs relating to fisheries development through the Alaska Native Claims Act, research programs involving the relationship of forest product and fisheries industry interests conducted by the U.S. Forest Service, consumer protection programs conducted by the Federal Trade Commission, and programs described below involving regulation of fisheries resource development programs.

III. NON-FISHERIES REGULATORY PROGRAMS

A. Environmental.

1. Corps of Engineers permits under §10 of the River and Harbor Act.
2. Corps of Engineers permit under §404 of the Federal Water Pollution Control Act Amendments of 1972.
3. Environmental Protection Agency certification under §401 of the Federal Water Pollution Control Act Amendments of 1972.
4. Preparation of Environmental Impact Statement pursuant to the National Environmental Policy Act.
5. Certification of federal consistency under the Coastal Zone Management Act.
6. Various approvals by other federal agencies-see SSRAA permit list.
7. Waste effluent treatment requirements pursuant to Federal Water Pollution Control Act, as amended.

CORRECTION

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

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B. Resource management.

1. Fishery Conservation and Management Act
(see above).
 - a. Relation to coastal zone management.
 - b. Relation to National Environmental Policy Act.
 - c. Relation to Federal Administrative Procedures Act.
 - d. Relation to activities of Forest Service.
2. U.S. Fish and Wildlife Service (see above).
3. National Marine Fisheries Service (to include the Anadromous Fish Conservation Act, the Fish and Wildlife Act of 1956, and the Federal Aid and Fish Restoration Act).

C. OTHER

A number of other federal regulatory programs affecting vessel and gear operation and harvesting techniques, regulation of fishermen and crews, regulation of vessel operation, regulation of seafood processing, product quality and marketing, and regulation of fisheries importing and exporting activities have been identified. Because of their comparatively indirect impact on fisheries resource development programs and activities, these programs will not be discussed in detail.

III. RELATIONSHIP BETWEEN FEDERAL FISHERIES PROGRAMS AND STATE OF ALASKA - POINTS FOR DISCUSSION

- A. Bulk of Alaska land and waters under federal control and jurisdiction.
- B. Fisheries related employment in Alaska, nineteen

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- percent (19%) of total employment; twenty-three percent (23%) including indirect effects.
- C. Fisheries revenues account for seven percent (7%) of Gross State Product; indirect twelve percent (12%) of GSP.
 - D. Little federal contribution to salmon development projects in Alaska.
 - E. Two Hundred Mile Limit Alaskan fisheries account for eighty percent (80%) of nation's potential harvestable resource.
 - F. Alaska salmon resource development program -- two-pronged approach (ADF&G, PNP).
 - G. Alaska Coastal Zone Management (CZM) in earliest stage of development.
 - H. Federal CZM program requires coordination of federal and state agencies on fisheries, forestry, environmental issues.
 - I. Alaska has no port authorities, only boroughs, unorganized boroughs and municipalities.
 - J. Local government authority relatively flexible in terms of ability to conduct development activities.
 - K. Major problem of local communities in Alaska is raising sufficient capital for public works and infrastructure.
 - L. Fishing community relationship with fisheries management agencies largely adversarial.
 - M. Relationship between ADF&G and Regional Aquaculture Association largely adversarial.
 - N. State legislature unable to fund new fisheries programs at this time (possible exception is bottomfish).
 - O. PNP assessment program tied up in litigation.
 - P. Management problems derived from hatchery versus natural stocks, presence of mixed stocks not

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adequately addressed - raises political problems.

- Q. Impact of D₂ Legislation on aquaculture not yet clear - fishermen and regional association concern over Borax.
- R. Role of sports and subsistence fisheries in resource development program and planning not clear.
- S. Regional management issues raised by federal and state legislation.

ECONOMIC EVALUATION

DISCUSSION OUTLINE

I Micro-Economic Evaluation Systems Reviewed

Kramer Chin & Mayo, Inc., Alaska Salmon Study, 1975

Frank Orth, The Economic Feasibility of Private Nonprofit Salmon Hatcheries, 1977

International Pacific Salmon Fisheries Commission, Proposed Program For Restoration & Extension of The Sockeye & Pink Salmon Stocks of The Fraser River, 1972

J.C. Barclay, Department of Fishery & The Environment, Benefits and Cost of Salmon Enhancement, 1978

Washington Department of Fisheries, Economic Evaluation of The 1967 Sport Salmon Fishery, 1970

Crutchfield & MacFarlane, Economic Evaluation of The 1965-66 Salt Water Fisheries of Washington, 1968

Alaska Life Cycle Cost System

A.D. Little, Development of a Bottomfish Industry For Alaska, 1978

Superior Court MIS Cost Benefit Analysis, Miller & Associates, Inc., 1977

Weingartner, The Excess Present Value Index, 1963

Starr, "The Mini-Max Valve", 1963

May, etal, Introduction to Financial Accounting, 1975

Fremgen, Accounting For Managerial Analysis, 1976

Center For Northern Educational Research, Alaskan Inter-regional Cost Differentials

II Micro-Economic Systems General Findings

1. There is a substantial variation in economic evaluation techniques applied to the fishery. These techniques range from simple cost/benefit ratios to complex formulas incorporating the time value of money.
2. The Alaska Life Cycle Cost System offers a comprehensive cash estimating and investment analysis modeling capability. The model, which is now becoming operational, does not contain much in the way of historical costs for use in salmon rehabilitation planning, nor does it include information relating to differing rates of return (benefits) of salmon. Both the historical cost and benefit information could be added to the system's data base as the data becomes available. This would make the system more useable in evaluating artificial propagation projects.
3. In performing economic evaluations of salmon enhancement projects, there is a critical lack of information regarding the expected returns for varying propagation methods for each species.
4. There are three economic evaluation perspectives which must be defined if the economic benefits of salmon enhancement are to be understood. One perspective is that of an "investment banker" who is concerned about the return on a specific proposed capital investment. The second view is that of a fisherman whose concern about the project is the net increases in allowable harvest for fishermen resulting from the project. The third economic evaluation perspective is that of the State of Alaska. The economic evaluation of the State for the most part is a macro-economic perspective which reflects the costs incurred in the form of grants, loss of interest income from providing low interest loans and other investments it makes in the fishery. Offsetting these costs, the State obtains, increases in personal and corporate income tax revenues (both direct and indirect) as well as other taxes and revenues. Reduced unemployment compensation taxes, welfare payments and other types of public aid are also factors which should be considered in the economic evaluation from the State perspective. Because the perspectives as well as their method of economic evaluation differ, investment bankers, the State and fishermen may judge the value of projects differently.

5. The current practice in economic evaluation is to evaluate each project separately. This project by project approach does not have the synergy of a systems or area-wide approach. For example, the project by project approach does not take into consideration economies of scale in operation, increases in harvest stability (particularly on the down side risk) which might be available from projects with marginal economic returns or the higher returns which can result from sizing the amount of investment to the scope of the economic opportunity.
6. Climate and access vary greatly in Alaska, both of which have a major impact on capital investment and operating costs for otherwise comparable projects.
7. Salmon prices vary greatly by region in Alaska which can have direct effect on the economic viability of a project or area-wide development plan.
8. While the economic goals and the means selected to achieve these goals may vary among the regional aquaculture associations, the recommended economic evaluation procedures should be flexible enough to accomodate these differences.
9. While the agricultural sector of the American economy has many parallels to the harvesting of fish, such incentives as investment tax credits, soil banks, modern equipment, government funded technology, low interest loans, price supports, crop insurance and others, have become such a part of the financing of agriculture that agricultural economic evaluations include many factors which are not presently at work in the fishery.
10. In addition to the substantial lack of information on expected returns of harvestable numbers of salmon for varying propagation methods, insufficient attention has been paid to the economic effects and examining of alternative propagation methods.

III Macro-Economic General Findings

1. A key ingredient in evaluating the economic value of the salmon fishing to the State of Alaska is the ability to reasonably accurately estimate the total tax revenue which annually accrues to the State from this industry.
2. Currently, the only information available on State tax receipts from the fishery is the raw fish tax. Personal and corporate income tax information for residents and non-residents is not available in a readily useable form.
3. Input/output analyses which identify the secondary multiplier effect of direct employment in the fishing industry, have not been conducted. Because of the large percentage of non-residents in the direct and indirect labor force, Washington State input/output ratios are not applicable to Alaska.
4. Based upon this lack of reasonably accurate information, the State of Alaska is not in a position to evaluate its return on its investment in the fisheries. Moreover, the lack of this information effectively precludes the State from explicitly formulating a fisheries economic development policy.
5. Department of Revenue research personnel are well aware of the information problem and are equipped to deal with the problem if authorized to do so.

Micro-Economic Techniques and Parameters

1. Attachments 1 and 2 to this report present an analysis of survival rates by species for alternative propagation methods. The data contained in this analysis were compiled with assistance of Washington State Fisheries and other biologists. THIS DATA MAY NOT BE REFLECTIVE OF RETURNS IN ALASKA. DATA WHICH ARE MORE REFLECTIVE OF ALASKAN RETURNS WILL BE COMPILED AND INCLUDED AT A LATER DATE.

The importance of attachments 1 and 2 not in the numbers presented, but INSTEAD IN THE PROCESS USED TO COMPARE AND COMPUTE SURVIVAL RATES WHICH PROVIDE AN EFFECTIVE MEANS FOR ANALYZING ALTERNATIVE PROPAGATION METHODS.

2. As indicated in Attachments 1 and 2, survival rates vary significantly from species to species as well as by propagation method. Operating and capital investment costs also vary greatly by propagation method. The different combinations of results and costs creates a wide variety of alternatives which can be used in planning and evaluating salmon enhancement projects.
3. It is currently fashionable to use cost-benefit ratios to evaluate the relative "goodness" of capital projects. Several of these methods are:

(a)
$$\frac{\text{Total Estimated Revenues}}{\text{To The Estimated Costs}} = \text{Cost Benefit Percent or Ratio}$$

(b)
$$\frac{\text{Present Value of Estimated Revenues}}{\text{Present Value of Estimated Costs}} = \text{Cost Benefit Percent or Ratio}$$

In technique (a) annual revenues and costs are estimated either based upon constant dollars or inflated/deflated amounts which reflect price changes in the value of fish and operating expenses. Revenue dollars are either expressed in prices paid to fishermen or in terms of the market value to the processors.

In technique (b) price changes are incorporated as well as a discount rate. The purpose of the discount rate is to equalize the differences in the time value of money by expressing all future cash flows (both income and outgo) in terms of the present (discounted) value.

4. The use of return on investment is a more traditionally accepted method, by financial institutions of evaluating the relative "goodness" of capital projects. Several return on investment methods commonly in use are:

(a)
$$\frac{\text{Total Estimated Revenue}}{\text{Total Investment}} = \text{ROI}$$

(b)
$$\frac{\text{Total Discounted Estimated Revenue}}{\text{Discounted Amount of Investment}} = \text{Effective Yield}$$

In (a) the estimated revenue is that which remains after all operating costs have been paid. In the case of a salmon enhancement project, the operating costs would include principal and debt service payments on borrowed money as well as the cost of personnel and supplies to operate the facility. This economic evaluation technique can be expressed in constant dollars or in terms which reflect price changes.

Computation (b) which is called the discounted rate of return, provides the true interest rate earned on an investment over the course of its economic life. This evaluation technique, while highly accurate, is very complex and does not lend itself to manual computation.

VI Micro-Economic Analysis Examples

Provide an economic evaluation in which alternative propagation methods are evaluated from two points of view: An investment banker concerned with return on investment and a fisherman concerned with the increased supply of harvestable numbers of fish.

Alternatives To Be Examined:

- (1) Natural propagation - natural runs which do not incur direct operating or capital expense.
- (2) Natural propagation - rehabilitation project.
In this case the project would involve gravel cleaning or placement, stream bed stabilization and similar work.
- (3) Hatchery propagation. This would entail construction of a hatchery and related facilities similar to that recently constructed by the Southern Southeast Aquaculture Association.
- (4) Spawning Channel Propagation. This would entail excavation of a channel similar in design to those used on the Fraser and Columbia Rivers, the placement of gravel suitable for spawning purposes and the use of ripwrap to aid in channel stabilization.
5. Incubation Box - Simple 4'x 8' design with upwelling flow. Gravity feed water supply to the box from the stream with pipe outlet returning to the stream. Estimates include facilities for eyeing eggs before placing them in the incubation boxes.

