SCOMM 5A: AQUACULTURE POLICY STUDY GROUP, 1978-79

The 1978 session of the Alaska State Legislature established the Aquaculture Policy Study Group as an advisory body to examine a number of policy matters relating to the Alaska Salmon Resource Development Program.

Membership in the Study Group included representatives from several regional non-profit aquaculture associations, Alaska Departments of Fish and Game, Commerce & Economic Development and Revenue, U. S. Forest Service and Department of Agriculture, the University of Alaska Sea Grant program and members of the Alaska legislature. Representative Terry Gardiner was chairman.

Contents: 1 three-ring binder of minutes, correspondence, bill draft and material handed out at meetings, and 2 reports written by consultants to the Study Group.

The reports were received by the Legislative Library in 1979. The binder was found by the staff of Legislative Finance in March 1989 with the House Finance minute binders and delivered to the Legislative Library.

LIST OF FILES (PAGE 1) MICROFICHE #

1. MINUTES BINDER

2. REPORT, "AN ANALYSIS OF THE ALASKAN SALMON FISHERY"

3. REPORT, "AN ANALYSIS OF SELECTED ELEMENTS OF THE ALASKAN SALMON RESOURCE DEVELOPMENT PROGRAM"

MINUTES

BINDER

SEPTEMBER 1978

TENTATIVE AGENDA
INTERAGENCY AQUACULTURE MEETING
SEPTEMBER 27, 1978

Time and Place: 8:30 a.m., September 27, 1978, USFS Regional Office Conference Room, No. 553, Federal Building, Juneau.

Objectives:

1. To define the role of State and Federal agencies and the aquaculture association in relation to the overall Aquaculture picture.

2. To assess the impact of RPA, RARE II, and Forest Land Management Plans and ensuing land allocation decision on Aquaculture programs.

3. To develop guidelines for cooperation and cordination of Aquaculture activities in the State as they relate to national Forest lands.

Agenda:

To be addressed by speakers, are 1) a definitive of their organization's role in the aquaculture scene, and 2) activities during the past year and plans for next year.

8:30 - 9:00	John Sandor, U.S. Forest Service (USFS)
9:00 - 9:30	Ray Clark, USFS; Rai Behnert, USFS
9:30 - 10:00	Harry Rietze, National Marine Fisheries
10:00 - 10:15	Break
10:15 - 10:45	Jack Milnes, S. SE. Reg. Aquaculture Assoc.
10:45 - 11:15	Derek Poon, N. SE. Aquaculture Assoc.
11:15 - 11:45	Bob Roys, Alaska Dept. of Fish and Game (ADF&G)
Lunch	
1:00 - 1:30	Representative, U.S. Fish and Wildlife Service
1:30 - 2:00	Dick Neve, U of W, Fisheries Research Institute
2:00 - 2:45	Open discussion
2:45 - 3:00	Break
3:00 - 4:30	Group develop cooperative approach to Aquaculture programs in Alaska. Discussion leader: ADF&G.

AQUACULTURE POLICY STUDY GROUP MEETING
September 8 1978

Six major areas of concern were chosen to be addressed by the study group. Members were assigned to each area and are to report to the full committee at the next meeting. The six major areas and the members assigned to each are as follows:

I. Clearly define the State's policies on Aquaculture - examine existing statutes/ resolutions/policies - A written draft is to be submitted to the full committee by Bob Burkett and John Sund. They will be assisted by John Williams.

II. Stock Management

A. Mixing of wild and hatchery stocks
B. Returns to common property fishery
C. Harvesting of stocks
D. Site selections
E. Brood stocks

A verbal review will be given by the Department of Fish and Game which will preview the Department's policy manual.

III. Define roles of organization and groups.

A. Capabilities of each group.
B. Agencies that oppose Aquaculture or certain projects.

John Williams will present a written condensation of previously written comments and agency interviews.

IV. Land Use Problems - Land use classifications to be discussed at the October 3 meeting in Juneau with the Forest Service.

V. Cost/Benefit Analysis of Private and State Projects

A. Financing of projects
B. Who should build/operate projects

Armin Koernig will work with the Departments of Revenue and Commerce and Economic Development to present a report to the group. Bob Grogan will assist.

VI. Research Base

A. Research problems
B. Who should carry out research.

No assignment made.

THE STUDY GROUP WILL MEET ON OCTOBER 4th at 9:00 A.M. IN ROOM 417, CAPITOL BUILDING

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Sund.

APC Gardiner 9/8/78

Morning presentation

Problem + Possible Study Areas

1. Management of stocks
   - A. Mixing of wild + hatchery stocks
   - B. How much of returns to common property fisher
   - C. Harvesting + marketing of returns
   - D. Brood stock policies
   - E. Site selection
2. Defining roles of Organizations + Groups
   - A. Agencies that oppose aquaculture of certain projects
   - C. Research + development
3. Site selection / Land use problems
   - ~~A. Brood stock policies~~
   - B. Land use classification
4. Cost / Benefit Analysis of Private + State Projects
   - A. Who should build them / operate them
   - B. How should projects be financed (Level of need)
5. Clear definition of state's policies on aquaculture
   - A. examination of existing statutes / regulations / policies
   - B. social aspect of maintaining
   - C.

~~6. Records Base for decision making~~

Problem & Possible Study Areas

1. Management of stocks
   - A. Mixing of wild & hatchery stocks
   - B. How much of returns to common property fishery
   - C. Harvesting & marketing of returns

2. Defining roles of Organizations & Groups
   - A. Agencies that oppose aquaculture of certain projects

3. Site selection / Land use problems
   - A. Brood stock policies
   - B. Classifications

4. Cost / Benefit Analysis of Private & State Projects
   - A. Who should build them / operate them
   - B. How should projects be financed (level of need)

5. Clear definition of state's policies on aquaculture
   - B. examination of existing statutes / regulations / policies

AQUACULTURE POLICY STUDY GROUP

September 8, 1978

Juneau, Alaska

Mission: Format and Direction of Study.

I. Assumptions

1. The private nonprofit legislation is the rea on for existence of the program and its' participating groups. Therefore, it should be a common ground of agreement.

2. Where the legislation is unclear or ambiguous, the study should develop corrective suggestions for changes in statute.

3. Operating from a base of enabling legislation, with proposed corrections as necessary, the Aquaculture Policy Study Group should develop a study outline designed to identify the groups involved, their capabilities, activities, and how these can be ultimately synthesized into a coherent program.

Outline of Study

I. Present Status

A. Listing of groups having aquaculture capability within State

(F.R.E.D., Regional Associations, PNP, University of Alaska, Forest Service, Other).

B. Capabilities of these groups

1. F.R.E.D.

a. biology
b. pathology
c. genetics
d. engineering
e. biometrics
f. administrative
g. interagency coordination
h. management
i. strategic planning

2. Repeat for Regional Associations, PNP, etc.

C. Activities of these groups

1. F.R.E.D.

a. enhancement
b. rehabilitation
c. coordination

d. education
e. other

2. Repeat for Regional Associations, PNP, etc.

II. Description of Alaska Aquaculture Legislation

A. Groups created by enabling legislation

B. Mission(s) delegated by legislation to groups

C. Comparison of activity of each group to that mandated by law

III. Assessment

A. Overlap

1. capability

2. activity

3. legislation

B. Comparative Analysis of Aquaculture Groups

1. capabilities - who has what capabilities

2. legislative - comparison of activity of group to that given it by law

IV. Synthesis

Who should be doing what?

Should relate to activities that are carried out in the context of

(1) overall program objectives

(2) unavoidable interim needs that must be met on a short term basis.

OCTOBER 1978

GENERAL OUTLINE

MINUTES
AQUACULTURE POLICY STUDY GROUP
October 4, 1978

CALL TO ORDER (Attendance list attached)

STUDY REPORT AND GROUP DISCUSSION COVERING THE FOLLOWING SUBJECTS:

STUDY REPORT - John Williams

STATUTES AND ROLES (Chart contents attached)

ADF&G

FRED

REGIONAL PLANNING TEAMS

REGIONAL ASSOCIATIONS

PROBLEM RE: INSPECTION COSTS

PROBLEM RE: LACK OF FUNDING FOR PLANNING

STATEMENT RE: NATIONAL MARINE FISHERIES RESEARCH SUPPORT AND EXTENSION WORK (Bob Simpson)

QUESTIONS RE: DETERMINATION OF REASONABLE HATCHERY COSTS

NEED FOR PROPER MANAGEMENT TO RECOVER HATCHERY COSTS

ADVISED OF BOARD OF FISHERIES HARVEST PLAN

LEGAL AND OTHER PROBLEMS

QUESTION RE: HATCHERY AUTHORITY TO HARVEST

PROBLEM RE: COPYRIGHTS ON FISH

SUGGEST AUDIT OF FRED PROGRAMS AND PERFORMANCE

DISCUSSION OF FRED FUNCTION, PROBLEMS, STATE REGULATION

SUGGESTED POSSIBLE BENEFIT FROM OFFSHORE DRILLING

DOUBLE STANDARD RE: PUBLIC AND PRIVATE HATCHERIES

FRED - NO SYSTEMATIC MANAGEMENT PLAN FOR HATCHERY
PROJECT REVIEW

SITE SELECTION

PROPOSED GOAL STATEMENT - John Sund

AQUACULTURE - SOCIAL, ECONOMIC, BIOLOGICAL CONFLICT
Somerville

CONSTITUTION ON RESOURCES

SUGGESTIONS THAT GOAL STATEMENT INCLUDE: Processing and
Subsistence

OBJECTION TO GOAL STATEMENT - Burkett

NEED FOR ESTABLISHMENT OF PROCESS FOR RECONCILING
COMPETING GOALS

POLICY & PROCEDURES MANUAL OVERVIEW - Dr. Kaill
(Overview attached to minutes)

NEED FOR REGIONAL FACILITY PARAMETERS

REGIONAL PLANNING TEAMS

STATE PLANNING TEAM

APPLICATION OF BOARD OF FISHERIES POLICIES

HATCHERY PROJECTS ON BOND ISSUES

FEDERAL INVOLVEMENT

INVESTIGATE COST BENEFIT ANALYSIS - Doernig and Milnes

INVESTIGATE BASE RESEARCH - Poon

ADJOURN 4:40 p.m.

MINUTES
AQUACULTURE POLICY STUDY GROUP
October 4, 1978

CALL TO ORDER

Chairman Gardiner called the meeting to order at approximately 9:20 a.m. (Names and addresses of those present for the meeting are contained on the attendance sheet appended to these minutes.)

STUDY REPORTS

Referring to the six major areas of concern to be addressed by the group, Chairman Gardiner called for reports on areas of study assigned at the group's previous meeting September 8, 1978 (Study Outline appended to these minutes), advising that John Williams would commence presentation on Item III - Roles of Organization and Groups.

STATUTES AND ROLES

Mr. Williams displayed handwritten charts setting forth the statutes relating to and role analysis of aquaculture throughout the state (Chart contents included as attachment to these minutes), indicating areas of conflict with an asterisk. The last chart displayed by Mr. Williams outlined possible Legal Questions and Other Problems, and Mr. Williams advised he would deal with those areas following discussion of role conflicts.

ADF&G

Referring to the Alaska Department of Fish and Game, Mr. Williams stated that under AS 16.10.443 the Commissioner is responsible for making "every effort to advise and assist in planning and construction" of hatcheries. The statute is vague in that it is up to the Department to decide what "every effort" entails. This is a problem area in that Department function is often in direct competition with private producers.

INSPECTION COSTS

A further problem in the area of Fish and Game was attested to by group member Armin Koernig when he advised of an unfair situation arising for facilities such as Sand Point, located a great distance from Fish and Game headquarters, which must bear costs of inspection such as meals and lodging.

FRED

Referring to his chart for the FRED Division, Mr. Williams advised that AS 16.05.092 states that FRED shall "encourage private investment, all things necessary." The statute

is, again, vague concerning assistance which should be given to private non-profit hatchery programs. Dr. Mike Kaill from the FRED Division agreed that the statute in this area is very ambiguous.

REGIONAL PLANNING TEAMS

Referring to Regional Planning Teams, Mr. Williams stated that the responsibility of the Team is not defined, he further questioned whether the Team is precluded from expanding its membership.

REGIONAL ASSOCIATIONS

Turning to Regional Associations, Mr. Williams advised that the statute charges that Associations be created for enhancement of salmon. The charge is vague and conflicts with FRED authority. Under the Association's Self Role of "enhancement and rehabilitation of salmon stocks," it is unclear just exactly what the Associations can do.

LACK OF FUNDING FOR PLANNING

Statement was made by group member Jack Milnes to the effect that Regional Planning Teams have little or no dollar commitment to their planning operation. The Planning function represents a tremendous charge, but unfortunately shows no dollar return for the time and people that should be specifically committed to working on planning. He concluded his remarks by advising that there is a definite expense to performing the planning function, while actual planning dollars are very small.

SIMPSON NATIONAL MARINE FISHERIES RESEARCH SUPPORT

Group member Bob Simpson from National Marine Fisheries attested to support from Federal research and development products which have universal benefit, i.e., improved incubation to increase survival, or strategy for release which maximizes survival. He further advised that his agency has to avoid site-specific activity, or advice to a particular hatchery; however, Marine Fisheries does make its research known in a format which can be used by all. Responding to a question from group member William Sheridan of the U. S. Forest Service, Mr. Simpson referred to correspondence of March 18, 1976, setting forth and establishing policies for research responsibility, advising that it is difficult not to become involved in site work, but Marine Fisheries research should be directed toward evolution of salmon generally. He further allowed that sometimes it is necessary to go to a particular site to conduct needed study.

Mr. Simpson further stated that Marine Fisheries does extension work to deliver the products of the agency's work, and advised of a problem presently being experienced resulting from a large number of requests for assistance from village groups. The agency only has a dozen people, and while requests are generally for Bill Hurd to come out to the village, the agency does not want Mr. Hurd in the position of traveling all the time. NMF EXTENSION WORK

Questions were raised concerning AS 16.10.450 regarding use of income from the sale of salmon and salmon eggs for payment of hatchery costs and regional association costs, whereafter surplus income "shall" be expended on other fisheries activities of the association. It was felt the statutes do not give a clear portrait of what is to be accomplished. HATCHERY COSTS

Statement was made regarding the Department of Revenue's concern for the 200 million dollar funding authority granted under AS 16.10.500, and the need for definition of "reasonable operating costs." Barbara Sorenson from the Dept. of Revenue responded that some guidelines will be provided by the IRS in that it will be interested in seeing that the hatchery operation remains non-profit. IRS will audit everything and takes a different view from that of enhancement, meaning that if the hatchery does not remain non-profit, it will lose its permit. Group member John Sund advised that the preferable classification for hatcheries under IRA Code 501(C) would be (C)3, adding that in terms of audit, the operator is going to have to show that his costs are reasonable in comparison to other similar operations, thus establishing a criteria for determining reasonable costs.

Statement was made that the problem was not IRS involvement or determination of costs but proper management to recover reasonable costs. Dr. Kaill advised that it was his understanding that after the hatchery has recovered its costs, the fish belong to the fleet. John Williams replied that the statute does not spell out what will happen in this area, and that is a problem the Group must deal with. Chairman Gardiner advised that it appeared the Group must construct a mechanism for management of returning fish. Response was made to the effect that the foregoing represents more of a financing problem. If a hatchery has the right amount of operating capital, it can survive the PROPER MANAGEMENT TO RECOVER HATCHERY COSTS

ups and downs of harvest; it depends upon who controls the spicket and funding. John Williams advised that the Board of Fisheries has moved into this area with a Harvest Plan, so a structure is currently in place. Rita Miller stated that the annual report form is broken down into two parts: one for Fish and Game, and the other for the Department of Revenue, adding that she assumed reasonable cost information would be determined from these forms. John Sund responded that the annual report required by Fish and Game does not represent an enforcing mechanism. Dr. Kaill allowed that the compliance requirement permits the Commissioner of Fish and Game to revoke a license. Mr. Sund replied that while the Commissioner may do so, revocation has nothing to do with the annual report.

DOES ANNUAL REPORT SET FORTH REASONABLE COSTS

Mr. Sund further stated that the Harvest Plan should provide guidelines enabling hatchery operators to establish needs which could be submitted to the Board of Fisheries. Armin Koernig advised that Prince William Sound will be monitored in an attempt to establish standards for escapement which can be used by hatcheries (private non-profit). The standard could then be used as an allocation process for hatcheries. The process is new,and it is yet uncertain whether the mechanism will work.

BOARD OF FISHERIES HARVEST PLAN

Dr. Kaill advised that the above-mentioned processes represent a combined function between the Dept. of Commerce and Fish and Game. He added that Fish and Game is currently working with Commerce to "bring it around," and suggested that a representative from Commerce be included within the Group.

SUGGESTION THAT COMMERCE BE REPRESENTED

John Williams next directed attention to the chart containing Legal Questions and Other Problems, advising that statutes relating to the areas in question are vague and pose interpretative problems. He further asked if it was the Group's wish that these problems be resolved by legislation, mentioning that alternative resolution rests in the courts. The Group concurred with Mr. William's feeling that clarification of the statutes would, hopefully, eliminate the overlap in function.

LEGAL AND OTHER PROBLEMS TO BE RESOLVED BY LEGISLATION

Armin Koernig made reference to the Community and Regional Affairs opinion concerning Regional Authorities, and Mr. Williams referred to Sec. 380, advising that a Regional Authority has political subdivision status.

REGIONAL AUTHORITIES POLITICAL SUBDIVISION STATUS

Derek Poon advised of a problem unique in his region containing a non-active sector. The problem relates to drafting of harvest management plans, particularly relating to Sheldon Jackson, and effective implementation of cost recovery. In Southeast Alaska the fishermen want to be given first opportunity to harvest the fish. An acceptable agreement must be reached from both the point of view of the fisherman and hatchery operators. POON, PROBLEM AT SHELDON JACKSON

Jack Milnes raised a question concerning whether the law addresses the legal authority of the hatchery to harvest fish. While the hatchery has authority to sell fish, it cannot do so without authority to harvest. Also, if the hatchery is not the harvester of these fish, who has such authority? John Sund advised that an opinion has been filed on the above issue, and Dr. Kaill added said opinion was rendered to the Board of Fisheries, adding that the above represents another area involving both Commerce and Fish and Game, requiring coordinated effort and addition of language to the effect that limited entry gear in the area receives first shot at the harvest. MILNES, CAN HATCHERY LEGALLY HARVEST

Armin Koernig attested to the lack of control on copyrights for fish. Existing copyright provisions relating to beach seine are entirely unsatisfactory, and this area presents a real jungle as to what the legislature or the Board of Fisheries means. Mr. Koernig advised that the Group must come to some decision on this issue, adding that he believed it would have to be clearly stated that the hatchery has authority to catch these fish. COPYRIGHTS ON FISH

John Sund advised that a new category of those able to catch fish should be established: (1) commercial fishermen, (2) sport fishermen, and (3) hatchery operators. The present opinion appears to be that a hatchery operator cannot conduct such harvest and must hire someone to perform recapture for him. NEW CATEGORY, HATCHERY OPERATORS

Chairman Gardiner suggested the Group draft a proposal resolving the hatchery harvest problem. Dr. Kaill advised that the Limited Entry Board also poses a problem in that it is not equipped to deal with hatcheries. SUGGESTION, DRAFT HARVEST PROPOSAL

Discussion followed concerning evaluation of FRED programs and performance, resulting in the opinion that outside audits of such programs and the results of said audits should be made available to the committee.

FRED PROGRAM & PERFORMANCE AUDIT

Dr. Burkett advised that he did not know whether failure of the planning function is due to lack of funding, or simply the failure of people to come together and effect the planning function. The function of the FRED Division is to encourage private investment, but FRED is approaching this function in a cautious manner. On the other hand, FRED is watchful for opportunities to bring people into investment in this area, and one of the Division's prime concerns at this time is the development of fish food in the State of Alaska. Dr. Burkett stated that he believes the word "encourage" needs to be more definitely defined, further advising that while the Division can provide advice to individuals interested in building a hatchery in the State, the Division is not a financial advisor or investment house.

FRED FUNCTION

Armin Koernig stated that the FRED Division has had many technical, personnel, etc. problems which have kept it from being as effective as it could be. Statement was made to the effect that an additional problem exists in that FRED is now charged with the task of getting the salmon industry back on its feet. The state is on the low side of the learning curve and trying to draw all facets together. What is needed is an orchestrater to pull these aspects into place. Armin Koernig advised that, at present, the private sector is not free to develop the hatchery industry because of the need to meet state regulations.

FRED PROBLEMS

STATE REGULATIONS

Statement was made that programs to rehabilitate the fishing industry within the state could learn a lot from the oil companies through their offshore drilling operations.

BENEFIT FROM OIL OFFSHORE DRILLING

John Williams advised that he would complete work in his area of study and disseminate a written summary of his findings to committee members.

Derek Poon attested to the existing double standard in policies applying to FRED and hatcheries in the private sector, advising that private facilities are expected to acquire data no other agency must supply.

POON, DOUBLE STANDARD PUBLIC v. PRIVATE HATCHERIES

Chairman Gardiner asked if the above-mentioned apparent double standard results from problems with statutes, regulations, or policy, and Mr. Poon replied that it appears to be a policy problem. Mr. Sund further advised that the previously mentioned annual report is required only of the private sector and not FRED.

Dr. Mike Kaill advised that Swan Lake represents a public facility which is just in the "start up" stage and has been submitted to the Regional Planning Team for review. He further mentioned that some private hatcheries appear to go "through a lot of hoopss" because their projects are experimental and not really representative of situations falling within the double standard problem area. Mr. Koernig advised that the state just doesn't have a systematic management plan to follow when effecting proposed hatchery project reviews.

FRED, NO SYSTEMATIC MGMT.PLAN FOR HATCHERY PROJECT REVIEW

Responding to a question concerning whether FRED is required to adhere to the same rules governing a private hatchery, Dr. Kaill stated that financially it is impossible for FRED to do so because bond issues are involved in FRED projects. Biologically, however, FRED must meet the policies applied to private hatcheries concerning disease control and genetics.

HATCHERIES, DIFFERING FINANCIAL ARRANGEMENTS

Bob Simpson advised that he could anticipate a difference in dealing with private versus public hatcheries, especially regarding surplus fish, and further stated that he did not believe management functions had yet been sufficiently developed to deal with this problem.

Rita Miller attested to a range of problems falling under a general category wherein the state has set in motion a process that pits government against private investment in a competitive function which the government regulates, advising that she was not sure such an arrangement could ever work.

PUBLIC AND PRIVATE HATCHERIES, STATE REGULATION

Chairman Gardiner asked if Department policy is the same for both FRED and the private sector as to site selection and which sites are available. Dr. Kaill advised that such a problem had arisen in Prince William Sound and the state relinquished the site to a private developer. He

SITE SELECTION

further advised that the site goes to the authority most capable of developing a hatchery there. Armin Koernig took exception to Dr. Kaill's statement, advising that his group conducted site surveys in the Sound in 1975, identifying 15 sites. Esther Lake was to be the next project. The state selected this site and his group said no. Now the group is dividing its defined sites between the state and the private sector.

AVAILABILITY OF SITES SUCH AS KLAWOCK TO PRIVATE SECTOR

Chairman Gardiner commenced discussion concerning the Klawock Hatchery and the availability of community services at the site versus prohibitative costs factors surrounding a site such as Dahl Island, asking if a site like Klawock with its attendant amenities would be available for development through a Regional Association. Dr. Kaill advised that he believed such sites were available, stating that at present the planning team is looking at Swan Lake. John Sund referred to a Department policy statement dated October 1974 (to his knowledge not updated or revised), advising that the Klawock Lake site, when measured against current statutes, appears to violate all of them. He further stated that Klawock represents a mix up from the past when planning teams were not yet functioning. He advised that with the teams now operating, perhaps such mix ups can be avoided in the future, adding that it appears the Department has violated its own policies in the past and Mr. Sund questioned whether such violations would continue in the future.

Bob Simpson advised that he had helped write the above-mentioned regulations at a time when hatcheries first began developing in Alaska, adding that the policies state they can be changed as needs change, further advising that with the inception of Regional Planning Teams, circumstances have changed, and the policies are in need of updating although they were proper for the time written.

FINANCING PRIVATE v. PUBLIC

Jack Milnes advised of his concern for financing and its total impact on the state, the state budget, and the private sector. Mr. Sund stated that the financing issue revolves around financing of private versus public facilities and where the funding will come from.

A brief discussion concerning the properties of aquaculture within the State followed, whereafter the committee took a short recess.

RECESS 11:20 a.m.

RECONVENE 11:30 a.m.

Upon reconvening, John Sund proposed the following goal statement for the study group:

PROPOSED GOAL STATEMENT

> A healthy salmon industry, paying its own way, providing employment, return on investment, and pleasure in recreation (sport fishing), by the year 2000.

Referring to "paying its own way," Mr Sund advised that prior to 1968, the salmon industry was the greatest state revenue producer. Since that time, the greatest revenue has come from the oil industry. He further advised that the Group should discuss whether "paying its own way" should include regulation of the industry.

Concerning "providing employment," Mr. Sund advised that such employment involves one of the functions of government which is to provide that which people do not provide for themselves.

Mr. Sund stated that he hoped that by analyzing aquaculture, the group could come up with reasons why and how it could function concerning what should be done for the future, including statutory changes if necessary, creation of new entities, and/or destruction of outdated entities.

IS AQUACULTURE RESOURCE OR PEOPLE ORIENTED

Dr. Burkette advised that he believed the group should approach aquaculture problems from the direction of a resource industry and couch its goal statement in those terms. Chairman Gardiner then asked group members if they wished to view the salmon industry from a resource or a people oriented outlook, adding that he tends to look from a people point of view while the Department takes the resource viewpoint. Dr. Burkett stated that the Department views aquaculture from the philosophy of a healthy resource; nothing else is involved. Armin Koernig advised that in the early days of Alaska, no attention was paid to the resource itself but rather to the economic income of the industry. He felt the committee should attempt to effect a well balanced resource that is a social/economic industry as well. Bob Simpson advised that National Marine Fisheries prefers to see salmon runs enhanced rather than enhancing the industry.

BOTH RESOURCE AND SOCIAL ECONOMIC INDUSTRY

Jack Milnes read Article VIII of the Alaska State Constitution, concerning natural resource policy, advising that the Constitution makes clear that use of the resource be directed toward the people. CONSTITUTION ON RESOURCES

Suggestion was made by Barbara Sorensen that language be included within the goal statement to cover processing within the industry, advising that processing has not heretofore been addressed by state policy. SHOULD PROCESSING BE INCLUDED IN GOAL STATEMENT

Further suggestion was made that provision for subsistence fishing be included within the statement, and Mr. Sund advised he had no objection to the inclusion of subsistence. He further stated that he believed the group needed a statement set within a time frame in order to produce a definite goal against which the group can measure accomplishments. GOAL STATEMENT TO INCLUDE SUBSISTENCE

Dr. Burkett objected to the proposed statement asking when it was decided the group should have such a statement, what the advantages to having one are, and who decided to effect such a statement. Chairman Gardiner advised that the decision had been made at the previous meeting of the group when Dr. Burkett and Mr. Sund were directed to come up with a goal statement. Mr. Sund formulated the wording and put it before the group. Dr. Burkett advised that he assumed the goal statement was going to be tabled as a possible area of pursuit. Dr. Kaill advised that he thought the purpose of the group was statutory clarification, and Armin Koernig attested to the need for a goal statement from which the group could work forward. OBJECTION TO GOAL STATEMENT

A brief discussion followed concerning whether or not there was need for a goal statement, after which the committee recessed for lunch.

LUNCH RECESS 12:05 p.m.

RECONVENE 1:40 p.m.

Discussion resumed concerning the need for a group goal statement, and Dr. Kaill proposed language providing for "optimum yield for the state salmon fisheries," advising that such a goal doesn't really mean anything until the group gets down to its real objectives. KAILL, GOAL LANGUAGE

Sandy Somerville advised that he believed a goal statement to be useful to the extent it would acknowledge that there is both a social and economic system at work here as well as a biological function. It would acknowledge conflicting economic, social, and biological needs, although the resources and needs would vary from region to region. Value judgments would be made by each region to determine how it will proceed in developing its resource, remembering that these economic, social, and biological needs are at odds, and each region must determine what is most important and what comes first. The group must design a process for reconciling competing goals.

SOMERVILLE, SOCIAL, ECONOMIC BIOLOGICAL CONFLICT

GROUP MUST ESTABLISH PROCESS FOR RECONCILING COMPETING GOALS

Mr. Sund read a section from the letter of intent formulating the study group, advising that the directive covers a lot of ground. He further stated that he believed the group could very easily agree on a goal, but he would prefer to have goal areas broken down and measurable against time.

Mr. Somerville suggested that assignments be made for developing goals in economic, social, and biological areas, advising that he felt the Alaska Department of Fish and Game would be in conflict with some of the guidelines the group might establish, adding that the group would have to get a concensus in each separate area. Mr. Sund advised that he would try to include all these areas in his statement citing as an example of Department action the Bristol Bay closure; a biological decision made without regard to economic or social results. He added that he did believe it necessary to set some statement down on paper in order to determine a realistic method for attaining the goal. Mr. Somerville stated that the question would remain as to where the checks rest, who makes the decision to intervene in action taken in the industry, who invests authority to integrate regional plans and reconcile competing interests.

Chairman Gardiner attested to the problem of different types of fishermen fishing the same area within differing time frames, advising that the Department has no method for evaluating its decisions. There should be some guidelines such as those governing Canadian and American catches.

PROBLEM DIFFERENT GEAR FISHING SAME AREA

Mr. Somerville advised that regional plans should make very clear statements of goals in a region where economic, social, and biological needs conflict. They would also define management goals, and goals for economic sharing of the income. The group must acknowledge that it understands the competition between these needs. Chairman Gardiner advised that he felt favorably toward Mr. Somerville's suggestion.

Jack Milnes advised that the goal statement is already in the Constitution of the State, stating that what the group must do is determine how to interpret the Constitution, adding that he was not addressing aquaculture but salmon restoration. Legislature has already been used in this area but it has not sufficiently defined functions. The group needs to start with some specific interpretations of what it is going to do.

SHOULD GOALS BE SET BY REG.PLANNING TEAMS

Dr. Burkett raised a question concerning the area encompassed by the group, advising that some of the previously discussed problem areas are the responsibility of the Regional Planning Teams. He further advised that in the course of operation, goals can change and flexibility is needed, adding that concerning the people and many areas involved, he believed goal determination should be set at the regional level.

FUNDING FOR REG. PLANNIN TEAMS

Mr. Sund spoke to problems with Regional Planning Teams arising from the fact that they are composed of half volunteer participants (fishermen, etc.) and half paid participants (employees of the Alaska Department of Fish and Game), advising that he didn't believe the power to function could be given these people without funding. Apparently funding is provided through Fish and Game which poses a problem in that getting funding out of Fish and Game has proven to be a"disaster." He advised that if the state is going to push responsibility on the Regional Teams, it is going to cost approximately $100,000 to $200,000 per year, per region (approximately $1,000,000 statewide).

Chairman Gardiner advised that Regional Planning Teams would be discussed at a later time and directed group attention back to the pending agenda.

POLICY & PROCEDURES MANUAL OVERVIEW

Dr. Kaill furnished group members his Overview of Policy and Procedures Manual (copy attached to these minutes), advising that such policies have tried to deal with genetic problems of natural versus hatchery salmon.

stated that the policies developed are being reviewed by the Governor's Office. Where the manual really "bogs down" concerns the decision as to who will do what--areas covered by the group in its morning discussions.

Dr. Kaill advised that the outline breaks down into two sections: (1) Private hatchery application and planning process and (2) Compilation of research, education, etc. for planning function. Dr. Kaill proceeded with the following outline review:

1. Application requirements - This refers to the forms, etc. Department has attempted to come close to middle line with new forms.

2. Siting criteria - Taken out of existing policy (1974 policies established by then Commissioner Brooks) and statutes directing management in favor of natural fish.

Rita Miller advised that the outline seemes to be good, but wondered if policies couldn't be better applied by making the outline a salmon aquaculture outline, rather than applying it simply to private non-profit facilities. Dr. Kaill responded that some of the policies have been directed strictly to private non-profit facilities to eliminate funding problems. Mr. Somerville suggested that policies, while making distinctions between public and private, cover both facilities.

COULD POLICIES APPLY ACROSS THE BOARD TO BOTH PUBLIC AND PRIVATE HATCHERIES?

3. Use of natural lakes by private hatcheries - this area relates to salmon stock and genetics, including the manner in which brute stock is taken and minimal samples.

Dr. Kaill advised that the manual represents an attempt to get the policies out for review and receive impact back; it is not in final unchangeable form. Rita Miller advised that again, she didn't see any policies that shouldn't apply "across the board." Dr. Kaill referred to 8, Responsibility for marking and evaluation of hatchery return - advising that this function differs between public and private operators. It is an option for the private operator, but the Department will fund such a function if used at public hatcheries. The

Department has placed special demands on private hatcheries which do not apply to public operations, because public operations are essentially research functions.

Derek Poon suggested that had such policies been in effect and applied to public operations, FRED disasters such as Crystal Lake might have been avoided. He further recommended that the Group address correspondence to Commissioner Skoog, requesting that manual review and release be given highest priority, and private and FRED areas be defined. Chairman Gardiner advised that he would take responsibility for writing Mr. Skoog.

Dr. Kaill apologized for having only a manual overview to present to the committee, advising that he was not at liberty to distribute policies not yet reviewed by the commissioner.

Mr. Somerville advised that he felt intent should be to get a draft of the manual as soon as possible, and review it with Regional Teams for their input.

POLICIES WITHIN U. S. ENVIRONMENTAL IMPACT REVIEW

Barbara Sorensen asked Dr. Kaill if the policies and procedures included within the manual fall within U. S. Environmental Impact review, and Dr. Kaill replied that Environmental Impact review would appear to be the approach the Department is trying to take, but at present it is still "in house."

Chairman Gardiner requested that policies which apply to both FRED and private hatcheries be designated as such. Dr. Kaill advised that transportation of Salmon and eggs and transfer of diseased eggs from one point to another would apply across the board. Regarding marketing and evaluation, program compliance will involve resolution of "reasonable operating costs," and what happens to left over fish. Handling of surplus fish by a private hatchery involves entering into a contract for use of these fish, while such a problem does not exist at public hatcheries because they involve only enhancement.

Derek Poon asked if there is any reason why all of number I, directed toward FRED hatcheries, should not fall under C 2, (Procedures) Application review and approval. Dr. Kaill replied that one problem in effecting the above would be the fact that FRED projects begin as bond issues. He further alluded to state problems with art in public buildings and EEO requirements.

NO RETURN HATCHERIES

John Sund attested to concern on the part of fishermen regarding hatcheries which do not produce return, and a desire on the part of fishermen to comment on where FRED and private hatcheries are to be located. Dr. Kaill responded that all hatchery projects henceforth would be reviewed by Regional Planning Teams.

SURPLUS HARVEST

Chairman Gardiner raised questions concerning the proposed procedures for surplus harvest, advising that such fish can depress the market and cause quality problems.

REGIONAL FACILITY PARAMETERS

Derek Poon advised that he felt one of the things the group should do is look at the Regional facilities and parameters under which they operate, and analyze returns to these hatcheries, been, advising of the poor quality of return at Starigaven, disease, etc.

Dr. Burkett attested to his observation of a movement of many people into the decision making process, advising that while the movement is larger than any single issue, nothing happens quickly.

Armin Koernig advised that he didn't believe FRED had yet made a decision whether program costs will be reimbursed or taken out of the general fund. Barbara Sorensen responded that FRED manages for escapement, not return or absorption of costs.

REGIONAL PLANNING TEAMS

Returning to his Overview, Dr. Kaill advised that policies for Regional Planning Teams are based on the Prince William Sound model of 3 on 3, adding that employees of Fish and Game serve as staff for the planning team. Jack Milnes asked Dr. Kaill if he was aware of prior reservations concerning the 3 on 3 model, asking why the Department had not effected a different balance. Dr. Kaill responded that he was aware of such reservations, but that Fish and Game had objections to balances other than 3 on 3. Mr. Milnes asked who would make the final decision, and Dr. Kaill replied that he believed it would be made by the commissioner.

Concerning II, Regional Comprehensive Salmon Planning, Dr. Kaill advised that the Department has devoted a great deal of time in this area, advising that he didn't know how the manual would come out in this area. Chairman Gardiner asked if statutory changes would still have to be effected here, or would proposed policies, if adopted, be good enough. Dr. Kaill replied that he didn't know how to respond to the above question, advising that the first thing the Group should do is get a legal opinion that will stand up. Mr. Somerville replied that the Group is going to know whether statutes require change after digesting Department comments and interpretation. If there is conflict, legislation might be the only remedy. Dr. Burkett advised that proposed policies cover a lot of new ground and some would have to be applied to determine whether or not they are workable.

WILL PROPOSED POLICIES NEGATE NEED FOR STATUTORY CHANGE?

Concerning II B, Regional Comprehensive Salmon Planning Policies, Derek Poon advised it would be useful to have Department interpretation of the authority contained therein, stating that he has had conversations with management to the effect that Regional Teams are not really going to be that big a part of the overall plan.

PLANNING TEAMS IN RELATION TO OVERALL PLAN

Chairman Gardiner posed the problem of authorities unable to take action when policies are violated, suggesting that a section be established dealing with force and effect of the plan.

AUTHORITIES FORCE AND EFFECT

Derek Poon attested to problems resulting from flow charts placing the State Planning Team between Regional Planning Teams and the commissioner. Dr. Kaill advised that while a State Planning Team does exist, it has not conducted any business, adding that he does not know the intent behind such a team. Mr. Somerville advised that the regional planning concept originally came from the State Planning Team, adding that he believes such a team to be necessary because Department plans function statewide, but its function in relation to the regional teams is unclear. Chairman Gardiner stated that legislative intent was such that the Regional Plans and Planning Teams were to go directly to the commissioner's office. Dr. Kaill advised that he has taken all plans directly to the commissioner. Mr. Somerville advised of his concern that the commissioner

STATE PLANNING TEAM

receive an unedited version of the plan, directly from the Planning Team.

Addressing the scope of regional planning, Mr. Milnes advised that Regions have some very specific feelings about what should be included within their scope, adding that the purpose of the Group is to advise the Department of what the people want, not accede to what the Department wants. REGIONAL SCOPE

Referring to numbers 5 and 6 (Plan development, and Public involvement),Dr. Kaill advised that these policies cover situations in need of clarification, and would allow "chunks" of a plan to be taken care of on an emergency basis, as well as get the public "on track" as quickly as possible. Mr. Milnes asked if policies describe the method for public involvement, and what happens to feedback. Dr. Kaill replied that he didn't believe policies define method, advising he was unable to answer the feedback issue. PLAN DEVELOPMENT PUBLIC INVOLVEMENT

Concerning the Planning Team, Dr. Kail stated that meetings would be called as necessary, and the chairman would serve for that meeting, relinquishing such duties thereafter. A quorum consists of 4, (two from each side) and substitutions must be okayed in advance. Support staff will be assigned to assist Planning Team members and will report back to them. PLANNING TEAM MEETINGS

Derek Poon advised that suggestion had been made that Planning Team meetings coincide with Board of Fisheries meetings, asking if such suggestion has been followed. Dr. Kaill advised that he didn't believe it had been, but didn't see why meetings should not be so scheduled. Mr. Sund advised of problems arixing when meetings do not coincide with staff schedules; Armin Koernig attested to problems arising from designees appearing unannounced at meetings; and Mr. Milnes advised that he believed meeting schedules should remain flexible within each region.

Armin Koernig raised questions concerning reasons why the Department has not followed Board of Fish policies, asking if anyone has ever seen a management plan for Fish and Game. Dr. Burkett advised that everything cannot fall in place at once, adding that he would investigate. Chairman Gardiner asked if it was the BOARD OF FISHERIES POLICIES

Board of Fisheries intent that its policies apply to all facilities, and Mr. Koernig responded that the policies deal with returns to private and public hatcheries.

HATCHERY PROJECTS ON BOND ISSUES

Mr. Milnes advised of a problem arising from the fact that preferred hatchery projects are listed on the bond issue prior to review by Regional Teams. Derek Poon stated that to the best of his knowledge, harvest management plans have to be approved before the project can go ahead, but such requirement does not apply to FRED projects, adding that to his knowledge there is no harvest plan for Snettisham. Again, Mr. Poon attested to existance of a double standard in that when FRED does not comply with requirements, such as a harvest plan, it goes ahead and puts the project on the bond issue anyway, but under the same circumstances a private project would not get its permit.

DOUBLE STANDARD RE: REQUIRE-MENTS

POLICIES TO BE APPLIED TO NEW AND EXISTING FACILITIES?

Chairman Gardiner advised that he would ask (in his correspondence to Commissioner Skoog) if newly established policies would apply to existing as well as new facilities.

FINANCING

Armin Koernig raised questions concerning financing plans and whether they apply to both public and private facilities, and attested to a problem concerning allocation of returning fish to peer groups, advising that an answer in this area will necessitate a political decision by the Board of Fisheries, but it should be addressed and conclusions drawn before hatcheries are built. Regional Planning Teams will have the authority to remove a project from the bond proposal if the fishermen think they will never be able to afford to pay for it.

RECESS 3:55 p.m.

RECONVENE 4:05 p.m.

Upon reconvening, John Williams advised that he would be mailing a written report of his study, together with answers to posed legal questions, as well as a draft of a proposed statutory change making hatchery operators legal harvesters.

Armin Koernig and Jack Milnes will investigate cost benefits of private and state projects reporting on what approaches can be taken by the Group and detailing means to accomplish such analysis. COST BENEFIT ANALYSIS

Derek Poon advised that he would take on area VI, Research Base, and report back at the next meeting. RESEARCH BASE

Jack Milnes advised that federal agencies operating in areas similar to those encompassed within Group review could yield valuable assistance, and John Williams stated he would contact federal agencies to determine if Regional Planning Teams could function within federal areas. Mr. Sheridan advised of a possible functioning problem in that Regional Planning Teams consist of State Department of Fish and Game Personnel as well as regional people. FEDERAL INVOLVEMENT

Dr. Kaill attested to the commissioner's recognition of need for federal participation, advising that the Forest Service is an ex-officio member on teams having forests in their regions.

Mr. Milnes advised that he believed the Group should have a clear understanding that it represents a pilot stage and as such has limits. It needs phased plans and criteria for and method of evaluating each stage of its function.

Mr. Sheridan advised that in reality the Forest Service is kind of on the sidelines, but intends to cooperate to the extent possible once a game plan is worked out.

Responding to a suggestion from Dr. Kaill that Commerce be included within the group, John Williams advised that Commerce currently has study funding, and could upon recommendation, conduct necessary studies.

Chairman Gardiner advised that the Group would meet again in approximately three weeks. Group members will be furnished written notice of such meeting as well as a copy of today's minutes.

The meeting adjourned at approximately 4:40 p.m. ADJOURN

AQUACULTURE POLICY STUDY GROUP

NAME	ADDRESS	AGENCY
Bob Blake	Box 939, Cordova 99574	
Bob Burkett	FRED, Juneau	ADF&G
Don Collingsworth	Subport Bldg, Juneau	ADF&G
Albert Collotzi	Pouch 6606, Anchorage 99502	U.S. Forest Service
Ivan E. Every	Rt 1, Box 970, Kenai	CIAA
James E. Fisher	2221 E. Northern Lights Blvd. Suite 126, Anchorage 99503	USDA - Representative
Terry Gardiner	Box 6092, Ketchikan	Alaska Legislature
Bob Grogan	Pouch WF, Juneau 99811	Legislative Finance Div.
Ernie Haugen	Box 1049, Petersburg 99833	Alaska Legislature
Floyd E. Heimbuch	Box 850, Soldotna 99669	Cook Inlet A.A.
Jack P. Jacobsen	Box 8794, Ketchikan	SSRAN - President
Mike Kaill	FRED Div. Subport Bldg, Juneau	ADF&G, FRED Division
Curt Kerns	3211 Providence, Anchorage 99504	Sea Grant
Armin E. Koernig	Box 191, Cordova 99574	PWSAC
Rita Marie Miller	Box 786, Sitka	NSRAA
J. N. Milnes	SSRAA, 307 Mill #5, Ketchikan	SSRAA
Sig Olson	Box 1628, Juneau 99802	U.S. Forest Service
Derek Poon	Box 786, Sitka	NSRAA
Dick Reynolds	Pouch EE, Juneau 99811	Dept. of C&ED
Bob Roys	FRED, Juneau	ADF&G, FRED Division
John Sandor	Box 1135, Juneau 99802	U.S. Forest Service
Jev Shelton	853 Basin Road, Juneau 99801	NSRAA
Bill Sheridan	Box 368, Juneau 99802	USDA - Forest Service
Bob Simpson	Box 1668, Juneau 99802	Nat'l Marine Fisheries
Sandy Somerville	Smith Tower, Seattle 98104	Martin-Simonds Assocs.
Barbara Sorensen	Pouch SA, Juneau 99811	Dept. of Revenue
John Sund	1285 Tongass, Ketchikan	SSRAA
Ken Thompson	Box 1980, Sitka 99835	U.S. Forest Service
John Williams	Pouch Y, Juneau 99811	Legislative Affairs Agcy.

AQUACULTURE POLICY STUDY GROUP MEETING
September 8 1978

Six major areas of concern were chosen to be addressed by the study group. Members were assigned to each area and are to report to the full committee at the next meeting. The six major areas and the members assigned to each are as follows:

I. Clearly define the State's policies on Aquaculture - examine existing statutes/ resolutions/policies - A written draft is to be submitted to the full committee by Bob Burkett and John Sund. They will be assisted by John Williams.

II. Stock Management

A. Mixing of wild and hatchery stocks
B. Returns to common property fishery
C. Harvesting of stocks
D. Site selections
E. Brood stocks

A verbal review will be given by the Department of Fish and Game which will preview the Department's policy manual.

III. Define roles of organization and groups.

A. Capabilities of each group.
B. Agencies that oppose Aquaculture or certain projects.

John Williams will present a written condensation of previously written comments and agency interviews.

IV. Land Use Problems - Land use classifications to be discussed at the October 3 meeting in Juneau with the Forest Service.

V. Cost/Benefit Analysis of Private and State Projects

A. Financing of projects
B. Who should build/operate projects

Armin Koernig will work with the Departments of Revenue and Commerce and Economic Development to present a report to the group. Bob Grogan will assist.

VI. Research Base

A. Research problems
B. Who should carry out research.

No assignment made.

THE STUDY GROUP WILL MEET ON OCTOBER 4th at 9:00 A.M. IN ROOM 417, CAPITOL BUILDING

STUDY REPORT

STATUTES AND ROLES

ADF&G - Commissioner

16.05.020(2) Manage, maintain, improve, extend.

16.05.050(3) Hatcheries, pipelines, rearing ponds, fishways, other.

* 16.10.400(f) Clarify streams for enhancement in conjunction with comprehensive plan

16.10.420 Approve egg procurement
placement
salmon release
Order egg destruction
Specify hatchery harvest
Approve egg sales

16.10.430 After comment of RPT, revoke permits, Alter conditions of permit

* 16.10.443 Make every effort to advise, and assist in planning, construction, or operation of hatchery within time and resource constraints.

SELF ROLE

* Leadership role in fisheries and aquaculture planning, management, and regulation

Maintain proper spectrum of activities to guarantee financial success of acquaculture without jeopardizing natural stocks or other valued fisheries.

Responsible for having all prerequisite disciplines for salmon rehabilitation.

FRED DIVISION

* 16.05.092 Comprehensive state plan; encourage private investment - all things necessary.

BOARD OF FISHERIES

16.10.221 Generally regulate taking of fish

16.10.440 Regulate take of hatchery fish, implement 400-470

REGIONAL PLANNING TEAMS

* 16.10.375 Subject to Commissioner's approval, develop comprehensive salmon plans, including public and private hatcheries.

Consists of Dept. personnel and representatives of qualified regional associations.

REGIONAL ASSOCIATIONS

* 16.10.350 Enhancement of salmon production

16.10.400 Preference rights to hatchery permits

* 16.10.600 Create regional authorities

16.10.450 Funds use specified

16.10.470 Annual Report

SELF ROLE

Organize regions

* Enhance and rehabilitate salmon stocks

Build and operate salmon hatcheries

Stream Clearance

Provide input to policy makers

Encourage investment

* Fully develop natural production capabilities

PNP's

16.10.400 Receive permits to build and operate salmon hatcheries

16.10.420 Pay for departmental expenses related to examinations

U.S.F.S

Cooperative agreements with Fish and Wildlife Managers

Protect and enhance habitat

Provide for sustained yields

* List known potential aquaculture sites

Facilitate permit granting

Lead in EIS completion

NMFS

Provide scientific and technical support

Cooperative agreements with fisheries managers

Comment on federal permits

EIS comments

U.S. FISH & WILDLIFE SERVICE

?

Game refuges, military lands, Indian reservations

Comment on federal permits

LEGAL QUESTIONS

Non-hatchery enhancement activities of regional associations

Regional authorities (CRA)

Non-departmental or regional association members on RPT's
(USFS, NMFS activities with RPT's)

Scope of regional plans
Force and effect of regional plans.

* (Cost recovery of non-association hatcheries
* hatchery harvest of fish?)

OTHER PROBLEMS

Reasonable operating expense

Information dissemination

Permit Processes

Financing (including state and private investment)

Interaction of federal authorities with regional associations

FRED Evaluation

RPT funding

Overview of Policy and Procedures Manual, in draft, ADF&G

I. Private Nonprofit Hatchery Program

A. Goals

1. Contribution to Common Property Fishery
2. Contributions possible through non association hatcheries.

B. Policies

1. Application requirements
2. Hatchery siting criteria
   - Harvest management consideration
   - Natural stock consideration
   - Consideration for siting
   - Site evaluation
3. Use of natural lakes by private hatcheries
4. Salmon stock genetics
   - Protection of genetic variance
   - Population mixing
5. Control of fish disease
   - Protection of wild stocks
   - Rearing, movement, release of infected fish
   - Stock selection
   - Hatchery practices
   - Chemotherapy
   - Consistency of public and private aquaculture Policies
6. Transportation of salmon and eggs
   - Importation and exportation of salmon and eggs
   - Transplantation of salmon and eggs
7. Basic harvest management plans
   (See Alaska Board of Fisheries Provisional Policy Number: 78-39-FB)
8. Responsibility for marking and evaluation of hatchery returns
9. Program compliance

C. Procedures

1. Preliminary and final applications
2. Application review and approval
3. Operations review
   - Annual report submission
   - Review by RPT, ADF&G Staff, Commissioner of ADF&G
   - Annual report format

II. Regional Comprehensive Salmon Planning

A. Goals

1. Creation of cooperative planning process
2. Development and publication of plan document

B. Policies

1. Scope of regional comprehensive planning (RCP)
2. Roles and responsibilities of Regional Planning Team
   - Role of the RPT
   - Responsibilities in hatchery application review
   - Responsibilities in annual review
   - Responsibilities in development of Regional Comprehensive Salmon plans
3. Composition of the RPT
4. Support RPT

5. Plan development
   Relationship between on-going programming and the development of RCP
6. Public involvement

C. RCP Procedures
   1. Planning team meetings
      Chairman
      Meeting frequency
      Quorum and voting
      Staff support
   2. Plan review and approval

APSC 10/4/78

Proposed goal statement.

A healthy salmon industry, paying its own way, providing employment, ~~and~~ return on investment, and pleasure in recreation, (sports fishing) by the year 2000.

quantify specific strategies.

PROBLEM AREAS DISCUSSED BY THE GROUP

1. Should inspection costs be borne by distant hatcheries?

2. How to alleviate lack of planning function funding.

3. Is there a need to define "reasonable costs" for private hatcheries, or will IRS set standards?

4. Is there need for mechanism for management of returning fish, or will Board of Fisheries Harvest plan cover this area?

5. Need to resolve copyright problem on fish?

6. Need to alleviate problem arising from government and private sector in competing industry regulated by government. Is there a double standard when applying regulations between public and private facilities?

7. Site Selection - Are desirable sites equally available to both public and private sector?

8. Should acknowledgement and resolution of social, economic, biological conflicts within the industry be resolved at Regional level?

9. Can a hatchery legally harvest fish? - Williams to draft proposed legislation.

10. Will proposed policies and procedures apply "across the board" to private and public facilities?

11. Will adoption of policies and procedures manual negate need for statutory change?

12. What is position of Regional Planning Teams in relation to State Planning Team?

13. Do Board of Fisheries policies apply to all facilities?

14. Are proposed policies and procedures to apply to new as well as existing facilities?

SUGGESTIONS MADE BY THE GROUP

1. A representative from the Dept. of Commerce be included within the study group.

2. FRED programs and performance be audited and a copy of the audit report furnished the study group.

3. Need for a goal statement and evaluation process.

4. Need for federal and regional team interaction.

NOVEMBER 1978

11/1/78

NOTICE OF MEETING

THE NEXT MEETING OF THE AQUACULTURE POLICY STUDY GROUP WILL BE HELD WEDNESDAY, NOVEMBER 29, 1978, 1:00 P.M. in ROOM 421, STATE CAPITOL BUILDING (House Finance Committee Room), JUNEAU, ALASKA. YOU WILL RECEIVE AN AGENDA LATER THIS MONTH.

Terry Gardiner, Chairman
Box 6092
Ketchikan, AK 99901

MINUTES
AQUACULTURE POLICY STUDY GROUP
November 29, 1978

Chairman Gardiner called the meeting to order at approximately 1:30 p.m. (Names and addresses of those present for the meeting are contained on the attendance sheet appended to these minutes.) CALL TO ORDER

He advised that he believed group effort should be directed toward solutions for aquaculture problems rather than further discussion of problem areas and submitted a five-item agenda for group review (copy of agenda and appended material attached to these minutes). AGENDA He further advised that review of matters scheduled on the agenda would commence with Item No. 5 (Review of proposal by Miller and Associates in regard to a financial analysis of salmon aquaculture), and that Item No. 4 would not be discussed during the meeting due to the absence of John Williams from the Juneau area. MILLER AND ASSOCIATES

Concerning Item No. 5, Chairman Gardiner advised that all group members should have received a copy of the financial analysis prepared by Miller and Associates. He stated that Mr. Miller had not been hired to perform the analysis but through contact with the Chairman unrelated to group efforts had expressed a desire to submit a proposal for review--that is where the proposal originated.

Armin Koernig advised that he had primarily been working on a preliminary assessment concerning what should be accomplished by the group in the socio-economic area, stating that the group must formulate: KOERNIG SOCIO ECONOMIC AREA

1. A clear statement of problems encountered in both public and private sectors.

2. Investment capital needed for both public and private facilities.

3. Economic analysis of the enhancement effort to provide the industry direction in the future, hopefully providing answers to some of the following questions:

   a. How much should be invested (privately and publicly)?

b. How is funding going to be invested?

c. How much is it going to cost to produce fish?

d. Who is going to benefit from these fish?

Mr. Koernig attested to the unavailability of figures satisfying the above questions from state agencies, advising that he believed the group should solicit assistance from consulting financial experts. Mr. Koernig questioned how long the general public would be willing to continue to invest in public and private hatcheries if such projects are not able to demonstrate beneficial return on the investment. Mr. Koernig concluded his statement advising that he believed everyone recognizes that aquaculture needs to secure some data in order to evaluate where it should be going.

Derek Poon stated that the group needs to identify what kind of questions it should be asking concerning socio-economic benefits behind the 1.3 million dollar investment, advising that the group should have before it several proposals for study.

Mr. Milnes suggested that the group consider as an additional social goal the understanding that the system should pay its own way. Mr. Koernig advised that Mr. Milnes' suggestion raised an additional question for group consideration: Is there a benefit to a subsidized system? Analytical work would determine whether it is possible for the system to pay its own way or whether a subsidy is necessary plus give insight to such questions as:

1. Should needed funding come from the Renewable Resource Fund?

2. General Fund?

3. Fisheries Fund or other sources?

4. How can the state more wisely use its resources through enhancement to produce benefits.

Chairman Gardiner, referring to figures furnished him by Jay Hogan, advised that last year the state's budget amounted to 1 billion 71 million dollars while revenue amounted to 1 billion 5 million dollars (the state brought in 66 million dollars less than it spent). Revenue for the coming year is anticipated at 1 billion 21 million dollars. The fact that the state has not experienced a budget increase of less than 13% in the last few years would indicate that if the state has new facilities coming on line this year, such facilities are coming "out of someone's pocket." There are no surplus state funds available for loan. Mr. Gardiner advised that financial problems are not matters of concern for regional groups alone but pose a statewide problem and constitute valid reason for formulating concrete financial plans.

STATE BUDGET DEFICIT

Mr. Koernig agreed with Chairman Gardiner, advising that while the private sector of the economy is characteristically identified with profit, the 3 million dollar loan fund for construction of facilities is not sufficient for private needs. The state cannot continue to invest money without a system of checks and balances provided by financial planning, demonstrating economic justification. If the group proposes to raise the loan limit from 3 million dollars to 6 million dollars, it must be able to prove that such a raise is feasible. The group needs definite proof for both the legislature and the general public to establish cost benefits. The group should have a financial plan that maps out investment strategy for the next 20 years.

NEED FOR FINANCIAL ANALYSIS

Mr. Frank Orth of Earl R. Combs, Inc. raised questions concerning the group's intent, asking:

MR. ORTH

1. Does the group want to hire a consultant to evaluate the technical aspects of enhancement, or

2. Does it wish to go backward and have assistance in developing a strategic plan for salmon enhancement.

He further advised that he believed it would be better for the group to go backward and develop the strategic plan. The group should define its planning needs, allow consultants to bid on providing such a plan, and following verbal proposal presentation by interested consultants, the group should hire the necessary work done. Mr. Orth concluded his

statements, advising that should the group decide to have a technical analysis performed, it would be of no value without a strategic plan.

Dr. Burkett stated that he didn't believe going backward would improve the present situation, advising that he believed the group should simply consider what is presently being done and move foreward from that point.

Derek Poon advised that he had understood Mr. Orth to mean, when suggesting the strategic plan, that formulation would commence from the status quo. Mr. Orth replied that Mr. Poon's understanding was correct and that "go back" had been a poor choice of words. He further advised that the original enhancement plan was a political plan which did not take into consideration many "real world issues," advising that the group should, beginning from its present position, develop a plan for the future.

Dr. Davis from the Alaska Department of Fish and Game stated that he believed the planning function to be the responsibility of regional teams, and Mr. Orth responded that he didn't believe regional plans could function without a statewide plan, advising of institutional conflicts within regions which he didn't believe the regions could overcome at this time.

Mr. Floyd Heimbuch advised that he believed statewide aquaculture groups were in need of a plan justifying requests for salmon production, and Barbara Sorenson stated that she believed what the group should do is evaluate what is in place now and determine what it means economically for both state-operated and private sectors, evaluate production in terms of who benefits, and from that analysis come up with a plan.

Derek Poon recommended that Mr. Orth be requested to provide recommendations for planning, and present such ideas to the group, adding that the group needs to agree that such a proposal is valid. Dr. Burkett inquired concerning time and money constraints upon Group activities, and Chairman Gardiner responded that the Group only has one hundred thousand dollars to spend, adding that if the Group intends to act during the upcoming legislative session, it doesn't have much remaining time.

Mr. Orth again attested to the need for a planning process rather than economic analysis containing no plan into which analysis figures could be plugged.

NEED FOR SUBSIDY?

Mr. Curt Kerns raised questions concerning methods for making enhancement costs appear in the cost of the product, and Armin Koernig attested to the need for determination of:

1. Whether a subsidy if needed.

2. To what degree it is needed.

3. Who pays the bill.

He added that aquaculture to date has spent too much time on biology; it is not tome to take a look at the economic side and force work in this area to catch up with biological work.

Derek Poon stated that he believed the group should:

1. Agree that it needs to get a financial handle on the social economic side of enhancement.

2. Define the scope of the work and get an analysis everyone can understand.

Chairman Gardiner advised that the group has already defined six study areas to which it intends to devote substantial effort, and Mr. Orth set forth the following process for obtaining necessary financial analysis:

1. Prepare a statement of the work to be performed.

2. Contact sources capable of performing such work, requesting that they furnish proposals.

3. Obtain proposals in a timely manner for review by the group.

4. Select outstanding proposals and have consultants make verbal presentation before the group.

5. Select consultant.

Ken Leon spoke to the inability of consultants, without first hand knowledge of private and public sectors performances, to evaluate the economic future and provide

direction, adding that he did not believe enough cycles had elapsed in either the private or public sector from which data could be compiled.

Chairman Gardiner directed Armin Koernig and group members of Mr. Koernig's choosing to define proposed analysis areas and get them down on paper for the purpose of hiring a consultant.

KOERNIG TO DEFINE FINANCIAL ANALYSIS NEEDS

Group attention was next turned to Agenda Item No. 1 (Presentation on salmon aquaculture research, coordinated by Derek Poon). Mr. Poon advised that R & D emphasis should be in proportion to the value of the resource. He then set forth a brief survey of yearly rates of fry return at Sheldon Jackson, Auke Bay, and Little Port Walter, attesting to the need for correlation between what is released and what returns. He further stated that under an Oregon program, existing since 1968, returns have been .2 to .5%, while FRED Division coho returns in Southeast Alaska have been well under 1.% although the projected economic calculation is 10%.

POON AQUACULTURE RESEARCH

Mr. Poon stated that aside from economics, biology is what is going to actually accomplish enhancement, attesting to the need for:

1. Management of enhancement.

2. Management of existing stocks.

3. Increased rate of return.

He advised that the goal of researchers is to take raw data and communicate significant data to interested parties, both public and private.

Mr. Poon further attested to the tremendous diversity of aquaculture resources, and set forth the following areas of need:

1. Need for management of natural stocks. Such management is particularly difficult in Southeast because of mixed stocks. The state does not have enough information on management of natural stocks.

2. There is little information on life history research.

3. Understanding of mortality rate on salmon is very low.

4. Need applied research in aquaculture technology.

Mr. Poon distributed to Group members copies of a Canadian publication relating to:

1. Inability to determine where enhancement is justified.

2. Utilization of single stocks or mixed stocks, adding that single stock approach should be modified to cover all enhancement.

3. The fact that the purpose of aquaculture is increase the overall benefit.

Mr. Poon concluded his remarks advising that R & D support is very important to aquaculture, adding that he hoped his presentation has put it in proper perspective.

WILLIAM HEARD

William Heard of National Marine Fisheries advised that the basic objective of research conducted through Marine Fisheries is to develop Alaska's fishing resources. He stated that his agency currently operates its main facility the Auke Bay Laboratory (established in the late 1950's) and two aquaculture field stations, one at Auke Creek (a small scale incubation facility) and a more extensive facility at Little Port Walter.

Mr. Heard directed Group attention to Item No. 2, in the black binder (copy appended to these minutes) prepared by John Williams, setting forth Marine Fisheries' role in aquaculture within the state. In addition, Mr. Heard distributed to group members NMFS Current Year Task Plan and a bibliography of publications related to salmon aquaculture research activities of the Auke Bay Laboratory dated November 29, 1978. (Task Plan and bibliography attached to these minutes)

Mr. Heard advised that Marine Fisheries deals with research and is not responsible for management. Its second most important function, after research, is publication and dissemination of information, accomplished through work shops, seminars, college-to-college discussions and conferences, technical society involvement, etc.

Mr. Heard attested to lack of increased funding for research resulting from President Carter's veto of aquaculture programs. He added that all new fishery developments

within the state represent research, and Marine Fisheries is in the R end of R & D. Marine Fisheries has developed a clearing house concept in order to keep up on what's being done within the state. It is also attempting to document the early days of aquaculture in Alaska to the turn of the century. He concluded his remarks stating that Marine Fisheries solicits advice from its constituents.

Jack Milnes raised a question concerning the leverage of biological research upon the total aquaculture budget, and Mr. Heard replied that R & D represents approximately 2 to 3% of the total 300 million dollar budget. RESEARCH LEVERAGE

Responding to questions concerning criteria for initiating research projects, Mr. Heard advised that Marine Fisheries' primary function, within its constraints and guidelines, is to perform research projects in areas in which information is most needed.

Mr. Ray Hadley with Sea Grants at the University of Alaska attested to constraints placed upon his area of research within the University, advising that groups such as the present Group on Aquaculture supply the leverage for undertaking projects. In addition, the University needs group backing for legislative financing to acomplish requested projects, and publish results upon completion. HADLEY SEA GRANTS

Mr. Curt Kerns with Sea Grants at the University in Anchorage advised of the use of questionnaires to solicit areas of needed research, and reiterated Mr. Hadley's request for support before the legislature for research financing.

Mr. Heard advised that the Auke Bay Laboratory is currently experiencing its second year of increased salmon research funding in seventeen years, advising that the increase was a direct result of Alaskan aquaculture groups working through Alaska's congressional delegation in Washington. Mr. Heard added that during the past five or six years, Marine Fisheries has had an important level of support from the Alaska Department of Fish & Game in the area of combined funding projects.

Ken Leon from the FRED Division of the Alaska Department of Fish & Game advised that the Department's efforts are almost totally directed toward production. He LEON ON FRED

next read a list of species, locations, and categories of research conducted by the Department. Mr. Leon attested to areas of greatest Departmental thrust such as incubation, loading density of hatchery space, subgrade development from gravel to astro-turf, etc., displaying a graph portraying world progress in incubation knowledge resulting from applied research. In addition, the Department is working on such projects as suitability of glacial water in rearing, short term rearing, heated water for rearing chinook and rearing of species in water temperatures differing from normal environment.

The Pathology department is working on vaccines against disease as well as fungus control, and currently has vaccinated fish returned to salt water where the vaccine will hopefully prove beneficial.

Mr. Leon further advised that the Department is attempting to develop a system of data collection and processing in which information would be available via computer terminal for retrieval statewide. FRED DATA COLLECTION

Mr. Koernig attested to the need for annual reports from the Department's fifteen facilities, and Derek Poon asked if a listing is available detailing information and programs accessible to groups on aquaculture, and Dr. Burkett distributed a listing of FRED Research (copy attached to these minutes). KOERNIG AND POON ON NEED FOR ANNUAL REPORTS

Chairman Gardiner questioned Mr. Leon concerning the Department's data processing system and the data to be computerized, and Mr. Leon advised that the Department intended to arrange information in such a way that when a species is selected, one may determine what is available on it, what results various facilities have accomplished, etc. Derek Poon advised he would rather see the actual reports from the facilities. Dr. Burkett advised that with the number of facilities and amount of information available the Department needs some type of data storage and retrieval system--a good information system.

Chairman Gardiner next directed Group attention to Agenda Item 2 (Review of Aquaculture Policy Manual recently distributed by ADF&G), and Joe Davis advised that approximately 80 copies have been distributed, indicating a great deal of interest in the industry. ADF&G AQUACULTURE POLICY MANUAL

He further stated that the Department intended the draft to serve as the basis for proposed policies and procedures, allowing everyone to look at it and make recommendations. The Department is taking a

very cautious approach in this area where there is a definite need for policies, but where the program is evolving so quickly, perhaps policies and procedures should not be too set.

Mr. Davis warned of inconsistencies in the draft, advising that some editorial changes were accomplished following copying, adding that the Department would like to receive all comments by January 31, 1979, and that comments should be sent directly to him. The Department will prepare a summary of comments which will be available to all and a copy forwarded to the Commissioner. If all comments are received by the 31st, the Department hopes to have a final draft in early spring, and the Department anticipates upgrading the manual annually.

POLICY DRAFT RECOMMENDATIONS DUE 1/31/79

Mr. Davis, speaking to procedures dealing with annual reports and the concept of regional planning teams, advised that the Department does not know whether these areas will work until they have been tried.

Mr. Koernig inquired concerning whether the Department is totally satisfied with the draft or whether there is debate and controversy within the Department. Mr. Davis advised that there is a certain amount of controversy but no real opposition. Mr. Koernig expressed concern that certain areas of the manual do not meet regional corporation intent and inquired concerning the method for having regional wishes included as state policy.

Chairman Gardiner advised that the group's intent is to review the manual and as a group come up with recommendation for the Department. Dr. Kaill stated that many of the policies within the manual are not new but existing statutes, while others were standing policies established by Jim Brooks. Some were implied policies which have now been set forth for the first time, and some are new policies.

Chairman Gardiner directed that Group members review the manual and submit objections to specific areas in writing, such written form to include be a recommendation as to how the policy should be changed.

Armin Koernig inquired concerning what effect the group's recommendations would have upon policies and procedures, and Dr. Burkett replied that he did not

know, advising "we will have to wait and see." Chairman Gardiner stated that goup recommendations could also be taken to the legislature for implementation and have equal opportunity for acceptance as were they submitted to the Department.

POLICY MANUAL RECOMMENDATIONS DUE IN FEBRUARY

Chairman Gardiner advised that the Group would anticipate meeting sometime the first part of February to work out recommendations for the Policy Manual.

NEXT MEETING

He further advised that the Group would next meet January 5, 1979.

ADJOURN

The meeting adjourned at approximately 5:00 p.m.

ATTENDANCE

AQUACULTURE POLICY STUDY GROUP

NOVEMBER 30, 1978

NAME	ADDRESS	AGENCY
Terry Gardiner	Box 6092, Ketchikan	State Representative
Derek Poon	Box 786, Sitka	NSRAA
Barbara Sorensen	Pouch SA, Juneau 99811	Dept. of Revenue
Frank Orth		Earl R. Combs, Inc.
Bill Marsh		NSRAA
John Sund	1285 Tongass, Ketchikan	SSRAA
J. N. Milnes	307 Mill #5, Ketchikan	SSRAA
Ken Leon	FRED Juneau	ADF & G
Bob Burkett	FRED, Juneau	ADF & G
Joe Davis	FRED, Juneau	ADF & G
Armin Koernig	Box 191, Cordova 99574	PWSAC
Wallace H. Noerenberg	Consultant	PWSAC
William R. Heard	Auke Bay Laboratory	NMFS
Bob Simpson	Regional Office	NMFS
James E. Fisher	2221 E. No. Lights Blvd. Anchorage 99504	USDA Rep.
Floyd E. Heimbuch	Box 850, Soldotna 99669	Cook Inlet A.A.
R. S. Hadley	U. of Alaska - Fairbanks	Sea Grant
C. L. Kerns	3211 Providence Anchorage 99504	Sea Grant
Ivan E. Every	Rt. 1, Box 970, Kenai	Cook Inlet A.A.
Jev Shelton	853 Basin Road, Juneau 99801	NSRAA
Rita Marie Miller	Box 786, Sitka	NSRAA

Mike Kaill	FRED, Subport Bldg. Juneau	ADF & G
Bill Sheridan	Box 368, Juneau 99802	USDA Forest Service

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copy of material mailed out

STATE OF ALASKA

THE LEGISLATURE

465-3795

BUDGET AND AUDIT COMMITTEE

FINANCE DIVISION
POUCH MF—STATE CAPITOL
JUNEAU 99801

A G E N D A

AQUACULTURE POLICY STUDY GROUP
NOVEMBER 29, 1978
1:00 P.M.
ROOM 421, State Capitol Building
Juneau, Alaska

1. Presentation on salmon aquaculture research coordinated by Derek Poon
2. Review of Aquaculture Policy Manual recently distributed by ADF&G
3. Review of proposed statute change of salmon harvesting (attached to this agenda)
4. Presentation and review of October 24 report by John Williams
5. Review of proposal by Miller and Associates in regard to a financial analysis of salmon aquaculture.

LEGISLATIVE AFFAIRS AGENCY

INTER-AGENCY ROUTING SLIP

TO Representative Gardiner

w.o. 5735
Vassar

REMARKS:

Attached is a draft of one of your prefile requests. Please advise if any changes are required and whether or not you wish to have this one formally prefiled.

FROM Ken Vassar DATE 10/13/78

BY GARDINER

HOUSE BILL NO.

IN THE LEGISLATURE OF THE STATE OF ALASKA

ELEVENTH LEGISLATURE - FIRST SESSION

A BILL

For an Act entitled: "An Act relating to the harvest of hatchery fish by salmon hatchery operators; and providing for an effective date."

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

* Section 1. AS 16.10.440(a) is amended to read:

(a) Fish released into the natural waters of the state by a hatchery operated under AS 16.10.400 - 16.10.470 are available to the people for common use and are subject to regulation under applicable law in the same way as fish occurring in their natural state until they return to the specific location designated by the department for harvest by the hatchery operator. <u>While harvesting fish at the specific location designated by the department for harvest, the hatchery operator is exempt from any permit requirement under AS 16.43.</u>

* Sec. 2. AS 16.43.140(a) is amended to read:

(a) After January 1, 1974, no person may operate gear in the commercial taking of fishery resources without a valid entry permit or a valid interim-use permit issued by the commission <u>except as provided in AS 16.10.440(a)</u>.

* Sec. 3. This Act takes effect immediately in accordance with AS 01.10.-070(c).

Northern Southeast Regional Aquaculture Association, Inc.

P.O. BOX 786 SITKA, ALASKA 99835

(907) 747-6850

RM. 205, OLD CITY HALL BLDG.

MEMORANDUM OCTOBER 26, 1978

TO: MR. BILL HEARD, NATIONAL MARINE FISHERIES SERVICE
DR. KEN LEON, FRED, ALASKA DEPARTMENT OF FISH & GAME
MR. DONALD ROSENBERG, UNIVERSITY OF ALASKA

FROM: DEREK POON, PH.D., GENERAL MANAGER

RE: PRESENTATION ON SALMON AQUACULTURE RESEARCH AT THE NEXT AQUACULTURE POLICY STUDY GROUP (APSG) MEETING.

As a member of the APSG and on behalf of Representative Terry Gardiner, this is to request your attendance at the next APSG meeting to give a presentation on aquaculture research activities of your agency. Date of the meeting has not been announced but it will probably be in late November. Please check with John Williams of the Legislative Affairs Agency for the time slot for your presentation.

In addressing aquaculture policies, the Group may wish to make recommendations on future research directions and responsibilities. Accordingly, it will be useful reference for us if you can present the following information:

-- research objectives
-- research facilities
-- current and planned research programs
-- bibliography of research publications
-- method of disseminating research results
-- recommendations for future research directions and responsibilities

If you have any suggestions for modifications of the presentation format, please give me a call.

DP/pd

cc: Dr. Bob Burkett
Representative Terry Gardiner
Mr. Robert Simpson
Mr. John Williams

Miller & Associates, Inc. CONSULTANTS
PLANNING • MANAGEMENT • FINANCIAL ANALYSIS
EVERGREEN PLAZA BUILDING • 711 SO. CAPITOL WAY • OLYMPIA, WASHINGTON 98501 • (206) 943-3885

October 31, 1978

Representative Terry Gardiner
Chairman
Acquaculture Policy Study Group
Alaska State Legislature
Juneau, Alaska 99901
Pouch 0

Dear Representative Gardiner;

The firm of Miller and Associates, Inc. is pleased to have this opportunity to propose an economic analysis of the Alaskan salmon fishery.

It is our understanding that the State of Alaska has made a policy decision to restore Alaskan salmon runs to their historic high levels.

A decision of this nature will require not only the restoration of certain wild runs but also the creation of new runs through artificial propagation. The question becomes one of whether the cost of such an overall restoration is economically advantageous to the State of Alaska.

We believe the economic analysis of this issue is indeed a critical one. Traditional economic analyses of salt water fisheries have tended to focus on ex-vessel prices paid to fishermen and the value added to the product through canning or other market preparation activities.

We do not believe that this approach to economic analyses of the saltwater fishery adequately records the full value of the fishery.

For example, these traditional economic analyses do not recognize that the State of Alaska receives substantial tax revenues from the salmon fishery. This revenue comes from income taxes and fees paid by fishermen and processors and their employees and suppliers as well as from the indirect employment and ecomomic wealth which results from the fishery.

In addition to the substantial tax revenues to the State which could accrue from a revitalized salmon fishery, there are hidden governmental costs in the form of unemployment compensation and welfare payments which could be reduced as a result of an economically healthy fishery. These costs are again not generally recognized in traditional economic analyses of the fishery.

There are social considerations, which while difficult to place an economic value upon, should be fully recognized in an economic analysis of the fishery. Salmon fishing is a part of Alaskan culture. If the resource is allowed to dwindle, many fishing villages, towns and cities would either cease to exist or be substantially changed because there are no viable alternative economic pursuits available at these locations. The loss of these communities would unalternably change the basic social and cultural character of the state.

The subsistence fishery which is inseparable from much of Alaskan native American culture as well as the recreational fishery could both be irreparably harmed by a dwindling supply of harvestable salmon.

We have listed several of the major factors which we believe must be addressed in order to fully value the salmon fishery. The work plan, schedule and cost to perform this economic and social analysis are set forth in the subsequent sections of this proposal.

We believe the firm of Miller and Associates, Inc. based upon our economics and financial planning work for the Washington State Department of Fisheries and the Presidential Task Force on Northwest Fisheries is highly qualified to perform the proposed plan.

To assure the effective performance of the proposed economic analysis, we have reached agreement with William R. Wilkerson, an attorney with the Tacoma law firm of Eisenhower, Carlson, Newlands, Rega, Henriot and Quinn, to participate in all elements of the project. Mr. Wilkerson brings considerable economic, legal and governmental experience to this team, as well as much practical fisheries management experience. Most recently he has served as Chief Negotiator for the State of Washington in federal-state-tribal efforts to reach settlement of the Northwest fisheries dispute. He also served as Chairman of the Governor's Task Force for Fishing Industry Assistance (1975-76), which developed a major economic relief program for depressed Washington fisheries.

The time schedule to accomplish the work in this proposal is designed to provide information to assist and advise the 1979 session of the Alaska State legislature.

We look forward to working with you on this critically important economic and social issue.

Sincerely,

Wallace Miller

Wallace G. Miller
President

WGM/asp

WORK PLAN

The following is a series of tasks which Miller and Associates, Inc. proposes to perform in order to establish the economic and social value of expanding the Alaskan salmon fishery. This value will in turn be compared to the investment which will be required to finance this expansion.

Investment sources as well as alternative repayment mechanisms are also included in the study.

TASK #1 - Review and coordinate estimates of salmon fishery potential for expansion.

The Alaskan salmon fishery achieved historic catch levels well in excess of 100 million salmon. The Alaskan Department of Fish and Game (ADFG) estimates indicate that a salmon fishery in excess of 100 million salmon is possible. Regional Acquaculture Associations and the state have or are in the process of developing regional plans and estimates of the salmon catch potential of their regions. The historic high catch levels, the ADFG estimates and the regional acquaculture associations estimates will undoubtedly differ in the total number of attainable harvestable salmon. These historic highs and estimates will also likely differ in the species makeup as well as the actions which are necessary to restore the fishery. Some may propose, for example that the depleted salmon fishery can be restored entirely through the build-up of natural runs. Others will propose to assist the restoration of the natural runs through such actions as stream rehabilitation and stock re-planting as well as the use of a variety of artificial propagation methods which are necessary to develop new runs in areas when natural runs cannot be adequately restored.

These currently differing views as to the species makeup, the total potential catch level, and the cost of restoring the runs to historic levels need to be reconciled into a single estimate which can be used as a basis for the economic analysis of the fishery.

The Contractor proposes to accomplish this task by taking the following steps.

The Contractor proposes to meet with the regional acquaculture associations and review their estimates and plans for restoring the salmon runs within their regions. If plans and estimates have not been completed, the Contractor will work with knowlegable local association members and assist in the development of these estimates.

The Contractor will next meet with ADFG and review their estimates of potential regional run sizes, by species, as well as their estimates of cost to accomplish the restoration.

The Contractor will compare estimates of run sizes and costs and attempt to resolve any differences. If all differences are not resolved, both estimates of the restoration potential and the restoration cost (ADFG and the regional association) will be included in the next steps of the economic analysis.

Upon completion of Task #1, the Contractor would meet with the Acquaculture Policy Study Group (APSG) to review the estimates of the potential for restoring salmon runs to their historic high as well as the estimates of the cost for accomplishing the restoration. Based upon the advise and comments received from the APSG the Contractor would incorporate appropriate changes and proceed with Task #2.

TASK #2 - Economic analysis.

The economic analysis would be developed based upon performing the following steps.

Step I - The build-ups to potential run sizes will be spread out by region, by species over the number of years required to achieve that potential.

Step II - Estimates of the proportion of potential run sizes attributable to fishery restoration efforts (e.g. stream rehabilitation and artificial propagation) will be developed by region, by species, by year.

Step III - The estimated investment in stream rehabilitation and artificial propagation facilties required to achieve the potential run sizes, by region, by species will be spread out over the number of years required to achieve that potential. Annual operating costs will be separately estimated.

Step IV - The information from Step II will be compared with that contained in Step III. The increase in run sizes resulting from stream rehabilitation, artificial propagation and other restorative efforts will be compared to the financial investment required to achieve this increase. This information will be broken down by region.