Relevant Factors to be Considered in the Analysis:

1. Estimated returns by propagation method.
2. Annual operating cash.
3. Annual principal and debt service.
4. Estimated average ex-vessel price per fish.

Example Problem:

For each alternative, based upon the propagation of 25 million eggs:

1. How many fish will return?
2. How many can be harvested?
3. What proportion of the harvest may be needed to pay operating and capital costs?
4. Is the project a sound investment?
5. Of what value is the project to fishermen?

EXAMPLE ANALYSIS # 1

PINK SALMON

FACTORS	NATURAL	NATURAL REHABILITATION	HATCHERY	S. CHANNEL	INCUBATION BOX
<u>PLAN:</u>					
Eggs Prop.	25 million	Same	Same	Same	Same
Return %	.003	.003	.041	.012	.0225
Total Returns	75,000	75,000	1,025,000	300,000	562,500
Spawners %	.333	.333	.015	.083	.044
Number Spawners	25,000	25,000	15,625	25,000	25,000
Hatchery Surplus	0	0	9,375	0	0
Harvestable Nos.	50,000	50,000	1,000,000	275,000	537,500
Hatchery Surplus + Harvest Nos.	50,000	50,000	1,009,375	275,000	537,500
Value/Fish (1)	\$1.25	Same	Same	Same	Same
Total value of Harvest + Surplus	\$62,000	62,500	\$1,261,719	\$343,750	\$671,875

COSTS:

Capital Invest (2)	0	\$100,000	\$2,500,000	\$500,000	\$300,000
Useful Life	-	5 Years	25 Years	10 Years	5 Years
Cost of Capital	-	8%	8%	8%	8%
Annual Capital Cost	-	\$24,360	\$231,600	\$72,804	\$73,000
Annual O & M (3)	-	-	\$400,000	\$25,000	\$200,000
O & M Startup (4)	-	-	74,100	7,280	97,000
TOTAL ANNUAL COST	-	\$24,360	\$705,700	105,084	370,000

ANALYSIS:

Net Income	\$62,500	\$38,140	\$556,019	\$238,666	\$301,875
Return on Invest.	-	38%	22%	48%	101%

RUN BREAKDOWN:

Spawners	25,000	25,000	15,625	25,000	25,000
Fishermen	50,000	24,000	258,375	163,200	143,800
Annual Costs (5)	-	26,000	751,000	111,800	393,700
TOTALS	75,000	75,000	1,025,000	300,000	562,500

EXAMPLE ANALYSIS #2

CHUM SALMON

<u>FACTORS</u>	<u>NATURAL</u>	<u>NATURAL</u> <u>REHABILITATION</u>	<u>HATCHERY</u>	<u>S.</u> <u>CHANNEL</u>	<u>INCUBATION</u> <u>BOX</u>
<u>RUN PLAN:</u>					
Eggs Prop.	25 million	Same	Same	Same	Same
Return %	.0015	.0015	.017	.006	.0077
Total Returns	37,500	37,500	425,000	150,000	192,500
Spawners %	44%	44%	.025	.111	.087
Number Spawners	16,500	16,500	10,312	16,500	16,500
Hatchery Surplus	0	0	6,188	0	0
Harvestable Nos.	21,000	21,000	408,500	133,500	176,000
Hatchery Surplus + Harvestable Nos	21,000	21,000	414,688	133,500	176,000
Value/Fish (1)	\$4.98	Same	Same	Same	Same
Total Value of Harvest + Surplus	\$104,580	\$104,580	\$2,065,000	\$665,000	\$877,000
<u>COSTS:</u>					
Capital Invest (2)	0	\$100,000	\$2,500,000	\$500,000	\$300,000
Useful Life	-	5 Years	25 Years	10 Years	5 Years
Cost of Capital	-	8%	8%	8%	8%
Annual Capital Cost	-	24,360	231,600	72,804	73,000
Annual O & M (3)	-	-	400,000	25,000	200,000
O & M Startup (4)	-	-	148,200	14,600	195,000
TOTAL ANNUAL COST	-	\$24,360	\$779,800	\$112,404	\$468,000
<u>ANALYSIS:</u>					
Net Income	\$137,550	\$80,220	\$1,285,200	\$552,596	\$409,000
Return on Invest.	-	80%	51%	111%	136%
<u>RUN BREAK DOWN:</u>					
Spawners	16,500	16,500	10,312	16,500	16,500
Fishermen	21,000	14,495	206,688	103,500	51,000
Annual Costs (5)	-	6,505	208,000	30,000	125,000
TOTALS	37,500	37,500	425,000	175,000	192,500

EXAMPLE ANALYSIS #3

SOCKEYE SALMON

<u>FACTORS</u>	<u>NATURAL</u>	<u>NATURAL REHABILITATION</u>	<u>S. CHANNEL</u>	<u>INCUBATION BOX</u>
<u>RUN PLAN:</u>				
Eggs Prop:	25 million	Same	Same	Same
Return %	.0016	.0016	.0049	.006
Total Returns	40,000	40,000	122,500	150,000
Spawners %	.357	.357	.117	.095
Number Spawners	14,280	14,280	14,280	14,280
Hatchery Surplus	0	0	0	0
Harvestable Nos.	25,720	25,720	108,220	135,720
Hatchery Surplus + Harvestable Nos.	25,720	25,720	108,220	135,720
Value/Fish (1)	\$5.68	Same	Same	Same
Total Value of Harvest + Surplus	\$146,090	\$146,090	\$614,690	\$770,890
<u>COSTS:</u>				
Capital Invest (2)	-	\$100,000	\$500,000	\$300,000
Useful Life	-	5 Years	10 Years	5 Years
Cost of Capital	-	8%	8%	8%
Annual Capital Cost	-	24,360	72,804	73,000
Annual O & M (3)	-	-	25,000	200,000
O & M Startup (4)	-	-	14,600	195,000
TOTAL ANNUAL COST	-	\$24,360	\$112,404	\$468,000
<u>ANALYSIS:</u>				
Net Income	\$146,090	\$121,720	\$502,286	\$302,890
Return on Invest.	-	122%	100%	101%
<u>Run Breakdown:</u>				
Spawners	14,280	14,280	14,280	14,280
Fishermen	15,720	20,020	81,920	26,120
Annual Costs	-	5,700	26,300	109,600
TOTALS	40,000	40,000	122,500	150,000

FOOTNOTES

- (1) Value of Fish - Based upon 1978 Alaska State-wide weights and prices.
- (2) Capital Investment - Basis of Estimates are as follows:
 - (a) Natural Rehabilitation - Cost is estimated at \$15.00 per square yard of stream bed rehabilitated (approximately 7,000 yards rehabilitated).
 - (b) Hatchery - Generally based upon Southern Southeast Aquaculture Association experience.
 - (c) Spawning Channel - Estimated in part upon Frazer River and Columbia River experience.
 - (d) Incubation boxes - based upon Washington State experience escalated to reflect higher Alaska costs.
- (3) Annual O & M - Estimated based upon a combination of Washington and Alaska experiences. Higher Coho O & M reflects additional holding time and costs.
- (4) O & M startup is estimated to be 2 years O & M costs for pinks and 4 years O & M costs for other species amortized at 8% interest for the useful life of the project.
- (5) Annual costs include an allowance to pay for the costs of harvesting that portion of the harvest allocated to cover annual costs.

AN ANALYSIS OF ARTIFICIAL & NATURAL SALMON PROPAGATION METHODS

SPECIES	FECUNDITY (1)	Survival-Egg Take to Emerge Stage by Propagation Method				Survival Emerge to Migrant Stage by Propagation Method				Marine Survival by Propagation Method			
		Natural	Hatchery	S. Channel	Incu. Box	Natural	Hatchery	S. Channel	Incu. Box	Natural	Hatchery	S. Channel	Incu. Box
		PINK	1400-2300 Ave. 2000	200	1700	1200	1500	-	1615	-	-	6	82
SOCKEYE	2800-4200 Ave. 3500	700	-	2100	2625	70	-	210	263	5.6	-	17	21
CHUM	2100-3500 Ave. 3000	450	2700	1800	2250	-	2565	-	-	4.5	51	18	23
COHO	2500-3500 Ave. 3000	600	2850	-	-	120	2565	-	-	10	128	-	-
CHINOOK	3000-5500 Ave. 4000	800	3800	2400	3000	400	3600	1200	1500	8	36	24	30

(1) Salmon Ranchers Manual
NMFS Report, July, 1975
Average is estimated for demonstration purposes.

(2) Survival - Egg Take to Emerge Stage
Percentile Estimates

	Natural	Hatchery	S. Channel	Incu. Box
PINK	10%	85%	60%	75%
SOCKEYE	20%	-	60%	75%
CHUM	15%	90%	60%	75%
COHO	20%	95%	-	-
CHINOOK	20%	95%	60%	75%

(3) Survival - Emerge to Migrant Stage
Percentile Estimates

	Natural	Hatchery	S. Channel	Incu. Box
PINK	-	95%	-	-
SOCKEYE	10%	-	10%	10%
CHUM	-	95%	-	-
COHO	20%	90%	-	-
CHINOOK	50%	95%	50%	50%

(4) Marine Survival Estimates

	Natural	Hatchery	S. Channel	Incu. Box
PINK	3%	5%	3%	3%
SOCKEYE	8%	-	8%	8%
CHUM	1%	2%	1%	1%
COHO	8%	5%	-	-
CHINOOK	2%	1%	2%	2%

AN ANALYSIS OF ARTIFICIAL & NATURAL
SALMON PROPAGATION METHODS

	Marine Survival Percentage of Egg Deposition				Percentage of Total Run Required for Constant Harvest Rate				% Temporary Reduction in Harvest To Increase Run Size by 50%			
	Natural Hatchery S. Channel Incub. Box				Natural Hatchery S. Channel Incub. Box				Natural Hatchery S. Channel Incub. Box			
PINK	.3%	4.1%	1.2%	2.25%	33.3%	* 1.5%	8.3%	4.4%	25%	* .8%	4.5%	2.3%
SOCKEYE	.16%	-	.49%	.6%	35.7%	-	11.7%	9.5%	28%	-	6.6%	5.3%
CHUM	.15%	1.7%	.6%	.77%	44%	2.5%	11.1%	8.7%	40%	1.3%	6.3%	4.7%
COHO	.3%	4.3%	-	-	22%	1%	-	-	14%	.5%	-	-
CHINOOK	.2%	.9%	.6%	.75%	25%	3.5%	8.3%	6.7%	17%	1.8%	4.5%	3.6%

*Includes 1/4 Male Spawners
for propagation with 3/4
used as hatchery surplus

*Harvest reduction would be on
each run until the higher level
run size is established. For
Pinks, because of the two year
cycle the harvest reduction
would be for a two year period.
For Chums the reduction would
be for four years.

JULY 1979

NOTICE OF MEETING

AQUACULTURE POLICY STUDY GROUP

THE AQUACULTURE POLICY STUDY GROUP WILL MEET ON MONDAY
JULY 9, 1979, 9:00 A.M. IN ROOM 423 OF THE STATE CAPITOL
BUILDING, JUNEAU, ALASKA. A PRESENTATION WILL BE MADE
BY THE FIRM OF MILLER & ASSOCIATES.

Terry Gardiner, Chairman
Pouch V
Juneau, Alaska 99811
Ph: 465-3720

MINUTES
AQUACULTURE POLICY STUDY GROUP
JULY 9, 1979

MONDAY - JULY 9, 1979

Call to Order

Chairman Terry Gardiner called the meeting to order at 9:30 a.m. in Room 423 of the State Capitol Building.

Roll Call

See attached attendance list.

Agenda

Meeting with Miller and Associates to discuss their draft findings and various options available for the salmon fisheries plan.

Introduction

Wally Miller of Miller and Associates started the presentation.

Discussion on Draft Recommendations and Options

Wally Miller advised that he was going to cover the economics review and the various investment techniques and would appreciate the input from the Committee. See Contract Task #3 "Economics" attached hereto. Mr. Miller discussed the cost benefit ratio analysis versus return on investment techniques. He advised that he personally favors the return on investment measure inasmuch as he felt it was the sterner of the two alternatives. Discussion ensued with various members of the Committee stating their views. It was the opinion of John Sandor that both areas are gray and thus it is possible to fudge on both. It was the opinion of the majority of the Committee that it would be necessary to utilize both techniques in order to get a complete picture and they questioned if it was economically feasible to utilize both.