Step V - An analysis will be conducted on the information contained in Step IV. Basically this information will indicate the amount of regional investment required to develop salmon runs for the area. This data in turn will

be used to develop estimates of the increases in fishermens' incomes, community direct and indirect employment and general economic wealth which will result from the salmon restoration program.

Estimates of the additional tax and other revenues accruing to the State of Alaska will be made as a result of the additional economic activity. Savings to the state resulting from reduced unemployment compensation, welfare and other payments will be made.

Step VI - Based upon the information contained in Step V, an investment break-even analysis of the salmon restoration program will be conducted. In this investment analysis the annual principal and debt service on the restoration investment and the annual operating cost of the restoration facilities will be compared to the additional tax and other revenue plus the reduced cost of government (i.e. unemployment compensation, welfare, etc.) which will accrue to the state.

Step VII - In order to convert the basis investment analysis contained in Step VI into the final economic and social analysis a number of adjustments must be made. These are: (1) to the extent that regional associations through pass-along assessments, the Federal Forest Service appropriations or other federal programs contribute to the salmon restoration investment and/or annual operating costs, these investments should be deducted from the investment and operating cost break-even figures contained in Step VI. (The resulting annual investment and operating cost estimates after these deductions are made represents an approximation of the net "bottom-line" investment to Alaskans for the salmon restoration program.

(2) The revenue to the State of Alaska, or government cost savings side of the equation must also be adjusted. The first adjustment is for the "value" of an enhanced sports fishery and subsistence fishery. (Several methods for valuing these fisheries will be developed for review and discussion with the APSG prior to the selection of the final method to be used in the analysis). A second adjustment should also be made to the increased revenue/government cost savings side of the equation. The maintenance of the small salmon fishing communities has both a cultural as well as an economic benefit to Alaska. The question which must be answered in this adjustment is, what would it cost the state in economic development programs, training programs and other acitivties to sustain these communities at the same level of economic health as the restored salmon fishery, if the salmon fishery were not restored.

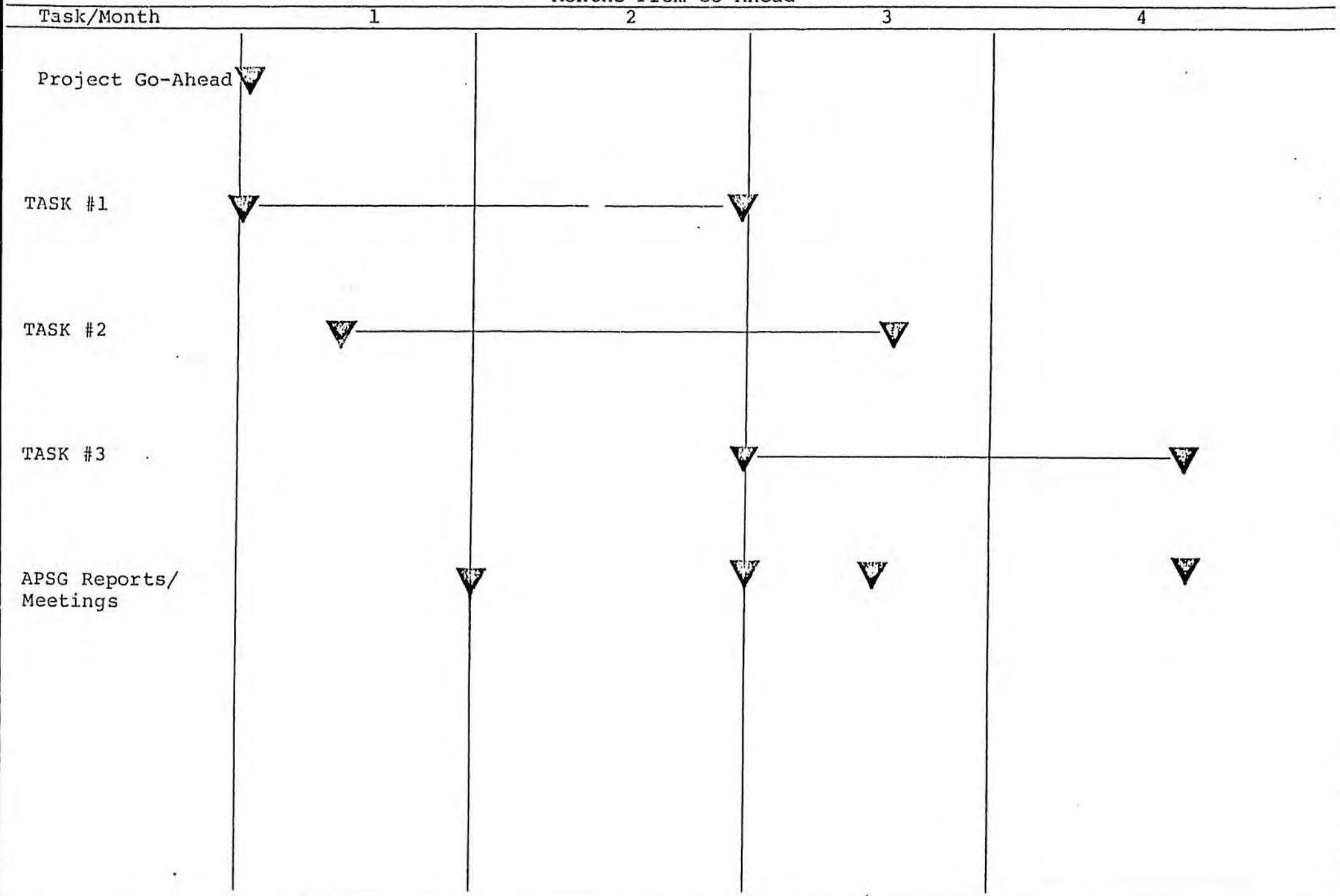
Adjustments (1) and (2) will be made to the investment break-even analysis and the final resulting economic analysis will be presented to the APSG for review and discussion. A methodology will also be developed which will provide the capability to perform economic assessments of individual rehabilitation projects in accordance with the procedures set forth in this proposal.

TASK #3 - Study documentation.

Upon completion of the proposed study as outlined, the Contractor will formally document the study findings and conclusions.

SALMON RESTORATION PROGRAM ANALYSIS

MASTER SCHEDULE



SALMON RESTORATION PROGRAM ANALYSIS

ESTIMATED COST

Direct Labor	Hours	Rate/Hour	Total
TASK #1			
W. Miller (Project MGR)	100		
W. Wilkerson (Project Consultant)	90		
TASK #2			
W. Miller	160		
W. Wilkerson	80		
TASK #3			
W. Miller	80		
W. Wilkerson	80		
Total Direct	590	$60.00	$35,400.00
Other Direct Expenses:			
Travel			
8 RT Seattle to Juneau			1,656.00
Regional Travel (Estimated cost of travel to visit regional acquaculture association etc.)			1,000.00
Per Diem			
40 Days			1,800.00
Total Other Direct Expenses			4,456.00
TOTAL ESTIMATED COST			$39.856.00

FIRM EXPERIENCE

AND

PERSONAL RESUMES

FIRM EXPERIENCE

The firm of Miller and Associates, Inc., was formed in May, 1975. The founder of the firm, Mr. Wallace G. Miller, is the former Budget Director for the State of Washington. As Budget Director, Mr. Miller became involved in establishing sound governmental planning, budgeting, and administrative practices within state government. In the process of developing effective, modern management systems, Mr. Miller acquired an extensive knowledge of governmental policies, programs, and administrative procedures. In order to share his knowledge and continue to assist units of government in solving their management and administrative problems, he formed Miller and Associates, Inc., a firm organized to serve government with a high standard of excellence.

The following consulting contracts awarded Miller and Associates, Inc., indicate that we have the experience necessary for successfully completing the proposed work and are typical of the capabilities of Miller and Associates, Inc.:

WASHINGTON STATE LEGISLATURE - Prepared a comprehensive fiscal, management and program review of the primary and secondary public education systems of the State of Washington. This comprehensive review resulted in several important pieces of new legislation being enacted. The prospect is for additional legislation to be proposed in future sessions of the Washington State Legislature.

OFFICE OF THE GOVERNOR, STATE OF ILLINOIS - Conducted an extensive study of the budgetary and fiscal management policies and practices of the Chicago Public School System and the Chicago Board of Education. This study covered employee compensation and staffing for all the district's educational and service programs, the district construction program as well as the Chicago system of taxation. Study results are still being reviewed with the likelihood that many of the recommendations will be implemented.

WASHINGTON STATE DEPARTMENT OF SOCIAL AND HEALTH SERVICES - Developed a new concept for the delivery of mental health care in the State of Washington. Drafted a State Mental Health Financial Plan based upon this concept which will be implemented during the next three years.

WASHINGTON STATE DEPARTMENT OF FISHERIES - Developed a comprehensive financial plan and bond issue to finance a major construction program aimed at greatly increasing the number of artificially and naturally propagated salmon in Washington State. Current estimates indicate the construction program will be in the range of $40 million.

WASHINGTON STATE OFFICE OF COMMUNITY DEVELOPMENT - Conducted an evaluation of the Indian Employment and Economic Assistance Program to determine the effectiveness of the program in assisting Indians in achieving employment and economic self-sufficiency goals.

WASHINGTON STATE DEPARTMENT OF VETERANS AFFAIRS - Developed a master plan for state-wide delivery of services and prepared an overall financial plan and budget to assist the newly formed agency in becoming established.

WASHINGTON STATE DEPARTMENT OF SOCIAL AND HEALTH SERVICES - Conducted a review of the current method of distributing State support for county probation programs and developed several alternative funding methods which would ensure greater funding equity among the counties and improved program financial stability.

WASHINGTON STATE BOARD FOR COMMUNITY COLLEGE EDUCATION - Conducted an evaluation of the Council on Post Secondary Education's recommended revisions to the higher education instruction budget formula and their financial impact on two-year institutions.

WASHINGTON STATE HOSPITAL COMMISSION - The firm was engaged to conduct an extensive review of the State Hospital Commission's budgetary policies and accounting methodology for providing growth and development allowances in the rates charged by non-profit hospitals. This study has been favorably received in two national healthcare publications.

SPOKANE COUNTY COMMISSION - Conducted a management and organization study of the Motor Vehicle Licensing Section of the Spokane County Auditor's office. The study involved an analysis of the organization, workload, and operating procedures of the Motor Vehicle Licensing Section and included specific recommendations for improving the efficiency and effectiveness of the program.

WASHINGTON STATE SUPERIOR COURTS - Completed a comprehensive cost-benefit analysis of a proposed management information system for the twenty-eight Superior Courts in the State of Washington. This study has been cited by the National Center for State Courts as a model cost-benefit analysis of judicial information systems.

PRESIDENTIAL TASK FORCE ON NORTHWEST FISHING PROBLEMS - Recently completed a contract to provide overall management services in support of the U.S. Departments of Justice, Interior and Commerce which have joint responsibilities assigned by the President to seek solutions to the fishing problems.

WASHINGTON COMMISSION FOR THE HUMANITIES - Developed a financial management and control system, a procedures manual and administrative management system to ensure accountability, control and efficiency.

STATE CAPITOL MUSEUM - Will shortly be completing a study of the feasibility of making the State Capitol Museum financially self-supporting through the sale of various types of merchandise including reproductions of antique furniture.

ILLINOIS STATE LEGISLATURE - Developed a master plan for the implementation of an automated state-wide financial reporting system for the Illinois State Legislature. Work is underway in installing that system.

U.S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE - Currently completing a study of implementation of Title IX of the Education Amendments of 1972 in the states of Alaska, Washington, Idaho and Oregon.

SPOKANE COUNTY COMMISSION - Currently under contract to reorganize the staffing patterns and work flow processes of the County Treasurer's Office. The study emphasizes greater efficiency, improved investment earnings and more timely financial status reporting.

Wallace G. Miller, President
Miller and Associates, Inc.

Education

B.S., Accounting
Montana State University, 1957

MBA, Business Administration
University of Washington, 1964

Professional Experience

Mr. Miller recently served as Project Director for the Presidential Task Force on Northwest Fishing Problems. Major contracts completed include a statewide study of the Washington public education system for the Washington State Legislature, a study of the Chicago public education system for the Governor of Illinois, and a financial plan for a state salmon enhancement program as well as other projects described in the "Firm Experience" statement.

Prior to forming Miller and Associates, Inc., Mr. Miller was the Budget Director for the State of Washington, reporting to Governor Daniel J. Evans. While Budget Director he also held the responsibility of Director of State Planning and Director of State Accounting. In his capacity as Budget Director, Mr. Miller directed the efforts of over 80 planners, budget analysts, accountants and other professional personnel in administering the State's planning and fiscal affairs. During the eight years he managed the State's fiscal affairs (first as an assistant director, later as deputy director and then as director), no increases in basic business and individual taxes were necessary to finance the state budget.

During his career with the state, Mr. Miller developed many new budgeting systems and concepts. The Program Decision System, which was implemented in 1974 is one of the most modern program budgeting systems in the nation. Mr. Miller was also a pioneer in the development of remote job entry systems for use in state fiscal management. In the field of planning, Mr. Miller initiated the Aternatives for Washington Program, a new concept in state planning based upon citizen involvement, which has been copied by other states.

Mr. Miller is the author of a number of publications on planning and budgeting systems for state and local government which have received national recognition.

Mr. Miller, until recently, served for a number of years as an advisor to the University of Washington Graduate School of Business for accounting curriculum development.

Prior to joining the State of Washington, Mr. Miller spent nine years in various financial management positions with The Boeing Company.

WILLIAM R. WILKERSON

Biographical Data

Born Seattle, Washington, March 2, 1946. Primary and secondary education in Seattle public schools. Bachelor of Arts degree from University of Washington (History and Economics majors), 1968. Doctor of Jurisprudence (JDS) degree from University of Oregon School of Law, 1971. Admitted to practice of law in the State of Washington, 1971.

Spent four years in federal practice in Washington, D.C. Served as Assistant Director, Office of Domestic Business Policy, U.S. Department of Commerce; Legislative Counsel for International Economic Policy, Executive Office of the President; and, Special Assistant to the General Counsel, U.S. Small Business Administration. Administrative and legislative practice, involving development of international trade policy, economic development policy and planning, and business regulation (including environmental, labor, tax and trade policy).

In private practice in Olympia, Washington, from January 1975 to September 1978. Primary practice included assisting business and state agencies in resloving problems with the federal government, economic development planning, small business financing, environmental planning, and natural resources development. Served as Chairman of Governor's Task Force on Fishing Industry Assistance (1975-1976), Chairman of the Governor's Advisory Committee on Regulatory Reform (1976), and most recently as Chief Negotiator for the State of Washington on federal-state-tribal settlement activities involving Northwest treaty fishing rights.

In September of 1978, associated with the law firm of Eisenhower, Carlson, Newlands, Reha, Henriot & Quinn in Tacoma, Washington. Major fisheries and natural resource oriented clients have included the Washington Department of Fisheries, Southern Southeast Alaska Regional Aquaculture Association, Martin-Simonds and Associates, CH_2M Hill, and the the Office of the Governor of the State of Washington. Major clients with environmental and economic development concerns have included the Washington Department of Commerce and Economic Development, the Pacific Northwest Regional Commission, and the U.S. Small Business Administration.

Currently serving as Vice-Chairman of the U.S. Small Business Administration's Regional Advisory Council, Chairman of the Regulatory Task Force of the Association of Washington Business, and as an advisor to the Director of the Washington Department of Fisheries for long-term planning.

11/29/78
Wm. Heard Handout
to accompany booklet document

NMFS CURRENT YEAR TASK PLAN
TASK NARRATIVE

Alaska Salmon Aquaculture (Ocean Ranching)

DATE PREPARED
11-24-78

31. CYTP NUMBER
NWC-311.00-79-XX

32. NARRATIVE DESCRIPTION OF TASK (limit to 500 words)

This task focuses on salmon aquaculture (Ocean Ranching) in Alaska, a region with high interest and much current activity in hatchery development, both in the public and private sectors. Major areas of concern include: (1) biological factors and management strategies affecting marine survival, ocean migration patterns and distribution of juvenile salmon; (2) concepts of brood stock development including behavioral aspects of juvenile imprinting and adult homing, genetic considerations of relict, endemic and transplanted stocks of salmon; (3) biological, environmental and management interactions of hatchery - wild stock relationships and (4) other relevant priority research needs of developing ocean ranching programs in Alaska including those of the State of Alaska, private non-profit hatcheries and Regional Aquaculture Associations. Specific activities at research facilities located at Little Port Walter and Auke Creek currently are focused on pink, coho and chinook salmon with less emphasis on chum and sockeye salmon. Attention is directed toward carefully evaluating important elements of fish culture technology on the marine life stages of juvenile salmon. The effects of specific incubation and rearing treatments on ocean survival is determined through releases of fin-marked and coded wire tagged groups of fry and smolts. Marked returning adult salmon are sampled in various fisheries and at fish weirs across streams.

Contract activities planned for this fiscal year include: a construction and materials contract for completion of alternates 1 and 2 of the replacement-renovation of Auke Creek weir; a feasibility engineering contract for modifying and upgrading Sashin Creek weir; a research contract on historical aspects of salmon aquaculture in Alaska; a research contract for detailed analysis of salmon scales possibly reflecting marine environmental variables and a research contract for freshwater ecology studies on sockeye salmon in the Nushagak district of Bristol Bay.

NMFS CURRENT YEAR TASK PLAN
TASK NARRATIVE

Alaska Salmon Aquaculture (Estuarine Determinants of Salmon Survival)

DATE PREPARED 11/24/78

31. CYTP NUMBER

NWC-310.00-79-XX

32. NARRATIVE DESCRIPTION OF TASK (limit to 500 words)

The long-range objective of this task is to evaluate hypotheses on causes of variable marine survival of pink and chum salmon fry. Marine survival of pink salmon fry, for example has varied over 20-fold in 7 years of record at Auke Creek and has varied over 75-fold in 37 years of record at Sashin Creek. The study is coordinated with the ABL marine ecosystems program, Causes Underlying Recruitment Variability in Ecosystems (CURVES) and interfaces with that program to obtain ecosystem data and descriptive oceanography, share vessel time, and share information on larval and juvenile fish, predators, and competitors of the estuarine ecosystem. Pink and chum salmon were selected as target species because of their role in developing public and private aquaculture; their relative and potential enhanced abundance in the larval and juvenile fish populations; and the probability of significant impacts on estuarine ecosystems due to enhanced abundance. The knowledge gained from these studies will form an essential element of the information base needed by the North Pacific Fishery Management Council in evaluating and forecasting the impact of natural and man-caused factors upon marine resources and by the Regional Aquaculture Associations in planning and implementation of salmon enhancement projects. Laboratory studies will seek to describe feeding tactics, digestion rates, and food requirements of fry under known ecological conditions. Field studies will include bioassays of selected estuarine habitats using calibrated hatchery fry. Hypotheses of brood year success will be developed from historical commercial catch statistics, scale analyses, and other project data and will ultimately be examined with the aid of computer simulation models of the ecosystem using inputs from the CURVES program.

This is the first year of a planned reorientation of research personnel and resources from Alaskan Salmonid Aquaculture (Ocean Ranching) and other programs into the Salmon CURVES task. The reorientation will include completion of cooperative studies with the State of Alaska for evaluation of Lake Nunavaugaluk salmon enhancement; upgrade of the Auke Creek weir; and selection and testing of equipment and techniques for the field and laboratory studies. Field studies will be conducted primarily at Auke Bay with additional sites at Lisianski Inlet and Tenakee Inlet to be studied less intensively to represent differences in the ecosystem associated with relative proximity to the Gulf of Alaska.

Contract activities that are planned for this fiscal year are as follows: Continuation of $50 k contract to University of Washington, FRI, to evaluate use of artificial fertilizers to increase sockeye salmon smolt production from the lakes of the Nushagak District, Bristol Bay, Alaska.

Heard 2nd Handout Bibliography

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1/ In addition to formally published literature, several kinds of unpublished manuscripts and reports are also listed. These include manuscripts at some stage of a peer review process, completed manuscripts on file in the ABL Library (MR-F series), and Processed Reports for limited distribution of preliminary data.

11/29/78 Dr. Burkett Handout

F.R.E.D. RESEARCH

Species

Chum	Sockeye
Coho	Rainbow
Pink	Sheefish
Chinook	Grayling

Chum at Beaver Falls, Snettisham, Crystal Lake, Klawock, Hidden Falls, Clear, Kotzebue, Russell Creek, Tutka, and Halibut Cove.

Coho at Starrigavan, Snettisham, Crystal Lake, Klawock, Hidden Falls, Fish Creek, Big Lake, Elmendorf, Fort Richardson, Little Port Walter, Seward Lagoon, Kachemak Bay, Halibut Cove, Fire Lake and Kasilof.

Pink at Starrigavan, Tutka, Kitoi, Halibut Cove, Auke Bay, Little Port Walter and Anan Creek.

Chinook at Deer Mountain, Beaver Falls, Starrigavan, Fish Creek, Snettisham, Crystal Lake, Kasilof, Fire Lake, Elmendorf, Fort Richardson and Clear.

Sockeye at Auke Bay, Big Lake, Kasilof, Karluk, Kitoi, Halibut Cove, Nunavaugaluk, Moose Creek and Hidden Lake.

Rainbow at Deer Mountain, Crystal Lake, Elmendorf, Fort Richardson and Fire Lake.

Sheefish at Fire Lake and Clear.

Grayling at Fire Lake and Clear.

Incubation

Types of incubators - 502
Loading Densities - Increase from 7-12 eggs per cubic inch for chum, 10-20 per cubic inch for pinks.
Substrate - Progression from none, to gravel, to Astroturf, to Intalox Saddles.
Fry transport and handling - Volitional-type incubators, fish pumps, fry separators, pen towing.
Glacial water suitability - Incubation in glacial water such as Kenai Lake.
Accelerated incubation - 0-age smolts

Rearing

Short-term fry rearing - Pinks and chums in estuarine pens and fresh water units to measure any changes in adult survival.
Accelerated coho and chinook growth - Using heated water from power plants or hatchery heaters, 0-age smolts are produced.
Normal coho and chinook growth - Using ambient temperature water, either to produce one-year old smolts because no heat is available or to compare survival of these to accelerated smolts.
Fresh and salt water rearing - To compare efficacy of the two methods.

Types of units - To compare raceways, Swedish Ponds, net pens, cones, floating raceways.
Loading densities - Maximum in tidal flow and in piped flow-through units, reaeration.
Multiple pass systems - For increasing carrying capacities.
Diet testing - Comparing AMP (Alaska Moist Pellet) to OMP, also ADP (Alaska Dry Pellet) to improve survival, reduce cost, and to develop Alaskan industry based on better-use of fish products.

Release and Stocking

Compare timing of release - To improve survival.
Size at release - To compare and improve survival.
Estuarine productivity - To determine carrying capacity of marine waters near hatcheries and to pick best time of release.
Predation effects - To maximize survival by manipulating size of fish released and timing and place. Also to measure effects of predator control. King River Chin-

Pathology

Vaccines - To combat disease such as Vibriosis.
Disease transmission - To determine mode of disease transmission so that it can be minimized.
Kidney disease prevention - Studying the effect of erythromycin on preventing kidney disease transmission.
Hatchery disinfection - Crystal Lake and Kasilof.
Controlling fungus - Comparing use of chemicals and salt water to reduce fungus.

Genetics

Selection - Rainbow brood stocks are being selected for desirable traits.
Genetic variability - Is being measured in wild and hatchery stocks to determine need for maintaining gene pools and for incorporating additional variability in stocks.
Phenotypic traits - Studying characteristics of chinook and coho stocks to determine which donors may be most useful to programs (Speel Lake coho, King Salmon River chinook).
Age at maturity - To maximize production potentials of hatcheries and to produce larger adults.
Run timing - To allow segregation of stocks in fisheries and to provide fish to sport fishermen at appropriate times.
Maintaining stock integrities - Specifying minimum numbers of adults to spawn at hatcheries and minimize transplantation of stocks.

Carrying Capacity

Lake and stream inventory - To determine production potential of lakes and streams for rehabilitation and enhancement projects.
Lake fertilization - Improvement of production potential of lakes.

Brood Stocks

Surveying potential donor stocks for rehabilitation and enhancement projects.

Enumeration

Tagging - Technology in coded wire tagging has increased (tagging 1.0g fry).
Fish counters - Studying and utilizing sonar for smolt and adult counting. A new fry counter is being tested.

Geothermal

Surveys - To determine availability of geothermal heat for accelerated salmon production.

Induced Spawning

Gonadotropins - By accelerating spawning time, coho or chinook may be smolt size the following spring or summer.

Egg Planting

Egg planting devices - Have proven to be better than traditional shovel methods -- may be used in rehabilitation or enhancement projects such as Karluk.

Homing and Imprinting

Studies to determine time necessary for imprinting transplanted stocks, degree of straying.

Migration

Our tagging studies and commercial fisheries recovery efforts are showing migratory patterns and degree of continuous harvesting of stocks over wide areas.

Fish Passes

Baseline studies to determine need for fish passes (Anan, Apollo).
Construction and evaluation of fish passes to measure efficacy (Anan, Frazer River).
Evaluation of types of fish passes.

Habitat Alteration

Studying effects of log jam and beaver dam clearance.
Channel stabilization - Effect on escapement (Ocean River-Alaska Peninsula).

11/29/78 Handout R. S. Hadley
Alaska Sea Grant
University of Alaska

A REVIEW OF AQUACULTURE RELATED PROGRAMS AT THE UNIVERSITY OF ALASKA

November 27, 1978

RESEARCH OBJECTIVE

Aquaculture research is carried out under the Renewable Marine Resources Research program of the University of Alaska Sea Grant Program. The objective of the program is:

> *To provide new information which will assist in the development of new industries, new management techniques, or new harvesting methods which will utilize and conserve the renewable marine resources of Alaskan waters.*

Specific to aquaculture, the short-term research objective is as follows:

> *To assist in the development of the non-profit salmon hatchery through research, advisory and education programs.*

RESEARCH FACILITIES

Facilities of the University of Alaska which are utilized in aquaculture research include the laboratories and marine station of the Institute of Marine Science in Fairbanks and Seward, and the Division of Fisheries in Juneau.

All three locations possess faculty, graduate students and staff with an interest in pursuing research which would be useful to the advancement of the art of aquaculture in Alaska. These interests cover the broad areas of physical, chemical and biological oceanography, and special emphasis at the Juneau campus on fishery research in the area of genetics, fish culture, fish diseases, and fish ecology.

To a greater or lesser extent, laboratories are maintained at each location which are equipped to perform research applicable to aquaculture, including flow-through, saltwater, live tank systems.

CURRENT AQUACULTURE PROGRAMS

The following are the education, extension and research aquaculture projects which are currently carried out by the University of Alaska statewide system:

EDUCATION

Course Development: Experimental Fish Culture

ADVISORY

Marine Advisory Program, Mission B - Aquaculture

RESEARCH

Carrying Capacity of Estuarine Waters

Fishfeed Development

Genetic Interaction of Auke Creek Hatchery Pink Salmon with Natural Spawning Stocks in Auke Creek

Inheritance of Egg and Fry Characteristics in Chum Salmon

Descriptions of each project are included in Appendix A.

Additional research is underway by graduate students associated with the various University programs. The following are the areas of the student research:

Dave Urquhart - U of A, Fairbanks - Feeding ecology of pink salmon in Prince William Sound.

Dave Barnard - U of A, Fairbanks - Feeding ecology of chum salmon fry in Prince William Sound.

Andrew McGregor - U of A, Juneau - Comparison of local pink salmon stocks at Auke Creek.

METHOD FOR DISSEMINATION OF RESEARCH RESULTS

Research results are published either as technical reports or as articles in scientific journals. In all cases, copies of these reports or articles are provided to an extensive, permanent mailing list. This includes the required distribution to all University and state libraries. Additionally, information on current importance on aquaculture information is provided in the "Aquaculture News Briefs" section of *Alaska Seas and Coasts*.

The Alaska Sea Grant Program, in conjunction with the Cooperative Extension Service, maintains a Marine Advisory Program. This program provides direct one-to-one dissemination of information of interest to the marine community. Curt Kerns of the MAP staff is the Aquaculture Specialist and is responsible for the communication between the University and the aquaculture "industry."

RECOMMENDATIONS FOR FUTURE RESEARCH DIRECTION AND RESPONSIBILITIES

The University of Alaska will continue to seek new knowledge and assist in the development of new industrial development in order to meet the major objectives of the program. Major areas of research for the future are:

- Continuation of an understanding of the estuarine survival of young salmon.
- Continuation of the understanding of genetic interactions and genetic tagging.

AQUACULTURE RELATED PUBLICATIONS

Alaska Statutes: Commercial Fishing Loan Act, Salmon Hatcheries, Fisheries Enhancement Loan Program, Salmon Authorities (as amended through 1977) Compiled by E. Thomas Robinson in Aquaculture Notes, AK-SG-77-6, 17 pp.

Aquaculture in Alaska: A Resource Potential
E. J. Kelley and D. W. Hood, eds. Institute of Marine Science, Public Information Bulletin 73-1, AK-SG-73-5, 20 pp.

Artificial Salmon Spawning
Curt L. Kerns and William W. Smoker, Marine Advisory Bulletin No. 6, 1977 (in press).

Artificial Upwelling in Alaska Fiord Estuaries
W. E. Shiels and D. W. Hood, in The Northern Engineer, Vol. 2, No. 4, 1970, pp. 8-12.

Accounting for Private Nonprofit Salmon Hatcheries
E. Thomas Robinson, AK-SG-77-13 (in press).

Economic Feasibility of Private Nonprofit Salmon Hatcheries
Franklin L. Orth, AK-SG-77-4, 99 pp.

Enhancement of Primary Productivity by Artificial Upwelling
R. A. Neve', R. Clasby, J. J. Goering, and D. W. Hood, in Aquaculture Notes, AK-SG-76-8, 22 pp.

History of the Marine Hatcheries of Alaska
William R. Hunt, AK-SG-76-10, 45 pp.

Japanese and Soviet Attitudes Toward Aquaculture
Tsuneo Nishiyama, in Aquaculture Notes, AK-SG-77-2, 19 pp.

Notes on Rearing Juvenile Chum Salmon, Oncorhynchus keta, in an Artificial Upwelling System
A. J. Paul, D. W. Hood, and R. A. Neve', in Aquaculture, Vol. 9, July 12, 1976, pp. 387-390

Preliminary Study on Rearing Chum Salmon, Oncorhynchus keta, in an Artificial Upwelling System
A. J. Paul, D. W. Hood and R. A. Neve', in Aquaculture Notes, AK-SG-76-11, 6 pp.

Private Nonprofit Salmon Hatcheries in Alaska
E. Thomas Robinson, in Aquaculture Notes, AK-SG-76-1, 5 pp.

Proceedings of the Conference on Salmon Aquaculture and the Alaskan Fishing Community
Donald H. Rosenberg, ed., AK-SG-76-2, 302 pp.

Proceedings of the Second Alaska Aquaculture Conference
Brenda Melteff, ed., AK-SG-77-7, 78 pp.

Some Aspects of the Carrying Capacity of Prince William Sound, Alaska, for Hatchery Released Pink and Chum Salmon Fry
R. Ted Cooney, David Urquhart, Richard Neve', John Hilsinger, Robert Clasby and David Barnard, 98 pp.

APPENDIX A

Program: EDUCATION AND TRAINING
Project: E/59-03

Title: Course Development: Experimental Fish Culture

Principal Investigator: W. W. Smoker
Unit: Division of Fisheries

Funding Information

Present level:	SG: $0 UA: $0	Proposed level:	SG: $10,209 UA: $ 2,493
Date Initiated:	1 Nov 1978	Est. Comp. Date:	31 Oct 1979

BACKGROUND AND NEED

In recent years Alaska has made a commitment to enhance the productivity of salmon resources by means of artificial propagation. Both state government and private organizations have begun large scale programs to build and operate hatcheries and other fish production facilities. There are a number of relationships between the development and growth of fish and aspects of their environment which must be understood if the design and operation of a facility are to be successful. Some of these relationships are, for example, the effects of water quality, incubation environments, and cultural practice on development.

Students preparing for work on this new aspect of salmon resource management need to be familiar with these relationships. As a result of this need, the Division of Fisheries at the University of Alaska, Juneau, will be offering a two-semester laboratory course during the 1978-79 school year. This course will be offered to graduate and advanced undergraduate students.

As the course is currently planned, students will perform a series of demonstration experiments using salmon embryos spawned at the beginning of the course. Such experiments might include a series of embryologic preparations, comparison of different incubation environments in their effects on development, comparison between species or populations in the course of events in development, or observations of the effects of different cultural practices on the quality of fry produced. Students will gain experience in the operation of an elementary incubation facility and will gain insight into the biology and technology of propagation of fish. Furthermore, they will learn some practical elements of experimental design and analysis.

There are no other "hands-on" courses offered in the University system in which students explore the problems of fish culture. This course will fill that need and will therefore augment and complement

the program of the University of Alaska, Juneau, Fisheries Division. The course will provide training for students beginning graduate research programs.

The equipment and experience gained during the course of this project should help provide impetus for the future development of a research program in salmon aquaculture at the University of Alaska, Juneau.

Current state funding policy does not allow for special release time for University faculty to establish this type of extensive laboratory course. Currently there are no special laboratory facilities established. Considerable effort will be necessary to establish this student laboratory including construction of egg incubation equipment and development of trial demonstration experiments. Likewise, state funding is not available for the purchase of the special laboratory teaching equipment.

ACCOMPLISHMENTS

New project.

OBJECTIVE

To develop the class material and special laboratory facilities for a two-semester laboratory course in fish culture.

APPROACH

Funding under this project will allow the Principal Investigator release time from one 3 credit course for two semesters. (Normal load is 3 credit courses per semester.) This will allow the Principal Investigator the extra time necessary during the first offering of the course to develop the special laboratory experiments and to construct the special laboratory facilities. The project will also provide some of the special laboratory equipment and the installation supplies necessary for the laboratory experiments.

INTERACTION

The project interacts with Sea Grant Education and Training Project E/59-02.

EQUIPMENT

4 Health Tecna Fish Incubation Cabinets	$2,000
4 Little Giant Recirculation Pumps	320

MISSION B

Aquaculture

BACKGROUND AND NEED

While recent runs of Pacific salmon have improved somewhat, the long range trends of this $200 million a year fishery are down. Most of the decreases in the catch of salmon have been and are occurring in Alaska. Runs in other Pacific northwest states have been stabilized by extensive federal and state salmon enhancement programs.

Alaska is rapidly implementing a very large salmon enhancement program; the plans are for $400 million to be spent on private and public production facilities over the next 20 years. The idea of private investment in participation in salmon enhancement is fundamentally different in Alaska than elsewhere. The Alaska Salmon Enhancement Program (ASEP) is of a three-pronged nature: (1) traditional public sector involvement via the Alaska Department of Fish and Game; (2) regional, private nonprofit associations comprised of user groups; and (3) non-association, private nonprofit groups.

Salmon enhancement efforts in other states are largely public and serve primarily the recreation segment of the fishery; efforts in Alaska are directed predominately toward the commercial fishery. The economics are predictably much different. Higher costs incurred due to remote siting of enhancement facilities, lower product price, and the economic constraints of the marketplace all contribute toward the necessity of rapid, rigorous evolution of the biotechnology of salmon enhancement. Excitement and potentials are high, but the problems are many.

Alaska now has four regional aquaculture associations and approximately 10 non-association corporations with permits granted or being acted upon. The first returns of salmon to private facilities occurred in the summer and fall of 1977. The Prince William Sound Regional Aquaculture Corporation (PWSAC) had a return of 55,000 fish to its Evans Island Facility; the Sheldon Jackson Aquaculture training program had a return of some 110,000 fish. Several more facilities are due to go on line this coming year.

As a result of the Alaska Sea Grant Program's involvement with the formation and development of Prince William Sound Aquaculture Corporation, six major categories of need have been identified. They are:

1. Organization, finance, and business management.

2. Biological information on spawning, incubation, egg handling, and estuarine survival.

3. Engineering design.

4. Cost/benefit information.

5. Cost efficiency in subsystem design.

6. Identification of biological constraints to increase return.

It is felt that the nonprofit, private fish hatcheries will have the very positive effect of stimulating local economy, the fishing industry, and all supporting industries. Armin Koernig, President of the Prince William Sound Aquaculture Corporation, summed up the feeling behind the private hatchery scheme when he said, "These projects involve self-help and determination in the best spirit of Alaska independence."

ACCOMPLISHMENTS

In response to requests for assistance, a talent bank was established two years ago to assist the Aquaculture Agent in getting information to developing hatchery firms. To date, the following assistance has been provided:

1. Development of a Chart of Accounts for regional aquaculture associations by Mr. E. Thomas Robinson, adopted in whole or in part by all four regional associations.

2. An economic assessment of the PWSAC hatchery by Dr. F. L. Orth that has resulted in changes that have improved the economic picture for the facility.

3. Via talent bank, personnel assisted the Board of Directors of PWSAC in becoming a more effective corporation.

4. Stimulated Cook Inlet Aquaculture Association into planning several lake fertilization projects for 1979.

5. Precipitated Kodiak-area Native corporations' awareness of aquaculture; a staff person has been hired, several projects are planned by village corporations.

6. In conjunction with user groups, started the process of developing a practical diet for pink and chum salmon fry held in saltwater.

7. Working with the seafood specialist and a fish meal producer, ran a series of experiments that point the way toward the economical use of the vast quantities of fish waste produced in Alaska.

8. A major focus was the development of a Uniform Reporting Procedure for all ASEP efforts, public and private, which will provide accurate industry statistics to economists, planners, the Alaska State Legislature and other user groups.

ACTIVITIES

Aquaculture Class

Thirty-five persons were trained in basic aquaculture, salmon biology, and enhancement techniques via a course, Fisheries 393, taught in Petersburg and Kodiak. The class will also be offered in the Kenai area later this year. Many of these students were would-be or actual hatchery permit holders or corporation board members.

Aquaculture Notes

Several publications have been distributed:

- "History of Marine Hatcheries of Alaska"
- "Alaska Statutes--Commercial Fishing Loan Act, Salmon Hatcheries, Fisheries Enhancement Loan Program, Salmon Authorities"
- "Economic Feasibility of Private Nonprofit Ocean Ranching Ventures"
- "Artificial Salmon Spawning, a Manual"
- "Japanese and Soviet Attitudes Toward Aquaculture"
- "The Alaska Salmon Enhancement Program: Imperatives for Economic Success"

Additionally, the following publications are currently being readied for publication:

- "Engineering for Aquaculturists"
- "Life Cycle Costing: a Tool for Decision Making"
- "Accounting for Private Nonprofit Salmon Hatcheries"

Other Publications

A major article on the ASEP appeared in the widely distributed periodical Alaska Seas and Coasts, as does a column "Aquaculture News Briefs."

Aquaculture Distribution List

A mailing list of some 30 aquaculturists is maintained. Information of importance to Alaskan salmon culturists is rapidly disseminated. Some 40 items such as evaluations of new laws, a paper on corporate insurance, news of Canadian enhancement techniques, use of a Secci disk, sources of information, reprints of scientific articles of especially high interest, etc., were sent out. A five-page questionnaire was mailed out inquiring as to specific needs and ways to improve the distribution list service.

A Fisheries Institute was held in Petersburg that brought together the state's aquaculturists and commercial fishermen to exchange views and address issues of common interest.

OBJECTIVES

To assist in the development of the state's aquaculture potential by offering technical information to interested corporations, individuals, schools, and other government entities. During the next year, the following specific objectives will be addressed:

- To respond to requests for assistance by aquaculture groups in the areas of business management, economics, salmon hatchery techniques, chemistry, and biological engineering.
- To train individuals in hatchery techniques through the use of University of Alaska credit and non-credit courses in conjunction with other experienced state and local personnel. Coordinate training of hatchery personnel of the regional corporations working in cooperation with other federal agencies such as CETA.
- To train management officers and board members of new aquaculture corporations in principles of business management, cost accounting, and decision making vis-a-vis aquaculture.
- To disseminate results of research projects to specific user groups in a timely manner. Disseminate information on relevant state and federal legislation to user groups.

APPROACH

Talent Bank

Our best response for help can be made by utilizing a team of specialists and drawing upon the appropriate specialist or specialists for assistance to any group at any time. This "talent bank" will consist of fishery and hatchery biologists, hydraulic engineers and designers, business management specialists, chemists, and economists.

Of immediate concern is the continued need for the economist or business management specialist. Assistance in this area of need is not readily available to corporations and is too often not considered a high priority. However, failure to attend to the details of organizational management, business management, and the economics of the entire operation, will absolutely lead to failure. Therefore, based on past performances, we are expecting, that the demand for an economist and business management help will be of continued high priority.

Requests for assistance from newly developing corporations or from existing corporations will be directed through the Marine Advisory Aquaculture Specialist. He will arrange for meetings or workshops between the University personnel and the corporation. Individuals from the University will advise the corporation in their areas of expertise. There are currently 10 people who can respond to requests for assistance:

W. Phillips	Corporation management
T. Robinson	Nonprofit corporate accounting
G. Gleason	Marketing
H. Zach	Computers
R. Solie	Public sector labor relations
J. Colonell	Engineering
R. Carlson	Water management
T. Cooney	Oceanography/carrying capacity of estuaries
D. Hoffman	Business management
C. Kerns	Aquaculture techniques/facility design/ feasibility.

Others are expected to become available as the need arises.

Aquaculture Class

User group response has resulted in the creation of an Introduction to Aquaculture class which has been taught and will continue to be taught through the Division of Fisheries, University of Alaska,

Juneau, by the Aquaculture Specialist. Major approach philosophy has been to introduce students to the basics in salmon biology, hatchery technology, genetics, and management implications. Each class requires 15 lecture hours. Classes have been taught in Petersburg and Kodiak and will be taught on the Kenai Peninsula.

Aquaculture Workshops

Besides offering specific advice to aquaculture corporations, much could be gained by offering a technical business management seminar to officers and managers of all aquaculture corporations. Several such seminars are to be given for the funding year and will be planned by the School of Management and the Aquaculture Specialists.

The Aquaculture Specialist will serve as the educational coordinator between the talent bank specialist and the officers and management of the aquaculture corporation. He and the local advisory agents will assist the aquaculture corporations on a local level in implementing the finance and business management plans set forth by the talent bank. This will provide the continuity and rapid problem solving capability that an effective training program requires.

A workshop on sharing risk is planned for the upcoming year. While aquaculturists are the prime audience, a wide range of marine resource users could benefit from a better understanding of risk taking and sharing.

Aquaculture Notes

Results of University research in the field of aquaculture will continue to be disseminated through the publication of Aquaculture Notes.

INTERACTION

This project interacts with Sea Grant Renewable Marine Resource projects on Ocean Ranching.

EQUIPMENT REQUESTED

None.

Program: RENEWABLE MARINE RESOURCE
Project: R/02-01

Title: Carrying Capacity of Estuarine Waters

Principal Investigator: R. T. Cooney
Unit: Institute of Marine Science

Associate Investigator: W. S. Reeburg
Unit: Institute of Marine Science

Associate Investigator: R. A. Nevé
Unit: Institute of Marine Science

Funding Information:

Present level:	SG: $53,300	Proposed level:	SG: $74,300
	UA: $26,500		UA: $33,600
Date Initiated:	1 Nov 75	Est. Comp. Date:	31 Oct 78

BACKGROUND AND NEED

The development of private nonprofit salmon hatcheries is a reality in Alaska. This research project was initiated on request of the Prince William Sound Aquaculture Corporation (PWSAC) to examine the ability of the estuary adjacent to the Port San Juan hatchery to support the large numbers of fry pink salmon released each spring from the facility. Port San Juan is located on Evans Island in southwest Prince William Sound.

Bailey, et al., (1975) looked at the carrying capacity of a cove in southeastern Alaska with regard to its ability to support natural runs of pink and chum salmon. The results were speculative due to insufficient data, but they did point out the importance of consideration of carrying capacity when operating a hatchery or choosing new hatchery sites. It is difficult to know which factors are significant in terms of the capacity of an estuary to accommoddate high levels of fry survival; but certainly food availability, predation, competition, and variations in temperature which may affect growth rates and timing of emergence, are among the important factors.

As was detailed in a previous proposal, the literature describing the feeding dependencies of juvenile pink salmon suggests the young fishes may first exploit epibenthic and meiobenthic food sources close to home streams before assuming a more pelagic feeding role as they move out of the estuaries into the open shelf and ocean environments (Gerke and Kaczynski, 1972; Manzer, 1969; Robinson, et al., 1968). If this notion concerning an initial dependency on shallow water meiobenthic communities is correct,

the carrying capacity of a region would be more closely related to the nearshore area exhibiting appropriate "nursery" characteristics than to the productivity of the overlying waters. Nothing is known about the vulnerability of first feeding fry in the nearshore areas except that Dolly Varden trout and some other sea fishes commonly congregate around stream mouths feeding on fry as they emerge.

Our present research is designed to evaluate the extent to which the nearshore benthic community is utilized. If this habitat proves to be "critical" and limiting in the extent to which it can support large introduced fry populations, something significant will have been learned since the meiofaunal community is generally considered to be at the top of a food chain with only the larger epibenthic harpacticoid copepods occasionally being used as a food source (McIntyre and Murison, 1973). The information would be invaluable to PWSAC as an aid in selection of additional hatchery sites as well as in the advisability of holding and feeding the young fishes in the hatchery prior to release in the pelagic zone of the estuary.

ACCOMPLISHMENTS

A preliminary investigation of the salmon fry carrying capacity of the estuarine waters adjacent to the Prince William Sound Aquaculture Corporation's Port San Juan salmon hatchery was carried out during the period 4 April through 8 June 1976. The field party consisted of a Biological Oceanographer, Mr. Bob Clasby, and two graduate students. Selected stations were sampled in the bay and adjacent waters for temperature, salinity, nutrients, chloropyll *a*, and phytoplankton and zooplankton standing stocks. Potential salmon fry food items were collected using fine-mesh (216μ Nitex) plankton nets towed vertically or horizontally. Salmon fry were sampled with handheld dip nets.

A first order analysis of our observations indicates that the chemical and physical characteristics of the bay are governed by tidal currents moving in and out through the entrances to the north and east of Bettles Island. The predominant northeast to east winds of the area cause some wind mixing to occur within the bay. The production of organic matter and its transfer up the food chain preceded the out-migration of salmon fry by approximately one month. Phytoplankton standing stock (measured as chlorophyll *a*) exhibited a gradual increase starting in early April, peaking in late May, then declining with a slight increase again in early June. The zooplankton in the upper 20 m of the water column were most abundant between 15 to 30 April. Salmon fry emergence became significant at about this time and continued into mid June. These observations suggest that maximum zooplankton densities in the surface waters of the bay fell

below 500/m^3 prior to significant fry out-migration, although the concentration did start to increase again in late May. At this time there is no way of knowing if the low concentration of zooplankton had any effect on the feeding of the salmon fry.

Concentrations of salmon fry were observed in the nearshore areas of the bay, while none were observed in the pelagic areas. Stomach content analyses conducted on a small number of these fry indicated that they were feeding on the dominant zooplankton of the nearshore area (copepod genus *Oncaea*) which differed from that found in the pelagic areas of the bay. It appears that the nearshore habitat is unique and deserves a more concentrated research effort than was expended on this area in 1976.

The first year's effort demonstrated the feasability of collecting, processing and evaluating data in the field, and showed where to concentrate major research during the 1977 field season.

This season, April-June 1977, we expect to address two major questions: (1) What are the food dependencies of first feeding fry in the area adjacent to the hatchery and are these dependencies benthic or pelagic? and (2) What features characterize "critical habitat" for first feeding fry if the meiobenthos proves to be important, and can "habitat" be ascribed to a planktophagous feeding regime if pelagic organisms prove to be the food source?

Of secondary importance will be our efforts to gain more information about the kind of predation to which the salmon fry are susceptible and the frequencies with which it occurs. We will also take every opportunity to follow the salmon fry past their "critical" first feeding and learn what we can about feeding dependencies as the fry mature, increasing in size and swimming capability.

OBJECTIVES

To identify those parameters which, when monitored seasonally, will provide the basis for deciding on optimal release times for hatchery-raised fry. During the third year, the following specific objectives will be addressed:

- Complete studies of the nursery habitats in the estuary adjacent to the Port San Juan hatchery.
- Examine habitat and fry feeding habits off several naturally producing pink salmon streams for comparison with the Port San Juan model.

APPROACH

We plan to put a field party in the area in mid-April or at the time when fry are beginning to migrate from the hatchery

into the estuary. Personnel will complete specific studies of nursery habitats adjacent to the Port San Juan hatchery and then will conduct assessments of several other areas in Prince William Sound from a charter fishing vessel. The selection of streams or sites will be accomplished through interaction with PWSAC biologists and by consulting the historical records published by Alaska Department of Fish and Game.

This approach will characterize the final step in the sequencing of the overall project as envisioned at this point in time (March 1977). It is possible that developments emerging from efforts planned this summer will cause a revision in plans for the 1977-7 funding period.

The development and finalization of a quantitative description of "carrying capacity" will be attempted using the results of the studies examining feeding dependencies, nearshore nursery areas, food abundance both benthic and pelagic, predator-prey relationships, competitors, and temperature or other environmental factor At the least we expect to be able to rank the most obvious variables in order of importance, and to suggest some strategies for optimizing fry survival.

INTERACTION

This project interacts with Sea Grant Information and Advisory Pr A/71-05; Renewable Marine Resource Research Project R/02-05; and Program of the Alaska Department of Fish and Game.

EQUIPMENT REQUESTED

None.

REFERENCES

Bailey, J.E., B. L. Wing, and C. R. Mattson. 1975. Zooplankton Abundance and Feeding Habits of Fry or Pink Salmon, *Oncorhynchus gorbusha*, and Chum Salmon, *Oncorhynchus keta*, in Traitors Cove, Alaska, with Speculation on the Carrying Capacity of the Area. Fish. Bull. 73(4): 846-859.

Gerke, R. J. and V. W. Kaczynski. 1972. Food of Juvenile Pink and Chum Salmon in Puget Sound Washington. Wash. Dept. Fish; Tech. Rep. 10, 27 p.

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McIntyre, A. D., Murison, D. J. 1973. The Meiofauna of a Flatfish Nursery Ground. J. mar. biol. Ass. U.K. 53: 93-118.

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Program: RENEWABLE MARINE RESOURCES
Project: R/02-06

Title: Fishfeed Development

Principal Investigator: C. L. Kerns
Unit: Marine Advisory Program

Funding Information

Present level:	SG: $0	Proposed level:	SG: $10,104
	UA: $0		UA: $ 5,900
Date Initiated:	1 Nov 78	Est. Comp. Date:	31 Oct 81

BACKGROUND AND NEED

An efficacious regimen for pink (*Oncorhynchus gorbuscha*) and chum salmon (*O. keta*) has yet to be developed. While salmon ranching is burgeoning in Alaska (and elsewhere), the biological realities are that unfed salmon fry face very severe environs upon release. Short term rearing has been demonstrated to markedly increase survival, fry to adult. With the added expenses that Alaskan aquaculturists face due to the high cost of goods and services, every economic advantage must be sought. The development of a practical ration for pink and chum salmon will be of inestimable value to Alaskan salmon ranchers.

Researchers at the Pacific Biological Station in British Columbia have found that pink and chum salmon have different nutritional requirements than do king (*O. tschawytscha*) and coho salmon (*O. kisutch*). In a series of experiments on saltwater net pen rearing of the various Pacific salmon, it was noted that year after year king and coho salmon grew satisfactorily but pink and chum salmon did not. Diet has been determined to be the central problem. (The commonly used rations, Oregon Moist Pellet (OMP) and the dry ration, Abernathy, were developed specifically for king and coho.)

In the Japanese experience short term rearing, i. e., holding salmon fry until estuary conditions are optimal before release, increases the survival, fry to adult, by approximately two-fold. The increases in survival are thought to be related to the timing of the spring plankton blooms. If fry migrate before the bloom they suffer two manifestations of essentially one problem: (1) limited food supply for themselves; and (2) increased susceptibility to predation. Researchers at the National Marine Fisheries Service's Auke Bay Laboratory found that with one lot of pink salmon fry that migrated two weeks earlier than another, the survival of the later migrating fry was increased 1.7-fold over that of the earlier departing lot.

The present locally produced supply and the prognosis for the future supply of fish meals, the major component of artificial fish diets, is excellent. Alaska currently has three fish meal plants in operation; bottomfish and increased shore-based processing should increase the meal supply sharply. Crab, herring and salmon meal are currently shipped to feed mills in Oregon and Washington where with the addition of scrap fish and cereal meals they are made into salmon rations that are returned to Alaska. This obvious energy-inefficient practice started before local demand for salmon rations warranted local production. With the state's $500 million public and private salmon enhancement program just beginning, the local need for economical fish rations is sure to grow.

OBJECTIVE

To develop and test an economical dry salmon ration composed of readily available locally produced dry ingredients and a species of abundant underutilized fresh fish.

Specific objectives for this project during year one will be to test varying rations of calories to protein (c/p) (see Table I, Diet Formulations) in order to find the optimal regimen that pink salmon fry require under the local conditions of Prince William Sound. A comparison with the commercially available moist and dry ration will be made as controls (see Table II for contents of test diets).

Year two will be spent determining optimum dietary protein levels. In year three alternate waste or by-product ingredients will be explored; in addition, a statistical evaluation of the returning adult pink salmon from year one will be run.

APPROACH

Three or four test rations with varying levels of energy and protein, consequently varying ratios of c/p, will be manufactured and tested on a pilot scale level. The rations contain the same proportions of herring, salmon and crab meals, whey and vitamins. The amount of fresh fish and lipids will be varied inversely to produce the different c/p ratios. The test rations will be made by using extrusion-heat drying-cracking-screening.

Of the three levels of testing available--laboratory, pilot, and production--pilot scale was thought to provide the best mix of speed and practical significance.

Efforts to develop the ration will be shared by three groups: Seward Fisheries (SF), Prince William Sound Regional Aquaculture

Association (PWSAC), and the University of Alaska Sea Grant Program. Seward Fisheries are to supply most of the feed ingredients, some chemical analyses, and selected equipment. PWSAC will supply its facilities at Port San Juan, the manpower to feed the fish, the fish, and other assistance. It is planned that the Principal Investigator will manufacture the ration, assist with experimental design and statistical analyses, and write up the results.

INTERACTION

This project interacts with Sea Grant Information and Advisory project A/71-01 Mission B and with Renewable Marine Resource Research project on salmon ranching.

EQUIPMENT REQUESTED

5 hp meat grinder	$1,200
dryer	600
grist mill	100
dry mill	800
screens	200
nets	3,000

TABLE I

YEAR 01 DIET FORMULATION

INGREDIENTS

DIET #	DRY									WET		
	Halibut Meal	Salmon Meal	Crab Meal	Herring Meal	Whey	Wheat Germ	Yeast	Vit.	Kelp	Fresh Fish	Marine Oil	Soy Oil
1	5	15	10	5	10	5	5	2	5	31	7	--
2	5	15	10	5	10	5	5	2	5	26	7	5
3	5	15	10	5	10	5	5	2	5	21	7	10
4	5	15	10	5	10	5	5	2	5	16	7	15

Purpose: To establish optimal calorie-to-protein (c/p) ratio for pink and chum salmon fry.

TABLE II

TOTAL DIET FORMULATED PROXIMATE CONTENTS (EXPRESSED AS % DRY WEIGHT)

DIET #	COMPUTATIONS			
	CP	LIPID	ME	C/P
1	57.1	11.86	3446.4	60.4
2	52.655	16.805	3686.4	70.0
3	48.255	21.755	3926.	81.4
4	43.855	26.705	4166.4	95.

WET FRACTION DIET FORMULATED PROXIMATE CONTENTS (EXPRESSED AS % DRY WEIGHT)

DIET #	COMPUTATIONS			
	CP	LIPID	ME	C/P
DRY FRACTION 1-4				
Expressed as 57%	29.23	4.495	1837.35	62.96
(Expressed as 100%)	(51.2)	(7.89)	(3223.42)	
WET FRACTION				
(Expressed as 43%)				
1	27.825	7.36	1609.	57.8
2	23.425	12.31	1849.	78.93
3	19.025	17.26	2089.	109.8
4	14.625	22.21	2329.	159.24

Program: RENEWABLE MARINE RESOURCES
Project: R/02-05

Title: Genetic Interaction of Auke Creek Hatchery Pink Salmon with Natural Spawning Stocks in Auke Creek

Principal Investigator: A. J. Gharrett
Unit: Division of Fisheries

Funding Information:

Present level:	SG: $23,700 UA: $22,600	Proposed level:	SG: $14,571 UA: $12,037
Date Initiated	1 Nov 77	Est Comp. Date:	31 Oct 82

Director's Note:

This project was scheduled to start on November 1, 1977. Due to financial problems within the University, the start of this project has been delayed until July 1, 1978. Even with this delay, samples and some equipment and chemicals have been obtained.

BACKGROUND AND NEED

The study of the genetics of salmon possesses some important implications for both fishery and hatchery management. It is not only possible to use genetic differences between populations as a basis for stock identification, but it is also important to employ genetic considerations initially in locating a hatchery and subsequently in operating it. Unfortunately, there is little information currently available regarding the genetics of Alaskan stocks and little work is being done to accumulate such information. Since extensive construction of hatcheries is being planned throughout the state as a result of private-nonprofit hatchery legislation and of public bonds for the Alaska Department of Fish and Game, it is especially important at this time to thoroughly examine the genetics of Alaska's salmon. The implementation of these hatchery programs make it important to obtain information that may help answer such questions as: How can genetics be used to improve hatchery practice? Can "genetic tagging" be practically employed to mark different hatchery stocks? What impact do hatchery fish have on natural stocks? While it is premature to expect genetics to exert an influence in aquaculture comparable to that realized in agriculture, the potential for such significant contributions exists, and answers to the questions posed above should receive serious consideration in the development of Alaska's aquaculture programs.

The crux of most genetic considerations at the populations level is genetic variation. The genetic composition of each population

of fish displays some degree of variation and has evolved from a combination of influences such as population size, selective pressures, and immigration from other populations. Because it serves as a buffer for environmental fluctuations, genetic variation is essential for the long term survival of a population; hence, the maintenance of variation in the genetic composition of their hatchery stocks should be of major concern to fish culturists.

Variation is manifested by population differences in allelic frequencies which are determined by individual differences in allelic composition at a particular locus. Allelic differences are expressed by small structural variations in the polypeptide specified by a locus. Frequently these differences can be resolved by starch gel electrophoresis, a technique by which dif ferently charged particles (e.g., proteins) are separated in an electric field (see e.g., Gordon, 1975). Following the electrophoresis of samples, histochemical stains are utilized to identify specific enzyme activities (Hunter and Markert, 1957; Shaw and Prasad, 1970). In this way, the genetic variability present at a number of different genetic loci may be assessed. The five Alaskan species of *Oncorhynchus* have all demonstrated variability at a minimum of ten electrophoretically detectable loci and only the coho has fewer than six loci that are commonly polymorphic (Utter, personal communication).

As mentioned previously, good hatchery procedures require that genetic variation be maintained in the cultured stock. This can be done utilizing a large number of breeders taken at random from the returning adults, thereby minimizing variability losses as a result of inbreeding and inadvertant selection. Changes in variability of a stock from year to year can be monitored electrophoretically.

Genetic variability has been used extensively to identify and compare discrete populations of fishes, especially salmonids (Allendorf, 1975); and some studies have been made of Alaskan stocks (e.g., Aspinwall, 1974; Grant, 1977; Donnelly, et al., 1977). The applications of electrophoretic techniques can be further extended in a hatchery situation where it is possible to alter allelic frequencies by appropriate breeding schemes, thereby producing a stock of fish which is uniquely identifiable. Usually the enhancement of relatively rare alleles is involved in this process. Such genetic "tags" could be enormously important to fishery management because they are readily detected and relatively inexpensive to implement and recover. Because these tags are heritable, once a stock is tagged, all the descendants of that stock are also tagged.

There are two potential problems with genetic tagging; the first concerns the means of implementation and the second concerns the results. When a rare allele is enhanced in a stock, one must choose parents from the relatively small number of individuals possessing that allele. Because decreases in variability may

result if an insufficient number of breeders are used, it is important that breeding schemes employed minimize inbreeding. The second potential problem in genetic tagging results from the fact that the genetic composition of the population is altered by the process. Presumably the process acts randomly on all loci except the one involved in the tag and possibly a few loci closely linked to it; nevertheless, a rearrangement is being made which could affect the fitness of the stock. Although the possibility is small that a selective disadvantage may be conveyed to inheritors of such a tag, it is necessary that genetic tagging be critically examined under a variety of circumstances (location, species, and genetic locus) before such tagging is applied extensively.

While starch gel electrophoresis provides a powerful tool for the study of the genetics of fishes, it is limited because only a small portion of the loci present in an organism can be characterized electrophoretically. In addition, many questions remain unanswered because of their complexity. Notable are questions concerning interactions between genes and between genes and the environment; such relationships can only be generally described. Within a population, particular combinations of genetic information develop that provide a genetic strategy which allows a population to interact successfully with its environment(s). A successful strategy is not necessarily unique but it is complex and may be disrupted by the introduction of genetic information from a population that has developed a different strategy. Such a disruption may result from genetic interaction of hatchery fish (particularly those descended from transplants) with nearby natural stocks. The possibility of a loss of fitness in local natural stocks resulting from such interactions make it necessary to determine the extent to which hatchery fish interbreed with local, naturally spawning stocks. Natural stocks serve as a "reserve" to genetic variability. Thus, it is essential to the sound management of salmon fisheries that the implications of these interactions be examined. While it is not possible to assess the impact of genetic interactions of hatchery fish or native stocks, it is possible to estimate the extent of interactions. This can be done by observing the rate at which an allele enhanced in the hatchery stock increases in naturally spawning stocks with which they interbreed.

In this proposal the Auke Lake system will be used as a model system to examine the interaction of hatchery pink salmon with the naturally spawning fish in this system. To accomplish this, a relatively rare allele will be enhanced in the hatchery fish and the subsequent increase of this allele in the other portions of this system will be monitored. At the same time, the relative survival of "tagged" and "untagged" hatchery fish will be examined. Finally, the genetic compositions of all the breeding groups in this system will be determined and compared.

ACCOMPLISHMENTS

Because it is the middle of the first year of funding for this project, all the milestones listed for this year have not been achieved. Significant progress has been made, however: samples have been obtained from all breeding groups for the 1977 brood year and from the hatchery stock; equipment and chemicals necessary to initiate electrophoretic screening have been procured; and a preliminary examination of a number of enzyme systems have been done on the hatchery samples. As a result of these preliminary studies, it is apparent that the activities of some enzymes deteriorate with prolonged storage. This loss in activity indicates that in order to obtain the maximum information from a particular sample, it must be processed as soon as possible after it has been taken. An encouraging note is that laboratory facilities dedicated to research will be available by mid-summer. Presently, research must be planned around heavy class use of the only laboratory facility.

OBJECTIVE

A number of genetic problems which are important to the effective management of both Alaska's salmon fisheries and its hatcheries may be addressed by employing electrophoretic techniques. Specifically, in this project these techniques will be used to examine the genetic variability and changes in variability that occur in discrete breeding groups of pink salmon to provide some insight into the following questions:

(1) To what extent do hatchery fish interbreed with naturally spawning stocks?

(2) Do genetic tags significantly reduce the fitness of the populations into which they are introduced?

(3) Do substantial differences between distinct breeding groups exist within a stream system; and if they exist, do these differences reflect a loss in variability of the hatchery stock?

APPROACH

Use of stocks from the Auke Lake System is advantageous for several reasons:

(1) There is an operational hatchery in the system, which has been stocked from native fish.

(2) The hatchery is oriented toward research.

(3) The local stocks have been identified and the drainage system well characterized.

(4) Some assistance from NMFS Auke Bay Laboratory personnel is available for obtaining samples and identifying particular stocks. This work is obtained on a reciprocation basis.

(5) The location of the Auke Bay system is adjacent to the University, thus minimizing transportation and field costs.

In the Auke Lake system both the odd and even year cycles of pink salmon are comprised of distinct breeding groups as determined by the location and the timing of spawning. Using the 20 or more distinct loci in *Oncorhynchus* that may be examined electrophoretically (Utter, personal communication; May, 1975), we will characterize the compositions of the nine different stocks of pink salmon that have been observed in the Auke Lake system as well as the pink salmon used as hatchery stock. Information obtained from these characteristics will be used to determine the following:

(1) The extent to which variation exists within each stock.

(2) The extent of similarity between stocks.

(3) The extent of divergence between even and odd year cycles.

From these results and in cooperation with the NMFS Auke Bay Laboratory, it will be possible to choose a relatively rare allele ($0.05 < p < 0.10$) which will be enhanced in the hatchery stock for use as a "genetic tag." Such tags will be used in the brood years of 1979 and 1980. Males homozygous or heterozygous for this allele will be mated with females randomly selected from the population. As a result the frequency of this allele in the hatchery population will be increased. In 1981 and 1982, the incidence of these "tags" among fish taken from the spawning grounds will be ascertained. These "tags" provide a preliminary estimate of the degree to which salmon from the hatchery interbreed with each distinct breeding group. Increased incidence of the tag in the run as a whole in subsequent generations will provide additional information.

Additionally, since a random sample of the released juveniles is routinely fin clipped, it will be possible to examine the fitness of the genetically "tagged" fish relative to the "untagged" hatchery fish. To do this the genotypic frequencies of the returning fin clipped fish (only hatchery fish) will be compared to their frequencies at release.

INTERACTION

The project interacts with Sea Grant's Renewable Marine Resource Research projects on salmon ranching and genetic research on salmon being carried out by the Alaska Department of Fish and Game and the Auke Bay Laboratory of the National Marine Fisheries Service.

EQUIPMENT

None requested.

REFERENCES

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Aspinwall, N. 1974. Genetic analysis of North American populations of pink salmon, *Oncorhynchus gorbuscha*, possible evidence for the neutral mutation - random drift hypothesis. Evolution 28:295-305.

Donnelly, R. F., K. R. Johnson, W. H. Hershberger, and D. E. Bevan. 1977. A biochemical investigation of Kodiak Island pink salmon gene frequencies. Final Report, Contract No. 3475, Alaska Department of Fish and Game.

Gordon, A. H. 1975. Electrophoresis of proteins in polyacrylamide and starch gels. Revised enlarged edition, American Elsevier Publishing Company, Inc., New York.

Grant, S. 1977. Biochemical genetic variation in sockeye salmon: the use of biochemical markers for stock identification in Bristol Bay and Cook Inlet, Alaska. Final Report, Contract No. 3131, Alaska Department of Fish and Game, Division of Commercial Fisheries.

Hunter, R. L., and C. L. Markert. 1957. Histochemical demonstration of enzymes separated by zone electrophoresis in starch gels. Science 125:1294-1295.

May, B. 1975. Electrophoretic variation in the genus *Oncorhynchus*: the methodology, genetic basis, and practical applications to fisheries research and management. M.S. Thesis, University of Washington, Seattle, Washington.

Shaw, C. R., and R. Prasad. 1970. Starch gel electrophoresis of enzymes: a compilation of recipes. Biochem. Genet. 4:297-320.

Taylor, S. USNMFS Auke Bay Laboratory, Auke Bay, Alaska 99821.

Utter, F. M. USNMFS Montlake Laboratory, Seattle Washington 98111.

MILESTONES

Project R/02-05

Current Year

(1) Equip laboratory
(2) Develop laboratory and staining techniques
(3) Assay and compare 1977 and 1978 pink salmon runs
(4) Choose allele to be enhanced in 1979
(5) Assay other local pink salmon stocks and compare with Auke Creek fish.

1978-1979

(1) Assay 1979 pink salmon run
(2) Genetically tag hatchery fish
(3) Compare with 1977 and 1978 runs
(4) Assay and compare other local pink salmon stocks.

1979-1980

(1) Assay 1980 pink salmon run
(2) Genetically tag hatchery fish (different allele from 1979)
(3) Compare with runs of other local stocks and previous years.

1980-1981

(1) Assess interaction of hatchery fish with naturally spawning fish
(2) Assess relative survival of tagged fish
(3) Assess tagging efficiency.

1981-1982

See previous year.

APPENDIX

Procedures to be Used in Genetic Study

Sampling

Spent adult pink salmon will be obtained from each spawning site. Liver, heart, eyes, and white muscle samples will be excised from each individual. Where possible, fresh samples will be used for electrophoresis, otherwise they will be kept on ice until they can be frozen.

Downstream migrants will be sampled with small fyke nets throughout their migration period. The samples will again be used fresh when possible and frozen otherwise. The eye portion of the head will be excised for use as well as the fleshy portion of their tails.

Electrophoresis

Small tissue samples are mascerated in an equal volume of distilled water. A small rectangular piece of filter paper is dipped into the extract and inserted into a slab of gel made from hydrolyzed potato starch. Such a gel can accommodate 40 to 50 such wicks in a row. Direct current is applied to the slab so that the current flow is perpendicular to the row of wicks. After the gels have been run they may be sliced horizontally (much like peeling pages off a tablet) so that several different stains may be made for each gel. Histochemical stains specific for particular enzymes or general protein stains are used to stain these slices. Stains for more than 20 specific enzymes are available.

Sample size for comparison of groups

Sample sizes will be from 100 to 200 fish of each group being compared. This is a realistic sample size to run electrophoretically and will produce a 95 percent confidence interval of $\pm$ .03 to .04 for an allele whose frequency is .10.

Method used for genetic tagging (see Figure 1)

A relatively rare allele will be enhanced in the hatchery population by mating randomly chosen females with males heterozyous or homozygous for the rare allele. A small (approximately 1 g) muscle sample will be taken from live males which will be subsequently tagged with a numbered tag and held until it has been determined whether or not they are suitable for the experiment. At least one-half of the progeny will carry that allele (the tag). The relative frequency of the allele used should be present at .05 to .10 in the parental population. As a result of this enhancement the number of tagged individuals will increase from 2.5 to 5 fold in the offspring.

Introgression of genes from hatchery fish into naturally spawning groups

One can detect in samples of naturally spawning fish (100 to 200 fish) a contribution of 10 percent to 20 percent from the hatchery stock tagged as described above. These samples are obtained from spawnouts on the spawning grounds.

Selective disadvantage of a tag

It is necessary to determine that a particular genetic "tag" does not convey a selective disadvantage to its carrier. Approximately 10 percent of the fish released from the Auke Creek hatchery are fin clipped so they may be distinguished from naturally spawned fish when they return. By comparing the genetic compositions of returning fin clipped fish to the compositions of the released stock it will be possible to measure fitness losses greater than 20 percent to 30 percent. While this seems to be a substantial loss, there is no way to practically measure any smaller losses and even this degree of loss will require samples of 200 to 400 fish.

BASIC ENZYME PATTERNS

common homozygote AA	heterozygote AB	rare homozygote BB

INITIAL POPULATION (95% A, 5%, B)

10%	90%	10% of fish tagged

STEP 1

Screen for males heterozygous or homozygous for rare allele (about 150 will occur in 1500 returns).

Cross these males with females chosen at random:

	X	=	and ;	
males (mostly)	females (mostly)			
PARENTS		54%	46%	PROGENY

This population will stablize in one more generation if no followup selection is done:

8%	40%	52%	50% of fish tagged

STEP 2

A single followup in which both males and females are screened will produce an equilibrium population:

28%	50%	22%	80% of fish tagged

Figure 1. Methods used for genetic tagging.

Program: RENEWABLE MARINE RESOURCES
Project: R/02-08

Title: Inheritance of Egg and Fry Characteristics in Chum Salmon

Principal Investigator: W. W. Smoker
Unit: Division of Fisheries

Funding Information

Present level:	SG: $0 UA: $0	Proposed level:	SG: $4,645 UA: $0
Date Initiated:	1 Nov 78	Est. Comp. Date:	31 Oct 79

BACKGROUND AND NEED

In recent years, Alaska has made a commitment to enhance the productivity of salmon resources by means of artificial propagation. Both state government and private organizations have begun large scale programs to build and operate hatcheries and other fish production facilities.

One major source of biological concern is the effects of transplanting stocks of salmon from place to place. (This is a feature of many potential facilities.) Will the artificial maintenance of large numbers of salmon which are naturally adapted to an exotic environment reduce the fitness of neighboring wild populations by the introgression of "hatchery strays"?

The answer to this question requires a precise study of how transplanted fish home to their new natal place, i.e., the extent of straying from a transplanted stock and an answer to the question of the extent of genetic control over characteristics of the fish which are strongly related to fitness (survival and reproduction). It is the latter which is addressed here.

Breeding experiments are a means of investigation of the extent and manner of genetic control over characteristics of salmon. Brannon (1972) observed rheotaxis in artificially incubated sockeye salmon fry born of parents collected in the outlet stream or inlet stream of a lake. Fry whose parents both were from the outlet exhibited a positive rheotaxis. This would have been required of natural offspring of such parents in order for them to migrate from the spawning beds to nursery grounds in the lake. Similarly fry whose parents both were from an inlet stream exhibited negative rheotaxis. Rheotaxis of hybrid fry was indeterminate. This, then, is good evidence of genetic control over characteristics important to fitness.

Bams (1976) observed the homing behavior of two groups of pink salmon. In one, male parents had been chosen from the population

occurring naturally at a hatchery site; female parents were chosen from an exotic, distant, population. In the other group, both parents were from the exotic population. Both groups were incubated, marked, and released at the hatchery site. Homing of the hybrid group, whose fathers occurred naturally at the hatchery, was much more precise in fresh water than was homing of the group in which both parents had been transplanted. Recovery rates for the two groups in the estuarine fishery were similar.

These experiments indicate the power of breeding experiments to at least qualitatively describe the genetic basis of important characteristics of salmon. While a Ph.D. student (and Sea Grant supported research assistant) in Fisheries at Oregon State University, the Principal Investigator performed two breeding experiments with chum salmon at the Netarts Bay field station. In the fall of 1975, eggs from four female Netarts chum salmon were separated into 80 lots and fertilized by five male chum salmon from each of the following populations: Hoodsport Washington (Puget Sound), the Nemah River (Willipa Bay on the Washington Coast), and local Netarts Bay. Observations were recorded of development rate (time of hatching and swimup) for each lot or sibling group. After marking by freeze branding or fin clipping, the short-term growth rates of fry in these 80 lots were observed in a common rearing environment. Their comparative susceptibilities to a bacterial disease (Vibriosis) were observed after a controlled exposure to the pathogen in the Oregon State University fish disease laboratory.

In fall, 1976, gametes from three males and three females were collected from the Netarts Bay population; a similar collection was made from the Kilchis River population about 50 miles distant. These gametes were combined in every possible combination and incubated in replicate lots in incubators designed particularly to allow precise observation of fry emergence from a gravel substrate. In two experiments some sibling groups of these fry were exposed to natural challenges of the same bacterial disease, Vibriosis, in a sea water rearing situation.

Most of this body of data remains unanalyzed. When it is analysed it will provide insight into the suitability of breeding experiments for estimating the inherent differences between stocks of salmon. It will provide experience upon which the differences between stocks of Alaska salmon can be based. When these differences are more quantitatively understood, the policies governing location of hatcheries and transplanting of stocks can be made with better reasoning.

OBJECTIVE

To determine the effects of intraspecies hydridization on hatchery swimup behavior and susceptibility to bacterial disease stress.

APPROACH

The experiments were designed so that data could be subjected to variance analysis. Programs available in the UCLA Biomedical Computer Programs library are capable of this analysis and will be used. The library is available on the University of Alaska Computer System. Data are now recorded in a format suitable for input to the machine, obtaining analysis results should be straight forward.

INTERACTION

None.

EQUIPMENT REQUESTED

None.

REFERENCES

Bams, R. A. 1976. Survival and Propensity for Homing as affect by presence or absence of locally adapted paternal genes in two transplanted populations of pink salmon (*Oncorhynchus gorbuscha*). J. Fish. Res. Board Can. 33:2716-2725.

Brannon, E. L. 1972. Mechanisms controlling migration of sockeye salmon fry. Int. Pac. Salmon Fish. Comm. Bull. 21. 86 pp.

JANUARY 1979

STATE OF ALASKA

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

FINANCE DIVISION
POUCH WF–STATE CAPITOL
JUNEAU, ALASKA 99811
PHONE: (907) 465-3795

NOTICE OF CHANGED MEETING DATE

AQUACULTURE POLICY STUDY GROUP

PLEASE DISREGARD THE NOTICE DATED 12/27/78 WHICH SCHEDULED THE AQUACULTURE POLICY STUDY GROUP MEETING ON JANUARY 5.

CHAIRMAN TERRY GARDINER HAS SET THE MEETING FOR WEDNESDAY, JANUARY 10, 1979, 9:00 A.M. in ROOM 421, STATE CAPITOL BUILDING, JUNEAU, ALASKA. AT THIS MEETING THE GROUP WILL REVIEW PROPOSALS AND SELECT A CONSULTANT FOR THE FINANCING STUDY.

* * * * * *

31-Q1LH

STATE OF ALASKA

12/28/78

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

FINANCE DIVISION
POUCH WF–STATE CAPITOL
JUNEAU, ALASKA 99811
PHONE: (907) 465-3795

NOTICE OF CHANGED MEETING DATE

AQUACULTURE POLICY STUDY GROUP

PLEASE DISREGARD THE NOTICE DATED 12/27/78 WHICH SCHEDULED THE AQUACULTURE POLICY SGROUP MEETING ON JANUARY 5. CHAIRMAN TERRY GARDINER HAS SET THE MEETING FOR WEDNESDAY, JANUARY 10, 1979, 10:00 A.M. in ROOM 421, STATE CAPITOL BUILDING, JUNEAU, ALASKA. AT THIS MEETING THE COMMITTEE WILL REVIEW PROPOSALS AND SELECT A CONSULTANT FOR THE FINANCING STUDY.

* * * * *

STATE OF ALASKA

12/27/78

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

FINANCE DIVISION
POUCH WF–STATE CAPITOL
JUNEAU, ALASKA 99811
PHONE: (907) 465-3795

NOTICE OF MEETING

THE NEXT MEETING OF THE AQUACULTURE POLICY STUDY GROUP WILL BE HELD FRIDAY, JANUARY 5, 1978, 1:00 P.M. IN ROOM 421, STATE CAPITOL BUILDING (House Finance Committee Room), JUNEAU, ALASKA. AT THIS MEETING THE GROUP WILL REVIEW PROPOSALS FOR DEVELOPMENT OF A DETAILED WORK PLAN FOR THE AQUACULTURE POLICY STUDY GROUP WHICH HAVE PEEN SUBMITTED BY CONSULTANTS.

* * * * * *

AQUACULTURE POLICY STUDY GROUP
January 10, 1979
9:55 a.m.

CALL TO ORDER

Chairman Gardiner called the meeting to order at approximately 9:55 a.m. (attendance list appended to these minutes).

PURPOSE

He advised that the purpose of the meeting was discussion of consultant proposals submitted in response to the Group's request for development of a work plan for Aquaculture within the State.

CONSULTANT PROPOSAL REVIEW POSTPONED

Chairman Gardiner suggested that due to the absence of a number of the Group's membership, action on the pending proposals (from Earl R. Combs, Inc.; Miller & Associates, Inc.; and Barbara Sorensen) be delayed until the Group's next meeting scheduled for February 5 and 6.

NEXT MEETINGS FEBRUARY 5 & 6, 1979

The Chairman advised that copies of the proposals would be mailed to absent members for review prior to the February meetings. He further advised that the agenda for the upcoming meetings would include:

UPCOMING AGENDA

(1) Discussion of Aquaculture Study Proposals

(2) Recommendations for the Alaska Department of Fish and Game Aquaculture Policy Manual

(3) Miscellaneous proposals - information provided by John Williams.

AQUACULTURE IN HAWAII

Jack Milnes furnished the chairman copies of an outline for aquaculture development in Hawaii, asking that the outline be mailed to all members of the Group and that Mr. Grogan procure the documents set forth in outline from the State of Hawaii.

MR. TRACY RARE II LAND DECISION

Mr. Bob Tracy of the U. S. Forest Service in Juneau appeared before the Group commenting upon land status in Prince William Sound and Southeast Alaska as a result of administrative land selections under Rare II, advising that such selections may have implications for aquaculture development.

He displayed maps of the Tongass and Chugach National Forests, stating that within Wilderness classifications exceptions or exclusions would have to be made for aquaculture development.

Mr. Heimbuch asked if a Wilderness designation would be more restrictive than HR 39, and Mr. Tracy replied that he did not believe the proposed action would be more restrictive, adding that the Forest Service is in the process of developing regulations for management of the lands. WILDERNESS vs HR 39

Referring to National Monuments (Admiralty Island and Misty Fjords) Mr. Tracy advised that regulations for management are being developed and it now appears there is leeway for conducting some type of activity as long as such activity meets the requirements of the Antiquities Act. NATIONAL MONUMENTS

The Rare II decision announced by Secretary Bergland places land into three categories: RARE II DESIGNATIONS

(1) Wilderness

(2) Non-Wilderness

(3) Undecided areas requiring further planning before a designation is made.