Mr. Miller inquired of Barbara Sorensen as to the Department of Revenue's progress with the SIC code. Ms. Sorensen advised that certain conditions within the department had caused this to come to a standstill and at this point she is uncertain as to whether or not they would be continuing with it. Mr. Miller advised that he would discuss the Department of Revenue statistics in his final report.

Ms. Sorensen advised that the National Council on Water Resources has developed a complete system for a cost benefit ratio.

It was the consensus of opinion that the cost benefit ratio method is more a program than a project and that this function should be performed by another agency. Mr. Miller advised that he will, in his report, summarize how data could be obtained.

Contract Task 3.2

Mr. Miller advised that they were considering disregarding predation and subsistence as far as the quantifiable and non-quantifiable economic parameters. Chairman Gardiner expressed his feeling that it was important to consider subsistence and that possibly this should fall under the sport fish category. Mr. Miller expressed his desire to meet with the FRED division to discuss how his data coincides with financial accounting. It was suggested that risk analysis be included as a possible parameter.

Other areas of discussion included inexpensive versus expensive hatcheries; a ten-year as opposed to a six-year plan; and yield or return in comparison with cost of facility.

It was recommended that a seventh category be included under "cost factors" No. 7 "evaluation". Mr. Sandor inquired as to how the final report would deal with rehabilitation of streams and fishways. He again reiterated that he felt that it was a mistake to use return on investment in those particular cases. Mr. Sandor also presented to the Committee a sheet outlining the various projects that the Forest Service had been involved in since 1962. See attachment. He advised that he had been successful in obtaining money for the Forest Service efforts from Congress for 300 projects. However, their main problem is in the area of prioritization.

Mr. Wendte of SSRA felt that it was important to break the projects down by revenue versus non-revenue, which allowed different sources for funds.

Contract Task 4 - Financial Planning

Discussion ensued on the Department of Commerce's position regarding loans for fisheries projects; the fact that Weyerhaeuser will probably be looking at Alaska in the future as an additional investment; Mr. Miller would like to see something like the port authority in Washington set up in Alaska; and the possibility of Alaska floating its own bonds.

Mr. Sandor discussed the adverse impact on streams due to timber harvest. He advised that rehabilitation funds are collected out of timber receipts. A percentage of the timber receipts from each individual logging effort is assigned to rehabilitation of any streams within the boundaries of that particular logging show. It was Mr. Sandor's goal to have the State team up with the Forest Service on projects for joint financing in order to make the best use of the available dollars. It was his feeling

that the teamwork concept would be more effective. It was his opinion that the time is right now for formalization of the concepts due to the money available.

Break

The meeting recessed at 12:15 p.m., scheduled to reconvene at 1:30 p.m.

Called to Order

Terry Gardiner called the meeting back to order at 1:30 p.m.

Discussion on Task 4 (Continued)

Discussion ensued on the problem of getting brood stocks; transplanted brood stock versus Alaska brood stock; competition for eggs between the Fish and Game and fishermen's associations; the effect between loan policies and brood stock. It was suggested that the consultants obtain data from Washington state regarding the number of years for a return on brood stock and the resulting costs thereto. They then might be able to better determine whether their six-year plan was realistic or unrealistic.

Task 2

Mr. Bill Wilkerson of Eisenhower, Carlson, et al, spoke to Contract Task 2. It was Mr. Wilkerson's opinion that the present aquaculture program lacks organization. He feels that realism should be built in; so far only experimentation has taken place and that there is essentially no program at this time. Mr. Wilkerson advised that the final report was ready from Leonard Lane Associates on Task 1 and would soon be distributed. He further felt that organization and changes are needed to meet their goals. According to Mr. Wilkerson, coordination is necessary between the hatcheries and harvest management. The opinion was expressed by one of the Committee members that there should be a member of the Governor's administration present at the meeting to observe, direct and coordinate in order to ensure that all agencies were working for a common goal.

Mr. Wilkerson also pointed out the need for uniform reporting and accounting and for information-sharing among the hatcheries, Alaska Department of Fish and Game, the federal government and the Department of Commerce.

Goals

Mr. Wilkerson set forth the following tentative time frames for the goals:

PHASE I

1. Research and development phase. Two or three years in order to improve planning.
2. Development of fair share pay scheme.
3. Institutional relationships involving coordination of research.

He reiterated that informational development is absolutely essential.

PHASE II

Initial implementation as a result of the research stage.

PHASE III

Complete implementation.

PHASE IV

Final evaluation of the program. Is the program working?

Discussion

It was the opinion of many of the Committee members that the states of Washington and Oregon should be explored, as well as Canada, to determine whether they already had a program which the State might look to as opposed to individual activities. It was agreed that often too much planning is gone into with no concrete results.

Chairman Gardiner advised that due to an oversight, no money was appropriated this fiscal year for Committee meetings. He advised that members must pay their own travel and per diem for any future meetings but that their travel and per diem would be taken care of for this particular meeting. He advised that there was \$29,000 in contract money left over and that with the permission of the Committee, a contract extension would be granted to Miller and Associates for continuation of the program development. There being no opposition expressed, Chairman Gardiner advised that this would be done.

Next Meeting

A meeting will be set within a month or six weeks from now in order to review the final report and decide what to do and whether additional work needs to be done.

The Committee asked that the final report be distributed prior to this meeting in order that they might review it prior to

providing input.

Break

The meeting adjourned at 4:30 p.m.

AQUACULTURE POLICY STUDY GROUP

Bob Burkett	ADF&G, F.R.E.D.
Terry Gardiner	Alaska Legislature
Floyd E. Heimbuch	Cook Inlet A.A.
Joe Davis	ADF&G, F.R.E.D.
Curt Kerns	Sea Grant
Armin E. Koernig	PWSAC
Bill Marsh	NSRAA
Derek Poon	NSRAA
John Sandor	U.S. Forest Service
Bill Sheridan	ADF&G
Barbara Sorensen	Department of Revenue
John Sund	SSRAA
Ron Wendte	SSRAA
Jack McBride	IMARPIK Aquaculture
Margaret Branson	Alaska Legislature

GUESTS IN ATTENDANCE

Bill Wilkerson	Eisenhower, Carlson, et al
Wally Miller	Miller & Associates
Paul A. McCollum	AUCP Fisheries Development Corp.

Irish Keku Creeks
Red Creek
Hobo Creek
Logging Camp Creek
Solf Lake

Kupreanof Island
Prince William Sound
Prince William Sound
Prince William Sound
Prince William Sound

In addition to the more costly fishway projects, the fish habitat enhancement program has included numerous stream clearance projects, stream channel improvements, installation of trickle dams and gabions, construction of incubation boxes, and fish planting activities. These are done with the close cooperation and coordination of the Alaska Department of Fish and Game.

To date, over 300 additional fish habitat enhancement projects and/or opportunities have been identified on the Tongass and Chugach National Forests. Those projects shown to be feasible will be incorporated into the Resources Planning Act (RPA), Sikes Act, and budget proposals. An example is the Sixmile Creek Project on the Kenai now in the planning stages. It should be noted here that the Cook Inlet Aquaculture Association has contributed \$50,000 toward the initial stages of the Six Mile Creek Project.

The Forest Service is currently working with the State in updating the Sikes Act cooperative fish and wildlife comprehensive plan developed first in 1976. The State and Aquaculture Association have submitted comments on the Resources Planning Act Program. The Forest Service will identify specific projects for planning and construction during the 1980-85 period. We will explore, with the Alaska Department of Fish and Game, and the various aquaculture groups, opportunities for cooperation in the planning and accomplishment of these projects.

There are further opportunities for fisheries habitat enhancement under the

authority of the Knudsen-Vandenburg Act as amended by the National Forest Management Act of 1976. K-V funding may now be used to accomplish habitat improvements and restoration on sale areas on National Forest lands. We are still in the planning stages, however, significant projects such as the fishway on Log Jam Creek on Prince of Wales Island can be funded with these monies.

It is possible that on privately owned land similar arrangements could be made to reinvest a portion of the stumpage receipts in such things as fisheries and wildlife habitat improvement projects.

Although not discussed in any detail here, it should be noted that the Forest Service Fisheries Habitat Management Program includes the enhancement and protection of the sport fish resource which often is closely associated with the salmon fisheries.

In summary, it can be seen that the Forest Service has been actively involved for the past 25 years in a substantial fisheries habitat management program in cooperation with the State. More recently, the aquaculture organizations have come into the picture as cooperators and have participated in funding in some instances. The Renewable Resource Corporation may also consider cooperative ventures to enhance the fisheries. With continual cooperation, our organization can play a significant role in the development of Alaska's fisheries resource.

FISH HABITAT ENHANCEMENT
ACCOMPLISHMENTS AND OPPORTUNITIES
ON THE NATIONAL FORESTS OF ALASKA^{1/}

The Forest Service has a long involvement in fish habitat improvement in the Alaska Region. From 1952 to the present, some 250 projects have been completed on the Tongass and Chugach National Forests at a cost of approximately three million dollars. These costs have, in many instances, been equally shared with the Alaska Department of Fish and Game. Examples of the more important fisheries projects completed (or being worked on) are:

<u>Stream and Location</u>		<u>Cost</u>
Shrode Creek	Prince William Sound	\$42,000
Seal Bay	Afognak Island	15,000
Control Creek	Prince William Sound	35,000
Parlor Creek	Chicagof Island	40,000
Anan Creek	Bradfield Canal	262,000
Italio River	Yakatat	2,800

In December 1976, under the authority of the Sikes Act, a comprehensive fish and wildlife plan was developed by Forest Service and ADF&G. In this plan, approved by Governor Hammond, Commissioner Brooks, and Regional Forester Sandor, 23 projects related to fish habitat were identified. In Fiscal Year 1978, the Forest Service received \$600,000 under a special appropriation by the Congress for fishway projects. The planning done under the Sikes Act and the special funding in 1978 helped set the stage for the expansion of the Forest Service wildlife and fisheries programs.

As a result, additional fish habitat improvement projects have been either completed or are under contract. Examples of these are:

^{1/} Summary prepared for the July 9, 1979 Aquaculture Study Group, Juneau, Alaska.

J & R

Miller & Associates, Inc. CONSULTANTS

PLANNING • MANAGEMENT • FINANCIAL ANALYSIS

EVERGREEN PLAZA BUILDING • 711 SO. CAPITOL WAY • OLYMPIA, WASHINGTON 98501 • (206) 43-3885

July 9, 1979

To: Members Acquaculture Policy Study Group

From: Wallace Miller *WJM*

Subject: Agenda for July 9, 1979 Meeting

The Contractor proposes to provide a status report, discuss preliminary findings, identify additional areas for study or research by the Contractor and solicit comments regarding possible alternative courses of action or recommendations to be included in the final report.

The objective of this meeting is to stimulate discussions among the members of the committee on the issues presented so that the Contractors can fully consider these views in preparing a recommended course of action.

In order to facilitate the discussion, the Contractor proposes to conduct the meeting in the following sequence of discussion topics:

1. Economics
2. Financing
3. Institutional and Policy Arrangements
4. Goals

I look forward to a stimulating discussion and understanding your views and ideas about the issues to be presented.

AQUACULTURE POLICY STUDY GROUP

MEETING

July 9, 1979

Contract TASK #3 Economics

- I. Contract Task #3.1 - Inventory both micro and macro economic systems in use in the state and elsewhere in fisheries as well as other resource areas.
- II. Task I Status Report - Prior to the May 7, 1979 meeting of the Aquaculture Policy Study Group the Contractor evaluated a variety of micro and macro economic systems in use in the States of Alaska and (Kramer Chin and Mayo and others), the University of Washington and leading authors to determine the most appropriate means for conducting an economic analysis of the salmon fisheries.

While a listing of the alternative techniques will be included in the final report, the two basic techniques are:

Cost Benefit Ratio Analysis

Return on Investment

Because of the private sector orientation of Aquaculture development in Alaska, the need to attract increased amounts of investment (risk) capital to the Aquaculture program and given the traditional use of Return on Investment techniques by financial institutions, the Contractor prepared a series of Return on Investment comparisons for several alternative types of salmon propagation facilities. This information was reviewed with study group members on May 7 and a follow-up memorandum soliciting additional information and comments was sent to those members most directly involved with aquaculture operations.