Wilderness areas will allow no development activities pending determination by Congress as to whether or not these areas will be established Wilderness. WILDERNESS

Non-Wilderness areas permit activities to be undertaken after April 15, 1979, contingent upon approved plans. NON-WILDERNESS

Undecided areas permit no development activities until the necessary planning has been completed and the areas designated either Wilderness or Non-Wilderness. UNDECIDED

Chairman Gardiner questioned Mr. Tracy concerning exemptions included within the 1964 Wilderness Act, advising that he understood such exemptions would likewise need be included within current congressional action establishing the Wilderness. Mr. Tracy advised that the Chairman's understanding was correct.

Mr. Tracy referred to his maps of the Tongass and Chugach areas, advising that under the Rare II decision total acreage has been thus classified:

Tongass TONGASS

5.4 Million Acres - Wilderness

7.3 Million Acres - Non-Wilderness

3.5 Million Acres - Undecided

16.2 Million Acres

Chairman Gardiner stated that from the above figures it is his understanding that approximately 1/3 of the Tongass has been designated Wilderness and the remaining 2/3 is in some form of restricted status, meaning that approximately 1/2 of Southeast Alaska could end up in some form of Wilderness status. Mr. Tracy responded that the Chairman's understanding was correct.

Concerning the Chugach area, Mr. Tracy advised that CHUGACH the administration had already testified before congressional committees recommending Wilderness sites on the Kenai and Polish Fjord. He added that these areas were not included in the Forest Service inventory of land when it was compiled. Additional Wilderness areas proposed under Rare II include Afognak Island and an area on the Kenai near the Moose Range boundry. There are two areas on the Kenai included within the Non-Wilderness designation, while the rest of the acreage on the Kenai is in the undecided/planning category.

Chugach

233 Thousand Acres - Wilderness

237 Thousand Acres - Non-Wilderness

2 Million 800 Thousand Acres - Undecised

69 Thousand Acres - Previously proposed Wilderness

Referring to the above figures set forth by Mr. Tracy, Mr. Heimbuch stated it was his understanding that national legislation could alter the designations set forth under Rare II, and Chairman Gardiner advised that congressional action would supersede anything effected by the administration, but the President could also veto such congressional action.

EFFECT OF CONGRESSIONAL LEGISLATION

Mr. Fisher raised a question concerning whether environmental impact statements would be necessary for hatcheries contemplated within Forest Service management plans. Mr. Tracy replied that it would depend upon the magnitude and significance of the hatchery activity. The Forest Service would prepare an environmental analysis on any project, and on the basis of that analysis would decide whether an environmental impact statement is needed.

ENVIRONMENTAL IMPACT STATEMENTS

Mr. Davis raised a question concerning the Cannery Creek Project on Prince William Sound, and Mr. Tracy advised that the Secretary had excluded that area from the Rare II decision.

CANNERY CREEK PROJECT

Discussion followed on difficulties encountered in mining activities (Borax--road construction) on restricted lands and the overall affect of Native Land Claim Selections.

The meeting adjourned at approximately 10:55 a.m.

ADJOURNMENT

ATTENDANCE
AQUACULTURE POLICY STUDY GROUP
JANUARY 10, 1979

Bob Tracy	Forest Service	Juneau
Bill Sheridan	Forest Service	Juneau
Ivan E. Every	Cook Inlet Aquaculture	Kenai
Floyd E. Heimbuch	Cook Inlet Aquaculture	Soldotna
James E. Fisher	U.S.D.A Rep.	Anchorage
Conner Sorensen (for Barbara Sorensen)	R.R. 4, Box 4903-8	Juneau
Joe Davis	A.D.F. & G.	Juneau
Bob Burkett	A.D.F. & G. FRED Division	Juneau
Jack Milnes	SSRAA	Ketchikan
Ernie Haugen	Legislature	Juneau
Terry Gardiner	Legislature	Juneau
Armin Koernig	PWSAC	Cordova
Bob Grogan	Legislative Finance	Juneau

FEBRUARY 1979

STATE OF ALASKA

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

FINANCE DIVISION
POUCH WF–STATE CAPITOL
JUNEAU, ALASKA 99811
PHONE: (907) 465-3795

NOTICE OF MEETING

AQUACULTURE POLICY STUDY GROUP

THE AQUACULTURE POLICY STUDY GROUP WILL MEET TUESDAY, FEBRUARY 13, 1979, 9:00 A.M. IN THE GOVERNOR'S CONFERENCE ROOM, 3rd FLOOR, CAPITOL BUILDING, JUNEAU, ALASKA. THE FOLLOWING ITEMS WILL BE ON THE AGENDA:

(1) Review of proposals and selection of a consultant for the Financing Study.

(2) Formulation of input for the Department of Fish & Game Aquaculture Policy Manual.

STATE OF ALASKA

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

FINANCE DIVISION
POUCH WF–STATE CAPITOL
JUNEAU, ALASKA 99811
PHONE: (907) 465-3795

NOTICE OF MEETING

AQUACULTURE POLICY STUDY GROUP

THE AQUACULTURE POLICY STUDY GROUP WILL MEET ON FEBRUARY 5th AND 6th IN THE COMMISSIONER OF ADMINISTRATION'S CONFERENCE ROOM ON THE 10th FLOOR OF THE STATE OFFICE BUILDING, JUNEAU, ALASKA. THE MEETINGS WILL START AT 9:00 A.M. ON BOTH DAYS.

THE FOLLOWING ITEMS WILL BE ON THE AGENDA:

(1) Review of proposals and selection of a consultant for the Financing Study.

(2) Formulation of input for the Department of Fish & Game Aquaculture Policy Manual.

ENCLOSED FOR THE REVIEW OF THOSE WHO DID NOT ATTEND THE JANUARY 10 MEETING ARE COPIES OF PROPOSALS RECEIVED.

MINUTES
AQUACULTURE POLICY STUDY GROUP
FEBRUARY 13-14, 1979

TUESDAY - FEBRUARY 13, 1979

Call to Order

Chairman Terry Gardiner called the meeting to order at 9:15 AM in the Governor's Conference Room, Third Floor, Capitol Building.

Roll Call

See attached attendance list.

Agenda

1. Selection of consultant for salmon study.

2. Recommended changes for Department of Fish and Game Aquaculture Policy and Procedures Manual.

Salmon Fisheries Plan

Committee members discussed the various proposals that had been submitted for the salmon fisheries plan. Those included the letter proposal by Barbara Sorensen, Miller & Associates, Inc. and Earl R. Combs, Inc. Ms. Sorensen advised that her letter proposal in no way fell into the same category as the other two proposals. Her plan was more of an expanded one that could not possibly be done in the time constraints involved in this particular study.

Introduction

Jack Milnes introduced Bill Spear, Trustee, Alaska Renewable Resources Corporation. Mr. Spear outlined the purpose for which the corporation was formed and encouraged all participants to get a copy of the Act establishing the corporation which was passed in the last days of the previous legislative session. The address for the Alaska Renewable Resources Committee is P. O. Box 1647, Juneau, Alaska 99802.

Salmon Proposals Continued

Discussion ensued on the proposals of Earl R. Combs, Inc. and Miller and Associates, Inc. It was the consensus of opinion that both firms are qualified to do the study, as well as having qualified staff. However, the Miller report appeared to be more specific and was written in such a manner as to indicate a better understanding of the tasks at hand, with the exception of Task 3.

Acting Chairman

At 9:45 AM Chairman Terry Gardiner appointed Bob Burkett, ADF&G, as Acting Chairman, inasmuch as he had to participate in open session of the legislature.

Salmon Proposals Continued

It was the consensus of opinion of the group that the program needed a strong project leader for liaison between the contract consultant and the group. John Williams recommended that Bob Grogan be selected as that project leader. There was concern among the group that the results of the study must be completed before the end of this legislative session. John Williams indicated that that was not essential and that additional monies could be allocated, if necessary, for the group to get together. Acting Chairman Burkett moved to table the selection of the consultant until after Chairmam Gardiner returned. There being no objection the matter was tabled.

Redraft of Task 3

A committee of the whole went into discussion on better guidelines for the successful contractor as far as Task 3 of the study.

Break

The meeting recessed at 12 Noon, scheduled to reconvene at 1:30 PM.

Salmon Study

Upon reconvening at 1:30 PM the following was selected as the Task 3 guidelines for the Alaskan Salmon Fisheries Study:

1. To inventory both micro and macro economic evaluation systems in use in the state and elsewhere in fisheries, as well as in other resource areas.

2. To identify the economic parameters, both quantifiable and non-quantifiable, and the various methods of analyses that can be applied to these parameters.

3. To select those parameters that would be effective in making an economic evaluation appropriate to the State of Alaska.

4. In light of Tasks 1 and 2 of the request for proposals, furnish a recommendation of the most appropriate parameters and the means to analyze them.

Armin Koernig of PWSAC advised that he felt there was a need for a state coordinator between Fish and Game and Congress concerning the D-2 lands issue lobbying effort. He felt that without such a coordinator various groups might be representing conflicting stands on various issues.

Chairman Gardiner resumed the Chair at 2:15 PM.

Motion

Chairman Gardiner moved and asked for unanimous consent for the selection of Miller and Associates, Inc. to prepare the analysis of the Alaskan Salmon Fishery, Tasks 1, 2, and 4 as submitted in their January 2, 1979 response to the group request proposal and following the amended Task 3 as drafted heretofore by the study group. There being no objection, the motion carried. Chairman Gardiner agreed with the necessity for appointing a coordinator between the Legislature, the group, and the contractor. He therefore agreed to appoint one or more persons employed in the Legislative Finance Division to perform these duties. The group urged that the contract be drawn by March 1, 1979 and that they meet with the consultant at about that time.

Aquaculture Policy and Procedures Manual

Various members of the group advised that they had already submitted in writing their recommendations for changes to the Fish and Game Aquaculture Policy and Procedures Manual.

New Agenda Item

Jack Milnes recommended as an agenda item the matter of the $40,000 remaining from the original $90,000 appropriation received and whether it could be used in some positive way.

Aquaculture Policy and Procedures Manual Continued

Again Chairman Gardiner indicated his hope that the committee as a whole could come up with recommendations to the Fish and Game rather than each separate organization submitting criticism with the possibility of no positive recommendations following. The committee as a whole then commenced reviewing the Policy and Procedures Manual item by item starting with the Definitions and Terms sections.

At 3:30 PM Chairman Gardiner again excused himself turning the Chair back over to Acting Chairman Burkett.

It was suggested that a group workshop might be the more appropriate forum for recommendations to the Policy and Procedures Manual.

Break

The meeting adjourned at 4:10 PM with various members of the study group to meet in a work session immediately following.

WEDNESDAY, FEBRUARY 14, 1979

Call to Order

The meeting was called to order at 9:10 AM by Chairman Terry Gardiner, who appointed Bob Burkett as Acting Chairman, due to the fact that he has to attend legislative committee meetings.

Aquaculture Policy and Procedures Manual

Discussion again ensued on recommendations for the Policy and Procedures Manual. Various hatchery representatives indicated the problems that presently existed in the fishery including facilities with no brood stocks; the need for help managing mixed stocks; the lack of an inventory; and problems of site selection. It was the feeling of the hatchery representatives that the Department of Fish and Game should take the biggest risks. It was their opinion that that Department had the least to lose and thus should give the hatchery every benefit of the doubt.

Break

A 15 minute recess was called at 10:35 AM, reconvening at 11 AM. Ivan Every spoke to the need for corrective legislation concerning the initiative process. It was his opinion that the initiative process should only be allowed to occur once instead of looming over the industry as a constant threat.

Jack Milnes spoke concerning his position with the Renewable Resources Corporation.

Policy and Procedures Manual Continued

It was the concensus of opinion of the group that Goal Statement No. 1 was adequate and that Policy Goal Statement No. 2 should be deleted. Inasmuch as time was running short, Armin Koernig agreed to have his own secretarial staff type up the agreed upon recommended changes to the Policy and Procedures Manual and submit them to Legislative Finance, where they would then be distributed with the Minutes to the members of the Committee.

Break

The meeting adjourned at 12 Noon.

Terry Gardiner	Legislature
Curt Kerns	Sea Grant
Ivan E. Every	C.I.A.
Patrick M. Connell	Legislature
Bill Marsh	NSRAA
Bob Burkett	ADF&G, FRED Division
Sig Olson	USFS
Joe Davis	ADF&G
Margaret Branson	Legislature
Judy Jones	Reporter
Armin F. Koernig	PWSAC
John Williams	LAA
Barbara Sorensen	Revenue
J. N. Milnes	SSRAA
Wm. Spear	Alaska Renewable Resources Corp.
John Sund	Speaker of House Office
Romayne Kareen	Internal Audit
William Sheridan	Formerly USFS now ADF&G
Bob Grogan	Legislative Finance

July 1979
Meeting

MARCH 1979

STATE OF ALASKA

THE LEGISLATURE

BUDGET AND AUDIT COMMITTEE

FINANCE DIVISION
POUCH WF–STATE CAPITOL
JUNEAU, ALASKA 99811
PHONE: (907) 465-3795

NOTICE OF MEETING

AQUACULTURE POLICY STUDY GROUP

THE AQUACULTURE POLICY STUDY GROUP WILL MEET ON SATURDAY, MARCH 3, 1979, 9:00 A.M. IN ROOM 423, CAPITOL BUILDING, JUNEAU, ALASKA. THE PURPOSE OF THE MEETING IS TO REVIEW A PROPOSED CONTRACT WITH MILLER ASSOCIATES.

* * * * * *

31-Q1LH

Alaska State Legislature Ph: 465-3795
3796

JUNEAU ALASKA

NOTICE OF MEETING

THE AQUACULTURE POLICY STUDY GROUP WILL MEET ON MAY 7, 1979, 9:00 A.M. IN ROOM 423 OF THE STATE CAPITOL BUILDING, JUNEAU.

THE FOLLOWING IS A PROPOSED AGENDA.

PROPOSED AGENDA

INSTITUTIONAL AND POLICY ANALYSIS: The contractors will present an investigation of policy and organizations having an effect on the salmon fishery. They will present an assessment of the areas and the extent to which identified policy and organizational problems have a detrimental effect on achieving any desired goals.

ECONOMIC EVALUATION: The contractors will present a discussion of macro and micro economic evaluation methods and perameters; particular emphasis will be placed on those parameters that have an effect in making economic evaluations of the salmon fishery.

SEARCH FOR GOALS: The contractors will present information regarding goals for fisheries, goals for the salmon industry which have been previously established, criteria for goal selection and will encourage comments from the committee regarding possible new goals.

FINANCIAL PLANNING: The contractors will discuss the existing elements of the financial system in the context of the economic analysis as well as those changes which will be necessary to achieve possible future goals.

MINUTES
AQUACULTURE POLICY STUDY GROUP
MARCH 3, 1979

SATURDAY - MARCH 3, 1979

Call to Order

Chairman Terry Gardiner called the meeting to order at 9:15 AM in Room 423 of the State Capitol Building.

Roll Call

See attached attendance list.

Agenda

Meeting with Miller and Associates, successful contractor for the salmon fisheries plan.

Introduction

Wally Miller of Miller and Associates introduced himself as well as Bill Wilkerson of Eisenhower, Carlson, et al. and Dan Malick of Leonard Lane and Associates.

Discussion on Contracts

Mr. Miller advised that his firm was open for questions and discussion on the contract. He wanted as much input from the group as possible as to how they wanted the study conducted. Bill Marsh of NSRAA suggested monthly meetings between the policy study group and the consultants or their representatives throughout the program. Mr. Wilkerson advised that although they would be willing to do so, that he didn't feel that it was absolutely necessary due to the fact that Leonard Lane and Associates had a Juneau office and would be close at hand to answer questions and to accept input. The pros and cons of soliciting federal funds for the program were discussed. The result was that funding from all areas should be looked at in order to enhance the success of the program.

Various tentative guidelines provided by the group included, among other things:

1. Maintaining the Alaska way of life on which no monetary amount can be set.

2. The State of Alaska's fiscal situation and its impact on the program.

3. The possibility of private financing taking over publicly supported projects.

4. Looking into the State's present investments to determine if this might not be a good investment under the permanent fund.

5. The fact that the Alaska Constitution as well as existing statutes would need to be reviewed in order to perform tasks 1 and 2. The questions is "is our Legislative package adequate"? Mr. Miller advised that he had already reviewed our Alaska Constitution and was struck by the strength in its language. Wherein most constitutions were vague using terms such as "may", Alaska's Constitution for the main says, "shall".

6. Miller advised that an important ingredient to the success of the program was the need for long-term financial authority as well as long-term management authority.

7. The need to minimize the competition between the fisheries, i.e. competition between salmon and bottom fish.

8. An evaluation of the permitting process.

The consultants were advised that the Fish and Game engineering staff coordinates the permitting process and can possibly be of assistance to them. Mr. Milnes advised that Jeanne Sandy had a graph on the permitting procedure and could provide them with this information.

9. The suggestion was made that the consultants secure ideas from sportsmen's associations.

Wally Miller advised that he would be obtaining a list of all members of the group as well as their telephone numbers and would be contacting them for input. He further advised that this was not merely a "paper study" and they would be talking with people from all sectors in order to get input.

Federal Fisheries Program

Mr. Wilkerson advised that it was a 99% possibility that the Forest Service would be moved to the Department of Natural Resources. Some members expressed their regret due to the excellent cooperation between the Forest Service and the State Department of Fish and Game.

Chairman Gardiner advised that he had been to Washington, D.C. and met with members of the National Resources Committee to discuss the D-2 issue. He advised he learned that there would definitely be federal oversight due to subsistence. He was surprised to learn that Alaska's Congressional delegation had already conceded this.

It was suggested that the consultants call upon Bob Grogan frequently inasmuch as he would be able to provide them with lots of information as well as the location thereof.

Mr. Miller advised that he would be needing a copy of the Little Study on "bottom fish".

Break

The meeting adjourned at 12 Noon.

AQUACULTURE POLICY STUDY GROUP

Bob Burkett	ADF&G, F.R.E.D.
Terry Gardiner	Alaska Legislature
Bob Grogan	Legislative Finance Division
Floyd E. Heimbuch	Cook Inlet A.A.
Joe Davis	ADF&G, F.R.E.D.
Curt Kerns	Sea Grant
Armin E. Koernig	PWSAC
J. N. Milnes	SSRAA
Bill Marsh	NSRAA
Bill Sheridan	Formerly USFS now ADF&G
Barbara Sorensen	Department of Revenue

GUESTS IN ATTENDANCE

Margaret Branson	Legislature
Wally Miller	Miller & Associates
Bill Wilkerson	Eisenhower, Carlson, et al
Dan Malick	Leonard Lane & Associates
Ron Wenty	

MAY 1979

MINUTES
AQUACULTURE POLICY STUDY GROUP
MAY 7, 1979

MONDAY - MAY 7, 1979

Call to Order

Chairman Terry Gardiner called the meeting to order at 9:25 a.m. in Room 423 of the State Capitol Building.

Roll Call

See attached attendance list.

Agenda

A combined presentation by Wally Miller of Miller and Associates, Inc., Bill Wilkerson of Miller and Associates, Inc. and Dan Malick of Leonard Lane and Associates of the beginning investigative work done by the contractors for the salmon fisheries plan.

Presentation of Study

Mr. Malick made the first presentation on Institutional & Policy Analysis. He referred to a chart which was an analysis of federal, state and local governments and other entities having an effect on the fisheries. He wanted comments from the group on observations they might make about the organizational complexities of trying to get a fisheries program in operation.

Mr. Wilkerson followed up with a presentation of his investigation of key federal institutions involved in the concept of salmon resource development in regards to funding and regulatory activities. He discussed the relationship between established federal fisheries programs and the State of Alaska as to the problems already faced by the state in regards to federal control and jurisdiction of Alaska land and waters. He advised, in conclusion, that at this time, as far as the federally-funded EDA is concerned, there has been no real contribution at the federal level in terms of constructing hatcheries or development of the salmon resource.

Summary

Mr. Miller commented, in summary, that Alaska has a choice of simply reacting to what the federal government does or to decide on a program and pursue that and believes that their presentation has suggested the latter as a means of accomplishing the goal of a salmon resource development program.

Mr. Malick then summarized his presentation on the Alaska Salmon Resource Development Program. Referring to the chart, he advised

that looking at each of the individual institutions a lot of variations between the specificity and clarity of their programs and goals can be seen, and a clear picture cannot be gotten of what the Alaska Salmon Resource Development Program is doing as a single entity. He concluded that maybe one of the things that will come out of here is the group can see that program as a single entity directed towards a goal and then having the institutions themselves direct the way in which the program can achieve its goal. The question is the direction the group can head towards.

Break

Meeting recessed at 11:45 a.m., scheduled to reconvene at 1:15 p.m.

Economic Evaluation

Upon reconvening at 1:30 p.m., Mr. Miller made his presentation on economic evaluations of salmon enhancement projects which encompassed the macro and micro economic evaluation techniques as applied to salmon fishing. In conjunction with this study, he presented an analysis of survival rates by species (Pink, Sockeye, Chum, Coho and Chinook) for artificial and natural salmon propagation methods. He advised that the data used are not reflective of Alaska returns, because there is a critical lack of information on expected returns in Alaska. However, he advised that the two prepared analyses can be used as models for comparing and computing survival rates for analyzing alternative propagation methods for the Alaska Salmon Resource Development Program.

Barbara Sorensen, of the Department of Revenue, advised that data is available but not readily available. Before compilation of all the pertinent data can be accomplished, a budget appropriation must be made for a data system. She further advised that the new commissioner has been made aware of the problem, but no decisions have been made regarding an appropriation.

Discussion

Members of the group discussed the first two presentations. Their input included:

1. The various economic benefits of the development of the salmon resource to the state.

2. The benefit in regard to each area's particular needs.

3. The cost benefit to fishermen.

4. A major factor: will the price of salmon continue to increase?

5. The value of presenting the project as one economic package - not just as a benefit to fishermen or the state.

6. Financial responsibility: who pays?

Financing and Search for Goals

Mr. Miller resumed the presentation with a discussion of the basic problems related to financing and information regarding goals for fisheries, goals previously established for the salmon industry and the establishment of criteria for selecting goals for this particular project.

Other Matters

Ron Wendte advised the group that he had just been made aware of a meeting scheduled this week by Pete Jeans to push a high-level discussion in the administration to end the private aquaculture program. The meeting will be attended by Specking and representatives from Fish & Game and Commerce to decide whether the program should continue to exist.

There ensued discussion among the members of the group and Mr. Miller regarding the ramifications of the possibility of the ending of the program.

Close of Presentation

Mr. Miller advised that he will contact individual members for information before continuing compilation of data for the study.

Final Discussion

Last-minute suggestions were offered by Terry Gardiner and Derek Poon for the group to consider.

Terry Gardiner suggested using the George Inlet facility and the Klawock facility for some experimental input of data to use with the suggested models of salmon propagation methods and survival rates just to get an idea of how these models would work for the Alaska data.

Derek Poon suggested, due to rising costs, investigating the possibility of investing in a faciliity and waiting to supply it with brood stock.

Break

The meeting adjourned at 5:10 p.m.

AQUACULTURE POLICY STUDY GROUP

Bob Burkett	ADF&G, F.R.E.D.
Joe Davis	ADF&G, F.R.E.D.
Terry Gardiner	Legislature
Floyd Heimbuch	Cook Inlet A.A.
Armin Koernig	PWSAC
Bill Marsh	NSRAA
Tom Meyer	NSRAA
Paul McCollum	A.V.C.P. - Fisheries Develop. Corp.
Pat Petuchov	NSRAA
Derek Poon	NSRAA
Bill Sheridan	Forest Service
Barbara Sorensen	Department of Revenue
Don Walker	NSRAA
Ron Wendte	SSRAA

GUESTS IN ATTENDANCE

Margaret Branson	Legislature
Carl Gonder	Leonard Lane & Associates
Dan Malick	Leonard Lane & Associates
Wally Miller	Miller & Associates, Inc.
Bill Wilkerson	Miller & Associates, Inc.

Alaska State Legislature

Ph: 465-3795
3796

JUNEAU ALASKA

NOTICE OF MEETING

THE AQUACULTURE POLICY STUDY GROUP WILL MEET ON MAY 7, 1979, 9:00 A.M. IN ROOM 423 OF THE STATE CAPITOL BUILDING, JUNEAU.

THE FOLLOWING IS A PROPOSED AGENDA.

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5

ACQUACULTURE POLICY

STUDY GROUP

MEETING

MAY 7, 1979

ommercial Fisheries Program:

- Established by AS 16.05.090 but powers and duties not statutorily specified

TYPE:

- Division within the State Department of Fish & Game

SIZE:

- 160 PFT requested for FY 80
- 3 PPT requested for FY 80
- 140 Temp requested for FY 80

STRUCTURE:

- Division organized into five components
- 25% of resources in research component
- 45% of resources in management component
- 10% of resources in administration component
- 14% of resources in federal aid programs component
- 7% of resources in special projects (primarily federal aid)

GEOGRAPHICAL LOCATION:

- Statewide responsibilities
- Staff located statewide

FUNDS:

- $1,374,000 federal receipts requested for FY 80
- $443,000 General Fund requested for FY 80 (exclusively matching funds)
- $9,137,000 General Fund requested for FY 80
- $25,000 program receipts requested for FY 80

PRIMARY CONSTITUENTS:

- Commercial fishermen and seafood processors
- General public as consumers of commercial salmon products
- General public as sport users of adequately protected and maintained natural resource
- Subsistence fishermen as users of adequately protected and maintained natural resource

GOALS:

- o Protection of fisheries resources through prevention of loss due to inappropriate harvest methods and regulation of other fisheries to prevent unacceptable incidental harvests
- o Maintenance of fisheries resources through maintenance of brood stock levels of resources currently capable of producing optimum yield
- o Rehabilitation of fisheries resources by selectively protecting depressed stocks from harvest to increase the level of brood stock availability to levels capable of producing optimum yield
- o Development of new fisheries through research and regulation efforts

OBJECTIVES:

- o Maintain statewide commercial natural stock salom harvests at an average annual level equal to or above 49 million
- o Rehabilitate depressed stocks to increase average annual commercial harvest to 69 million of natural stock by 1990
- o Maintain statewide subsistence harvest of 600,000 to 1,000,000 salmon annually
- o Maintain Cook Inlet commercial harvest of salmon at 4 million annually and rehabilitate fishery gradually to 4.7 million annual natural stock harvest
- o Maintain Southeast commercial harvest of salmon at 15 million annually and rehabilitate fishery gradually to 25 million annual harvest
- o Maintain Arctic-Yukon-Kuskokwim harvest of salmon at 2 million annually and rehabilitate fishery gradually to 4 million annual harvest
- o Maintain Bristol Bay harvest of salmon at 9.8 million annually and rehabilitate fishery gradually to 14 million

PROGRAMS:

- o Primary strategy, in concert with the Board of Fisheries, is stock regulation by allocation of resources to users(total allocation is surplus beyond brood stock needed to maintain optimum resource yield)
- o Stock regulation accomplished through regulation of season openings and closures, harvest methods, and types and amount of fishing gear
- o Research and federal aid programs generate new knowledge on various aspects of fish species life history and provide the necessary knowledge and methodology for scientific management of fish resources
- o Assess total population abundance, distribution, migration routes, and timing of major salmon stocks
- o Apply biometrics and computer technology to data analysis to improve effectiveness of management and research programs

PROBLEMS:

- o Not enough funds for adequate research on life cycle of species and habitat
- o Not a lead agency---reactive once problems develop

M E M O R A N D U M

TO: WALLY MILLER

FROM: WILLIAM R. WILKERSON

DATE: May 2, 1979

RE: OUTLINE OF PRESENTATION ON FEDERAL INSTITUTIONS

I. INTRODUCTORY REMARKS

A. Summary of findings.

B. Summary of conclusions.

II. DIRECT FISHERIES PROGRAMS

A. General authority.

1. U.S. Department of Commerce Organic Act.
2. Fish and Wildlife Act of 1956 (reorganization plan No. 4, 84 Stat. 2090, October 3, 1970).
3. Agricultural Marketing Act of 1946.
4. Saltonstall-Kennedy Act of 1954.

B. Fisheries management and enforcement.

1. Fish and Wildlife Act of 1956.
2. General authority of National Oceanographic and Atmospheric Administration (NOAA).
3. Fishery Conservation and Management Act of 1976 (FCMA).
4. Black Bass Act.

C. Fish production.

1. Fishery research and experimentation program.
2. Food and Agriculture Act of 1977.
3. Loans for production of fish (Consolidated Farm and Rural Development Act).

D. Research and cooperation in resource development.

1. Cooperative agreements with nonprofit organizations, etc. (15 U.S.C. §1525).
2. Harvest Development Research (16 U.S.C. §§744 & 745).
3. Sea Grant Programs (33 U.S.C. §§1121 et seq.).
4. Commercial Fisheries Research and Development Act of 1964 (16 U.S.C §779).
5. The Food and Agriculture Act of 1977 (7 U.S.C. §3171).
6. The Defense Production Act of 1950.
7. The Anadromous Fish Conservation Act (16 U.S.C. §757).

E. Financial and technical assistance.

1. Section 607 of the Merchant Marine Act of 1936, as amended (46 U.S.C. §1177).
2. Title XI of the Merchant Marine Act of 1936, as amended (46 U.S.C. §§1271-80).
3. Fish and Wildlife Act of 1956 (16 U.S.C. §742c).

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.

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 consistancy 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.

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

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) [illegible] earliest stage of development.

H. Federal CZM program [illegible] federal and state agencies [illegible] 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 adversary.

M. Relationship between ADF&G and Regional Aquaculture Association largely adversary.

N. State legislature [illegible] to fund new [illegible] programs at this time (possible exception is bottomfish).

O. PNP assessment program [illegible] up in litigation.

P. Management problems derived from hatchery versus natural stocks, problem of mixed stocks not

adequately addressed - raises political problems.

Q. Impact of D_2 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 acquaculture 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) $\frac{\text{Total Estimated Revenues}}{\text{To The Estimated Costs}}$ = Cost Benefit Percent or Ratio

   (b) $\frac{\text{Present Value of Estimated Revenues}}{\text{Present Value of Estimated Costs}}$ = 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 Acquaculture 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 facilites 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

:TORS	NATURAL	NATURAL REHABILITATION	HATCHERY	S. CHANNEL	INCUBATION BOX
N PLAN:					
;gs Prop.	25 million	Same	Same	Same	Same
.eturn %	.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
ALYSIS:					
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

FACTORS	NATURAL	NATURAL REHABILITATION	HATCHERY	S. CHANNEL	INCUBATION BOX
RUN PLAN:					
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	θ	θ	6,188	θ	θ
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
COSTS:					
Capital Invest (2)	θ	$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
ANALYSIS:					
Net Income	$137,550	$80,220	$1,285,200	$552,596	$409,000
Return on Invest.	-	80%	51%	111%	136%
RUN BREAK DOWN:					
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

FACTORS	NATURAL	NATURAL REHABILITATION	S. CHANNEL	INCUBATION BOX
RUN PLAN:				
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	θ	θ	θ	θ
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
COSTS:				
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
ANALYSIS:				
Net Income	$146,090	$121,720	$502,286	$302,890
Return on Invest.	-	122%	100%	101%
Run Breakdown:				
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 rehabitated.

(b) Hatchery - Generally based upon Southern Southeast Acquaculture 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

	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									6	82	36	45
	Ave. 2000	200	1700	1200	1500	-	1615	-	-				
SOCKEYE	2800-4200									5.6	-	17	21
	Ave. 3500	700	-	2100	2625	70	-	210	263				
CHUM	2100-3500									4.5	51	18	23
	Ave. 3000	450	2700	1800	2250	-	2565	-	-				
COHO	2500-3500									10	128	-	-
	Ave. 3000	600	2850	-	-	120	2565	-	-				
CHINOOK	3000-5500									8	36	24	30
	Ave. 4000	800	3800	2400	3000	400	3600	1200	1500				

(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%

ATTACHMENT #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 Weyerhauser 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	Kupreanof Island
Red Creek	Prince Willian Sound
Hobo Creek	Prince William Sound
Logging Camp Creek	Prince William Sound
Solf Lake	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:

Stream	Location	Cost
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) 943-3885

July 9, 1979

To: Members Acquaculture Policy Study Group

From: Wallace Miller WM

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 sutdy 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 employement 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 is 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 esamining 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 responese 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 acquaculture 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 sruvival rates for eggs artificially propagated (as opposed to those occuring 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

Attachment I

F.R.E.D. DIVISION

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
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 x .95 x .95 x .95 x .80 x .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 x .95 x .95 x .10 x .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

FACTORS	NATURAL	NATURAL REHABILITATION	HATCHERY
RUN PLAN:			
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	θ	θ	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
COSTS:			
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
ANALYSIS:			
Net Income	$380,835	$356,475	$5,621,400
Return on Invest.	-	256%	225%
RUN BREAKDOWN:			
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 mades 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 devisive 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.

SB232

2. Again, pending the outcome of the litigation it may be desirable to re-direct the proceeds from ~~H.B. 306~~ going to local government to the regional associations so as to ensure projects are properly priortized 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 restructured. 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 acquaculture 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 madeavailable 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 be 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 data, 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 ADRDPmust 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 roll 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 acquaculture 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 diegested 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 idenfify 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 indiciated above, needs of Alaska's regions differ and ADF & G and regional association activities shouldreflect 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 idnetifying 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 occured 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 subsistance 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, federalofficials 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 vaccum and ignore off-shore opportunities. It makes for greater sense to develelopin 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 propogation 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 direclty 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.

7/9/79 minutes

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 concensus 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 recomend 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	ADF&G, F.R.E.D. Division
James E. Fisher	USDA - Representative
Terry Gardiner, Chairman	Legislature
Floyd E. Heimbuch	Cook Inlet A.A.
Joe Davis	ADF&G, F.R.E.D. Division
Curt Kerns	Sea Grant
Bill Marsh	NSRAA
Derek Poon	NSRAA
Jev Shelton	NSRAA
Bill Sheridan	U. S. Forest Service
Barbara Sorensen	Department of Revenue
John Sund	Legislative Employee
Margaret Branson	Legislature
Ron Wendte	SSRAA
Jack McBride	IMARPIK

GUESTS IN ATTENDANCE

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Wally Miller	Miller & Associates
Paul A. McCollum	AVCP Fisheries Corp.
Dan Malick	Leonard Lane & Associates

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REPORT.

"AN ANALYSIS OF THE ALASKAN SALMON FISHERY"

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AN ANALYSIS OF THE ALASKAN SALMON FISHERY

PREPARED FOR:

THE AQUACULTURE POLICY STUDY GROUP
OF THE
ALASKA STATE LEGISLATURE

BY THE FIRMS OF:

MILLER AND ASSOCIATES, INC.,

LEONARD LANE AND ASSOCIATES AND,

MR. WILLIAM R. WILKERSON, ATTORNEY, LAW FIRM OF
EISENHOWER, CARLSON, NEWLANDS,
REHA, HENRIOT & QUINN

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Legislative Affairs Agency
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Juneau, Alaska 99811

August 30, 1979.

2/8/80

CONTRACT REPORT

The 1978 session of the Alaska State Legislature established the Aquaculture Policy Study Group as an advisory body to examine a number of policy matters relating to the Alaska Salmon Resource Development Program. Membership in the Study Group includes representatives from the several regional non-profit aquaculture associations, the Alaska Departments of Fish and Game, Commerce and Economic Development and Revenue, the U.S. Forest Service and Department of Agriculture, the University of Alaska Sea Grant program and members of the Alaska legislature.

In March, 1979 the Aquaculture Policy Study Group retained the consulting services of a consortium of three firms. Miller and Associates, Inc., Olympia, Washington; Leonard Lane and Associates, Anchorage, Alaska; and Mr. William Wilkerson, Attorney, law firm of Eisenhower, Carlson, Newlands, Reha, Henriot & Quinn, Tacoma, Washington.

The consulting services to be provided by the team of consultants was defined to include four basic tasks each of which are briefly described as follows:

TASK #1 - Search for Goals

The consulting team was required to research and examine Alaska state constitutional provisions, statutes and

other documentation to determine the extent to which goals for an Alaskan Salmon Resource Development Program had been established. The consulting team was further instructed to examine existing goals and present possible alternative goals to the Study Group for their consideration.

TASK #2 - Institutional and Policy Analysis

The consulting team was required to examine the roles and missions of existing institutions involved in the Salmon Resource Development Program, define existing problems, and recommend alternative institutional arrangements which would be more suitable for obtaining the goals set forth in Task #1.

TASK #3 - Economic Evaluation Techniques

The consulting team was requested to inventory micro and macro economic evaluation techniques, economic factors and methods of analysis and recommend an effective means for making economic evaluations of evaluating Salmon Resource Development Projects.

TASK #4 - Financial Planning

The consulting team was requested to examine the present means of financing salmon development programs, define problems and recommend a model financial planning framework.

The consulting team prepared analytical information for presentation to the Study Group in meetings held in March, May and July.

A fourth meeting was held in late July. At the meeting, discussions and plans were focused upon initiating alternative financing strategies as a result of the State Superior Court ruling in Wayne Alex, etal., v. Southern Southeast Aquaculture Association, etal. As a result of the redirection received during the July meeting, project research priorities were altered. Increased emphasis was to be placed upon developing alternative financing mechanisms to the unconstitutional mandatory assessment.

The consulting team held up preparation of the final report to the Study Group pending the receipt of clarifications to the court decision and to discuss with the Office of the State Attorney General possible alternative organizational as well as financial strategies which might be available to the regional aquaculture associations in light of the court ruling.

This final report incorporates the effect of this late development and attempts in greater detail than originally planned to provide the Study Group with alternatives and recommendations which expressly recognize the severe impact on regional aquaculture programs from the ruling for their further review and analysis. We emphasize that considerable further work and analysis of financial and institutional

alternatives will be required prior to the 1980 session as a result of present legal uncertainties.

The consulting team wishes to express its deep appreciation to members of the Aquaculture Policy Study Group, Mr. John Sund and legislative staff for their interest and valuable assistance in conducting the studies which are contained in this report.

Sincerely,

WALLACE G. MILLER
President

MILLER & ASSOCIATES, INC.

PREFACE

It may be helpful to the reader to understand why the sequence of subject matter is arranged in this report as it is.

Rather than begin this report with a discussion on goals and proceeding on with a discussion of organizational arrangements, economics and financing, it seemed more appropriate to the consulting team to address these subjects in their natural order of occurrence.

In terms of their natural order, the foremost concern about salmon aquaculture is whether it is or can become economically feasible. If aquaculture programs are not or cannot become economically attractive, then there would seem to be little point in carrying the analysis through the remaining subjects, therefore the economic issue is contained in Chapter I.

If salmon aquaculture is or can become economically attractive, it seems the next most appropriate question to raise is who pays for the program and how can this be accomplished, particularly in light of the recent State Superior Court ruling. Financing issues are discussed in Chapter II.

Assuming that salmon aquaculture is economically sound and a method of financing can be developed and implemented, the question of how to organize to carry out salmon aquaculture seemed appropriate for Chapter III.

If the economic, financing and organizational hurdles can be cleared, only then does it seem appropriate to talk about both existing and potentially new goals as well as other measures which could be adopted to ensure the long term success of the State salmon resources development program, which is covered in Chapter IV.

Finally, in the interest of readibility, we have prepared this report in such a manner so as to eliminate almost all mathematical equations and formulas.

INTRODUCTION

The objectives of this introductory section is to provide a brief recapitulation of the events and circumstances which led to the formation of the Aquaculture Policy Study Group and explain why, at this late date, it is necessary to raise some very fundamental questions about the Alaska Salmon Resource Development Program.

Much has been written elsewhere, and in greater detail about the size of historic salmon runs in Alaska. In recent years, the 1950's to the mid-1970's, and for a variety of reasons, Alaskan salmon runs declined precipitously. This decline in the fishery with its resulting loss of income, employment, subsistence and recreation was a common concern among commercial, sports and subsistence fishermen. The fishing industry (including salmon, shellfish and bottom-fish) was and is the largest private sector employer in Alaska. In addition, fishing had become so ingrained into so much of Alaskan culture and lifestyle that alternative choices were both distasteful and unrealistic for the many small communities and villages in Southeast and other parts of Alaska.

While the propagation of salmonoid species was initiated in western coastal states and British Columbia in the late 1800's, no similar long-term resource development steps were taken in Alaska. In 1971, the Alaska legislature

created the Division of Fisheries Rehabilitation, Enhancement and Development (F.R.E.D.) (Chapter 113 SLA 1971) of the Alaska Department of Fish and Game. The legislature, among other duties, charged F.R.E.D. with the responsibility to "develop and continually maintain a comprehensive, coordinated long-range plan for the orderly present and long-range rehabilitation ... of all aspects of the state's fishery ..." In addition, the legislation authorized the new division to "encourage the investment by private enterprise in the technological development and economic utilization of the fisheries resources."

The creation of F.R.E.D. was the first expressed statutory authorization for the state to enter into programs to rehabilitate, enhance and develop its salmon fishery, notwithstanding that the framers of the Constitution in 1959 (Article VIII, Section 5) authorized the legislature to "provide for facilities, improvements and services ... to assure further utilization and development of the fisheries."

In 1972, the Alaska legislature proposed and the citizens passed a constitutional amendment which provided the state with a constitutional basis for limiting entry into the fishery (resouce conservation) and carrying out aquaculture programs in the state. Clearly, restoring the salmon fishery to higher historic harvest levels was and is a high priority in the state.

Through these and other constitutional and statutory provisions two potentially powerful tools had been created which could be used to restore the fishery: (1) limited entry, combined with improved biological data, management, enforcement and stock regulation; and, (2) the rehabilitation, enhancement and development authority of the F.R.E.D. Division. Both were viewed as complementary means for restoring the salmon fishery.

These tools were soon employed in the restoration of the fishery. Stringent restrictions were placed on harvesting to allow natural brood stocks to increase and build run strength. The F.R.E.D. division began the long, arduous process of acquiring technical expertise, enhancement sites and capital funds to design, develop and place into operational status the facilities, rehabilitation projects and similar activities associated with restoring or creating new salmon runs.

Hindsight suggests that regardless of the methods employed, restoration of salmon runs requires a great deal of time, even under the best of circumstances. Two to four years, depending upon the salmon species involved, is the smallest increment of time which can elapse before improvements can be noticeable. Given variations in climatic conditions, the difficulty in regulating escapement needs, and problems attendant to finding suitable sites for construction of propagation facilities and constructing the facilities

under extremely difficult conditions, delays were inevitable and encountered in the anticipated salmon recovery time table.

In 1974 the State legislature enacted what is commonly known as the "Private Non-Profit Hatcheries Act" (Chapter III, SLA 1974), which authorized the private ownership of salmon hatcheries by qualified non-profit corporations for the purpose of contributing by artificial means to the rehabilitation of the state's depleted and depressed salmon fishery. (Emphasis added by underlining.)

It is difficult at this point to accurately gauge all of the factors which motivated the enactment of this legislation. In part the act reflected a declaration of a choice between private for-profit aquaculture and private non-profit aquaculture. Beyond this, a strong motivating factor was the desire to see if less bureaucratic and costly means of restoring the salmon fisheries' stocks could produce the desired result.

While subsequent legislation during the 1976 and 1978 sessions provided a major financing basis for F.R.E.D. division capital facilities, and for further refinements to the Private Non-Profit Hatcheries Act, the stage was being set in 1974 for the addition of private non-profit hatcheries as yet a third potentially powerful tool to the two already established and at work in restoring the salmon fishery.

Results from the improvement management of natural stocks became noticeable in 1976 and by 1978 and 1979 statewide harvest levels reached approximately 80 million salmon. F.R.E.D. artificial production facilities in 1978 provided several hundred thousand additional returning salmon. With the exception of the Prince William Sound Regional Association, the new regional non-profit aquaculture corporations were in the beginning stages of production development and did not contribute significantly to the almost record level returns of 1978 and 1979.

The recent near record level salmon harvests, when coupled with the planned increased production capability of the F.R.E.D. division and the limitations imposed by the court decision on the Private Non-Profit Aquaculture Associations, could combine to produce some curious effects on future development of the fishery. A question exists whether, given the current near record levels of harvest, affected fishermen will be willing to re-impose a mandatory assessment or royalty on their harvest income now that the years of deprivation appear to be behind them? On the other hand, are fishermen willing to absorb the cost of resource expansion if regulation of natural stocks is the only tool to be utilized to achieve this goal for Alaska's renewable salmon resource?

One of the present policies of Alaskan state government is for production facilities to become economically

self-sufficient over a reasonable period of time. Thus, a major issue to be addressed by policymakers over the next few years is the level of fisheries development program costs to be borne by primary benefactors or users. For example, if the F.R.E.D. division continues with its planned expansion of operational facilities, who is to pay for the operating cost of the facilities, all of the taxpayers of the state or those who primarily benefit from the development of the resouce?

Another major issue to be resolved is whether a satisfactory working arrangement can be established among the now competing salmon restoration tools: natural production, state artificial production and regional non-profit corporation production?

Finally, is it possible to effect a timely solution to the financial dilemma of the non-profit regional associations which will pass muster by the court, thus avoiding the need for state subsidies or state collected mandatory assessments which will allow these organizations to continue to contribute to the restoration of the fishery?

Clearly there are a number of additional major and unresolved issues affecting the state's Salmon Resource Development Program. While the original scope of the work planned for this report was somewhat limited, we have attempted to broaden its scope to reflect the possible effects current harvest levels and other issues could have in the considera-

tion and selection of alternative courses of action by the Aquaculture Policy Study Group. Moreover, at the direction of the study group, we have addressed organization of fisheries development activities in the context of a holistic program, identifying the reasons why and means for addressing multi-species development which we believe is in the best interest of the citizens of Alaska.

Chapter I - SALMON AQUACULTURE ECONOMIC EVALUATION TECHNIQUES

Micro Economic Evaluation Techniques

The need to have one or more objective means for evaluating in a micro economic sense, the value of a salmon aquaculture project has two primary sources. First, regional non-profit aquaculture associations need a uniformly applicable methodology for assessing whether or not a planned aquaculture project will provide a satisfactory return on the capital investment and expenses of operating the facility.

Regional associations have borrowed millions of dollars, and will borrow more, for capital facility investments and operating expenses. These monies must be repaid. In addition, start-up expenses must be incurred for a minimum of two to four years, depending upon the species, prior to any returning adults being available for fishermen to harvest. Moreover, if required, a terminal area harvest could be implemented with the income from the terminal area harvest used to help defray facility operating costs and to provide a source of funds for repaying the borrowed capital and related interest charges.

A second objective means for evaluating the value of an aquaculture project is required by government agencies. This measure is somewhat different than the valuation measurement needs of regional associations or the private sector.

Whereas the primary concern of regional associations must by necessity be limited to narrow regional financial and economic criteria, government agencies are often charged with performing socially beneficial acts which are seldom, if ever, accorded a value in the traditional financial market places.

In these private markets, a financial/economic evaluation system for salmon propagation facilities would be concerned only with the income produced from the harvest and sale of adults returning to the facility by association members or as necessary to pay the costs associated with the facility.

Because of the more encompassing responsibilities of government agencies, the value of government sponsored salmon propagation facilities must be extended beyond the boundaries established by the traditional financial/economic evaluation system. For example, salmon harvested by sports and subsistence fishermen, which must be considered "losses" in a traditional financial/economic model, should be valued by government agencies whose responsibilities extend beyond pecuniary returns.

Another example is the "value added" to the salmon through processing. This does not directly enure income to fishermen of regional associations; consequently, this societal benefit is not a factor affecting the economic and financial decisions of fishermen or regional associations. The "value added" of processing, however, can and should be

considered by government agencies in valuing the benefits to be derived from a government sponsored propagation facility.

At a more theoretical level at least, the value of the employment provided by the propagation facility as well as indirect employment (the additional clerk at the grocery store who serves fishermen or the attendant who fuels their boats) could also be considered as benefits to values added by aquaculture projects.

The "value added" micro economic model has some practical limitations. If one attempts to be too precise in using the cost benefit analysis micro economic system for valuing government sponsored propagation projects, it obviously becomes difficult and costly to obtain the necessary financial and economic information needed for evaluating each project under consideration. Similar technical measurement problems also plague the traditional financial/economic evaluation system, in its application to salmon propagation facilities. The discounting of future revenues and expense streams, the proper selection of the discount rate, and similar technical considerations, while professionally satisfying, provide for a level of refinement which may be excessive when compared with the value of obtaining information relating to other formula elements such improving as the state of the art in predicting the number of returning adult salmon. In other words, the choice of the parameters or factors and the degree of refinement to be used in both the traditional

financial/economic evaluation model and the government oriented socio-economic evaluation model, should be generally tempered by the cost and availability of financial and economic information as well as the existing capability to estimate the number of adult returns to a propagation facility.

After carefully weighing all of the factors, parameters and methodologies which could be utilized in valuing the benefits to be derived from a salmon resouce development project, and after giving equal consideration to the availability and cost of acquiring data and taking into account the many unknowns which limit the state of the art in predicting run size, the contracting team recommends the following models, factors and parameters be used to meet the evaluation needs of regional associations and government agencies.

I. Financial/Economic Evaluation Model for Regional Aquaculture Associations.

Because of the private sector orientation of aquaculture development in Alaska and the need to attract increased amounts of investment capital to provide for the orderly growth and development of this means of developing Alaska's salmon resources, the most appropriate micro economic model for evaluating salmon propagation project is the use of a return on investment model.

The use of a return on investment model by the

regional aquaculture associations meets several critically important needs. First, each aquaculture project developed by the non-profit corporations must pay its own way, or in the alternative be financially supported from excess revenues available from other aquaculture projects of the corporation. It is amply clear from recent events that a major concern of lending institutions (including state and federal agencies) is whether or not specific aquaculture projects are sound investments. Moreover, the state legislature needs such information to monitor on a continuing basis the worth of this program. Given the current absence of any mutually acceptable return on investment model, lending institutions and others have no objective basis for considering the relative merits of requested loans and now must use more subjective and arbitrary criteria in approving or disapproving a loan request.

Additionally, fishermen belonging to a regional aquaculture association are critically concerned about the overall soundness of an investment in an aquaculture project and need to know whether or not borrowed funds can be repaid by the project without requiring higher levels of assessment against the fishermen. Fishermen are also concerned about the net benefit to them from the investment in an aquaculture project. They need to know, or have a believable estimate of the number of salmon which can be harvested by them as a result of their investment in an aquaculture project.

Professional managers of the regional associations also need to have an established and accepted means for evaluating alternative investment opportunities, securing the necessary financing for selected opportunities and being reasonably assured that the returns from the investment will be adequate to pay for the cost of the project.

In summary, the use of a return on investment (ROI) model is the most appropriate means for satisfying the financial assessment needs of lending institutions, the legislature and fishermen and to evaluate the financial risks and rewards to managers and members of regional aquaculture associations.

II. Considerations in the Development of a Return on Investment Model for Salmon Aquaculture Projects.

The standard formula for computing return on investment can be stated as follows:

$$\text{Return on Investment} = \text{'s } \frac{\text{Total Revenues Less Costs}}{\text{Total Investment}}$$

While the ROI formula can be stated in quite simple terms, substantial work can be involved in identifying total revenues, total costs, and the total investment.

Total revenues, for example, are a product of the number of returning adult salmon which can be harvested multiplied by the going ex-vessel price paid to fishermen for a particular species in each of the various geographic areas of Alaska.

The single most difficult part of the revenue equation involves the accurate estimate of the number of adult salmon which will return from a particular given brood year. Rates of return, which can be expressed in terms of the percentage of adult survivors to the number of eggs deposited, vary significantly from brood year to brood year for the same species, vary significantly among species and vary greatly among the various means for artificially and naturally propagating salmon. To further compound the problem of accurately estimating returns, run strengths or survival rates for the same species can vary significantly between broad geographic regions as well as between adjoining watersheds.

Notwithstanding, the severe difficulty in accurately estimating salmon survival rates, the F.R.E.D. Division of the Alaska Department of Fish and Game has developed some standard assumptions on salmon survival rates. These rates are shown in Table I, in a somewhat different format than set forth in the ADF&G directive.

Table 1

AN ANALYSIS OF ARTIFICIAL & NATURAL SALMON PROPAGATION METHODS

	FECUNDITY	STAGE I Survival-Egg Take to Emerge Stage by Propagation Method(2)			STAGE II Survival Fry to Migrant Stage by Propagation Method (3)				STAGE III Marine Survival by Propagation Method (4)			
		Natural	Hatchery	Incu. Box	Natural	Hatchery	Lk. Fert.	Incu. Box	Natural	Hatchery	Lk. Fert.	Incu. Box
PINK	Ave. 1600	160	1360	720	-	1224	-	-	5	23	-	7
SOCKEYE	Ave. 3000	300	2550	1350	60	170	-	98	5	11	-	14
CHUM	Ave. 2200	220	1870	990	-	1683	-	-	6	11	-	14
COHO	Ave. 2800	280	2380	-	56	1666	-	-	4	100	-	-
CHINOOK	Ave. 6500	650	5525	2925	130	3868	-	293	4	77	-	1

(1) Survival rates for artificial production based on F.R.E.D. Division Directive.
Natural production estimated by contractor.
All percentages rounded to nearest whole percent, where possible.

(2) Survival - Egg Take to Emerge Stage
Percentile Estimates (10% estimate is shown in the Table)

	Natural	Hatchery	Incu. Box
PINK	7-10%	85%	45%
SOCKEYE	7-10%	85%	45%
CHUM	7-10%	85%	45%
COHO	7-10%	85%	-
CHINOOK	7-10%	85%	45%

(3) Survival Fry to Migrant Stage
Percentile Estimates

	Natural	Hatchery	Lk. Fert.	Incu. Box
PINK	-	90%*	-	-
SOCKEYE	2-3%	75%**	-	7%
CHUM	-	90%*	-	-
COHO	2-3%	70%	-	-
CHINOOK	2-3%	75%	-	10%

*To fingerling size
**Lake reared as resident fry
***Because of their high value chinook would be hatchery reared rather than placed in an incubation box.

(4) Marine Survival Estimates

	Natural	Hatchery	Lk. Fert.	Incu. Box
PINK	4%	23%	-	1%
SOCKEYE	6%	6%	-	1%
CHUM	4%	2%	-	1%
COHO	8%	6%	-	-
CHINOOK	1%	2%	-	1%

Table I suggests that there are at least three distinct stages in the life cycle of a salmon where artificial means can be employed to change the rate of survival of adult returning salmon. In addition, within each stage there are a variety of alternative propagation choices which can enhance survival, each of which have different cost characteristics and yield different rates of return on their associated investment.

As indicated in Table I (Stage I), the basic economic attractiveness of artificially propagating salmon results from the fact that under natural spawning conditions only 7 to 10 percent of the green eggs deposited by spawning salmon produce emergent fry. Under the more controlled conditions of a hatchery, survival rates from the green egg stage to the emergent fry stage of 85% are estimated to be achievable. This 8 to 10 times greater Stage I survival rate provides a major economic justification for artificially propagating salmon. This reasoning is based upon the assumption that the more salmon which are initially produced, the greater the number that will survive to be available for harvest. This should lead to increased fishermen's incomes and provide sufficient economic benefits (e.g. terminal harvests) to pay for the cost of constructing and operating the propagation facility.

There are other alternatives in Stage I to simply choosing between natural production and hatcheries. For

example, incubation boxes, which involve a mere fraction of the cost of hatcheries, under certain circumstances can be considered as an attractive financial and biological alternative to either natural or hatchery propagation methods. Stream rehabilitation (not shown in Table I), a method for improving natural runs, is another example of the type of biological and economic choice which could be made to increase the size of a salmon run or improve survival rates. (Note: In Chapter III we discuss a variety of research activities to be undertaken to improve survival rates at each state.)

The important point to recognize is that survival rates vary with the type of propagation method, which in turn vary significantly in terms of cost. By combining survival rates and the costs associated with the methods for achieving those survival rates in a return on investment model, a means is available for objectively analyzing and determining which sets of biological and economic considerations will produce the better return for the required investment.

Stage II deals with a second set of economic choices and survival rates from those contained in Stage I. During Stage II for example, emergent fry can be reared to a larger size in a hatchery, which improves their survival rate, but again, certain costs are incurred which have to be carefully weighed against the estimated increase in the number of returning salmon. It is important to recognize

that Stage II economic choices and survival rates may be largely independent of the choices made during Stage I. For example, during Stage I, it may be economically desirable to release unfed pink and chum fry without incurring further costs associated with Stage II types of activities. Alternatively, it may be economically desirable in Stage I, to incur no propagation costs on sockeye salmon by depending upon natural spawning but during Stage II use the newly developing lake fertilization technique as a means of increasing Stage II survival rates.

Another highly interesting Stage II method for improving survival rates is the predation control program established by the Alaska Department of Fish and Game in the Wood River Lake System. Arctic chum are impounded in a holding pen to reduce their predation on outmigrating smolt. According to estimates, up to one million smolts are saved each season by the control project.

Again, the point is made that both Stage I and Stage II propagation methods involve a series of often independent economic choices and differing survival results. The current inability (or limited ability) to clearly distinguish the costs and benefits (increased survival) associated with each stage substantially limits the useability of such data for economic analysis purposes.

Table I, Stage III depicts a very limited series of possible marine survival rates. These rates are largely

predicated upon the current methology in which Stage I and Stage II propagation methods are assumed to be interdependent, which as we discussed earlier, is not always the case. For example, no assumptions or estimates are included which indicate the potential increase in the marine survival of Stage I natural spawning sockeye resulting from lake fertilization during Stage II.

Stage III, Marine Survival also offers an opportunity, quite independently of Stages I and II, to increase the number of returning adults. Methods for reducing predation by beluga whales (or sea lions) in the marine environment, and techniques for reducing shaker (coho, chinook) mortality are but two means which could be used to increase the number of returning adult salmon. The implementation of either or any of these techniques during Stage III, like Stages I and II, depends both upon the expected increase in survival rates as well as the costs to be incurred.

Five critically important observations about salmon survival rates which are apparent from the information contained in Table I need to be made at this point prior to further defining the elements to be included in a return on investment model for salmon aquaculture projects. These are:

(1) There are an increasing variety of opportunities within each of these three stages in the life cycle of salmon to employ artificial methods which will increase salmon survival rates.

(2) The mission of regional aquaculture associations, the F.R.E.D. division and the Salmon Resource Development Program (ASRDP) as a whole, should not be limited to Stage I types of choices (i.e., natural production v. hatcheries v. incubation boxes) but should instead encompass the entire range of biological and economic choices available to them in order to allow the maximum return on investments to be realized.

(3) Too little emphasis has been placed on doing research on improving survival rates and there is a lack of data which corresponds to the alternative economic choices within and across the various life cycle stages. This severely limits the current capability to develop reliable financial estimates of the potential economic benefits to be derived from almost any given salmon propagation endeavor.

(4) Let us assume for a moment, at least, that the F.R.E.D. division were adequately funded to perform the necessary data gathering and research and development of alternative means for increasing salmon survival rates. Let us further assume that such data and means were used in a wide variety of ways by regional associations to increase Stage I, Stage II and Stage III survival rates (in independent as well as an interdependent fashion). As a result of the possible interactions and combinations of propagation techniques, in many instances there may not be a separately identifiable, artifically propagated run which could be

subjected to a terminal area harvest as a means of recovering the capital and operating costs associated with achieving the increased survival rate. A simple example of this dilemma occurs when a regional association incurs costs to rehabilitate a stream bed to improve natural spawning conditions. Because no artificial run was created no terminal area harvest can be employed to recover the investment. Regional associations now regard such projects as non-revenue producing and absorb the attendant costs of the project within available funds. If future aquaculture developments make Stage I - II hatchery type operations economically less attractive then other choices, and at the same time the regional associations are placed in a position of developing and operating new hatcheries simply because they are dependent upon terminal area harvests for a major source of operating revenue it would be indeed unfortunate. Given the growing technological developments in salmon enhancement, it is important that the selected financing mechanisms not lock regional associations into less attractive propagation methods because of harvest considerations.

(5) The bulk of information critical to a return on investment model is biological. Lending institutions must have the capability to evaluate this critical information, or alternatively the lending authority must be placed with those who have the biological expertise to evaluate such proposals (See Chapter III).

III. Elements of a Return on Investment Model for Salmon Aquaculture Projects.

Notwithstanding the present limitations on the availability of reliable information upon which to estimate the number of returning adult salmon, the following propagation factors must be reflected in a return on investment model for salmon aquaculture projects.

A. Salmon Propagation Factors.

1. The Number of Eggs to be Propagated.

If green eggs are used for the initial planning basis it will in turn (together with an estimate of the average number of eggs available per female spawner) provide a basis for estimating the number of salmon required for egg taking purposes as well as the estimated number of adult returns.

2. Stage I Estimated Survival Rates by Species - (Green Egg to Emerge Stage).

(a) Natural production;

(b) Natural production rehabilitation (i.e., stream bed rehabilitation);

(c) Hatchery production;

(d) Incubation box;

(e) Other.

3. Stage II Estimated Survival Rates by Species (Emergent Fry to Migrant Stage).

(a) Natural production;

(b) Natural production rehabilitiation;

(c) Hatchery production

(1) Fed fry;

(2) Fingerling;

(3) Smolt.

(d) Hatchery production (out-station plants)

(1) Fed fry;

(2) Fingerling;

(3) Smolt.

(e) Incubation box;

(f) Lake fertilization (In combination with 2(a), (b), (c) or (d), above);

(g) Other.

4. Stage III Estimated Survival Rates - by Species (Marine Survival).

(a) Natural survival (no human intervention directed at increasing the survival rate of the particular run);

(b) Enhanced survival (human intervention i.e., predator controls applied).

5. Estimated Total Returns - by Species.

Estimate of the number of adult salmon which will return to the area of harvest as a result of propagation methods and any enhanced survival techniques employed.

6. Number of Spawning Stock Required for Run Maintenance - by Species.

Estimate of the number of male and female spawners required to maintain the initial run.

7. Number of Spawning Stocks Required - by Species.

Estimate of the number of additional male and female spawners required to increase initial run size. The decision to increase a run size should reflect the lost opportunity costs (to fishermen) represented by the value of the additional spawners required to build the level of the run).

8. Hatchery or Other Surplus - by Species.

There are often surplus male salmon which are not needed for spawning purposes, therefore an estimate of the amount of the return which cannot be harvested nor is required for spawning purposes needs to be made if the surplus can be sold. (Any value of spawned out carcasses should also be included).

9. Estimated Total Number of Harvestable Salmon - by Species.

The estimated total number of harvestable salmon is the estimated total return less spawning stock required and any surpluses.

B. Salmon Revenue Factors.

Salmon revenue estimates for the return on investment model should be based upon the estimated total number of harvestable salmon and estimates of the ex-vessel prices being paid for the salmon. Salmon revenue should also include any revenues received from the sale of spawned-out carcasses and spawning surpluses.

Considerable variations occur in Alaskan salmon ex-vessel prices by region. The quality of the fish harvested as well as the supply of salmon which is available also affect ex-vessel prices.

In addition to the regional price variations, total project revenues can be based upon a constant dollar basis or on a current dollar basis. A constant dollar basis for estimating revenues would, for example, be 1979 ex-vessel prices extended for the expected life of the project. The current dollar basis would be based upon estimates of future ex-vessel prices during the life of the project. There are advantages and disadvantages to both.

The use of a constant dollar basis works well for short-term projects where the returns tend to be immediate. It works less well when long term (20-30 years) pay-outs on investments are required and inflation is increasing operating costs at a rate which may or may not be commensurate with increases in the market price for salmon.

The use of the current dollar basis attempts to adjust for the effect of inflation on operating costs and to reflect future market prices for salmon based upon inflationary trends as well as the effects of supply and demand at various production levels. While the main advantage of the current dollar basis is that it is an attempt to take future prices and costs into consideration in evaluating the return on investment potential of a particular aquaculture project. A

primary disadvantage of the current dollar basis is the lack of reliable forecasts of future costs and prices for the salmon industry. A further disadvantage is that the relative merits of a project (in relation to an alternative investment choice) can become so obscured by price and cost change assumptions, which may or may not be reliable, that short-term choices tend to be selected over longer-term projects simply because of the uncertainty over future costs and prices.

Despite the advantages and disadvantages of both the constant dollar basis and current dollar basis for estimating costs and revenues, each can be effectively used in a return on investment model.

The following general guidelines may be helpful in selecting whether to use a constant dollar basis or a current dollar basis for use in a return on investment analysis.

1. During times of high rates of cost inflation and high levels of salmon production and where market prices are not increasing at a rate commensurate with inflation, the use of a current dollar basis in the return on investment model will help ensure that spiraling operating costs together with stable production and market prices do not create a future situation whereby all of the salmon production from a propagation project is required to pay operating costs, with no harvest allowance provided to fishermen.

2. If a choice is being made from among like projects (i.e., approximately the same level of capital investment, return timing, operating costs, depreciable facility life and etc.) the use of a constant dollar basis would be suitable for inclusion in the return on investment model.

3. Short-term capital projects which require little or no continuing operating expense can be comparatively evaluated using the constant dollar basis.

4. When in doubt about which basis is more appropriate and the amount of the investment at risk is significant, use both the constant dollar basis and the current dollar basis and make any decisions on the set of data which indicates the least favorable return on investment.

The salmon revenue factors to be taken into consideration are as follows:

1. Estimated Total Number of Harvestable Salmon (as derived earlier).

2. The Value or Price Per Pound of the Salmon.

The regional ex-vessel price expressed in terms of constant dollars or current dollars over the useful life of the project.

3. The Estimated Weight Per Fish.

4. The Total Value of the Estimated Numbers of Harvestable Salmon.

Item 1, multiplied by item 2 multiplied by item 3.

5. The Value of Surplus and Spawners.

The estimated revenues resulting from the sale of spawned out carcasses and hatchery or other surpluses.

6. The Total Estimated Value of the Run.

Add item 4 and item 5.

C. Cost Factors.

There are a variety of categories of costs incurred by regional associations, not all of which are fully allocable nor attributable to a propagation project or facility. These cost categories, their allocability, and other characteristics are discussed as follows:

1. Regional Association Administration.

Regional Association Administration includes all expenses related to the selection of and expenses incurred by the directors of the regional association. Other allocable expenses (see 2 below) related to operating and maintaining the regional association belong in this category. Under the financing plan presented in Chapter II, none of the costs of Regional Association Administration would be charged to a propagation facility or project.

2. Administrative and Supportive Services.

Included in this cost category are the salaries and wages of the executive director, clerical and secretarial personnel and such expenses as newsletters, assessment bookkeeping activities, accounting, purchasing and payroll services, general planning (consulting) services, office

rent, office utilities and equipment. These costs are fully allocable to Regional Association Administration as well as to Technical Services, Full Production Hatchery Operations and other cost categories. The division in Administrative and Supportive Service Costs between Regional Association Administration and other cost categories should be based upon the proportion of payroll and other expenses attributable to the support of each activity.

3. Technical Services.

This cost category includes the salaries and wages of regional biologists and other technical personnel who perform regional planning activities, conduct stream surveys, conduct tagging and other research activities, plan and conduct egg takes and similar technical activities not involved with the day to day operation of hatcheries or other production enhancement activities. A portion of the Administrative and Supporting Service overhead costs should be allocated to this category in porportion to the services received or expenses incurred. The rental of aircraft, marine vessels and other similar expenses associated with egg takes, stream surveys and other related activities should be direct charges to the Technical Services category of expenses.

4. Full Production Hatchery Operations.

This category includes the direct salaries and wages of hatchery supervisory and operating personnel, fish

food utilities and other expenses attendant to operating a hatchery or other propagation facility once that full returns are being realized. Also included in this cost category are costs attendant to performing a terminal area harvest.

5. Hatchery & Enhancement Projects Start-Up Costs.

This cost category includes all hatchery or enhancement project costs similar to those listed for 4 above or 6 below which are incurred or must be paid during the period of time between initial start-up and when full returns are being realized. Recurring expenses related to a rehabilitation project, lake fertilization project or similar production improvement activity, occurring prior to the full returns being realized should be recorded as a direct start-up charge to each such project.

6. Capital Investment Program.

This cost category includes all capital investments for hatcheries and other propagation facilities as well as such one-time enhancement projects as stream rehabilitation. Costs included for each facility include land, buildings, utilities installation, architect's fees interest and similar costs relating to the projects. One-time salaries and wages and other direct costs attributable to a stream rehabilitation or similar enhancement project should be recorded as a direct charge to each project.

7. Total Cost.

Includes all costs for cost categories 1-6.

8. Total Propagation Facility (Project) Cost.

Includes allocated administrative and supporting services overhead charges to categories 4 and 5 as well as direct charges to categories 4 and 5 plus the appropriate capital and interest charges from category 6.

D. Economic Analysis Factors.

Based upon the revenue resulting from a salmon propagation project and the project costs as previously defined, it is possible to identify the estimated net revenue (gross revenue less allocable costs), either on an annual basis or for the estimated total useful life of the facility. Net revenue divided by the total investment in the propagation facility (cost category 6) will provide an estimate of the percent return on investment resulting from the project.

E. Propagation Facility Run Breakdown Analysis Factors.

The final element of a Return on Investment Model for salmon aquaculture projects is an analysis of who harvests the runs from the facility. There are three main elements contained in the run breakdown analyses. These include: That part of the run required for spawning stocks; that part of the run harvested by fishermen; and, that part of the run harvested in the terminal area which is used to pay a portion of the facility operating costs.

In summary, the elements which need to be considered in a return on investment model for salmon aquaculture

projects are: Salmon Propagation Factors; Salmon Revenue Factors; Cost Factors; Economic Analysis Factors and Propagation Facility Run Breakdown Analysis Factors. Table II provides an example of how the return on investment model can be applied in evaluating a potential aquaculture propagation project.

TABLE II

Example Return on Investment Analysis

(25 Million Egg Facility).

Analysis of Annual Costs - 25 Year Facility Life

	Reference Section	Constant Dollars (1)	Current Dollars (2)
SALMON PROPAGATION FACTORS	(A)		
Eggs Propagated	(A-1)	25 Million	25 Million
Estimated Total Returns	(A-5)		
Number Spawning Stock	(A-6)		
Hatchery or other surplus	(A-8)		
Estimated No. Harvestable Salmon	(A-9)		
SALMON REVENUE FACTORS	(B)		
Regional Expressed price per pound	(B-2)		
Estimated Average Weight per fish	(B-3)		
Value of Harvestable Salmon	(B-4)		
Value of Surplus and spawners	(B-5)		
Total Estimated Value of run	(B-6)		

TABLE II
(Continued)

	Reference Section	Constant Dollars (1)	Current Dollars (2)
COST FACTORS	(C)		
Full production of operations	(C-4)		
Hatchery start-up costs	(C-5)		
Capital Investment (3)	(C-6)		
Total propagation Facility Cost	(C-8)		
ECONOMIC ANALYSIS FACTORS	(D)		
Gross Income	(B-6)		
Total Cost	(C-8)		
Net Income			
Return on Investment			
RUN BREAKDOWN ANALYSIS FACTORS	(E)		
Spawners			
Fishermen			
Annual Costs			

IV. Elements of a Cost Benefit Analysis Model for Salmon Aquaculture Projects.

Earlier in this Chapter in the general discussion about micro-economic evaluation techniques, it was pointed out that cost benefit models, like return on investment models can be designed to include some very complex refinements.

In a cost benefit analysis model, for example, such refinements as adding certain operating costs incurred by fishermen to the cost side of the equation as well as adding allowances for direct and indirect secondary employment effects beyond the fish processing activity to the benefit side of the equation, while technically correct, involve estimates which are so speculative that their inclusion would severely strain the credibility of the cost benefit analysis.

While cost benefit analysis models can be made overly complex, at the other end of the spectrum the current practices of using ex-vessel prices paid to fishermen and excluding interest costs on capital investments results in an equally inaccurate statement of costs and benefits.

It is also important to recognize that while some of the factors included in a return on investment model can be used in a cost benefit model, other return on investment factors do not apply. While both models can be used to measure the "value" of an aquaculture project, the term "value" has different meanings in each model.

Again, the value of an aquaculture project to a regional non-profit aquaculture corporation must be expressed in terms of ex-vessel prices paid to association fishermen for the salmon provided as a result of the project and harvested by association members if the corporation is to remain financially solvent. Prior interceptions by non-association fishermen and terminal area harvests to pay hatchery operating costs must be regarded as "losses" because they reduce the amount of revenue accruing to the fishermen.

A cost benefit analysis model, unlike the return on investment model, does not have a narrowly defined regional income criterion. Hence, the term value in a cost benefit analysis model is more encompassing. The value of a government sponsored aquaculture project should include for example, consideration of prior interceptions by other domestic commercial and sports fishermen. (The term domestic for a federal agency would include all American fishermen. Alaska state departments may wish to define domestic to include only Alaska's resident fishermen.)

The use of ex-vessel prices, while appropriate in a return on investment model for regional non-profit corporations, is not appropriate in a cost benefit analysis model. If the objective of a cost benefit analysis is to measure the domestic value of a salmon aquaculture project, the "value" must not only include money paid to fishermen but also the value added to the domestic economy as a result of

producing the run and processing the harvest. In other words, the salaries and wages paid to hatchery operating personnel, cannery workers and employees of firms who process fresh and frozen salmon are part of the value to the domestic economy from the aquaculture project which must be recognized in the cost benefit analysis model.

It might appear strange to include the salaries and wages of hatchery operating personnel in both the cost and benefit sides of an equation. Clearly such costs belong in computing the "cost" of an aquaculture project. It is equally clear that the employment of hatchery personnel is as valuable an addition to the domestic economy as the employment of fishermen or others, regardless of the fact that the form of compensation differs.

As can be demonstrated in the following simple example, it is not only important to include the salaries and wages of hatchery personnel as both a cost and a benefit, but further that these costs/benefits do not cancel out and therefore cannot be excluded from both sides of the equation.

Cost Benefit Analysis Example

Costs:	
Hatchery operators salaries and wages:	$20,000
Other costs:	10,000
Total costs:	$30,000

Benefits:

Hatchery operators salaries and wages:	$20,000
Other benefits:	80,000
Total benefits:	$100,000

Cost Benefit Ratio: 3.33:1

If the $20,000 in hatchery operators salaries and wages is excluded from the perceived benefits to the domestic economy from the aquaculture project, and the benefits were valued at $80,000, the cost benefit ratio would be 2.67:1. Alternatively, if the hatchery operators salaries and wages were excluded from both sides of the equation leaving a cost of $10,000 and a benefit of $80,000, the resulting ratio would be 8:1 rather than the correct amount of 3.33:1.

A most difficult issue in defining value in a cost benefit analysis has to do with predation. Some would argue that the salmon from an aquaculture project harvested by bears, eagles and other predators should be valued as a means of recognizing the social goal of preserving wildlife which is often a stated goal of some government agencies. While there is a certain amount of attractiveness to such a proposal, it presents several problems which are difficult to resolve.

First, the amount of predation is so uncertain and speculative that its explicit recognition would severely strain the credibility of the cost benefit analysis. Second, the value recommended for measurement in the cost benefit

analysis model is the contribution made to the domestic economy by the aquaculture project. This definition would generally exclude consideration of imputing a value to predation except under unusual circumstances. It is conceivable that predators might be attracted to an artificially propagated run, thus providing a greater harvest opportunity on an adjacent natural run. To the extent that such a circumstance might occur, and further to the extent that the harvesters of the natural run benefit from the substitution, an argument could be developed for adding the number of additional natural salmon harvested to the predator reduced artificial run. Again, such technical refinements, though intellectually attractive, are so difficult to accurately quantify that the credibility and cost of the analysis would be highly questionable.

To conclude, perhaps the most difficult choice is establishing a readily available "price" per pound for salmon to be used in the cost benefit analysis model. As was discussed earlier, the ex-vessel price only partially recognizes the contribution to the domestic economy from a salmon run. A substantially greater "price" per pound can be quoted for sport caught salmon while salmon used for domestic consumption are often not accorded a "price".

After weighing all of the possible "price" choices, the most representative price which should be used in the cost benefit model is the first level wholesale price for

canned or frozen salmon, by species, by region in Alaska. Such an index is not now currently available for Alaskan salmon. However, such an economic valuation index could be regularly published by the Alaskan Department of Fish and Game (or the National Marine Fisheries Service) for use in economic planning by ADF&G and other state and federal agencies. By having a state agency prepare such an economic valuation index, the confidentiality of individual financial records can be maintained. Failure to develop such an index will force the state to assume value added for fish processed at ratios consistent with other industries. The most common estimate of this ratio is 2:1 over ex-vessel prices.

In summary, the factors contained in a cost benefit analysis model are somewhat different from those contained in the return on investment model. The reason for these differences largely results from the varying objectives each serve. The objective of the return on investment model is to provide a means for private non-profit corporations to make economic choices based upon their need to be economically self-sufficient. The cost benefit analysis model on the other hand is directed at measuring the total domestic economic benefits to be derived from an aquaculture project.

A. Salmon Propagation Factors.

1. The Number of Eggs to be Propagated.

If green eggs are used for the initial planning basis, it will in turn (together with an estimate of the

average number of eggs available per female spawner) provide a basis for estimating the number of salmon required for egg taking purposes.

2. Stage I Estimated Survival Rates by Species - (Green Egg to Emerge Stage).

(a) Natural production;

(b) Natural production rehabilitation (i.e., stream bed rehabilitation);

(c) Hatchery production;

(d) Incubation box;

(e) Other.

3. Stage II Estimated Survival Rates - by Species (Emergent Fry to Migrant Stage).

(a) Natural production;

(b) Natural production rehabilitation;

(c) Hatchery production

(1) Fed fry;

(2) Fingerling;

(3) Smolt.

(d) Hatchery production (out-station plants)

(1) Fed fry;

(2) Fingerling;

(3) Smolt.

(e) Incubation box;

(f) Lake fertilization (In combination with 2(a), (b), (c) or (d) above);

(g) Other.

4. Stage III Estimated Survival Rates - by Species (Marine Survival).

(a) Natural survival (no human intervention directed at increasing the survival rate of the particular run);

(b) Enhanced survival (human intervention i.e., predator controls applied).

5. Estimated Total Returns - by Species.

Estimate of the number of adult salmon which will return to the area of harvest as a result of propagation methods and any enhanced survival techniques employed.

6. Estimated Prior Interceptions by Domestic Fishermen by Species.

Include estimates of prior interceptions by domestic sports and commercial and domestic consumption fishermen.

7. Estimated Total Run Adult Run Strength - by Species.

Add together items 5 and 6.

8. Number of Spawning Stock Required for Run Maintenance - by Species.

Estimate the number of male and female spawners required to maintain the initial run size.

9. Net Total Adult Run Strength - by Species.

Item 7 less item 8.

10. Hatchery or Other Surplus - by Species.

Often there are surplus male salmon not needed for spawning purposes, therefore, an estimate of the amount of the return which cannot be harvested nor is required for

spawning purposes needs to be made if the surplus can be sold or used in domestic consumption. (Any value of spawned out salmon carcasses can also be included.)

B. Salmon Revenue Factors.

The salmon revenue price considerations for use in the cost benefit analysis model are similar to those for the return on investment model except that wholesale rather than ex-vessel prices are used.

The discussion on the use of the current dollar basis and constant dollar basis for evaluating projects using the return on investment model apply equally as well to the cost benefit analysis model.

The salmon revenue factors to be taken into consideration in the cost benefit analysis model are as follows:

1. Net Total Adult Run Strength.

As derived earlier.

2. The Value or Price Per Pound of the Salmon.

The regional wholesale price expressed in constant dollars or current dollars over the life of the project. If a portion of the run is to be destined for the frozen market, the wholesale price for frozen salmon should be used. If the market is largely for canning purposes, the canned wholesale price should be used.

3. The Estimated Weight Per Fish.

4. The Value of the Net Total Adult Salmon Run.

Item 1 multiplied by item 2 multiplied by item 3.

5. The Value of Surplus and Spawners.

Add in any value in terms of domestic consumption or revenue from this source.

6. The Total Estimated Value of the Run.

Add items 4 and 5.

C. Other Benefit Factors.

As discussed earlier, the salaries and wages associated with creating a salmon run are as economically beneficial as the salaries paid to fishermen and processing personnel. (An estimate of the hatchery personnel salaries and wages and other similar benefits should be made and included in Table III, Other Benefit Factors).

D. Cost Factors.

There are several categories of costs to be included in a cost benefit analysis. These are as follows:

1. Project Planning and Surveys.

Included in this category are all the costs associated with performing stream surveys, site research and selection, preliminary design and other work preceding construction.

2. Construction.

This category includes all of the costs to construct the facility, perform the stream rehabilitation or similar work.

3. Imputed or Actual Interest Expense.

If interest expense is being paid through a bond issue, for example, the bond interest rate should be applied

to the amount of capital funds used for the project. If the project is being funded through a cash appropriation, a cost of capital rate should be included for the project. A typical state rate might be the going rate on state general obligation bonds. A typical federal rate might be the going rate on long term treasury notes.

4. Facility Operation.

This would include all salaries and wages, utilities, fish food and other expenses associated with operating the facility from inception of the operation through full production.

Table III, as follows, is an example of how a cost benefit analysis can be applied to an aquaculture project.

TABLE III

An Example Cost Benefit Analysis

(25 Million Egg Facility)

Analysis of Annual Costs - 25 Year Facility Life

Factors	Reference Section	Constant Dollars	Current Dollars
SALMON PROPAGATION FACTORS	(A)		
Estimated Adult Run Strength	(A-7)		
Number Spawning Stock	(A-8)		
Net Total Adult Run Strength	(A-9)		
Hatchery or other surplus	(A-10)		
SALMON REVENUE FACTORS			
Regional Wholesale Price Per Pound	(B-2)		
Estimated Average, Weight Per Fish	(B-3)		
Value of the Net Total Adult Salmon Run	(B-4)		
Value of Surplus and Spawners	(B-5)		
Total Estimated Value of the Run	(B-6)		
OTHER BENEFIT FACTORS			
Total Estimated Benefits			

TABLE III
(Continued)

Factors	Reference Section	Constant Dollars	Current Dollars
COST FACTORS			
Project Planning and Surveys			
Construction Costs			
Imputed/Actual Interest Expense			
Total Propagation Facility Costs			
Cost to Benefit Ratio			

MACRO ECONOMIC EVALUATION TECHNIQUES

The return on investment and cost benefit analysis models are micro-economic evaluation techniques that are applicable to measuring the economic value of individual salmon aquaculture projects. While these models are useful in making economic choices on a project by project basis, equal attention should be given to the economic value of all such projects, collectively, as well as the overall economic value of the salmon fishery. There are several reasons why it is important to develop an economic understanding of the salmon industry as a whole. First, the salmon fishing and processing industry employs more people than any other element of the private sector with the total value of the salmon harvest in 1978 exceeding 230 million dollars at ex-vessel prices.

Secondly, Alaska is currently overly dependent upon revenues from non-renewable resources, and the full development of the salmon fishery could aid in redressing the current disparity in tax revenues from renewable and non-renewable resource sources.

There are other perhaps more critical reasons to assess the economic benefits of the fishery from an overall state perspective. Alaska has a life-style which is in part characterized by the independence desired by its citizens. The capability to maintain this life-style is for many

people dependent upon earning all or part of their income as fishermen or working in seasonal fish processing jobs. Salmon fishing and/or processing provides the major source of income to communities like Ketchikan, Petersburg, Dillingham, Cordova and others. Without a strong, healthy fishery, many of these communities would suffer because their citizens would not have an alternative way of earning an income. Manufacturing and agriculture, which are the mainstays of many similar communities in the lower 48 states, are simply not an option open to citizens in these Alaskan communities.

Finally, if the state is to maintain its current prosperity, it must move out of the current raw material resource exploitation state of economic development to one which is more favorable to the state and its citizens in terms of the income to be realized from increasing the direct and secondary benefits derived from processing, marketing and consumption of salmon.

For these and other reasons, it is critically important that the state have the economic tools necessary to plan and administer its economic future. Currently, however, few economic planning tools are available and the capability to perform macro-economic analyses in Alaska is severely limited. The information and tools needed to perform the proposed macro-economic analysis are rather straight forward. These include:

1. State Tax Revenue Collection Reports Coded by the Standard Industrial Code and Geographic Region.

One of the best ways of measuring changes in economic conditions is through the state tax collection system. The change in the number of corporate and individual tax payers as well as changes in their earning status is critically important information for economic planning.

2. Development of a State Input/Output Economic Model.

An input/output model is a planning tool which can be used to identify the economic or employment multiplier effect of the various segments of industry. It can also be useful in examining the relative balance between imports and exports by industry segment.

3. Employment/Unemployment Reports by Standard Industrial Code.

In order to perform economic analysis it is important to know employment by type of industry within a region. Employment and unemployment characteristics should also include information on the age, sex and household dependency status.

With the development of at least these three economic planning tools, it would be possible to perform the following types of macro-economic analysis:

1. Assume that the State of Alaska is willing to invest some of its non-renewable resource tax revenue into producing future recurring income streams both as a means

for financing state and local government as well as providing a healthy economic climate for its citizens. Assume further that the interest rate on investment opportunities in the major capital money markets outside of Alaska or government securities is nine percent (9%). An investment in an in-state economic development project which yields an interest rate of only seven percent (7%) could be more financially attractive to the state than an out of state investment because of the additional revenue generated from the added in-state employment, personal and corporate taxes.

2. The State of Washington in 1972 received voter approval to invest 415 million dollars of state funds in a statewide capital investment program. Federal and local matching funds were expected to bring the total investment to approximately 1.5 billion dollars. According to the economic planners (Washington State Budget, 1972 Volume II, page 63) "... the construction impact alone will generate 240,000 full-time equivalent years of employment ... and help meet the projected employment needs of 23,000 net new labor force entrants each year." The budget document goes on to report that, "the Washington futures program will not require new taxes ... the expenditures on construction projects ... together with the turnover of those expenditures through suppliers and payrolls will provide additional state sales, and business and occupation tax revenue. Second, the new industries which can be established as a result of these

Washington future projects will also provide new state revenue." The Washington Futures Program represents the type of economic planning capability which the State of Alaska needs if it is to make informed economic choices on investment opportunities.

In summary, the consulting team makes the following findings and recommendations regarding the development of macro-economic evaluation tools for the State.

1. A key ingredient in evaluating the economic value of the salmon fishing to the State of Alaska is the ability to reasonably and 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 usable form.

3. Input/output analyses which identify the direct and secondary multiplier effect of employment and income from in the fishing industry, need to be conducted.

4. Based upon the current lack of reasonably accurate macro-economic information, the State of Alaska is not in a position to evaluate its investment opportunity in the fisheries. Moreover, the current lack of this information effectively precludes the State from explicitly formulating an economically sound fisheries development policy.

5. The State Departments of Revenue, Commerce and Economic Development and Labor should be authorized to develop the necessary macro-economic analysis information and tools so that the state can appropriately assess the economic value of its salmon fishery and formulate an economically sound fisheries development policy.

Chapter II - SOURCES AND METHODS FOR FINANCING SALMON AQUACULTURE PROGRAMS

Mandatory Assessments

Prior to discussing some of the other considerations involved with developing a stable financial basis for salmon aquaculture, the most critical financial issue currently pressing on the regional aquaculture associations is the recent Superior Court ruling in Wayne Alex etal., v. Southern Southeast Aquaculture Association etal. in which the court held that Alaska Statute 16.10.530, which establishes the funding mechanism for private aquaculture, is unconstitutional.

In a letter to Governor Hammond, as a result of the court ruling, the State Attorney General identified five "potential legislative alternatives to the now-unconstitutional statutory scheme for your consideration." These are as follows:

1. Regional aquaculture association programs could be funded through direct appropriation. We believe there would be no legal difficulties with this approach.

2. A statewide tax on the sale of salmon could be imposed, with proceeds of the tax deposited in the state's general fund and regional aquaculture association programs funded through annual appropriations in amounts based on the amounts collected in each region. While such a scheme conceivably could be challenged on the basis that it

violates the constitutional prohibition on the dedication of state tax revenues, we believe such a statute could be drawn artfully enough to pass constitutional scrutiny.

3. Regional taxes could be imposed on the sale of salmon to become effective only upon a majority vote of commercial fishermen in each region, proceeds of the tax would be deposited in the State's general fund and the regional association's programs would be funded through annual appropriations in amounts based on the amounts collected in the region. In addition to the dedicated fund problem, such a scheme could be challenged on the ground that it violates equal protection (treating commercial fishermen differently depending upon the region in which they are fishing) and on the ground that it constitutes an unconstitutional delegation of the power to levy a tax. While there are good arguments that such a program does not violate equal protection and does not constitute an unconstitutional delegation of the power to tax, we cannot predict with certainty how the issue would be resolved by the Alaska courts.

4. The program could be restructured to take advantage of the constitutional authorization of "service areas" -- in effect, utility districts. This approach would require agreements between the state and municipalities in each region, but would avoid the dedicated fund problem and (probably) the delegation problem as well.

5. The Fisheries Rehabilitation and Enhancement Division (F.R.E.D.) in the Department of Fish and Game could be restructured and directed to be more responsive to the concerns of the user groups in the various

regions. Under this scheme, the Department of Fish and Game (through F.R.E.D.) would have primary responsibility for implementing any aquaculture program established for any given region. There are no legal obstacles to such an approach to the problem.

The following comments are directed at each of the alternatives suggested.

1. It would be possible to fund the regional associations for a limited period of time through direct appropriations. The use of this approach must be regarded as a short term measure for several reasons. One of the major policies of Alaska state government is to require that programs which benefit primarily a group of resource users shall become, to the extent possible, economically self-sustaining. If the regional aquaculture programs, and the fishermen who benefit from the expanded harvests, are to operate in a manner which is consistent with this policy, some alternative means of financing fisheries development projects must be found. We discuss further the problems related to this option in Chapter III.

2. A statewide mandatory tax on the sale of salmon could be imposed with the proceeds from the tax appropriated to each region in proportion to their contribution to the taxes collected. A major problem with such a course of action is that several of the major fishing areas now operate in a satisfactory manner on voluntary assessments. Others would vigorously oppose the tax. Whether or not such tax

receipts could be dedicated raises serious legal questions. To subject the program to further legal uncertainties at this time should be avoided at all cost.

3. Again, the legal complexities of alternative number three present risks which may not be necessary or appropriate to take.

4. Alternative #4, suggests that regional associations might be restructured into service districts based upon agreements between the state and the boroughs. This alternative seems to find considerable constitutional support and is discussed in detail in Chapter III.

The implementation of special service districts for regional aquaculture has several attractive features. Regional aquaculture, if it is to grow and make a significant contribution to the fishery, requires two characteristics which are not now present in their organizational make-up. The regional associations need a stable source of financing and a stable organizational structure.

The inherent financial structure of private non-profit corporations has several characteristics which severely limit the use of this form of organization for fisheries development. First, because the corporations are non-profit, they have little capability to raise private venture (risk) capital which is vitally needed to meet reasonable production goals. While it is true that the non-profit corporations can borrow substantial sums from government,

unless that government is very knowledgeable about the investment risks, is willing to undergo long periods of initial start-up costs without a pay back, and is very committed to maintaining its support, the non-profit corporations will not have an adequate financial structure upon which they can develop and grow.

Secondly, just as the non-profit corporations have none of the financial strengths of a private sector for profit corporation, such as the capability to attract risk capital, neither do they have any of the financial strengths of a unit of government such as an assured tax base. They must now depend upon voluntary contributions for their subsistence.

The private non-profits not only suffer from the lack of a stable source of financing, they also suffer from the lack of a stable organizational structure such as those structures found either in the private sector or in government.

For example, members of the boards of directors of private sector corporations often have a major financial interest in seeing the corporation succeed, and offer considerable expertise relevant to the fixing of sound corporate policy. It is difficult for the regional associations to educate their boards while at the same time expecting them to fix sound policy. Moreover, many of the associations are organized on the foundation of an active board. The goals and programs of the associations are ambitious and there

have been frustrations. It may be difficult for enough fishermen to maintain such an active role or interest without adequate renumeration or status.

Neither the financial rewards associated with service on a board of directors of a for-profit corporation, nor the status conferred in an elective public position are currently present in the regional association. Currently, members of the boards of directors of regional aquaculture corporations regard their service on the board as a "civic duty" or because of a personal commitment to the fishery. Few board members expect to see any significant financial return to themselves as a result of the aquaculture program for a long time, if ever. In essence the sense of "civic duty" or sense of personal commitment to the fishery must be strengthened so that increased organizational stability can be achieved for the regional aquaculture associations.

The use of the special service district could provide a means for achieving both a stable financial base and a more stable organizational base than presently exists. For a further discussion of this option, see Chapter III.

5. The fifth alternative means of resolving the loss of the mandatory assessment would be to restructure the F.R.E.D. division of ADF&G into a regional aquaculture program.

While this type of change on the surface has some attractiveness in that it may offer the possibility of a

somewhat improved financial base (presumably through state appropriations), the same long-term financial problems that are present in alternative #1 are present in #5. That is to say, if one of the major policies of Alaska state government is for the users of government service to pay their fair share for the service and for programs to become economically self-sufficient, ultimately a fair share of the cost of operating a regionalized F.R.E.D. division will have to be shifted to the user groups. Many of the pros and cons of the state's assumption of an active role in funding the program are addressed in detail in Chapter III.

The F.R.E.D. division will have in operational status by the mid-1980's, hatchery production capacity in excess of 600 million eggs being incubated. At some point in time, it is possible that the significant costs incurred in operating these state salmon production facilities will need to be offset by an adequate income stream (e.g. terminal harvest or user assessments). In essence, selection of alternative #5 would be inconsistent not only with current Alaskan state policy, but would mean ever greater costs to the state in the future for operation and maintenance of facilities, this at a time when state revenues (e.g. oil taxes) may be on the decline.

6. A sixth alternative not suggested by the Attorney General would be an Amendment to the Alaska Constitution expressly providing for such regional economic develop-

ment as aquaculture. The drafters of the Alaska Constitution eliminated the junior taxing districts which "plague" government operations in most of the lower 48 states. They limited the general taxing powers to the state and boroughs and expressly authorized boroughs to set up special service districts to provide for services required in the borough. If the state legislature acting on behalf of the unorganized boroughs and the boroughs acting on behalf of themselves, are unable to create a special service district whose boundaries encompass areas included in both the organized and unorganized boroughs, as suggested in alternative number 4, then it would be impossible to create a regional aquaculture association with boundaries comparable to those which currently exist. If we accept the argument that broad regional areas are a logical geographic feature required by regional aquaculture associations, a constitutional amendment may be required to provide the associations with a taxing authority which encompasses a service district which includes area in both the organized and unorganized boroughs (or perhaps two boroughs).

While the framers of the Alaska Constitution expressly intended to avoid the nuisance of junior taxing districts, it may be time to reassess the wisdom of a policy which entirely eliminates any mechanism for infrastructure development in Alaska except as it might exist in an organized borough or through state appropriations. If special service

districts cannot be created to extend beyond the boundaries of the organized borough, a constitutional amendment could be offered to allow this type of infrastructure development. The difficulties of obtaining necessary constitutional amendments are addressed in Chapter III.

In summary, the loss of the capability to have mandatory assessments by the regional aquaculture associations is a severe shock to their already inadequate financial structure. Six alternative methods of making up for the financial loss have been discussed. Two alterations, the creation of special service districts or an amendment to the Alaska Constitution allowing for junior taxing districts or service districts to be created which extend into adjacent boroughs or the unorganized borough, are the most attractive alternatives. Both of these alternatives can be consistent with the goal of ultimate economic self-sufficiency of program. Secondly, these alternatives provide the opportunity to create a more stable regional aquaculture organization as well as provide a more stable source of financing.

Other Financing Issues

Through a series of legislative acts, beginning in 1971, the Alaska Legislature has established a number of mechanisms for supporting or financing the Salmon Resource Development Program (ASRDP). These are each separately discussed as follows:

1. Creation and State Tax Support of the F.R.E.D. Division of ADF&G (1971).

As indicated earlier, one of the expressed purposes of the F.R.E.D. division is to rehabilitate Alaska salmon runs through enhancement or propagation of hatchery runs. By the mid-1980's the F.R.E.D. division will have a salmon egg rearing capacity in excess of 600 million eggs. Major facilities at Klawock (78 million egg capacity), Hidden Falls (65 million), Main Bay (65 million), Snettisham (73 million) Prince Williams Sound (39 million), Kodiak Island (50 million), Cold Bay (52 million), and Moose Pass (84 million) will become operational within the next few years. The State of Alaska will incur a heavy financial burden during the entire decade of the 1980's as these facilities go through expensive start-up periods and achieve stable production. Current state tax revenues from the fishery as well as revenues which could be derived from a terminal area harvest may not equal operating and maintenance costs, in the aggregate, until very late in the decade. The question which will soon confront the citizens of Alaska and the State Legislature, is, who should ultimately pay the operating costs of these facilities? If the strong, current state policy for economic self-sufficiency is continued, either a higher tax would have to be imposed or a terminal area harvest implemented with the proceeds of either or both used to pay the costs.

While there is inadequate information to develop anything approaching reasonable cost standards for hatchery operations which cover all species, a very rough guide is that the cost of running a hatchery which is in full production, and does not require expensive off-site egg take or equally as expensive off-station plants, should be about equal to the harvest value of 1/3 of the run. (An analysis of current operating costs of existing regional facilities has been partially hampered because of the lack of information. Sufficient financial data was collected, however, to indicate that if such costs as Regional Association Administration, Administrative and Supportive Services, Technical Services and Start-up Costs which have been previously defined were only allocated to hatchery operations as would be appropriate, the cost of hatchery operations would be roughly 1/3 of the value of the run in Southeast Alaska. Because operating costs in Central and Western Alaska are as high or higher than those in the Southeast and because the ex-vessel prices paid to fishermen in these regions are much lower than those paid in Southeast, this ratio will not hold for hatcheries in Central and Western Alaska. However, if the changing patterns currently occurring in the marketing of salmon continue, regional price variations should diminish over the next few years and then this rough guide could also apply to these areas.)

If a tax of 33% (which would be the dollar equivalent of harvesting 1/3 of the run to pay hatchery operating costs) were imposed on state hatchery returns, it is unlikely that fishermen would choose to harvest hatchery runs if other choices were available. Given this likely circumstance, the most probable method of recovering the costs of F.R.E.D. division hatchery operations (and for the regional associations) will be through a terminal area harvest. If the choice is made to finance hatchery operations through such a mechanism, there would be little to distinguish between a state operated facility and those operated by regional associations (so long as they are reasonably successful producers).

It is also important to recognize that the F.R.E.D. division's responsibilities extend substantially beyond those of the regional associations, but to the extent that there is an overlap in duties with those of the regional associations as they pertain to the operation of facilities in full production suggests that consideration must be given to shifting the financial and management burden of operating these facilities from the state tax base to a user pay, regional association basis. (Other criteria besides financing must be considered including the managerial and technical capability of the regional associations to manage such facilities.)

The shifting of the cost of managing and operating state salmon production facilities to the regional associations should not be construed to mean that the State of Alaska should lessen its commitment of state financial resources to development of the fisheries. These state financial resources should be commensurately shifted to the far more pressing needs for a comprehensive fisheries research and development program and harvest management systems improvements. Additionally, there may be hatchery facilities, stream clearance and habitat improvement projects, and the like, which can or should occur for a variety of reasons, but which cannot be undertaken by the associations on an economic basis.

2. State Loans to Regional Aquaculture Associations.

Current legislation provides for 25 year loans to regional aquaculture associations of up to 3 million dollars per facility with a maximum interest rate of 8% with deferred payments for six years.

There are several problems with this legislation. First, the 3 million dollar loan ceiling can be artificially restrictive on the choice and size of the facility. Secondly, while returns on pink salmon may be achieved within the six year deferred payment period on the loan, there is little likelihood that this period will be adequate for other species. Difficulties in obtaining sufficient brood stock, initial production and similar problems can and should be expected. A ten year maximum deferment period would seem to

be much more realistic. Additional provisions should provide for an additional time extension of five years (with an approval procedure specified) as well as an early payment clause, should stable production be achieved earlier than the ten year period.

If a ten year deferment period were established, the loan repayment period should be set for a maximum of twenty years after the deferment period, otherwise the capital recovery period will be so compressed it will require an excessive terminal area harvest during the capital recovery period.

Finally, the loan should be for capital investment costs and should not include start-up costs. As will be discussed more fully later on, start-up costs should be expensed against the current period. This will help avoid the need for excessive terminal area harvests during the capital recovery period as well as avoid unnecessary interest expense associated with capitalizing these costs.

3. <u>The Existing Assessment Program (if Re-enacted) Does Not Provide Sufficient Revenues to Pay Administrative Costs, Regional Technical Expertise and Hatchery Start-up and Operating Costs for More Than One Large Facility at a Time</u>.

This financial issue has been partially addressed in a variety of legislative enactments. These include:

(a) The provision of organizational and planning grants to qualified associations of up to $100,000 with a second $100,000 to be matched on a 50/50 basis.

(b) The provision of an appropriation in the State FY 1980 budget to the F.R.E.D. division for allocation to the regional associations in the amount of $400,000 for regional planning activities.

(c) The passage of Senate Bill 232 which provides that 20% of the revenues realized from the measure are to be allocated to the boroughs for local salmon enhancement and related projects; 60% of the revenues are allocated the state general fund; the remaining 20% of the revenues are to be allocated to the Commercial Fishing and Agriculture Bank which in turn can be loaned or used as a loan guarantee for regional aquaculture projects.

(d) The establishment of the Renewable Resources Corporation of Alaska and Development Fund into which not less than 5% of the receipts of certain revenues will be deposited to be used to enhance and develop renewable resource programs.

The creation and state financing of the F.R.E.D. division, the creation and revision of loans to private non-profit regional aquaculture corporations, as well as these additional acts by the Alaska Legislature evince a continuing interest and struggle to find an acceptable solution to re-establishing the salmon fishery and developing other renewable resources.

While it is also understandable how these various legislative actions have evolved over a number of years, it

is equally clear that the pieces do not fit as well together as necessary. If, however, the variety of programs were to be restructured along the lines described, we believe adequate financial resources could be available to substantially accomplish a Salmon Resource Development Program (or as recommended in the organizational analysis in this report a Fisheries Resource Development Program).

Establish Regional Entities Responsible for Fisheries Development

Through either the creation of special service districts or appropriate constitutional amendment it would be possible to provide regional structures which have the capability to make mandatory salmon harvest assessments. Voluntary assessments could be continued in those areas where they are selected as the financing means.

Establish Regional Aquaculture Program Source and Applications of Funds Model

As our earlier analysis indicated, there are six distinct cost categories for activities associated with regional aquaculture. These are:

Regional Association Administration

Administrative and Supporting Services

Technical Services

Full Production Hatchery Operations

Hatchery and Enhancement Start-up Costs

Capital Investment Program

The costs associated with administering the regional association could be funded from the regional assessment or like funding mechanism. Administrative and Supporting Services, while a budget category, would be allocated to the other categories (i.e. Regional Association Administration, Technical Services, etc.).

Technical Services could be financed through a redirection of the proceeds from Senate Bill 232. The cost of full production hatcheries would be borne by remaining funds from the regional assessment, and through the operation of terminal area harvests.

Hatchery and Enhancement Start-up costs could be financed through the redirected funds from Senate Bill 232 and any assessment royalty not required for Full Production Hatchery Operations or the Capital Investment Program. The payment of capital and interest costs would be financed from a combination of remaining assessments and terminal area harvests.

Finally, and to the extent that local fisheries development priorities indicate the need, non-revenue producing projects such as stream rehabilitation for natural runs could be financed with a combination of assessment revenues and Senate Bill 232 funds together with any federal and state funds that may be received for such a project. (This

procedure avoids the necessity of having terminal area harvests on natural runs as a means of recovering the cost of non-revenue producing projects.) Regional associations could perform such projects on a contract basis on behalf of the state.

This proposed Source and Applications of Funds Model accomplishes several objectives. First, it can be used as a means for guaranteeing to the State that repayment of State loans will be accorded a preferred position for assessment and terminal area harvest revenues equal to that of paying the costs associated with Full Production Hatchery Operations.

Secondly, the redirection of Senate Bill 232 funds to the regional associations provides a continuing stable revenue base for financing Technical Services and Hatchery and Enhancement Start-up Costs which are highly interrelated activities. The inclusion of start-up costs, to be funded from this source would also eliminate the present practice of capitalizing start-up costs within the present loan program. If the present loan program were modified to include only capital facilities, loan decisions could be more easily made because it would be unnecessary to make speculative or arbitrary determinations about whether the regional associations were properly spending their other income as a part of the loan approval process. The determination of the adequacy, over-abundance or inadequacy of other

income, as well as judgments about how wisely these resources are utilized should be the responsibility of the local borough assembly and the legislature.

According to financial information supplied by the Southern Southeast and Northern Southeast Regional Aquaculture Associations, for calendar years 1978 and 1979, the annual average operating expenditures (excluding capital investments) would have amounted to approximately 1.0 million dollars in these two regions had the assessment revenue been fully realized.

Under the proposed plan, had it been in effect in 1978, and based upon a 3% assessment rate, assessment revenues would have been approximately 1.7 million dollars. In addition, had Senate Bill 232 been in effect in 1978, it could have provided (depending on the percentage of revenue redirected) an additional 2.0 million dollars. Both sources together would have provided almost four times the amount which would have been expended. Had these funds been available, the two Southeast regional associations could have begun developing the necessary capital reserves required to pay future facility start-up costs; conducted the necessary stream surveys; performed stock enumerations and similar activities; and proceeded to develop the fishery in a comprehensive and organized manner through an integrated system of production and financial planning.

Establish Regional Long Range Production and Financial Plan

A third key element to the development of an economically and financially sound regional aquaculture program is the establishment of a production and financial management system consistent with the proposed organizational structure and financing mechanisms.

Once the regional associations have an assured and reasonably adequate revenue base, they should begin the development of ten year and perhaps longer range Production and Financial Plan. (The ten year plan is the minimum necessary to cover the deferred payment period prior to reaching full production and capital repayment.) The implementation of a long range production and Financial Plan by each regional aquaculture association is critically necessary if these associations are to approach the development of the salmon fishery in a comprehensive manner. Currently, because of the limited financial resources available to them, regional associations have tended to limit their production planning activities to a few projects. Current financial planning practices, because of financial uncertainties, tend to be very much oriented toward short term considerations.

If the organizational structure and the financing mechanism recommended in this report are implemented, it must be accompanied by a major change in the current "hand to mouth" type of planning now dictated by the fiscal constraints. For example, because of the substantial streams

of stable revenues which this report would direct at the regional associations, each regional association must begin to develop a comprehensive list of production alternatives. Enough information about each production alternative must be obtained to provide the capability to evaluate each project using the recommended return on investment model. Once a list of economically attractive projects is developed, the regional association will have to develop a time phased production plan which optimizes the use of the revenues flowing to the association. The corresponding financial plan, which will include a ten year annual forecast of revenues by source (i.e. assessment revenue, Senate Bill 232 revenue) should identify for each category of cost included in the recommended Source and Applications of Funds Model, the estimated level of activity which can be supported by each revenue stream. Because of the long duration between the initial start-up of a facility and the time when the facility reaches full production status, the regional associations will have to very carefully consider and plan for the costs to be incurred during this period so as to avoid over-committing available revenues and having a facility completed without the funds with which to operate it. As recommended in the Source and Applications of Funds Model, Technical Services, Hatchery and Enhancement Start-up costs and non-revenue producing projects could all be financed from the same source of funds, namely the redirected proceeds from

Senate Bill 232. If a regional association were to expend all of its annual revenues from this source on Technical Services and/or non-revenue producing projects and not create a substantial capital reserve to be used for projects during their start-up phase, the association would substantially limit its capability to place more than a few projects in start-up status. (Capital reserves are also necessary as a hedge against periods of low harvest levels.)

While it will require some experience developing the financial trade-offs between current expenditures for Technical Services and non-revenue producing projects with building capital reserves for future facility start-up costs or times of low returns, this type of activity will lead to an optimized and integrated production and financial plan.

Relative Balance Between Operating and Capital Funds

It is difficult to ascertain at this point whether the availability of capital investment funds to the regional associations are in balance with their need for operating and start-up funds. Given the state commitment to a 200 million dollar loan program for aquaculture, the availability of loans through the Renewable Resources Corporation and the Fisheries and Agriculture Bank, capital funds may be available in excess of those required. If there is an imbalance between capital and operating funds, and the operating funds

are found to be inadequate, it may be desirable to merge the Renewable Resources Corporation Development Fund with the Fisheries and Agriculture Bank and redirect the 20% portion of Senate Bill 232 proceeds from the Fisheries and Agriculture Bank to the regional associations to be used for Technical Services and Hatchery and Enhancement Start-up costs.

The diversion of Senate Bill 232 revenues to regional aquaculture plus the assessment income should provide for a substantially greater build-up of necessary capital reserves to be expended during future periods when the regional associations have a number of facilities in the start-up phase of operations as well as provide a more satisfactory means of financing some short term non-revenue producing projects.

Chapter III - INSTITUTIONAL PROBLEMS AND POTENTIAL REFORMS

Introduction

In Chapters I and II we have discussed methodologies for evaluating the economic viability of certain types of resource enhancement activities which are a critical element of Alaska's salmon fisheries resource development program, and several means for assuring the financial stability for such a program. We recognize that the Alaska salmon resource development program (ASRDP) is a relatively new endeavor. Its major elements, the private non-profit hatchery program (PNP) and the division of Fisheries Rehabilitation, Enhancement and Development (F.R.E.D.) within the Alaska Department of Fish and Game, are each less than 10 years old. ASRDP has come a long way in a short period of time toward achieving a basic goal of expanding the available harvest of salmon for Alaska's fishermen. We also recognize the program's potential has not been reached and positive program results can be expanded if present financial, legal and institutional barriers are overcome.

In this discussion, we will be addressing problems with ASRDP and means of achieving program improvements. The natural tendency of consultant studies to concentrate on program deficiencies is not intended. We believe that the managers of regional associations and the Alaska Department

of Fish and Game have many successes to point to in their implementation of this ambitious and important program.

While achieving stable financing for economically sound ASRDP programs is essential to meet established statutory and program goals, our analysis indicates that revisions to the institutional arrangement of Alaska's fisheries development program are required if the goals enunciated in statutes and regulations by the state, and in program goals and statements of regional associations are to be met. The detailed institutional review contained in Appendix A to this report indicates that there are a large number of programs, each of which can and does affect ASRDP, which are not centrally coordinated. The wide variety of government agencies and private activities impacting on ASRDP presents a critical need for greater horizontal coordination and cooperation among such programs, greater coordination with federal and local agencies, and increased cooperation between the private and public sectors. This discussion concentrates on some of the potential institutional reforms which could be implemented to positively impact those programs with primary responsibility for achievement of fisheries resource development goals and objectives for Alaska. We do not suggest all of the detailed reforms relating to improved coordination among regulatory agencies, financing agencies, construction entities, and other programs affecting ASRDP should be the responsibility of the Aquaculture Policy Study Group. The study group should, however, focus

their attention on necessary reforms in those agencies having primary responsibility affecting fisheries resource development.

We have identified a number of federal institutions and programs which have significant impact on overall fisheries development in the United States. Many of these programs impact on Alaska fisheries development, and it has been suggested to the study group that, to date, the State of Alaska may not have received its "fair share" of benefits from federal programs impacting on Alaskan fisheries. We offer the observation that there are many federal agencies which enjoy special working relationships within Alaska who provide positive support to ASRDP. Noteworthy is the U.S. Forest Service, which has established cooperative agreements with the Alaska Department of Fish and Game, and informal arrangements with many of the regional associations to maximize the effectiveness and impact of its programs on the important Alaska salmon fisheries resource.

We briefly identify in outline form other federal institutions affecting ASRDP (Appendix B). We will discuss means of improving relationships between key federal and state agencies affecting ASRDP.

Finally, perhaps the most critical element to the success of an Alaska fisheries development program is the commitment of the legislative and executive branches. A major reason why this study has been conducted is the concern

shared among persons within executive and legislative branches that the salmon fisheries development program is not producing satisfactory results as measured against the original goals of primary programs. This concern was reflected in the most recent legislatively approved budget for the F.R.E.D. division and for regional associations. The members of the study group were well aware in formulating this study that the key programs in ASRDP could be the subject of ever greater scrutiny in the future, particularly in the face of projected tight budgets and declining revenues.

Among the general program recommendations which have evolved from our analysis of existing institutions and policies are the following:

1. There is a need for increased cooperation and coordination among major program elements of ASRDP;

2. ASRDP should be expanded or altered to include consolidation and coordination of programs affecting the development of species other than salmon, i.e., establishment of an Alaska Fisheries Resource Development Program (AFRDP);

3. There is a need for improved and expanded research, data and information affecting AFRDP;

4. Region-specific planning, programs and institutional arrangements which will maximize the benefits of the program consistent with area needs should be established;

5. There is a need to identify the appropriate level of activity for individual program elements within

AFRDP; this should be done on a continuing basis and not merely through established budget processes;

6. Improved relationships with federal, local and private sector programs affecting or having potential impact on AFRDP is necessary;

7. There is a need to develop institutional reforms which ensure greater financial stability for existing and new programs; and

8. There is a need to develop an information base sufficient to evaluate program successes and failures in the future.

(Note: Because of the present financial difficulties of the regional association program, the consulting team was directed when the study was nearing completion to spend more time evaluating institutional arrangements which could affect the future of the regional association program. We suggest that further more detailed analysis by the study group of financial and institutional alternatives affecting the regional association program will be required prior to the 1980 legislative session.

Identification of Primary Programs to be Included in Alaska Fisheries Development Program (AFRDP)

In the series of meetings with the Aquaculture Policy Study Group the consulting team sought to identify those programs primarily involved in fisheries development

activities at the state level. As indicated in Appendix A, there are a number of other programs which have an impact on fisheries development activities in Alaska, but the study group has designated the following programs and activities as includable in the primary program category:

A. Alaska Department of Fish and Game.

1. Fisheries Rehabilitation, Enhancement and Development Division (F.R.E.D.);

2. Commercial Fisheries Division;

3. Sport Fisheries Division;

4. Shellfish Program.

B. Private Nonprofit Hatchery Program/Regional Associations.

C. Office of the Governor/Bottomfish Coordinator.

D. Department of Commerce and Economic Development (Division of Business Loans).

E. Department of Transportation (construction of facilities).

F. Alaska Commercial Fisheries Entry Commission.

G. Department of Community and Regional Affairs.

Because the initial focus of this project was to be on the salmon fisheries development program, major concentration on reforms affecting programs involved in this arena resulted. This is consistent with the goals, makeup and interests of the study group. However, we strongly believe that the salmon development program and its major elements cannot be planned or managed independent from other fisheries and that in the future it becomes critically important to

integrate the salmon development program with those for shellfish and bottomfish.

Statement of Project Findings and Needs

A. There is a Need for Increased Cooperation and Coordination Among Major Program Elements of AFRDP.

1. General Statement of Problems and Needs.

The detailed program outlines included in Appendix A indicate a need for greater horizontal coordination among a wide variety of programs and agencies in Alaska having impact on the successful operation of AFRDP. There is a need for clear direction as to the relative roles and responsibilities of each such entity: (a) as they relate to the overall goal of fisheries development; (b) as they relate to interrelationships of such programs in achieving established goals for the total fisheries development program; and, (c) as necessary to ensure that such programs and activities are not operating at cross purposes from one another. Increased coordination can be provided through the Office of the Governor or the State Legislature. Some lead agency could be assigned this responsibility by the Governor or the Legislature.

Following are a number of specific issues which must be addressed to increase cooperation and coordination among major program elements of AFRDP. These include improved relationships among:

(a) ADF&G Commercial Fish, Sport Fish and F.R.E.D. divisions.

(b) ADF&G and regional associations.

(c) ADF&G, DCED and regional associations.

(d) All Regional Associations.

(e) ADF&G salmon and shellfish program elements, regional associations, and the Office of the Governor/Bottomfish Coordinator.

Increased coordination and cooperation are necessary for a variety of reasons. In some instances, improved relationships among these entities is absolutely essential to the future success of ASRDP. For instance, policies adopted by ADF&G regarding egg take and brood stock could effectively eliminate any prospect of success for individual hatchery programs or other activities undertaken by the regional associations.

In some instances, existing laws infer that coordination of activities among AFRDP entities is required or should occur. However, we suggest that there are situations where this legislative mandate is not strong enough. For example, legislation establishing the fisheries enhancement loan program, A.S. 16.10.500 et seq., provides authority in the Department of Commerce and Economic Development (DCED) to make loans and grants to regional associations for fisheries enhancement. There is no provision in the statute requiring or defining the necessary relationship between DCED and ADF&G regarding any aspect of the program. While

these agencies have undertaken certain steps to communicate and coordinate program activities, the regional associations have indicated dissatisfaction with the level and quality of those relationships. This matter could be resolved, in part, through legislative action.

In certain cases, relationships among program activities have not even been addressed by the legislature or the executive branch. For example, the newly established activities within the Office of the Governor relating to bottomfish development have evolved to date without identification of potential and necessary relationships between that office and fisheries development activities by ADF&G and the regional associations. If the legislature considers expanding the authority of regional associations to include other species, coordination with development activities of the Bottomfish Coordinator will be required.

Finally, there are situations where the legislature may wrongfully presume that coordination and cooperation among such entities is established and routinely occurring. One such instance involves the relationships among divisions within ADF&G. Testimony during study group meetings and a number of previous studies have indicated that the relationships among the F.R.E.D. division and the Commercial and Sport Fish divisions are less than fully cooperative. While considerable effort in recent years has been made to establish coordinated goals and objectives for these programs, it does

not appear that such activities have produced a result wherein each is working in as coordinated fashion as possible toward a common fisheries resource development goal.

2. Need for Improved Relationships Between ADF&G Commercial Fish, Sport Fish and F.R.E.D. Divisions.

There are a number of indications that despite considerable efforts in recent years to establish policies and practices which will effect improved relationships between the state's resource development program and management activities of the commercial and sport fish divisions, there remain areas of conflict between these divisions. As hatcheries come on line, the need for coordination and communication among such divisions will become all the more important. Management to maximize harvest and protect viable natural runs is all the more complex with the interjection of hatchery runs.

Relationships between harvest and hatchery managers are affected by statutes and policies protecting natural runs. A.S. 16.10.420(10) provides:

> A hatchery (shall) be located in an area where a reasonable segregation from natural stocks occurs, but when feasible, in an area where returning hatchery fish will pass through traditional salmon fisheries.

The existing policy of the Alaska Department of Fish and Game (see Alaska Fishery Management Policy Manual, Policy #1, (1974) provides as follows:

> The management of naturally occurring wild stocks will not be unduly hampered by locating the hatchery at the proposed site . . . . If complexities arise in managing mixed stocks, including both hatchery fish and wild fish, it will be the state's policy to manage the collective resource in a manner that favors protection of the wild stocks. (Emphasis added.)

As indicated at page 25 of the proposed Policy and Procedures, even "minor runs of salmon" must be given first priority consideration when a massive supplementally produced salmon run is imposed in fishing areas where wild fish are harvested. ADF&G acknowledges that this policy may lead to larger than required returns to the production sites. Over-protection of certain weak natural stocks at the expense of harvest of productive hatchery runs seems inconsistent with goals of the PNP hatchery program.

The department states that "long-term and continuing analysis will be conducted to assess benefits and disbenefits resulting from the fish cultural activity prior to any decision to sacrifice or overharvest wild stocks." (C.F. AK. Fish. management policy #7, page 4). The issue of protection of natural runs in areas where hatchery stocks have been introduced (e.g., Washington) is one of great controversy. This is in part because of failure of fisheries managers to address the potential problem prior to the evolution of major hatchery programs. At this time, the

State of Washington is struggling with the definition of "viable natural run" at a time when as much as half of the state-wide production of salmon is through artificial propagation. This has occurred in part because of the lack of imposed relationships and some conflict between harvest managers and hatchery managers at the outset of the resource development program. Alaska should make every effort to avoid repeating this experience.

A review of Washington's 1979 proposed salmon management plan is illustrative of a major change in approach to harvest-hatchery management patterns. The plan suggests harvest of certain natural runs prior to full production from planned facilities in the same area. In some instances, this "writing off" of natural runs is occurring before construction of a facility has even started. We do not begin to suggest this policy for Alaska. However, it does indicate the potential significant changes that may evolve in terms of harvest management practices as the hatchery program evolves.

The present policy regarding natural runs can also impact on the necessary development of brood stocks and egg takes for existing and planned hatcheries. At page 26f of the draft Policy and Procedures, ADF&G proposes the following:

> It is recognized that an objective of salmon fisheries harvest management is the attainment of an appropriate magnitude and distribution of brood stock to drainages in all management

> units. It is not always possible through management of mixed stock fisheries to ensure the appropriate escapement to a specific stream or stream segment, but generally, desired escapement ranges can be obtained over larger geographical units. Hatchery brood stock goals, as an additional part of the desired escapement [sic]. Where possible, brood stock development plans will include harvest management procedures or recommendations which will enhance the potential for achieving hatchery brood stock requirements without significantly reducing harvest from other stocks. Where restrictions on mixed stock fisheries to create additional donor escapements are requested, Board of Fisheries approval will be required, unless the Commissioner determines that no substantial impacts on established fisheries would occur.

The proposed brood stock policy of ADF&G further states that hatchery egg take schedules will be formulated to realistically provide for brood stock while "minimizing impact on natural recruitment."

This policy may present problems even now as the demand for eggs and brood stock for hatcheries coming on line is immediate (particularly during bad run years). A policy of "long-term and continuing analysis" prior to any decision to sacrifice or overharvest wild stocks not only impacts on the ultimate harvest on hatchery stocks by Alaska fishermen, it also may affect the front-end potential and timing of ultimate production by state and regional association hatcheries. Definition of "viable natural runs" is not a matter which should be deferred any longer than

necessary. Legislative direction regarding alteration of harvest management and brood stock policies may be necessary to resolve this problem.

A second problem reflected in the draft Policy and Procedures is the lack of guidance regarding the interface between the resource development and management divisions within ADF&G as they might affect regional association resource development activities. Appropriate alteration to the above policies will require joint research stream surveys, site selection and planning by these divisions and the associations. The regional comprehensive planning process should be instituted in a fashion which more directly requires effective interface between harvest management and resource development programs. Representation of each activity on regional planning teams is suggested by ADF&G Policies and Procedures; inter-divisional cooperation can be further achieved by assuring development of harvest management plans in concert with hatchery planning activities (which can positively improve relationships with regional associations as well).

At page 26a of ADF&G's proposed Policy and Procedures, it is stated: "There is a need to clarify the relationships between the management of hatchery returns and the issuance of a private nonprofit hatchery permit." ADF&G proposes development of a basic harvest management plan before a private nonprofit hatchery permit is issued or approved by

the commissioner and the Board of Fisheries. The basic plan would be developed by department area biologists in consultation with the applicant. The regional planning team would review the plan as p rt of the application review process to determine the proposed hatchery's compatibility with finalized or preliminary "comprehensive regional plans" required under A.S. 16.10.375. Ultimately, the basic harvest management plan would be part of the "regional comprehensive plan". Why should harvest management plans be formulated separately and in a different manner than other elements of a comprehensive plan? Are basic harvest management plans merely to be developed on a project-by-project basis and then incorporated into regional plans?

We believe that the comprehensive regional planning process must be upgraded to develop a multi-species harvest plan for the region which will allow hatchery locations to maximize harvest. This will require much new data as to existing and planned runs by species. Establishment of a comprehensive harvesting plan as part of the regional salmon plan is not to suggest that regional associations should in any way be involved in actual management of salmon stocks (i.e. delegation of regulatory authority). It is to suggest that policies which in any way segregate harvest and hatchery management and planning activities should be changed to ensure fuller coordination.

3. Need for Improved Relationships Between Regional Associations and ADF&G.

We have indicated that past relationships between regional associations and ADF&G have been less than cooperative, and improvements are still necessary. Lack of cooperation and coordination among these entities can jeopardize the future success of all programs.

Regional association managers have stated that in many cases they have had difficulties with ADF&G regarding methods selected to enhance the resource. They have had problems in obtaining state approval to take brood stock and eggs for existing facilities and proposed new facilities and the quality of relations during the evolution of the regional planning activity has varied. These factors indicate little evidence of clear commitment by ADF&G officials to assure on a priority basis the successful evolution of the regional association program or vice versa.

A.S. 16.10.375 provides that the Commissioner of ADF&G shall have developed regional plans for salmon enhancement. The plans are to be developed by regional planning teams consisting of ADF&G personnel and representatives of qualified regional associations. Ultimately, a state-wide plan is to be developed. Regional plans have been developed in some regions and not in others pursuant to this statute. Some are more comprehensive than others. No state-wide plan has been completed.

Legislative recognition of the need for comprehensive regional planning with input by regional user groups is a most progressive policy. In fact, this fisheries development planning effort appears more sophisticated than those existing in other states. However, the legislature needs to address means of upgrading this process to achieve express goals and effect improved relations between ADF&G and the associations.

First, at present, regional plan approval is the exclusive prerogative of the Commissioner of ADF&G. This level of control has been the subject of some criticism. Association representatives and others have indicated that while their voices are exercised through this process, whether they are heard or not is by no means assured. We believe that ultimate management authority should reside at the professional management or state agency level. However, it may be that the level and quality of association input into the planning process will better reflect the legislative policy of regional input if a dispute resolution mechanism, or at least a discussion process, were developed to satisfactorily air differences of opinion with regard to adopted plans.

Second, we question whether comprehensive planning in the various regions should be allowed to run at a pace which depends exclusively on the commitment of local users to establishment of regional associations and approval by ADF&G of same. To date, the basic thrust of the planning

process has been that regional plans themselves can be as simple or complex as those individuals involved choose to make them. Likewise, the amount of time, effort and money which is spent in developing comprehensive plans varies by region. Differentiation between short-term planning necessary to start a reasonable number of development projects and long-range planning must occur.

If there is truly a need for comprehensive planning with user participation on a regional basis, and we think there is, tying the level and quality of planning to the progress a particular region makes in organizing regional associations makes no sense. In fact, a decision whether a regional association is a necessary entity in a particular region may well depend in part on the findings of a comprehensive planning activity. The voluntary aspects of the hatchery development program are appropriate; however, comprehensive resource development plans for a region are necessary regardless of the election to establish regional associations. While this point is moot in certain regions from an organizational standpoint, it is not in others. Moreover, if the legislature expands regional association activities to include projects relating to other species, short and long-range planning to define new goals and programs will be necessary. Finally, we suggest throughout this report means of upgrading the planning process. This contemplates a <u>long-range</u> planning effort, with commitment to

development of necessary data and information. Recent efforts to speed the development of regional plans based on this year's appropriation to existing associations is inconsistent with this proposal (see below).

Third, relationships between ADF&G and the regional associations are affected by the quality and content of comprehensive salmon resource development plans. As the regional associations improve their management and technical skills, and this is occurring, they will be frustrated by present limits in the quality of planning.

We believe establishment of a truly effective comprehensive salmon resource development plan will necessitate substantial technical support services, research, stream surveys tagging and other activities by or on behalf of the planning teams. This is particularly true if the management plan is to include those elements suggested as necessary below. It should be noted that the planning process cannot be carried out without adequate financing, region-by-region, in budgets of both ADF&G and the regional associations.

The quality of regional plans is also affected by present state policies protecting all natural runs. The proposed Policy and Procedures by ADF&G establish long-range and short-term objectives to be included in the regional comprehensive plan. Present policies may not apply over the long-term, and long-range planning which does not reflect likely changes in such policies will not be adequate. This

further states the need to address the issue and to begin to identify viable runs now.

ADF&G defines the focus of long-range comprehensive planning to include determination of public needs by species and user groups, proposal of numerical objectives by species to meet these needs, determination of numerical goals for natural stock maintenance and rehabilitation, determination of numerical goals for enhancement strategies by species, and integration of long-term user group needs with technical considerations on the biological potential of the resource. Short-term objectives involve essentially the same analysis for incremental time periods within the long-range (17 year) plan. We do not believe these objectives for comprehensive resource development plans, particularly for the long-term, are sufficient. While the establishment of numerical objectives may make some sense, it is the road map to establishment and achievement of those numerical objectives which should be the basic content of the comprehensive salmon resouce development plans for each region and for the state.

Establishment of a comprehensive management plan might include at least the following basic elements:

1. Establish guidelines for salmon production.
2. Identify program objectives (it appears that this is the primary area of concentration presently contemplated for the regional planning process).
3. Describe and assess present natural production.

4. Determine and assess present artificial production.

5. Determine potential natural production.

6. Identify viable stocks and nonviable stocks that have potentially valuable characteristics.

7. Determine appropriate regional stocks by species.

8. Identify acceptable enhancement possibilities. These must be consistent with harvest management strategies.

Further consideration must be made for short-term and long-term policies for egg availability and development of brood stock. These policies must reflect the goals of maintaining reasonable fisheries and protecting viable natural runs during program implementation. All proposed projects in a region must be measured against the goals, policies or standards which will result from this analysis. This may require establishment of a construction and operating review process to ensure program activities consistent with approved plans.

Another major aspect affecting relations between ADF&G and regional associations involves the duplicity of roles to be assumed by the department. On the one hand, ADF&G is to help organize and help maintain viable regional associations. A.S. 16.10.380 provides that the Commissioner of ADF&G shall assist in and encourage the formation of qualified regional associations for the purpose of enhancing salmon production. On the other hand, the legislature has

also authorized the Commissioner to issue permits for salmon hatcheries to regional associations organized as non-profit corporations under A.S. 10.20 and regulate many operational aspects of the program. Thus, not only is the Commissioner the superseding authority over all regional planning activities as discussed above, he is also directed to assist regional associations and at the same time regulate all efforts pertaining to enhancement of salmon by the association-private non-profit corporation. Achievement of cooperation and assistance between ADF&G and the regional associations will be difficult, at best, given the nature and diversity of relationships presently existing. It will take strong management direction by both the state and the associations to recognize and deal with these sometimes conflicting roles. Establishment of clear biological, economic and management standards against which performance can be measured, and upgrading of the planning process may help offset the fact of these conflicting roles.

A.S. 16.10.443 states that the department shall make every effort "within the limits of time and resources" to advise and assist applicants in the planning, construction and operation of salmon hatcheries. The level and quality of assistance by the department to regional associations has varied from region to region and is affected by personalities and budget. Most association managers have indicated that relationships with local ADF&G officials at the technical

staff level have been quite positive and they have received considerable assistance from such persons. However, they have received less cooperation and support from the central office as a general rule. Procedures to clearly delineate reporting relationships and for expediting decision making on issues of concern to the associations need to be improved. Establishment of policies and procedures involving interrelationships between ADF&G and the associations should be developed with the cooperation of the associations. Moreover, top level management control and commitment to the success of both regional association and F.R.E.D. programs is essential. Association managers must have clear access to the director of the F.R.E.D. division, the commissioner and board members.

A third major issue and necessary element to improve on relationships between ADF&G and the regional associations involves clarification of the activities to be undertaken by both. We have suggested in Chapter II the evolvement of defined roles and responsibilities over a ten year period. Of course, it is difficult at this point to finally determine the types of projects and programs which should be undertaken by regional associations other than planning until their financial viability and organizational stability is secured. However, assuming that problems relating to financing can be resolved on a satisfactory basis, clear definition of roles and responsibilities of ADF&G and the associations for both short-term and long-term

operations is essential. Specific program activities to be undertaken by ADF&G and regional associations in a particular region can and should be addressed, in part, in the development of comprehensive regional plans. However, guidance from the legislature as to the division of responsibilities is also appropriate. The study group and/or the Fisheries Council should be continued to assist the legislature and the Governor in continuing to define these roles.

To date, regional associations have built hatcheries and other artificial propagation projects, performed habitat rehabilitation, conducted (region-specific) research, they have created greater public awareness of the need for salmon resource development, participated in regional planning activities, and institutionalized themselves to varying degrees. At the same time, ADF&G has built hatcheries and other artificial propagation projects, performed habitat rehabilitation, conducted research, created greater public awareness of the need for salmon resource development, and participate in regional planning. Again, ADF&G exercises considerable regulatory authority over regional association projects and programs and controls the regional planning process. Based on present mandates, there is considerable potential for duplication of activities between the regional associations and ADF&G, and unhealthy competition between these entities for limited dollars and projects: The Potential for the operation of certain programs at cross purposes from

one another, and perpetuation of adversary relationships are equally serious problems resulting from the lack of clear guidelines, priorities and authorities for each program.

The legislature can direct a phasing-in of operational authorities (or segregation of same) over a reasonable period of time, with final program assignments reflecting the relative maturity, skills, interests and financial capacity of each. Regional associations could over time become responsible for operation of production facilities operating at full or near full capacity consistent with approved comprehensive plans. This would reflect the legislature's goal of continuing to attract reasonable sums of private monies, to maintain user group participation in ASRDP, and would avoid long-term commitment of budget for operation and maintenance of hatcheries at a time of projected declining revenues. Projects of higher risk and supportive of the production program, but presenting costs or risks which would not naturally be borne by the private sector, would in large part be undertaken by ADF&G. For example, research operations and facilities would also be ADF&G's responsibility. Stream surveys might be the responsibility of the state, but conducted by associations on a contract basis. Joint participation in planning for production facilities and support services, including clear assignment of tasks can occur as institutions mature and obtain the financial commitments consistent with evolving assignments

which will further contribute to an improved and coordinated program.

Another element critical to the joint success of ADF&G and regional association programs, discussed in Chapter II, is assurance over time that financial resources will be sufficient to support a program which will begin to achieve established numerical production goals as part of an upgraded comprehensive regional plan. At present, it appears that the regional associations and ADF&G are strictly limited by statute and available financial resources as to the number and types of production projects they may undertake, regardless of the final outcome of the assessment litigation. Review of proposed long-range association plans reflects a fairly conservative approach to expansion of existing programs. While this may make sense under present circumstances, we suggest that Alaska will not begin to reach appropriate production goals in a reasonable period of time if it is unwilling to assume greater risk and undertake projects more aggressively than indicated by its present course. Improved planning, research and data, and coordination of program activities are steps that will minimize risk over time. The legislature and the Governor must recognize, however, that legitimate expansion of AFRDP consistent with its established goals will require approval of actions and management decisions that involve some yet unanswered questions. ADF&G and the associations cannot achieve reasonable production goals within the present financial, budget and statutory limits.

4. Need for Improved Relationships Between or Alteration of Roles of ADF&G and DCED.

A.S. 16.10.500 et seq. provides authority for a fisheries enhancement loan program. The Commissioner of the Department of Commerce and Economic Development (DCED) is authorized to make loans to qualified regional associations holding permits pursuant to A.S. 16.10.400-470 for the planning, construction, and operation of hatchery facilities. Thus, the financing of regional association activities largely within the authority of DCED. We have indicated above an apparent lack of an appropriate cooperative relationship between ADF&G and DCED by statute. The proposed Policy and Procedures by ADF&G, at page 60, infers that coordination between ADF&G and DCED is necessary for orderly review and approval of permit applications and loan applications. Members of the study group have indicated that relationships between the two agencies are not well coordinated.

DCED operates a number of financial assistance programs and conducts other activities related to the economic development policies of the State of Alaska. It is perhaps for this reason that the financing program for the regional association hatchery program was originally assigned to that agency. We do not believe this assignment of authority for financing of regional association projects is appropriate.

As noted above, the financial viability of proposed artificial propagation is directly related to a number of

biological factors and harvest management strategies, among other things. We have suggested guidelines for evaluation of the economic feasibility of artificial production projects from both a micro- and macro-economic perspective. Again, many of the criteria involved in the evaluation of individual projects, or a broad-based regional program, involve consideration of a number of factors which require the expertise of persons familiar with the science of fisheries production. Further the bulk of analysis related to the financing of regional association projects, not to mention those to be undertaken by ADF&G, involves information not traditionally considered by lending officers. In fact, association grant and loan decisions presently made by DCED are more akin to hatchery program budget analysis than traditional lending practices.

A further point related to ADF&G, DCED and regional association relationships involves recent problems by the Southern Southeast Regional Aquaculture Association in obtaining a final installment of its loan for a major hatchery facility. This failure to make a scheduled installment payment by DCED would effectively have stopped construction at a very late stage of the project, thus rendering the investment in the facility to date as wasted. Concerns of the financial officer might have been alleviated if he had a better understanding of fisheries related aspects of such projects and if project risks were not to be evaluated

within the context of traditional lending practices. Even if financial concerns at this stage of the project were legitimate, it is suggested that holding a loan officer blameworthy for the failing of a project of this magnitude and kind and for a program in a relatively early stage of public experimentation would be most inappropriate. It is (or should be) widely understood that there are technical risks inherent in these programs which may dictate training and experience not common to persons with traditional financial backgrounds.

Finally, the state has not established sufficient standards, guidelines or criteria to evaluate the potential rate of return on investment for its salmon production programs or to evaluate the relative cost and benefits of such programs. This expertise can and should be developed within ADF&G. With this accomplished, transfer of authority for financing of fisheries enhancement facilities from DCED to ADF&G would clearly be desirable. We see no justification for continuing the financial aspects of the program under DCED authority.

5. Need for Improved Relationships Among All Regional Associations.

Regional associations are at varying levels of maturation, and in some instances, have not been formed to the point of approval by the Commissioner of ADF&G. We have

observed in recent meetings with the study group a growing inclination for association managers to discuss among themselves various problems and potential solutions. Communication as to research and planning results, means of operation of facilities, and other activities is occurring. However, members of the study group and others have reported and our own observations have indicated the need for improved relations among the associations. Some of the improvement is necessary because of differences in personalities, and in other cases a misguided spirit of competition among the associations appears to exist.

There is good reason for allowing associations to establish resource development programs at their own respective paces within each region, although in some instances the pace of program and project development has unnecessarily been slowed because of regulatory problems, obtaining necessary approvals, and the like. The experiences of the more mature organizations will be most helpful to those in the beginning stages of development. Much research, data and information has been performed and compiled by some regional associations. The sharing of such information should occur as a matter of course, and it may be necessary to establish a system among the associations to ensure that this occurs. This could be mandated by the state legislature.

It is critical for each association to understand what the others are doing. The potential for duplication of

tasks unnecessarily among the associations exists without a clearly established system of communications. It is suggested that the study group or perhaps an upgraded Fisheries Council be continued into the future, perhaps with a specific mission to ensure continued communication and improved relationships among association representatives (and state agencies).

6. Need for Improved Relationships Among Salmon, Shellfish and Bottomfish Development Program Elements.

We have suggested that the development of Alaska's abundant fisheries resources be viewed and organized as a single program (AFRDP). Competition for research, management, development and investment dollars among program elements at federal, state and local government levels and from the private sector is presently unavoidable among salmon, shellfish and species development activities. This competition among species has been heightened by new opportunities available as a result of enactment of the Fisheries Conservation and Management Act (FCMA).

Assuming the goal for development and utilization of fisheries resources off the shores of Alaska is to maximize potential benefits to the citizens of the state consistent with principles of sound conservation and enhancement, establishment of programs and activities to achieve that goal based upon treating each fishery independent of one another and on a haphazard basis makes no sense. Certainly salmon, shellfish and bottomfish species are at varying

stages in terms of development, utilization, management sophistication, market potential and value, industrial development, and understanding of resource status and potential. All such factors will be reflected in the ultimate budget commitment and programs of the state to affect reasonable maintenance, development and utilization of these renewable resources. However, the organizational and professional disciplines to be applied to proper utilization of all species of fish are relatively the same. The fixing of sound state policies, budgets and management principles for each fishery with maximum avoidance of conflicts, and the sharing of information, expertise and program experiences to maximize effectiveness of each is essential.

In the development of its "Alaska Fisheries Plan," ADF&G acknowledged that salmon stocks can and need to be rehabilitated. Numerical objectives were established by ADF&G to provide minimum annual harvests of 40 million salmon at the end of seven years and 100 million salmon at the end of eighteen years. These goals would be achieved through a combination of enhancement, rehabilitation, management, development research and habitat protection at a cost of 300 million dollars over fifteen years according to the proposed plan. ADF&G acknowledged that implementation of the plan would "require a major effort on the part of fishermen, industry and government alike . . ."

The level and quality of government and private sector planning, management and development activities for shellfish and bottomfish lag far behind those for salmon. The maturity of programs and dedication of state resources to maintenance and proper utilization of these important species differ as well, largely because the legal and economic opportunities affecting the harvesting and production of each has varied.

The study group is well aware that salmon harvests will no longer predominate fisheries development activities because of these newly available opportunities and the economic reality of need for diversified harvesting activities by fishermen formerly able to target primarily on salmon. There has been much talk, and considerable study, planning, and now, pilot projects related to necessary economic development activities to maximize benefits to Alaskans of utilization of offshore fisheries. Most representatives of the industry, fishermen, processors, bankers, public officials and other participants at regional and national conferences on 200-mile limit fisheries (despite differing findings from a variety of consultant reports), indicate that by necessity this new industry will not develop separate and apart from existing fisheries and industry. This reality further establishes the need for a holistic fisheries development and utilization policy and program.

As noted above, responsibility for development activities relating to these fisheries presently resides in a number of different agencies and offices. The need for program activities and budget for each have not been addressed in the context of a single program or policy, priorities affecting each have not been established nor have relationships or coordination among them been imposed. We have been directed by the study group to assess on a preliminary basis alternative means of converting ASRDP programs to the broader program context of AFRDP. Our review is not only to include potential organizational arrangements affecting state activities, but also alteration of the missions and structure of regional associations. To this latter point we will now briefly speak.

It is our view that an altered regional association form (already necessary) which allows such associations to become involved in diversified activities necessary to the development of all fish resources consistent with local priorities and needs is appropriate. This suggested diversity and expansion of authority may seem odd at a time when the financial arrangements for the program are directly threatened by legal extinction. However, certain features of the existing program are most applicable to development needs and opportunities in other fisheries. These include:

1. There is a clear need for involvement of fishermen and other sectors of the industry

in the protection, utilization and development decisions affecting all fisheries.

2. There is a need for fishermen and other sectors of the industry to participate in the financing of all fisheries development activities (the legislature's recent re-enactment of A.S. 43.75, which taxes all species harvested in Alaska waters to finance fisheries development indicates support for this rationale).

3. There are varying needs and interests by region with regard to fisheries development. For example, salmon fisheries development may be a priority to fishermen in Southeast Alaska, while projects related to bottomfish development may be more relevant in the Aleutian Chain.

4. The more flexible the regional association structure is in terms of meeting clear regional needs and reacting to priority development activities, the greater the likelihood of financial and institutional stability.

5. A feature of the regional associations is their clear mandate and need as an organization to be responsive to the variety of interests among local fishermen. We believe that over time, a balanced approach to fisheries produc-

tion will evolve as a result of this program, and that this will occur on a multi-species basis if the mandate and membership of such associations is broadened to include development of and planning for other fisheries.

6. The need for a holistic fisheries approach, if appropriate for state programs, is also necessary for regional associations. This is especially true if the role of user groups in regional fisheries planning (regional planning teams) is to be upgraded.

7. Regional fisheries planning can and should address potential gear and harvest conflicts on a multi-species basis.

Certain other features will need to be built into the regional fisheries development program as a result of the recent Superior Court decision and the need for a secure income and financing stream. If the program assumes more of a local quasi-governmental character than at present (e.g., borough or municipal fisheries development service areas), assumption of a more diverse economic development program may be appropriate. The legislature should address whether newly instituted associations could finance, construct and operate needed infrastructure, marina space, processor facilities (for lease) and other activities much as do port facilities, economic development districts or other local

governmental entities. However, care must also be taken to preserve certain of the private sector features of the present associations in deciding what activities they might undertake.

Assuming that the appropriate institutional arrangements for regional associations necessary to expand their basic authority can be made, necessary relationships will need to be established between such associations and the existing Office of the Governor/Bottomfish Coordinator. Governor Hammond has created a bottomfish task force, whose membership includes state legislators, agency commissioners, and private sector representatives, to define specific goals for the state and to design a work plan for industry development relating to the state's bottomfish development opportunity. In a draft report by the bottomfish program coordinator, dated May, 1979, a program management and organization structure which would have all bottomfish program elements operate at the direction of the bottomfish coordinator, with advice from the bottomfish task force, was proposed. This program proposal suggests that the Department of Commerce and Economic Development would pinpoint areas of industrial weakness and offer strategies and guidelines to strengthen the economic incentive for harvesting bottomfish. The Department would also provide capitalization to the industry through state loan programs, the Commercial Fishing and Agriculture Bank, and the Alaska Industrial Development

Authority. ADF&G would monitor the biological characteristics of the bottomfish resource to provide information for managing the resources for optimum sustainable yield and to assess harvest potential. ADF&G would sample commercial harvest efforts and identify areas of potential conflict between bottomfish fisheries and those of traditional salmon and shellfish fisheries. The Department of Community and Regional Affairs would draw up strategies to assist local communities in alleviating specific local physical and social-economic impediments to development.

While relationships with other fisheries development activities at federal, state and local levels are suggested by the Bottomfish Coordinator's report, establishment of a holistic fisheries development program is not. The proposed program plan to achieve bottomfish development goals and objectives is an impressive start toward the establishment of specific program activities to achieve the state's bottomfish resource utilization goals. However, only limited program budget monies are committed to the resource management aspects of the proposed program. Resource development and enhancement is only vaguely referred to and the relationship between salmon and shellfish fisheries development programs and that for bottomfish is not seriously addressed. The concept of top-level management control over all elements of the Alaskan fishery with provision for coordination among agencies and programs is essential to the success of AFRDP.

B. There is a Need for Improved Information, Data and Research Results for AFRDP.

1. Introduction.

We have discussed the clear need for improved data and information regarding fisheries development activities from economic, financial and biological perspectives, by both state agencies and regional associations, 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 makes short- and long-range planning very difficult.

We have also described the likely prospect of competition for dollars among salmon, shellfish and bottomfish development program activities, and have suggested that lack of a holistic of the fishery and an understanding of its needs will make it difficult for the Governor and the legislature to make proper budget decisions. Not only is a methodology for assessing potential returns on investment and relative program costs and benefits necessary, provision of technical data and information upon which to base such assessments will be required.

Finally, we have referred to the need for greater coordination and expansion of research activities related to AFRDP. This section will describe certain non-financial data and information needs for both ADF&G and regional

associations as well as the expanded research and development requirements associated with development goals for the Alaska fisheries. This section will also describe alternative institutional arrangements which are necessary to meet the goal of improved information, data and research.

2. Need for Improved and Expanded Research for AFRDP.

While there is a major need for improvement of data and information for budget purposes, increased biological information regarding existing and proposed projects and to accomplish the objectives of AFRDP also are necessary. A first step in improving Alaska's research program is establishment of categories of research which will afford biologists a common basis to fix research priorities and goals.

For salmon, we would place federal, state and private sector research into three categories. The first category would include evaluation of the potential for maintaining and enhancing artificial and wild salmon. The second would include development of improved techniques to increase the numbers and quality of artificially propagated salmon. A third category would involve assessment of environmental factors causing variations in the abundance of anadromous species. A further description follows:

Category 1: Evaluation of Potential for Maintaining and Enhancing Artificial and Wild Salmon.

Evaluation should extend to existing wild and artificially produced populations as well as proposed new

production because of the need to monitor the Alaska salmon production system as a whole. Priorities and areas of investigation will need to be continuously re-assessed as information is gathered.

The following specific areas are suggested for priority investigation:

(a) Evaluate the economics of enhancement - benefits versus cost or return on investment to improve knowledge about the economics of fisheries.

(b) Determine population levels and behaviors of wild and artificially produced stocks, and population interactions for the purpose of reducing negative impacts. This would include determination of catch distribution and migratory routes for mixed stock fisheries.

(c) Assess environmental limits for productive capacity of wild and artificially produced stocks.

(d) Determine and solve disease problems as they relate to stocking policies.

(e) Identify valuable stocks, including measures of isolation or inbreeding, and examine opportunities for new introductions both in nature and artificial facilities.

Category 2: Improved Techniques to Increase the Numbers and Quality of Artificially Propagated Salmon.

Research should be aimed at improving the cost effectiveness of artificial propagation systems through

modification of existing technology or the development of new culture techniques, including increased survival of artificially propagated salmon. It follows that newly developed techniques must ultimately be shown to contribute significantly to the fishery under carefully controlled pilot-scale rearing and/or release experiments. Examples of recommended research are given under the five following headings:

1. Physiology: Development of physiological, biochemical, and endrocrinological measures to assess the effect of the rearing environment on smolt quality. Development of smoltification indices as a tool to predict optimum time for release and techniques to enforce, advance, or delay smoltification.

2. Genetics: Development of brood stock management and breeding regimes to identify and enhance those characteristics of salmon that produce the greatest benefit to the fisheries. Develop strain of disease-resistant, fast-growing, early-maturing salmon. Test the application of various brood stock techniques and breeding regimes to particular artificial propagation strategies.

3. Disease: Development of new methods for diagnosis and prevention of hatchery diseases.

4. Nutrition: Development of cost-effective feeds using new or under-utilized nutrient sources.

5. Behavior: Development of a technology to control migratory and homing patterns in appropriate circumstances.

Category 3: Environmental Considerations.

Enhancement, which is defined as all means of increasing production--both natural and artificial--of anadromous salmon, not only is dependent upon the successful rearing of the animal, but also the ability of the animal to survive in its total environment. Information is required to assess the effect of habitat alterations on the fish. Emphasis should be given to delineating environmental factors, good and bad, causing variation in the abundance of anadromous species.

1. Habitat Maintenance.

Studies to be directed toward improving existing habitat, including in-stream flow and temperature requirements and barrier passage.

2. Evaluation of the Animal and its Habitat.

To assess environmental changes, it is necessary to measure the response of the animal to such changes.

Establishment of these research categories suggests the need for a long-range research program in Alaska to improve salmon resource development activities for natural and artificially produced salmon from the point of egg take or implantation (including improved incubation methods) to

the emerge stage, to survival through the full migratory pattern of the fish. Research related to the stages of a salmon's survival and growth should be undertaken on a cooperative basis with the federal government, University of Alaska, and others with research capabilities consistent with the jurisdictional interests of each. For example, assessment of the salmon in the ocean environment, which is within the jurisdiction of the federal government should be a priority of the National Marine Fisheries Service. It appears that research relating to environmental concerns are now a priority of the U.S. Fish and Wildlife Service, and to a lesser degree the U.S. Forest Service. Research relating to hatchery operations and performance and that relating to the natural environment in fresh waters, including certain research relating to environmental considerations, would appropriately be the priority of the state. Discussions with study group members indicate that this division among federal and state research activities is evolving on an informal basis.

Biological standards for construction and operation of hatcheries and other artificial propagation projects need to be established as part of the comprehensive planning process. ADF&G has done some work in this area. However, the adoption of final standards will require further research and analysis on the impact of such projects on existing natural runs; the viability of projects in the face of

competing beneficial uses of watersheds, and a wide variety of other critical biological issues will also require additional research before final standards can be established.

The establishment of guidelines to evaluate potential areas for the construction and operation of hatcheries and other projects, and evaluation of performance of such projects will necessarily require improved data and information regarding stock identification (i.e. tagging, scale studies and various other marking methods), and stock assessment through improved means of counting salmon in various stages of the life cycle. Such data and information will be necessary in order to make improved management decisions, including those related to the development program.

For bottomfish, the draft report to the bottomfish program coordinator of May, 1979, describes a role for ADF&G in the development of fisheries management plans for offshore fisheries. While the management authority over such resources largely resides within the North Pacific Fisheries Management Council, ADF&G is recommended as the state entity responsible for overseeing the activities of the Council and recommending sound management practices to ensure protection of bottomfish resources. Data and information and research activities relating to both shellfish and bottomfish lag behind that available and presently being conducted for salmon. Included among those proposed activities to be undertaken by ADF&G for bottomfish which relate to the above research, data and information goal, are the following:

1. Coordinate research activities and cooperate in the design of needed projects with other research agencies.
2. Sample commercial harvests for biological, effort and technical data in a manner and volume which is statistically significant.
3. Assess resource independently of the commercial harvest (survey, tagging) and analyze data collected.
4. Collect and distribute to the public relevant biological and technical information generated by resource agencies, including ADF&G.
5. Identify areas of conflict between the bottom-fish fishery and present historical fisheries and recommend measures to resolve these conflicts in a manner resulting in optimum yield from these interacting fisheries.

Discussions with a number of persons in the industry, federal and state policymakers, and others, indicate that the single most important effort to be undertaken by government in the next few years to ensure the appropriate development of off-shore fisheries is related to the research and data goal. The concern has been expressed that investments in some fisheries may be lost because so-called under-utilized species may already be on the decline as a result of over-harvesting by foreign fleets. Mistakes of the past regarding

other species which allowed overharvesting without consideration of resource impact should not be repeated. The potential to enhance presently depressed species needs to be evaluated. The role of the state in protecting resources off its shores cannot be minimized. If new industry or benefits are to accrue to Alaska by development of off-shore fisheries, there is a legitimate state interest in doing that which is necessary to protect these resources. The state can best accomplish this by preparing to be an effective advocate before and assistant to the federal resource manager.

While research relating to shellfish management and development is in a more advanced stage than for most bottomfish species, this may not be true on a world-wide basis. Accessing foreign data and information developed with regard to off-shore fisheries may begin to offset some of the information gaps.

The proposed research, data and information program to be undertaken by ADF&G pursuant to the report of the bottomfish coordinator is an ambitious one. Priorities will need to be established between this and other fisheries research and information development programs. Clearly, ADF&G will need adequate funding if it is to begin to accomplish the suggested goals.

2. <u>There is a Need to Coordinate Research and Development and Information Systems Among Federal and State Agencies and Regional Associations</u>.

We have sought to identify certain research cate-

gories and information needs which over time must be met in order to maximize the productivity of AFRDP. Another factor necessary to the accomplishment of this goal is improved coordination among federal, state and private sector research activities. Avoidance of unnecessary competition for dollars among state agencies and duplication of activities among all research entities, as well as the establishment of priorities for research consistent with guidelines and criteria, can and should be accomplished with or without legislative action. However, a legislative mandate for improved research coordination may be required.

Perhaps the single most important means for ensuring greater coordination of research would be the establishment of a comprehensive joint research facility in Alaska. As has been previously discussed, Alaska may not be receiving its fair share of fisheries research benefits when compared to other states. Particularly in view of the fact that it produces as much as eighty percent of the nation's bottomfish resources, is the largest producer of salmon, and is a major source for shellfish. In Washington, a joint research facility is being funded in large part by the federal government and is to include state, tribal and university research facilities as well. Justification for the joint facility included the obvious need for improved research coordination, increased information and greater likelihood of joint projects, an expanded skill base for research as a result of centraliza-

tion of research staffs in a single facility, and the avoidance of unnecessary duplication. Such a facility may be more appropriate for Alaska and is necessary to attract quality research staffs, appropriate levels of funding for state-federal projects, and to respond to the major research requirements evolving from development of new off-shore fisheries. Such a facility could be jointly funded by federal and state governments.

A second major step at improving coordination among research entities is to clarify research responsibilities among programs within AFRDP itself. As previously indicated, a major thrust of an improved AFRDP will require clearer definition of the roles and responsibilities of state agencies and regional associations. It has been suggested that a long-term policy could be established to specifically provide that research activities by or in behalf of the state be the responsibility of ADF&G. Were this accomplished, assurances must be provided that regional association needs will be met, possibly by legislative mandate. Establishment of a comprehensive regional plan for salmon fisheries development and other species can and should include fixing research priorities for the region. Of course, continuous upgrading of the comprehensive plan based on experience and information developed over time will be required.

A third means of improving coordination among research activities may be found in action already undertaken

by the legislature. The Science and Technology Act of 1978 established a statutory framework for the creation of the Alaska Council on Science and Technology (ACST), a comprehensive planning mechanism to guide important research activities in support of state objectives and to ensure the efficient transfer of resulting data and information. This act reflects legislative recognition of the importance of the role of science and technology in public policy and decision making.

The Council's activities are to include:

1. Objective evaluation of the need for specific research;

2. Set priorities for state research requirements;

3. Identify and evaluate immediate and future options available to solve a particular problem or implement an idea; and

4. Coordinate data and information exchange among research organizations to avoid unnecessary and costly duplication of effort.

The Council's authority is not limited to fisheries research activities. Additionally, its involvement in evaluating and coordinating priorities for research by the private sector, the federal government, and others, appears somewhat limited.

We believe ACST can provide an appropriate model for ensuring coordination and fixing of appropriate research priorities for fisheries in Alaska. It might be possible to

establish a sub-committee to ACST to deal specifically with fisheries research activities. (Note: That Council membership includes representatives with fisheries-related research backgrounds from the University of Alaska, the U.S. Department of Commerce and ADF&G.)

An alternative approach might be establishment through legislation or executive order of a fisheries research council or work group, to perform many of the fisheries related tasks of ACST. A council would be responsible for establishing cooperative agreements with federal research agencies and private research laboratories; reviewing and incorporating research priorities established by regional associations through proposed regional planning processes; and, working with the state legislature in the development of budget proposals to fund an improved and expanded research program. The committee could also oversee the funding, design and construction of a joint research facility. Membership on the committee might include representatives from the U.S. Forest Service, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Bureau of Indian Affairs, ADF&G, the Legislative Affairs Agency, the Alaska Department of Transportation, the Office of the Bottomfish Coordinator, and representation from the Regional Associations and Native Corporations, among others.

A fourth means for improving research is the establishment of cooperative agreements between federal and

state agencies to ensure research consistent with the needs and priorities of AFRDP. ADF&G has in effect a cooperative agreement with U.S. Forest Service, although this agreement does not significantly address research coordination as discussed above. There is considerable interest and precedent at the federal level in providing for coordination with state activities through interagency agreement.

The legislature can mandate that the regional associations and the state negotiate cooperative agreements with all appropriate federal agencies. These agreements should not necessarily be limited to fisheries agencies or affect the research function alone. Research conducted by environmental agencies, industrial development agencies, economic planning programs, and others will occur and coordination is appropriate if AFRDP is to achieve its lofty goals.

A fifth important means of upgrading the research and information development elements of AFRDP is establishment of a uniform reporting and accounting system for each association. State agencies (DCED and ADF&G) and legislators have to date been relatively critical of the level and quality of information available to them regarding internal activities of the associations. While an annual report by the regional associations is required, a more sophisticated budget and accounting system by which the legislature can evaluate individual regional programs and ADF&G projects will be

helpful. Economic data and financial information consistent with the methodology described in Chapter I should be required.

In analyzing economic and biological projections, as well as total program results over the long-term, it will be necessary for regional associations and ADF&G to work from much common data. This is necessary to compare the effectiveness and efficiency of different programs and approaches to resource development undertaken by the associations and federal and state agencies. Any improved 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 costs to the associations. Obviously, the regional associations must participate in any program effort at information and data system development. The state-wide comprehensive planning process might be an appropriate vehicle for accomplishing this.

C. There is a Need to Improve Relationships With and Expand the Contribution of Federal, Local and Private Sector Programs Affecting or Having Potential Impact on AFRDP.

1. Introduction.

We have identified in outline form a number of federal fisheries programs which have direct and indirect impact on achievement of the goals of AFRDP (see Appendix B for outline presented to the study group), and have discussed the need for federal and state research coordination. Improved relationships with local governments have been

discussed during the last two years because of the enactment of the FCMA. A number of commentators have indicated the need for local governments to develop infrastructure, processing capabilities, and other necessary support services to the growing bottomfish industry if Alaska is to maximize the benefits to be obtained from this important resource. We have suggested that local government involvement in the development of all fisheries resources is growing in importance as a result of the recent decision by the Superior Court affecting the authority of regional associations to raise revenues for salmon production and the reenactment of A.S. 43.75 relating to fisheries taxes on all species harvested in Alaska waters or off its coast. The new law provides for sharing a proportion of such revenue with local governments after the end of fiscal year 1980. This will necessitate greater interaction between state program elements of AFRDP and local governments. Finally, the considerable efforts of the state through regional planning processes and the regional association program to increase the input and stake of various elements of the fishing industry in AFRDP have been identified.

Alteration of the regional association institutional form to better assure financial and organizational stability, upgrading of the association's role in regional planning, and expansion of the ASRDP program concept to AFRDP provide the means for increasing private sector and local government

involvement in AFRDP. This section will concentrate on the need for improvement of federal and state relations.

2. There is a Need to Build a Case for a More Equitable Federal Contribution to AFRDP.

Although it was impossible to obtain detailed budget statements regarding commitment of federal dollars to programs and activities relating to AFRDP, we would suggest that a number of factors indicate that Alaska may not be obtaining a fair share of federal research monies commensurate both with its resource availability and potential when compared with other states. While the overall federal presence in Alaska is perhaps greater than in any other state, competition for limited dollars is again a fact of life among the states when it comes to monies which would contribute positively to accomplishment of the goals of AFRDP. A first reality when exploring possible reasons for less than appropriate federal expenditures relating to Alaska's fisheries than may be justified is the state's comparative lack of presence at congressional and federal agency levels. Alaska's Congressional delegation is small, and in recent years has been forced to concentrate the bulk of its efforts to the D_2 lands issue.

A second reality is that Alaska is not perceived as conveniently located by most persons in the lower forty-eight states. Federal regional offices and major district offices for the Western region are located in large part in

Seattle and Portland. Fisheries policy is generally made in these offices or in Washington D.C. Most of the major regional and local fisheries research facilities are located outside the State of Alaska. These and other factors may have tended to reduce Alaska's input into federal decision making.