The additional information requested has been received from a number of study group members and is currently being evaluated. The objective of this evaluation is to develop as realistic as possible estimates of returns and costs associated with alternative investment options.

With regard to the macro economic evaluation system, during the May 7 meeting of the study group the Contractor and a representative of the Alaska State Department of Revenue advised the study group of the following general findings:

1. A key ingredient in evaluating the economic value of the salmon fishing to the State of Alaska is the ability to reasonably accurately estimate the total tax revenue which annually accrues to the State from this industry.
2. Currently, the only information available on State tax receipts from the fishery is the raw fish tax. Personal and corporate income tax information for residents and non-residents is not available in a readily useable form.

3. Input/output analyses which identify the secondary multiplier effect of direct employment in the fishing industry, have not been conducted. Because of the large percentage of non-residents in the direct and indirect labor force, Washington State input/output ratios are not applicable to Alaska.
4. Based upon this lack of reasonably accurate information, the State of Alaska is not in a position to evaluate its return on its investment in the fisheries. Moreover, the lack of this information effectively precludes the State from explicitly formulating a fisheries economic development policy.
5. Department of Revenue research personnel are well aware of the information problem and are equipped to deal with the problem if authorized to do so.

Since the May 7 study group meeting the Contractor has met with Alaska Department of Revenue personnel to further discuss the need to develop a macro economic evaluation system.

During this meeting it was decided to defer any further action on macro economic systems until such time as current internal departmental policy discussions on this subject are resolved. It is anticipated that this subject will be re-opened at an appropriate time and that a macro economic system will be defined for the State of Alaska to use in evaluating the salmon aquaculture program.

III. Micro-Economic Systems - Preliminary Findings

1. There are three economic evaluation perspectives which must be defined if the economic benefits of salmon enhancement are to be understood. One perspective is that of an "investment banker" who is concerned about the return on a specific proposed capital investment. The second view is that of a fisherman whose concern about the project is the net increases in allowable harvest for fishermen resulting from the project. The third economic evaluation perspective is that of the State of Alaska. The economic evaluation of the State for the most part is a macro-economic perspective which reflects the costs incurred in the form of grants, loss of interest income from providing low interest loans and other investments it makes in the fishery. Offsetting these costs, the State obtains, increases in personal and corporate income tax revenues (both direct and indirect) as well as other taxes and revenues. Reduced unemployment compensation taxes, welfare payments and other types of public aid are also factors which should be considered in the economic evaluation from the State perspective. Because the perspectives as well as their method of economic evaluation differ, investment bankers, the State and fishermen may judge the value of projects differently.

5. In addition to the substantial lack of information on expected returns of harvestable numbers of salmon for varying propagation methods, insufficient attention has been paid to the economic effects and examining of alternative propagation methods.

V. Micro Economic Systems - Preliminary Findings

Deferred to later meeting.

VI. Macro Economic Systems - Discussion Items

Deferred to later meeting.

- I. Contract Task #3.2 - Identify the economic parameters, both quantifiable and non-quantifiable and the various methods of analysis that can be applied to these parameters.

- II. Task #3.2 - Status Report - During the May 7 meeting of the study group the Contractor identified the following parameters as being critically important to the economic evaluation of salmon aquaculture:

Salmon Propagation Factors

1. Number of eggs to be propagated
2. Survival rates - egg take to emerge stage
 - emerge to migrant stage
 - marine survival
3. Total returns - by project
4. Number of spawners required
5. Hatchery surplus (if any)
6. Harvestable numbers of fish
7. Value per fish
8. Total value of harvest plus surplus

Cost Factors

1. Amount of capital investment
2. Useful life of facility
3. Cost of capital
4. Annual capital cost
5. Annual O & M cost
6. O & M startup cost

Economic Analysis Factors

1. Net income
2. Return on Investment

Run Breakdown Analysis

1. Spawners
2. Harvest by fishermen
3. Portion of run used to offset operating costs

In addition to these preceding factors which must be quantified to conduct a complete economic analysis, the Contractor has considered the following factors but has not yet attempted to quantify them.

Run losses to natural predation.
Run losses to subsistence fisheries.

Since the May 7 meeting the Contractor has requested additional information from ADF & G and the Aquaculture Associations with regard to more realistic survival rates and costs. Based upon further analysis of available data the Contractor now believes it would be appropriate to change the earlier O & M cost factors to the following:

O & M Costs
Association Administration
Regional Technology Development & Application
Facilities in Start-up
Facilities in Operation

Additional analysis of response provided to the Contractor have been analyzed and some difficulty has occurred in translating ADF & G, F.R.E.D. Division Standard Assumpiton on Salmon Survivals (attached) in a manner which allows alternative facilities (and investment levels) to be evaluated. Meetings will be held to clear up these difficulties.

III. Economic Parameters - Preliminary Findings

1. The suggested economic parameters are designed to answer the following questions for each aquaculture project:
 - a. How many fish will return?
 - b. How many fish can be harvested?
 - c. is the project a sound investment?
 - d. Of what value is the project to fishermen?
 - e. What proportion of the harvest may be needed to pay facility O & M costs?
2. Based upon the results of the survival rate and cost information provided by the Associations and further based upon the outcome of discussions with with F.R.E.D. Division regarding salmon survival rates, the economic analyses presented during the May 7 meeting will be reworked to provide more realistic estimates of return on investments and run distributions.
3. Notwithstanding the changes which might occur as a result of more refined data substantially different rates of return are anticipated for differing species and depending upon the type cost of propagation method being used.

4. Because of the potentially greater survival rates for eggs artificially propagated (as opposed to those occurring in nature), and reduced percentage of the run required for spawning, artificially propagated runs have the potential of providing greatly increased numbers of harvestable fish, given the same number of eggs naturally deposited.

For example, based upon F.R.E.D. Division Standard Assumptions, of 1,000,000 green Coho eggs raised to smolt and planted at a stream mouth, 62,000 would return as adults approximately ±60,000 could be harvested.

Comparable data for natural coho runs indicate that approximately 8,500 adults would return providing for a harvest (less escapement) of about 6,000 fish.

Assuming this order of magnitude to be generally correct, the question to be answered through additional analysis is what proportion of the artificial run can be harvested by fishermen and what proportion is necessary to pay for the cost of its creation.

IV. Economic Parameters - Discussion Items

1. What other factors, either dealing with salmon survival or costs, by category, is it reasonable and necessary to include as an economic parameter?
- I. Contract Tasks #3.3 and #3.4 - Select those parameters that would be effective in making an economic evaluation appropriate to the State of Alaska and in light of Tasks 1 and 2 furnish a recommendation of the most appropriate parameters and means to analyze them.
 - II. Tasks #3.3 and #3.4 - Status Report - Work on these tasks will be initiated pending review by the study group of the preliminary findings, receipt of additional information from regional associations and the classification of survival rates with F.R.E.D. Division.

DIRECTIVE

F.R.E.D. DIVISION

Attachment I

POLICY: STANDARD ASSUMPTIONS ON SALMON SURVIVALS (Unmarked fish)

PROCEDURE:

For your guidance in planning, budgeting and evaluating, these values are to be used.

In the hatchery

Green Egg	to	Eyed Egg	90%
Eyed Egg	to	Emergent Fry	95%
Emergent Fry	to	Fed Fry*	95%
Fed Fry	to	Fingerling**	95%
Fingerling	to	Smolt (10 gram)	80%
Smolt (10 gram)	to	Post Smolt	90%
Green Egg	to	Smolt	62%

In lake or stream

Hatchery Produced

Eyed Egg (Plant)	to	Emergent Fry	50%
Emergent Fry (King, Coho, Sockeye)	to	Smolt	7%
Fed Fry	to	Smolt	10%
Fingerling (King, Coho, Sockeye)	to	Smolt	20%
Smolt (Coho, Sockeye)	to	Adult	10%
Smolt (King)	to	Adult	3%

Lake or Stream Produced***

Emergent Fry (Pink, Chum)	to	Adult	1%
Emergent Fry (King, Coho, Sockeye)	to	Smolt	10%

Hatchery Produced Fish Planted Near or in Tidewater

Emergent Fry (Pink, Chum)	to	Adult	0.7%
Fed Fry (Pink, Chum)	to	Adult	1%
Fingerling (Pink, Chum)	to	Adult	2%
Smolt (Coho, Sockeye)	to	Adult	10%
Smolt (King)	to	Adult	3%

DIRECTIVE No. _____

DATE: _____

DIRECTIVE

F.R.E.D. DIVISION

To calculate the expected survival of a fish lot, multiply together all treatment values. For example: Coho salmon raised to smolt and planted at a stream mouth.

Green	to	Eyed	90
Eyed	to	Emergent	95
Emergent	to	Fed Fry	95
Feeding	to	Fingerling	95
Fingerling	to	Smolt	80
Smolt	to	Adult	10

$.90 \times .95 \times .95 \times .95 \times .80 \times .10 = .062$ or 6.2% survival from Green Egg to Adult.

Sockeye salmon planted as fed fry in a lake

Green	to	Eyed	90
Eyed	to	Emergent Fry	95
Emergent Fry	to	Fed Fry	95
Fed Fry	to	Smolt in lake	10
Smolt	to	Adult	10

$.90 \times .95 \times .95 \times .10 \times .10 = .0081$ or .81% survival from Green Egg to Adult

Fecundities by Species (fecundity values may be changed where actual observations are available).

Chum	2,200
Pink	1,600
Coho	2,800
King	6,500
Sockeye	3,000

- * Definition of Fed Fry -- 25% weight gain from emergent (swim-up) weight.
- ** Definition of Fingerling -- 100% weight gain from emergent (swim-up) weight.
- *** Includes fry from egg plants, stream incubation boxes, incubation channels, etc.

COHO SALMON

<u>FACTORS</u>	<u>NATURAL</u>	<u>NATURAL REHABILITATION</u>	<u>HATCHERY</u>
<u>RUN PLAN:</u>			
Eggs Prop.	25 million	Same	Same
Return %	.003	.003	.043
Total Returns	75,000	75,000	1,075,000
Spawners %	22%	22%	1%
Number Spawners	16,500	16,500	10,312
Hatchery Surplus	0	0	6,188
Harvestable Numbers	58,500	58,500	1,058,500
Hatchery Surplus + Harvestable Nos.	58,500	58,500	1,064,688
Value/Fish (1)	\$ 6.51	Same	Same
Total Value of Harvest + Surplus	\$380,835	\$380,835	\$6,931,000
 <u>COSTS:</u>			
Capital Invest. (2)	-	\$100,000	\$2,500,000
Useful Life	-	5 Years	25 Years
Cost of Capital	-	8%	8%
Annual Capital Cost	-	24,360	231,600
Annual O & M (3)	-	--	800,000
O & M Startup (4)	-	--	278,000
TOTAL ANNUAL COST		\$24,360	\$1,309,600
 <u>ANALYSIS:</u>			
Net Income	\$380,835	\$356,475	\$5,621,400
Return on Invest.	-	256%	225%
 <u>RUN BREAKDOWN:</u>			
Spawners	16,500	16,500	10,312
Fishermen	58,500	53,500	797,088
Annual Costs (5)	-	5,000	267,600
TOTALS	75,000	75,000	1,075,000

Contract TASK #4 - Financial Planning

- I. Contract Task #4 - Evaluate existing financial planning for the A.S.R.D.P. Define problems. Develop criteria for financial planning and recommend model financial planning framework.
- II. Task 4 Status Report - The Contractor has examined the current financial planning mechanisms established in statute which provide funding for the Alaska Salmon Resource Development Program.

Through a series of legislative acts beginning in 1974, the Alaska State Legislature has established and refined several mechanisms for the development of private-non-profit hatcheries and more generally the renewable resources of the State.