An expanded federal contribution to AFRDP is clearly justified. First, the federal presence in Alaska is greater than in any other state in the union. Second, considerable degradation of fisheries resources in Alaska occurred during years in which the federal government was responsible for management of the resource (before statehood). Third, a major proportion 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, the need for expansion of fisheries resources to meet subsistence and other needs of Alaska natives will be heightened in coming years. Finally, the State of Alaska is among the most economically dependent of any of the states on its fisheries.

Research needs related to Alaska's unique fisheries problems (e.g., weather, methods of stream classification to be applied to the large number of Alaska streams, migration patterns, etc.), dictate establishment of research priorities to achieve the goals of AFRDP. An articulation of these

needs will help Alaska better justify expanded federal and state expenditures. Coordination of research activities with federal agencies through cooperative facilities and agreements will be a further important step towards justifying increased contributions to meet the goals of AFRDP.

3. There is a Need for Greater Federal-State Regulatory Coordination.

We have identified a number of federal requirements and regulations which can (and do) significantly increase costs and reduce the productivity for AFRDP. The regional associations have experienced the need to obtain an excessive number of permits from federal agencies merely to begin their operations. These requirements are also imposed on ADF&G. Regulations affecting the development of the bottomfish industry are perhaps even more difficult because of the broad jurisdictional authority of the federal government over coastal zones outside three miles. While many and perhaps all of the permit requirements are justified, the process for obtaining necessary approvals can be greatly simplified. The first step should be a concerted effort by the state to consolidate its permit requirements, eliminate duplication, and provide services which may include a one-stop licensing process for AFRDP activities.

Alaska has already enacted legislation for a one-stop licensing program, and this program could serve as a vehicle to minimize regulatory impacts on AFRDP. The state

program could reasonably be applied specifically to fisheries resource development projects on a priority basis. A necessary next step would be the expansion of this program to include federal regulatory activities. AFRDP activities, including the development of salmon hatcheries, other enhancement projects, infrastructure development, and necessary support services for a growing bottomfish industry, could also provide an appropriate model means for bringing about coordinated and consolidated non-fishery related federal and state regulatory 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 federal government as a potential vehicle to achieve rational development through simplified processes, monies are available to incorporate measures of regulatory reform and coordination into this process. As part of a special AFRDP program effort (perhaps to be undertaken by the study group or Fisheries Council at the direction of the legislature), policies, processes and initiatives which will ensure improved coordination by federal and state regulatory activities should be developed.

It is noteworthy that most existing fisheries statutes, not to mention upland regulatory activities, specifically authorize coordination, and in some cases, the federal government has appropriated funds for the establish-

ment of such processes through programs other than coastal zone management. Yet, implementation of model programs for specific interest areas (e.g., fisheries development) are in effect only on a limited basis to date. Impetus towards development of off-shore fisheries can be utilized as a further rationale for incorporating a model permitting project for AFRDP, which could be funded in large part by the federal government.

4. <u>There is a Need to Identify Federal Programs Which May Contribute to Accomplishment of the Goals of AFRDP</u>.

Most states have difficulty identifying on a continuing basis the many federal programs which may be utilized to contribute to accomplishment of broad state policies. The State of Alaska can and should make special efforts to identify federal activities and funding sources, not to mention those in the private sector, which can be utilized to contribute to the accomplishment of the goals for AFRDP.

A major argument against seeking federal financing for fisheries development programs is a legitimate concern over the "strings attached" to such funds. Given the level of federal presence in Alaska, this concern is clearly justified. Thus, in the framing of an overall Alaska fisheries resource development program, <u>attention must be paid to the true cost of federal funding</u>. It is suggested that loss of resource management authority or local government

planning control over development activities is hardly worth the sacrifice for additional federal dollars.

The legislature can mandate identification of information and data needs for effective intergovernmental advocacy and relations, coordination with the federal government as discussed above, and a continuous monitoring of federal programs to ensure maximum support for AFRDP. Because working with the federal government can involve considerable time and effort, any monitoring and fund seeking activity should be measured by the legislature, over time, on a cost-benefit basis. Building the expertise in working with the federal government is a necessary element of this program.

5. <u>There is a Need to Evaluate AFRDP Program Goals in Relation to the President's Recently Announced National Policy on Fisheries</u>.

In May, President Carter announced a national fisheries 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 reversal of existing federal policies relating to fisheries activities. As indicated in prior study group meetings, the U.S. Office of Management and Budget has indicated in the past no special treatment of fisheries related programs is justified and all such programs must be considered as in competition with

other resource and economic development projects. While this reversal in policy indicates greater federal interest in fisheries development, the study group must understand that the impetus for the change in policy is not salmon fisheries development.

We are aware of considerable national interest in the proper development of Alaska's fisheries consistent with this new policy. While the state is taking a number of actions to take advantage of the national policy, this is not a coordinated or priority activity at this time. We suggest that a major state effort be undertaken to upgrade AFRDP and effective presentations of state oriented proposals to federal policymakers are essential to achieving a more appropriate federal contribution to the state program.

Alternative Institutional Arrangements for Consideration by the Study Group and the Alaska State Legislature

A. Introduction.

We have discussed a number of potential reforms to AFRDP which we believe are necessary to accomplishment of the broad fisheries development goals and objectives established by the state legislature and the executive branch for expansion and utilization of all the state's fisheries resources to the maximum benefit of its citizens. We have directed attention to the need for sound economic evaluation of AFRDP projects and programs prior to and during the course of

tneir operation, means of achieving greater financial stability for AFRDP program elements, and evaluation of institutional needs to achieve broad program goals. This review suggests a number of alternative institutional arrangements and possible reforms which should be considered by the legislature during the 1980 session. It is the purpose of this section to assist the study group in addressing certain alternative approaches to reform of AFRDP.

Alternative approaches include:

1. Options to assure greater central management control and horizontal coordination among all 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.

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

We have identified a number of institutions at the state level directly involved in or impacting on AFRDP. Additional to those are a number of specific programs which indirectly affect accomplishment of fisheries development goals of various programs. (See Appendix A.) The needs and

missions of these many programs or offices must be also considered in the development of any proposed alternative organizational structure for AFRDP.

Option 1 - Maintain Present Organizational Structure, With Firm Legislative Mandate for Inter-Agency Cooperation and Coordination of Activities, and With Reforms to Individual Programs Responsive to Above Findings and Conclusions.

This approach would contemplate no alteration of the organizational structure of AFRDP as it presently exists, but would require legislative and executive action on a program-by-program basis to effect coordination and many of the necessary reforms. Authorities of various program activities would be altered or expanded to allow the programs to perform in a manner consistent with approved recommendations.

Legislative mandates to coordinate program activities already exist in a number of cases. In many instances, however, effective implementation of enacted programs has not occurred. Thus, a weakness of this approach is the lack of assurance that coordination among the wide variety of AFRDP activities will occur through clearer direction from the legislature.

Specific identification on a program-by-program basis of each activity which must be coordinated may be difficult from a legislative perspective because it would require a large number of amendments and detailed definition

of agency relationships. Certain of the program elements (e.g., office of the bottomfish coordinator, division level program activities, etc.), are not specifically established by state legislation. In other cases, reorganization deemed appropriate by the executive branch may be inhibited by legislation which specifically authorizes and refers to division and office level activities.

While we have proposed a number of reforms which could require legislation affecting the various programs of AFRDP, we doubt that the goal of centralized coordination and consolidation of program as has been suggested can be achieved without some stricter mandate and clearer form of direction to the executive branch. A lack of accountability for such coordination, except on an individual program basis, would imply that AFRDP program results can be achieved through piecemeal management and without significant centralized direction. We do not believe this can be realistically achieved.

Option 2 - <u>Present Structure, but Defined Through Executive or Legislative Action, With Lead Agency Responsibility for Certain Program Activities Within AFRDP</u>.

This organizational alternative contemplates establishment of a lead agency which would be responsible for directing implementation and coordination of all activities related to AFRDP. While the basic authority of each individual

program, division or other activity would not be altered except as pursuant to accepted recommendations, their responsibility to respond and work cooperatively with the lead agency in establishment and implementation of AFRDP would be clearly established either by legislation or executive order.

This alternative 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 a best choice among the candidates. Clearly, fisheries development involves more than just an understanding of salmon and other species. A lead agency must have or <u>be able to draw expertise</u> on such issues as the economics of fisheries, infrastructure development, construction of capital facilities, administration projects, project financing, among other things. No single agency presently has this broad capability.

However, we believe that the agency with the clearest mission and most relevant skill base to the task of over-seeing AFRDP is the Alaska Department of Fish and Game. We have discussed the problems of separating financial and operational aspects of the regional association program and recommended transfer of the financing program from DCED to

ADF&G. Such a consolidating action would not be necessary in other instances. What is necessary is establishing that by statute a lead agency be provided with sufficient management authority and control over various agencies and program elements to achieve and direct cooperation and support for AFRDP.

We believe that ADF&G is best suited to serve as lead agency because their understanding of resource issues is critical in the development of management, conservation and enhancement strategies for all species. As noted in our discussion relating to establishment of a methodology for economic evaluation of programs and assessment of financing needs of such programs, most proposed criteria or standards are clearly related to accurate assessment or projection of biological factors. However, a typical weakness of state fisheries management agencies is that they are dominated at mid-level and top management levels by persons who have worked themselves up through the ranks. In many cases, such persons lack the broad range of professional and management skills necessary to oversee the variety of disciplines involved in a major resource development program. Thus, if ADF&G is to assume a lead agency role, evaluation of existing talent within that agency and its capacity to perform in a managerial capacity consistent with the goals of AFRDP should occur.

We are impressed with the institutional arrangement

in effect for Alaska's bottomfish development program. While we do not believe it is essential for a program coordinator to reside within the office of the Governor, it would appear that this has contributed to greater visibility and attention to the off-shore fisheries opportunity than might have occurred had the program been located within a single department at the outset. Over time, and particularly if ADF&G or some other department is established as a lead agency for AFRDP, it will make sense to remove the office to that lead agency.

A second feature of the state's bottomfish development activity is the establishment of a bottomfish task force, comprised of individuals within and without state government. The task force serves in an advisory capacity to the bottomfish coordinator and the Governor. Establishment of a similar advisory task force to work with the lead agency in the evaluation of AFRDP options, to offer new ideas and proposed actions, and to assist in the oversight of program activities makes sense. Such a task force would be primarily involved in the evaulation of centralized or state-wide management aspects of the program with regional associations and regional planning teams being primarily involved in dealing with local problems and interests. The legislature has already mandated that a comprehensive state-wide salmon development plan be established. This planning process should be expanded to include other species

consistent with proposals for AFRDP, and a top level task force could be involved in the development and evaluation of this comprehensive plan. A primary goal would of course be to ensure the integrity and protection of regional plans unless they are inconsistent with approved state-wide policies. Finally, we have suggested herein a continuation of the study group or the Governor's Fisheries Council. The functions defined for a task force could be assigned either of these groups if they were reorganized and properly funded. This would help avoid unnecessary duplication and possible competition.

Option 3 - 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 would in many ways mirror Alaska's bottomfish development program. With the many 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 would elevate the level of public visibility for the fisheries development program, it would offer the opportunity for greater policy direction and control from that office, and

it would provide an office responsible for ensuring that agencies not operate at cross-purposes. Again, an AFRDP task force could operate in a manner consistent with the bottomfish program.

If this option were elected, the coordinator would need sufficient staff and direction either by executive order or from the state legislature to clearly define its functions, powers over existing agencies, program goals and priorities. This is not to suggest establishment of a new bureaucracy, but merely a coordinating office with sufficient staff to perform assigned tasks consistent with established goals for AFRDP.

Some negative aspects of this option include the appearance of establishment of a new super agency or "czar" responsible for operation of fisheries programs at the expense of powers of other agencies. Moreover, it would be difficult for this office to maintain control over a wide variety of program elements with only indirect day-to-day oversight and incidental involvement in program operations. The potential for conflict between the office of the AFRDP coordinator and mid-level and top-level management in the various agencies is considerable.

Establishment of an AFRDP coordinator within the Office of the Governor could also be subject to the vicissitudes of politics. The legislature may be hesitant to place necessary powers in such office, and may tend to limit

necessary powers.

Finally, creation of an AFRDP coordinator within the Office of the Governor for any long-term period may tend to remove further centralized management and state-wide policy and planning activities from those proposed to be accomplished at regional levels. Line agencies have local staffs and experience or responsibility for close relations with regional entities. An AFRDP coordinator would not (unless his office was to be expanded to include field representation) participate in development of local plans and policies. A major new bureaucracy may have to be developed to deal with fisheries development activities if the new office were to expand its operations and involvement into regional development and planning activities.

Option 4 - Establish a Separate Fisheries Development Agency or Office Through Executive Reorganization Authorized or 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 might be possible.) This agency would have the specific responsibility to work directly with regional associations in a manner consistent with newly established

policies. Positive aspects of this alternative include clear high-level visibility for AFRDP by establishment of a special program and agency; single agency control over budget and responsibility for all elements of AFRDP; and, separation of major development and management activities. This organizational option may more clearly separate development and management from a regional association perspective, with key association relationships evolving with the development agency rather than the harvest management agency.

Negative aspects include likely competition for dollars between fisheries development and fisheries management agencies, perhaps greater difficulties in coordinating fisheries development and management activities which are necessary to the success of both programs, and the possibility of a larger bureaucracy with increased program costs. Moreover, it would be impossible to include all program development activities within a single agency. For example, activities pertaining to infrastructure development, data collection applicable to both management and development programs, a wide variety of state regulatory activities, and the like, would not likely be included in this "umbrella agency."

C. Organizational Alternatives Affecting Greater Regional Coordination Between State Agencies and Regional Associations.

It is our view that the peculiar needs of the many diverse regions of Alaska must continue to be addressed by

the study group and the state legislature. We have already suggested a number of reforms to affect improved relationships between the state and regional associations. Among major recommendations are:

1. Expansion of regional association authority to become involved in development activities related to species other than salmon (i.e., an active role in AFRDP);
2. Upgrading the regional planning process and regional association involvement in that process;
3. Upgrading of data and information and benefits of research to be available to regional associations and establishment of procedures to ensure sharing of information and research among regional associations and state agencies;
4. Consolidation of regional association financing and operational programs within a single agency;
5. Establishment of clear biological, economic and management guidelines against which all development projects and their performance can be measured;
6. Establishment of a one-stop model permit program for fisheries development activities;
7. Mandatory cooperation between ADF&G and

regional associations regarding specified activities;

8. Establishment of a coordinated research program, including construction of a joint or consolidated research laboratory and coordinated research planning mechanisms and methods to fix research priorities consisten' with AFRDP program goals;

9. Mandatory coordination of AFRDP activities through development of cooperative agreements between ADF&G, regional associations and appropriate federal and state agencies;

10. Establishment of a ten-year operations plan which ensures development and clear delineation of responsibilities of regional associations and state agencies to be assumed over the long-term, and which seeks to build requisite skills in such associations and state agencies to ensure accomplishment of AFRDP goals; and,

11. Alteration of the regional association form to include greater local government involvement, this to ensure stability of financing and improved operations.

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 legislation, and would expect the study group to focus on this or similar approaches, we have directed our attention to alternative institutional arrangements relating specifically to the operations of regional associations and ADF&G, including those outlined above. For purposes of this discussion, we assume a basic goal of facilitating greater responsiveness of AFRDP to regional development needs. Alternative institutional arrangements would appear to include:

1. No alteration in ADF&G or regional associations (this option would assume that the financing problems for regional associations might be resolved without altering the regional association form);
2. Expansion of ADF&G regional staffs to better address local development needs and implement a coordinated program to include increased support services to regional associations;
3. Legislative establishment of regional offices, empowering a regional administrator to fix ADF&G regional policies and implement approved programs--such legislation would include clear definition of relative roles and responsibilities of ADF&G regional offices and regional associations.
4. If an AFRDP coordinating office is established

in the office of the Governor, somewhat similar to establishment of an office of the bottomfish coordinator, it may be appropriate to establish regional offices to ensure a direct link between regional associations, fisheries development program staffs, and the Office of the Governor.

5. If development activities are in any way separated out from fisheries management activities, regional relationships between these functions would have to be established for purposes of regional planning and program implementation and operation.

In assessing institutional arrangements to further improve the level and quality of consideration of regional interests and increased coordination among regional associations and development program staffs, certain key issues must be addressed. Included are:

1. Assessment and identification of roles, responsibilities and powers of both regional associations and program staffs in planning and in the development of policies and implementation of programs. Again, we have suggested that the evolvement of AFRDP, including final institutional arrangements consistent with goals and recommendations herein, will involve

approximately a ten-year planning and implementation cycle. Assignments of responsibilities and powers will be dependent upon the maturation of various program elements and their relative capacity to perform assigned tasks. In many instances, experimentation will be required on a model project basis (e.g., regional association involvement in development projects related to species other than salmon).

2. Appropriate assignment of technical staff support on the basis of needs of each particular region;
3. Arrangements to ensure resolution of disputes and conflicting policies among the regions;
4. Establishment of a methodology for implementation of state-wide policies region-by-region;
5. Establishment of a methodology for making responsible and equitable budget decisions as they affect each particular region;
6. Establishment of means to assure coordination between regional officials and all programs directly or indirectly involved with AFRDP; and,
7. Identification of means to establish relationships between regional officials and external activities (e.g., federal, private) affecting

fisheries development activities in the region.

We have not focused on developing a detailed institutional arrangement related to the organization of regional agency staffs. This is a matter which may appropriately be addressed by the study group prior to the 1980 session, at least to determine necessary first steps to be considered and reviewed during the course of the proposed ten-year reorganization plan. While we have developed a number of concepts regarding the regional organization structure, these have not been sufficiently tested or evaluated to be included in this report.

D. Organizational Alternatives Affecting Regional Associations.

1. Introduction.

As discussed in Chapter II, the recent Superior Court decision ruling that A.S. 16.10.530 is unconstitutional forces us to consider a number of alternative institutional arrangements to the present regional association program. This would have been necessary in any event because of the need for greater financial and organizational stability for the program.

The State Attorney General has suggested the need for legislation and has identified five "potential legislative alternatives to the now unconstitutional statutory scheme" in a letter to the Governor dated July 20, 1979. We have

suggested a sixth option which would require alteration of certain constitutional provisions and have elaborated on alternative options pertaining to establishment of service areas. We also explore alternative approaches to financing regional associations in the future.

2. Potential Institutional Arrangements, Assuming No Constitutional Revision.

Option 1 - Active Legislative Involvement in Regional Association Program.

Article VIII, Section 5 of the Alaska Constitution provides:

> The legislature may provide for facilities, improvements, and services to assure greater utilization, development, reclamation, and settlement of lands, and to assure fuller utilization and development of the fisheries, wildlife, and waters.

The legislature could on an annual basis approve specific facilities and services (or appropriate funds on a more general basis) and directly appropriate funds to the associations for specified purposes. The level of funding of approved projects and services could be established with or without reference to fisheries taxes collected by legislature, but an appropriation would be required (see Article IV, Section 7 of the Alaska Constitution prohibiting dedicated funds). Any taxes collected for fisheries development would be by the state, assessments as declared unconstitutional in Alex v. SSRAA would not occur.

This option suggests legislative control of all activities to be undertaken by regional associations, much as if they were individual state agencies. Funds for planning have been appropriated this past year for regional associations, and appropriations to DCED's loan fund for the program also occur.

More direct legislative involvement in the program than at present arguably presents problems. First, subjecting the program to the vicissitudes of the appropriations process on an annual basis offers limited financial stability. Second, the concept of user pay is not present and commitment to the program may be limited because of the heavy front end investment in both the F.R.E.D. and regional association programs without special arrangements to offset this burden with contributions from those who would achieve the primary benefits. Third, regional associations would have to annually lobby for financial support. Fourth, there would be excessive competition for limited dollars among the associations and F.R.E.D. Fifth, this financial plan does not provide for any reduction in operating and maintenance costs to the state over time. Because of these problems, we suggest that this option be considered only as an interim funding source.

Option 2 - <u>Establishment of Special Service Districts Consistent With Constitutional Provisions</u>.

Article X, Section 5 of the Alaska Constitution

provides that a borough assembly may establish service areas to provide special services within its boundaries, and authorize "the levying of taxes, charges or assessments within a service area to finance the special services." Article X, Section 6 provides that the legislature may do the same for unorganized boroughs. We have suggested in Chapter II that alteration of the regional association program to conform with the service area concept could provide greater organizational and financial stability than does the present form.

Conversion of the regional associations to a service district, however, presents some problems. The first problem is the obvious alteration of the regional corporations to a quasi-governmental arm of local government. This may present a philosophical problem for legislators, association members and local governments themselves who may not be pleased with so strong a user controlled form of governance. Additionally, some may not accept this arrangement as an acceptable alternative to private non-profit or for-profit aquaculture.

Second, borough boundaries do not conform with those presently established for the associations. The legislature can likely fix relatively the same service area boundaries as for regional associations in the unorganized boroughs. It will be more difficult for organized boroughs to extend service areas beyond their boundaries (see Article

X, Section 5 of the Constitution). Article X, Section 13 of the Constitution authorizes cooperative agreements for joint administration of any functions or powers among local government units. Extending jurisdiction of a service area to parts of another organized borough, but perhaps not all of it presents obvious problems. Reaching agreements among these local boroughs will not be easy, as powers to be divided among the governments will be the subject of dispute. Pressures for changes of governmental roles and controls could be a constant as local interests become concerned with their perceived share of program benefits. Cooperative agreements can be broken or altered under difficult circumstances. There is a valid question whether persons outside the borough but included in the service area will be satisfied that they are truly being represented by borough officials whom they do not elect.

The present association boundaries are founded for good reason. Fishermen are licensed to fish in specific areas in Alaska and the benefactors of the program (and those to be assessed) are easily defined. Borough boundaries, if used, may also present a special "free rider" problem for the regional association program. To the extent boroughs represent smaller districts and are not drawn to reflect where fish are hatched or harvested, aquaculture by such a small service area may inhibit investment in the resource because there is less assurance of returns to the investor

(payers of the assessment).

Another critical issue in the establishment of service areas will be to preserve to a reasonable degree the level and quality of input and control user-benefactors are to exercise for both development and planning activities. The organization and functions of the service area are again a matter for the legislature. It is likely that local officials will expect a greater role in the operation and management of the service area, as they are ultimately accountable for performance. Moreover, to the extent these entities are to provide financing for construction and operation of local port facilities and infrastructure, the impact of such programs on other municipal and borough functions must be considered.

A special effort to resolve problems related to this service area option is necessary, as it offers a number of positive benefits. First, the legislature may be more inclined to accept greater risk and fund more liberally activities of a local government entity. Legislators are used to dealing with such entities; they recognize that accountability for failures or success will exist; local agencies will be able to offer certain services, administrative assistance, and data and information more easily to service districts than to the associations; and, service areas present a more mature organizational form with a wider experience base than do the organizations of existing

regional associations.

Expansion of the authority of the regional associations consistent with the concept of AFRDP fits especially well with this possible alteration of the association form. Many of the development activities related to utilization of off-shore fisheries involve funding for infrastructure, port facilities, marina and dry-dock space, etc. These activities are often funded in large part by local government entities (e.g., port districts). Additionally, attraction of federal and state matching funds for such purposes will be easier for local government entities than the present associations, and the local citizenry can be taxed to the extent they may benefit from local development activities. Local government permits will be easier for approved service area actions than perhaps is the case at present for the associations.

Finally, there are some specific legal questions regarding the service area option which need to be considered prior to the 1980 legislative session. First, does the legislature have authority to establish service districts or areas within the organized borough? If so, can the legislature extend such service area bourdaries into another organized borough or the unorganized borough? A positive determination as to these questions would make it possible to establish service area boundaries consistent with those for existing and planned regional associations more easily, and without

Sixth, in the face of the Superior Court's holding that "an incorporated non-profit association may not become a 'service area', either by inference or express legislative declaration," and that the "hybrid creature legislatively conceived cannot survive the constitutional infirmities and defects present at its birth . . .," is it realistic to assume that the regional associations can maintain any of their private or corporate characteristics? Further, is it even possible for some new agency to assess and collect taxes in behalf of or pass through state taxes a regional association which retains these characteristics? Could such monies be collected by or through to Salmon Authorities established by A.S. 16.10.600 et. seq.?

3. Potential Institutional Arrangements, Assuming Constitutional Revision.

Potential constitutional revisions to resolve the legal problems affecting the regional association assessment problem and to affect greater organizational stability include:

(a) Amendment to Article X, Section 5, which allows for establishment of service areas, to allow extension of the boundaries for provision of special services beyond those of an organized borough.

(b) Amendment to Article IX, Section 7, which prohibits dedication of the proceeds

constitutional amendment.

Second, can the legislature mandate that organized boroughs establish service areas for fisheries development and further require that the borough reach cooperative agreements with other boroughs for extension of the service area into their area of jurisdiction? Again, a positive determination will resolve in part boundary problems relating to the service area option.

Third, can the legislature authorize organized boroughs to levy taxes, charges or assessments within a service area (perhaps beyond its boundaries) in behalf of a fisheries development service district established by state legislation and performing most of its functions (other than taxation or assessments) separate and apart from the organized borough? This issue arises if the legislature seeks to separate the regional fisheries development program authority from the taxing authority, with the local government entities (organized boroughs) passing tax or assessment receipts directly through to the program. The problem of dedicated funds from a local government entity needs to be addressed if a positive determination is made that such separation can occur. A related and similar question involves what level of control or authority over fisheries development activities must be exercised by borough officials if the service district concept is adopted?

Fourth, in the case of the unorganized borough,

what entity would be responsible for taxing or assessing fishermen in behalf of the association or service district established by the legislature? Additionally, in the case where a borough service area is extended into the adjacent borough or unorganized borough, who collects taxes or assessments from fishermen licensed to fish in areas outside the borough, but in the service area?

Fifth, we are concerned about preserving the voluntary assessment aspects of the existing program. Presently, fishermen in a given region must elect to form regional associations and assess themselves for aquaculture development activities. We have discussed the possibility of diverting a portion of state-wide fish taxes (A.S. 43.75) to the regional association or its predecessor organization. Another possibility is to increase this tax, in lieu of an assessment or separate local or state-wide tax for aquaculture. Regional fishermen might then have the option to elect <u>not</u> to pay a certain percentage of the state tax (e.g., that percentage added to the existing tax). Will a state-wide tax, with provision that a service district exercise an option either for or against an additional tax for purposes of fisheries development, stand the constitutional test under the due process and equal protection doctrine? A related question involves who must be represented in the organization of the service district and who must be taxed to pass this constitutional test?

of any state tax or license to any special purpose, to allow for dedication of fisheries tax monies (e.g., A.S. 43.75) to regional associations for construction and operation of fisheries development facilities (Article IX, Section 13 requiring appropriations to withdraw monies from the Treasury may also have to be amended).

(c) Amendments to Article X, Sections 1 and 2, which seek to limit potential duplication of taxing authority by allowing the State to delegate its taxing authority to organized boroughs and cities only, to allow assessments or levies by associations established by law for a public purpose. Again, any amendment to the Constitution could be difficult, particularly if its purpose is limited to a single interest or program.

The first of these amendments would be helpful to resolve potential boundary problems discussed above if the regional association form were to be altered to conform to the service area concept.

The second of these amendments would allow the state to collect a tax on fish harvests and direct those

taxes back to the regional association for use in a manner consistent with the present assessment and without an appropriation by the legislature.

The third of these amendments would allow for significant alteration of the regional association form and increase capability to finance its operations. It contemplates the establishment of "junior" taxing districts in any variety of forms. There are many examples in the lower 48 states which might serve as appropriate models for an altered regional association program. We have suggested that port authorities in Washington and Oregon provide an excellent model for "junior" governmental economic development activities similar to those of AFRDP. Port authorities operate pursuant to statute, elected officials administer them, they have bonding and taxing authority (with ceilings on each), and are subject to considerable voter controls.

Economic development districts have been formed pursuant to federal and state statutes to perform a variety of tasks and are somewhat less visible, more limited in authority and political accountability, and largely have been formed in major centers of commerce. METRO, a local authority in King County, is an example of an organization formed for specific purposes (e.g. transportation, sewage control) to deal with governmental problems shared across jurisdictional lines.

While infrastructure development and other economic

development activities may well be inhibited in Alaska as a result of present constitutional prohibitions, the framers obviously felt strongly that the spectre of junior taxing authorities presented more ominous concerns for Alaska's citizens. This may or may not still hold true, but we wonder if the regional association financing problem and the 200 mile limit fisheries opportunity are sufficient impetus to reverse so strong a policy. This is particularly true if there are alternative legislative remedies to deal with this problem.

To conclude, amendment to the Constitution could affect greater flexibility than presently exists for the legislature to alter the basic form of regional associations and to provide greater organizational and financial stability. However, the process to amend the Constitution is by no means an easy one, and to amend certain of the above provisions for the purposes stated herein may not be realistic. We suggest this is an option which may ultimately have to be considered if further legislative attempts fail to achieve a fisheries development program consistent with the constitutional mandate contained in Article VIII, Section 15, that the powers of the state not be restricted to prevent economic distress in the fishery or promotion of the "efficient development of aquaculture in the state".

Chapter IV - SEARCH FOR GOALS

Introduction

We have discussed in the previous chapters a variety of program reforms which may be necessary to achieve the basic goal articulated in Article VIII, Section 15 of the Alaska Constitution: "... to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the State." Article VIII, Section 5 of the Constitution further provides: "The legislature may provide for facilities, improvements, and services... to assure fuller utilization and development of the fisheries..." These provisions indicate the high priority the citizens of Alaska attach to responsible fisheries development. (Note: These provisions do not single out any single species of fish for such development.)

A second series of goals articulated in the Constitution involves the role of local government units in economic development activities. Article X, Section 5 authorizes the borough assembly to establish "service areas to provide special services within an organized borough." Article X, Section 6 authorizes the legislature to do the same in the unorganized borough. The legislature, pursuant to this latter section is to allow "for a maximum of local participation and responsibility." Article X, Section 2 articulates the strong policy of the state against junior taxing districts. The State may "delegate taxing powers to organized boroughs and cities only."

Finally, Article X, Section 13 provides for intergovernmental cooperation or joint administration among local, state and federal governments. These provisions reflect the legitimacy of local involvement in fisheries development activities, but also suggest constraints as to the form such involvement is to take.

We have discussed in detail the financial, economic and institutional implications of these clearly articulated constitutional provisions. It is suggested here that these constitutional goals are sufficient to justify a major expenditure of effort to maximize the effectiveness of all program elements in AFRDP. In fact, our detailed review of studies, program plans and reports, legislation, regulations and policies indicates perhaps too great concentration among fisheries policymakers on the fixing of numerical or other resource development goals, and not enough concentration on the "road map" to achievement of those goals.

Recommendations

With this in mind, we offer little in the way of alteration of State goals affecting AFRDP. We have read the goals articulated in ADF&G's "Alaska Fisheries Plan" for salmon, i.e.,

Short-Term (7 years) - A minimum annual harvest of 40 million salmon.

Long-Term (18 years) - A minimum annual harvest of 100 million salmon.

We have indicated the apparent concentration of regional planning team efforts on the fixing of like goals on a region specific basis and our dissatisfaction with this approach to planning.

The proposed reforms discussed in Chapters I-III suggest that the legislature, the Governor and their constituents should concentrate on a number of improvements to the existing fisheries development program. The basic framework for a solid development program has been developed (with the notable exception of a framework which will assure financial stability to key program elements). Improvement of the program, consistent with the above stated constitutional goals will require in general terms at least the following:

(1) Establishment of a program approach to fisheries development on a multi-species basis (AFRDP);

(2) Improved direction, fixing of program and financial priorities, and coordination among AFRDP program elements;

(3) Establishment of methodologies for the biological, social and economic evaluation of program activities;

(4) Significantly improved and expanded resource data and information;

(5) Expansion of fisheries research in Alaska and improved coordination among federal, state, university and private research activities;

(6) Increased financial stability for state and regional fisheries development programs;

(7) Upgraded planning which addresses region-specific fisheries development needs with input from local user interests and adequate technical support from state agencies;

(8) Establishment of a financial support base and income streams to ensure economic self-sufficiency of development program elements, as appropriate, over a reasonable period of time;

(9) Phasing in of all proposed actions over a ten-year program development cycle, with continued monitoring of progress and reevaluation of priorities and needs; and,

(10) Absolute commitment of the Office of the Governor and the Alaska Legislature to the effective implementation of approved program reforms, recommendations or initiatives.

Each of the above goal statements is directed at improvement of the existing fisheries development program. Each addresses basic needs identified by the study group and the contractors. While there will be disagreement in different circles with some or all of the recommendations addressed in this report, it is our hope that we have articulated a series of program initiatives which will contribute to the accomplishment of the basic goal of the Aquaculture Policy Study Group: to improve on the considerable effort by the State of Alaska to date to provide for the "efficient development of aquaculture in the State," and to "assure fuller utilization and

development of the fisheries." The Constitutional framers and citizens of Alaska have fixed these goals, it is for the Governor and the legislature, with help from their constituents, to effectively implement necessary programs and activities to achieve them.

REPORT

"AN ANALYSIS OF SELECTED ELEMENTS OF THE ALASKAN SALMON RESOURCE DEVELOPMENT PROGRAM"

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STUDY Group 78-79
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An Analysis of Selected Elements of the Alaskan Salmon Resource Development Program

A Report to the Aquaculture Policy Study Group of the Alaska Legislature

By the Firms of:

MILLER AND ASSOCIATES, INC.,

LEONARD LANE AND ASSOCIATES AND,

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December 1,1979

AN ANALYSIS OF SELECTED ELEMENTS OF THE ALASKAN SALMON RESOURCE DEVELOPMENT PROGRAM

A REPORT TO THE
AQUACULTURE POLICY STUDY GROUP
OF THE ALASKA LEGISLATURE

December 1, 1979

December 1, 1979

TO: Members of the Aquaculture Policy Study Group

FROM: Wallace G. Miller

SUBJECT: Final Report

Attached is the final report, An Analysis of Selected Elements of the Alaskan Salmon Resource Development Program.

The draft report presented earlier has been modified as follows:

-The report has been re-edited to improve its readibility and accuracy.

-An executive summary has been included.

-A brief chapter on goals has been added.

-A comments and response section (Appendix I) has been added to list comments and questions we have received as well as our responses to those comments.

As was discussed during our September meeting the report is a report to the Aquaculture Policy Study Group and as such the recommendations contained in the report should not be construed to be reflective of the views of the members of the Study Group.

While Mr. Wilkerson and I have made every effort to set forth an effective and responsible means for achieving a sound fisheries resource development program in Chapters I through IV, we none-the-less realize that not all of the recommendations will be approved and that others are of a longer range nature and will be subjected to further review and discussion.

We are pleased to have had this opportunity to work with you.

Sincerely,

Wallace G. Miller

Wallace G. Miller
President

WGM/sam

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EXECUTIVE SUMMARY

This report sets forth the contractors' findings and recommendations resulting from an analysis of selected elements of the Alaskan Salmon Resource Development Program. This study does not address either the role of the small private or potential role for large for-profit corporations in the state salmon aquaculture program. Care must be exercised to ensure that policy or statutory changes to the state aquaculture program as a result of this report do not have an adverse effect on small non-regional hatchery operations.

Chapter I of the report addresses the need and provides a means for conducting micro and macro economic analyses of the Alaskan salmon fishery. The report recommends that a Return on Investment technique be used by the regional associations to evaluate potential aquaculture projects. The ROI technique is a means for ensuring that sufficient returns will accrue to the project to contribute to the fishery as well as provide the means through a terminal area harvest for the project to eventually become economically self-sufficient.

A second micro economic analysis technique is recommended for government aquaculture projects. This Cost Benefit Analysis technique differs from the ROI method in several important respects. Regional associations, because of their need to repay loans and remain financially solvent, count as "losses", those aquaculture produced salmon caught by domestic non-association members because no revenue accrues to the association from these prior interceptions. Government agencies,

which have a broader constituency, count prior interceptions by domestic fishermen as "benefits" in their calculations of the value of an aquaculture project. In addition, government agencies are not usually dependent upon assessment fees or revenues from terminal area harvests to provide the income necessary to continue in operation.

A second significant difference in the two micro economic evaluation techniques is the value of the catch used in each formula. Ex-vessel prices are used in the ROI analysis because it is the amount association members are paid for their harvest, and it would be the price paid to the association for fish harvested and sold from a terminal area.

Because the intent of a cost benefit analysis is to measure the benefits created by an aquaculture project, the first wholesale price of salmon is recommended for use because it is more reflective of the total value (harvesting and processing) to the domestic economy than ex-vessel prices.

In Chapter I, explicit recognition is given to the need, from an economic point of view, to recognize not only the different stages in the life of a salmon where artificial means can be employed to enhance survival but also the different methods, their attendant costs, as well as differing survival rates which can be employed in salmon propagation. As this analysis indicates, there are a significant number of economic trade-offs which should be considered in the selection of a propagation method.

In addition to the micro economic analysis models, Chapter I recommends the establishment of at least three macro economic evaluation techniques. Whereas the micro economic evaluation models are designed to be applied to specific projects, the purpose of the macro techniques is to provide the state with the economic tools necessary to measure the value of the fishery from a statewide or regional basis. Based upon analyses and information from these models, the state could explicitly formulate an economically sound basis for the fisheries development program.

Chapter II sets forth sources and methods for financing salmon aquaculture programs.

Prior to discussing the financing recommendations it seems appropriate to clarify a misconception about the financial structure of the regional aquaculture corporations. They are non-profit, meaning they cannot sell stock and raise risk capital from speculators. They have three primary sources for financing: fishermen and processors; terminal area harvests in which the association uses part of the harvest to pay operating costs and repay loans; and the state.

Currently all state operated propagation facilities are supported by state appropriations. It is the recommendation of this chapter that ultimately all regional and state production facilities be operated on an economically self-sufficient basis. We do not believe that the regional associations, even if the mandatory assessment were re-enacted, will have adequate revenues available to them to build enough facilities over the next decade to make a significant contribution to the harvestable

number of salmon. We believe an additional state investment in the program, over the next decade, could significantly expand the production capability of the regional associations and allow them to develop to the point where they can assume the managerial and financial responsibility for operating both regional as well as state production facilities. Such an investment will provide two substantial benefits to the state: increased tax revenues and citizen employment from an expanded and more stable fishery and reduced operating costs because the cost of operating state production hatcheries would be shifted from state sources to the primary beneficiaries of the production.

Chapter II discusses the relative advantages and disadvantages of six alternative means for making up the revenue lost as a result of the successful court challenge of the mandatory assessment. As of this writing, option #3, which would provide for a state collection of a regional tax has been reviewed for its constitutional considerations and is being prepared in draft from for further discussion by the Fisheries Council.

Chapter II also contains recommendations regarding the state aquaculture loan program. If a replacement revenue is found for re-establishing the assessment revenue, and if some new revenue stream could be established to provide for the orderly expansion of regional aquaculture programs, then the state aquaculture loan program should be modified as follows:

(a) The $3.0 million loan limitation should be removed;
(b) The loan should be limited to capital construction costs (as defined in Chapter 168, Laws of 1978);
(c) The term of the construction loan should be established at 20 years;
(d) The deferment period should be increased from six years to a maximum of 10 years.

Other recommendations contained in Chapter II include establishing common aquaculture cost categories and a source of funds and applications model. Establishment of common cost categories would aid both the regional associations and the state by providing planning and analysis information. The source and applications of funds model is a standard financial planning technique not only for matching revenue streams to cost categories but is also used as a means for relating long range production expansion to sources for financing the expanded production.

Chapter III contains a discussion of institutional problems and alternative means which could be implemented to overcome these problems. Four general categories of needs are discussed in the chapter. These are: the need to develop means for ensuring that the salmon, shellfish and bottomfish elements of the Alaskan fishery are managed, at least from an overall policy point of view, on an integrated basis; the need to improve coordination among federal, state and regional associations in developing the Alaskan fishery; the shifting of the aquaculture loan program to ADF & G; and, the need to expand and provide for increased coordination of an Alaskan fisheries research program.

The chapter sets forth a variety of alternative means for meeting the identified needs.

In order to improve coordination and provide for a balanced policy management approach over all of the elements of th. Alaskan fisheries, the report recommends the establishment of an Alaskan Fisheries Resource Development Program which encompasses all species. Several options are set forth for achieving this balanced management approach including: an Alaskan fisheries resource development coordinator within the Office of the Governor; establishing lead agency responsibility for the Alaskan Fisheries Resource Development Program; and, establishing a separate office or agency for the program. The assignment of ADF & G as the lead agency over the fishery is the preferred option.

With regard to the need to improve coordination and cooperation among the various elements of the fishery, the report contains a number of optional ways of achieving this need. This includes: enacting a legislative mandate which requires cooperation in certain activities; providing a one stop permitting process for both state and regional fisheries development activities; the use of cooperative agreements between ADF & G, regional associations and federal agencies; the expansion and strengthening of ADF & G regional staffs to improve coordination and support to regional associations; the establishment of a continuing regional association structure to improve coordination among association members; as well as a number of other possible options.

The recommendation regarding shifting the aquaculture loan program from DCED to ADF & G is predicated upon achieving greater consideration in the loan approval process of such biological factors as proposed site location, construction costs, harvest management considerations and other technical factors. The recommendation is also conditioned upon limiting the aquaculture loan to capital construction as discussed in the chapter on financing.

The final need recognized in Chapter III is for an expanded and coordinated fisheries research program in Alaska. The report recommends that efforts be undertaken to expand federal funding of fisheries research in Alaska and further that consideration be given to the establishment of a joint (federal, state and local) fisheries research facility as one means of providing for the necessary research and coordination among the parties involved in the Alaskan fishery.

Chapter IV discusses goals for the Alaskan fishery. The Alaskan Constitution provides an unusually clear goal for the development of Alaskan fisheries. No additional goals are necessary. The remaining need is for effective programs and activities to achieve them.

CONTRACT REPORT

The 1978 session of the Alaska State Legislature established the Aquaculture Policy Study Group as an advisory body to examine a number of policy matters relating to the Alaska Salmon Resource Development Program. Membership in the Study Group includes representatives from the several regional non-profit aquaculture associations, the Alaska Departments of Fish and Game, Commerce and Economic Development and Revenue, the U.S. Forest Service and Department of Agriculture, the University of Alaska Sea Grant program and members of the Alaska legislature.

In March, 1979 the Aquaculture Policy Study Group retained the consulting services of a consortium of three firms. Miller and Associates, Inc., Olympia, Washington; Leonard Lane and Associates, Anchorage, Alaska; and Mr. William Wilkerson, Attorney, law firm of Eisenhower, Carlson, Newlands, Reha, Henriot & Quinn, Tacoma, Washington.

The consulting services to be provided by the team of consultants were defined to include four basic tasks each of which are briefly described as follows:

TASK #1 - Search for Goals

The consulting team was required to research and examine Alaska state constitutional provisions, statutes and other documentation to determine the extent to which goals for an Alaskan Salmon Resource Development Program had been established.

The consulting team was further instructed to examine existing goals and present possible alternative goals to the Study Group for their consideration.

TASK #2 - Institutional and Policy Analysis

The consulting team was required to examine the roles and missions of existing institutions involved in the Salmon Resource Development Program, define existing problems, and recommend alternative institutional arrangements which would be more suitable for obtaining the goals set forth in Task #1.

TASK #3 - Economic Evaluation Techniques

The consulting team was requested to inventory micro and macro economic evaluation techniques, economic factors and methods of analysis and recommend an effective means for making economic evaluations of evaluating Salmon Resource Development Projects.

TASK #4 - Financial Planning

The consulting team was requested to examine the present means of financing salmon development programs, define problems and recommend a model financial planning framework.

The consulting team prepared analytical information for presentation to the Study Group in meetings held in March, May and July.

A fourth meeting was held in late July. At the meeting, discussions and plans were focused upon initiating alternative financing strategies as a result of the State Superior Court ruling in Wayne Alex, etal., v. Southern Southeast Aquaculture Association, etal. As a result of the redirection received during the July meeting, project research priorities were altered. Increased emphasis was to be placed upon developing alternative financing mechanisms to the unconstitutional mandatory assessment.

The consulting team held up preparation of the final report to the Study Group pending the receipt of clarifications to the court decision and to discuss with the Office of the State Attorney General possible alternative organizational as well as financial strategies which might be available to the regional aquaculture associations in light of the court ruling.

This final report incorporates the effect of this late development and attempts in greater detail than originally planned to provide the Study Group with alternatives and recommendations for their further review and analysis which expressly recognize the severe impact on several of the regional aquaculture programs from the ruling. Additional work and analysis of financial and institutional alternatives will be required prior to the 1980 session as a result of present legal uncertainties.

It should be noted that the contractual work almost exclusively focused upon regional aquaculture associations and their interrelationships with government agencies, consequently this report does not specifically cover private, non-association hatcheries sometimes referred to as "mom and pop" hatcheries. As policies or statutes are formulated, full consideration should be given to any effect the proposed changes would have on this group of hatchery operators.

Finally, the consulting team has received comments regarding the report from a number of sources. Because these comments for the most part focus on important issues, they together with responses to the comments have been included in special Appendix I to the report in the hope that this information could aid in clarifying the report and the issues.

The consulting team wishes to express its deep appreciation to members of the Aquaculture Policy Study Group, Mr. John Sund and legislative staff for their interest and valuable assistance in conducting the studies which are contained in this report.

PREFACE

It may be helpful to the reader to understand why the sequence of subject matter is arranged in this report as it is.

Rather than begin this report with a discussion on goals and proceeding on with a discussion of organizational arrangements, economics and financing, it seemed more appropriate to the consulting team to address these subjects in their natural order of occurrence.

In terms of their natural order, the foremost concern about salmon aquaculture is whether it is or can become economically feasible. If aquaculture programs are not or cannot become economically attractive, then there would seem to be little point in carrying the analysis through the remaining subjects, therefore the economic issue is contained in Chapter I.

If salmon aquaculture is or can become economically attractive, it seems the next most appropriate question to raise is who pays for the program and how can this be accomplished, particularly in light of the recent State Superior Court ruling. Financing issues are discussed in Chapter II.

Assuming that salmon aquaculture is economically sound and a method of financing can be developed and implemented, the question of how to organize to carry out salmon aquaculture seemed appropriate for Chapter III.

Appendix I contains some comments and responses concerning various issues discussed in the report.

Appendices II and III contain listings of the state and federal institutions involved in the Alaska Salmon fishery.

If the economic, financing and organizational hurdles can be cleared, only then does it seem appropriate to talk about both existing and potentially new goals as well as other measures which could be adopted to ensure the long term success of the State salmon resources development program, which is covered in Chapter IV.

Finally, in the interest of readibility, we have prepared this report in such a manner so as to eliminate almost all mathematical equations and formulas.

INTRODUCTION

The objectives of this introductory section is to provide a brief recapitulation of the events and circumstances which led to the formation of the Aquaculture Policy Study Group and explain why, at this late date, it is necessary to raise some very fundamental questions about the Alaska Salmon Resource Development Program.

Much has been written elsewhere, and in greater detail about the size of historic salmon runs in Alaska. In recent years, the 1950's to the mid-1970's, and for a variety of reasons, Alaskan salmon runs declined precipitously. This decline in the fishery with its resulting loss of income, employment, subsistence and recreation was a common concern among commercial, sports and subsistence fishermen. The fishing industry (including salmon, shellfish and bottom-fish) was and is the largest private sector employer in Alaska. In addition, fishing had become so ingrained into so much of Alaskan culture and lifestyle that alternative choices were both distasteful and unrealistic for the many small communities and villages in Southeast and other parts of Alaska.

While the propagation of salmonoid species was initiated in western coastal states and British Columbia in the late 1800's, no similar long-term resource development steps were taken in Alaska. In 1971, the Alaska legislature

created the Division of Fisheries Rehabilitation, Enhancement and Development (F.R.E.D.) (Chapter 113 SLA 1971) of the Alaska Department of Fish and Game. The legislature, among other duties, charged F.R.E.D. with the responsibility to "develop and continually maintain a comprehensive, coordinated long-range plan for the orderly present and long-range rehabilitation ... of all aspects of the state's fishery ..." In addition, the legislation authorized the new division to "encourage the investment by private enterprise in the technological development and economic utilization of the fisheries resources."

The creation of F.R.E.D. was the first expressed statutory authorization for the state to enter into programs to rehabilitate, enhance and develop its salmon fishery, notwithstanding that the framers of the Constitution in 1959 (Article VIII, Section 5) authorized the legislature to "provide for facilities, improvements and services ... to assure further utilization and development of the fisheries."

In 1972, the Alaska legislature proposed and the citizens passed a constitutional amendment which provided the state with a constitutional basis for limiting entry into the fishery (resource conservation) and carrying out aquaculture programs in the state. Clearly, restoring the salmon fishery to higher historic harvest levels was and is a high priority in the state.

Through these and other constitutional and statutory provisions two potentially powerful tools had been created which could be used to restore the fishery: (1) limited entry, combined with improved biological data, management, enforcement and stock regulation; and, (2) the rehabilitation, enhancement and development authority of the F.R.E.D. Division. Both were viewed as complementary means for restoring the salmon fishery.

These tools were soon employed in the restoration of the fishery. Stringent restrictions were placed on harvesting to allow natural brood stocks to increase and build run strength. The F.R.E.D. division began the long, arduous process of acquiring technical expertise, enhancement sites and capital funds to design, develop and place into operational status the facilities, rehabilitation projects and similar activities associated with restoring or creating new salmon runs.

Hindsight suggests that regardless of the methods employed, restoration of salmon runs requires a great deal of time, even under the best of circumstances. Two to four years, depending upon the salmon species involved, is the smallest increment of time which can elapse before improvements can be noticeable. Given variations in climatic conditions, the difficulty in regulating escapement needs, and problems attendant to finding suitable sites for construction of propagation facilities and constructing the facilities

under extremely difficult conditions, delays were inevitable and encountered in the anticipated salmon recovery time table.

In 1974 the State legislature enacted what is commonly known as the "Private Non-Profit Hatcheries Act" (Chapter III, SLA 1974), which authorized the private ownership of salmon hatcheries by qualified non-profit corporations for the purpose of contributing by artificial means to the rehabilitation of the state's depleted and depressed salmon fishery. (Emphasis added by underlining.)

It is difficult at this point to accurately gauge all of the factors which motivated the enactment of this legislation. In part the act reflected a declaration of a choice between private for-profit aquaculture and private non-profit aquaculture. Beyond this, a strong motivating factor was the desire to see if less bureaucratic and costly means of restoring the salmon fisheries' stocks could produce the desired result.

While subsequent legislation during the 1976 and 1978 sessions provided a major financing basis for F.R.E.D. division capital facilities, and for further refinements to the Private Non-Profit Hatcheries Act, the stage was being set in 1974 for the addition of private non-profit hatcheries as yet a third potentially powerful tool to the two already established and at work in restoring the salmon fishery.

Results from the improved management of natural stocks became noticeable in 1976 and by 1978 and 1979 statewide harvest levels reached approximately 80 million salmon. F.R.E.D. artificial production facilities in 1978 provided several hundred thousand additional returning salmon. With the exception of the Prince William Sound Regional Association, the new regional non-profit aquaculture corporations were in the beginning stages of production development and did not contribute significantly to the almost record level returns of 1978 and 1979.

The recent near record level salmon harvests, when coupled with the planned increased production capability of the F.R.E.D. division and the limitations imposed by the court decision on the Private Non-Profit Aquaculture Associations, could combine to produce some curious effects on future development of the fishery. A question exists whether, given the current near record levels of harvest, affected fishermen will be willing to re-impose a mandatory assessment or royalty on their harvest income now that the years of deprivation appear to be behind them. On the other hand, are fishermen willing to absorb the cost of resource expansion if regulation of natural stocks is the only tool to be utilized to achieve this goal for Alaska's renewable salmon resource?

One of the present policies of Alaskan state government is for production facilities to become economically

self-sufficient over a reasonable period of time. Thus, a major issue to be addressed by policymakers over the next few years is the level of fisheries development program costs to be borne by primary benefactors or users. For example, if the F.R.E.D. division continues with its planned expansion of operational facilities, who is to pay for the operating cost of the facilities, all of the taxpayers of the state or those who primarily benefit from the development of the resouce?

Another major issue to be resolved is whether a satisfactory working arrangement can be established among the now competing salmon restoration tools: natural production, state artificial production and regional non-profit corporation production.

Finally, is it possible to effect a timely solution to the financial dilemma of the non-profit regional associations which will pass muster by the court, thus avoiding the need for state subsidies or state collected mandatory assessments which will allow these organizations to continue to contribute to the restoration of the fishery?

Clearly there are a number of additional major and unresolved issues affecting the state's Salmon Resource Development Program. While the original scope of the work planned for this report was somewhat limited, we have attempted to broaden its scope to reflect the possible effects current harvest levels and other issues could have in the considera-

tion and selection of alternative courses of action by the Aquaculture Policy Study Group. Moreover, at the direction of the study group, we have addressed organization of fisheries development activities in the context of a holistic program, identifying the reasons why and means for addressing multi-species development which we believe is in the best interest of the citizens of Alaska.

Chapter I - SALMON AQUACULTURE ECONOMIC EVALUATION TECHNIQUES

Micro Economic Evaluation Techniques

The need to have one or more objective means for evaluating in a micro economic sense, the value of a salmon aquaculture project has two primary sources. First, regional non-profit aquaculture associations need a uniformly applicable methodology for assessing whether or not a planned aquaculture project will provide a satisfactory return on the capital investment and expenses of operating the facility.

Regional associations have borrowed millions of dollars, and will borrow more, for capital facility investments and operating expenses. These monies must be repaid. In addition, start-up expenses must be incurred for a minimum of two to four years, depending upon the species, prior to any returning adults being available for fishermen to harvest. Moreover, if required, a terminal area harvest could be implemented with the income from the terminal area harvest used to help defray facility operating costs and to provide a source of funds for repaying the borrowed capital and related interest charges.

A second objective means for evaluating the value of an aquaculture project is required by government agencies. This measure is somewhat different than the valuation measurement needs of regional associations or the private sector.

Whereas the primary concern of regional associations must by necessity be limited to narrow regional financial and economic criteria, government agencies are often charged with performing socially beneficial acts which are seldom, if ever, accorded a value in the traditional financial market places.

In these private markets, a financial/economic evaluation system for salmon propagation facilities would be concerned only with the income produced from the harvest and sale of adults returning to the facility by association members or as necessary to pay the costs associated with the facility.

Because of the more encompassing responsibilities of government agencies, the value of government sponsored salmon propagation facilities must be extended beyond the boundaries established by the traditional financial/economic evaluation system. For example, salmon harvested by sports and subsistence fishermen, which must be considered "losses" in a traditional financial/economic model, should be valued by government agencies whose responsibilities extend beyond pecuniary returns.

Another example is the "value added" to the salmon through processing. This does not directly enure income to fishermen of regional associations; consequently, this societal benefit is not a factor affecting the economic and financial decisions of fishermen or regional associations. The "value added" of processing, however, can and should be

considered by government agencies in valuing the benefits to be derived from a government sponsored propagation facility.

At a more theoretical level at least, the value of the employment provided by the propagation facility as well as indirect employment (the additional clerk at the grocery store who serves fishermen or the attendant who fuels their boats) could also be considered as benefits to values added by aquaculture projects.

The "value added" micro economic model has some practical limitations. If one attempts to be too precise in using the cost benefit analysis micro economic system for valuing government sponsored propagation projects, it obviously becomes difficult and costly to obtain the necessary financial and economic information needed for evaluating each project under consideration. Similar technical measurement problems also plague the traditional financial/economic evaluation system, in its application to salmon propagation facilities. The discounting of future revenue and expense streams, the proper selection of the discount rate, and similar technical considerations, while professionally satisfying, provide for a level of refinement which may be excessive when compared with the value of obtaining information relating to other formula elements such as improving the state of the art in predicting the number of returning adult salmon. In other words, the choice of the parameters or factors and the degree of refinement to be used in both the traditional

financial/economic evaluation model and the government oriented socio-economic evaluation model, should be generally tempered by the cost and availability of financial and economic information as well as the existing capability to estimate the number of adult returns to a propagation facility.

After carefully weighing all of the factors, parameters and methodologies which could be utilized in valuing the benefits to be derived from a salmon resouce development project, and after giving equal consideration to the availability and cost of acquiring data and taking into account the many unknowns which limit the state of the art in predicting run size, the contracting team recommends the following models, factors and parameters be used to meet the evaluation needs of regional associations and government agencies.

I. Financial/Economic Evaluation Model for Regional Aquaculture Associations.

Because of the private sector orientation of aquaculture development in Alaska and the need to attract increased amounts of investment capital to provide for the orderly growth and development of this means of developing Alaska's salmon resources, the most appropriate micro economic model for evaluating salmon propagation projectsis the use of a return on investment model.

The use of a return on investment model by the

regicnal aquaculture associations meets several critically important needs. First, each aquaculture project developed by the non-profit corporations must pay its own way, or in the alternative be financially supported from excess revenues available from other aquaculture projects of the corporation. It is amply clear from recent events that a major concern of lending institutions (including state and federal agencies) is whether or not specific aquaculture projects are sound investments. Moreover, the state legislature needs such information to monitor on a continuing basis the worth of this program. Given the current absence of any mutually acceptable return on investment model, lending institutions and others have no objective basis for considering the relative merits of requested loans and now must use more subjective and arbitrary criteria in approving or disapproving a loan request.

Additionally, fishermen belonging to a regional aquaculture association are critically concerned about the overall soundness of an investment in an aquaculture project and need to know whether or not borrowed funds can be repaid by the project without requiring higher levels of assessment against the fishermen. Fishermen are also concerned about the net benefit to them from the investment in an aquaculture project. They need to know, or have a believable estimate of the number of salmon which can be harvested by them as a result of their investment in an aquaculture project.

Professional managers of the regional associations also need to have an established and accepted means for evaluating alternative investment opportunities, securing the necessary financing for selected opportunities and being reasonably assured that the returns from the investment will be adequate to pay for the cost of the project.

In summary, the use of a return on investment (ROI) model is the most appropriate means for satisfying the financial assessment needs of lending institutions, the legislature and fishermen and to evaluate the financial risks and rewards to managers and members of regional aquaculture associations.

II. Considerations in the Development of a Return on Investment Model for Salmon Aquaculture Projects.

The standard formula for computing return on investment can be stated as follows:

$$\text{Return on Investment} = \text{'s } \frac{\text{Total Revenues Less Costs}}{\text{Total Investment}}$$

While the ROI formula can be stated in quite simple terms, substantial work can be involved in identifying total revenues, total costs, and the total investment.

Total revenues, for example, are a product of the number of returning adult salmon which can be harvested multiplied by the going ex-vessel price paid to fishermen for a particular species in each of the various geographic areas of Alaska.

The single most difficult part of the revenue equation involves the accurate estimate of the number of adult salmon which will return from a particular given brood year. Rates of return, which can be expressed in terms of the percentage of adult survivors to the number of eggs deposited, vary significantly from brood year to brood year for the same species, vary significantly among species and vary greatly among the various means for artificially and naturally propagating salmon. To further compound the problem of accurately estimating returns, run strengths or survival rates for the same species can vary significantly between broad geographic regions as well as between adjoining watersheds.

Notwithstanding the severe difficulty in accurately estimating salmon survival rates, the F.R.E.D. Division of the Alaska Department of Fish and Game has developed some standard assumptions on salmon survival rates. These rates are shown in Table I, in a somewhat different format than set forth in the ADF&G directive.

Table I

AN ANALYSIS OF ARTIFICIAL & NATURAL SALMON PROPAGATION METHODS

		STAGE I			STAGE II				STAGE III			
	FECUNDITY	Survival-Egg Take to Emerge Stage by Propagation Method(2)			Survival Emerge to Migrant Stage by Propagation Method (3)				Marine Survival by Propagation Method (4)			
		Natural	Hatchery	Incu. Box	Natural	Hatchery	Lk. Fert.	Incu. Box	Nautral	Hatchery	Lk. Fert.	Incu. Box
PINK	Ave. 1600	160	1360	720	-	1224	-	-	5	24	-	7
SOCKEYE	Ave. 3000	300	2550	1350	60	179	-	98	5	11	-	10
CHUM	Ave. 2200	220	1870	990	-	1683	-	-	6	34	-	0
COHO	Ave. 2800	280	2380	-	56	1666	-	-	4	100	-	-
CHINOOK	Ave. 6500	650	5525	2925	130	3868	-	293	4	77	-	1

(1) Survival rates for artificial production based on F.R.E.D. Division Directive.
Natural production estimated by contractor.
All percentages rounded to nearest whole percent, where possible.

(2) Survival - Egg Take to Emerge Stage
Percentile Estimates (10% estimate is shown in the Table)

	Natural	Hatchery	Incu. Box
PINK	7-10%	85%	45%
SOCKEYE	7-10%	85%	45%
CHUM	7-10%	85%	45%
COHO	7-10%	85%	-
CHINOOK	7-10%	85%	45%

(3) Survival Emerge to Migrant Stage
Percentile Estimates

	Natural	Hatchery	Lk. Fert.	Incu. Box
PINK	-	90%*	-	-
SOCKEYE	20%	7%**	-	7%
CHUM	-	90%*	-	-
COHO	20%	70%	-	-
CHINOOK	20%	70%	-	10%

*To fingerling size
**Lake released as emergent fry
***Because of their high value chinook would be hatchery reared rather than placed in an incubation box.

(4) Marine Survival Estimates

	Natural	Hatchery	Lk. Fert.	Incu. Box
PINK	3%	2%	-	1%
SOCKEYE	8%	6%	-	1%
CHUM	3%	2%	-	1%
COHO	8%	6%	-	-
CHINOOK	3%	2%	-	3%

Table I suggests that there are at least three distinct stages in the life cycle of a salmon where artificial means can be employed to change the rate of survival of adult returning salmon. In addition, within each stage there are a variety of alternative propagation choices which can enhance survival, each of which have different cost characteristics and yield different rates of return on their associated investment.

As indicated in Table I (Stage I), the basic economic attractiveness of artificially propagating salmon results from the fact that under natural spawning conditions only 7 to 10 percent of the green eggs deposited by spawning salmon produce emergent fry. Under the more controlled conditions of a hatchery, survival rates from the green egg stage to the emergent fry stage of 85% are estimated to be achievable. This 8 to 10 times greater Stage I survival rate provides a major economic justification for artificially propagating salmon. This reasoning is based upon the assumption that the more salmon which are initially produced, the greater the number that will survive to be available for harvest. This should lead to increased fishermen's incomes and provide sufficient economic benefits (e.g. terminal harvests) to pay for the cost of constructing and operating the propagation facility.

There are other alternatives in Stage I to simply choosing between natural production and hatcheries. For

example, incubation boxes, which involve a mere fraction of the cost of hatcheries, under certain circumstances can be considered as an attractive financial and biological alternative to either natural or hatchery propagation methods. Stream rehabilitation (not shown in Table I), a method for improving natural runs, is another example of the type of biological and economic choice which could be made to increase the size of a salmon run or improve survival rates. (Note: In Chapter III we discuss a variety of research activities to be undertaken to improve survival rates at each stage.)

The important point to recognize is that survival rates vary with the type of propagation method, which in turn vary significantly in terms of cost. By combining survival rates and the costs associated with the methods for achieving those survival rates in a return on investment model, a means is available for objectively analyzing and determining which sets of biological and economic considerations will produce the better return for the required investment.

Stage II deals with a second set of economic choices and survival rates from those contained in Stage I. During Stage II for example, emergent fry can be reared to a larger size in a hatchery, which improves their survival rate, but again, certain costs are incurred which have to be carefully weighed against the estimated increase in the number of returning salmon. It is important to recognize

that Stage II economic choices and survival rates may be largely independent of the choices made during Stage I. For example, during Stage I, it may be economically desirable to release unfed pink and chum fry without incurring further costs associated with Stage II types of activities. Alternatively, it may be economically desirable in Stage I, to incur no propagation costs on sockeye salmon by depending upon natural spawning but during Stage II use the newly developing lake fertilization technique as a means of increasing Stage II survival rates.

Another highly interesting Stage II method for improving survival rates is the predation control program established by the Alaska Department of Fish and Game in the Wood River Lake System. Arctic chum are impounded in a holding pen to reduce their predation on outmigrating smolt. According to estimates, up to one million smolts are saved each season by the control project.

Again, the point is made that both Stage I and Stage II propagation methods involve a series of often independent economic choices and differing survival results. The current inability (or limited ability) to clearly distinguish the costs and benefits (increased survival) associated with each stage substantially limits the useability of such data for economic analysis purposes.

Table I, Stage III depicts a very limited series of possible marine survival rates. These rates are largely

predicated upon the current methology in which Stage I and Stage II propagation methods are assumed to be interdependent, which as we discussed earlier, is not always the case. For example, no assumptions or estimates are included which indicate the potential increase in the marine survival of Stage I natural spawning sockeye resulting from lake fertilization during Stage II.

Stage III, Marine Survival also offers an opportunity, quite independently of Stages I and II, to increase the number of returning adults. Methods for reducing predation by beluga whales (or sea lions) in the marine environment, and techniques for reducing shaker (coho, chinook) mortality are but two means which could be used to increase the number of returning adult salmon. The implementation of either or any of these techniques during Stage III, like Stages I and II, depends both upon the expected increase in survival rates as well as the costs to be incurred.

Five critically important observations about salmon survival rates which are apparent from the information contained in Table I need to be made at this point prior to further defining the elements to be included in a return on investment model for salmon aquaculture projects. These are:

(1) There are an increasing variety of opportunities within each of these three stages in the life cycle of salmon to employ artificial methods which will increase salmon survival rates.

(2) The mission of regional aquaculture associations, the F.R.E.D. division and the Salmon Resource Development Program (ASRDP) as a whole, should not be limited to Stage I types of choices (i.e., natural production v. hatcheries v. incubation boxes) but should instead encompass the entire range of biological and economic choices available to them in order to allow the maximum return on investments to be realized.

(3) Too little emphasis has been placed on doing research on improving survival rates and there is a lack of data which corresponds to the alternative economic choices within and across the various life cycle stages. This severely limits the current capability to develop reliable financial estimates of the potential economic benefits to be derived from almost any given salmon propagation endeavor.

(4) Let us assume for a moment, at least, that the F.R.E.D. division were adequately funded to perform the necessary data gathering and research and development of alternative means for increasing salmon survival rates. Let us further assume that such data and means were used in a wide variety of ways by regional associations to increase Stage I, Stage II and Stage III survival rates (in independent as well as an interdependent fashion). As a result of the possible interactions and combinations of propagation techniques, in many instances there may not be a separately identifiable, artifically propagated run which could be

subjected to a terminal area harvest as a means of recovering the capital and operating costs associated with achieving the increased survival rate. A simple example of this dilemma occurs when a regional association incurs costs to rehabilitate a stream bed to improve natural spawning conditions. Because no artificial run was created no terminal area harvest can be employed to recover the investment. Regional associations now regard such projects as non-revenue producing and absorb the attendant costs of the project within available funds. If future aquaculture developments make Stage I - II hatchery type operations economically less attractive than other choices, and at the same time the regional associations are placed in a position of developing and operating new hatcheries simply because they are dependent upon terminal area harvests for a major source of operating revenue it would indeed be unfortunate. Given the growing technological developments in salmon enhancement, it is important that the selected financing mechanisms not lock regional associations into less attractive propagation methods because of harvest considerations.

(5) The bulk of information critical to a return on investment model is biological. Lending institutions must have the capability to evaluate this critical information, or alternatively the lending authority must be placed with those who have the biological expertise to evaluate such proposals (See Chapter III).

III. Elements of a Return on Investment Model for Salmon Aquaculture Projects.

Notwithstanding the present limitations on the availability of reliable information upon which to estimate the number of returning adult salmon, the following propagation factors must be reflected in a return on investment model for salmon aquaculture projects.

A. Salmon Propagation Factors.

1. The Number of Eggs to be Propagated.

If green eggs are used for the initial planning basis it will in turn (together with an estimate of the average number of eggs available per female spawner) provide a basis for estimating the number of salmon required for egg taking purposes as well as the estimated number of adult returns.

2. Stage I Estimated Survival Rates by Species - (Green Egg to Emerge Stage).

(a) Natural production;

(b) Natural production rehabilitation (i.e., stream bed rehabilitation);

(c) Hatchery production;

(d) Incubation box;

(e) Other.

3. Stage II Estimated Survival Rates by Species (Emergent Fry to Migrant Stage).

(a) Natural production;

(b) Natural production rehabilitiation;

(c) Hatchery production

(1) Fed fry;

(2) Fingerling;

(3) Smolt.

(d) Hatchery production (out-station plants)

(1) Fed fry;

(2) Fingerling;

(3) Smolt.

(e) Incubation box;

(f) Lake fertilization (In combination with 2(a), (b), (c) or (d), above);

(g) Other.

4. Stage III Estimated Survival Rates - by Species (Marine Survival).

(a) Natural survival (no human intervention directed at increasing the survival rate of the particular run);

(b) Enhanced survival (human intervention i.e., predator controls applied).

5. Estimated Total Returns - by Species.

Estimate of the number of adult salmon which will return to the area of harvest as a result of propagation methods and any enhanced survival techniques employed.

6. Number of Spawning Stock Required for Run Maintenance - by Species.

Estimate of the number of male and female spawners required to maintain the initial run.

7. Number of Spawning Stocks Required - by Species.

Estimate of the number of additional male and female spawners required to increase initial run size. The decision to increase a run size should reflect the lost opportunity costs (to fishermen) represented by the value of the additional spawners required to build the level of the run.

8. Hatchery or Other Surplus - by Species.

There are often surplus male salmon which are not needed for spawning purposes, therefore an estimate of the amount of the return which cannot be harvested nor is required for spawning purposes needs to be made if the surplus can be sold. (Any value of spawned out carcasses should also be included).

9. Estimated Total Number of Harvestable Salmon - by Species.

The estimated total number of harvestable salmon is the estimated total return less spawning stock required and any surpluses.

B. Salmon Revenue Factors.

Salmon revenue estimates for the return on investment model should be based upon the estimated total number of harvestable salmon and estimates of the ex-vessel prices being paid for the salmon. Salmon revenue should also include any revenues received from the sale of spawned-out carcasses and spawning surpluses.

Considerable variations occur in Alaskan salmon ex-vessel prices by region. The quality of the fish harvested as well as the supply of salmon which is available also affect ex-vessel prices.

In addition to the regional price variations, total project revenues can be based upon a constant dollar basis or on a current dollar basis. A constant dollar basis for estimating revenues would, for example, be 1979 ex-vessel prices extended for the expected life of the project. The current dollar basis would be based upon estimates of future ex-vessel prices during the life of the project. There are advantages and disadvantages to both.

The use of a constant dollar basis works well for short-term projects where the returns tend to be immediate. It works less well when long term (20-30 years) pay-outs on investments are required and inflation is increasing operating costs at a rate which may or may not be commensurate with increases in the market price for salmon.

The use of the current dollar basis attempts to adjust for the effect of inflation on operating costs and to reflect future market prices for salmon based upon inflationary trends as well as the effects of supply and demand at various production levels. While the main advantage of the current dollar basis is that it is an attempt to take future prices and costs into consideration in evaluating the return on investment potential of a particular aquaculture project. A

primary disadvantage of the current dollar basis is the lack of reliable forecasts of future costs and prices for the salmon industry. A further disadvantage is that the relative merits of a project (in relation to an alternative investment choice) can become so obscured by price and cost change assumptions, which may or may not be reliable, that short-term choices tend to be selected over longer-term projects simply because of the uncertainty over future costs and prices.

Despite the advantages and disadvantages of both the constant dollar basis and current dollar basis for estimating costs and revenues, each can be effectively used in a return on investment model.

The following general guidelines may be helpful in selecting whether to use a constant dollar basis or a current dollar basis for use in a return on investment analysis.

1. During times of high rates of cost inflation and high levels of salmon production and where market prices are not increasing at a rate commensurate with inflation, the use of a current dollar basis in the return on investment model will help ensure that spiraling operating costs together with stable production and market prices do not create a future situation whereby all of the salmon production from a propagation project is required to pay operating costs, with no harvest allowance provided to fishermen.

2. If a choice is being made from among like projects (i.e., approximately the same level of capital investment, return timing, operating costs, depreciable facility life, and etc.) the use of a constant dollar basis would be suitable for inclusion in the return on investment model.

3. Short-term capital projects which require little or no continuing operating expense can be comparatively evaluated using the constant dollar basis.

4. When in doubt about which basis is more appropriate and the amount of the investment at risk is significant, use both the constant dollar basis and the current dollar basis and make any decisions on the set of data which indicates the least favorable return on investment.

The salmon revenue factors to be taken into consideration are as follows:

1. Estimated Total Number of Harvestable Salmon (as derived earlier).

2. The Value or Price Per Pound of the Salmon.

The regional ex-vessel price expressed in terms of constant dollars or current dollars over the useful life of the project.

3. The Estimated Weight Per Fish.

4. The Total Value of the Estimated Numbers of Harvestable Salmon.

Item 1, multiplied by item 2 multiplied by item 3.

5. The Value of Surplus and Spawners.

The estimated revenues resulting from the sale of spawned out carcasses and hatchery or other surpluses.

6. The Total Estimated Value of the Run.

Add item 4 and item 5.

C. Cost Factors.

There are a variety of categories of costs incurred by regional associations, not all of which are fully allocable nor attributable to a propagation project or facility. These cost categories, their allocability, and other characteristics are discussed as follows:

1. Regional Association Administration.

Regional Association Administration includes all expenses related to the selection of and expenses incurred by the directors of the regional association. Other allocable expenses (see 2 below) related to operating and maintaining the regional association belong in this category. Under the financing plan presented in Chapter II, none of the costs of Regional Association Administration would be charged to a propagation facility or project.

2. Administrative and Supportive Services.

Included in this cost category are the salaries and wages of the executive director, clerical and secretarial personnel and such expenses as newsletters, assessment bookkeeping activities, accounting, purchasing and payroll services, general planning (consulting) services, office

rent, office utilities and equipment. These costs are fully allocable to Regional Association Administration as well as to Technical Services, Full Production Hatchery Operations and other cost categories. The division in Administrative and Supportive Service Costs between Regional Association Administration and other cost categories should be based upon the proportion of payroll and other expenses attributable to the support of each activity.

3. Technical Services.

This cost category includes the salaries and wages of regional biologists and other technical personnel who perform regional planning activities, conduct stream surveys, conduct tagging and other research activities, plan and conduct egg takes and similar technical activities not involved with the day to day operation of hatcheries or other production enhancement activities. A portion of the Administrative and Supporting Service overhead costs should be allocated to this category in proportion to the services received or expenses incurred. The rental of aircraft, marine vessels and other similar expenses associated with egg takes, stream surveys and other related activities should be direct charges to the Technical Services category of expenses.

4. Full Production Hatchery Operations.

This category includes the direct salaries and wages of hatchery supervisory and operating personnel, fish

food, utilities and other expenses attendant to operating a hatchery or other propagation facility once full returns are being realized. Also included in this cost category are costs attendant to performing a terminal area harvest.

5. Hatchery & Enhancement Projects Start-Up Costs.

This cost category includes all hatchery or enhancement project costs similar to those listed for 4 above or 6 below which are incurred or must be paid during the period of time between initial start-up and when full returns are being realized. Recurring expenses related to a rehabilitation project, lake fertilization project or similar production improvement activity, occurring prior to the full returns being realized should be recorded as a direct start-up charge to each such project.

6. Capital Investment Program.

This cost category includes all capital investments for hatcheries and other propagation facilities as well as such one-time enhancement projects as stream rehabilitation. Costs included for each facility include land, buildings, utilities installation, architect's fees, interest and similar costs relating to the projects. One-time salaries and wages and other direct costs attributable to a stream rehabilitation or similar enhancement project should be recorded as a direct charge to each project.

7. Total Cost.

Includes all costs for cost categories 1-6.

8. Total Propagation Facility (Project) Cost.

Includes allocated administrative and supporting services overhead charges to categories 4 and 5 as well as direct charges to categories 4 and 5 plus the appropriate capital and interest charges from category 6.

D. Economic Analysis Factors.

Based upon the revenue resulting from a salmon propagation project and the project costs as previously defined, it is possible to identify the estimated net revenue (gross revenue less allocable costs), either on an annual basis or for the estimated total useful life of the facility. Net revenue divided by the total investment in the propagation facility (cost category 6) will provide an estimate of the percent return on investment resulting from the project.

E. Propagation Facility Run Breakdown Analysis Factors.

The final element of a Return on Investment Model for salmon aquaculture projects is an analysis of who harvests the runs from the facility. There are three main elements contained in the run breakdown analyses. These include: that part of the run required for spawning stocks; that part of the run harvested by fishermen; and, that part of the run harvested in the terminal area which is used to pay a portion of the facility operating costs.

In summary, the elements which need to be considered in a return on investment model for salmon aquaculture

projects are: Salmon Propagation Factors; Salmon Revenue Factors; Cost Factors; Economic Analysis Factors and Propagation Facility Run Breakdown Analysis Factors. Table II provides an example of how the return on investment model can be applied in evaluating a potential aquaculture propagation project.

TABLE II

Example Return on Investment Analysis

(25 Million Egg Facility)

Analysis of Annual Costs - 25 Year Facility Life

(Chum Salmon)

	Reference Section	Constant Dollars (1)	Current Dollars (2)
SALMON PROPAGATION FACTORS	(A)		
Eggs Propagated	(A-1)	25 Million	25 Million
Estimated Total Returns	(A-5)	500,000	500,000
Number Spawning Stock	(A-6)	14,218	14,218
Hatchery or other surplus	(A-8)	8,530	8,530
Estimated No. Harvestable Salmon	(A-9)	477,252	477,250
SALMON REVENUE FACTORS	(B)		
Regional Expressed price per pound	(B-2)	$0.75	$1.38
Estimated Average Weight per fish	(B-3)	6 lbs.	6 lbs.
Value of Harvestable Salmon	(B-4)	$2,147,634	$3,951,630
Value of Surplus and spawners	(B-5)	$ 38,385	$ 70,628
Total Estimated Value of run	(B-6)	$2,186,019	$4,022,258

TABLE II
(Continued)

	Reference Section	Constant Dollars[1]	Current Dollars[2]
ANNUAL COST FACTORS	(C)		
Technical Services[3]	(C-3)	$ 50,000	$ 92,000
Full production operations[4]	(C 4)	500,000	920,000
Hatchery start-up costs[5]	(C-5)	207,000	207,000
Capital Investment[6]	(C-6)	345,000	345,000
Total annual propagation Facility Cost	(C-8)	$1,102,000	$1,564,000
ANNUAL AVERAGE ECONOMIC ANALYSIS FACTORS	(D)		
Gross Income	(B-6)	$2,186,019	$4,022,258
Total Cost	(C-8)	1,102,000	1,564,000
Net Income		1,084,019	2,458,258
Return on Investment		27%	61%
ANNUAL AVERAGE RUN BREAKDOWN ANALYSIS FACTORS	(E)		
Spawners		14,218 (39%)	14,218 (3%)
Fishermen		240,893 (48%)	296,891 (59%)
Annual Costs		244,889 (49%)	188,891 (38%)
Total Run		500,000	500,000

TABLE II
(Continued)

(1) Item (B-2) based upon 1978 Southeast prices.

(2) Fish price and labor cost inflation estimated at 5% per year. Current dollars based upon average inflation over the 25 year life of the facility.

(3) Estimated annual professional fisheries biological services.

(4) Includes hatchery operations and an allowance to pay for the costs of harvesting that portion of the run for annual costs.

(5) Estimated at 6 years; cost capitalized and amortized over 19 years; 9 1/2% interest rate.

(6) Includes 25% run allowance of terminal area harvest; 2.5 million investment amortized over 25 years at 9 1/2% interest with interest and principal deferred for 6 years.

IV. Elements of a Cost Benefit Analysis Model for Salmon Aquaculture Projects.

Earlier in this Chapter in the general discussion about micro-economic evaluation techniques, it was pointed out that cost benefit models, like return on investment models can be designed to include some very complex refinements.

In a cost benefit analysis model, for example, such refinements as adding certain operating costs incurred by fishermen to the cost side of the equation as well as adding allowances for direct and indirect secondary employment effects beyond the fish processing activity to the benefit side of the equation, while technically correct, involve estimates which are so speculative that their inclusion would severely strain the credibility of the cost benefit analysis.

While cost benefit analysis models can be made overly complex, at the other end of the spectrum the current practices of using ex-vessel prices paid to fishermen and excluding interest costs on capital investments results in an equally inaccurate statement of costs and benefits.

It is also important to recognize that while some of the factors included in a return on investment model can be used in a cost benefit model, other return on investment factors do not apply. While both models can be used to measure the "value" of an aquaculture project, the term "value" has different meanings in each model.

Again, the value of an aquaculture project to a regional non-profit aquaculture corporation must be expressed in terms of ex-vessel prices paid to association fishermen for the salmon provided as a result of the project and harvested by association members if the corporation is to remain financially solvent. Prior interceptions by non-association fishermen and terminal area harvests to pay hatchery operating costs must be regarded as "losses" because they reduce the amount of revenue accruing to the fishermen.

A cost benefit analysis model, unlike the return on investment model, does not have a narrowly defined regional income criterion. Hence, the term value in a cost benefit analysis model is more encompassing. The value of a government sponsored aquaculture project should include for example, consideration of prior interceptions by other domestic commercial and sports fishermen. (The term domestic for a federal agency would include all American fishermen. Alaska state departments may wish to define domestic to include only Alaska's resident fishermen.)

The use of ex-vessel prices, while appropriate in a return on investment model for regional non-profit corporations, is not appropriate in a cost benefit analysis model. If the objective of a cost benefit analysis is to measure the domestic value of a salmon aquaculture project, the "value" must not only include money paid to fishermen but also the value added to the domestic economy as a result of

producing the run and processing the harvest. In other words, the salaries and wages paid to hatchery operating personnel, cannery workers and employees of firms who process fresh and frozen salmon are part of the value to the domestic economy from the aquaculture project which must be recognized in the cost benefit analysis model.

It might appear strange to include the salaries and wages of hatchery operating personnel in both the cost and benefit sides of an equation. Clearly such costs belong in computing the "cost" of an aquaculture project. It is equally clear that the employment of hatchery personnel is as valuable an addition to the domestic economy as the employment of fishermen or others, regardless of the fact that the form of compensation differs.

As can be demonstrated in the following simple example, it is not only important to include the salaries and wages of hatchery personnel as both a cost and a benefit, but further that these costs/benefits do not cancel out and therefore cannot be excluded from both sides of the equation.

Cost Benefit Analysis Example

Costs:	
Hatchery operators salaries and wages:	$20,000
Other costs:	10,000
Total costs:	$30,000

Benefits:

Hatchery operators salaries and wages:	$20,000
Other benefits:	80,000
Total benefits:	$100,000

Cost Benefit Ratio: 3.33:1

If the $20,000 in hatchery operators salaries and wages is excluded from the perceived benefits to the domestic economy from the aquaculture project, and the benefits were valued at $80,000, the cost benefit ratio would be 2.67:1. Alternatively, if the hatchery operators salaries and wages were excluded from both sides of the equation leaving a cost of $10,000 and a benefit of $80,000, the resulting ratio would be 8:1 rather than the correct amount of 3.33:1.

In addition to identifying hatchery personnel salaries and wages as a benefit, or being of value to the domestic economy, the added one-time value of the stimulus to the domestic economy from the construction activity associated with an aquaculture project should be estimated and included as a part of the benefits to be desired from the project.

A most difficult issue in defining value in a cost benefit analysis has to do with predation. Some would argue that the salmon from an aquaculture project harvested by bears, eagles and other predators should be valued as a means of recognizing the social goal of preserving wildlife, which is often a stated goal of some government agencies.

While there is a certain amount of attractiveness to such a proposal, it presents several problems which are difficult to resolve.

First, the amount of predation is so uncertain and speculative that its explicit recognition would severely strain the credibility of the cost benefit analysis. Second, the value recommended for measurement in the cost benefit analysis model is the contribution made to the domestic economy by the aquaculture project. This definition would generally exclude consideration of imputting a value to predation except under unusual circumstances. It is conceivable that predators might be attracted to an artificially propagated run, thus providing a greater harvest opportunity on an adjacent natural run. To the extent that such a circumstance might occur, and further to the extent that the harvesters of the natural run benefit from the substitution, an argument could be developed for adding the number of additional natural salmon harvested to the predator reduced artificial run. Again, such technical refinements, though intellectually attractive, are so difficult to accurately quantify that the credibility and cost of the analysis would be highly questionable.

To conclude, perhaps the most difficult choice is establishing a readily available "price" per pound for salmon to be used in the cost benefit analysis model. As was discussed earlier, the ex-vessel price only partially

recognizes the contribution to the domestic economy from a salmon run. A substantially greater "price" per pound can be quoted for sport caught salmon while salmon used for domestic consumption are often not accorded a "price".

After weighing all of the possible "price" choices, the most representative price which should be used in the cost benefit model is the first level wholesale price for canned or frozen salmon, by species, by region in Alaska. Such an index is not now currently available for Alaskan salmon. However, such an economic valuation index could be regularly published by the Alaskan Department of Fish and Game (or the National Marine Fisheries Service) for use in economic planning by ADF&G and other state and federal agencies. By having a state agency prepare such an economic valuation index, the confidentiality of individual financial records can be maintained. Failure to develop such an index will force the state to assume value added for fish processed at ratios consistent with other industries. The most common estimate of this ratio is 2:1 over ex-vessel prices.

In summary, the factors contained in a cost benefit analysis model are somewhat different from those contained in the return on investment model. The reason for these differences largely results from the varying objectives each serve. The objective of the return on investment model is to provide a means for private non-profit corporations to make economic choices based upon their need to be economically

self-sufficient. The cost benefit analysis model on the other hand is directed at measuring the total domestic economic benefits to be derived from an aquaculture project.

A. Salmon Propagation Factors.

1. The Number of Eggs to be Propagated.

If green eggs are used for the initial planning basis, it will in turn (together with an estimate of the average number of eggs available per female spawner) provide a basis for estimating the number of salmon required for egg taking purposes.

2. Stage I Estimated Survival Rates by Species - (Green Egg to Emerge Stage).

(a) Natural production;

(b) Natural production rehabilitation (i.e., stream bed rehabilitation);

(c) Hatchery production;

(d) Incubation box;

(e) Other.

3. Stage II Estimated Survival Rates - by Species (Emergent Fry to Migrant Stage).

(a) Natural production;

(b) Natural production rehabilitation;

(c) Hatchery production

(1) Fed fry;

(2) Fingerling;

(3) Smolt.

(d) Hatchery production (out-station plants)

(1) Fed fry;

(2) Fingerling;

(3) Smolt.

(e) Incubation box;

(f) Lake fertilization (In combination with 2(a), (b), (c) or (d) above);

(g) Other.

4. Stage III Estimated Survival Rates - by Species (Marine Survival).

(a) Natural survival (no human intervention directed at increasing the survival rate of the particular run);

(b) Enhanced survival (human intervention i.e., predator controls applied).

5. Estimated Total Returns - by Species.

Estimate of the number of adult salmon which will return to the area of harvest as a result of propagation methods and any enhanced survival techniques employed.

6. Estimated Prior Interceptions by Domestic Fishermen by Species.

Include estimates of prior interceptions by domestic sports and commercial and domestic consumption fishermen.

7. Estimated Total Run Adult Run Strength - by Species.

Add together items 5 and 6.

8. Number of Spawning Stock Required for Run Maintenance - by Species.

Estimate the number of male and female spawners required to maintain the initial run size.

9. Hatchery or Other Surplus - by Species.

Often there are surplus male salmon not needed for spawning purposes, therefore, an estimate of the amount of the return which cannot be harvested nor is required for spawning purposes needs to be made if the surplus can be sold or used in domestic consumption. (Any value of spawned out salmon carcasses can also be included.)

10. Net Total Adult Run Strength - by Species.

Item 7 less item 8 plus 9.

B. Salmon Revenue Factors.

The salmon revenue price considerations for use in the cost benefit analysis model are similar to those for the return on investment model except that wholesale rather than ex-vessel prices are used.

The discussion on the use of the current dollar basis and constant dollar basis for evaluating projects using the return on investment model apply equally as well to the cost benefit analysis model.

The salmon revenue factors to be taken into consideration in the cost benefit analysis model are as follows:

1. Net Total Adult Run Strength.

As derived earlier.

2. The Value or Price Per Pound of the Salmon.

The regional wholesale price expressed in constant dollars or current dollars over the life of the project. If a portion of the run is to be destined for the frozen market, the wholesale price for frozen salmon should be used. If the market is largely for canning purposes, the canned wholesale price should be used.

3. The Estimated Weight Per Fish.

4. The Value of the Net Total Adult Salmon Run.

Item 1 multiplied by item 2 multiplied by item 3.

5. The Value of Surplus and Spawners.

Add in any value in terms of domestic consumption or revenue from this source.

6. The Total Estimated Value of the Run.

Add items 4 and 5.

C. Other Benefit Factors.

As discussed earlier, the salaries and wages associated with creating a salmon run are as economically beneficial as the salaries paid to fishermen and processing personnel. The net economic benefit of the one-time stimulus to the domestic economy from the construction of an aquaculture project is another benefit which should be included in Other Benefit Factors. (An estimate of the hatchery personnel salaries and wages and other similar benefits should be made and included in Table III, Other Benefit Factors).

D. Cost Factors.

There are several categories of costs to be included

in a cost benefit analysis. These are as follows:

1. Project Planning and Surveys.

Included in this category are all the costs associated with performing stream surveys, site research and selection, preliminary design and other work preceding construction.

2. Construction.

This category includes all of the costs to construct the facility, perform the stream rehabilitation or similar work.

3. Imputed or Actual Interest Expense.

If interest expense is being paid through a bond issue, for example, the bond interest rate should be applied to the amount of capital funds used for the project. If the project is being funded through a cash appropriation, a cost of capital rate should be included for the project. A typical state rate might be the going rate on state general obligation bonds. A typical federal rate might be the going rate on long term treasury notes.

4. Facility Operations.

This would include all salaries and wages, utilities, fish food and other expenses associated with operating the facility from inception of the operation through full production.

Table III, as follows, is an example of how a cost benefit analysis can be applied to an aquaculture project.

TABLE III

An Example Cost Benefit Analysis

(25 Million Egg Facility)

Analysis of Annual Costs - 25 Year Facility Life
(Chum Salmon)

Factors	Reference Section	Constant Dollars	Current Dollars(7)
SALMON PROPAGATION FACTORS	(A)		
Estimated Adult Run Strength	(A-7)	500,000	500,000
Number Spawning Stock	(A-8)	14,218	14,218
Hatchery or Other Surplus	(A-9)	8,530	8,530
Net Total Adult Run Strength	(A-10)	485,782	485,782
SALMON REVENUE FACTORS			
Regional Wholesale(1) Price Per Pound	(B-2)	$1.35	$2.48
Estimated Average, Weight Per Fish	(B-3)	6 lbs	6 lbs
Value of the Net Total Adult Salmon Run	(B-4)	$3,865,741	$7,101,510
Value of Surplus and Spawners	(B-5)	$ 69,093	$ 126,926
Total Estimated Value of the Rum	(B-6)	$3,934,834	$7,228,436
OTHER BENEFIT FACTORS(2)	(C)	$ 120,000	$ 220,800
TOTAL ESTIMATED BENEFITS		$4,054,834	$7,449,236

TABLE III
(Continued)

Factors	Reference Section	Constant Dollars	Current Dollars(7)
ANNUAL COST FACTORS			
Project Planning and Surveys(3)	(D-1)	$ 10,000	$ 10,000
Construction Costs(4)	(D-2)	$100,000	$100,000
Imputed/Actual Interest Expense(5)	(D-3)	$162,200	$162,200
Facility Operations(6)	(D-4)	$457,000	$667,000
Total Annual Propagation Facility Costs		$729,200	$939,200
Cost to Benefit Ratio		1:5.56	1:7.93

(1) Estimate wholesale price for frozen chum.

(2) Estimated annual salaries and wages paid to hatchery operating personnel.

(3) Estimated at 10% of construction costs.

(4) Estimated $2.5 million construction costs annualized over 25 years.

(5) Interest expense on construction costs at a rate of 9 1/2% annualized over 25 years.

(6) Hatchery operations only, excludes terminal area harvest costs; includes cost for six years start-up amortized over 19 years of production at 9 1/2% interest.

(7) Fish price and labor cost inflation estimated at 5% per year.

MACRO ECONOMIC EVALUATION TECHNIQUES

The return on investment and cost benefit analysis models are micro-economic evaluation techniques that are applicable to measuring the economic value of individual salmon aquaculture projects. While these models are useful in making economic choices on a project by project basis, equal attention should be given to the economic value of all such projects, collectively, as well as the overall economic value of the salmon fishery. There are several reasons why it is important to develop an economic understanding of the salmon industry as a whole. First, the salmon fishing and processing industry employs more people than any other element of the private sector, with the total value of the salmon harvest in 1978 exceeding 230 million dollars at ex-vessel prices.

Secondly, Alaska is currently overly dependent upon revenues from non-renewable resources, and the full development of the salmon fishery could aid in redressing the current disparity in tax revenues from renewable and non-renewable resource sources.

There are other perhaps more critical reasons to assess the economic benefits of the fishery from an overall state perspective. Alaska has a life-style which is in part characterized by the independence desired by its citizens. The capability to maintain this life-style is for many

people dependent upon earning all or part of their income as fishermen or working in seasonal fish processing jobs. Salmon fishing and/or processing provides the major source of income to communities like Ketchikan, Petersburg, Dillingham, Cordova and others. Without a strong, healthy fishery, many of these communities would suffer because their citizens would not have an alternative way of earning an income. Manufacturing and agriculture, which are the mainstays of many similar communities in the lower 48 states, are simply not an option open to citizens in these Alaskan communities.

Finally, if the state is to maintain its current prosperity, it must move out of the current raw material resource exploitation state of economic development to one which is more favorable to the state and its citizens in terms of the income to be realized from increasing the direct and secondary benefits derived from processing, marketing and consumption of salmon.

For these and other reasons, it is critically important that the state have the economic tools necessary to plan and administer its economic future. Currently, however, few economic planning tools are available and the capability to perform macro-economic analyses in Alaska is severely limited. The information and tools needed to perform the proposed macro-economic analysis are rather straight forward. These include:

1. State Tax Revenue Collection Reports Coded by the Standard Industrial Code and Geographic Region.

One of the best ways of measuring changes in economic conditions is through the state tax collection system. The change in the number of corporate and individual tax payers as well as changes in their earning status is critically important information for economic planning.

2. Development of a State Input/Output Economic Model.

An input/output model is a planning tool which can be used to identify the economic or employment multiplier effect of the various segments of industry. It can also be useful in examining the relative balance between imports and exports by industry segment.

3. Employment/Unemployment Reports by Standard Industrial Code.

In order to perform economic analysis it is important to know employment by type of industry within a region. Employment and unemployment characteristics should also include information on the age, sex and household dependency status.

With the development of at least these three economic planning tools, it would be possible to perform the following types of macro-economic analyses.

1. Assume that the State of Alaska is willing to invest some of its non-renewable resource tax revenue into producing future recurring income streams both as a means

for financing state and local government as well as providing a healthy economic climate for its citizens. Assume further that the interest rate on investment opportunities in the major capital money markets outside of Alaska or government securities is nine percent (9%). An investment in an in-state economic development project which yields an interest rate of only seven percent (7%) could be more financially attractive to the state than an out of state investment because of the additional revenue generated from the added in-state employment, personal and corporate taxes.

2. The State of Washington in 1972 received voter approval to invest 415 million dollars of state funds in a statewide capital investment program. Federal and local matching funds were expected to bring the total investment to approximately 1.5 billion dollars. According to the economic planners (Washington State Budget, 1972 Volume II, page 63) "... the construction impact alone will generate 240,000 full-time equivalent years of employment ... and help meet the projected employment needs of 23,000 net new labor force entrants each year." The budget document goes on to report that, "the Washington futures program will not require new taxes ... the expenditures on construction projects ... together with the turnover of those expenditures through suppliers and payrolls will provide additional state sales, and business and occupation tax revenue. Second, the new industries which can be established as a result of these

Washington future projects will also provide new state revenue." The Washington Futures Program represents the type of economic planning capability which the State of Alaska needs if it is to make informed economic choices on investment opportunities.

In summary, the consulting team makes the following findings and recommendations regarding the development of macro-economic evaluation tools for the State.

1. A key ingredient in evaluating the economic value of the salmon fishery to the State of Alaska is the ability to reasonably and 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 concerns the raw fish tax. Personal and corporate income tax information for residents and non-residents is not available in a readily usable form.

3. Input/output analyses which identify the direct and secondary multiplier effect of employment and income from in the fishing industry, need to be conducted.

4. Based upon the current lack of reasonably accurate macro-economic information, the State of Alaska is not in a position to evaluate its investment opportunity in the fisheries. Moreover, the current lack of this information effectively precludes the State from explicitly formulating an economically sound fisheries development policy.

5. The State Departments of Revenue, Commerce and Economic Development and Labor should be authorized to develop the necessary macro-economic analysis information and tools so that the state can appropriately assess the economic value of its salmon fishery and formulate an economically sound fisheries development policy.

Chapter II - SOURCES AND METHODS FOR FINANCING SALMON AQUACULTURE PROGRAMS

Mandatory Assessments

Prior to discussing some of the other considerations involved with developing a stable financial basis for salmon aquaculture, the most critical financial issue currently pressing on the regional aquaculture associations is the recent Superior Court ruling in Wayne Alex etal., v. Southern Southeast Aquaculture Association etal. in which the court held that Alaska Statute 16.10.530, which establishes the funding mechanism for private aquaculture, is unconstitutional.

In a letter to Governor Hammond, as a result of the court ruling, the State Attorney General identified five "potential legislative alternatives to the now-unconstitutional statutory scheme for your consideration." These are as follows:

1. Regional aquaculture association programs could be funded through direct appropriation. We believe there would be no legal difficulties with this approach.

2. A statewide tax on the sale of salmon could be imposed, with proceeds of the tax deposited in the state's general fund and regional aquaculture association programs funded through annual appropriations in amounts based on the amounts collected in each region. While such a scheme conceivably could be challenged on the basis that it

violates the constitutional prohibition on the dedication of state tax revenues, we believe such a statute could be drawn artfully enough to pass constitutional scrutiny.

3. Regional taxes could be imposed on the sale of salmon to become effective only upon a majority vote of commercial fishermen in each region, proceeds of the tax would be deposited in the State's general fund and the regional association's programs would be funded through annual appropriations in amounts based on the amounts collected in the region. In addition to the dedicated fund problem, such a scheme could be challenged on the ground that it violates equal protection (treating commercial fishermen differently depending upon the region in which they are fishing) and on the ground that it constitutes an unconstitutional delegation of the power to levy a tax. While there are good arguments that such a program does not violate equal protection and does not constitute an unconstitutional delegation of the power to tax, we cannot predict with certainty how the issue would be resolved by the Alaska courts.

4. The program could be restructured to take advantage of the constitutional authorization of "service areas" -- in effect, utility districts. This approach would require agreements between the state and municipalities in each region, but would avoid the dedicated fund problem and (probably) the delegation problem as well.

5. The Fisheries Rehabilitation and Enhancement Division (F.R.E.D.) in the Department of Fish and Game could be restructured and directed to be more responsive to the concerns of the user groups in the various

regions. Under this scheme, the Department of Fish and Game (through F.R.E.D.) would have primary responsibility for implementing any aquaculture program established for any given region. There are no legal obstacles to such an approach to the problem.

The following comments are directed at each of the alternatives suggested.

1. It would be possible to fund the regional associations for a limited period of time through direct appropriations. The use of this approach must be regarded as a short term measure for several reasons. One of the major policies of Alaska state government is to require that programs which benefit primarily a group of resource users shall become, to the extent possible, economically self-sustaining. If the regional aquaculture programs, and the fishermen who benefit from the expanded harvests, are to operate in a manner which is consistent with this policy, some alternative means of financing fisheries development projects must be found. We discuss further the problems related to this option in Chapter III.

2. A statewide mandatory tax on the sale of salmon could be imposed with the proceeds from the tax appropriated to each region in proportion to their contribution to the taxes collected. A major problem with such a course of action is that one of the major fishing areas now operates in a satisfactory manner on voluntary assessments. Others would vigorously oppose the tax. Whether or not such tax

receipts could be dedicated raises serious legal questions. To subject the program to further legal uncertainties at this time should be avoided at all cost.

3. Again, the legal complexities of alternative number three present risks which may not be necessary or appropriate to take.

4. Alternative #4, suggests that regional associations might be restructured into service districts based upon agreements between the state and the boroughs. This alternative seems to find considerable constitutional support and is discussed in detail in Chapter III.

The implementation of special service districts for regional aquaculture has several attractive features. Regional aquaculture, if it is to grow and make a significant contribution to the fishery, requires two characteristics which are not now present in their organizational make-up. The regional associations need a stable source of financing and a stable organizational structure.

The inherent financial structure of private non-profit corporations has several characteristics which severely limit the use of this form of organization for fisheries development. First, because the corporations are non-profit, they have little capability to raise private venture (risk) capital which is vitally needed to meet reasonable production goals. While it is true that the non-profit corporations can borrow substantial sums from government,

unless that government is very knowledgeable about the investment risks, is willing to undergo long periods of initial start-up costs without a pay back, and is very committed to maintaining its support, the non-profit corporations will not have an adequate financial structure upon which they can develop and grow.

Secondly, just as the non-profit corporations have none of the financial strengths of a private sector for-profit corporation, such as the capability to attract risk capital, neither do they have any of the financial strengths of a unit of government such as an assured tax base. They must now depend upon voluntary contributions for their subsistence.

The private non-profits not only suffer from the lack of a stable source of financing, they also suffer from the lack of a stable organizational structure such as those structures found either in the private sector or in government.

For example, members of the boards of directors of private sector corporations often have a major financial interest in seeing the corporation succeed, and offer considerable expertise relevant to the fixing of sound corporate policy. It is difficult for the regional associations to educate their boards while at the same time expecting them to fix sound policy. Moreover, many of the associations are organized on the foundation of an active board. The goals and programs of the associations are ambitious and there

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have been frustrations. It may be difficult for enough fishermen to maintain such an active role or interest without adequate renumeration or status.

Neither the financial rewards associated with service on a board of directors of a for-profit corporation, nor the status conferred in an elective public position are currently present in the regional association. Currently, members of the boards of directors of regional aquaculture corporations regard their service on the board as a "civic duty" or because of a personal commitment to the fishery. Few board members expect to see any significant financial return to themselves as a result of the aquaculture program for a long time, if ever. In essence the sense of "civic duty" or sense of personal commitment to the fishery must be strengthened so that increased organizational stability can be achieved for the regional aquaculture associations.

The use of the special service district could provide a means for achieving both a stable financial base and a more stable organizational base than presently exists. For a further discussion of this option, see Chapter III.

5. The fifth alternative means of resolving the loss of the mandatory assessment would be to restructure the F.R.E.D. division of ADF&G into a regional aquaculture program.

While this type of change on the surface has some attractiveness in that it may offer the possibility of a

somewhat improved financial base (presumably through state appropriations), the same long-term financial problems that are present in alternative #1 are present in #5. That is to say, if one of the major policies of Alaska state government is for the users of government service to pay their fair share for the service and for programs to become economically self-sufficient, ultimately a fair share of the cost of operating a regionalized F.R.E.D. division will have to be shifted to the user groups. Many of the pros and cons of the state's assumption of an active role in funding the program are addressed in detail in Chapter III.

The F.R.E.D. division will have in operational status by the mid-1980's, hatchery production capacity in excess of 600 million eggs being incubated. At some point in time, it is possible that the significant costs incurred in operating these state salmon production facilities will need to be offset by an adequate income stream (e.g. terminal harvest or user assessments). In essence, selection of alternative #5 would be inconsistent not only with current Alaskan state policy, but would mean ever greater costs to the state in the future for operation and maintenance of facilities, this at a time when state revenues (e.g. oil taxes) may be on the decline.

6. A sixth alternative not suggested by the Attorney General would be an Amendment to the Alaska Constitution expressly providing for such regional economic develop-

ment as aquaculture. The drafters of the Alaska Constitution eliminated the junior taxing districts which "plague" government operations in most of the lower 48 states. They limited the general taxing powers to the state and boroughs and expressly authorized boroughs to set up special service districts to provide for services required in the borough. If the state legislature acting on behalf of the unorganized boroughs and the boroughs acting on behalf of themselves, are unable to create a special service district whose boundaries encompass areas included in both the organized and unorganized boroughs, as suggested in alternative number 4, then it would be impossible to create a regional aquaculture association with boundaries comparable to those which currently exist. If we accept the argument that broad regional areas are a logical geographic feature required by regional aquaculture associations, a constitutional amendment may be required to provide the associations with a taxing authority which encompasses a service district which includes area in both the organized and unorganized boroughs (or perhaps two boroughs).

While the framers of the Alaska Constitution expressly intended to avoid the nuisance of junior taxing districts, it may be time to reassess the wisdom of a policy which entirely eliminates any mechanism for infrastructure development in Alaska except as it might exist in an organized borough or through state appropriations. If special service

districts cannot be created to extend beyond the boundaries of the organized borough, a constitutional amendment could be offered to allow this type of infrastructure development. The difficulties of obtaining necessary constitutional amendments are addressed in Chapter III.

In summary, the loss of the capability to have mandatory assessments by several of the regional aquaculture associations is a severe shock to their already inadequate financial structure. Six alternative methods of making up for the financial loss have been discussed. Two alterations, the creation of special service districts or an amendment to the Alaska Constitution allowing for junior taxing districts or service districts to be created which extend into adjacent boroughs or the unorganized borough, are the most attractive alternatives. Both of these alternatives can be consistent with the goal of ultimate economic self-sufficiency of the program. Secondly, these alternatives provide the opportunity to create a more stable regional aquaculture organization as well as provide a more stable source of financing.

Other Financing Issues

Through a series of legislative acts, beginning in 1971, the Alaska Legislature has established a number of mechanisms for supporting or financing the Salmon Resource Development Program (ASRDP). These are each separately discussed as follows:

1. Creation and State Tax Support of the F.R.E.D. Division of ADF&G (1971).

As indicated earlier, one of the expressed purposes of the F.R.E.D. division is to rehabilitate Alaska salmon runs through enhancement or propagation of hatchery runs. By the mid-1980's the F.R.E.D. division will have a salmon egg rearing capacity in excess of 600 million eggs. Major facilities at Klawock (78 million egg capacity), Hidden Falls (65 million), Main Bay (65 million), Snettisham (73 million) Prince Williams Sound (39 million), Kodiak Island (50 million), Cold Bay (52 million), and Moose Pass (84 million) will become operational within the next few years. The State of Alaska will incur a heavy financial burden during the entire decade of the 1980's as these facilities go through expensive start-up periods and achieve stable production. Current state tax revenues from the fishery as well as revenues which could be derived from a terminal area harvest may not equal operating and maintenance costs, in the aggregate, until very late in the decade. The question which will soon confront the citizens of Alaska and the State Legislature, is, who should ultimately pay the operating costs of these facilities? If the strong, current state policy for economic self-sufficiency is continued, either a higher tax would have to be imposed or a terminal area harvest implemented with the proceeds of either or both used to pay the costs.

While there is inadequate information to develop anything approaching reasonable cost standards for hatchery operations which cover all species, a very rough guide is that the cost of running a hatchery which is in full production, and does not require expensive off-site egg take or equally as expensive off-station plants, should be about equal to the harvest value of 1/3 of the run. (An analysis of current operating costs of existing regional facilities has been partially hampered because of the lack of information. Sufficient financial data was collected, however, to indicate that if such costs as Regional Association Administration, Administrative and Supportive Services, Technical Services and Start-up Costs which have been previously defined were only allocated to hatchery operations as would be appropriate, the cost of hatchery operations would be roughly 1/3 of the value of the run in Southeast Alaska. Because operating costs in Central and Western Alaska are as high or higher than those in the Southeast and because the ex-vessel prices paid to fishermen in these regions are much lower than those paid in Southeast, this ratio will not hold for hatcheries in Central and Western Alaska. However, if the changing patterns currently occurring in the marketing of salmon continue, regional price variations should diminish over the next few years and then this rough guide could also apply to these areas.)

If a tax of 33% (which would be the dollar equivalent of harvesting 1/3 of the run to pay hatchery operating costs) were imposed on state hatchery returns, it is unlikely that fishermen would choose to harvest hatchery runs if other choices were available. Given this likely circumstance, the most probable method of recovering the costs of F.R.E.D. division hatchery operations (and for the regional associations) will be through a terminal area harvest. If the choice is made to finance hatchery operations through such a mechanism, there would be little to distinguish between a state operated facility and those operated by regional associations (as long as they are reasonably successful producers).

It is also important to recognize that the F.R.E.D. division's responsibilities extend substantially beyond those of the regional associations, but to the extent that there is an overlap in duties with those of the regional associations as they pertain to the operation of facilities in full production suggests that consideration must be given to shifting the financial and management burden of operating these facilities from the state tax base to a user pay, regional association basis. (Other criteria besides financing must be considered including the managerial and technical capability of the regional associations to manage such facilities.)

The shifting of the cost of managing and operating state salmon production facilities to the regional associations should not be construed to mean that the State of Alaska should lessen its commitment of state financial resources to development of the fisheries. These state financial resources should be commensurately shifted to the far more pressing needs for a comprehensive fisheries research and development program and harvest management systems improvements. Additionally, there may be hatchery facilities, stream clearance and habitat improvement projects, and the like, which can or should occur for a variety of reasons, but which cannot be undertaken by the associations on an economic basis.

2. State Loans to Regional Aquaculture Associations.

Current legislation provides for 25 year loans to regional aquaculture associations of up to 3 million dollars per facility, with a maximum interest rate of 9 1/2%, with deferred payments for six years.

There are several problems with this legislation. First, the 3 million dollar loan ceiling can be artificially restrictive on the choice and size of the facility. Secondly, while returns on pink salmon may be achieved within the six year deferred payment period on the loan, there is little likelihood that this period will be adequate for other species. Difficulties in obtaining sufficient brood stock, initial production and similar problems can and should be expected. A ten year maximum deferment period would seem to

be much more realistic. Additional provisions should provide for an additional time extension of five years (with an approval procedure specified) as well as an early payment clause, should stable production be achieved earlier than the ten year period.

If a ten year deferment period were established, the loan repayment period should be set for a maximum of twenty years after the deferment period, otherwise the capital recovery period will be so compressed it will require an excessive terminal area harvest during the capital recovery period.

Finally, the loan should be for capital investment costs and should not include start-up costs. As will be discussed more fully later on, start-up costs should be expensed against the current period. This will help avoid the need for excessive terminal area harvests during the capital recovery period as well as avoid unnecessary interest expense associated with capitalizing these costs.

3. <u>The Existing Assessment Program (if Re-enacted) Does Not Provide Sufficient Revenues to Pay Administrative Costs, Regional Technical Expertise and Hatchery Start-up and Operating Costs for More Than One Large Facility at a Time</u>.

This financial issue has been partially addressed in a variety of legislative enactments. These include:

(a) The provision of organizational and planning grants to qualified associations of up to $100,000 with a second $100,000 to be matched on a 50/50 basis.

(b) The provision of an appropriation in the State FY 1980 budget to the F.R.E.D. division for allocation to the regional associations in the amount of $400,000 for regional planning activities.

(c) The passage of Senate Bill 232 which provides that 20% of the revenues realized from the measure are to be allocated to the boroughs for local salmon enhancement and related projects; 60% of the revenues are allocated to the state general fund; the remaining 20% of the revenues are to be allocated to the Commercial Fishing and Agriculture Bank which in turn can be loaned or used as a loan guarantee for regional aquaculture projects.

(d) The establishment of the Renewable Resources Corporation of Alaska and Development Fund into which not less than 5% of the receipts of certain revenues will be deposited to be used to enhance and develop renewable resource programs.

The creation and state financing of the F.R.E.D. division, the creation and revision of loans to private non-profit regional aquaculture corporations, as well as these additional acts by the Alaska Legislature evince a continuing interest and struggle to find an acceptable solution to re-establishing the salmon fishery and developing other renewable resources.

While it is also understandable how these various legislative actions have evolved over a number of years, it

is equally clear that the pieces do not fit as well together as necessary. If, however, the variety of programs were to be restructured along the lines described, we believe adequate financial resources could be available to substantially accomplish a Salmon Resource Development Program (or as recommended in the organizational analysis in this report a Fisheries Resource Development Program).

Establish Regional Entities Responsible for Fisheries Development

Through either the creation of special service districts or appropriate constitutional amendment it would be possible to provide regional structures which have the capability to make mandatory salmon harvest assessments. Voluntary assessments could be continued in those areas where they are selected as the financing means.

Establish Regional Aquaculture Program Source and Applications of Funds Model

As our earlier analysis indicated, there are six distinct cost categories for activities associated with regional aquaculture. These are:

Regional Association Administration

Administrative and Supporting Services

Technical Services

Full Production Hatchery Operations

Hatchery and Enhancement Start-up Costs

Capital Investment Program

The costs associated with administering the regional association could be funded from the regional assessment or a like funding mechanism. Administrative and Supporting Services, while a budget category, would be allocated to the other categories (i.e. Regional Association Administration, Technical Services, etc.).

Technical Services could be financed through a redirection of the proceeds from Senate Bill 232. The cost of full production hatcheries would be borne by remaining funds from the regional assessment, and through the operation of terminal area harvests.

Hatchery and Enhancement Start-up Costs could be financed through the redirected funds from Senate Bill 232 and any assessment royalty not required for Full Production Hatchery Operations or the Capital Investment Program. The payment of capital and interest costs would be financed from a combination of remaining assessments and terminal area harvests.

Finally, and to the extent that local fisheries development priorities indicate the need, non-revenue producing projects such as stream rehabilitation for natural runs could be financed with a combination of assessment revenues and Senate Bill 232 funds together with any federal and state funds that may be received for such a project. (This

procedure avoids the necessity of having terminal area harvests on natural runs as a means of recovering the cost of non-revenue producing projects.) Regional associations could perform such projects on a contract basis on behalf of the state.

This proposed Source and Application of Funds Model accomplishes several objectives. First, it can be used as a means for guaranteeing to the state that repayment of state loans will be accorded a preferred position for assessment and terminal area harvest revenues equal to that of paying the costs associated with Full Production Hatchery Operations.

Secondly, the redirection of Senate Bill 232 funds to the regional associations provides a continuing stable revenue base for financing Technical Services and Hatchery and Enhancement Start-up Costs which are highly interrelated activities. The inclusion of start-up costs, to be funded from this source would also eliminate the present practice of capitalizing start-up costs within the present loan program. If the present loan program were modified to include only capital facilities, loan decisions could be more easily made because it would be unnecessary to make speculative or arbitrary determinations about whether the regional associations were properly spending their other income as a part of the loan approval process. The determination of the adequacy, over-abundance or inadequacy of other

income, as well as judgments about how wisely these resources are utilized should be the responsibility of the local borough assembly and the legislature.

According to financial information supplied by the Southern Southeast and Northern Southeast Regional Aquaculture Associations, for calendar years 1978 and 1979, the annual average operating expenditures (excluding capital investments) would have amounted to approximately 1.0 million dollars in these two regions had the assessment revenue been fully realized.

Under the proposed plan, had it been in effect in 1978, and based upon a 3% assessment rate, assessment revenues would have been approximately 1.7 million dollars. In addition, had Senate Bill 232 been in effect in 1978, it could have provided (depending on the percentage of revenue redirected) an additional 2.0 million dollars. Both sources together would have provided almost four times the amount which would have been expended. Had these funds been available, the two Southeast regional associations could have begun developing the necessary capital reserves required to pay future facility start-up costs; conducted the necessary stream surveys; performed stock enumerations and similar activities; and proceeded to develop the fishery in a comprehensive and organized manner through an integrated system of production and financial planning.

Establish Regional Long Range Production and Financial Plan

A third key element to the development of an economically and financially sound regional aquaculture program is the establishment of a production and financial management system consistent with the proposed organizational structure and financing mechanisms.

Once the regional associations have an assured and reasonably adequate revenue base, they should begin the development of a ten-year and perhaps a longer range Production and Financial Plan. (The ten year plan is the minimum necessary to cover the deferred payment period prior to reaching full production and capital repayment.) The implementation of a long range Production and Financial Plan by each regional aquaculture association is critically necessary if these associations are to approach the development of the salmon fishery in a comprehensive manner. Currently, because of the limited financial resources available to them, regional associations have tended to limit their production planning activities to a few projects. Current financial planning practices, because of financial uncertainties, tend to be very much oriented toward short term considerations.

If the organizational structure and the financing mechanism recommended in this report are implemented, it must be accompanied by a major change in the current "hand to mouth" type of planning now dictated by the fiscal constraints. For example, because of the substantial streams

of stable revenues which this report would direct at the regional associations, each regional association must begin to develop a comprehensive list of production alternatives. Enough information about each production alternative must be obtained to provide the capability to evaluate each project using the recommended return on investment model. Once a list of economically attractive projects is developed, the regional association will have to develop a time phased production plan which optimizes the use of the revenues flowing to the association. The corresponding financial plan, which will include a ten year annual forecast of revenues by source (i.e. assessment revenue, Senate Bill 232 revenue) should identify for each category of cost included in the recommended Source and Applications of Funds Model, the estimated level of activity which can be supported by each revenue stream. Because of the long duration between the initial start-up of a facility and the time when the facility reaches full production status, the regional associations will have to very carefully consider and plan for the costs to be incurred during this period so as to avoid over-committing available revenues and having a facility completed without the funds with which to operate it. As recommended in the Source and Applications of Funds Model, Technical Services, Hatchery and Enhancement Start-up costs and non-revenue producing projects could all be financed from the same source of funds, namely the redirected proceeds from

Senate Bill 232. If a regional association were to expend all of its annual revenues from this source on Technical Services and/or non-revenue producing projects and not create a substantial capital reserve to be used for projects during their start-up phase, the association would substantially limit its capability to place more than a few projects in start-up status. (Capital reserves are also necessary as a hedge against periods of low harvest levels.)

While it will require some experience developing the financial trade-offs between current expenditures for Technical Services and non-revenue producing projects with building capital reserves for future facility start-up costs or times of low returns, this type of activity will lead to an optimized and integrated production and financial plan.

Relative Balance Between Operating and Capital Funds

It is difficult to ascertain at this point whether the availability of capital investment funds to the regional associations are in balance with their need for operating and start-up funds. Given the state commitment to a 200 million dollar loan program for aquaculture, the availability of loans through the Renewable Resources Corporation and the Fisheries and Agriculture Bank, capital funds may be available in excess of those required. If there is an imbalance between capital and operating funds, and the operating funds

are found to be inadequate, it may be desirable to merge the Renewable Resources Corporation Development Fund with the Fisheries and Agriculture Bank and redirect the 20% portion of Senate Bill 232 proceeds from the Fisheries and Agriculture Bank to the regional associations to be used for Technical Services and Hatchery and Enhancement Start-up costs.

The diversion of Senate Bill 232 revenues to regional aquaculture plus the assessment income should provide for a substantially greater build-up of necessary capital reserves to be expended during future periods when the regional associations have a number of facilities in the start-up phase of operations as well as provide a more satisfactory means of financing some short term non-revenue producing projects.

Chapter III - INSTITUTIONAL PROBLEMS AND POTENTIAL REFORMS

Introduction

In Chapters I and II we have discussed methodologies for evaluating the economic viability of certain types of resource enhancement activities which are a critical element of Alaska's salmon fisheries resource development program, and several means for assuring the financial stability for such a program. We recognize that the Alaska salmon resource development program (ASRDP) is a relatively new endeavor. Its major elements, the private non-profit hatchery program (PNP) and the division of Fisheries Rehabilitation, Enhancement and Development (F.R.E.D.) within the Alaska Department of Fish and Game, are each less than 10 years old. ASRDP has come a long way in a short period of time toward achieving a basic goal of expanding the available harvest of salmon for Alaska's fishermen. We also recognize that the program's potential has not been reached and positive program results can be expanded if present financial, legal and institutional barriers are overcome.

In this discussion, we will be addressing problems with ASRDP and means of achieving program improvements. The natural tendency of consultant studies to concentrate on program deficiencies is not intended. We believe that the managers of regional associations and the Alaska Department

of Fish and Game have many successes to point to in their implementation of this ambitious and important program.

While achieving stable financing for economically sound ASRDP programs is essential to meet established statutory and program goals, our analysis indicates that revisions to the institutional arrangement of Alaska's fisheries development program are required if the goals enunciated in statutes and regulations by the state, and in program goals and statements of regional associations are to be met. The detailed institutional review contained in Appendix II to this report indicates that there are a large number of programs, each of which can and does affect ASRDP, which are not centrally coordinated. The wide variety of government agencies and private activities impacting on ASRDP presents a critical need for greater horizontal coordination and cooperation among such programs, greater coordination with federal and local agencies, and increased cooperation between the private and public sectors. This discussion concentrates on some of the potential institutional reforms which could be implemented to positively impact those programs with primary responsibility for achievement of fisheries resource development goals and objectives for Alaska. We do not suggest all of the detailed reforms relating to improved coordination among regulatory agencies, financing agencies, construction entities, and other programs affecting ASRDP should be the responsibility of the Aquaculture Policy Study Group. The study group should, however, focus

their attention on necessary reforms in those agencies having primary responsibility affecting fisheries resource development.

We have identified a number of federal institutions and programs which have significant impact on overall fisheries development in the United States. Many of these programs impact on Alaska fisheries development, and it has been suggested to the study group that, to date, the State of Alaska may not have received its "fair share" of benefits from federal programs impacting on Alaskan fisheries. We offer the observation that there are many federal agencies which enjoy special working relationships within Alaska who provide positive support to ASRDP. Noteworthy is the U.S. Forest Service, which has established cooperative agreements with the Alaska Department of Fish and Game, and informal arrangements with many of the regional associations to maximize the effectiveness and impact of its programs on the important Alaska salmon fisheries resource.

We briefly identify in outline form other federal institutions affecting ASRDP (Appendix III). We will discuss means of improving relationships between key federal and state agencies affecting ASRDP.

Finally, perhaps the most critical element to the success of an Alaska fisheries development program is the commitment of the legislative and executive branches. A major reason why this study has been conducted is the concern

shared among persons within executive and legislative branches that the salmon fisheries development program is not producing satisfactory results as measured against the original goals of primary programs. This concern was reflected in the most recent legislatively approved budget for the F.R.E.D. division and for regional associations. The members of the study group were well aware in formulating this study that the key programs in ASRDP could be the subject of ever greater scrutiny in the future, particularly in the face of projected tight budgets and declining revenues.

Among the general program recommendations which have evolved from our analysis of existing institutions and policies are the following:

1. There is a need for increased cooperation and coordination among major program elements of ASRDP;

2. ASRDP should be expanded or altered to include consolidation and coordination of programs affecting the development of species other than salmon, i.e., establishment of an Alaska Fisheries Resource Development Program (AFRDP);

3. There is a need for improved and expanded research, data and information affecting AFRDP;

4. Region-specific planning, programs and institutional arrangements which will maximize the benefits of the program consistent with area needs should be established;

5. There is a need to identify the appropriate level of activity for individual program elements within

AFRDP; this should be done on a continuing basis and not merely through established budget processes;

6. Improved relationships with federal, local and private sector programs affecting or having potential impact on AFRDP is necessary;

7. There is a need to develop institutional reforms which ensure greater financial stability for existing and new programs; and

8. There is a need to develop an information base sufficient to evaluate program successes and failures in the future.

(Note: Because of the present financial difficulties of the regional association program, the consulting team was directed when the study was nearing completion to spend more time evaluating institutional arrangements which could affect the future of the regional association program. We suggest that further, more detailed analysis by the study group of financial and institutional alternatives affecting the regional association program will be required prior to the 1980 legislative session.

Identification of Primary Programs to be Included in Alaska Fisheries Development Program (AFRDP)

In the series of meetings with the Aquaculture Policy Study Group the consulting team sought to identify those programs primarily involved in fisheries development

activities at the state level. As indicated in Appendix II, there are a number of other programs which have an impact on fisheries development activities in Alaska, but the study group has designated the following programs and activities as includable in the primary program category:

A. Alaska Department of Fish and Game.

   1. Fisheries Rehabilitation, Enhancement and Development Division (F.R.E.D.);

   2. Commercial Fisheries Division;

   3. Sport Fisheries Division;

   4. Shellfish Program.

B. Private Nonprofit Hatchery Program/Regional Associations.

C. Office of the Governor/Bottomfish Coordinator.

D. Department of Commerce and Economic Development (Division of Business Loans).

E. Department of Transportation (construction of facilities).

F. Alaska Commercial Fisheries Entry Commission.

G. Department of Community and Regional Affairs.

Because the initial focus of this project was to be on the salmon fisheries development program, major concentration on reforms affecting programs involved in this arena resulted. This is consistent with the goals, makeup and interests of the study group. However, we strongly believe that the salmon development program and its major elements cannot be planned or managed independent from other fisheries and that in the future it becomes critically important to

integrate the salmon development program with those for shellfish and bottomfish.

Statement of Project Findings and Needs

A. There is a Need for Increased Cooperation and Coordination Among Major Program Elements of AFRDP.

1. General Statement of Problems and Needs.

The detailed program outlines included in Appendix II indicate a need for greater horizontal coordination among a wide variety of programs and agencies in Alaska which impact on the successful operation of AFRDP. There is a need for clear direction as to the relative roles and responsibilities of each such entity: (a) as they relate to the overall goal of fisheries development; (b) as they relate to interrelationships of such programs in achieving established goals for the total fisheries development program; and, (c) as necessary to ensure that such programs and activities are not operating at cross purposes from one another. Increased coordination can be provided through the Office of the Governor or the State Legislature. Some lead agency could be assigned this responsibility by the Governor or the Legislature.

Following are a number of specific issues which must be addressed to increase cooperation and coordination among major program elements of AFRDP. These include improved relationships among:

(a) ADF&G Commercial Fish, Sport Fish and F.R.E.D. divisions.

(b) ADF&G and regional associations.

(c) ADF&G, DCED and regional associations.

(d) All Regional Associations.

(e) ADF&G salmon and shellfish program elements, regional associations, and the Office of the Governor/Bottomfish Coordinator.

Increased coordination and cooperation are necessary for a variety of reasons. In some instances, improved relationships among these entities is absolutely essential to the future success of ASRDP. For instance, policies adopted by ADF&G regarding egg take and brood stock could effectively eliminate any prospect of success for individual hatchery programs or other activities undertaken by the regional associations.

In some instances, existing laws infer that coordination of activities among AFRDP entities is required or should occur. However, we suggest that there are situations where this legislative mandate is not strong enough. For example, legislation establishing the fisheries enhancement loan program, A.S. 16.10.500 et seq., provides authority in the Department of Commerce and Economic Development (DCED) to make loans and grants to regional associations for fisheries enhancement. There is no provision in the statute requiring or defining the necessary relationship between DCED and ADF&G regarding any aspect of the program.

This absence of a statutorily established coordination requirement could be resolved through legislative action.

In certain cases, relationships among program activities have not even been addressed by the legislature or the executive branch. For example, the newly established activities within the Office of the Governor relating to bottomfish development have evolved to date without identification of potential and necessary relationships between that office and fisheries development activities by ADF&G and the regional associations. If the legislature considers expanding the authority of regional associations to include other species, coordination with development activities of the Bottomfish Coordinator will be required.

Finally, there are situations where the legislature may wrongfully presume that coordination and cooperation among such entities is established and routinely occurring. One such instance involves the relationships among divisions within ADF&G. Testimony during study group meetings and a number of previous studies have indicated that the relationships among the F.R.E.D. division and the Commercial and Sport Fish divisions are less than fully cooperative. While considerable effort in recent years has been made to establish coordinated goals and objectives for these

programs, it does not appear that such activities have produced a result wherein each is working in as coordinated a fashion as possible toward a common fisheries resource development goal.

2. Need for Improved Relationships Between ADF&G Commercial Fish, Sport Fish and F.R.E.D. Divisions.

There are a number of indications that despite considerable efforts in recent years to establish policies and practices which will effect improved relationships between the state's resource development program and management activities of the commercial and sport fish divisions, there remain areas of conflict between these divisions. As hatcheries come on line, the need for coordination and communication among such divisions will become all the more important. Management to maximize harvest and protect viable natural runs is all the more complex with the interjection of hatchery runs.

Relationships between harvest and hatchery managers are affected by statutes and policies protecting natural runs. A.S. 16.10.420(10) provides:

> A hatchery (shall) be located in an area where a reasonable segregation from natural stocks occurs, but when feasible, in an area where returning hatchery fish will pass through traditional salmon fisheries.

The existing policy of the Alaska Department of Fish and Game (see Alaska Fishery Management Policy Manual, Policy #1, (1974) provides as follows:

> The management of naturally occurring wild stocks will not be unduly hampered by locating the hatchery at the proposed site . . . . If complexities arise in managing mixed stocks, including both hatchery fish and wild fish, it will be the state's policy to manage the collective resource in a manner that favors protection of the wild stocks. (Emphasis added.)

As indicated at page 25 of the proposed Policy and Procedures, even "minor runs of salmon" must be given first priority consideration when a massive supplementally produced salmon run is imposed in fishing areas where wild fish are harvested. ADF&G acknowledges that this policy may lead to larger than required returns to the production sites. Over-protection of certain weak natural stocks at the expense of harvest of productive hatchery runs seems inconsistent with goals of the PNP hatchery program.

The department states that "long-term and continuing analysis will be conducted to assess benefits and disbenefits resulting from the fish cultural activity prior to any decision to sacrifice or overharvest wild stocks." (C.F. AK. Fish. management policy #7, page 4). The issue of protection of natural runs in areas where hatchery stocks have been introduced (e.g., Washington) is one of great controversy. This is in part because of failure of fisheries managers to address the potential problem prior to the evolution of major hatchery programs. At this time, the

State of Washington is struggling with the definition of "viable natural run" at a time when as much as half of the state-wide production of salmon is through artificial propagation. This has occurred in part because of the lack of imposed relationships and some conflict between harvest managers and hatchery managers at the outset of the resource development program. Alaska should make every effort to avoid repeating this experience.

A review of Washington's 1979 proposed salmon management plan is illustrative of a major change in approach to harvest-hatchery management patterns. The plan suggests harvest of certain natural runs prior to full production from planned facilities in the same area. In some instances, this "writing off" of natural runs is occurring before construction of a facility has even started. We do not begin to suggest this policy for Alaska. However, it does indicate the potential significant changes that may evolve in terms of harvest management practices as the hatchery program evolves.

The present policy regarding natural runs can also impact on the necessary development of brood stocks and egg takes for existing and planned hatcheries. At page 26f of the draft Policy and Procedures, ADF&G proposes the following:

> It is recognized that an objective of salmon fisheries harvest management is the attainment of an appropriate magnitude and distribution of brood stock to drainages in all management

> units. It is not always possible through management of mixed stock fisheries to ensure the appropriate escapement to a specific stream or stream segment, but generally, desired escapement ranges can be obtained over larger geographical units. Hatchery brood stock goals, as an additional part of the desired escapement [sic]. Where possible, brood stock development plans will include harvest management procedures or recommendations which will enhance the potential for achieving hatchery brood stock requirements without significantly reducing harvest from other stocks. Where restrictions on mixed stock fisheries to create additional donor escapements are requested, Board of Fisheries approval will be required, unless the Commissioner determines that no substantial impacts on established fisheries would occur.

The proposed brood stock policy of ADF&G further states that hatchery egg take schedules will be formulated to realistically provide for brood stock while "minimizing impact on natural recruitment."

This policy may present problems even now as the demand for eggs and brood stock for hatcheries coming on line is immediate (particularly during bad run years). A policy of "long-term and continuing analysis" prior to any decision to sacrifice or overharvest wild stocks not only impacts on the ultimate harvest of hatchery stocks by Alaska fishermen, it also may affect the front-end potential and timing of ultimate production by state and regional association hatcheries. Definition of "viable natural runs" is not a matter which should be deferred any longer than

necessary. Legislative direction regarding alteration of harvest management and brood stock policies may be necessary to resolve this problem.

A second problem reflected in the draft Policy and Procedures is the lack of guidance regarding the interface between the resource development and management divisions within ADF&G as they might affect regional association resource development activities. Appropriate alteration to the above policies will require joint research stream surveys, site selection and planning by these divisions and the associations. The regional comprehensive planning process should be instituted in a fashion which more directly requires effective interface between harvest management and resource development programs. Representation of each activity on regional planning teams is suggested by ADF&G Policies and Procedures; inter-divisional cooperation can be further achieved by assuring development of harvest management plans in concert with hatchery planning activities (which can positively improve relationships with regional associations as well).

At page 26a of ADF&G's proposed Policy and Procedures, it is stated: "There is a need to clarify the relationships between the management of hatchery returns and the issuance of a private nonprofit hatchery permit." ADF&G proposes development of a basic harvest management plan before a private nonprofit hatchery permit is issued or approved by

the commissioner and the Board of Fisheries. The basic plan would be developed by department area biologists in consultation with the applicant. The regional planning team would review the plan as part of the application review process to determine the proposed hatchery's compatibility with finalized or preliminary "comprehensive regional plans" required under A.S. 16.10.375. Ultimately, the basic harvest management plan would be part of the "regional comprehensive plan". Why should harvest management plans be formulated separately and in a different manner than other elements of a comprehensive plan? Are basic harvest management plans merely to be developed on a project-by-project basis and then incorporated into regional plans?

We believe that the comprehensive regional planning process must be upgraded to develop a multi-species harvest plan for the region which will allow hatchery locations to maximize harvest. This will require much new data as to existing and planned runs by species. Establishment of a comprehensive harvesting plan as part of the regional salmon plan is not to suggest that regional associations should in any way be involved in actual management of salmon stocks (i.e. delegation of regulatory authority). It is to suggest that policies which in any way segregate harvest and hatchery management and planning activities should be changed to ensure fuller coordination.

3. Need for Improved Relationships Between Regional Associations and ADF&G.

We have indicated that past relationships between regional associations and ADF&G have been less than cooperative, and improvements are still necessary. Lack of cooperation and coordination among these entities can jeopardize the future success of all programs.

Regional association managers have stated that in many cases they have had difficulties with ADF&G regarding methods selected to enhance the resource. They have had problems in obtaining state approval to take brood stock and eggs for existing facilities and proposed new facilities and the quality of relations during the evolution of the regional planning activity has varied. These factors indicate little evidence of clear commitment by ADF&G officials to assure on a priority basis the successful evolution of the regional association program or vice versa.

A.S. 16.10.375 provides that the Commissioner of ADF&G shall have developed regional plans for salmon enhancement. The plans are to be developed by regional planning teams consisting of ADF&G personnel and representatives of qualified regional associations. Ultimately, a state-wide plan is to be developed. Regional plans have been developed in some regions and not in others pursuant to this statute. Some are more comprehensive than others. No state-wide plan has been completed.

Legislative recognition of the need for comprehensive regional planning with input by regional user groups is a most progressive policy. In fact, this fisheries development planning effort appears more sophisticated than those existing in other states. However, the legislature needs to address means of upgrading this process to achieve express goals and effect improved relations between ADF&G and the associations.

First, at present, regional plan approval is the exclusive prerogative of the Commissioner of ADF&G. This level of control has been the subject of some criticism. Association representatives and others have indicated that while their voices are exercised through this process, whether they are heard or not is by no means assured. We believe that ultimate management authority should reside at the professional management or state agency level. However, it may be that the level and quality of association input into the planning process will better reflect the legislative policy of regional input if a dispute resolution mechanism, or at least a discussion process, were developed to satisfactorily air differences of opinion with regard to adopted plans.

Second, we question whether comprehensive planning in the various regions should be allowed to run at a pace which depends exclusively on the commitment of local users to establishment of regional associations and approval by ADF&G of same. To date, the basic thrust of the planning

process has been that regional plans themselves can be as simple or complex as those individuals involved choose to make them. Likewise, the amount of time, effort and money which is spent in developing comprehensive plans varies by region. Differentiation between short-term planning necessary to start a reasonable number of development projects and long-range planning must occur.

If there is truly a need for comprehensive planning with user participation on a regional basis, and we think there is, tying the level and quality of planning to the progress a particular region makes in organizing regional associations makes no sense. In fact, a decision whether a regional association is a necessary entity in a particular region may well depend in part on the findings of a comprehensive planning activity. The voluntary aspects of the hatchery development program are appropriate; however, comprehensive resource development plans for a region are necessary regardless of the election to establish regional associations. While this point is moot in certain regions from an organizational standpoint, it is not in others. Moreover, if the legislature expands regional association activities to include projects relating to other species, short and long-range planning to define new goals and programs will be necessary. Finally, we suggest throughout this report means of upgrading the planning process. This contemplates a <u>long-range</u> planning effort, with commitment to

development of necessary data and information. Recent efforts to speed the development of regional plans based on this year's appropriation to existing associations is inconsistent with this proposal (see below).

Third, relationships between ADF&G and the regional associations are affected by the quality and content of comprehensive salmon resource development plans. As the regional associations improve their management and technical skills, and this is occurring, they will be frustrated by present limits in the quality of planning.

We believe establishment of a truly effective comprehensive salmon resource development plan will necessitate substantial technical support services, research, stream surveys,tagging and other activities by or on behalf of the planning teams. This is particularly true if the management plan is to include those elements suggested as necessary below. It should be noted that the planning process cannot be carried out without adequate financing, region-by-region, in budgets of both ADF&G and the regional associations.

The quality of regional plans is also affected by present state policies protecting all natural runs. The proposed Policy and Procedures by ADF&G establish long-range and short-term objectives to be included in the regional comprehensive plan. Present policies may not apply over the long-term, and long-range planning which does not reflect likely changes in such policies will not be adequate. This

further states the need to address the issue and to begin to identify viable runs now.

ADF&G defines the focus of long-range comprehensive planning to include determination of public needs by species and user groups, proposal of numerical objectives by species to meet these needs, determination of numerical goals for natural stock maintenance and rehabilitation, determination of numerical goals for enhancement strategies by species, and integration of long-term user group needs with technical considerations on the biological potential of the resource. Short-term objectives involve essentially the same analysis for incremental time periods within the long-range (17 year) plan. We do not believe these objectives for comprehensive resource development plans, particularly for the long-term, are sufficient. While the establishment of numerical objectives may make some sense, it is the road map to establishment and achievement of those numerical objectives which should be the basic content of the comprehensive salmon resouce development plans for each region and for the state.

Establishment of a comprehensive management plan might include at least the following basic elements:

1. Establish guidelines for salmon production.
2. Identify program objectives (it appears that this is the primary area of concentration presently contemplated for the regional planning process).
3. Describe and assess present natural production.

4. Determine and assess present artificial production.

5. Determine potential natural production.

6. Identify viable stocks and nonviable stocks that have potentially valuable characteristics.

7. Determine appropriate regional stocks by species.

8. Identify acceptable enhancement possibilities. These must be consistent with harvest management strategies.

Further consideration must be made for short-term and long-term policies for egg availability and development of brood stock. These policies must reflect the goals of maintaining reasonable fisheries and protecting viable natural runs during program implementation. All proposed projects in a region must be measured against the goals, policies or standards which will result from this analysis. This may require establishment of a construction and operating review process to ensure program activities consistent with approved plans.

Another major aspect affecting relations between ADF&G and regional associations involves the duplicity of roles to be assumed by the department. On the one hand, ADF&G is to help organize and help maintain viable regional associations. A.S. 16.10.380 provides that the Commissioner of ADF&G shall assist in and encourage the formation of qualified regional associations for the purpose of enhancing salmon production. On the other hand, the legislature has

also authorized the Commissioner to issue permits for salmon hatcheries to regional associations organized as non-profit corporations under A.S. 10.20 and regulate many operational aspects of the program. Thus, not only is the Commissioner the superseding authority over all regional planning activities as discussed above, he is also directed to assist regional associations and at the same time regulate all efforts pertaining to enhancement of salmon by the association-private non-profit corporation. Achievement of cooperation and assistance between ADF&G and the regional associations will be difficult, at best, given the nature and diversity of relationships presently existing. It will take strong management direction by both the state and the associations to recognize and deal with these sometimes conflicting roles. Establishment of clear biological, economic and management standards against which performance can be measured, and upgrading of the planning process may help offset the fact of these conflicting roles.

A.S. 16.10.443 states that the department shall make every effort "within the limits of time and resources" to advise and assist applicants in the planning, construction and operation of salmon hatcheries. The level and quality of assistance by the department to regional associations has varied from region to region and is affected by personalities and budget. Most association managers have indicated that relationships with local ADF&G officials at the technical

staff level have been quite positive and they have received considerable assistance from such persons. However, they have received less cooperation and support from the central office as a general rule. Procedures to clearly delineate reporting relationships and for expediting decision making on issues of concern to the associations need to be improved. Establishment of policies and procedures involving interrelationships between ADF&G and the associations should be developed with the cooperation of the associations. Moreover, top level management control and commitment to the success of both regional association and F.R.E.D. programs is essential. Association managers must have clear access to the director of the F.R.E.D. division, the commissioner and board members.

A third major issue and necessary element to improve on relationships between ADF&G and the regional associations involves clarification of the activities to be undertaken by both. We have suggested in Chapter II the evolvement of defined roles and responsibilities over a ten year period. Of course, it is difficult at this point to finally determine the types of projects and programs which should be undertaken by regional associations other than planning until their financial viability and organizational stability is secured. However, assuming that problems relating to financing can be resolved on a satisfactory basis, clear definition of roles and responsibilities of ADF&G and the associations for both short-term and long-term

operations is essential. Specific program activities to be undertaken by ADF&G and regional associations in a particular region can and should be addressed, in part, in the development of comprehensive regional plans. However, guidance from the legislature as to the division of responsibilities is also appropriate. The study group and/or the Fisheries Council should be continued to assist the legislature and the Governor in continuing to define these roles.

To date, regional associations have built hatcheries and other artificial propagation projects, performed habitat rehabilitation, conducted (region-specific) research, they have created greater public awareness of the need for salmon resource development, participated in regional planning activities, and institutionalized themselves to varying degrees. At the same time, ADF&G has built hatcheries and other artificial propagation projects, performed habitat rehabilitation, conducted research, created greater public awareness of the need for salmon resource development, and participate in regional planning. Again, ADF&G exercises considerable regulatory authority over regional association projects and programs and controls the regional planning process. Based on present mandates, there is considerable potential for duplication of activities between the regional associations and ADF&G, and unhealthy competition between these entities for limited dollars and projects. The potential for the operation of certain programs at cross purposes from

one another, and perpetuation of adversary relationships are equally serious problems resulting from the lack of clear guidelines, priorities and authorities for each program.

The legislature can direct a phasing-in of operational authorities (or segregation of same) over a reasonable period of time, with final program assignments reflecting the relative maturity, skills, interests and financial capacity of each. Regional associations could, over time, become responsible for operation of production facilities operating at full or near full capacity consistent with approved comprehensive plans. This would reflect the legislature's goal of continuing to attract reasonable sums of private monies, to maintain user group participation in ASRDP, and would avoid long-term commitment of budget for operation and maintenance of hatcheries at a time of projected declining revenues. Projects of higher risk and supportive of the production program, but presenting costs or risks which would not naturally be borne by the private sector, would in large part be undertaken by ADF&G. For example, research operations and facilities would also be ADF&G's responsibility. Stream surveys might be the responsibility of the state, but conducted by associations on a contract basis. Joint participation in planning for production facilities and support services, including clear assignment of tasks can occur as institutions mature and obtain the financial commitments consistent with evolving assignments

which will further contribute to an improved and coordinated program.

Another element critical to the joint success of ADF&G and regional association programs, discussed in Chapter II, is assurance over time that financial resources will be sufficient to support a program which will begin to achieve established numerical production goals as part of an upgraded comprehensive regional plan. At present, it appears that the regional associations and ADF&G are strictly limited by statute and available financial resources as to the number and types of production projects they may undertake, regardless of the final outcome of the assessment litigation. Review of proposed long-range association plans reflects a fairly conservative approach to expansion of existing programs. While this may make sense under present circumstances, we suggest that Alaska will not begin to reach appropriate production goals in a reasonable period of time if it is unwilling to assume greater risk and undertake projects more aggressively than indicated by its present course. Improved planning, research and data, and coordination of program activities are steps that will minimize risk over time. The legislature and the Governor must recognize, however, that legitimate expansion of AFRDP consistent with its established goals will require approval of actions and management decisions that involve some yet unanswered questions. ADF&G and the associations cannot achieve reasonable production goals within the present financial, budget and statutory limits.

4. Need for Improved Relationships Between or Alteration of Roles of ADF&G and DCED.

A.S. 16.10.500 et seq. provides authority for a fisheries enhancement loan program. The Commissioner of the Department of Commerce and Economic Development (DCED) is authorized to make loans to qualified regional associations holding permits pursuant to A.S. 16.10.400-470 for the planning, construction, and operation of hatchery facilities. Thus, the financing of regional association activities largely within the authority of DCED. We have indicated above an apparent lack of an appropriate cooperative relationship between ADF&G and DCED by statute. The proposed Policy and Procedures by ADF&G, on page 60, recognizes that coordination between ADF&G and DCED is necessary for orderly review and approval of permit applications and loan applications.

DCED operates a number of financial assistance programs and conducts other activities related to the economic development policies of the State of Alaska. It is perhaps for this reason that the financing program for the regional association hatchery program was assigned to that agency.

The financial viability of proposed artificial propagation is directly related to a number of biological factors and harvest management strategies, among other things. These criteria involved in the evaluation of individual projects, or a broad-based regional program, require

consideration of a number of factors which require the expertise of persons familiar with the science of fisheries production. Further the bulk of analysis related to the financing of regional association projects, not to mention those to be undertaken by ADF&G, involves scientific information not traditionally considered by lending officers.

It is (or should be) clearly recognized that there are technical risks inherent in aquaculture programs which dictate training and experience not common to persons with traditional financial backgrounds.

Given the choice of continuing the aquaculture loan program within DCED, and establishing biological expertise within that department, we believe a more practical option would be to provide ADF&G with the capability to perform the loan function. With this accomplished, transfer of authority for financing of fisheries enhancement facilities from DCED to ADF&G would reduce the need to depend upon interagency relationships to ensure that program and loan approval are coordinated.

5. Need for Improved Relationships Among All Regional Associations.

Regional associations are at varying levels of maturation, and in some instances, have not been formed to the point of approval by the Commissioner of ADF&G. We have

observed in recent meetings with the study group a growing inclination for association managers to discuss among themselves various problems and potential solutions. Communication as to research and planning results, means of operation of facilities, and other activities is occurring. However, members of the study group and others have reported and our own observations have indicated the need for improved relations among the associations. Some of the improvement is necessary because of differences in personalities, and in other cases a misguided spirit of competition among the associations appears to exist.

There is good reason for allowing associations to establish resource development programs at their own respective paces within each region, although in some instances the pace of program and project development has unnecessarily been slowed because of regulatory problems, obtaining necessary approvals, and the like. The experiences of the more mature organizations will be most helpful to those in the beginning stages of development. Much research, data and information has been performed and compiled by some regional associations. The sharing of such information should occur as a matter of course, and it may be necessary to establish a system among the associations to ensure that this occurs. This could be mandated by the state legislature.

It is critical for each association to understand what the others are doing. The potential for duplication of

tasks unnecessarily among the associations exists without a clearly established system of communications. It is suggested that the study group or perhaps an upgraded Fisheries Council be continued into the future, perhaps with a specific mission to ensure continued communication and improved relationships among association representatives (and state agencies).

6. Need for Improved Relationships Among Salmon, Shellfish and Bottomfish Development Program Elements.

We have suggested that the development of Alaska's abundant fisheries resources be viewed and organized as a single program (AFRDP). Competition for research, management, development and investment dollars among program elements at federal, state and local government levels and from the private sector is presently unavoidable among salmon, shellfish and species development activities. This competition among species has been heightened by new opportunities available as a result of enactment of the Fisheries Conservation and Management Act (FCMA).

Assuming the goal for development and utilization of fisheries resources off the shores of Alaska is to maximize potential benefits to the citizens of the state consistent with principles of sound conservation and enhancement, establishment of programs and activities to achieve that goal based upon treating each fishery independent of one another and on a haphazard basis makes no sense. Certainly salmon, shellfish and bottomfish species are at varying

stages in terms of development, utilization, management sophistication, market potential and value, industrial development, and understanding of resource status and potential. All such factors will be reflected in the ultimate budget commitment and programs of the state to affect reasonable maintenance, development and utilization of these renewable resources. However, the organizational and professional disciplines to be applied to proper utilization of all species of fish are relatively the same. The fixing of sound state policies, budgets and management principles for each fishery with maximum avoidance of conflicts, and the sharing of information, expertise and program experiences to maximize effectiveness of each is essential.

In the development of its "Alaska Fisheries Plan," ADF&G acknowledged that salmon stocks can and need to be rehabilitated. Numerical objectives were established by ADF&G to provide minimum annual harvests of 40 million salmon at the end of seven years and 100 million salmon at the end of eighteen years. These goals would be achieved through a combination of enhancement, rehabilitation, management, development research and habitat protection at a cost of 300 million dollars over fifteen years according to the proposed plan. ADF&G acknowledged that implementation of the plan would "require a major effort on the part of fishermen, industry and government alike . . ."

The level and quality of government and private sector planning, management and development activities for shellfish and bottomfish lag far behind those for salmon. The maturity of programs and dedication of state resources to maintenance and proper utilization of these important species differ as well, largely because the legal and economic opportunities affecting the harvesting and production of each has varied.

The study group is well aware that salmon harvests may no longer predominate fisheries development activities because of these newly available opportunities and the economic reality of need for diversified harvesting activities by fishermen formerly able to target primarily on salmon. There has been much talk, and considerable study, planning, and now, pilot projects related to necessary economic development activities to maximize benefits to Alaskans of utilization of offshore fisheries. Most representatives of the industry, fishermen, processors, bankers, public officials and other participants at regional and national conferences on 200-mile limit fisheries (despite differing findings from a variety of consultant reports), indicate that by necessity this new industry will not develop separate and apart from existing fisheries and industry. This reality further establishes the need for a holistic fisheries development and utilization policy and program.

As noted above, responsibility for development activities relating to these fisheries presently resides in a number of different agencies and offices. The need for program activities and budget for each have not been addressed in the context of a single program or policy; priorities affecting each have not been established nor have relationships or coordination among them been imposed. We have been directed by the study group to assess on a preliminary basis alternative means of converting ASRDP programs to the broader program context of AFRDP. Our review is not only to include potential organizational arrangements affecting state activities, but also alteration of the missions and structure of regional associations. To this latter point we will now briefly speak.

It is our view that an altered regional association form which allows such associations to become involved in diversified activities necessary to the development of all fish resources consistent with local priorities and needs is appropriate. This suggested diversity and expansion of authority may seem odd at a time when the financial arrangements for a number of the regional associations are severely restricted. However, certain features of the existing program are most applicable to development needs and opportunities in other fisheries. These include:

1. There is a clear need for involvement of fishermen and other sectors of the industry

in the protection, utilization and development decisions affecting all fisheries.

2. There is a need for fishermen and other sectors of the industry to participate in the financing of all fisheries development activities (the legislature's recent re-enactment of A.S. 43.75, which taxes all species harvested in Alaska waters to finance fisheries development indicates support for this rationale).

3. There are varying needs and interests by region with regard to fisheries development. For example, salmon fisheries development may be a priority to fishermen in Southeast Alaska, while projects related to bottomfish development may be more relevant in the Aleutian Chain.

4. The more flexible the regional association structure is in terms of meeting clear regional needs and reacting to priority development activities, the greater the likelihood of financial and institutional stability.

5. A feature of the regional associations is their clear mandate and need as an organization to be responsive to the variety of interests among local fishermen. We believe that over time, a balanced approach to fisheries produc-

tion will evolve as a result of this program, and that this will occur on a multi-species basis if the mandate and membership of such associations is broadened to include development of and planning for other fisheries.

6. The need for a holistic fisheries approach, if appropriate for state programs, is also necessary for regional associations. This is especially true if the role of user groups in regional fisheries planning (regional planning teams) is to be upgraded.

7. Regional fisheries planning can and should address potential gear and harvest arrangements on a multi-species basis.

Certain other features will need to be built into the regional fisheries development program as a result of the recent Superior Court decision and the need for a secure income and financing stream. If the program assumes more of a local quasi-governmental character than at present (e.g., borough or municipal fisheries development service areas), assumption of a more diverse economic development program may be appropriate. The legislature should address whether newly instituted associations could finance, construct and operate needed infrastructure, marina space, processor facilities (for lease) and other activities much as do port facilities, economic development districts or other local

governmental entities. However, care must also be taken to preserve certain of the private sector features of the present associations in deciding what activities they might undertake.

Assuming that the appropriate institutional arrangements for regional associations necessary to expand their basic authority can be made, necessary relationships will need to be established between such associations and the existing Office of the Governor/Bottomfish Coordinator. Governor Hammond has created a bottomfish task force, whose membership includes state legislators, agency commissioners, and private sector representatives, to define specific goals for the state and to design a work plan for industry development relating to the state's bottomfish development opportunity. In a draft report by the bottomfish program coordinator, dated May, 1979, a program management and organization structure which would have all bottomfish program elements operate at the direction of the bottomfish coordinator, with advice from the bottomfish task force, was proposed. This program proposal suggests that the Department of Commerce and Economic Development would pinpoint areas of industrial weakness and offer strategies and guidelines to strengthen the economic incentive for harvesting bottomfish. The Department would also provide loans to the industry through state loan programs, the Commercial Fishing and Agriculture Bank, and the Alaska Industrial Development

Authority. ADF&G would monitor the biological characteristics of the bottomfish resource to provide information for managing the resources for optimum sustainable yield and to assess harvest potential. ADF&G would sample commercial harvest efforts and identify areas of potential conflict between bottomfish fisheries and those of traditional salmon and shellfish fisheries. The Department of Community and Regional Affairs would draw up strategies to assist local communities in alleviating specific local physical and social-economic impediments to development.

While relationships with other fisheries development activities at federal, state and local levels are suggested by the Bottomfish Coordinator's report, establishment of a holistic fisheries development program is not. The proposed program plan to achieve bottomfish development goals and objectives is an impressive start toward the establishment of specific program activities to achieve the state's bottomfish resource utilization goals. However, only limited program budget monies are committed to the resource management aspects of the proposed program. Resource development and enhancement is only vaguely referred to and the relationship between salmon and shellfish fisheries development programs and that for bottomfish is not seriously addressed. The concept of top-level management control over all elements of the Alaskan fishery with provision for coordination among agencies and programs is essential to the success of AFRDP.

B. There is a Need for Improved Information, Data and Research Results for AFRDP.

1. Introduction.

We have discussed the clear need for improved data and information regarding fisheries development activities from economic, financial and biological perspectives, by both state agencies and regional associations, 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 makes short and long-range planning very difficult.

We have also described the likely prospect of competition for dollars among salmon, shellfish and bottomfish development program activities, and have suggested that lack of a holistic view of the fishery and an understanding of its needs will make it difficult for the Governor and the legislature to make proper budget decisions. Not only is a methodology for assessing potential returns on investment and relative program costs and benefits necessary, provision of technical data and information upon which to base such assessments will be required.

Finally, we have referred to the need for greater coordination and expansion of research activities related to AFRDP. This section will describe certain non-financial data and information needs for both ADF&G and regional

associations as well as the expanded research and development requirements associated with development goals for the Alaska fisheries. This section will also describe alternative institutional arrangements which are necessary to meet the goal of improved information, data and research.

2. Need for Improved and Expanded Research for AFRDP.

While there is a major need for improvement of data and information for budget purposes, increased biological information regarding existing and proposed projects and to accomplish the objectives of AFRDP also are necessary. A first step in improving Alaska's research program is establishment of categories of research which will afford biologists a common basis to fix research priorities and goals.

For salmon, we would place federal, state and private sector research into three categories. The first category would include evaluation of the potential for maintaining and enhancing artificial and wild salmon. The second would include development of improved techniques to increase the numbers and quality of artificially propagated salmon. A third category would involve assessment of environmental factors causing variations in the abundance of anadromous species. A further description follows:

Category 1: Evaluation of Potential for Maintaining and Enhancing Artificial and Wild Salmon.

Evaluation should extend to existing wild and artificially produced populations as well as proposed new

production because of the need to monitor the Alaska salmon production system as a whole. Priorities and areas of investigation will need to be continuously re-assessed as information is gathered.

The following specific areas are suggested for priority investigation:

(a) Evaluate the economics of enhancement - benefits versus cost or return on investment to improve knowledge about the economics of fisheries.

(b) Determine population levels and behaviors of wild and artificially produced stocks, and population interactions for the purpose of reducing negative impacts. This would include determination of catch distribution and migratory routes for mixed stock fisheries.

(c) Assess environmental limits for productive capacity of wild and artificially produced stocks.

(d) Determine and solve disease problems as they relate to stocking policies.

(e) Identify valuable stocks, including measures of isolation or inbreeding, and examine opportunities for new introductions both in nature and artificial facilities.

Category 2: Improved Techniques to Increase the Numbers and Quality of Artificially Propagated Salmon.

Research should be aimed at improving the cost effectiveness of artificial propagation systems through

modification of existing technology or the development of new culture techniques, including increased survival of artificially propagated salmon. It follows that newly developed techniques must ultimately be shown to contribute significantly to the fishery under carefully controlled pilot-scale rearing and/or release experiments. Examples of recommended research are given under the five following headings:

1. Physiology: Development of physiological, biochemical, and endrocrinological measures to assess the effect of the rearing environment on smolt quality. Development of smoltification indices as a tool to predict optimum time for release and techniques to enforce, advance, or delay smoltification.

2. Genetics: Development of brood stock management and breeding regimes to identify and enhance those characteristics of salmon that produce the greatest benefit to the fisheries. Develop strain of disease-resistant, fast-growing, early-maturing salmon. Test the application of various brood stock techniques and breeding regimes to particular artificial propagation strategies.

3. Disease: Development of new methods for diagnosis and prevention of hatchery diseases.

4. Nutrition: Development of cost-effective feeds using new or under-utilized nutrient sources.

5. Behavior: Development of a technology to control migratory and homing patterns in appropriate circumstances.

Category 3: Environmental Considerations.

Enhancement, which is defined as all means of increasing production--both natural and artificial--of anadromous salmon, not only is dependent upon the successful rearing of the animal, but also the ability of the animal to survive in its total environment. Information is required to assess the effect of habitat alterations on the fish. Emphasis should be given to delineating environmental factors, good and bad, causing variation in the abundance of anadromous species.

1. Habitat Maintenance.

Studies to be directed toward improving existing habitat, including in-stream flow and temperature requirements and barrier passage.

2. Evaluation of the Animal and its Habitat.

To assess environmental changes, it is necessary to measure the response of the animal to such changes.

Establishment of these research categories suggests the need for a long-range research program in Alaska to improve salmon resource development activities for natural and artificially produced salmon from the point of egg take or implantation (including improved incubation methods) to

the emerge stage, to survival through the full migratory pattern of the fish. Research related to the stages of a salmon's survival and growth should be undertaken on a cooperative basis with the federal government, University of Alaska, and others with research capabilities consistent with the jurisdictional interests of each. For example, assessment of the salmon in the ocean environment, which is within the jurisdiction of the federal government should be a priority of the National Marine Fisheries Service. It appears that research relating to environmental concerns are now a priority of the U.S. Fish and Wildlife Service, and to a lesser degree the U.S. Forest Service. Research relating to hatchery operations and performance and that relating to the natural environment in fresh waters, including certain research relating to environmental considerations, would appropriately be the priority of the state. Discussions with study group members indicate that this division among federal and state research activities is evolving on an informal basis.

Biological standards for construction and operation of hatcheries and other artificial propagation projects need to be established as part of the comprehensive planning process. ADF&G has done some work in this area. However, the adoption of final standards will require further research and analysis on the impact of such projects on existing natural runs; the viability of projects in the face of

competing beneficial uses of watersheds, and a wide variety of other critical biological issues will also require additional research before final standards can be established.

The establishment of guidelines to evaluate potential areas for the construction and operation of hatcheries and other projects, and evaluation of performance of such projects will necessarily require improved data and information regarding stock identification (i.e. tagging, scale studies and various other marking methods), and stock assessment through improved means of counting salmon in various stages of the life cycle. Such data and information will be necessary in order to make improved management decisions, including those related to the development program.

For bottomfish, the draft report to the bottomfish program coordinator of May, 1979, describes a role for ADF&G in the development of fisheries management plans for offshore fisheries. While the management authority over such resources largely resides within the North Pacific Fisheries Management Council, ADF&G is recommended as the state entity responsible for overseeing the activities of the Council and recommending sound management practices to enhance protection of bottomfish resources. Data and information research activities relating to both shellfish and bottomfish lag behind that available and presently being conducted for salmon. Included among those proposed activities to be undertaken by ADF&G for bottomfish which relate to the above research, data and information goal, are the following:

1. Coordinate research activities and cooperate in the design of needed projects with other research agencies.
2. Sample commercial harvests for biological, effort and technical data in a manner and volume which is statistically significant.
3. Assess resource independently of the commercial harvest (survey, tagging) and analyze data collected.
4. Collect and distribute to the public relevant biological and technical information generated by resource agencies, including ADF&G.
5. Identify areas of conflict between the bottom-fish fishery and present historical fisheries and recommend measures to resolve these conflicts in a manner resulting in optimum yield from these interacting fisheries.