More specifically the legislature has provided:

- (1) For a royalty assessment of either 2 or 3 percent of the fair market value of salmon sold by persons holding entry permits, with the proceeds to be used by regional aquaculture associations for salmon enhancement projects.
- (2) Provided for 25 year state loans to regional aquaculture associations of up to \$3,000,000 per facility at a maximum interest rate of 8% with deferred payments for six years.
- (3) Provided for organizational and planning grants to qualified associations of up to \$100,000 initially with a second \$100,000 to be matched on a 50/50 basis.
- (4) Established the Renewable Resources Corporation of Alaska and Development Fund into which not less than 5% of the receipts from certain revenues will be deposited to be used to enhance and develop renewable resource programs.
- (5) Provided additional revenue for salmon enhancement and related projects through the passage of H.B. 306. *SB 232*
- (6) Provided for the establishment of the Commercial Fishing and Agriculture Bank which may receive 1/3 of the revenues as provided for in H.B. 306 which in turn can be loaned, or used as a guarantee for regional aquaculture association loans.
- (7) Creation and state funding of the F.R.E.D. Division of ADF & G.

As a result of these actions, it appears that the Alaska Legislature has taken a number of positive steps toward the encouragement of salmon resource development.

The main financing problem is presently not the lack of investment capital (which could become a problem), but instead the problem is a lack of financial resources by the regional associations. Financial problems at the regional level are as follows:

1. The regional royalty assessment does not provide sufficient revenues to pay administrative costs, regional technical expertise and hatchery O & M start-up costs for more than one large facility at a time.
2. No agreed upon financing mechanism has been established for financing hatchery O & M costs, once the hatchery is in production.
3. The \$3.0 million loan ceiling can be artificially restrictive on the choice and size of facilities.
4. The responsibility as to who is responsible for the "investment risk" is not defined nor understood. Local fishermen and association managers fear financial failure.
5. The use of non-profit organizations, while desirable from some perspectives, is simply not geared to take the financial risks that for profit organizations are willing to take.
6. The lack of a unique system of budgeting, accounting and financial reporting among the associations makes it very difficult to develop comprehensive financial policies at the state level.
7. The regional associations lack the necessary mechanisms for stability. Assessment revenues remain uncertain and no reserves exist to cover a "bad year" or further expansion.

In addition to these financial problems at the regional level, there are several financial problems at the state level which are impacting the A.S.R.D.P. These are:

1. Notwithstanding the public's willingness to support bond issues for the construction of salmon propagation facilities, the state, because of scarce financial resources and a strong user pay orientation is not committed to paying the O & M costs for facilities once they are in production. As more state operated facilities become operational the controversy over who pays will increase, which in turn will effectively limit the amount of production, which will in turn control the achievement of any quantitative goal such as "100 million salmon by the year 2000".
2. The emergence of for-profit salmon resource development corporations in Oregon, California and sooner or later in Washington with their very persuasive "free" fish argument could become a highly devious alternative in Alaska which can best be countered by a system which produced results at a minimum cost to the taxpayers.

3. The State of Alaska by choosing to constitutionally limit taxing authority has deprived itself of one of the primary methods for economic development found in other states. The states of Washington and Oregon, through their port authorities and such mechanisms as METRO have devised long term organizations which have comparatively stable and adequate financing so they can and do prepare long range plans and achieve them.

III. Task 4 - Preliminary Findings

1. Pending the outcome of the litigation, some additional actions such as a constitutional amendment (or state collection and re-distribution of the royalty assessment) may be necessary to ensure this source of financing can be counted upon by the regional associations.
2. Again, pending the outcome of the litigation it may be desirable to re-direct the proceeds from ~~H.B. 306~~ ^{SB232} going to local government to the regional associations so as to ensure projects are properly prioritized and to improve the revenue base of the associations.
3. A "source and applications" funding model needs to be developed and tested. Such a model might include the following elements.

APPLICATION	FUNDING SOURCE
1. Association Administrative Costs	Royalty Assessment
2. Regional technology development and application (Regional Fisheries Biologists and other technical personnel involved in facility planning, stream surveys, test fisheries etc.)	State Planning and Survey Grants Federal EDA Planning Grants
3. Facilities in Start-up operations and maintenance	Royalty Assessment or State Loan or Guarantee to be repaid from 4 below
4. Facilities in production operations and maintenance	Hatchery harvest (limited to not more than 50% of the run) surplus fish and eggs, royalty assessment subsidy, federal and state mitigation payments
5. Capital costs for facilities and rehabilitation projects	Initially state loan or guarantee, then same as 4 above

4. The hatchery loan programs needs to be substantially re-structured. Based upon approved plans, the regional association should be able to receive a construction loan separate from a start-up loan and further be guaranteed that the start-up loan will be available and can be repaid from future production revenues or royalty assessments or combination thereof at the election of the regional association.
5. The state needs to consider its level of responsibility for the financial risk if an association were to default in its payments as a result of a "bad year" or other circumstances creating financial difficulties. The objective of such action is to more clearly define for the associations, a state position which acknowledges the financial risks involved in aquaculture development and the level of financial risk acceptable to the state. In addition, such action would relieve state lending officials from making arbitrary judgements about the financial policies of the regional associations.
6. A uniform system of budgeting, accounting and financial reporting needs to be established for the associations which will satisfy legislative and executive branch concerns over the finances of the regional associations. Such a system would in turn will help ensure that the assumed financial risk by the state can be appropriately monitored.
7. In terms of state financial policies it will become increasingly more difficult for ADF & G to secure state appropriations to operate production hatchery facilities are being operated on a user pay basis by the regional associations. For ADF & G research facilities which would not be duplicated by regional associations, on the other hand, it could be argued should be a state funding responsibility because of their state-wide benefits and importance to the total program.

Contract TASK #2 - Institutional
and Policy Analysis

- I. Contract Task #2 - Evaluate existing institutions and policies and the implications of present and possible alternatives for suitability to achieve goals. Evaluate ramifications of possible alternatives. Define existing problems.
- II. Contract Task #2 - Status Report - Leonard Lane and Associates reported a detailed outline of state programs impacting on the salmon fishery. An outline format describing each program by type, size, structure, geographical location, funds and primary constituents was presented for each such program. A horizontal diagram depicting all such programs on a wall chart was presented to indicate the morass of state programs affecting the Alaska Salmon Fisheries Development Program (ASRDP).

A less detailed presentation regarding federal programs was also offered at the May 7, 1979 meeting by William R. Wilkerson. A breakdown of federal programs to identify those directly involved in fisheries management, development research, enforcement and financing, non-fisheries regulatory activities, and other economic assistance programs was done for purposes of review. It was indicated at the meeting that it would be impossible and inappropriate pursuant to this contract to conduct the investigation necessary to compile information in the same manner as for the State of Alaska. Some initial analysis as to basic issues and needs to maximize effectiveness of federal program activities vis a ASRDP was made available to the study group.

Since the May 7, 1979 meeting, the detailed outlines regarding state program activities have been completed and the first stages of analysis (below) have been performed by the Contractors. This includes a detailed listing of preliminary findings and conclusions regarding the status of ASRDP and some suggested courses of action. Additionally, some possible institutional arrangements consistent with project findings and existing and potential new goals are being offered for discussion at the second study group meeting. All are stated in general terms to trigger discussions and suggestions of alternative courses of action by the study group.

III. Contract Task #2 - Preliminary Findings

The following is a detailed listing of preliminary findings and conclusions regarding the present institutional arrangement for ASRDP. It is emphasized that these findings are largely the product of detailed review of available literature, studies and program outlines, comparative analysis with programs in other states, and limited discussions with members of the study group, among others. We have not conducted detailed discussions with all parties involved in ASRDP, as it has been our view that until the study group has had the opportunity to review and assess certain alternative

options regarding alternative and reform of the present institutional arrangement, and to provide specific guidance to the Contractors, discussions with key policymakers is inappropriate. We await guidance from the study group as to how best to proceed.

Statement of Findings and Needs

A. Need for Consolidation of ASRDP Policies and Goals

The wording of the Constitution of the State of Alaska and its statutes and policy statements clearly indicate that fisheries development is a top priority activity for the state. What is needed is not new goals, but consolidation of goals into a single ASRDP program statement consistent with proposed reforms and implementation, coordination, direction and accountability for results within the executive branch. (See discussion for Contract Task #1).

B. Need to Address Institutional Disarray Which is a Present Feature of ASRDP

The detailed program outlines developed by Leonard Lane and Associates indicate a need for greater horizontal coordination among a wide variety of programs and agencies in Alaska having impact on the successful operation of ASRDP. Clear direction as to the relative roles and responsibilities of each entity as it related to the overall goal of fisheries development, their interrelationships in achieving established goals, and means of assuring that such programs and activities not operate at cross purposes from one another, need to be established. The role of the Office of the Governor, agencies with major involvement and responsibility for ASRDP, regional associations and the private sector, as part of a consolidated approach to fisheries development must be addressed in terms of alternative institutional arrangements to be considered by the study group. The findings and needs addressed throughout this outline suggest certain reforms and approaches to program reform, consolidation and coordination. Among the specific issues which must be addressed relating to greater coordination among ASRDP programs are:

1. Need for improved harvest and hatchery management relations - A number of studies have identified the need for greater coordination among harvest management and hatchery programs within ADF & G, especially with regard to research conducted by both. As hatcheries come on line, the need for coordination and communication among such divisions within ADF & G will loom all the more important. Moreover, competition for limited research dollars among the two divisions can backfire for both. Over time, improved relationships between the F.R.E.D. Division and commercial and sport fisheries divisions will be required, as management to maximize harvest and protect viable runs loom all the more complex with the interjection of hatchery runs. Thus, the need for coordination among these divisions is not limited to the problem of competition for limited research dollars.

2. Need for improved relations between regional associations and ADF & G - The existing arrangement for development of regional associations and private nonprofit hatcheries presents a number of problems. First, the relationship between regional associations and ADF & G has been identified by a number of writers as hostile. Lack of cooperation and coordination among these entities has jeopardized the future successful operation of all. The legislature must consider imposition of requirements on both ADF & G and the regional association to jointly achieve results contemplated for ASRDP.

To date, both ADF & G and the regional associations have been dependent on state monies to support a variety of activities relevant to salmon resource development. Regional associations have built hatcheries, other artificial propagation projects, they have conducted research, they have created greater public awareness of the need for salmon resource development, and they have participated in some regional planning. Yet, cooperation with ADF & G has been limited and it differs from association to association.

On the other hand, it appears that the regional associations have had to fight ADF & G with regard to methods being undertaken to develop the resource, they have had problems obtaining brood stock and eggs for existing facilities from the state, and in many cases, the recommendations of regional associations through a legislatively established planning process have often been ignored. There is no apparent commitment by ADF & G to guarantee the successful evolution of the private non-profit hatchery program or vice versa.

While we do not suggest that either ADF & G or the regional associations are singly at fault for the relative adversary relationships which have evolved, we do suggest that the legislature itself can and should mandate improved relationships. Moreover, if regional associations are to be viable, program goals and missions for both the PNPs and ADF & G must be more clearly defined. In other words, comparative roles of both in regional planning and operation of activities related to the ASRDP must be defined.

3. Salmon, shellfish, bottomfish development - need for improved relationships - Competition for research, management and investment dollars among program activities will be further heightened by the growing interest in development of off-shore fisheries in Alaska. The state will have only limited involvement in actual management control over such fisheries, although its interest in the activities of the North Pacific Fisheries Management Council, and assumption of a responsible advocacy role before such council, will dictate the need to develop data and information regarding management problems which are likely to evolve now and in the future. With regard to bottomfish, the primary concern will be how to develop this fishery to the maximum benefit of the citizens in the State of Alaska. Initial development efforts will require substantial biological data and information for the private sector to be motivated towards utilization of such species, but it is suggested

that the bulk of activity from the state's perspective will be concentrated on the economics and social aspects of responsible development.

Thus, there will be a need to establish clearly defined relationships between any bottomfish and shellfish development programs, and the Alaska Salmon Resource Development Program. The commonality of objectives, i.e., to maximize benefits for the citizens of Alaska of all such fisheries, are not followed by commonality of needs and solutions. However, competition for dollars, the existence of programs which can be utilized for all fisheries development at both state and federal levels, ultimate relationships in the harvesting of many such species, and the clear need for Alaska to have its "act together" if it is to receive appropriate levels of benefits from all such fisheries, necessitate establishment of a coordinated fisheries resource development program, which takes into account the needs of each of the three above fisheries.

4. Need for improved federal-state relations - see discussion below.

C. Need for Improved Information, Data and Research Results for ASRDP

1. Budget implications and financial stability - We have identified a clear need for improved data regarding fisheries development activities, both by state agencies and regional corporations, if financing for expansion of the fisheries resources of the state is ever to be secure. Lack of information and proof of success of existing programs has affected budget reductions and instability which renders short-and long-range planning difficult.