Discussions with a number of persons in the industry, federal and state policymakers, and others, indicate that the single most important effort to be undertaken by government in the next few years to ensure the appropriate development of off-shore fisheries is related to the research and data goal. The concern has been expressed that investments in some fisheries may be lost because so-called under-utilized species may already be on the decline as a result of over-harvesting by foreign fleets. Mistakes of the past regarding

other species which allowed overharvesting without consideration of resource impact should not be repeated. The potential to enhance presently depressed species needs to be evaluated. The role of the state in protecting resources off its shores cannot be minimized. If new industry or benefits are to accrue to Alaska by development of off-shore fisheries, there is a legitimate state interest in doing that which is necessary to protect these resources. The state can best accomplish this by preparing to be an effective advocate before and assistant to the federal resource manager.

While research relating to shellfish management and development is in a more advanced stage than for most bottomfish species, this may not be true on a world-wide basis. Accessing foreign data and information developed with regard to off-shore fisheries may begin to offset some of the information gaps.

The proposed research, data and information program to be undertaken by ADF&G pursuant to the report of the bottomfish coordinator is an ambitious one. Priorities will need to be established between this and other fisheries research and information development programs. Clearly, ADF&G will need adequate funding if it is to begin to accomplish the suggested goals.

2. <u>There is a Need to Coordinate Research and Development and Information Systems Among Federal and State Agencies and Regional Associations</u>.

We have sought to identify certain research cate-

gories and information needs which over time must be met in order to maximize the productivity of AFRDP. Another factor necessary to the accomplishment of this goal is improved coordination among federal, state and private sector research activities. Avoidance of unnecessary competition for dollars among state agencies and duplication of activities among all research entities, as well as the establishment of priorities for research consistent with guidelines and criteria, can and should be accomplished with or without legislative action. However, a legislative mandate for improved research coordination may be required.

Perhaps the single most important means for ensuring greater coordination of research would be the establishment of a comprehensive joint research facility in Alaska. As has been previously discussed, Alaska may not be receiving its fair share of fisheries research benefits when compared to other states. Particularly in view of the fact that it produces as much as eighty percent of the nation's bottomfish resources, is the largest producer of salmon, and is a major source for shellfish. In Washington, a joint research facility is being funded in large part by the federal government and is to include state, tribal and university research facilities as well. Justification for the joint facility included the obvious need for improved research coordination, increased information and greater likelihood of joint projects, an expanded skill base for research as a result of centraliza-

tion of research staffs in a single facility, and the avoidance of unnecessary duplication. Such a facility may be more appropriate for Alaska and is necessary to attract quality research staffs, appropriate levels of funding for state-federal projects, and to respond to the major research requirements evolving from development of new off-shore fisheries. Such a facility could be jointly funded by the federal and state governments.

A second major step at improving coordination among research entities is to clarify research responsibilities among programs within AFRDP itself. As previously indicated, a major thrust of an improved AFRDP will require clearer definition of the roles and responsibilities of state agencies and regional associations. It has been suggested that a long-term policy could be established to specifically provide that research activities by or in behalf of the state be the responsibility of ADF&G. Were this accomplished, assurances must be provided that regional association needs will be met, possibly by legislative mandate. Establishment of a comprehensive regional plan for salmon fisheries development and other species can and should include fixing research priorities for the region. Of course, continuous upgrading of the comprehensive plan based on experience and information developed over time will be required.

A third means of improving coordination among research activities may be found in action already undertaken

by the legislature. The Science and Technology Act of 1978 established a statutory framework for the creation of the Alaska Council on Science and Technology (ACST), a comprehensive planning mechanism to guide important research activities in support of state objectives and to ensure the efficient transfer of resulting data and information. This act reflects legislative recognition of the importance of the role of science and technology in public policy and decision making.

The Council's activities are to include:

1. Objective evaluation of the need for specific research;

2. Set priorities for state research requirements;

3. Identify and evaluate immediate and future options available to solve a particular problem or implement an idea; and

4. Coordinate data and information exchange among research organizations to avoid unnecessary and costly duplication of effort.

The Council's authority is not limited to fisheries research activities. Additionally, its involvement in evaluating and coordinating priorities for research by the private sector, the federal government, and others, appears somewhat limited.

We believe ACST can provide an appropriate model for ensuring coordination and fixing of appropriate research priorities for fisheries in Alaska. It might be possible to

establish a sub-committee to ACST to deal specifically with fisheries research activities. (Note: That Council membership includes representatives with fisheries-related research backgrounds from the University of Alaska, the U.S. Department of Commerce and ADF&G.)

An alternative approach might be establishment through legislation or executive order of a fisheries research council or work group, to perform many of the fisheries related tasks of ACST. A council would be responsible for establishing cooperative agreements with federal research agencies and private research laboratories; reviewing and incorporating research priorities established by regional associations through proposed regional planning processes; and, working with the state legislature in the development of budget proposals to fund an improved and expanded research program. The committee could also oversee the funding, design and construction of a joint research facility. Membership on the committee might include representatives from the U.S. Forest Service, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Bureau of Indian Affairs, ADF&G, the Legislative Affairs Agency, the Alaska Department of Transportation, the Office of the Bottomfish Coordinator, and representation from the Regional Associations and Native Corporations, among others.

A fourth means for improving research is the establishment of cooperative agreements between federal and

state agencies to ensure research consistent with the needs and priorities of AFRDP. ADF&G has in effect a cooperative agreement with U.S. Forest Service, although this agreement does not significantly address research coordination as discussed above. There is considerable interest and precedent at the federal level in providing for coordination with state activities through interagency agreement.

The legislature can mandate that the regional associations and the state negotiate cooperative agreements with all appropriate federal agencies. These agreements should not necessarily be limited to fisheries agencies or affect the research function alone. Research conducted by environmental agencies, industrial development agencies, economic planning programs, and others will occur and coordination is appropriate if AFRDP is to achieve its lofty goals.

A fifth important means of upgrading the research and information development elements of AFRDP is establishment of a uniform reporting and accounting system for each association. State agencies (DCED and ADF&G) and legislators have to date been relatively critical of the level and quality of information available to them regarding internal activities of the associations. While an annual report by the regional associations is required, a more sophisticated budget and accounting system by which the legislature can evaluate individual regional programs and ADF&G projects will be

helpful. Economic data and financial information consistent with the methodology described in Chapter I should be required.

In analyzing economic and biological projections, as well as total program results over the long-term, it will be necessary for regional associations and ADF&G to work from much common data. This is necessary to compare the effectiveness and efficiency of different programs and approaches to resource development undertaken by the associations and federal and state agencies. Any improved 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 costs to the associations. Obviously, the regional associations must participate in any program effort at information and data system development. The state-wide comprehensive planning process might be an appropriate vehicle for accomplishing this.

C. There is a Need to Improve Relationships With and Expand the Contribution of Federal, Local and Private Sector Programs Affecting or Having Potential Impact on AFRDP.

1. Introduction.

We have identified in outline form a number of federal fisheries programs which have direct and indirect impact on achievement of the goals of AFRDP (see Appendix III for outline presented to the study group), and have discussed the need for federal and state research coordination. Improved relationships with local governments have been

discussed during the last two years because of the enactment of the FCMA. A number of commentators have indicated the need for local governments to develop infrastructure, processing capabilities, and other necessary support services tc the growing bottomfish industry if Alaska is to maximize the benefits to be obtained from this important resource. We have suggested that local government involvement in the development of all fisheries resources is growing in importance as a result of the recent decision by the Superior Court affecting the authority of regional associations to raise revenues for salmon production and the reenactment of A.S. 43.75 relating to fisheries taxes on all species harvested in Alaska waters or off its coast. The law provides for sharing a proportion of such revenue with local governments after the end of fiscal year 1980. This will necessitate greater interaction between state program elements of AFRDP and local governments. Finally, the considerable efforts of the state through regional planning processes and the regional association program to increase the input and stake of various elements of the fishing industry in AFRDP have been identified.

Alteration of the regional association institutional form to better assure financial and organizational stability, upgrading of the association's role in regional planning, and expansion of the ASRDP program concept to AFRDP provide the means for increasing private sector and local government

involvement in AFRDP. This section will concentrate on the need for improvement of federal and state relations.

2. There is a Need to Build a Case for a More Equitable Federal Contribution to AFRDP.

Although it was impossible to obtain detailed budget statements regarding commitment of federal dollars to programs and activities relating to AFRDP, we would suggest that a number of factors indicate that Alaska may not be obtaining a fair share of federal research monies commensurate both with its resource availability and potential when compared with other states. While the overall federal presence in Alaska is perhaps greater than in any other state, competition for limited dollars is again a fact of life among the states when it comes to monies which would contribute positively to accomplishment of the goals of AFRDP. There are a number of possible reasons for the less than appropriate federal expenditures relating to Alaska's fisheries. Alaska's Congressional delegation is small, and in recent years has been forced to concentrate the bulk of its efforts to the D_2 lands issue.

Secondly, Alaska is not perceived as conveniently located by most persons in the lower forty-eight states. Federal regional offices and major district offices for the Western region are located in large part in

Seattle and Portland. Fisheries policy is generally made in these offices or in Washington D.C. Most of the major regional and local fisheries research facilities are located outside the State of Alaska. These and other factors may have tended to reduce Alaska's input into federal decision making and budget allocations.

An expanded federal contribution to AFRDP is clearly justified. First, the federal presence in Alaska is greater than in any other state in the union. Second, considerable degradation of fisheries resources in Alaska occurred during years in which the federal government was responsible for management of the resource (before statehood). Third, a major proportion 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, the need for expansion of fisheries resources to meet subsistence and other needs of Alaska natives will be heightened in coming years. Finally, the State of Alaska is among the most economically dependent of any of the states on its fisheries.

Research needs related to Alaska's unique fisheries problems (e.g., weather, methods of stream classification to be applied to the large number of Alaska streams, migration patterns, etc.), dictate establishment of research priorities to achieve the goals of AFRDP. An articulation of these

needs will help Alaska better justify expanded federal and state expenditures. Coordination of research activities with federal agencies through cooperative facilities and agreements will be a further important step towards justifying increased contributions to meet the goals of AFRDP.

3. There is a Need for Greater Federal-State Regulatory Coordination.

We have identified a number of federal requirements and regulations which can (and do) significantly increase costs and reduce the productivity for AFRDP. The regional associations have experienced the need to obtain an excessive number of permits from federal agencies merely to begin their operations. These requirements are also imposed on ADF&G. Regulations affecting the development of the bottom-fish industry are perhaps even more difficult because of the broad jurisdictional authority of the federal government over coastal zones outside three miles. While many and perhaps all of the permit requirements are justified, the process for obtaining necessary approvals can be greatly simplified. The first step should be a concerted effort by the state to consolidate its permit requirements, eliminate duplication, and provide services which may include a one-stop licensing process for AFRDP activities.

Alaska has already enacted legislation for a one-stop licensing program, and this program could serve as a vehicle to minimize regulatory impacts on AFRDP. The state

program could reasonably be applied specifically to fisheries resource development projects on a priority basis. A necessary next step would be the expansion of this program to include federal regulatory activities. AFRDP activities, including the development of salmon hatcheries, other enhancement projects, infrastructure development, and necessary support services for a growing bottomfish industry, could also provide an appropriate model means for bringing about coordinated and consolidated non-fishery related federal and state regulatory 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 federal government as a potential vehicle to achieve rational development through simplified processes, monies are available to incorporate measures of regulatory reform and coordination into this process. As part of a special AFRDP program effort (perhaps to be undertaken by the study group or Fisheries Council at the direction of the legislature), policies, processes and initiatives which will ensure improved coordination by federal and state regulatory activities should be developed.

It is noteworthy that most existing fisheries statutes, not to mention upland regulatory activities, specifically authorize coordination, and in some cases, the federal government has appropriated funds for the establish-

ment of such processes through programs other than coastal zone management. Yet, implementation of model programs for specific interest areas (e.g., fisheries development) are in effect only on a limited basis to date. Impetus towards development of off-shore fisheries can be utilized as a further rationale for incorporating a model permitting project for AFRDP, which could be funded in large part by the federal government.

4. There is a Need to Identify Federal Programs Which May Contribute to Accomplishment of the Goals of AFRDP.

Most states have difficulty identifying on a continuing basis the many federal programs which may be utilized to contribute to accomplishment of broad state policies. The State of Alaska can and should make special efforts to identify federal activities and funding sources, not to mention those in the private sector, which can be utilized to contribute to the accomplishment of the goals for AFRDP.

A major argument against seeking federal financing for fisheries development programs is a legitimate concern over the "strings attached" to such funds. Given the level of federal presence in Alaska, this concern is clearly justified. 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 the sacrifice for additional federal dollars.

The legislature can mandate identification of information and data needs for effective intergovernmental advocacy and relations, coordination with the federal government as discussed above, and a continuous monitoring of federal programs to ensure maximum support for AFRDP. Because working with the federal government can involve considerable time and effort, any monitoring and fund seeking activity should be measured by the legislature, over time, on a cost-benefit basis. Building the expertise in working with the federal government is a necessary element of this program.

5. <u>There is a Need to Evaluate AFRDP Program Goals in Relation to the President's Recently Announced National Policy on Fisheries</u>.

In May, President Carter announced a national fisheries 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 reversal of existing federal policies relating to fisheries activities. As indicated in prior study group meetings, the U.S. Office of Management and Budget has indicated in the past no special treatment of fisheries related programs is justified and all such programs must be considered as in competition with

other resource and economic development projects. While this reversal in policy indicates greater federal interest in fisheries development, the study group must understand that the impetus for the change in policy is not salmon fisheries development.

We are aware of considerable national interest in the proper development of Alaska's fisheries consistent with this new policy. While the state is taking a number of actions to take advantage of the national policy, this is not a coordinated or priority activity at this time. We suggest that a major state effort be undertaken to upgrade AFRDP and effective presentations of state oriented proposals to federal policymakers are essential to achieving a more appropriate federal contribution to the state program.

Alternative Institutional Arrangements for Consideration by the Study Group and the Alaska State Legislature

A. Introduction.

We have discussed a number of potential reforms to AFRDP which we believe are necessary to accomplishment of the broad fisheries development goals and objectives established by the state legislature and the executive branch for expansion and utilization of all the state's fisheries resources to the maximum benefit of its citizens. We have directed attention to the need for sound economic evaluation of AFRDP projects and programs prior to and during the course of

their operation, means of achieving greater financial stability for AFRDP program elements, and evaluation of institutional needs to achieve broad program goals. This review suggests a number of alternative institutional arrangements and possible reforms which should be considered by the legislature during the 1980 session. It is the purpose of this section to assist the study group in addressing certain alternative approaches to reform of AFRDP.

Alternative approaches include:

1. Options to assure greater central management control and horizontal coordination among all 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.

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

We have identified a number of institutions at the state level directly involved in or impacting on AFRDP. Additional to those are a number of specific programs which indirectly affect accomplishment of fisheries development goals of various programs. (See Appendix II.) The needs and

missions of these many programs or offices must also be considered in the development of any proposed alternative organizational structure for AFRDP.

Option 1 - Maintain Present Organizational Structure, With Firm Legislative Mandate for Inter-Agency Cooperation and Coordination of Activities, and With Reforms to Individual Programs Responsive to Above Findings and Conclusions.

This approach would contemplate no alteration of the organizational structure of AFRDP as it presently exists, but would require legislative and executive action on a program-by-program basis to effect coordination and many of the necessary reforms. Authorities of various program activities would be altered or expanded to allow the programs to perform in a manner consistent with approved recommendations.

Legislative mandates to coordinate program activities already exist in a number of cases. In many instances, however, effective implementation of enacted programs has not occurred. Thus, a weakness of this approach is the lack of assurance that coordination among the wide variety of AFRDP activities will occur through clearer direction from the legislature.

Specific identification on a program-by-program basis of each activity which must be coordinated may be difficult from a legislative perspective because it would require a large number of amendments and detailed definition

of agency relationships. Certain of the program elements (e.g., office of the bottomfish coordinator, division level program activities, etc.), are not specifically established by state legislation. In other cases, reorganization deemed appropriate by the executive branch may be inhibited by legislation which specifically authorizes and refers to division and office level activities.

While we have proposed a number of reforms which could require legislation affecting the various programs of AFRDP, we doubt that the goal of centralized coordination and consolidation of program as has been suggested can be achieved without some stronger mandate and clearer form of direction to the executive branch. A lack of accountability for such coordination, except on an individual program basis, would imply that AFRDP program results can be achieved through piecemeal management and without significant centralized direction. We do not believe this can be realistically achieved.

Option 2 - <u>Present Structure, but Defined Through Executive or Legislative Action, With Lead Agency Responsibility for Certain Program Activities Within AFRDP</u>.

This organizational alternative contemplates establishment of a lead agency which would be responsible for directing implementation and coordination of all activities related to AFRDP. While the basic authority of each individual

program, division or other activity would not be altered except as pursuant to accepted recommendations, their responsibility to respond and work cooperatively with the lead agency in establishment and implementation of AFRDP would be clearly established either by legislation or executive order.

This alternative 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 a best choice among the candidates. Clearly, fisheries development involves more than just an understanding of salmon and other species. A lead agency must have or be able to draw expertise on such issues as the economics of fisheries, infrastructure development, construction of capital facilities, administration projects, project financing, among other things. No single agency presently has this broad capability.

However, we believe that the agency with the clearest mission and most relevant skill base to the task of over-seeing AFRDP is the Alaska Department of Fish and Game. We have discussed the problems of separating financial and operational aspects of the regional association program and recommended transfer of the financing program from DCED to

ADF&G. Such a consolidating action would not be necessary in other instances. What is necessary is establishing that by statute a lead agency be provided with sufficient management authority and control over various agencies and program elements to achieve and direct cooperation and support for AFRDP.

We believe that ADF&G is best suited to serve as lead agency because their understanding of resource issues is critical in the development of management, conservation and enhancement strategies for all species. As noted in our discussion relating to establishment of a methodology for economic evaluation of programs and assessment of financing needs of such programs, most proposed criteria or standards are clearly related to accurate assessment or projection of biological factors. However, a typical weakness of state fisheries management agencies is that mid-level and top management personnel often lack the broad range of professional and management experience necessary to oversee the variety of disciplines involved in a major resource development program. Thus, if ADF&G is to assume a lead agency role, it may be required to add personnel who have the experience and skills to carry out the goals of AFRDP.

We are impressed with the institutional arrangement in effect for Alaska's bottomfish development program. While we do not believe it is essential for a program coordi-

nator to reside within the office of the Governor, it would appear that this has contributed to greater visibility and attention to the off-shore fisheries opportunity than might have occurred had the program been located within a single department at the outset. Over time, and particularly if ADF&G or some other department is established as a lead agency for AFRDP, it will make sense to move the function to that lead agency.

A second feature of the state's bottomfish development activity is the establishment of a bottomfish task force, comprised of individuals within state government. The task force serves in an advisory capacity to the bottomfish coordinator and the Governor. Establishment of a similar advisory task force which includes industry representatives to work with the lead agency in the evaluation of AFRDP options, to offer new ideas and proposed actions, and to assist in the oversight of program activities makes sense. Such a task force would be primarily involved in the evaulation of centralized or state-wide management aspects of the program with regional associations and regional planning teams being primarily involved in dealing with local problems and interests. The legislature has already mandated that a comprehensive state-wide salmon development plan be established. This planning process should

be expanded to include other species consistent with proposals for AFRDP, and a top level task force could be involved in the development and evaluation of this comprehensive plan. A primary goal would of course be to ensure the integrity and protection of regional plans unless they are inconsistent with approved state-wide policies. Finally, we have suggested a continuation of the study group or the Governor's Fisheries Council. The functions defined for a task force could be assigned to either of these groups if they were properly funded. This would help avoid unnecessary duplication and possible competition.

Option 3 - 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 would in many ways mirror Alaska's current bottomfish development program. With many 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 would elevate the level of public visibility for the fisheries development program, it would offer the opportunity for greater policy direction and control from that office, and

it would provide an office responsible for ensuring that agencies not operate at cross-purposes. Again, an AFRDP task force could operate in a manner consistent with the bottomfish program.

If this option were elected, the coordinator would need sufficient staff and direction either by executive order or from the state legislature to clearly define its functions and powers over existing agencies, and in establishing program goals and priorities. This is not to suggest establishment of a new bureaucracy, but merely a coordinating office with sufficient staff to perform assigned tasks consistent with established goals for AFRDP.

Some negative concerns about this option might include the appearance of the establishment of a new super agency or "czar" responsible for operation of fisheries programs at the expense of powers of other agencies. Moreover, it might be difficult for this office to maintain control over a wide variety of program elements with only limited day-to-day oversight and incidental involvement in program operations. The potential for conflict between the office of the AFRDP coordinator and mid-level and top-level management in the various agencies could also be a limiting factor to this approach.

Establishment of an AFRDP coordinator within the Office of the Governor could also be subject to the vicissitudes of politics. The legislature may be hesitant to place necessary powers in such office, and may tend to limit

necessary powers.

Finally, creation of an AFRDP coordinator within the Office of the Governor for any long-term period may tend to remove further centralized management and state-wide policy and planning activities from those proposed to be accomplished at regional levels. Line agencies have local staffs and experience or responsibility for close relations with regional entities. An AFRDP coordinator would not (unless his office was to be expanded to include field representation) participate in development of local plans and policies. An expanded office may have to be developed to deal with fisheries development activities if the new office were to expand its operations and involvement into regional development and planning activities.

Option 4 - Establish a Separate Fisheries Development Agency or Office Through Executive Reorganization Authorized or 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 might be possible.) This agency would have the specific responsibility to work directly with regional associations in a manner consistent with newly established

policies. Some positive aspects of this alternative include clear high-level visibility for AFRDP by establishment of a special program and agency; single agency control over budget and responsibility for all elements of AFRDP; and, separation of major development and management activities. This organizational option may more clearly separate development and management from a regional association perspective, with key association relationships evolving with the development agency rather than the harvest management agency.

Some negative aspects include likely competition for dollars between fisheries development and fisheries management agencies, perhaps greater difficulties in coordinating fisheries development and management activities which are necessary to the success of both programs, and the possibility of a larger bureaucracy with increased program costs. Moreover, it would be difficult to include all program development activities within a single agency. For example, activities pertaining to infrastructure development, data collection applicable to both management and development programs, a wide variety of state regulatory activities, and the like, would not likely be included in this "umbrella agency."

C. Organizational Alternatives Affecting Greater Regional Coordination Between State Agencies and Regional Associations.

It is our view that the peculiar needs of the many diverse regions of Alaska must continue to be addressed by

the study group and the state legislature. We have already suggested a number of reforms to affect improved relationships between the state and regional associations. Among major recommendations are:

1. Expansion of regional association authority to become involved in development activities related to species other than salmon (i.e., an active role in AFRDP);
2. Upgrading the regional planning process and regional association involvement in that process;
3. Upgrading of data and information and benefits of research to be available to regional associations and establishment of procedures to ensure sharing of information and research among regional associations and state agencies;
4. Consolidation of regional association financing and operational programs within a single agency;
5. Establishment of clear biological, economic and management guidelines against which all development projects and their performance can be measured;
6. Establishment of a one-stop model permit program for fisheries development activities;
7. Mandatory cooperation between ADF&G and

regional associations regarding specified activities;

8. Establishment of a coordinated research program, including construction of a joint or consolidated research laboratory and coordinated research planning mechanisms and methods to fix research priorities consistent with AFRDP program goals;

9. Mandatory coordination of AFRDP activities through development of cooperative agreements between ADF&G, regional associations and appropriate federal and state agencies;

10. Establishment of a ten-year operations plan which ensures development and clear delineation of responsibilities of regional associations and state agencies, to be assumed over the long-term, and which seeks to build requisite skills in such associations and state agencies to ensure accomplishment of AFRDP goals; and,

11. Alteration of the regional association form to include greater local government involvement, this to ensure stability of financing and improved operations.

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 legislation, and would expect the study group to focus on this or similar approaches, we have directed our attention to alternative institutional arrangements relating specifically to the operations of regional associations and ADF&G, including those outlined above. For purposes of this discussion, we assume a basic goal of facilitating greater responsiveness of AFRDP to regional development needs. Alternative institutional arrangements would appear to include:

1. No alteration in ADF&G or regional associations (this option would assume that the financing problems for regional associations might be resolved without altering the regional association form);
2. Expansion of ADF&G regional staffs to better address local development needs and implement a coordinated program to include increased support services to regional associations;
3. Legislative establishment of regional offices, empowering a regional administrator to fix ADF&G regional policies and implement approved programs--such legislation would include clear definition of relative roles and responsibilities of ADF&G regional offices and regional associations.
4. If an AFRDP coordinating office is established

in the office of the Governor, somewhat similar to establishment of an office of the bottomfish coordinator, it may be appropriate to establish regional offices to ensure a direct link between regional associations, fisheries development program staffs, and the Office of the Governor.

5. If development activities are in any way separated out from fisheries management activities, regional relationships between these functions would have to be established for purposes of regional planning and program implementation and operation.

In assessing institutional arrangements to further improve the level and quality of consideration of regional interests and increased coordination among regional associations and development program staffs, certain key issues must be addressed. Included are:

1. Assessment and identification of roles, responsibilities and powers of both regional associations and program staffs in planning and in the development of policies and implementation of programs. Again, we have suggested that the evolvement of AFRDP, including final institutional arrangements consistent with goals and recommendations herein, will involve

approximately a ten-year planning and implementation cycle. Assignments of responsibilities and powers will be dependent upon the maturation of various program elements and their relative capacity to perform assigned tasks. In many instances, experimentation will be required on a model project basis (e.g., regional association involvement in development projects related to species other than salmon).

2. Appropriate assignment of technical staff support on the basis of needs of each particular region;
3. Arrangements to ensure resolution of disputes and conflicting policies among the regions;
4. Establishment of a methodology for implementation of state-wide policies on a region by region basis;
5. Establishment of a methodology for making responsible and equitable budget decisions as they affect each particular region;
6. Establishment of means to assure coordination between regional officials and all programs directly or indirectly involved with AFRDP; and,
7. Identification of means to establish relationships between regional officials and external activities (e.g., federal, private) affecting

in the office of the Governor, somewhat similar to establishment of an office of the bottomfish coordinator, it may be appropriate to establish regional offices to ensure a direct link between regional associations, fisheries development program staffs, and the Office of the Governor.

5. If development activities are in any way separated out from fisheries management activities, regional relationships between these functions would have to be established for purposes of regional planning and program implementation and operation.

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1. Assessment and identification of roles, responsibilities and powers of both regional associations and program staffs in planning and in the development of policies and implementation of programs. Again, we have suggested that the evolvement of AFRDP, including final institutional arrangements consistent with goals and recommendations herein, will involve

fisheries development activities in the region.

We have not focused on developing a detailed institutional arrangement related to the organization of regional agency staffs. This is a matter which may appropriately be addressed by the study group prior to the 1980 session, at least to determine necessary first steps to be considered and reviewed during the course of the proposed ten-year reorganization plan. While we have developed a number of concepts regarding the regional organization structure, these have not been sufficiently tested or evaluated to be included in this report.

D. Organizational Alternatives Affecting Regional Associations.

1. Introduction.

As discussed in Chapter II, the recent Superior Court decision ruling that A.S. 16.10.530 is unconstitutional forces us to consider a number of alternative institutional arrangements to the present regional association program. This would have been necessary in any event because of the need for greater financial and organizational stability for the program.

The State Attorney General has suggested the need for legislation and has identified five "potential legislative alternatives to the now unconstitutional statutory scheme" in a letter to the Governor dated July 20, 1979. We have

suggested a sixth option which would require alteration of certain constitutional provisions and have elaborated on alternative options pertaining to establishment of service areas. We also explore alternative approaches to financing regional associations in the future.

2. Potential Institutional Arrangements, Assuming No Constitutional Revision.

Option 1 - Active Legislative Involvement in Regional Association Program.

Article VIII, Section 5 of the Alaska Constitution provides:

> The legislature may provide for facilities, improvements, and services to assure greater utilization, development, reclamation, and settlement of lands, and to assure fuller utilization and development of the fisheries, wildlife, and waters.

The legislature could on an annual basis approve specific facilities and services (or appropriate funds on a more general basis) and directly appropriate funds to the associations for specified purposes. The level of funding of approved projects and services could be established with or without reference to fisheries taxes collected by legisla-

but an appropriation would be required (see Article IV, Section 7 of the Alaska Constitution prohibiting dedicated funds). Any taxes collected for fisheries development would be by the state assessments as declared unconstitutional in Alex v. SSRAA would not occur.

This option suggests legislative control of all activities to be undertaken by regional associations, much as if they were individual state agencies. Funds for planning have been appropriated this past year for regional associations, and appropriations to DCED's loan fund for the program also occur.

More direct legislative involvement in the program than at present arguably presents problems. First, subjecting the program to the vicissitudes of the appropriations process on an annual basis offers limited financial stability. Second, the concept of user pay is not present, and commitment to the program may be limited because of the heavy front-end investment in both the F.R.E.D. and regional association programs without special arrangements to offset this burden with contributions from those who would achieve the primary benefits. Third, regional associations would have to annually lobby for financial support. Fourth, there would be excessive competition for limited dollars among the associations and F.R.E.D. Fifth, this financial plan does not provide for any reduction in operating and maintenance costs to the state over time. Because of these problems, we suggest that this option be considered only as an interim funding source.

Option 2 - Establishment of Special Service Districts Consistent With Constitutional Provisions.

Article X, Section 5 of the Alaska Constitution

provides that a borough assembly may establish service areas to provide special services within its boundaries, and authorize "the levying of taxes, charges or assessments within a service area to finance the special services." Article X, Section 6 provides that the legislature may do the same for unorganized boroughs. We have suggested in Chapter II that alteration of the regional association program to conform with the service area concept could provide greater organizational and financial stability than does the present form.

Conversion of the regional associations to a service district, however, presents some problems. The first problem is the obvious alteration of the regional corporations to a quasi-governmental arm of local government. This may present a philosophical problem for legislators, association members and local governments themselves who may not be pleased with so strong a user controlled form of governance. Additionally, some may not accept this arrangement as an acceptable alternative to private non-profit or for-profit aquaculture.

Second, borough boundaries do not conform with those presently established for the associations. The legislature can likely fix relatively the same service area boundaries as for regional associations in the unorganized boroughs. It will be more difficult for organized boroughs to extend service areas beyond their boundaries (see Article

X, Section 5 of the Constitution). Article X, Section 13 of the Constitution authorizes cooperative agreements for joint administration of any functions or powers among local government units. Extending jurisdiction of a service area to parts of another organized borough, but perhaps not all of it,presents obvious problems. Reaching agreements among these local boroughs will not be easy, as powers to be divided among the governments will be the subject of dispute. Pressures for changes of governmental roles and controls could be a constant as local interests become concerned with their perceived share of program benefits. Cooperative agreements can be broken or altered under difficult circumstances. There is a valid question whether persons outside the borough but included in the service area will be satisfied that they are truly being represented by borough officials whom they do not elect.

The present association boundaries are founded for good reason. Fishermen are licensed to fish in specific areas in Alaska and the benefactors of the program (and those to be assessed) are easily defined. Borough boundaries, if used, may also present a special "free rider" problem for the regional association program. To the extent boroughs represent smaller districts and are not drawn to reflect where fish are hatched or harvested, aquaculture by such a small service area may inhibit investment in the resource because there is less assurance of returns to the investor

(payers of the assessment).

Another critical issue in the establishment of service areas will be to preserve to a reasonable degree the level and quality of input and control user-benefactors are to exercise for both development and planning activities. The organization and functions of the service area are again a matter for the legislature. It is likely that local officials will expect a greater role in the operation and management of the service area, as they are ultimately accountable for performance. Moreover, to the extent these entities are to provide financing for construction and operation of local port facilities and infrastructure, the impact of such programs on other municipal and borough functions must be considered.

A special effort to resolve problems related to this service area option is necessary, as it offers a number of positive benefits. First, the legislature may be more inclined to accept greater risk and fund more liberally activities of a local government entity. Legislators are used to dealing with such entities; they recognize that accountability for failures or success will exist; local agencies will be able to offer certain services, administrative assistance, and data and information more easily to service districts than to the associations; and, service areas present a more mature organizational form with a wider experience base than do the organizations of existing

regional associations.

Expansion of the authority of the regional associations consistent with the concept of AFRDP fits especially well with this possible alteration of the association form. Many of the development activities related to utilization of off-shore fisheries involve funding for infrastructure, port facilities, marina and dry-dock space, etc. These activities are often funded in large part by local government entities (e.g., port districts). Additionally, attraction of federal and state matching funds for such purposes will be easier for local government entities than the present associations, and the local citizenry can be taxed to the extent they may benefit from local development activities. Local government permits will be easier for approved service area actions than perhaps is the case at present for the associations.

Finally, there are some specific legal questions regarding the service area option which need to be considered prior to the 1980 legislative session. First, does the legislature have authority to establish service districts or areas within the organized borough? If so, can the legislature extend such service area boundaries into another organized borough or the unorganized borough? A positive determination as to these questions would make it possible to establish service area boundaries consistent with those for existing and planned regional associations more easily, and without

constitutional amendment.

Second, can the legislature mandate that organized boroughs establish service areas for fisheries development and further require that the borough reach cooperative agreements with other boroughs for extension of the service area into their area of jurisdiction? Again, a positive determination will resolve in part boundary problems relating to the service area option.

Third, can the legislature authorize organized boroughs to levy taxes, charges or assessments within a service area (perhaps beyond its boundaries) in behalf of a fisheries development service district established by state legislation and performing most of its functions (other than taxation or assessments) separate and apart from the organized borough? This issue arises if the legislature seeks to separate the regional fisheries development program authority from the taxing authority, with the local government entities (organized boroughs) passing tax or assessment receipts directly through to the program. The problem of dedicated funds from a local government entity needs to be addressed if a positive determination is made that such separation can occur. A related and similar question involves what level of control or authority over fisheries development activities must be exercised by borough officials if the service district concept is adopted.

Fourth, in the case of the unorganized borough,

what entity would be responsible for taxing or assessing fishermen in behalf of the association or service district established by the legislature? Additionally, in the case where a borough service area is extended into the adjacent borough or unorganized borough, who collects taxes or assessments from fishermen licensed to fish in areas outside the borough, but in the service area?

Fifth, we are concerned about preserving the voluntary assessment aspects of the existing program. Presently, fishermen in a given region must elect to form regional associations and assess themselves for aquaculture development activities. We have discussed the possibility of diverting a portion of state-wide fish taxes (A.S. 43.75) to the regional association or its predecessor organization. Another possibility is to increase this tax, in lieu of an assessment or separate local or state-wide tax for aquaculture. Regional fishermen might then have the option to elect <u>not</u> to pay a certain percentage of the state tax (e.g., that percentage added to the existing tax). Will a state-wide tax, with provision that a service district exercise an option either for or against an additional tax for purposes of fisheries development, stand the constitutional test under the due process and equal protection doctrine? A related question involves who must be represented in the organization of the service district and who must be taxed to pass this constitutional test?

Sixth, in the face of the Superior Court's holding that "an incorporated non-profit association may not become a 'service area', either by inference or express legislative declaration," and that the "hybrid creature legislatively conceived cannot survive the constitutional infirmities and defects present at its birth . . .," is it realistic to assume that the regional associations can maintain any of their private or corporate characteristics? Further, is it even possible for some new agency to assess and collect taxes in behalf of or pass through state taxes to a regional association which retains these characteristics? Could such monies be collected by or through to Salmon Authorities established by A.S. 16.10.600 et. seq.?

3. Potential Institutional Arrangements, Assuming Constitutional Revision.

Potential constitutional revisions to resolve the legal problems affecting the regional association assessment problem and to affect greater organizational stability include:

(a) Amendment to Article X, Section 5, which allows for establishment of service areas, to allow extension of the boundaries for provision of special services beyond those of an organized borough.

(b) Amendment to Article IX, Section 7, which prohibits dedication of the proceeds

of any state tax or license to any special purpose, to allow for dedication of fisheries tax monies (e.g., A.S. 43.75) to regional associations for construction and operation of fisheries development facilities (Article IX, Section 13 requiring appropriations to withdraw monies from the Treasury may also have to be amended).

(c) Amendments to Article X, Sections 1 and 2, which seek to limit potential duplication of taxing authority by allowing the State to delegate its taxing authority to organized boroughs and cities only, to allow assessments or levies by associations established by law for a public purpose. Again, any amendment to the Constitution could be difficult, particularly if its purpose is limited to a single interest or program.

The first of these amendments would be helpful to resolve potential boundary problems discussed above if the regional association form were to be altered to conform to the service area concept.

The second of these amendments would allow the state to collect a tax on fish harvests and direct those

taxes back to the regional association for use in a manner consistent with the present assessment and without an appropriation by the legislature.

The third of these amendments would allow for significant alteration of the regional association form and increase capability to finance its operations. It contemplates the establishment of "junior" taxing districts in any variety of forms. There are many examples in the lower 48 states which might serve as appropriate models for an altered regional association program. We have suggested that port authorities in Washington and Oregon provide an excellent model for "junior" governmental economic development activities similar to those of AFRDP. Port authorities operate pursuant to statute, elected officials administer them, they have bonding and taxing authority (with ceilings on each), and are subject to considerable voter controls.

Economic development districts have been formed pursuant to federal and state statutes to perform a variety of tasks and are somewhat less visible, more limited in authority and political accountability, and largely have been formed in major centers of commerce. METRO, a local authority in King County, is an example of an organization formed for specific purposes (e.g. transportation, sewage control) to deal with governmental problems shared across jurisdictional lines.

While infrastructure development and other economic

development activities may well be inhibited in Alaska as a result of present constitutional prohibitions, the framers obviously felt strongly that the spectre of junior taxing authorities presented more ominous concerns for Alaska's citizens. This may or may not still hold true, but we wonder if the regional association financing problem and the 200 mile limit fisheries opportunity are sufficient impetus to reverse so strong a policy. This is particularly true if there are alternative legislative remedies to deal with this problem.

To conclude, amendment to the Constitution could affect greater flexibility than presently exists for the legislature to alter the basic form of regional associations and to provide greater organizational and financial stability. However, the process to amend the Constitution is by no means an easy one, and to amend certain of the above provisions for the purposes stated herein may not be realistic. We suggest this is an option which may ultimately have to be considered if further legislative attempts fail to achieve a fisheries development program consistent with the constitutional mandate contained in Article VIII, Section 15, that the powers of the state not be restricted to prevent economic distress in the fishery or promotion of the "efficient development of aquaculture in the state".

Chapter IV - SEARCH FOR GOALS

Introduction

We have discussed in the previous chapters a variety of program and other changes which may be necessary to achieve the basic fisheries resource development goal articulated in Article VIII, Section 15 of the Alaska Constitution: ". . . to prevent economic distress among fishermen and those dependent upon them for a livelihood and to promote the efficient development of aquaculture in the State." Article VIII, Section 5 of the Constitution further provides: "The legislature may provide for facilities, improvements, and services... to assure fuller utilization and development of the fisheries..." These constitutional provisions clearly set forth the fisheries resource development goals for Alaska.

A second series of goals articulated in the Constitution may provide a basis for providing a role for local government units in fisheries resource development activities. Article X, Section 5 authorizes the borough assembly to establish "service areas to provide special services within an organized borough." Article X, Section 6 authorizes the legislature to do the same in the unorganized borough. The legislature, pursuant to this latter section is to allow "for a maximum of local participation and responsibility." Finally, Article X, Section 13 provides for intergovernmental cooperation or joint administration among local, state and federal governments. This second series of constitutional

provisions seem to encourage local involvement in fisheries resource development activities, as well as suggest the form such involvement could take.

Bearing in mind the desire on the part of the framers of the Alaskan Constitution to have the constitution be a broad policy document, we do not see a need for additional goals for the fisheries resource development program. In fact, the constitution is unusually clear about "the efficient development of aquaculture" and in other states similarly worded language has been construed to be a constitutional mandate.

While some may agree or disagree as to whether it makes sense to read the aquaculture provisions together with those provisions which encourage local government involvement in fisheries development, the concept of regional planning and the involvement of the regional associations in the fisheries resource development process, seem to at least go part of the way toward the constitutional intent of local involvement.

Recommendations

Based upon our review of the fisheries resource development goals which are constitutionally established, we see no need at this point to either add to or alter these constitutional provisions. Rather than focus further attention upon resource development goals, we believe it would be more productive to instead focus attention on the

means established for achieving those goals.

The recommendations discussed in Chapters I-III suggest that the legislature, the Governor and their constituents should concentrate on a number of improvements to the existing fisheries development program. The basic framework for a resource development program has been initiated with the notable exception of a framework which will assure financial stability to key program elements. Further improvements in the program which meet the spirit as well as the intent of the stated constitutional goals will require in general terms at least the following:

(1) Establishment of an overall policy management approach to fisheries development on a multi-species basis (AFRDP);

(2) Improved direction, fixing of program and financial priorities, and coordination among AFRDP program elements;

(3) Establishment of methodologies for the biological, social and economic evaluation of program activities;

(4) Significantly improved and expanded resource data and information;

(5) Expansion of fisheries research in Alaska and improved coordination among federal, state, university and private research activities;

(6) Increased financial stability for state and regional fisheries development programs;

(7) Upgraded planning which addresses region-specific fisheries development needs with input from local user interests and adequate technical support from state agencies;

(8) Establishment of a financial support base and income streams which will ensure the economic self-sufficiency of the aquaculture program, as appropriate, over a reasonable period of time;

(9) The phasing in of all proposed actions over a multi-year program development cycle, with continued monitoring of progress and reevaluation of priorities and needs; and,

(10) The continued commitment of the Office of the Governor and the Alaska Legislature to the implementation of effective programs designed to meet the constitutional goals.

Each of the above statements is directed at strengthening the existing fisheries development program. Each addresses basic needs identified by the study group and the contractors. While there will be disagreement with some or all of the recommendations addressed in this report, it is our hope that the program recommendations contained in this report will contribute to the accomplishment of the basic goal of the Aquaculture Policy Study Group: "to improve on the considerable effort by the State of Alaska to date to provide for the efficient development of aquaculture in the

State," and to "assure fuller utilization and development of the fisheries." The Constitutional framers and citizens of Alaska have fixed these goals; it is for the Governor and the legislature, with help from their constituents, to ensure that the effective programs and activities to achieve them are implemented.

APPENDIX I

COMMENTS AND RESPONSES

APPENDIX I

COMMENTS AND RESPONSES

Chapter I - Salmon Aquaculture Economic Evaluation Techniques

Comment: From whose perspective is the micro-economic analysis being conducted?

Response: The report clearly identifies two "investor" perspectives. The Return on Investment micro-economic analysis technique is recommended for regional associations who are the "investors" in their regional programs and facilities. The Cost Benefit Analysis technique is recommended when governmental agencies are the "investors" in government programs and facilities.

While there a number of other interested parties including sportsmen, taxpayers and processors, for example, the investors and not these groups bear the financial responsbility for aquaculture projects and programs.

Comment: The recommendation that additional state tax revenues be diverted to regional associations is inconsistent with the Governor's policy of user pay. Secondly, why shouldn't the PNP's be operated without government subsidies?

Response: There are two issues involved in this comment. During the first meeting of the Policy Study Group a decision was made to exclude consideration in this study of opening up the salmon aquaculture program to large for profit corporations, consequently this option is not addressed in this report.

With regard to the second issue, because the PNP's are non-profit they cannot attract risk capital because there is no profit incentive to make such investments. The current levels of assessment will not provide a sufficient amount of revenue to allow the regional associations to make a sufficient contribution to the harvestable number of salmon over the next decade or two. Currently the State of Alaska pays for all operating costs for state facilities. What we are recommending in the report is for the state, over the next decade to invest some of its one-time oil revenues in the regional aquaculture program so they can make a more significant contribution to the fishery. In addition, we recommend that once state hatchery facilities reach full production status that these facilities be managed by the regional

associations with the operating costs for these facilities as well as regional facilities be paid for by a terminal area harvest. This approach will allow the state to shift its growing cost burden of operating hatcheries from the general tax payers to the primary beneficiaries of the facilities.

In summary, we are not proposing a "government subsidy" of the PNP's. We see an opportunity and a need for the state to invest in a program which will not only return more state tax dollars in the future but also allow the state to reduce its expenditures.

Comment: Why do you recommend that hatcheries not be required to carry the full cost burden of administration, start-up and other cost items?

Response: In both the Return on Investment and the Cost Benefit Analysis models, all costs associated with a facility are included in the analysis to aid the decision makers in assessing the economic viability of projects.

In the Source and Applications of Fund Model we are recommending that start-up costs be expensed and not capitalized. We believe it is critically important to minimize the size of the terminal harvest required to pay operating costs. If the operating costs can be contained to the point where no more of the artificial run is required to pay these costs than would return to spawning grounds for natural runs, we can avoid establishing two sets of harvest regulations - one for the natural run and one for the artificial run, so we avoid the regulatory problems in mixed stock fisheries. We also avoid the problem of harvest area compression which could result from having two sets of regulations.

The cost studies we presented to the study groups during the May meeting indicated that operating costs, with start-up costs capitalized, and the payback of the capital investment would in most examples consume about 50% of the run which led us to search for ways to minimize the cost burden placed on hatcheries and avoid the harvest regulation problems.

In the long run, once the regional associations are of a sufficient size to spread administrative and technical service costs over a larger base of operations and when expensive egg takes are no longer required because of the runs being established, hatcheries can be operated on an economically self-sufficient basis.

Comment: Is there a threshhold ROI value, using your computational methods, below which the aquaculture project would be considered economically unsound.

Response: Typically in ROI analyses, any investment which would not provide a return on the investment equal to what could be earned by putting the money in a bank and drawing interest is regarded as a threshhold measure.

Chapter II - Sources and Methods of Projects Financing Salmon Aquaculture

Comment: On page 68, you state that, "the existing assessment program (if re-enacted) does not provide sufficient revenues to pay administrative costs, regional technical expertise and hatchery start-up and operating costs for more than one large facility at a time." I disagree with this statement.

Response: One of the primary concerns of the Aquaculture Policy Study Group prior to the court decision overturning the mandatory assessment program was whether or not the assessment revenue and revenue from terminal area harvests would be sufficient to provide for an orderly expansion of the regional aquaculture program.

In our examination of the financial information provided to us it did not appear that there would be sufficient revenues available, and we therefore recommend that additional revenue equivalent to that available from assessments would be necessary to allow Southeast Alaska to annually produce 5 million harvestable salmon at the end of 20 years.

Three factors could have a significant influence on this recommendation. If, based upon the regional plans, regional associations decide on a slower growth rate or on a program which emphasizes rehabilitation of natural stocks, it is possible that current revenues could be sufficient to carry out the desired program.

A second factor could be a decision to produce pink salmon because of the early returns.

The third factor is the high rate of technical development now occurring in the fishery. The use of relatively inexpensive incubation boxes and lake fertilization could result in substantially lower unit costs which would in turn reduce the level of revenue required.

One final point should be noted. We acknowledge in the report that the 200 million in funds available for loans appears to be adequate for the near future. In theory, at least,a regional association could borrow the funds to start a second or third facility. As a practical matter, however, unless some way is found to drastically reduce construction and or operating costs, the present $3.0 million loan ceiling does not provide enough funds to construct a facility and operate it until sufficient returns are available to help pay part of the cost. In addition, if start-up costs are capitalized, rather than expensed we get back to the problem of requiring a disproportionate share of the run required for operating costs and loan repayment and the attendant harvest regulation problems discussed earlier.

Comment: The six alternative financing proposals are all tax mechanisms in one form or another. Did you consider a private sector solution?

Response: We considered a number of financing alternatives, however it boils down to three choices. These are: the fishermen and processors and how much they can reasonably be expected to pay; a terminal area harvest which requires facilities in production; and, the state's willingness to make a short term investment (over the next decade) in the fishery. As we indicated earlier we did not examine the financing option of large for profit corporations.

Comment: There are tremendous potentials and problems (both biological and economic) with the terminal area harvest concept. It needs to be more carefully examined as a method of financing.

Response: We fully agree with the comment. It is clear from the legislation that some level of terminal area harvests was contemplated as a source of financing. When the regional plans are completed, assuming they include site and species-specific information, the harvest management implications of these plans need to be carefully reviewed. Because of our concern over potential problems we have stressed the importance, and do again, of the need to minimize any difference in the harvest rate on natural and artificial stocks.

Chapter III - Institutional Problems and Potential Reforms

Comment: Why should the state have an Alaskan Fisheries Resource Development Program? Shouldn't we be concerned with getting the Alaskan Salmon Resource Program working first?

Response: We fully agree that a Salmon Resource Development Program needs to be in place and fully functioning. We also are concerned that unless some effort is made to coordinate the entire fishery (bottomfish, shellfish and salmon) overfishing, for example, on one segment of the fishery could have severe effects on other segments.

In addition to a concern over the significant degree of interdependence among the species, we are seeing a growing number of multi-species fishermen (fishermen who fish for salmon and crab, fishermen who fish for salmon and bottomfish, and etc.). It takes only a little imagination to predict that some form of limited entry will soon be required across the entire fishery. If steps are taken now to rationally plan fleet sizes and composition now, perhaps Alaska can avoid the excessive gear and attendant harvest regulation problems which have made salmon harvest management so difficult not only in Alaska but Washington, Oregon and California as well.

In summary, we believe that some level of activity which overviews the entire fishery could help avoid potential future problems and help Alaskan decision makers formulate sound overall fisheries management policies.

Comment: The discussion on research is too cursory.

Response: It was not intended in the report to specify a research program in detail, but rather to indicate the type of research activities we see as necessary to ensure a more coordinated scientific basis for the management of the fishery.

During the fourteen months the Presidential Task Force on Northwest Fisheries was in existence, federal, state and tribal fisheries scientists and biologists spent a great deal of time defining the research needs of the salmon fishery in Washington state, much of which was reviewed to form the basis of our recommendation. In addition, because of their concern over the lack of research and information, a consolidated fishery research facility (federal, state and tribal) is being constructed in Washington state at a cost of $15 million. Given that the Washington salmon fishery is less than 1/10 of the size of the Alaskan salmon fishery and given the importance attached by the fisheries scientists to the Washington state research problems, we are persuaded that the State of Alaska could also benefit from an expanded and coordinated research program.

Comment: Coordination between DCED and ADF & G has been significantly improved during the past two years regarding the project and loan approval of aquaculture projects. In addition, DCED has employed a fisheries biologist who participates in the aquaculture loan review. Given these improvements in coordination and technical review, how would shifting the loan authority to ADF & G result in any significant benefit to the state or the regional associations?

Response: Our recommendations are based upon two factors. First, if the loan program is limited to loans for capital facilities and not operating funds, then we believe the project and loan approval should be a single action performed by the department with the greatest overall expertise in fisheries, construction costs and technology.

Secondly, the process of selecting productive sites and appropriate facilities requires substantial local knowledge of stream conditions, harvest management problems, construction costs, egg takes, remote release requirements and similar issues. ADF & G through their regional staffs is in a better position to acquire and apply this knowledge in an approval process.

Comment: If the loan program is continued in its present form (i.e., both capital and operating costs), would you still favor totally removing the loan ceiling?

Response: No. The proposal to remove the loan ceiling again was conditioned upon the recommendation that the loan cover only capital construction costs. If the loan program is continued in its present form an increase in the ceiling should be made to reflect inflationary impacts on construction costs and the longer term required for start-up. In addition, if the ceiling is increased and operating costs are continued within the loan program, our recommendation to shift the loan program from DCED to ADF & G loses much of its support because of the need to annually monitor operating loans over a further extended start-up period.

APPENDIX II

INSTITUTIONAL ANALYSIS

INSTITUTIONAL ANALYSIS

INSTITUTIONAL ANALYSIS

Introduction

The following analysis has been developed after review of the prime contract for this project, the sub-contract to Leonard Lane Associates, our clarifying letter of March 23, and our original proposal to the Aquaculture Policy Study Group. From each of these documents, we determined that the institutional analysis should include the following items:

- A comprehensive list of organizations and institutions involved in the Alaska Salmon Resource Development Program.
- A data-base of various characteristics for the primary organizations and institutions.
- General comments on the institutional framework of these organizations as they pertain to the Alaska Salmon Resource Development Program.
- Various recommendation and action steps for improvement to the institutional framework.
- A search for goals for the Alaska Salmon Resource Development Program as indicated by the various goals of the institutions in the ASRDP.
- Various institutional and operational problems as noted by each institution including our review of these problems.
- A suggestion of alternative goals and/or methods for producing goals improving the ASRDP.
- Alternative institutional frameworks of benefit to the ASRDP.

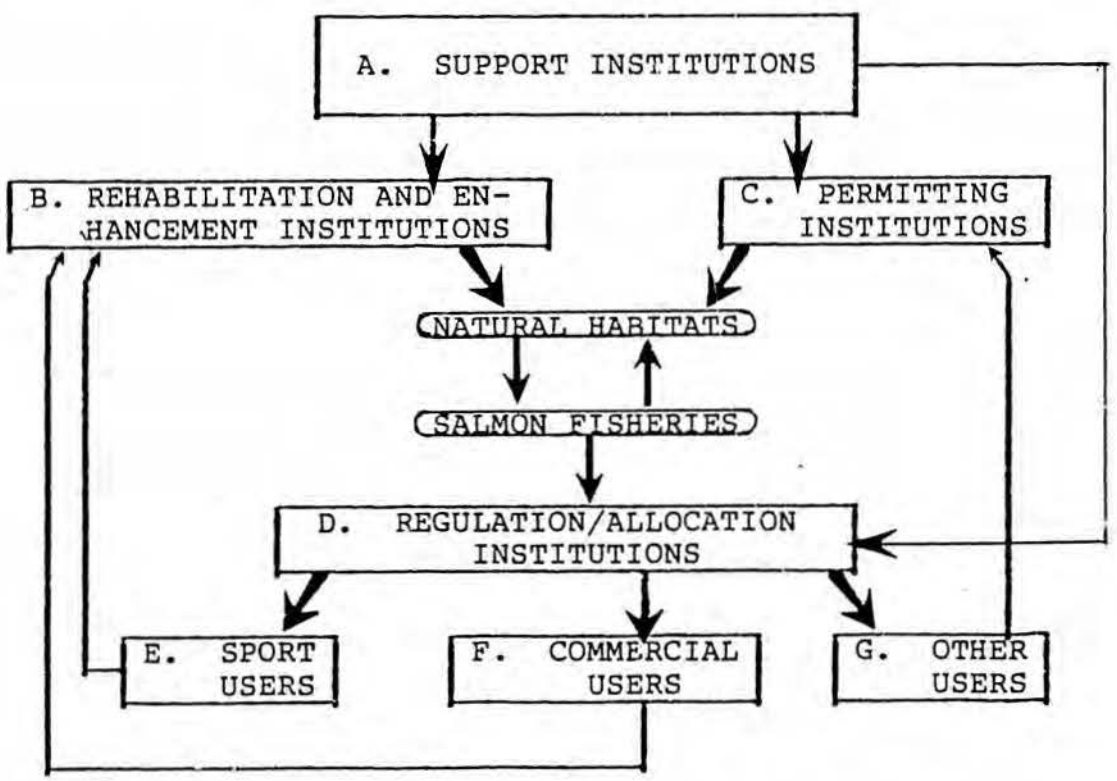
The following analysis and supporting data fulfills and requirements of each of the above items. The discussion commences with an overview of the institutional framework

and proceeds through a detailed discussion of our findings, conclusions, and recommendations in each of the first two tasks noted in our prime contract. The final two sections of this report provide the detailed institutional data from which this analysis was derived.

Institutional Framework

The following discussion describes the institutional framework of those organizations and individuals involved in Alaska's salmon fishery. The organizational concept includes all organizations and individuals who either impact Alaska's salmon fishery or it's habitat, directly or indirectly (primary institutions), and also includes secondary institutions which dramatically impact primary institutions. The organizational concept includes management of the resource, protection and enhancement of the habitat, harvesting, processing, marketing, and the academic, financial, and regulatory institutions effecting the salmon production industry in Alaska.

After having identified and researched all publicly and privately funded organizations in Alaska qualifying as primary institutions, each institution was contacted and a series of its characteristics described in detail. A review of this data indicated seven (7) major categories for the institutions, the following diagram illustrates the institutional framework for these institutions and the arrow indicating the flow of influence between institutions. Institutions are indicated by rectangles whereas the natural eco-system of the salmon is indicated with ovals. A detailed discussion of each institutional category is provided in the following pages.



A. SUPPORT INSTITUTIONS

Support Institutions include those organizations involved in research, financing, policy development, and planning. These institutions predominately support the fisheries rehabilitation and enhancement efforts, the permitting activities of the public sector, and the regulation and allocation activities of the public sector.

B. REHABILITATION AND ENHANCEMENT INSTITUTIONS

These institutions have as their primary goal the expansion of the Alaska Salmon Fishery through capital projects and operations in Aquaculture. Aquaculture projects would include both the artificial propogation of salmon as well as various activities enhancing the salmons natural ability to reproduce.

C. PERMITTING INSTITUTIONS

These institutions serve as a regulator of human activity impacting the habitat utilized by salmon in Alaska. These institutions are responsive to requests by individuals wishing to use the habitat. Permits require these potential users to operate within guidelines consistent with the primary goals of habitat use.

D. REGULATION/ALLOCATION INSTITUTIONS

These institutions represent the police powers of the state in the management and preservation of the salmon resource. These institutions predominately effect the harvester segment of the industry.

E. SPORT USERS

These institutions represent individuals of the state whose primary use of the salmon is for sport as defined by the state in it's Fish and Game Statutes and regulations (Title 16).

F. COMMERCIAL USERS

These institutions represent any individual or corporation which derives economic gain from the harvest, processing or sale of salmon taken in Alaskan waters. Commercial users are also defined in Alaskan Fish and Game Statutes and regulations (Title 16).

G. OTHER USERS

These individuals and institutions represent all non-sport and non-commercial users of salmon. The inclusion of these institutions, individuals and loosely knit segments of Alaska expands the traditional concept of "user" in order to encompass those who, through their actions, impact salmon without in some cases, having consumption of the salmon as their primary concern. These users include subsistence users, wildlife observers, conservationists and preservationists, other fisherman to whom salmon are an incidental catch, users of salmon habitat which may conflict with salmon propogation, supporters of enhancement of salmon predators and competitors, and the Alaska taxpayer in general.

Task 1: Search for Goals

This task required a review of the goals for the various institutions involved in the Alaska Salmon Resource Development Program (ASRDP). The primary thrust of our analysis was to set overall goals for the ASRDP. However since no coordinated and consolidated ASRDP organization exists, the only goals found were those developed individually by each institution. The following findings, conclusions and recommendations have been drawn from our analysis of the goals for all primary institutions.

Findings:

- There is no single Alaska Salmon Resource Development Program which has identifiable goals, and strategies for attainment of goals, organizational structure, or operations.
- No organization had as its goal the development of an Alaska Salmon Resource Development Program involving all institutions as defined by the institutional framework described here.
- The lack of a coordinated and comprehensive planning effort involving all institutions suggests that the cumulative goals of all institutions are neither consistent nor complete with respect to the demands of managing Alaska's salmon resource for all users.
- Only goals for individual institutions which might be part of an ASRDP, if such a program existed, were found.

- Whereas some individual goals might suggest conflict or mutual exclusivity between institutions, these cases were the exception rather than the rule.

- The goals of the Alaska Department of Fish and Game, while addressing Alaska's salmon resource management and production, do not encompass the interests of all institutions noted in the Institutional Analysis.

Conclusions:

- Since the ASRDP lacks clear definition and organization, it therefore does not have mechanisms to develop complete and consistent goals and strategies representative of all institutions.

- Goals setting for individual ASRDP related institutions is fairly well established and could be coordinated into an Alaska Salmon Resource Development Program if proper mechanisms were developed. developed.

- Current legislative funding and planning mandates show promise in developing limited ASRDP goals for various regions and restricted numbers and types of institutions though fall short of meeting the full needs of an ASRDP.

- There is a definite requirement for both initiative and formal mechanisms to develop the concept and organization for the ASRDP capable of taking specific steps to develop goals, strategies, and coordinating agreements with all existing institutions.

- There is a general trend towards regionalization and decentralization in both aquaculture and allocation decision making which has a tendency to complicate a coordination effort though certainly would not preclude such coordination.

Recommendations:

- There is a strong need to concentrate on the development of goals for Alaska's salmon fishery covering the next five to ten salmon life cycles (depending on species) and to develop strategies for both the public and private sector roles in achieving these goals. Attention should be placed

G. OTHER USERS

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upon the development of the assumptions utilized in selecting and implementing these strategies and upon the monitoring of all ASRDP institutions in order to insure the continuing reasonableness of assumptions or to alter strategies as required.

- The Legislature should develop a task force or a commission with powers to spend monies for the planning and coordination of the ASRDP similar in structure to the Governors Commission on the Handicapped and Gifted.

- The task force or commission should have a staff mandated to coordinate with all public and private sector institutions involved in the ASRDP in order to produce concensus ASRDP goals and stratagies similar to the role currently played by Alaska's bottom fish coordinator.

- The task force or commission should annually make recommendations to the BRC and Legislature pertaining to the goals, objectives, and program requests of all state institutions within the ASRDP.

- The existing ADF&G/PNP regional planning efforts should coordinate with, if not become part of the effort to formulate ASRDP goals and strategies under the funding and guidance of the task force and commission.

Task 2: Institutional and Policy Analysis

The following analysis and recommendations derive directly from a review of the institution data presented later in this report. The analysis has been directed mainly at the institutions and their characteristics and does not specifically analyze the effectiveness or quality of the operations of each institution. The thrust of the recommendations has been to recognize the strengths and weaknesses of the current institutional framework and suggest alterations to the framework consistent with a stronger more effective Alaska Salmon Resource Development Program. Much additional work would be required to translate these recommendations into specific changes. These specific changes, not dealt with in this review, would have to meet the test of practicality and cost effectiveness not analyzed here.

General

Findings:

- There are a large number of stable primary institutions in the ASRDP, (described in our institutional data section), and many new and evolving institutions particularly in the rural areas, (described in our final Other Institutions section)

- Recent trends are for a greater regionalization and fragmentation of the institutions into smaller and smaller interest groups, particularly as indicated by the interest shown by village corporations, special interest groups, and local user organizations as noted in our final section.

- Most institutions can be readily identified as either support, rehabilitation, or other institutional categories with very few overlapping (some possible exceptions with state programs.)

- Public sector funding is predominately by the state through numerous budget request units (BRU's) which have no unified review or acknowledgement as an Alaska Salmon Resource Development Program.

- Runs have been increasing significantly in the last ten years, slackening the initiative of certain resource users in the areas of rehabilitation and enhancement.

- Activities of the regulation and allocation institutions have been dramatically and primarily responsible for both increasing runs and providing some stability in the harvesting and processing industries indicating an effective role in ASRDP for these institutions.

- Recent complications posed by the permitting and funding for aquaculture facilities does not appear to have stymied the growth of runs though frustration of aquaculture facility producers has resulted.

- Some segments of the salmon industry are marginally represented as institutions in the

ASRDP, such as processive, sport user, subsistence users, local economic development organization, local governments, village corporations, and other non-state funded operations.

Conclusions:

- Newly evolving user groups and institutions should tend to increase in number and impact in the future with the maturing of native corporations and the public attitudes towards renewable resource investment thus expanding the complexities of coordinating ASRDP programs and institutions.

- Immediately concentrating on the formation of an ASRDP organization may meet the growing complexities early enough to reduce the anticipated complexities of planning and coordination.

- A state effort to coordinate their programs through the budget review process (BRC) would dramatically serve to improve coordination.

Recommendations:

- The ASRDP should be given structure and substance through a stable organization and a clearly defined mission for the organization. The organization will require state funding of staff and the mission should include goal and strategy formulation and program monitoring.

- The state should develop a structured organization with central policy and planning functions, as either an independent task force or commission, capable of developing goals and strategies and representing the concensus of all institutions in the ASRDP.

- The ASRDP should encompass all institutions as noted in this analysis.

- The state should encourage the participation of processing and marketing industry segments, not now adequately represented in the ASRDP.

- The ASRDP organization should implement its goals and strategies through their review of proposed state and federal programs and their comments and recommendations to the state BRC and the federal government through the A-95 process.

Support Institutions

Findings:

- These institutions are predominantly involved in policy development, habitat land use planning, economic development and biological and economic research. (See institutional data section for descriptions)

- These programs lack the consistency required in their planning and goals to support a coordinated ASRDP strategy.

- The support provided by these institutions to the salmon fishery often comes as a secondary consequence of programs focused in other areas, eg. habitate protection during oil line construction considers the preservation of anadromous streams as well as many other environmental concerns.

- Funding levels are generally insufficient to meet most estimates by the institutions of the tasks required to achieve existing goals.

- All support institutions are public sector funded.

Conclusions:

- The yet to be organized ASRDP will have to specifically and immediately investigate the support requirements of the ASRDP institutions in order to insure the proper prioritization of these efforts.

- A definitive strategy for the role of support institutions in the ASRDP is required.

- Dramatic improvements in the data and analytic understanding of the salmon resource would greatly serve to increase credibility of the ASRDP if not also be a prerequisite for its goal and strategy development responsibilities.

Recommendations:

- The recommended ASRDP organization should, at the strategic level, address the role of support institutions as a highest priority.

- The public sector should continue to take a lead and increase efforts in the funding and central coordination of biological and economic research on anadromous specifics.

Rehabilitation and Enhancement Institutions

Findings:

- Both the public and private sectors are involved as evidenced by operating hatcheries funded by both the state and the private non-profit associations.
- Private sector institutions exist. However, long-term viability is currently in question due to constitutional restrictions of financing mechanisms.
- Non-commercial users of the fishery are marginally represented within existing rehabilitation institutions.
- Current financial mechanisms (limited now to direct legislative appropriations and voluntary contributions) greatly limit growth rate of these institutions.
- Current financing for facilities and programs is not tied to production success and only through the state's loan program are the probabilities of success systematically considered for financing.
- There is a distinct lack of financial mechanisms allowing user payment for resource expansion.

Conclusions:

- Both clear state policy and authorized financial mechanisms are a primary requirement for continued private sector growth in salmon aquaculture.
- Future state action is critical to the solution of the regional non-profit problem and will require the authorization of new funding mechanisms.
- There is a rationale and demand for rehabilitation and enhancement facilities serving the needs of non-commercial users.

Recommendations:

- The ASRDP, as recommended, should immediately develop and recommend legislation that creates financing mechanisms which insure stable funding for private sector rehabilitation facilities.

- Maintain strong state support of public sector rehabilitation facilities until private sector financing mechanisms for aquaculture are in place and proven sufficient.

- The ASRDP, as recommended, should consider financing mechanisms for non-commerical user "investments" in aquaculture facilities which might include a dedicated tax on sport fish gear, and so forth.

Permitting Institutions

Findings:

- Permitting Institutions are organized around the demands of those requesting permits. (eg. gasline developers, forestors, coast line developers, etc.)

- Current funding levels for these institutions limit the speed and detail with which permit applications can be processed.

- The Department of Environmental Conservation has been charged with and funded for, the simplification and coordination of permitting, though not specifically for potential ASRDP goals.

- Permitting has been effective though conservative, since habitat degradation has been curtailed sometimes at the expense of proposed hatchery projects.

- Permitting contributes a major cost to the start-up of aquaculture facilities.

Conclusions:

- A credible ASRDP would aid permitting institutions and reduce need for conservative positions similar to the effect Coastal Zone Management Planning has had on coastal development proposals.

- Increased funding for the permitting institutions would reduce long delays experienced in obtaining necessary permits, thus reducing complications to aquaculture facility developers.

- Improved permitting would reduce the start-up costs of aquaculture facilities.

Recommendations:

- Permitting institutions should be involved in the formulating of ASRDP goals and strategies.

- A new mechanism should be developed whereby approval of the ASRDP goals and strategies by permitting institutions will reduce the number and detail of permit requirements on aquaculture facility developers when operating in conformance to the ASRDP.

- Increase funding to, and/or consolidate those permitting institutions primarily effecting aquaculture resource development, only after the financing mechanisms are in place and development proposals expected.

Regulation and Allocation Institutions

Findings:

- Appointed boards focus on allocation decisions and, by design, are responsive to socio-economic arguments of resource users.

- The state is responsible for in-season regulatory decisions, although data for decision making is limited.

- Current regulation and allocation institutions are centralized though constant lobbying has addressed decentralization and regionalization.

- The decisions of these institutions have been highly successful in increasing run-size in the last 10 years.

Conclusions:

- Current institutional arrangement has been effective.

- Decentralization will make the implementation of ASRDP goals and strategies more complicated, costly, and perhaps less effective.

- Clear authorities and centralized decision making have been key to the success of these institutions.

Recommendations:

- Maintain current centralized institutional structure.
- Greatly increase data availability for decision making through increased support of support institution activities.

Commercial Users

Findings:

- Most commercial user institutions represent harvest interests oriented around gear-type and harvest region.
- Native corporations and municipalities have an increasing interest in the salmon resource for economic development.
- Consideration of and involvement by processors, wholesalers, marketers and consumer segments of the industry in the current planning and management of the salmon resource is scarce.
- Commercial users are organized for lobbying, regional planning, and aquaculture development.
- There are no institutions coordinating harvesters with processors with marketers yielding an overall economic development plan for the resource.

Conclusions:

- Users tend to organize themselves around their interest in small segments of the industry.
- Aquaculture development as a means of economic development has not been specifically addressed by all commercial users of the resource.
- Expansion of the resource does not necessarily ensure economic development for all segments of the salmon industry since many of these segments compete with varying degrees of success.
- Harvesters, the prime private sector supporter of aquaculture at this time, often favor near-term investment decisions while aquaculture investments require a long-term venture capital attitude.

Recommendations:

- Strategy development by the ASRDP must include plans for economic development in all commercial industry sectors, not just harvesters.

- Private sector financing mechanisms for aquaculture, when developed, should be equally available to non-harvester users and reflect the different investment requirements of each. (e.g., harvesters want more fish, processors want cheaper fish, etc.)

- Commercial use of the rehabilitated fishery should be tied securely as possible to individual aquaculture development investments in order to clarify financial return evaluations and ensure long-term financial viability of aquaculture investments.

Sport Users

Findings:

- Sport users are not well represented in the regulation/allocation process except in urban areas where sport fishing rights are strongly debated. (Example: Cook Inlet).

- The state acts often as a proxy for sport users. (Example: Sport Fish Division of Alaska Department of Fish and Game).

- The value of the sport fishery has not been tapped as a mechanism for financing aquaculture facilities.

Conclusions:

- As population grows and portions of Alaska urbanize, sport institutions should evolve and provide pressure for representation in aquaculture development.

- Sport users would probably support rehabilitation and enhancement projects when competition for the resource with commercial interests increases.

- The value of the sport fishery to sport users could support aquaculture if adequate mechanisms were developed by the state.

Recommendations:

- The ASRDP should specifically address the design of financing mechanisms sufficient to meet the projected demands of sport fishermen.

- The state should implement financing mechanisms involving sport users for aquaculture projects.

Other Users

Findings:

- Subsistence use is a primary allocation by the state for the salmon resource.

- Conservation and preservation groups may have interests in conflict with rehabilitation. However, it appears these institutions have not organized or coordinated against aquaculture development.

- There are a number of organizations (AFN, ANF, etc.) which support the rights and interests of subsistence users.

- While many of these groups can be identified as impacting or impacted by the salmon resource, to date, these impacts have not been debated issues and therefore have not played a major role in salmon resource management.

Conclusions:

- While allocations will continue to be made to these users, these users are not likely candidates for financial support of aquaculture since their involvement with the resource has few financial transactions thus limiting both the motivation and mechanisms for investment.

- Use of rehabilitated and enhanced runs by these users will continue to generate a cost that must be recognized in aquaculture development, though it probably could not be quantified for any particular facility.

- It may be justifiable for the state to provide financial support for aquaculture facilities and operations in order to offset the costs generated by these users to private aquaculture developers.

Recommendations:

- The state should continue finacial support of rehabilitation facilities justified as compensation to private sector aquaculture developers for losses to these users.

- These users should be considered in the ASRDP goal and strategy formulation.

INSTITUTIONAL DATA

INSTITUTIONAL DATA

Introduction

The following pages detail the research effort documenting all state and local primary institutions in Alaska Salmon Resource Development Program. The institutional descriptions are accurate as of July 1979. Now that the State of Alaska is progressing through its FY81 planning cycle, some of these characteristics may no longer be applicable.

Methodology

The following methodology was employed in the collection and analysis of the institutional data.

1. A comprehensive list of institutions satisfying the criteria of a primary institution was developed by the study team.

2. The study team then developed a taxonomy and definition for characteristics to be noted for each of the institutions.

3. Published material, reports, budgets, and secondary sources were collected, organized and examined for information on institutional characteristics.

4. A representative of each institution was contacted on the phone to verify data and collect the institutions perceptions of problems.

5. The composite of all data were reviewed and discussed by the project team.

6. The data was reviewed in detail and a final report on findings, conclusions and recommendations was developed.

Data Format

The data is presented in sections for each of the institutional categories noted in the institutional analysis section. The level of detail and completeness of descriptions for each characteristic varies considerably from institution to institution depending upon the completeness and accuracy of the resource materials examined.

A. SUPPORT INSTITUTIONS

Support Institutions include those organizations involved in research, financing, policy development, and planning. These institutions predominately support the fisheries rehabilitation and enhancement efforts, the permitting activities of the public sector, and the regulation and allocation activities of the public sector.

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

DEPARTMENT OF COMMERCE AND ECONOMIC DEVELOPMENT

DATA

- State Department with two Divisions affecting Aquaculture, Economic Enterprises (AS 44.33.020) and Commercial Loans (AS 16.10.300-380)

Type:

- State Department funded by Legislature
- Division of Commerce and Economic Development

Size:

- Economic Enterprises has one employee assigned to anadromous fish projects

Structure:

- Reports to Commissioner, Commerce and Economic Development

Geographic Location:

- Statewide responsibilities
- Headquartered in Juneau

Goals:
Economic Enterprises Development:

- Develop and diversify Alaskan economic base
- Research, plan, promote, implement assistance to improve well being of State
- Provide Alaskans maximum opportunity to participate in State economy

Commercial Loans

- Promote rehabilitation of the State's fisheries primarily resident
- Maintenance of commercial fishing gear and vessels

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Dept. of Commerce & Economic Dev. - Cont.)

Objectives:
Economic Enterprise:

- Increased processing capacity
- New hatcheries
- Expanded seafood market

Commercial Loans:

- Private investment in aquaculture programs through the Regional Aquaculture Associations

Programs:
Commercial Loans:

- Loan up to $150,000 per application to commercial fishermen for repairs, restoration and upgrading of harvest gear and vessels
- Loan up to $3,000,000 per application to Regional Aquaculture Associations, for salmon hatchery construction and operation
- Loans are low-interest and long-term

Economic Enterprise:

- Has the potential to affect salmon aquaculture but is currently funded to concentrate its program in bottom fish

Accomplishments:
Commercial Loan:

- Assisted in development of Regional Aquaculture Association
- LOANED $2.4 mm to Southern Southeast Regional Aquaculture Association
- LOANED $1.9 mm to Prince William Sound Regional Aquaculture
- LOANED $175,000 to a Wrangell based project

Economic Role:

- Medium of State support for private aquaculture projects

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Dept. of Commerce & Economic Dev. - Cont.)

Problems:

- Funding has not been renewed to allow further business loans

Opportunities

- Method of State support of private investment in Aquaculture

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

COMMISSIONER OF FISH AND GAME

DATA

- Principal executive officer of the Department of Fish and Game
- Shall supervise and control the department and employ personnel (AS 16.05.020)
- Shall manage, protect, maintain, improve, and extend the fish, game and aquatic plant resources of the State in the interest of the economy and general well being of the State (AS 16.05.050)
- May assist USF and WS
- May design and construct projects beneficial for the fish and game resources of the State (AS 16.05.050)
- May capture, propagate, transport, buy, sell, or exchange fish or game or eggs for propagating, scientific or stocking purposes (AS 16.05.050)
- May provide public facilities for taking of fish and game
- May exercise administrative budgeting and fiscal powers
- May issue emergency openings and closures (AS 16.05.0601)
- May authorize any person to enforce fish and game laws (AS 16.05.1501)

Goals:

- Organize and develop the department's human, financial, and technical assets to maintain, rehabilitate, and enhance the fish and wildlife resources of the State and to provide their sustained optimum use consistent with the long-term social, economic, cultural, and environmental needs of the public

Objectives:

- Provide management direction consistent with the Governor's policies

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Commissioner of Fish and Game - Cont.)

Program:

- Provide primary management direction for the department
- Represent the department in various annual and special meetings concerning resources
- Represent the department on various boards and councils such as The Alaska Coastal Policy Council, North Pacific Fisheries Management Council, etc.

Type:

- Executive office of the State Department of Fish and Game

Size:

- 50 PFT requested for FY 80 for all three budget components
- 1 Temp requested for FY 80 for all three budget components

Structure:

- Three components
- Office of the Commissioner request $329,000 for FY 80
- Public Communications Section request $220,000 for FY 80
- Administrative Services request $2,309,000 for FY 80

Geographical Location

- State-wide responsibilities
- Staff located in Juneau

Funds:

- $359,000 federal receipts requested for FY 80
- $2,423,000 General Fund requested for FY 80
- $75,000 other funds requested for FY 80

DATA (Commissioner of Fish and Game - Cont.)

Primary Constituents:

- All users of fish and game resources of the State
- General public consuming commercial fish and game products.

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

ALASKA RENEWABLE RESOURCES CORPORATION

DATA

- A public corporation for the rehabilitation, enhancement, and development of the State's renewable resources (AS 37.12.010-015)
- Receipts consist of five per cent of total receipts paid the State from mineral lease bonuses and rentals and royalties
- Fifty per cent of receipts deposited into investment fund (AS 37.12.020)
- Fifty per cent of receipts deposited into development fund (AS 37.11.020)
- Unused balances at close of fiscal year transferred to investment fund (AS 37.11.040)
- Investment fund available only for prudent investments by treasury division (AS 37.11.090)
- Income from investments in investment fund to be used for capital and operating expenses for renewable resource programs (AS 37.11.070)
- Development fund provides funding for capital and operating expenditures for the rehabilitation, enhancement, and development of renewable resources (AS 37.11.030)
- Funding from development fund primarily equity and debt financing (House Finance Committee Report on CS HB 682)

Type:

- Legal existence independent of and separate from the State
- Public corporation
- Instrumentality of the State within the Department of Revenue

Size:

- 9 PFT for FY 80 includes Board of Trustees

Structure:

- Governing body is Board of Trustees
- Executive Director is responsible to Board and supervises staff

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Alaska Renewable Resources Corporation - Cont.)

Geographic Location:

- Statewide responsibilities
- Headquartered in Juneau

Funds:

- $860,000 request for FY 80 operating budget from Development Fund
- $11,150,000 capital request for FY 80 for Investment Fund
- $11,150,000 capital request for FY 80 for Development Fund

Primary Constituents:

- Development Fund primarily benefits private entrepreneurs
- Interest from Investment Fund primarily benefits general public and government agencies

Problems:

- New agency still in the process of hiring staff, assessing priorities, and developing criteria to evaluate proposals
- Not a lead agency -- must respond to requests

Goals:

- Rehabilitation, enhancement, and development of the State's renewable resources
- Identify, stimulate research and development of, and assist in the demonstration of feasibility of: new products, markets, and technologies for renewable resource industries in the State

Objectives:

- Maintain the productivity of healthy renewable resources
- Expand productivity of depleted or underutilized resources

DATA (Alaska Renewable Resources Corp. - Cont.)

Objectives: (cont.)

- Provide financial assistance for projects meeting goals above
- Promote in-state utilization of renewable resources
- Develop import substitution and export markets

Programs:

- Provide venture capital to meet goals and objectives
- Make equity (preferable) or debt investments in agriculture, fisheries, timber, and renewable energy up to 49% of stock ($1.5 million maximum)
- Provide grants as appropriate to meet above goals
- Develop long-range plans

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

ALASKA PERMANENT FUND

DATA

- At least 25% of all mineral lease rentals, royalties, royalty sale proceeds, federal mineral revenue sharing payments and bonuses received by the State, shall be placed in the Permanent Fund (Constitution of Alaska, Article IX, Section 15)
- Principal of the Permanent fund shall be used only for income producing investments specifically designated by law (Constitution, Article IX, Section 15)
- Income from the Permanent Fund shall be deposited in the General Fund unless otherwise provided by law (Constitution, Article IX, Section 15)
- Investments of the Permanent Fund restricted to notes and obligations of the United States, CD's, corporate securities, bankers' acceptance, repo's and deposits in federally insured savings and loans and credit unions (AS 37.10.065)

GOALS

- None specifically stated in the Constitution or Alaska Statutes

OBJECTIVES

- None specified by Constitution or Alaska Statutes

PROGRAMS

- Invest funds per AS 37.10.065

TYPE

- Responsibility for investment rests with the Commissioner of Revenue

SIZE

- No discrete agency or program identified as managing the fund

DATA (Alaska Permanent Fund - Con't.)