At present, stability of financing for salmon resource development programs appears a problem for both the regional associations and ADF & G. Again, the legislature has significantly cut the budgets of both activities, with no obvious future commitment to continuation of an aggressive salmon development program. In other words, a signal has been sent for all such activities to improve on existing operations. Part of the reason for this has been the perceived competition among such entities and their lack of ability to prove results which justify public investment. The relationship between ADF & G and the private nonprofit program and the legislature must be improved (see below). A first step is a commitment to develop data and information necessary to successful planning for and operation of the ASRDP. This is an area in which regional associations and ADF & G can immediately work closely together.

2. Need for expanded research to accomplish ASRDP goals - While a primary need is improvement of data and information for budget purposes, increased biological information regarding the implications of existing and proposed projects of ASRDP. Again, the large number of biological questions raised about any and all hatchery programs throughout the United States affect program budget.

Federal, state and private sector research must be directed at resolution of questions involving disease egg transfers, the relationship of hatchery planning and harvest management, improved methods for hatchery operation, and the like. Certain research needs are suggested in the Economics section above. A system for establishing research priorities consistent with broad goals for resource development should be established. This will include coordination with the Federal government (see below). In any event, expanded research and development of data and information must concentrate on exploration of artificial propagation alternatives and establishment of clear biological guidelines for the establishment, location and operation of fish production facilities.

- a. Exploration of artificial propagation techniques - As indicated in the discussion regarding economics of artificial propagation projects, there are a number of different means of producing salmon. Some such means are appropriate in certain regions while others are not. Moreover, certain means involve considerably greater front end costs, (hatcheries), while others (egg boxes) require relatively little in front end capital costs. Once economic and biological guidelines for various projects have been established in a particular region, regional associations and/or ADF & G must have sufficient capital available to them to conduct research to evaluate the best mix of alternatives. Moreover, if the goal of ASRDP is to get the "biggest bang for the buck", further research as to means of improving alternative means of propagation must occur. Some such research is now being done by regional associations, the federal government, colleges and universities and the state. Again, coordinated research is a must, and assignment of responsibility for such research to these entities must reflect regional needs, contribute to the accomplishment of state-wide production goals, and reflect an appropriate allocation of costs among citizens and users.
- b. Establishment of biological guidelines for the construction and operation of fish production facilities - In the discussion above, we have indicated that prior to approving a particular artificial propagation project, certain economic factors must prove the worthiness of such project. The need for economic guidelines is only a part of the analysis necessary for more successful ASRDP operations. Biological guidelines for the construction and operation of hatcheries and other artificial propagation projects must be established. This will require analysis of the impact of such projects on existing natural runs, the viability of projects in the face of competing beneficial uses of watersheds, and analysis of wide variety of other critical biological issues outlined in the Economics discussion above.

Other states involved in fisheries resource development programs have established detailed guidelines for evaluation of hatcheries before they are built and established procedures and guidelines for operation of such hatcheries in a manner consistent with statewide goals. As long as federal and state agencies and regional associations are involved in the production of salmon,

a process to assure selection and operation of facilities in a manner consistent with goals, objectives and guidelines of ASRDP will be required. We are in the process of evaluating proposed and existing processes and guidelines for hatchery programs.

D. Some Additional Specific Problems and Needs for Regional Associations Affecting Institutional Arrangements

Detailed analysis of financial needs and policy implications are discussed in the financing section above. Suffice it to say that the present financial arrangements for the associations have major institutional implications. Again, relationships between regional associations and ADF & G have been less than cordial thus affecting not only the program accomplishments and credibility of both, but also the long-term stability of ASRDP.

Financial decisions relating to ASRDP suggest the need for clarification of the relative responsibilities and roles of regional associations and ADF & G. Decisions regarding who should pay or bear the risk for failures affect the types of operations to be undertaken by the state and the private sector. Biological information needs (research) and economic prospects in part should dictate whether it is appropriate for regional associations or ADF & G to undertake particular projects.

We think it is an open question whether voluntary private non-profit institution(s) as have been established by the Legislature can in fact provide the organizational stability and operational flexibility to undertake a major economic development activity as is contemplated for ASRDP, e.g., returning harvest levels for salmon to historic high levels. As discussed above, non-profit corporations by their nature are not major risk takers. Moreover, the level and quality of constituent interest (primarily fishermen) in an active fisheries development role is by no means assured. In this latter point, the threat of private aquaculture filling a regional association void may well stimulate continued interest in the program. Again, financial needs for ASRDP may dictate altered structures.

Other needs and factors relating to the organization and structure of regional associations not suggested above include the following:

1. Need for uniform reporting and accounting system for regional associations - One of the problems during the early years of the regional association program has been the lack of a systematic reporting system which will allow state policymakers, fishermen, and others to review the progress of the various associations. Moreover, in the analysis of economic and biological projections, as well as program results over the long term, it will be necessary to work from a common set of data.

Comparing the effectiveness and efficiency of different programs and approaches undertaken by the associations, not to mention ultimate comparison of successes with federal and state projects, will be impossible without establishment of a uniform data and reporting system.

State agencies have been relatively critical of the level and quality of information available to them regarding internal activities of the associations. Moreover, legislators have apparently been frustrated by the lack of a common reporting system. Such a system must be simple and yet report out information necessary not only to evaluate the programs, but also to reduce and minimize administrative burdens and cost to the associations. Obviously, the regional associations must participate in any program effort at system development.

Establishment of a uniform reporting and accounting system for regional associations cannot be totally apart from those systems established for state agencies. Ultimately, the information from each ASRDP activity must be in a form which can be digested to evaluate successes and failures of its operations. Moreover, information sharing is facilitated by common systems. This is and to suggest a single information system for all ASRDP programs, as the varying needs and requirements of state and private activities will vary.

2. Need to assure equity in participation and sharing of regional association program results - A problem for the regional associations has been to treat fairly all interested user groups, not only through participation in regional association management and planning, but through receipt of benefits from programs undertaken by the associations. To improve the viability and quality of operation of the regional associations, means to better and more fairly involve sports fishermen, subsistence fisheries, less than dominant fisheries in particular regions, and interested citizens in the operations of such associations appear necessary.

Clearly, all user groups are interested in maximizing benefits from both the state development and management programs and regional association activities to their own members. Whether fisheries managers like to admit it or not, a critical issue in both management and enhancement decisions is who gets what? The ASRDP and its specific programs must be operated in a manner which better assures all parties equity in both participation in and benefits from such programs. This is not to mention the need to, maximize benefits for all citizens of the state at least to the extent of public investment in these programs.

3. Need to evaluate actual resource development needs for each region - There is little doubt that the resource development objectives of the many regions of Alaska will differ. For example, in the Aleutian Islands resource development priorities might not include any projects for salmon fisheries development. Their activities may more appropriately be

centered on bottomfish development. Regional associations could be authorized to become involved in projects related to bottomfish development in order to become a more effective tool for the rational economic development of a region.

Another example would be the differing types of salmon fisheries which may exist in regions where salmon is an important resource. Prevalance of gear in such regions will in part dictate the species which should be developed. In Cook Inlet, consideration of sport fisheries interests is looming all the more important, yet regional associations may not now be properly organized to deal with such interest. Over time, one must consider whether the existing regional association structure will appropriately meet true regional needs. We will suggest format changes which will accomodate more flexible utilization of regional associations in Alaska fisheries development activities.

Additionally, the research, management, and resource development staffs of regional associations and ADF & G are not presently directed or located to best address and meet regional fisheries development needs. Establishment of regional planning activities, with regional association participation, is but a small step towards achieving this goal. However, the mission and capabilities of regional fisheries planners must be clarified, expanded and improved.

4. Need to identify appropriate level of activity for regional associations - The need to identify the level of program activities to be undertaken by both ADF & G and the regional associations has surfaced. At present, certain regional associations are moving aggressively while others are going slow. At the same time, the commitment of ADF & G to expansion and establishment of new projects to achieve increased salmon runs is limited by virtue of significant budget cuts.

It is suggested that the goals established by the legislature, framers of Alaska's constitution, and individual program managers to return runs to their historic high levels, and to perhaps expand such runs beyond such levels, will not be achieved if regional associations are to operate on budgets which justify but a few projects. Moreover, ADF & G does not have a sufficient budget to undertake the kinds of projects necessary to begin to achieve the above goals.

ASRDP can be shaped to accomplish established goals. Stability of financing for such programs, coordination with harvest managers, improved and coordinated research, and the sharing and development of information to prove viability of all programs will be required if any aspect of the ASRDP is to be justified and continued. Again, the legislature must assure development of information early on to identify an appropriate level of program activities for both ADF & G and the regional associations.

5. Need to identify regional development and research priorities and assure adequate staffing to achieve regional goals and policies - The legislature has taken an important first step toward assessment of regional needs in establishment of regional planning activities as part of authorizing legislation for the private non-profit hatchery program. However, it is suggested that regional planning activities, as presently constituted, are not adequate to assure implementation of ASRDP in a manner consistent with established regional needs. As indicated above, needs of Alaska's regions differ and ADF & G and regional association activities should reflect these differences. This suggests to us consideration of alternative organizational structures for both ADF & G and regional associations, with greater concentration of resources by areas and according to established needs.

As noted in the financing and economics sections, regional associations are budgeted for regional planning. Yet, relative roles and responsibilities of ADF & G and the associations by no means assures that fisheries development policies approved by the state reflect their input. Resultant hostile or adversary relationships noted above are quite contrary to the goals for association involvement in planning established by the legislature. We are in the process of identifying means of improving relationships through planning process as well as exploring institutional alternatives which will better assure accomplishment of region specific ASRDP needs.

6. Need for cooperative agreements among federal and state agencies, regional associations and others - ADF & G has in effect a cooperative agreement with the U.S. Forest Service at this time. We have not evaluated the results that have evolved from this agreement. However, we suggest that improved federal-state relations, as well as relations between regional associations and the federal government, must occur if the ASRDP is to be improved. Model cooperative agreements, including sharing of information, research results and data, utilization of labor and skills, and the like, can go a long ways towards improvement of the existing resource development program. The legislature can mandate that regional associations and the state negotiate cooperative agreements with each other and with all appropriate federal agencies. This is not to limit such agreements merely to fisheries agencies. In fact, cooperative arrangements with regulatory activities, industrial development agencies, among others, will be as important over time as those among fisheries agencies themselves.

E. Activities to Improve Federal-State Relationships and Expand Federal Contribution to ASRDP

1. Need to build case for equitable federal expenditures into ASRDP - Although it was impossible to obtain detailed budget statements regarding commitment of federal dollars to research relating to Alaska Salmon Resource Development (nor would the time involved for such a task be justified at this time or as part of this

project), we would suggest that a number of factors indicate that Alaska may not be obtaining a share of federal research monies commensurate both with its resource availability and potential when compared with other states. While the federal presence in Alaska is perhaps greater than any other state, competition for limited dollars is again a fact of life when it comes to federal research monies. A first reality when exploring possible reasons for lesser federal expenditures relating to Alaska salmon fisheries than may be justified include comparative lack of political clout of Alaska's Congressional delegation (a very small delegation), the location of federal regional offices in Seattle and fisheries policy offices in either the region or in Washington, D.C., the location of most major regional research facilities outside the State of Alaska, the relatively small population of the state, comparative inaccessibility to the state, and the difficulty in getting highly qualified and skilled researchers to locate in Alaska.

We suggest that all is not lost however. A major reason for some comparative lack of attention to Alaska research, management, development, and other needs which are often filled by the federal government, is at least in part the lack of effective advocacy before appropriate policymakers by Alaskans themselves. We have noted above considerable lack of data and much information is necessary to presenting the state's case to federal agencies. However, without federal and state financial commitment to the development of such information, presentation of Alaska's case is difficult. Research regarding unique problems to Alaska, e.g., weather methods of stream classification to be applied to the large number of Alaska streams, migration patterns, etc., dictates development of research priorities to achieve the goals of the ASRDP, but also to help Alaska justify future federal and state expenditures for this program.

An expanded federal contribution to ASRDP is clearly justified. First, the federal presence in Alaska is greater than in any other state in the union. Second, degradation of fisheries resources in Alaska occurred in large part during years in which the federal government was responsible for management of the resource (before statehood). Third, so much of the nation's fisheries resources are off the shores of Alaska. Fourth, with enactment of legislation affecting native claims to fisheries, and the trust responsibility of the United States over such claims, expansion of fisheries resources to meet the subsistence and other needs of Alaska natives will be heightened in coming years. If the Alaska D-2 legislation is enacted, preservation and expansion of Native fisheries will be essential, and soon, if the problems regarding fisheries resources and native claims in other states are not to be repeated. Federal responsibility in this area is paramount. Finally the State of Alaska is among the most economically dependent of the states on its fisheries.

2. Federal-state formulating and regulatory coordination for ASRDP - We have identified a number of federal requirements and regulations which can (and have) affect significantly increased costs for ASRDP. The regional associations have experienced the need to obtain countless permits from the federal government merely to begin their operations, and these requirements are also imposed on ADF & G. While many and perhaps all of the requirements are justified, the process for moving the program forward can be simplified. The first step is a concerted effort by the state to consolidate permit requirements, eliminate duplication, and provide services which may include a one stop license licensing process. Once the state program, which is already in place, has been applied specifically to salmon resource development projects, a necessary next step is expansion of the program to include federal regulatory activities. It is possible to utilize fisheries development program activities as a model project to test the validity of coordinated and consolidated regulatory review by both federal and state agencies through simplified processes.

Because Alaska has not yet developed its coastal zone management program to the point of full implementation, and because coastal zone management is viewed by the Carter Administration as a vehicle to achieve rational development through simplified processes, monies can and should be available to incorporate into ASRDP policies, processes and initiatives which will insure improved coordination by federal and state regulatory activities. It is noteworthy that most existing fisheries authorities, not to mention upland regulatory activities, specifically authorize coordinated activities, and in some cases, the federal government has appropriated funds for establishment of such process. Yet, implementation of model programs for specific interest areas (e.g. fisheries development) are not truly in effect.

It is proposed that Alaska initiate on its own efforts to develop simplified processes for consideration, evaluation and approval of projects relating to fisheries development. Again, impetus towards development of offshore fisheries can be utilized as a further rationale for incorporating model projects such as the above to relate to all fisheries development projects in Alaska.

3. Need for federal-state research coordination - Again, federal officials have expressed interest in coordinating research and data sharing. Establishment of research priorities with federal, state and native representatives, as well as representatives of regional associations, will insure more effective expenditure of limited funds, and perhaps will contribute to Alaska's case for greater expenditure of external funds. A proposed program model for such an effort is in the review stage.
4. Need to identify federal programs which may contribute to ASRDP - A problem states have had in the past with regard to federal relationships has been difficulty in identifying on a continuing basis the countless programs which may be utilized to contribute to accomplishment of broad state policies. Thus, it is suggested that the State of Alaska in improving its fisheries development

program should make special efforts to identify those programs and funding sources available at federal levels, as well as in the private sector, which can be utilized to contribute to accomplishment of the goals for the state program.

5. Need to maximize level and quality of state control over fishery resources - A major argument against seeking federal financing for fisheries development program is legitimate concern by the states over the "strings attached" to such funds. Given the level of federal presence in Alaska, this concern is all the more legitimate. However, there are fisheries related programs and activities, not to mention economic development programs, which can and should be utilized to the fullest degree possible, which programs do not dictate absolutely an ominous federal presence. Alaska, like other states, will expect to receive their fair share of federal "benefits", many of these being directed specifically at resource needs and opportunities. Fisheries clearly fits within this niche.

Thus, in the framing of an overall Alaska fisheries resource development program, attention must be paid to the true cost of federal funding. It is suggested that loss of resource management authority or local government planning control over development activities is hardly worth sacrificing for additional federal dollars. It is submitted that the more effective the ASRDP, the less likely the concern over such federal preemption of legitimate state activities is justified.

6. Need to evaluate ASRDP in relation to the President's national policy on fisheries - In May, President Carter announced a national fisheries development policy aimed essentially at increased utilization by Americans of fisheries resources off the shores of the United States. The attractiveness of the development of off-shore fisheries has led to what can be termed a complete reversal of existing federal policy relating to fisheries activities. As indicated in prior study group meetings, the Office of Management and Budget has indicated in the past no special treatment of fisheries related programs is justified and all such projects must be considered as in competition with other resource development projects. While the policy reversal would indicate greater interest by this Administration in fisheries development, the impetus is hardly salmon fisheries development.

Thus we suggest again consideration of establishment of a state fisheries development program which considers the needs and potential benefits of all species. The attractiveness of new opportunities off-shore could in fact erode significantly dollars available at federal and state levels for salmon fisheries development. This is not a necessary result, as maintenance and enhancement of high value stocks is important off-shore. However, salmon planners cannot operate in a vacuum and ignore off-shore opportunities. It makes for greater sense to develop in Alaska a

program which takes into account the interest and potential of all species with the ultimate presentation of a coordinated package to the federal government which includes justification for positive federal contributions to the maintenance, enhancement and development of its fisheries. Again, effective advocates before federal agencies is a necessary goal and result of such an effort.

IV. TASK #2 - Alternative Institutional Arrangements for Preliminary Consideration by the Study Group - Brief Description

Preliminary analysis of financing, economics and institutional arrangements for ASRDP has led us to some general conclusions regarding potential reforms to the fisheries development program. A restatement of ASRDP goals is suggested in our discussion relating to TASK #1.

It is the purpose of this section at this time merely to focus the attention of the study group to some of the alternative approaches to reform of Alaska's fisheries development program which may be necessary if long-term goals are to be achieved. Focus on institutional arrangements includes:

- (1) Options to assure greater central management control and horizontal coordination among programs directly and indirectly involved in the development of Alaska's fisheries;
- (2) Options which reflect the need for planning and program implementation on the basis of identified regional needs; and,
- (3) Options responsive to the particular organizational needs and problems extant within the present regional association program.

A. Options Relating to Centralized Management of Alaska's Fisheries Development Program

Again, we have identified a number of institutions at the state level directly involved in or impacting on the ASRDP. Additional to those are certain specific programs relating to bottomfish development and shellfish development. The needs and missions of at least the following programs or offices must be specially considered in the development of any proposed alternative organizational structures for ASRDP. These are:

- (1) Alaska Department of Fish and Game
 - Fisheries Rehabilitation and Enhancement Division
 - Commercial Fisheries Division
 - Sport Fisheries Division
 - Shellfish Program
- (2) Office of the Governor/Bottomfish Coordinator
- (3) Regional Associations
- (4) Department of Commerce and Economic Development (loan program and economic development)
- (5) Department of Transportation (construction of facilities)
- (6) Others

Option One - Maintain present structure, with strong legislative mandate for interagency cooperation and coordination of activities, with some reforms responsive to above findings and conclusions.

This approach would contemplate no alteration of the organizational structure, but initiation at legislative and executive levels of certain reforms necessary to insure greater communication and consolidation of policy and program activities among key programs with ASRDP. This option would also contemplate greater coordination among salmon, bottomfish and shellfish programs. Executive and legislative reforms to accomplish the goals described in the above sections, affecting each of the individual programs critical to ASRDP would be necessary.

Option Two - Present structure, but define through executive or legislative action, lead agency responsibility for certain program activities within Alaska's Fisheries Resource Development Program.

This organizational alternative contemplates establishment of a lead agency which would be responsible for implementation and coordination of all activities related to the Alaska Fisheries Resource Development Program (AFRDP). While the basic authority of each individual program, division or other activity would not be altered, their responsibility to respond and work cooperatively with the lead agency in establishment and implementation of AFRDP would be clearly established either by legislative or executive order. Again, reforms to each individual program responsive to the above findings would be defined for each program.

This organizational option will help elevate the priority of fisheries development within Alaska's government, provide greater visibility to fisheries development goals and programs, and should assure greater horizontal coordination and efficiency and improved management. While there will be debate as to which program or activity most appropriately would serve as lead agency, it is suggested here that there is no real obvious choice. Fisheries development involves more than just an understanding of salmon and other species. The lead agency must be able to draw expertise on such issues as the economics of fisheries, infrastructure development, construction of capital facilities, administration of projects, and the like. No single agency presently has this capability. Thus, as when one discusses who should have the lead in terms of implementing the state's policy on fisheries development, provision of such lead to fisheries management agencies is not a necessary result. However, we suggest that the most likely candidate within the state structure at this time may well be the Alaska Department of Fish and Game.

Option Three - Maintain present structure, but establish within the Office of the Governor an Alaska Fisheries Resource Development Coordinator.

This organizational alternative contemplates top level oversight and policy management of the wide variety of AFRDP programs from the Office of the Governor. This process has already been established for Alaska's Bottomfish Development Program. It is suggested that with the wide variety of agencies

involved in fisheries development, the exercise of special top level management to ensure coordination and effective prioritization of the use of limited funds would be most helpful. Moreover, a coordinator's office within the Office of the Governor will elevate the level of public visibility for the fisheries development program, it will offer the opportunity for greater policy direction and control, and it will provide an office responsible for ensuring that agencies do not operate at cross purposes.

If such an office were established in the Office of the Governor, the coordinator would need sufficient staff and direction either from the Governor by executive order or the state legislature to clearly define functions, powers over existing agencies, program goals and priorities. We are not suggesting in this option the establishment of a massive new bureaucracy, but merely a coordinating office with sufficient staff to perform identified tasks consistent with established goals.

Option Four - Establish a separate fisheries development agency or office through executive reorganization authorized and approved by the state legislature.

Establishment of a fisheries development agency or office under the Governor, with assignment of existing programs from a wide variety of agencies to such new agency or office is a possibility. For example, assignment of all salmon, shellfish, and bottomfish development activities, loan programs, and facilities construction programs within a single agency would be a possibility. Moreover, this agency would have the specific responsibility to work directly with regional associations. The benefit of this type of effort would be a clear separation in terms of budget and responsibility of fisheries management and fisheries development functions. This would be useful not only to agencies themselves, but also to the regional associations, whose role in fisheries management is sometimes difficult to define.

Negative aspects include further competition for dollars between fisheries development and fisheries management activities, perhaps greater difficulties in coordinating fisheries development and management activities which is necessary to the success of both programs, and the prospect for expanded bureaucracy. Good points include clear delineation of assignments and possibly greater coordination, greater public visibility for the total fisheries development program, and management authority over the total program which will help the agency fix financial and budget requirements according to need. Again, regional association relationships may be enhanced if a separate fisheries development agency is established.

B. Organizational Alternatives Affecting Greater Regional Coordination Between the State and Regional Associations

As indicated above, it is our view that peculiar needs of the many diverse regions of Alaska must be addressed by the study group. It is suggested that institutional arrangements affecting greater regional assessment and program implementation merit special consideration by the study group. There are a variety of options available, but certain key issues must be addressed. These include:

- (1) Relative powers and authority of regional associations and regional staff (ADF&G for example) in the development of policies and implementation of programs;
- (2) Assignment of technical support on basis of need to the regions;
- (3) Resolution of disputes and conflicting policies among the regions;
- (4) Methodology for implementation of statewide policies;
- (5) Methodology for making responsible and equitable budget decisions as they affect the regions;
- (6) Means of assuring coordination between regional officials and all programs directly or indirectly involved with AFRDP;
- (7) Identification of means to establish relationships between regional officials and external activities (e.g. federal, private) affecting fisheries development in the region.

Options relating to regionalization of Alaska's Boards of Fish and Game were embodied in House Bill 193, introduced during the 1979 legislative session. While we have reviewed this proposed bill, and would expect the study group to focus on this approach, there are persons in the group better fixed to lead discussion as to its merits. At present, it is our intent to focus our attention on alternatives relating to the operations of regional associations and ADF&G to determine whether certain institutional arrangements might facilitate greater responsiveness of AFRDP to regional development needs. At present, options would appear to include:

- (1) No alteration in ADF&G or regional associations
- (2) Expansion of ADF&G regional staffs to address regional development needs and implement coordinated program with regional associations
- (3) Legislative establishment of regional offices and empower a regional administrator to fix certain policies and implement certain programs - this would include clear definition of relative roles and responsibilities of ADF&G regional offices and regional associations
- (4) If an AFRDP office is established in the Office of the Governor, regional coordinating offices might also be established
- (5) If development activities are in any way separated out from fisheries management activities, regional relationships between these functions would have to be established.

We have spent some time in assessing alternative institutional arrangements because of the problems related to fisheries development budgets and stability of program financing. Others have reviewed such options from the standpoint

of institutional or program efficiency. We will be looking for guidance and insights from the study group regarding the many alternatives suggested by detailed findings and conclusions of the study to date.

C. Organizational Alternatives Affecting Regional Associations

Obviously, any organizational decisions affecting AFRDP will impact on the operations of regional associations. We have discussed in some detail above our concerns that regional associations, as presently organized, may not offer the organizational stability and flexibility necessary to assure salmon development consistent with stated goals. We will not restate the financial, organizational and other findings which affect ultimate decisions relating to the organizational structure of the regional associations here. Suffice it to say, that a number of factors must again be considered in the consideration of alternatives. These include:

- (1) responsibilities and functions properly assigned to regional associations;
- (2) methods of financing their operations;
- (3) relationships with fisheries development agencies;
- (4) role in policy development and planning;
- (5) organization to include equitable balance of regional needs;
- (6) budget limitations;
- (7) ultimate project results.

We have suggested consideration of expanding the functions of regional associations to include fisheries development activities for species other than salmon. We have also addressed many of the problems and limitations related to financing (e.g. problems with assessments, etc.) and the economics of alternative propagation methods. Finally, we have indicated that the state and regional associations both may have legitimate yet difficult responsibilities as they relate to undertaking certain economically high, medium and low risk (yet legitimate) projects. These and the many other factors outlined above again suggest many organizational options. A few are:

- (1) Establish regional associations as an arm of local government.
- (2) Establish regional associations as a for profit activity.
- (3) Authorize regional associations to assume qualities of quasi-public economic development agency (e.g. METRO, Puget Sound Economic Development Council) with authority to become involved in infrastructure development, artificial production facilities, etc.
- (4) Maintain present PNP status, but provide financial flexibility through bonding authority and other like mechanisms.

(5) Separate facility operation and regional planning functions.

(6) Others.

Contract TASK #1 - Search for Goals

I. Contract Task #1 - Assignment

Research evidence in existing Alaska Salmon Resource Development Program of goal statements. Examine existing statements of goals and objectives of the Alaska Salmon Resource Development Program (ASRDP) as they are expressed or implied by the State of Alaska constitution, statutes, administrative policies, legislative intent and testimony as to clarity definition within biological, social and economic parameters. Define existing problems. Present to committee possible alternative sets of goals for ASRDP.

II. Task #1 - Status Report

As indicated in our discussion of Task #2, Leonard Lane and Associates has conducted an expansive program search and defined in outline form the goals of Alaska programs affecting ASRDP. This has included development of outlines expressing such policies as evidenced in the Constitution, statutes, administrative guidelines, etc. As is suggested above, the problem for ASRDP is hardly one of lack of goals. Rather, it is one of lack of a consolidation of those goals and implementing activities into a workable "program".

To arrive at a series of consolidated goals for consideration by the study group we have sought first to identify problems and findings related to the existing fisheries development program, then to begin to identify some alternative approaches to resolving those problems, and now, to suggest a series of goals or policies which will contribute to an improved "program".

III. Task #1 - Preliminary Findings

The only necessary goal of the study group and ultimately the executive and legislative branches, is to develop a series of policies and initiatives which will contribute to an improved Alaska fisheries development program. To achieve that objective we suggest the following general policies for consideration by the study group:

1. Improved coordination among state agencies impacting on ASRDP;
2. Improved relations among organizations directly participating in ASRDP;
3. Improved data and information and expanded research for ASRDP;
4. Expansion of ASRDP to include all fisheries development activities;
5. Clarification and better definition of roles for local, state and federal agencies and organizations presently involved in Alaska Fisheries development;
6. Development of biological and economic guidelines for program implementation and operation;

7. Establishment of a ten-year, phased-in development plan, with further organizational evaluation to find the "best mix" of public and private commitment and involvement in fisheries development;
8. Establishment of processes and programs which assure an equitable distribution of program benefits among Alaska citizens and interest groups;
9. Establishment of programs and processes which assure an equitable distribution of program costs among Alaska citizens, the fishing industry and benefactors outside the State of Alaska;
10. Provision of stability of financing for all fisheries development activities.

Our findings and options suggested by those findings contained herein necessarily reflect these goals or policies. It is suggested that an improved Alaska fisheries development program can be achieved by implementation of actions which focus on achievement of these policies.

OCTOBER 1979

STATE OF ALASKA

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

AUDIT DIVISION
POUCH W—ALASKA OFFICE BUILDING

FINANCE DIVISION
POUCH WF—STATE CAPITOL

JUNEAU, ALASKA 99811

9/14/79

NOTICE OF MEETING

THE AQUACULTURE POLICY STUDY GROUP WILL MEET ON TUESDAY,
OCTOBER 9, 1979, 9:00 A.M. IN ROOM 423 OF THE STATE CAPITOL
BUILDING, JUNEAU, ALASKA.

MINUTES
AQUACULTURE POLICY STUDY GROUP
October 10, 1979

Call to Order

Chairman Terry Gardiner called the meeting to order at 9:30 a.m., in Room 423 of the State Capitol Building.

Roll Call

See attached attendance list.

Agenda

Meeting with Miller and Associates to review final report for salmon fisheries plan.

Introduction

Wally Miller of Miller and Associates advised that the final report had been mailed out on October 1, 1979. He expressed his regrets that Bill Wilkerson of Eisenhower, Carlson, et al, could not be present due to a family emergency. Further, he would attempt to outline and answer questions concerning the Institutional section, although he was not quite as familiar with it as Mr. Wilkerson.

Chapter I - Salmon Aquaculture Economic Evaluation Techniques

Mr. Miller advised that their report recommended utilization of both the return on investment and cost benefit techniques, with the greater weight on return on investment in order to satisfy financial assessment needs of lending institutions.

Cost factors are set out on page 33 of their report.

A great deal of emphasis has been placed on breaking down the operating costs in such a manner as to get a clear picture as to the actual expense of raising salmon from egg to maturity and setting out separate categories for administration and technical services. An example, remote egg take has been separated from general hatchery operations. There was much discussion concerning the use of constant dollars and current dollars and discounting. It was the consensus of opinion that the cost benefit analysis should use the first wholesale price as a reasonable value for the project.

The Alaska Department of Fish and Game is currently using ex-vessel pricing rather than first wholesale pricing. It was the recommendation of the group that the Alaska Department of Fish and Game publish an annual report setting out the first wholesale prices in three regions of the State.

It was also the opinion of some members of the group that the matter of interim benefits, such as the value during construction, had not been addressed, only end stream benefits. It was suggested that possibly this should be set up in a separate category. This, in turn, spurred discussion concerning resident hire. The building of fish hatcheries results in 100% resident hire as opposed to pipelines which employ many nonresidents.

Macro-Economic Evaluation Techniques

Mr. Miller advised that two procedures needed to be implemented in order to perform macro-economic analyses; i.e., State Tax Revenue Collection Reports coded by the Standard Industrial Code and Geographic Region and that the State develop an Input/Output Economic Model. In this manner, they may accurately estimate the total tax revenue accruing to the State from this industry as well as the effect of employment and income from the fishing industry. It was Mr. Miller's recommendation that the State Departments of Revenue, Commerce and Economic Development and Labor be authorized to develop the information systems.

Chapter II - Sources and Methods for Financing Salmon Aquaculture Programs

Mr. Miller had outlined five alternatives for financing salmon aquaculture programs in light of the Wayne Alex, et al, vs. Southern Southeast Aquaculture Association, et al, court case. Mr. Miller personally felt that alternative 4 was the most attractive which, in essence, established service areas in the fishing regions of the State. This is like the Seattle Port Authority's system.

Much discussion ensued concerning the complications and mechanics of all of the various alternatives, including the fact that there are so many different types and forms of governments, with varying powers, making alternative 4 extremely complicated. A sixth category was suggested and that being a user pay tax.

Break

The meeting recessed at 11:45 a.m., reconvening at 1:15 p.m.

State Loans to Regional Aquaculture Associations

Concern was expressed over long-range monetary support for programs which take many years, such as lake fertilization.

Mr. Miller advised that he would look at FRED Division's cost categories for hatcheries as there are no comparisons between the various hatcheries.

Chapter III - Institutional Problems and Potential Reforms

There was some discussion concerning moving the fisheries loan program out of the Department of Commerce into the Department of Fish and Game. It was the opinion of some that the Department of Fish and Game is better qualified to determine the viability of a particular hatchery program than a conventional lending agency.

It was Mr. Miller's opinion that there should be one lead agency established statutorily with a published intent statement and established reporting functions.

A straw vote was taken and the majority of the group approved the research center concept. Inasmuch as 90% of the fish in the United States are harvested in Alaska, it was brought out that possibly the State would be eligible for some federal funding for the research institution. Sitka was recommended as a good location for the research center since there are a variety of species and it is a rather sheltered area.

Organization

The following points were brought up during the discussion on organization:

1. FRED should be researchers instead of managers.
2. Technical planning is important.
3. It should be determined what the viable species are.
4. Planning should not be done piecemeal.
5. Regional associations should meet regularly in order to improve relationships.
6. Concerning page 105 of the Miller and Associates report, finance officer should be changed to loan committee.
7. It was pointed out that the last 30 pages of the Miller and

Associates report was missing on the subject of goals.

Summary of Recommendations

It was agreed that salmon enhancement looked attractive, but that they needed a stable organization and financing. Various areas that should be explored are the service district proposition, State appropriations and a tax of the user groups. First, it was imperative that they resolve any organizational problems.

It was pointed out that the report had not addressed the small individual hatcheries of which there were quite a few. It was determined that the report would acknowledge the existence of such "ma and pa operations" and they would be dealt with at some future time.

Chairman Gardiner appointed two subcommittees in the areas of proposed legislation and the establishment of the research center.

Proposal and Legislative Committee

Duties:

- a. Draft statute changes.
- b. Draft policy changes or new policies.
- c. Prepare a list of subcommittee questions.

Members Appointed:

Legislature - Terry Gardiner and Margaret Branson
Administration - Joe Davis
Aquaculture Associations - Ron Wendte

Research Center

Duties:

Among other things, the Research Center Subcommittee should compare the amount of money spent in this State for research, the number of fish and dollar volume of fish versus the same figures in the other fishing states.

Members Appointed:

Bob Burkett, Chairman
Derek Poon
Curt Kearns
Floyd Heimbuch

Miller and Associates will work with the two subcommittees and an attorney from the Legislative Affairs Agency will do the drafting of the recommended pieces of legislation. Chairman Gardiner was appointed to renegotiate the Miller and Associates contract so that they might work with the subcommittees. It was pointed out by Chairman Gardiner that there is still \$25,000 left in the budget for use by the Aquaculture Study Group. This money had been tentatively set aside for an extended Miller and Associates contract at an earlier meeting.

Mr. Miller went through the following mental checklist to ascertain that he had written down the salient points brought out by the group by chapter:

Chapter I

1. That he recommend to the Alaska Department of Fish and Game that they publish annually the first wholesale prices of fish, and;
2. That the Department of Revenue develop an input/output economic model.

Chapter II

1. That a cost estimate is needed as an interim measure for next year.
2. That the committee must determine which is the most viable of the five proposals set out on pages 55 and 56 of the Miller report, with the addition of a user tax.
3. That they explore other financing avenues.
4. That the hatcheries loan program be moved from the Department of Commerce and Economic Development to the Alaska Department of Fish and Game.
5. That an accounting program be developed.
6. That a lead agency be appointed to essentially deal with the Aquaculture program.

U. S. Forest Service Projects

Bill Sheridan of the U. S. Forest Service presented a handout showing the fisheries enhancement projects that the Forest Service was currently working on.

Break

The meeting adjourned at 5:00 p.m.

AQUACULTURE POLICY STUDY GROUP

Bob Burkett
James E. Fisher
Terry Gardiner, Chairman
Floyd E. Heimbuch
Joe Davis
Curt Kerns
Bill Marsh
Derek Poon
Jev Shelton
Bill Sheridan
Barbara Sorensen
John Sund
Margaret Branson
Ron Wendte
Jack McBride

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USDA - Representative
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Cook Inlet A.A.
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Sea Grant
NSRAA
NSRAA
NSRAA
U. S. Forest Service
Department of Revenue
Legislative Employee
Legislature
SSRAA
IMARPIK

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Dan Malick

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