STRUCTURE

- No discrete agency or program identified as managining the fund

GEOGRAPHICAL LOCATION

- Commissioner located in Juneau

FUNDS

- No budget identified for management of the fund

PRIMARY CONSTITUENTS

- All citizens of the State, both present and future

PROBLEMS

- Legislature has failed to establish an agency to manage and invest the Permanent Fund
- Current law intended as an interim measure
- Proposed laws regarding the Permanent Fund before the current legislature (1979) not likely to pass this year

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

COMMERCIAL FISHERY TAXES

DATA

- Salmon canneries both shore based and floating pay tax of 3% of value of raw fish (AS 43.75.010)
- Herring processing plants pay annual tax of 1% of value of raw herring (AS 43.75.010)
- Crab canneries both shore based and floating pay annual tax of 2% of value of raw crabs (AS 43.75.010)
- Clam canneries pay tax of 2% of value of raw clams (AS 43.75.010)
- Shore based cold storages and other fish processors except the previously mentioned pay tax of 1% of value of raw fish (AS 43.75.060)
- Freezer ships and other floating cold storages pay annual tax of 4% of value of raw fish (AS 43.75.060)
- Commissioner of Revenue shall pay to each organized borough in each city of the first class, 10% of the amount of tax revenue collected in the borough or city (AS 43.75.130)
- Commissioner of Revenue shall pay an additional 10% to each organized borough of tax revenue collected in the borough, from taxes and 10% to each city of the first class in the unorganized borough from tax revenue collected in the city (AS 43.75.135)

GOALS

- None specified

OBJECTIVES

- None specified

PROGRAMS

- Collect taxes as required by law
- Pay refunds to local governments as required by the law

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Commericial Fishery Taxes - Con't.)

FUNDS

- FY78 collections exceeded $8,326,000
- FY78 refunds to local governments equalled $1,245,000

PRIMARY CONSTITUENTS

- Local governments
- State governments

PROBLEMS

- Proceeds of tax not dedicated to use for fisheries purposes
- HB 83 proposes to increase refunds to local governments from 10-30%
- HB 306 proposes to increase and make uniform fisheries tax to equal 6% of the value of the fishery resource process
- HB 306 proposes to pay local governments one-third of the tax revenue collected and require one-half of the refund to be used for docks or other fish enhancement projects
- HB 306 also proposes to permit the legislature to appropriate one-third of the receipts to the Commercial Fishing and Agricultural Bank

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

FISH AND GAME FUND

DATA

- Shall be used to carry out the purposes and provisions of the Fish and Game Code or other duties delegated to the Department of Fish and Game (AS 16.05.100)
- Fish and Game Funds shall be used to carry out the purposes and objectives of the Fish and Game Code as may be directed by the donor of any such funds (AS 16.05.100)
- Fish and Game Fund composed of money received from sale of sport fishing and hunting licenses, proceeds of fur sales, settlement caused by damage to fish and game resources, money received from donors for fish and game purposes, interest received on money in the Fund, and money appropriated by the legislature to the Fund (AS 16.05.110)

GOALS

- Protection, propagation, investigation, and restoration of sport fish and game resources
- Expenses of administering of the Sport Fish and Game Divisions of the Department of Fish and Game

OBJECTIVES

- None specified

PROGRAMS

- Approximately 50% of funds to Sport Fish Division
- Approximately 50% of funds to Game Division

FUNDS

- $1,905,000 deposited in Sport Fish Account for FY 78
- $2,047,000 deposited with the Game Account for FY 78

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Fish and Game - Con't.)

PRIMARY CONSTITUENTS

- Division of Sport Fish
- Division of Game Fish
- Users of sport fish and game resources of the State

PROGRAMS

- Some (small) funds apparently not going into the Fish and Game Fund (fees from trapping and funds earned as interest from money in the Fish and Game Fund)

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

ALASKA COASTAL MANAGEMENT PROGRAM

DATA

- Staffed by Office of Coastal Managements (AS 44.19.894)
- Managed by Alaska Coastal Policy Council (AS 44.19.891)
- Policy Council shall adopt standards for development of district Coastal Management Programs (AS 46.40.040)
- Policy Council shall develop standards for and adopt the Alaska Coastal Management Program
- Policy Council shall review and approve district Coastal Management Programs
- Coastal Resource Districts shall develop and adopt district coastal management programs (AS 46.40.030)
- Appropriate State agencies shall implement a district coastal management program when a local district does not exercise zoning or other controls (AS 46.40.090)
- In an unorganized area facing major economic development or an area incapable of completing its district plan the Department of Community & Regional Affairs shall prepare the plan (AS 46.40.160-170)
- State agencies shall comply with the Alaska Coastal Management Program (AS 46.40.200)
- U.S. Department of Commerce may make grants to states for development and initial implementation of management programs up to 80% of costs (PL 94-370, Sec. 305)
- U.S. Department of Commerce may make grants to states for administration of management programs up to 80% of costs provided the programs have been approved by the Secretary of Commerce (PL 94-370, Sec 306)
- Federal agencies shall to the maximum extent practicable comply with an approved state management program (PL 94-370, Sec 307)

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Alaska Coastal Management Program - Con't.)

TYPE

- State agency located in Office of the Governor

SIZE

- 16 PFT for FY 80
- 1 Temp for FY 80

STRUCTURE

- Section within the Division of Policy Development & Planning
- Chief executive officer reports to both the Alaska Policy Council and the Director of Policy Development & Planning

GEOGRAPHIC LOCATION

- Entire staff located in Juneau
- Statewide responsibilities

FUNDS

- $250,000 General Fund for FY 80
- 44,500,000 federal receipts for FY 80
- Approximately $4,100,000 is passed through to local or State agencies

PRIMARY CONSTITUENTS

- Other governmental institutions

GOALS

- Use, management, restoration, and enhancement of the overall quality of the coastal environment
- Development of industrial or commercial enterprises which are consistent with social, cultural, historic, economic and environmental interests of the people

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Alaska Coastal Management Program - Con't.)

GOALS (Con't)

- Utilization and protection of resources of the coastal area consistent with sound conservation and sustained yield principals
- Priority to uses that economically or physically require coastal locations (AS 46.40.020)
- Identification of areas of special attention such as habitat areas (AS 46.40.210)
- Identification and designation of areas suitable for location or development of facilities for commercial fishing and processing (6 AAC 80.090)
- Assure unrestricted fish movement in coastal waters where commercial timber harvest activities occur (6 AAC 80.100)
- Habitat areas must be managed wisely (6 AAC 80.130)

OBJECTIVES

- Completion of district coastal programs
- Implementation of district coastal programs by local, State and federal agencies
- Assure coordinated decision making
- Assure consistency with federal regulations
- Maintenance of data base
- Ability to handle special planning element introduced by State or federal agencies, such as fisheries enhancement programs

PROGRAMS

- Provide grants, technical assistance, and data to local districts
- Assure compliance and conformity by State agencies with regulations and district programs
- Coordinate between State and local agencies with regional planning staff

ACCOMPLISHMENTS

- Establishment of habitat standards that require local government consideration in the planning process

DATA (Alaska Coastal Management Program - Con't.)

PROBLEMS

- Probable long-term conflict between fishery and timber users---timber regulations presently have strong habitat protection provisions
- Wetlands probably not adequately protected
- Current boundaries provided by statute not suitable---boundaries need to be of a more geographic nature
- Development and implementation of district programs in the unorganized borough will be slow and in some cases non-existent
- Implementation of district programs in the unorganized borough for areas without zoning powers will present problems for the State agencies

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

NATURAL RESOURCES - Management and Administration Program

DATA

- Department of Natural Resources shall administer the State program for the conservation and development of natural resources, including forests, parks, and recreational areas, lands, waters, agriculture, soil conservation and minerals, but excluding commercial fisheries, sport fish, game and fur bearing animals (AS 44.37.020)
- Department shall determine and adjudicate rights of the waters of the State, and in its appropriation and distribution (AS 46.15.010)
- Department of Natural Resources shall establish a division to manage State forests and regulate operations on private forest land (AS 41.17.020 and .030)
- Commissioner of Natural Resources shall prepare and maintain an inventory of all State land and water and their resource and other values (AS 38.04.060)
- The Commissioner of Natural Resources shall develop and maintain land use plans for the use of State owned land (AS 38.04.065)

GOALS

- To develop, manage and conserve the State's natural resources for the benefit of all Alaskans, in accordance with sound resource management practices and consistent with the national interest in Alaska's resources

OBJECTIVES

- Improvement of administrative service and support to the dependent divisions and agencies
- Provide staff to handle land exchange programs to resolve land management and land ownership problems
- Continue to provide research, analysis, and policy direction, as well as recommend land which the State should own

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Natural Resources - Con't.)

OBJECTIVES _ (Con't.)

- Initiate and react to cooperative land and resource use agreements
- Provide state-wide resource inventory for use by the department and other agencies
- Provide analysis of major issues confronting the department

PROGRAMS

- See programs listed under other organizations of the Department of Natural Resources
- Expand State land policy analysis (selection, classification, and disposal)
- Maintenance, refinement, and computerization of the State's natural resource inventory data and other related land use information
- Expand implementation analysis of departmental coastal management responsibilities
- Analysis emphasis on selecting land for agriculture classification, and encourgement of additional agricultural development
- Land use planning for development of the North Slope
- Formulation of a state-wide water use plan to insure proper allocation of this valuable public resource
- Analysis of economic benefits to the public associated with alternative uses of State land
- Various administrative and management activities such as accounting functions, personnel functions, etc.

TYPE

- Sections within the State Department of Natural Resources

SIZE

- 42 PFT requested for FY 80

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Natural Resources - Con't.)

STRUCTURE

- Office organized into three components
- 53% of resources in the Office of the Commissioner
- 42% of resources in Planning and Research Section
- 5% of resources in temporary D-2 Operations Section

GEOGRAPHICAL LOCATION

- State-wide responsibilities
- Staff located in Anchorage and Juneau primarily

FUNDS

- $63,000 federal receipts requested for FY 80
- $1,685,000 General Fund requested for FY 80
- $83,000 other funds requested for FY 80

PRIMARY CONSTITUENTS

- General public
- Land owners

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

ALASKA CONSERVATION ACTION CORP PROGRAM

DATA

- Created in the Division of Parks and Recreation, Department of Natural Resources (As 41.20.390)
- Corp may be assigned to assist in environmental planning, litter clean-up including rivers and creeks, neighborhood improvement programs, fire prevention activities on forest lands, improving wildlife habitats and protection of wildlife refuges and wilderness areas under supervision of the Department of Fish and Game, erosion, erosion control projects (AS 41.20.395)

GOALS

- Develop and maintain a system of parks and recreational facilities
- Conserve and assure a maximum use in the public interest of Alaska's scenic, historic, archeologic, scientific, biological, and recreational resources
- Allow youth from throughout the State to work, earn, and learn together by doing meaningful projects which further the development and conservation of the State's natural resources

OBJECTIVES

- Maintain the number of jobs for youth at 150
- Maintain the number of youth environmental projects to include existing facility maintenance and construction of new facilities
- Maintain the number of students and cooperative environmental projects with school districts at 60
- Provide two months of staff services of interpretive specialists, to assist in development of state-wide visitors services program

PROGRAMS

- See objectives above

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Alaska Conservation Action Corp Program - Con't.)

TYPE

- Section within the State Department of Natural Resources

SIZE

- 3 PFT requested for FY 80
- 1 PPT requested for FY 80
- 187 Temp requested for FY 80

STRUCTURE

- Section within the Division of Parks

GEOGRAPHICAL LOCATION

- State-wide responsibilities
- Summer camp at Wasilla and at Bonanza Creek
- Non-resident (day camp) in Anchorage and Soldotna areas

FUNDS

- $414,000 federal receipts requested for FY 80
- $105,000 General Fund match requested for FY 80
- $5,000 General Fund requested for FY 80

PRIMARY CONSTITUENTS

- Youth who benefit from work and learning experience
- State's natural resources that are cleaned up, developed, or enhanced by this program

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

CADASTRAL ENGINEERING

DATA

- Not specifically established by Alaska Statutes

GOALS

- To wisely select, manage, develop, and conserve resources available on State owned lands and waters, so that the resultant actions optimize current and future public benefits while complying with the constitutional mandate for sustained yield

OBJECTIVES

- Maintain accurate, up-to-date land title records which are kept current daily, illustrating State land action
- Conduct, approve, and write survey criteria for all survey work conducted on Division of Lands administered State Lands
- Draft maps and plats of State surveys, disposal actions, and illustrating legal responsibilities and land activity

PROGRAMS

- Surveying and subdividing lands including the preparation of maps and plats of surveys
- Maintenance of a record system (primarily manual, although a microfilm information retrieval system is being developed) which includes recording of State land activity and surveillance filing of real property ownership statements outside of areas where local records are kept
- Production of status plats and historical indexes for the land records system for land conveyed to the State under the proposed D-2 Legislation
- Further development of the automated lands records system

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Cadastral Engineering - Con't.)

TYPE

- Section within the Department of Natural Resources

SIZE

- 40 PFT requested for FY 80

STRUCTURE

- Section within the Division of Forest, Land and Water Management

GEOGRAPHICAL LOCATION

- State-wide responsibilities
- Staff located primarily in Anchorage

FUNDS

- $3,315,000 General Fund requested for FY 80

PRIMARY CONSTITUENTS

- Land owners
- General public as owners in common of all State land

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

FORESTRY PROTECTION AND MANAGEMENT PROGRAM

DATA

- Department of Natural Resources shall establish a Division of Forest, Land and Water Management to manage the forestry sources of the State (AS 41.17.010)
- Forestry sources of Alaska are among the most valuable natural resources of the State and furnish timber and wood products, fish and wildlife, tourism, outdoor recreation, water, soil, air, minerals, and general health and welfare (AS 41.17.0101)
- The State has a fundamental obligation to insure that management of forest resources, guarantees perpetual supplies of renewable resources (AS 41.17.0101)
- Forest Resources and Practices Act (AS 41.17.) is the basis for forest management standards, policies, and guidelines under the Alaska Coastal Management Act (AS 41.17.0101)

GOALS

- To protect Alaska's forests from unacceptable losses caused by fire, insects, and disease
- Manage and utilize Alaska's forest resources for a maximum public benefit through environmentally sound and sustained yield principles
- Enhance the economic stability in human resource development for rural Alaskans by cooperatively assisting private land owners in forest management

OBJECTIVES

- Review 500 reports submitted by districts and BLM
- Conduct ten fire training sessions for other agency personnel and native village crews
- Review 250 assists given to private woodland owners relative to intensive management of these lands

DATA (Forestry Protection and Management Program - Con't.)

OBJECTIVES (Con't.)

- Review 50 forest practices notifications to insure compliance with forest practices act
- Provide for protection of approximately 23 million acres of State and private land
- Inspection of 150 forest operations and provide assistance regarding good forest practices
- Inspect 15 forest operations for compliance with the Forest Practices Act
- Provide ten GFA training sessions pertaining to management of private woodlands
- Provide 15 forest practice act training sessions to acquaint the public and division personnel with Forest Practices Act
- Produce 120,000 seedlings at the forest nursery in Palmer
- Review 35 timber sales for compliance with existing regulations
- Inspect 20 timber sales for compliance with contract specifications

PROGRAMS

- State Fire Protection Program has responsibility for review of district fire activities, coordination and direction of all project fires, development of a State fire plan, fire training courses, and supervision of fire detection activities (activities include fire pre-suppression, detection, and suppression)
- BLM Fire Protection funds a contractual arrangement between the State and BLM to cover costs incurred by the BLM in fire pre-suppression and suppression activities on State land
- Forest Management Program includes review of timber sale contracts and case files, maintenance of an accounting system for timber receipts and timber harvests, review of forest management and timber sale operations to assure compliance with the Forest Practices Act, development and maintenance of resource inventory of State forests, and recommendations for forest reserves

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Forestry Protection and Management Program - Con't.)

PROGRAMS - (Con't.)

- The Cooperative Forestry Assistance Program provides information and education regarding sound forest management of private forest lands
- State Forest Nursery Program provides free seedlings for reseeding of harvested forests

TYPE

- Section within the Division of Forest, Land, and Water Management

SIZE

- 22 PFT requested for FY 80

STRUCTURE

- Section within the Division of Forest, Land and Water Management within the Department of Natural Resources
- 18% of resources in the State Fire Protection Program
- 31% of resources in Management and Timber Sales Program (forest management)
- 10% of resources in Research and Technical Program
- 20% of resources in Administration

GEOGRAPHICAL LOCATION

- State-wide responsibilities
- Staff located primarily in Anchorage
- Some staff located in field offices

FUNDS

- $220,000 federal receipts requested for FY 80
- $180,000 General Fund match requested for FY 80
- $818,000 General Fund requested for FY 80

DATA (Forestry Protection and Management Program - Con't.)

PRIMARY CONSTITUENTS

- Timber industry
- Owners of private land that is forested
- General public as owners in common of State forest land

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

MANAGEMENT AND CLASSIFICATION - DEPARTMENT OF NATURAL RESOURCES

DATA

- Cites general authority of AS Title 29, AS Title 39, AS Title 34, AS Title 41, AS Title 45, AS Title 46
- In areas of the State outside first, second, or third class boroughs where there is no municipality with a zoning power, the Division of Lands shall exercise the zoning power by adopting zoning regulations (AS 38.05.037)
- The Division of Lands may exercise zoning power within any portion of a third class borough covered by the Alaska Coastal Management Program, if not done by a municipality (AS 38.05.037)
- Division of Lands may lease tide and submerged lands for fisheries development, which includes the utilization of shore gilnets or set nets (AS 38.05.082)
- State policy for retaining land in public ownership is to make the land available on a sustained yield basis for a variety of beneficial uses including subsistence, energy development, aquaculture, sport hunting and fishing, forestry, etc., (AS 38.04.015)
- State policy retaining land in public ownership is to protect critical wildlife habitat and areas of special scenic, recreational, scientific, or other environmental concerns (AS 38.04.015)
- Division of Lands must make available on an annual basis, a minimum of 50,000 acres of which 30,000 acres shall be for disposal under the homesite entry program and the open to entry program for disposal to private ownership (AS 38.04.020)
- No land may be classified for homesite entry which is located where homesites would threaten fish regeneration (AS 38.08.010)
- In determining which land availability program is appropriate for disposal of State lands, sale programs are preferred but lease programs should be used when a unique location with specific public values is involved, as in a deep water port, hydroelectric site, or aquaculture facility (AS 38.04.035)

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Management and Classification - Department of Natural Resources - Cont.)

- Department shall prepare and maintain an inventory of all State land and water resources and note areas of critical environmental concern (AS 38.04.0601)
- The department shall prepare and maintain land use plans for use of State owned land (AS 38.04.065)
- Management categories for classification of State land includes State public reserve lands which includes State forest reserves and State wildlife reserves (AS 38.04.0701)
- Definitions contained in AS 38.04 include "multiple use lands" which recognizes the value of wildlife and fish resources (AS 38.04.910)
- Definitions in AS 38.04 include "sustained yield" which means the achievement and maintenance in perpetuity of high level annual or regular periodic output of the various renewable resources of the State lands consistent with multiple use (AS 38.04.910)

Goals

- Identify resources available on public lands and waters and devise and implement logical management programs for meeting public and private needs for allocation of these resources while optimizing current and future public benefits and complying with sustained yield principles

Objectives:

- General management objectives which will not be enumerated in detail here are to provide personnel, fiscal, word processing and public information support for the sections directly involved in land inventories, land use planning, and land management and disposal
- Assess demand and supply of land and develop disposal plans
- Design appropriate survey and subdivision criteria for land to be disposed of to include easement and right-of-way

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Management and Classification - Department of Natural Resources - Cont.)

Objectives (Cont.)

- Continue implementation of municipal land entitlement
- Continue to coordinate implementation of the Cook Inlet land exchange
- Develop and maintain region or area land use plans for use of State owned lands (complete Kenai and Ketchikan area, continue work on Susitna, begin work on Fairbanks and Juneau)
- Identify State lands of special interest and develop management plans for them (complete Parks Highway, continue Richardson Highway, begin Glenn Highway and Tanana River)
- Assist in implementation and coordination of local and State Coastal Management Programs and ensure resolution of conflicts between State and district plans
- Maintain and update inventory of State land, water and other resource values
- Continue State land classification program
- Continue policy research and planning activities associated with land exchanges and State selections
- Coordinate input into A95 clearing house and to other government agencies
- Continue to provide municipal land selection assistance and joint planning
- Pursue cooperative planning and management efforts with federal and local governments, native organizations and private owners in selected areas of intermingled land ownership
- Accomplish planning, inventory, classification, and management studies necessary to make proper allocation of 66 million acres to be conveyed to State and proposed D-2 legislation

Programs:

- General Management Program
- Land disposal planning
- Regional and area land use planning
- Special project planning and classification
- Cooperative planning

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Management and Classification - Department of Natural Resources - Cont.)

Type:

- Section within the State Department of Natural Resources

Size:

- 52 PFT requested for FY 80

Structure:

- Sections within the Division of Lands

Geographical Location:

- State-wide responsibilities
- Staff located primarily in Anchorage

Funds:

- $2,250,000 General Fund requested for FY 80
- $33,000 other funds requested for FY 80
- $1,280,000 allocated to management for FY 80
- $1,002,000 allocated to classification program for FY 80

Primary Constituents:

- Land owners
- People who desire State owned Land
- General public as owners in common of State land and natural resources
- Municipalities and local governments

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

TERRESTRIAL PROGRAMS

DATA

- Program cites general discretionary authority of the Department of Environmental Conservation to protect the environment of the State (AS 46.03.020)
- Air pollution control statutes contain no specific provisions to protect fish and wildlife or their habitat (AS 46.03.140-230)
- Authority to control use of pesticides similarly contains no specific provisions to protect fish and wildlife or their habitat (AS 46.03.320)
- Federal statutes providing for the protection of air and water quality cited as authority for these programs contain no specific reference to fish or habitat (PL89-272)

Goals:

- The quality of the air, water, and land resources shall be healthful, productive, and enjoyable for people and shall support a diversity of animal and plant life

Objectives:

- Prevent an increase in the estimated 255,000 exposed to ambient air, not meeting health related standards in FY 80
- Prevent increases in adverse affects to plants and animals caused by man made contaminants
- Reduce the incidence of public exposure to air pollutants that are offensive or obnoxious, from 420 to 340
- Increase permit compliance from 48% to 63% on solid waste management and disposal facilities
- Maintain the number of persons injured or sickened by pesticides, to less than two per year
- Maintain the number of incidences where pesticides cause significant damage to non-target plants and animals to less than two per year

DATA (Terrestrial Programs - Cont.)

Programs:

- Develop and implement government wide car pooling and staggered work hours programs
- Public relations effort to inform the public of the extent of problems, means of control, and health hazards
- Continuation of voluntary motor vehicle inspection and maintenance program in Anchorage, and Fairbanks
- Provide technical assistance to local governments and evaluate the progress made towards achieving standards
- Conduct and oversee ambient air monitoring effort for carbon monoxide in both Fairbanks and Anchorage
- Provide inspection, surveillance, and technical assistance to existing sources of contaminants to ensure that their emissions come into and/or remain in compliance with permits and standards
- Provide new contaminant source review to assure that all major new sources are properly designed to meet all air quality standards
- Conduct ambient air monitoring throughout the State
- Develop a State environmental plan and revise solid waste management regulations with a maximum of public participation
- Develop a formal inventory of solid waste facilities
- Process approximately 50 permits, which act as the major tool for controlling the disposal practices
- Conduct training sessions for municipal decision makers concerning different disposal techniques
- Conduct program devoted to reducing litter
- Encourage resource recovery
- Conduct four major training sessions for commercial pesticide applicators and six minor sessions for single category applicators
- Process an estimated 15 permits for application of pesticides
- Conduct surveillance and enforcement of all commercial applicators
- Conduct investigations to determine if special Alaska labels are warranted for pesticide uses not specified on federal labels

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Terrestrial Programs - Cont.)

Type:

- Division within State Department of Environmental Conservation

Size:

- 15 PFT requested for FY 80

Structure:

- Division within Department of Environmental Conservation
- Organized into three components
- 35% of resources in air quality programs
- 51% of resources in land use programs
- 15% of resources in director's office, (or administration)

Geographical Location:

- State-wide responsibilities
- Staff located primarily in Juneau, but other staff located in major urban areas

Funds:

- $312,000 federal receipts requested for FY 80
- $91,000 General Fund match requested for FY 80
- $285,000 General Fund requested for FY 80

Primary Constituents:

- Applicators of pesticides
- Operators of solid waste disposal sites
- Owners of plants emitting particle contaminants into the air
- General public, wildlife, and habitat that may be damaged, due to improper use or disposal of aforementioned products

DATA (Terrestrial Programs - Cont.)

Problems:

- Some seafood processors dispose of solid waste on land and therefore require permits
- Some seafood processors, particularly fish meal plants, have air quality problems that require permits
- Some seafood processors use certain chemicals such as roach killers, disinfectants, and pesticides and therefore need training in the proper application of these chemicals

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

OIL POLLUTION CONTROL PROGRAM

DATA

- Safety standards and maneuverability features for tank vessels mandated by AS 30.20.020
- Department of the Environmental Conservation shall adopt and maintain a comprehensive, uniform system of traffic regulations for the operation of tank vessels (AS 30.20.030)
- Legislative findings establishing the authority to regulate tank vessel traffic stated that the introduction of crude oil refined petroleum products into the marine, estuarian, and adjacent terrestrial environment was potentially destructive to the valuable species of fish and shellfish harvested in Alaska waters (AS 30.20.010)
- In establishing legislation dealing with oil terminal facilities the legislature declared as its purpose, the protection from danger and damage to the marine, estuarian, and adjacent terrestrial environment, the residents of the State and other interests deriving livelihood from fishing and other marine related activities

Goals:

- The quality of the water and land resources of the State shall be healthful, productive, and enjoyable for people and shall support a diversity of animal and plant life

Objectives:

- Reduce the incidence of stream, lake, marine, and other water significantly failing to meet health related standards due to the discharge of oil and hazardous materials
- Minimize personnel losses due to oil spills

DATA (Oil Pollution Control Program - Cont.)

Programs:

- Maintain the level of tank vessel inspection and transfer operations at 50% of port visits in Alaska
- Decrease the number of oil spills from tanker and terminal operations from an average of ten per month to five per month
- Increase aerial surveillance of tanker routes and fishing fleets from an average of six per month to eight per month
- Decrease the time to settle violations of oil pollution laws, from ten months average time to three months
- Increase the number of spill contingency plans for compliance with State requirements from the present level of eight per year to twelve yearly
- Increase the number of oil spill trainee exercises from one to two per year
- Increase the number of State employees with former oil spill cleanup training from ten to fifteen persons
- Increase the number of spill related seminars and workshops held in Alaska from the present three per year to five per year
- Renew the proof of financial responsibilities submitted by thirty-five operators of tank vessels and oil terminal facilities

Type:

- Section within the State Department of Environmental Conservation
- Section Chief reports directly to commissioner

Size:

- 8 PFT requested for FY 80

Structure:

- Section serving as staff function to commissioner
- Regional offices
- Section chief reports to commissioner

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Oil Pollution Control Program - Cont.)

Geographical Location:

- Statewide responsibilities
- Staff located in Juneau, Soldotna and Valdez

Funds:

- $451,000 General Fund requested for FY 80

Primary Constituents:

- Companies using tank vessels to transport crude oil and petroleum products
- Users of the State's natural resources that might otherwise be contaminated or spoiled by petroleum contamination

Problems:

- Recent court decisions have voided the Alaska Tank Vessel Traffic Regulation Act and prohibited the State from collecting risk charges from virtually all the tankers trading in Alaska
- The State can no longer require or encourage equipment or certain design features on tank vessels
- Court decisions have in essence destroyed the source of funding for oil spill cleanup
- Program not limited to the regulation of oil transfer operations at terminals
- Department's only other effective tool is through requirement for oil spill contingency plans
- Oil pollution program, if it survives through passage of future legislation being developed for terminals and pipelines, etc., will be good

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

DEPARTMENT OF COMMUNITY AND REGIONAL AFFAIRS

DATA

- May advise and assist local governments (AS 44.47.050)
- May carry out administrative functions in unorganized boroughs prescribed by the legislature (AS 44.47.0501)
- May assist in procurring federal and State financial aid for local govenments (AS 44.47.0501)
- Administer revenue sharing, grants, and other forms of financial assistance to local governments (AS 44.47.0501)

Programs:

- Community planning assistance for items such as platting, comprehensive land use, planning and zoning, etc., (AS 44.47.080-100)
- Conduct programs to promote the development of rural areas of the State, primarily for rural development assistance grants (AS 44.47.130) Section 14(c) (III) of the Alaska Native Claims Settlement Act (AS 44.47.150)
- Provide assistance to local governments in the form of training, technical assistance, organizational planning, etc.,.

Type:

- Department within executive branch of State Government

Size:

- 141 positions requested for FY 80

Structure:

- Department organized into five divisions
- Division of Community Planning
- Division of Local Government Assistance
- Division of Manpower
- Division of Community and Rural Development
- Division of Administrative Services

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Department of Community and Regional Affairs - Cont.)

Geographical Location:

- State-wide responsibilities
- Staff located in Juneau, Anchorage, Fairbanks, Nome and Bethel

Funds:

- $27,868,000 General Fund requested for FY 80
- $21,760,000 federal funds requested for FY 80
- $3,819,000 funds requested for FY 80
- Majority of funds above are passed through

Primary Constituents:

- Local governments

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

MUNICIPALITIES OF THE STATE

DATA

- Alaska Statutes and Constitution authorize home rule, first class, second class, and third class boroughs as well as home rule, first class, and second class cities
- Municipalities may exercise powers necessary to provide specific public facilities and services including waste treatment facilities, harbors, wharfs, marine facilities, water course and flood control facilities, and water facilities, among others (AS 29.48.030)
- A municipality may regulate certain specified activities including water pollution control and waste collection and disposal (AS 29.48.035)
- A municipality may adopt ordinances to protect its water supply and watershed and may enforce them outside its boundaries (AS 29.48.037)
- Liberal construction shall be given to all powers and functions of boroughs and cities conferred in Title 29 (AS 29.48.310)
- Specific examples within an innumerated power or function conferred upon boroughs or cities are illustrative of the object and not a limitation on or exclusion from the exercise of a power or function (AS 29.48.330)

Goals:

- Provide citizens with those services that they desire

Objectives:

- Operate facilities and programs to provide the services expected by the citizens

Programs;

- Depends on the municipality and the powers assumed by the municipality

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Municipalities of the State - Cont.)

Type:

- Separate political subdivision of the State

Primary Constituents:

- Citizens residing within the boundaries of the local government

Problems:

- Majority of the land area within the State is unorganized in borough or city form
- Few local governments have taken advantage of the rather liberal powers and functions given them by statute to conduct programs that may affect the development of the salmon fishery
- Coastal Management Program may provide municipalities forming local coastal districts an opportunity to plan and zone habitat areas critical to salmon fisheries and to protect and enhance those resources, but it is a little early to tell what they will do with this possibility
- Types of activities most related to salmon fishery development include development of industrial parks eventually leased to fish processors, building of cold storage plants, leasing of city owned land to fish processors, and use of EDA Grant Funds to construct fish hatcheries.

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

OFFICE OF SPECIAL PROJECTS

DATA

- Not specifically established by statute
- Coordinates various activities related to development and implementation of special projects

Goals:

- Provide gubernatorial oversight to State and private development projects and activities

Objectives:

- Coordinate activities of the Alaska Fisheries Council
- Coordinate activities of the Alaska Agricultural Action Group
- Act as gubernatorial representative in several national associations

Programs:

- Coordinate the Alaska Fisheries Council in development of a state-wide enhancement plan for the salmon fisheries (Alaska Salmon Plan)
- Coordinate the Alaska Agricultural Action Group and development of such projects as the Delta Junction Barley Project
- Coordinate the Bottomfish exposition to be held in Anchorage in FY 80
- Provide comment to the various department plans for development activities fees of the gubernatorial policy

Type:

- Section within the Office of the Governor

Size:

- 2 PFT requested for FY 80

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Office of Special Projects - Cont.)

Structure:

- Section within the Office of the Governor

Geographical Location:

- Located in Juneau
- State-wide responsibilities

Funds:

- $171,000 General Fund requested for FY 80

Primary Constituents:

- Commercial fishermen and seafood processors
- Sport and subsistence fishermen
- Farmers
- Consumers of farm and commercial fisheries products

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

OFFICE OF INTERNATIONAL FISHERIES & EXTERNAL AFFAIRS

DATA

- Not specifically established by Alaska statutes
- No specific duties or responsibilities innumerated by statute
- Involved in Pacific Marine Fisheries compact (AS 16 45.010-040)
- Involved in Law of the Sea (AS 44.19.789-799, Treaty - 55/1600 UN January 1, 1942)

Goals:

- Ensure that gubernatorial positions regarding national, State and international marine resources policies are developed and considered in the formulation of national laws and international agreements

Objectives:

- Provide travel, communications, and support to Alaska's members of various fisheries commissions
- Participate in monthly North Pacific and Pacific fishery management council meetings and assist in preparation of council fishery management plans and testify at formal international forms
- Prepare testimony and testify at formal international forms affecting Alaska fisheries and marine mammals
- Chair Alaska's Law of the Sea Commission meetings
- Prepare an Alaska position on the Law of the Sea to present in Washington D.C. and Geneva, Switzerland
- Present Alaska's position on salmon preservation at the International North Pacific Fisheries Commission meeting in Tokyo
- Obtain additional Bowhead Whales for Alaskan subsistence hunters
- Maintain biologically sound fur seal harvest and increase the subsistence take
- Represent Alaska on the U.S. State Department's Ocean Affairs Advisory Commission
- Provide coordination and direction for the Alaska State Asian Office in Tokyo

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Office of Special Projects - Cont.)

Structure:

- Section within the Office of the Governor

Geographical Location:

- Located in Juneau
- State-wide responsibilities

Funds:

- $171,000 General Fund requested for FY 80

Primary Constituents:

- Commercial fishermen and seafood processors
- Sport and subsistence fishermen
- Farmers
- Consumers of farm and commercial fisheries products

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Office of International Fisheries and External Affairs - Cont.)

Programs:

- Refer to preceding "Objectives"

Type:

- Section within the Office of the Governor

Size:

- 2 PFT requested for FY 80
- 3 Temp requested for FY 80

Structure:

- 4 components within this section
- International North Pacific Fisheries Commission component
- International Fisheries component
- Pacific Marine Fisheries component
- Law of the Sea component

Geographical Location:

- State-wide responsibilities
- Staff located in Juneau

Funds:

- $25,000 federal receipts requested for FY 80
- $205,000 General Fund requested for FY 80

Primary Constituents:

- Commercial fishermen and seafood processors
- Subsistence and sports users of sea resources

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

UNIVERSITY OF ALASKA - SEA GRANT

DATA

Powers and Duties

- Sea Grant is a national program under the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA)
- Sea Grant operates as grantor for aquaculture projects through the University of Alaska Statewide system
- UA Sea Grant Program began seven years ago

Goals

- Provide the people of the State and the nation with knowledge and means of developing, utilizing, and conserving the marine resources of the State and the nation (this knowledge and means shall be developed through a program of teaching, research and advisory services)
- To build at the centers for higher education within Alaska, education and training programs to provide qualified professionals and technicians to meet the requirements for development and management of the marine and coastal resources of the State of Alaska and the nation
- To assist in the development and utilization of Alaska's marine resources and to aid in the understanding, appreciation, and enjoyment of Alaska's coastal and marine environment through the transfer of scientific, technological and other knowledge to industry, government, and the general public
- To provide new information which will assist in the development of new industries, new management techniques, or new harvesting methods which will utilize and conserve the renewable marine resources of Alaska waters

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (University of Alaska - Sea Grant - Cont.)

Accomplishments:

- Aided Regional Aquaculture Association in establishing programs
- Disseminated information regarding development and constraints on development of the commercial fishing industry
- Disseminated information about the marine environment through conferences, universities and public programs
- Aided projects whose purpose is to develop salmon ranching shellfish development, and seafood processing and marketing

Organization:

- Five functional areas: Education and Training; Information and Advisory; Renewable Marine Resource Research; Mineral Resource Research
- Administratively assigned to College of Environmental Sciences, UA Fairbanks
- Policy guidance provided by the Office of the President
- Projects carried out jointly between the program and the various college campuses and research institutes
- Institutes with which Sea Grant operates include: Division of Fisheries, (UA Juneau); Cooperative Extension Service (Division of Community Colleges); Extension and Rural Education (UA Fairbanks); Sheldon Jackson College

Size:

- Thirty plus, professional staff of biologists and educators

Funds:

- The proposed appropriation for 1979 is $299,500 plus increments for salary raises
- Total Program Budget for FY 78-79 is $1,879,300

DATA (University of Alaska - Sea Grant - Cont.)

Issues

- Sea Grant activities are constrained by the length of the budgeting process
- Sea Grant budget has not increased comensorate with increases in the costs of doing business

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

MARINE ADVISORY SERVICE

DATA

Powers and Duties:

- Functionary of UA state-wide system
- Part of UA extension service
- Established 1963
- Head office, Anchorage
- Concerned with: Marine Industry Management, Aquaculture, Commercial Fisheries Assistance and Development, Marine Safety, Seafood Processing Technology, Western Alaska Fisheries Advisory Services, Ocean Engineering Assistance

Organization:

- Advisory Extension Service
- Thirteen professional staff state-wide
- Principal offices in Anchorage and Fairbanks
- Field offices are in Bethel, Cordova, Juneau, Kodiak, Petersburg
- Funding from UA $164,000; Sea Grant $237,000
- Serves public and private interests as an appropriate need arises
- Tends to act as ombudsman solving disputes between State agencies and private sector
- Will respond to private individuals as time permits
- Will study private or public marine problems as staff time and expertise permit

Programs:
Goals:

- Disseminate educational and cultural information
- Provide communication channels through which the University system may best serve as an intellectual, scientific and cultural resource to the people of the entire State

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Marine Advisory Service - Cont.)

Objectives:

- Provide technical information to harvesters, developers and users of marine resources
- Aid in the development of leadership maritime areas and affairs
- Communicate the basic principles of conservation and the philosophy of sustained yield management to the public
- Provide information to and assist coastal communities on problems of coastal stabilization, coastal zone management and development of port facilities
- Provide information and assistance to the various users of marine resources and to help them solve multiple use conflicts
- Provide continuing education on marine safety to the maritime public
- Provide technical assistance and training to the emerging aquaculture industry
- Provide a communication link between the scientific, education and maritime communities so as to refer the needs of the maritime public to the researcher and academician

Accomplishments:

- Contribution to technical aquaculture and other marine literature for Alaska
- Workshops and conferences serving to develop marine resources
- Provided meeting ground for settlement of disputes between user groups and with State or federal agencies
- Providing Advisory Service to private sector where it is not otherwise economically available

Issues:

- MAS must strive to maintain credibility as a neutral source of information
- MAS travel budget cuts have drastically constrained activity
- Overall University Budget cuts have effected MAS ability to serve - future cuts will result in staff level cuts

B. REHABILITATION AND ENHANCEMENT INSTITUTIONS

These institutions have as their primary goal the expansion of the Alaska Salmon Fishery through capital projects and operations in Aquaculture. Aquaculture projects would include both the artificial propogation of salmon as well as various activities enhancing the salmons natural ability to reproduce.

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

FISHERIES REHABILITATION AND ENHANCEMENT DIVISION (F.R.E.D.)

DATA

- The 1971 Legislature created F.R.E.D. as a Division of A.D.F.& G. (AS 16.05.090)
- Prior to this time salmon research and management program of A.D.F.& G. were directed toward research in the technology of salmon aquaculture
- Shall develop and continually maintain a comprehensive, coordinated State plan for the orderly present and long-range rehabilitation, enhancement and development of all aspects of the State's fisheries (AS 16.05.092)
- Shall encourage the investment by private enterprise in the technological development and economic utilization of the fisheries resources (AS 16.05.092)
- Shall through rehabilitation, enhancement and development programs do all things necessary to ensure perpetual and increasing production and use of the food resources of Alaska waters and continental shelf areas (AS 16.05.092)
- Shall make a comprehensive annual report to the legislature containing detailed information regarding its accomplishments and proposals of plans and activities for the next fiscal year (AS 16.05.092)

Goals:

- Protection, maintenance, rehabilitation, enhancement and development of the salmon, trout, shellfish and grayling resources of Alaska

Objectives:

- FY 80 egg take of 222 million
- Increase production facilities from 35 to 41
- Maintain habitat improvement program
- Maintain disease research prevention and control program
- Maintain genetic research and control to establish and maintain viability of brood stocks

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Fisheries Rehabilitation and Enhancement Division (F.R.E.D.) - Cont.)

Objectives (Cont.)

- Develop comprehensive regional salmon plans to include all public and private institutions
- Establish cooperative agreements with other agencies to prevent duplication of basic research, applied research, and capital investment
- Conduct culture training for all personnel (both public and private)
- Conduct fish disease recognition, prevention, and control for all public and private facilities

Programs:

- Securing a staff of highly trained personnel in the fields of biology, salmon husbandry, fish pathology, engineering (plus the use of consultants for design)
- Monitoring the development of salmon technology in other areas of the world for possible application in Alaska
- Testing and refining technology to fit Alaska environmental parameters and potentials
- Construction of fish pass facilities throughout the State
- Establishing inventory and assessment teams for site investigation and evaluation of possible enhancement and rehabilitation opportunities (this includes industrial spin-off opportunities such as power developments)
- Laying the groundwork for the development of a long-range coordinated rehabilitation and enhancement plan based upon cost effective technology
- Programs include development and operation of 21 plus hatcheries throughout the State (½ mm adult return in 1978)
- Habitat improvement projects include fish passes and obstacle removal
- Operations projected to result in 47 mm returning hatchery adults in 1993
- F.R.E.D. spends some effort working with other aquaculture organizations, especially with the Regional Aquaculture Association coordinating effort of these various organizations

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Fisheries Rehabilitation and Enhancement Division (F.R.E.D.) - Cont.)

Type:

- Division of A.D.F.& G.

Size:

- 159 PFT requested for FY 80
- 7 PFT requested for FY 80
- 51 Temp requested for FY 80

Geographical Location:

- Organization headquarters in Juneau
- State-wide effort regionalized into Southeastern, Central, Northern and Western Regions

Funds:

- $9,642,000 General Fund requested for FY 80

Issues:

- Genetic and pathological mishaps have clouded some of F.R.E.D.'s successes
- Harvest management policies of the Board of Fisheries have effected F.R.E.D.'s ability to obtain adequate brood stock to a lesser degree than the private aquaculture associations
- F.R.E.D. activities have gained substantial support from the public as measured by $56 million bond authorizations in 1976 and 1978

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

PRINCE WILLIAM SOUND REGIONAL AQUACULTURE CORPORATION (P.W.S.A.C.)

DATA

Powers and Duties:

- Alaska Corporation
- Private non-profit status (IRS 501 (c)(3))
- Recognized by Alaska Department of Fish and Game Commissioner as Regional Association under AS 16.10.380
- Governed by Salmon Hatcheries Act of 1974 and other laws applying to Alaska Corporations
- Operations controlled by permitting authority vests in Commissioner of Fish and Game (A.D.F.& G)

Organization:

- Regional Aquaculture Association, organized similar to a cooperative
- Staff of employees plus active involvement by Board of Directors
- Interacts with various permitting agencies including A.D.F.& G., U.S. Forest Service and local borough authorities
- Region covers all Prince William Sound, and the Copper and Bearing Rivers
- Hatchery location at Port San Juan and Prince William Sound
- Funding provided through voluntary assessment of $.02 per fish, (this is matched by the processor)
- Additional funding sources include Planning Grant from A.D.F.& G. and aid from Coastal Management Impact Fund and Sea Grant Program
- Additional funding sources include Planning Grant from A.D.F.& G. and aid from Coastal Management Impact Fund
- Additional program support has come from Sea Grant programs to study various features of salmon aquaculture in Prince William Sound, including economics, accounting systems, legal implications, and some biological questions

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Prince William Sound Regional Aquaculture Corporation (PWSAC) - Cont.)

Goals and Objectives:

- These have not been verbalized into a concise statement, they include
- Expand hatchery capacity
- Provide net benefit to user groups
- Increase ability to control aquaculture development
- Develop abilities of the Regional Planning Team

Programs:

- Hatchery at Port San Juan currently rearing ½ million eggs taken from 1978 brood stock
- P.W.S.A.C. works closely with A.D.F.& G., F.R.E.D. Division, who operated two other facilities in the region at Main Bay and Cannery Creek
- P.W.S.A.C. is proposing expansion of the Port San Juan Hatchery to 60,000,000 pink and chum egg capacity
- P.W.S.A.C. is also considering additional hatchery sites
- P.W.S.A.C. has not accomplished an impact on the salmon harvest of Prince William Sound at this time (first run of hatchery chum should begin to return this year)
- P.W.S.A.C., like other regional associations plays the economic role of representing the user groups in the development of aquaculture

Issues:

- P.W.S.A.C. shares the brood stock constraints faced by other regional aquaculture associates
- A.D.F.& G. and Board of Fisheries Regulations regarding harvest management escapement have posed a serious threat to P.W.S.A.C.s' continued existence
- P.W.S.A.C. also faces A.D.F.& G. Regulations which may restrict its effort to transplant hatchery salmon (this is seen as an issue of constraint within the region)

DATA (Prince William Sound Regional Aquaculture Corporation (PWSAC) - Cont.)

Issues (cont.)

- P.W.S.A.C. is not affected by the law suit against the assessments in the southeastern regions because its assessment is voluntary $.02 per fish voluntary assessment is matched by the processor
- P.W.S.A.C. is constrained by limits of the Commerce and Economic Development Loan Program
- P.W.S.A.C. would like to expand its loan capacity to a more economic point but would be unable to obtain more than $3,000,000 financing
- P.W.S.A.C. operations are more difficult because of lack of a valid planning structure for salmon aquaculture development at the State level

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

NORTHERN SOUTHEASTERN REGIONAL AQUACULTURE ASSOC.

DATA

Powers and Duties:

- Alaska Corporation
- Private non-profit status (IRS #501 (c) (3)
- Recognized by Alaska Department of Fish and Game Commissioner as Regional Association under (AS 16.10.380)
- Governed by Salmon Hatcheries Act of 1974 and other laws applying to Alaska Corporations
- Operations controlled by permitting authority vested in Commissioner of Fish and Game (ADF&G)

Organization:

- Regional Aquaculture Association, organized similar to a cooperative
- Staff of employees plus active involvement by Board of Directors
- Represents fishermen in ADF&G Fishing Districts 9 through 16
- Funding provided by Commerce and Economic Development Loan, and a voluntary assessment on all salmon harvested sold in the region (assessment was self imposed by vote of the commercial fishermen)
- Interacts with various permitting agencies including ADF&G, U.S. Forest Service and local borough authorities

Goals:

- Assist in the development of a balanced regional salmon program designed with adequate emphasis on management technology, habitat improvement and cost-effective artificial propagation
- Encourage and support the development of improved management technology and data base
- Assist in the development of the maximum production capabilities of current unused or underutilized salmon habitats

DATA (Northern Southeastern Regional Aquaculture Association - Cont.)

Goals: (cont.)

- Develop in conjunction with State, federal and private organizations, a cooperative propagation program which adequately addresses user group input, sound biology and cost-effective strategies

Objectives:

- Over the long-term, the Association should have a primary purpose of developing self-perpetuating rather than artificially-sustained salmon stocks
- Projects should be cost-effective, pay their own way
- Major debts should be avoided as much as possible
- Participation of public agencies, municipalities and private fisheries interests should be encouraged in order to minimize direct cost to the Association and maximize interagency cooperation
- Association investments should focus on projects which can be stopped without incurring major financial losses if projects fail
- Any cost recovery projects must be defined carefully prior to implementation and the recovery process publicized as well ahead of expected harvest time to avoid public misunderstandings
- In brood stock development (1) native stocks should receive first priority; (2) stocks transplanted to an incubation or a rearing station should be released back to the original streams; (3) release of stocks in non-natal streams will be generally discouraged

Programs

- Chilkat River habitat improvement (probable project)
- Sitka Sound Coho Lake Stocking Program (probable project)
- Salmon Creek, Gastineau Channel summer chum and coho project (probable project)

DATA (Northern Southeastern Regional Aquaculture Association - Cont.)

Programs (Cont.)

- Pilot commercial harvest of dolly varden at selected nonurban areas (probable project)
- Sitka Sound coho, pink and chum central incubation facility (feasibility study)
- Cooperative projects: coho program at Angoon; coho, pink and chum program at Kake; pink and chum program at Hoonah (feasibility study)
- Cooperative sockeye program (feasibility study)
- Cooperative chinook program (feasibility study)
- Taiya Inlet, Lynn Canal pink and chum project (feasibility study)
- Cooperative habitat alteration and improvement field survey (feasibility study)
- NSRAA play an economic role of representing the user groups in development of salmon aquaculture
- NSRAA play an economic role of representing the user groups in development of salmon aquaculture
- NSRAA has not had significant impact on salmon runs because of its short history (future operations will increase the salmon runs to the region)

Issues:
Funding Shortage:

- Because of a class action lawsuit filed March 1978 by twelve fishermen challenging the constitutionality of the mandatory assessment legislation processors have withheld the major portion of assessment monies collected in 1978 for fear of liability
- Without the use of this money, NSRAA will probably not be able to implement any projects
- The legal problems are being addressed, and this plan is proposed with the anticipation that funding will be available for project initiation in 1979
- Brood stock availability is one of the crucial issues NSRAA faces along with all other hatchery programs in the State
- Alaska Board of Fisheries and ADF&G harvest management and escapement policies affect the ability to obtain brood adults for egg-take

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

SOUTHERN SOUTHEAST REGIONAL AQUACULTURE ASSOC.

DATA

Powers and Duties:

- Alaska Corporation
- Private non-profit status IRS #501 (c) (3)
- Recognized by Alaska Department of Fish and Game Commissioner as Regional Association under AS 16.10.380
- Governed by Salmon Hatcheries Act of 1974 and other laws applying to Alaska Corporations
- Operations controlled by permitting authority vested in Commissioner of Fish and Game (ADF&G)

Organization:

- Regional Aquaculture Association, organized similar to a cooperative
- Staff of ten employees plus active involvement by Board of Directors
- Represents fishermen in Alaska Department of Fish and Game fishing districts one through eight
- Funding provided by Commerce and Economic Development Loan, and a 3% assessment on all salmon harvested and sold in the region
- Interacts with various permitting agencies including ADF&G, U.S. Forest Service and local borough authorities

Goals:

- To enhance salmon production through the use of natural and artificial means, utilizing the most appropriate technology available for the region
- To optimize the social and economic benefits to the user groups through enhanced salmon runs
- To maintain a representative and flexible organizational structure that facilitates the enhancement of salmon production, emphasizes informed participation by all parties, stresses management practices which create a high performance climate and utilizes effective planning and control systems

DATA (Southern Southeastern Regional Aquaculture Association - Cont.)

Goals: (cont.)

- To develop consistent sources of revenue enabling the organization to maintain financial stability
- To manage the association's total activities in order to minimize costs and maximize benefits to user groups
- To propose, through appropriate channels and within legal limitations policy, regulations and plans that are required to effect the enhancement of salmon production

Objectives:

- Put Whitman Lake Hatchery into operation within budget by July 15, 1979
- Have Whitman Lake Hatchery at optimum productive capacity with 1979 brood
- Operate Whitman Lake Hatchery in the most technologically effective manner to achieve the highest total survival rates
- Develop and maintain an effective cost containment program which will hold cost to available financial resources
- Develop and implement an organizational plan and administrative capability for overall day-to-day management of the Association
- Develop and maintain systems and procedures for use by the Board and Management to evaluate performance of the organization
- Provide an economic benefit to peripheral segments of fisheries industry
- Develop strategies and undertake activities that will increase active participation of the user groups and maintain a constant source of revenue through user group investment
- Examine opportunities for additional hatchery facilities, rehabilitation projects and other enhancement projects
- Develop and propose required policy changes that will increase the ability of S.S.R.A.A. to effectively enhance salmon
- Develop sources of adequate financing for regional planning activities and management operation of regional projects

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Southern Southeastern Regional Aquaculture Association - Cont.)

Programs:

- Currently completing construction of $2.5 million permanent hatchery facility at Whitman Lake, six miles south of Ketchikan (hatchery designed to rear over 20 million smolts)
- Have not produced a run of salmon (first eggs taken from 1978 brood stock and will not return for several years)
- S.S.R.A.A. plays the economic role of representing the user groups in the development of salmon hatcheries

Issues:

- Suit was filed in Alaska District Court against Northern Southeastern Regional Aquaculture Association then expanded to include S.S.R.A.A. Suit claims that the assessment is unconstitutional because it allegedly transfers taxing authority to a private enterprize. Because the suit involves a constitutional question, it could be tied up in appeals for many years
- Brood stock availability is one of the crucial issues S.S.R.A.A. faces along with other hatchery programs
- Board of Fisheries and ADF&G policy regarding harvest management and escapement affect the ability to obtain brood adults for egg-take
- Construction completion of the Whitman Lake hatchery has encountered some difficulties
- S.S.R.A.A. must expedite construction to meet deadline of July 15, 1979. If this deadline is not met, complications will arise with summer chum egg-take

Constraints:

- The constraints on S.S.R.A.A.'s activities tend to fall into three categories; authority, data, attitude and role of State and federal agencies
- No current long-range plan to provide a specific role for S.S.R.A.A. activities

DATA (Southern Southeastern Regional Aquaculture Association - Cont.)

Constraints: (cont.)

- Lack of a well documented index of knowledge on available aquaculture technology
- Cooperation of fishermen limited in time and energy spent in the association
- Alaska Department of Fish and Game, recommends that the State should be primarily responsible for salmon enhancement and rehabilitation development
- Other fisheries Divisions (Commercial Fish and Sport Fish) have not formulated positions on the private non-profits in salmon enhancement
- The influence of D-2 on federal control of fisheries, other industries (timber and mining) lobbying efforts, and the drying up of State financial support of salmon aquaculture projects create additional potential threats

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

COOK INLET REGIONAL AQUACULTURE ASSOCIATION

DATA

Powers and Duties:

- Established under AS 16.10 Article 8, Salmon Hatcheries, 1974
- Recognized by Commissioner, ADF&G
- Private corporation under laws of Alaska
- Nonprofit corporation under 501(c)3 of IRS Code

Organization Type:

- Alaska Corporation
- Resembling cooperative
- To be representative of all commercial and private fishing interests in region

Size:

- Three full time employees (General Manager, Secretary, Biologist)
- Board of Directors

Geographic Location:

- Corporate office in Soldotna
- Coverage includes all waters draining into Cook Inlet, including those on the Kenai Peninsula and the Susitna

Funds:

- Provided by 2% royalty assessment on salmon harvested commercially
- FY 78 approximately $500,000
- Processors very cooperative in paying assessment based on high level of trust of the region
- Many commercial sales in region are not assessed because of the many small buyers who cannot be controlled

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Cook Inlet Regional Aquaculture Association-Cont.)

Primary Constituents:

- Commercial and private fishermen in region
- Cooperative relationships with ADF&G and USFS

Goals:

- To benefit all user groups in all geographic areas uniformly at the same time, through increased salmon runs resulting from aquaculture projects

Programs:

- Paint River habitat rehabilitation cooperative with ADF&G
- 6 Mile Creek habitat rehabilitation cooperative with USFS
- Discuss hatchery possibilities with interested private enterprises
- Study use at beaver dam passages in the region, to allow adult salmon to navigate waters blocked by beaver dams

Accomplishments:

- Placed 11 beaver dam passages in 1978 for study in 1979
- Developed cooperative relations with ADF&G and USFS to accomplish stream rehabilitation projects
- Made substantial headway on a regional plan for aquaculture development

Issues:

- Sport fishermen are a more significant factor in the region. This changes the nature of regional activity compared to other regional aquaculture associations
- Need good working user group relations not present now
- Need source of realistic defendable data for economic analysis
- Lack of business experience and understanding among board members

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Cook Inlet Regional Aquaculture Association-Cont.)

Opportunities:

- Strong cooperative relationship with processors, ADF&G and USFS
- Good fishing resource from which to start

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

IMAKPIK REGIONAL AQUACULTURE CORPORATION

DATA

Powers and Duties:

- Established under AS 16.10 Article 8, Salmon Hatcheries, 1974
- Recognized by Commission, ADF&G
- Private corporation under laws of Alaska
- Nonprofit corporation under 501(c)3 of IRS Code

Type:

- Resembles cooperative, representing all user groups in region

Size:

- Two staff employees

Structure:

- Funded in part through Bristol Bay Native Association's functionary Bristol Bay Regional Advisory Council

Geographical Location:

- Headquartered in Dillingham
- Represents user groups in Bristol Bay management district (ADF&G); from Cape Newingham to Cape Mistikov
- Represents 23 of 29 Bristol Bay villages

Funds:

- State $100,000 Regional Planning Grant for FY 79-80
- Assistance from Bristol Bay Regional Advisory Council

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Imakpik Regional Aquaculture Corporation - Cont.)

Primary Constituents:

- Represent all user groups in region
- Cooperative relationship with ADF&G

Programs:

- Imakpik is just getting started as a regional aquaculture corporation
- Only accomplishment to date has been preparation of an information leaflet which has not yet been published
- Studying involvement in lake fertilization, predator control, habitat alteration, and increasing management and prediction data base and reliability

Problems:

- Unlikely that Imakpik will be able to use the assessment method of starting operations because of existing taxes on Bristol Bay catch
  - 3% raw fish tax by Bristol Bay Borough
  - Permit buy backs will be charged to remaining fishermen at 0-7% of gross earnings
  - Too many taxes already
  - About 60% of permit holders are nonresidents - they don't appreciate the importance of aquaculture as do the residents
  - Poor communication in the Bristol Bay area hampers regional activity

C. PERMITTING INSTITUTIONS

These institutions serve as a regulator of human activity impacting the habitat utilized by salmon in Alaska. These institutions are responsive to requests by individuals wishing to use the habitat. Permits require these potential users to operate within guidelines consistent with the primary goals of habitat use.

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

HABITAT HAUL ROAD MONITORING PROGRAM

DATA

- Not specifically established by statute
- Program cites general responsibility to maintain and protect fish and game resources of Alaska (AS 16.05.020)
- Program cites authority to USF and WS (AS 16.05.050)
- Program cites authority to require construction of fish ways around stream obstructions (AS 16.05.840)
- Cites responsibility for protection of an anadromous fish streams (AS 16.05.870 & AS 16,10,010)
- Cites responsibility for protection of endangered species habitat (AS 16.20.105)

Goals:

- Eliminate or minimize adverse impacts of construction and maintenance of Yukon River to Prudhoe Bay Haul road upon fish and wildlife resources and their habitat
- Assure adequate recompensation and mitigation for fish and wildlife resources and habitat which are adversely affected by construction and operation of Yukon River to Prudhoe Bay haul road

Objectives:

- To issue AS 16.05.870 permits required for Haul road maintenance within seven working days of receipt of request
- To field review and verify 95% of all AS 16.05.870 permits to assure reasonableness of permit conditions and compliance by permitee
- To review 95% of plans for maintenance of the haul road to optimize protection of fish and game habitat

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Habitat Haul Road Monitoring Program - Cont.)

Programs:

- Assist the Department of Transportation and Public Facilities in remedying fish passage problems caused by inadequately sized drainage structures on the Haul road
- Coordinate, review and function as Department of Fish and Game representative and planning and negotiations concerning the Haul road
- Review, issue permits, and monitor Haul road maintenance activities to ensure compliance with permits and environmental stipulations
- Coordinate and cooperate with other state and federal offices on an interdisciplinary approach for overseeing all aspects of pipeline and Haul road construction and maintenance
- Function as Department of Fish and Game representative advising the State Pipeline Coordinator and Department of Transportation and Public Facilities on Haul road impacts to fish and wildlife resources

Type:

- Sub unit of Habitat Section within the State Department of Fish and Game

Size:

- 1 PFT requested for FY 80

Structure:

- Sub unit of Habitat Section
- Sub unit of reports to Chief of Habitat Section

Geographical Location:

- Staff located in Anchorage and Fairbanks
- Haul road north of Yukon River

Funds:

- $55,000 General Funds requested for FY 80

DATA (Habitat Haul Road Monitoring Program - Cont.)

Primary Constituents:

- Organization responsible for maintenance of Haul road (State Department of Transportation and Public Facilities or its subcontractors)
- Alyeska Pipeline Service Company

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

HABITAT PIPELINE SURVEILLANCE PROGRAM

DATA

- Not specifically established by statute
- Program cites general responsibility to maintain and protect fish and game resources of Alaska (AS 16.05.020)
- Program cites authority to assist USF and WS (AS 16.05.050)
- Program cites authority to require construction of fish ways around stream obstructions (AS 16.05.840)
- Cites responsibility for protection of an anadromous fish stream (AS 16.05.870 and AS 16.10.010)
- Cites responsibility for protection of endangered species habitat (AS 16.20.105)
- Prevent damage to the environment including damage to fish and wildlife, habitat and aquatic life along the route of the Trans-Alaska Pipeline (PL 930-153)

Goals:

- Monitor the development, design, preconstruction planning, and initial construction for the Alaska Natural Gas Trasportation System to ensure minimum environmental degradation
- Monitor operations of the Trans-Alaska Oil Pipeline to ensure that environmental, technical, and habitat resource problems arising as a result of construction and operation of the line are minimized and resolved in the State's interest
- Provide technical expertise to the Commissioner of the Department of Fish and Game on other resource development projects

Objectives:

- Review and monitor 100% of preconstruction and initial construction activity related to the state's technical and environmental interests for the Alaska Natural Gas Transportation System

DATA (Habitat Pipeline Surveillance Program - Cont.)

Objectives (cont.)

- Monitor the adequacy of the rehabilitation work and maintenance performed within the pipeline corridor
- Review and monitor any proposed development within the pipeline corridor

Programs:

- Issue AS 16.05.870 permits required for gas line construction
- To field review and verify 100% of all AS 16.05.870 permits to show reasonableness of permit conditions and compliance permitee
- Reveiw 100% of plans for design, preconstruction and maintenance of gas pipeline to optimize protection of fish and game habitat
- Establish joint surveillance and monitoring agreement (required under section 7 (a) 5 (A) of Alaska Natural Gas Transportation Act of 1976)
- Identify, plan, and commence limited scope investigations to provide baseline information to pipeline designers to avoid impact on fish and wildlife habitat
- Review 90% of plans for any development within the corridor to optimize protection of fish and wildlife habitat

Type:

- Sub unit within Habitat Section of State Department of Fish and Game

Size:

- 13 PFT requested for FY 80
- 8 PPT requested for FY 80

Structure:

- Sub unit of Habitat Section
- Sub unit reports to Chief of Habitat Section

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Habitat Pipeline Surveillance Program - Cont.)

Geographical Location:

- Staff located in Anchorage and Fairbanks
- Responsibilities north of the Yukon River

Funds:

- $1,691,000 program receipts requested for FY 80

Primary Constituents:

- Owner of gas pipeline company
- General public who use the State's fish and wildlife resources

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

HABITAT PROTECTION PROGRAM:

DATA

- Not specifically authorized by statutory reference
- General authority of Title 16 of Alaska Statutes cited as providing a Habitat Protection Section with the powers and duties to protect fish and wildlife habitat in Alaska

Goals:

- Conserve, maintain and/or improve integrity of all freshwater, marine, and terrestrial fish and wildlife habitats in Alaska in order to optimize fish and wildlife populations and to maintain species diversity
- When more than one division within the Department of Fish and Game is affected, or when more than one department of State government is affected, to develop and present in a timely manner, a comprehensive departmental response to actions affecting fish, wildlife, and/or their habitat and to foster a broad appreciation of habitat values, issues, and concerns
- Conduct a regulatory program which provides for maximum use and enjoyment of land and water resources consistent with continued maintenance and protection of fish, wildlife, and their habitat
- Conduct a program of resource analysis and planning toward the end of describing and protecting fish, wildlife, and habitat resources

Objectives:

- Identify and recommend for special management attention, areas of particular fish, wildlife, and/or habitat values
- Protect the biological integrity of all anadromous streams and freshwater rearing areas in Alaska
- Through maximum governmental and interagency involvement recommend best management practices for application to management of habitat resources

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Habitat Protection Program - Cont.)

Objectives: (cont.)

- Maintain viable estuarian and offshore rearing habitat
- Promote and protect access to public fish and wildlife resources
- Respond to certain federal and state regulatory or review actions (such as solid waste disposal, water appropriation, dam construction, tidelands use)
- Review and comment on oil and gas leasing activities
- Participate in interagency and/or intergovernmental land and water use planning and management
- Develop in-house habitat evaluation and classification capability
- Develop in-house resource information management program
- Participate and evaluate and cleanup of contaminant spills into the waters or onto the land of the State
- Review and comment on State and federal easement and right-of-way actions
- Fish habitat protection includes identification and protection of freshwater spawning and rearing areas, estuarian rearing areas, and offshore rearing areas
- Wildlife habitat protection includes recommendation for best management practices, promotion and protection of access to public resources, and identification and recommendation of critical habitat areas, game sanctuary areas, and game refuge areas

Programs:

- Participates in the Alaska Coastal Management Program
- Participates in the State's Coastal Energy Impact Program
- Process applications for Title 16 permits to approve, deny, or condition any activity which would affect anadromous water bodies, activities obstructing fish passage, or activities proposed for legislatively designated critical habitats (includes pre-permit issuance, site inspection, project evaluation and permit processing, and post-permit issuance surveillance)

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Habitat Protection Program - Cont.)

Type:

- Section within the State Department of Fish and Game

Size:

- 39 PFT requested for FY 80

Structure:

- Section organized into four components
- 21% of resources in wildlife habitat protection
- 14% of resources in administration and support
- 36% of resources in fish habitat protection
- 31% of resources in special federal projects

Geographical Location:

- State-wide responsibilities
- Staff located state-wide

Funds:

- $49,000 federal receipts requested for FY 80
- $830,000 General Fund requested for FY 80
- $612,000 Fish and Game Fund requested for FY 80

Primary Constituents:

- Entire public in general
- Commercial, sports, and subsistence users of fish and game resources

Problems:

- Not enough funds for adequate research and protection of habitat areas

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

GAS PIPELINE SURVEILLANCE PROGRAM

DATA

- AS 46.03.020 (10)(B) gives the Department of Environmental Conservation discretionary ability to adopt regulations necessary to safeguard standard petroleum and natural gas pipeline construction, operation, modification, or alteration
- AS 16.10.010 (3) makes it unlawful to render waters inexcessable or uninhabitable for salmon without obtaining a permit from the Department of Environmental Conservation
- Federal Statutes relating to the protection of air and water quality, while not specifically referring to fish or habitat, are also cited as statutory basis for the gas pipeline surveillance program (PL 89-272)

Goals:

- To protect, maintain and improve the environment and to encourage the wise use of the State's natural resources by monitoring the criteria development, design, and preconstruction planning for the Alaska Natural Gas Transportation System, to ensure a minimum of degradation

Objectives:

- Review and monitor 100% of the preconstruction and initial construction activity related to the State's technical environment interests
- Perform design reviews of 1) final route selection; 2) selections of all new facilities such as access roads, material sites, disposal sites, etc; 3) design review of all camps and associated facilities relative to permits from the department; 4) coordination of permit conditions and design and review comments with other agencies; 5) review of other preliminary activities

DATA (Gas Pipeline Surveillance Program - Cont.)

Programs:

- Ensure that the gas pipeline is designed, planned, and constructed within the limits set by the gas pipeline stipulations and State environmental standards
- Ensure that Alcan's 300 plus or minus disposal sites do not violate Alaska's water quality or solid waste regulations
- Ensure that Alcan's fifteen compressor stations do not violate Alaska's air quality regulations
- Ensure that Alcan's fourteen plus or minus construction camps do not violate Alaska's water quality, waste water, solid waste, water supply, air quality, or oil pollution regulations
- Ensure that construction of Alcan's 731 miles of final pipeline alignment and work pad, 125 access roads and 165 stream crossings do not cause any degradation to the environment
- Ensure that Alcan's 200 plus or minus material sites do not violate Alaska's water quality or solid waste regulations
- Identify, plan, and commence limited scope investigations to provide baseline information necessary for pipeline designers to avoid or minimize gas pipeline impacts to the environment

Type:

- Section within the Department of Environmental Conservation

Size:

- 15 PFT requested for FY 80
- Section chief reports to the Commissioner
- Section coordinates with the Office of the Governor and the Department of Natural Resources
- Section cooperates closely with the Pipeline Coordinator's Office

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Gas Pipeline Surveillance Program - Cont.)

Geographical Location:

- Responsibilities primarily north and east of Fairbanks
- Staff located in Anchorage and Fairbanks

Funds:

- $611,000 program receipts requested for FY 80

Primary Constituents:

- Northwest Alaska Pipeline Company
- General public who use the State's natural resources either for hunting, fishing, or aesthetic purposes

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

GENERAL PIPELINE SURVEILLANCE PROGRAM

DATA

- Established by administrative order of the Governor

Goals:

- Monitor the development, design, preconstruction planning, and initial construction planning for the Alaska Natural Gas Transportation System to ensure a minimum of environmental degradation
- Monitor the operations phase of the Alaska Oil Line to ensure environmental and technical resource problems arising as a result of initial construction and operation are minimized and resolved in the State's interest
- Provide technical expertise to the Commissioner of Natural Resources and other resource development projects

Objectives:

- Review and monitor 100% of preconstruction and initial construction activity related to the State's technical and environmental interests
- Monitor the adequacy of the rehabilitation work performed within the Alyeska Pipeline Corridor and mitigate pepeline integrity and public safety problems resulting from the operations phase of the pipeline
- Increase the effectiveness in developing other resource projects in the State by having technical and environmental expertise available to the Commissioner of Natural Resources

Programs:

- Act as coordinator and central point of contact between pipeline owner companies and all other State agencies involved in pipeline monitoring and permit activities

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (General Pipeline Surveillance Program - Cont.)

Programs: (cont.)

- Secure approval of the joint federal and State technical, environmental and socio-economic stipulations and the right-of-way lease for the Trans-Alaska Natural Gas Pipeline System
- Develop technical, environmental and socio-economic criterial for use by Northwest Alaska Pipeline Company in preparing specific plans, designs and construction procedures meeting requirements of the lease stipulations
- Continue permitting action for field exploration to gather baseline data consistent with environmental and technical requirements
- Complete the approved restoration program for the oil pipeline and related facilties
- Provide technical expertise to enable early development of corrective technical and environmental measures necessary to avoid potentially damaging environmental changes and pipeline integrity problems
- Provide one window permitting adopted by the State and various federal agencies

Type:

- Section within the Office of the Governor

Size:

- 21 PFT requested for FY 80
- 3 PFT requested for FY 80

Structure:

- Section organized into three components
- Gas pipeline review component
- Oil pipeline surveillance component
- Pipeline surveillance special projects component

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (General Pipeline Surveillance Program - Cont.)

Geographical Location:

- Responsibilities primarily north of the Yukon with responsibility east of Fairbanks to the Alaska border
- Office to be transferred from Anchorage to Fairbanks beginning in FY 80

Funds:

- $50,000 General Fund requested for FY 80
- $1,658,000 program receipts requested for FY 80

Primary Constituents:

- Northwest Alaska Pipeline Company
- Alyeska Pipeline Company
- General public who value the State's natural resources for their fish, wildlife and aesthetic value

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

BUREAU OF LAND MANAGEMENT AND WILDLIFE PROGRAM

DATA

Powers and Duties:

- Enacting Legislation and Federal Land Management Policy Act PL 94-579 10/21/76
- Division of BLM under Department of Interior
- Coordinate Aquaculture Programs on BLM lands statewide

Size:

- 8 fisheries biologists

Structure:

- Department of Interior, Bureau of Land Management, Division of Resources, Wildlife Program
- Regionally administered from Fairbanks and Anchorage

Funds:

- Approximately $200,000 annually
- Special extension for FY 78 may be extended through FY 79 to $70,000
- All from BLM budget
- Shared with ADF&G and other agencies as appropriate

Primary Constituents:

- Work in conjunction with ADF&G
- Some interaction with USFS

Goals:

- Establish guidelines for public land use planning which will limit use to "sustainable yield"
- Manage public lands in a manner which will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric water and archeological resources

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Bureau of Land Management and Wildlife Program - Cont.)

Programs:

- Observation of stream blockage preventing salmon spawning in 40 mile country
- Observation of effects of Bear Creek fire on spawning grounds
- Will recommend appropriate corrective activity in conjunction with ADF&G

Economic Role.

- Final authority and often original impetus for any corrective rehabilitation activity with respect to salmon aquaculture on BLM administrated lands

Problems:

- Budget has not increased with price level - effect decline

Opportunities:

- Interaction and fund sharing with ADF&G (all divisions) provide greatest utilization of budget and resources

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

ALASKA COMMERCIAL FISHERIES ENTRY COMMISSION

DATA

- Established by AS 16.43.010 to regulate and control entry into the commercial fisheries of Alaska
- Commission is a regulatory and quasijudicial agency of the State (AS 16.43.020)
- Commission consists of three members appointed by the Governor and confirmed by the legislature (AS 16.43.020)
- Commission shall regulate entry into the commercial fisheries and establish priorities and qualifications for issuance of entry permit (AS 16.43.100)
- Commission shall issue entry permits and interim use permits (AS 16.43.100)
- Commission shall establish the optimum number of entry permits (AS 16.43.100)
- Commission shall administer the buy back program to reduce the number of oustanding permits to the optimum number of permits (AS 16.43.100)
- Commercial taking of fisheries resources is illegal without a valid entry permit or a valid interim use permit (AS 16.43.140)
- Commission shall establish optimum number of entry permits for each fishery based upon economy and the number of fish available for commercial use (AS 16.43.290)
- The Commission may revise the optimum number of permits for a fishery (AS 16.43.300)
- The Commission shall establish and administer a buy back program to purchase entry permits, vessels, and gear at fair market value when the number of entry permits exceeds the optimum number of entry permits (AS 16.43.310-3201)

Goals:

- Promote the conservation and sustained yield management of Alaska's fisheries resources
- Promote the economic health and stability of commercial fishing in Alaska

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Alaska Commercial Fisheries Entry Commission - Cont.)

Objectives:

- Issue both original and renewal permits
- Issue commercial fishing vessel licenses
- Complete processing of applications and conduct hearings and adjudications
- Establish an optimum level of effort which must consider both management and economic factors (the assessment of management needs is provided by the Alaska Department of Fish and Game; the Commission together with the affected fishermen determines the economic optimum level of effort.)
- Change data processing system from a batch mode to an on-line system
- Establish administrative structure and rationale for buy back and distressed fisheries
- Continue monitoring all unlimited fisheries for resource depletion and economic hardship
- Provide support such as social or economic research, data analysis or drafting of portions of management plans with the North Pacific Fisheries Management Council
- Begin buy back in distressed fisheries
- Microfiche conversion of all permanent record files
- Provide application assistance for new fisheries that are brought under entry limitation

Programs:

- Administer entry limitation on 24 salmon net fisheries, salmon power trawl fishery, three herring per seine fisheries, and the Southeastern herring gill net fishery
- Prioritize applicants for entry permits based upon the degree of economic dependence upon the fishery and extent of past participation in the fishery
- Monitor open access fisheries by using Alaska Department of Fish and Game estimates of management optimum numbers and Commercial Fisheries Entry Commission's estimated economic optimum number to determine when entry limitation will be necessary

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Alaska Commercial Fisheries Entry Commission - Cont.)

Type:

- Section within the Office of the Governor

Size:

- 27 PFT requested for FY 80
- 3 Temp requested for FY 80

Structure:

- Commission consisting of three members
- Staff are hired and responsible to commission
- Statewide responsibilities
- Staff located primarily in Juneau

Funds:

- $1,337,000 General Fund requested for FY 80

Primary Constituents:

- Commercial fishermen
- Other users of fisheries resources that are widely managed so as to not decimate the resource
- Consumers of commercial salmon products

Problems :

- No fixed optimum numbers because resource, market, management techniques, and socioeconomic conditions are constantly changing
- This requires continuing monitoring process of each fishery on a periodic basis to reevaluate the estimated optimum number of entry permits for that fishery
- Litigation pending before Supreme Court challenging constitutionality of criteria used to award limited entry permits (Commercial Fisheries Entry Commission or John E. Apokedak)
- Funds not provided for proposed buy back program in the Prince William Sound drift gill net fishery

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

ENVIRONMENTAL PLANNING AND PROGRAM COORDINATION

DATA -

- Shall formulate and annually review and revise a statewide environmental plan for the management and protection of the quality of the environment and the natural resources of the state
- AS 46.35.020 proposes to establish a simplified procedure for obtaining federal, state, and local permits and to provide a better opportunity for public input on proposed uses of natural resources and related environmental concerns prior to agency decision on applications for permits
- The department shall establish a master form in which a person proposing a project may request the issuance of all permits necessary for the project (AS 46.35.030)
- Upon receipt of the completed master application, the department shall forward a copy to all agencies of the State and local municipalities, who shall respond back to the department within a period not exceeding fifteen days from receipt (AS 46.35.030)
- Permit includes waste water disposal permit, solid waste disposal permit, open burning permit, anadromous fish protection permit, critical habitat area permit, State game refuge land permit encroachment permit, State park incompatible use permit access roads permit, water well permit, brine and other salt water waste disposal permit, etc., (see AS 46.35.200 (4) for complete list of permit covered)
- Program also cites general powers of the department (AS 46.03.020)

Goals:

- The quality of air, water, and land resources shall be healthful, productive, and enjoyable for people and shall support a diversity of plant and animal life

DATA (Environmental Planning and Program Coordination - Cont.)

Objectives:

- Increase the number of persons informed about environmental problems in Alaska and the response of State government to these problems
- Increase the number of sets of review criteria for major types of development
- Maintain at 0 the number of permit approvals and plan reviews issued by the department which are not consistent with department statutes and regulations
- Maintain at 0 the number of recommendations for approval, denial or special conditions on permits issued by other State and federal agencies required to consult with DEC which are not consistent with adopted environmental standards, plans, or policies
- Increase the number of recommendations for approval of State and federally funded projects consistent with adopted environmental standards, plans and criteria
- Increase the incidence of administrative follow-up to determine the extent to which departmental recommendations have been carried out in project, design, construction, and operation
- Increase the incidence of assistance to applicants seeking approval of environmental permits

Programs:

- Coordinate State environmental management efforts for which DEC is responsible with those of other State and federal agencies and local governments
- Perform permit and project reviews and conduct enforcement action services for the department
- Document public concerns and the response of government towards environmental problems
- Coordinate DEC review of large projects affecting air, land, and water quality with review by other regulatory agencies
- Provide assistance to new industries, to determine the permits needed and time lines required
- Serve as a clearing house on environmental impact statements

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA

Type:

- State agency within the Department of Environmental Conservation

Size:

- 11 PFT requested for FY 80

Structure:

- Division within the Department of Environmental Conservation

Geographical Location:

- Statewide responsibilities
- Staff located primarily in Juneau

Funds:

- $106,000 federal receipts requested for FY 80
- $267,000 General Fund requested for FY 80
- $121,000 other funds requested for FY 80

Primary Constituents:

- Anyone with a project requiring a review or permit
- General public whose interests in the State's natural resources are protected by this program

Problems:

- Funding for the permit coordination has been small to date (fiscal note not processed)
- 1979 legislature likely to defund this program
- One step permit process could be a hindrance for a small project needing only one or two permits due to the time delay involved (application for individual permits may be faster than the one step process)
- Not much use for the one step permit process to date, except for a few very large projects

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

WATER PROGRAMS:

DATA

- Provide technical, management, and grant assistance to village safe water facilities (AS 46.07)
- Certify operators for sewer systems (AS 46.30)
- Review and issue permits for interference with salmon spawning streams and waters (AS 46.07)
- Comply with permit coordination responsibilities of (AS 46.35)
- Comply with the environmental conservation statutory responsibilities enunciated in (AS 46.03)

Goals:

- The air, water, and land resources shall be healthful, productive, and enjoyable and shall support a diversity of plant and animal life
- Protection of health has been selected as top priority
- Protection of plant and animal life and protection of environment from pollutants is secondary priority
- Problems classified as a public nuisance situation constitute a third priority

Objectives:

- Reduce the number of people who have become ill or die from consuming water in Alaska
- Reduce the number of people who are inconvenienced by the presence in public water supplies of non-health related contaminants that are a nuisance to consumers
- Maintain at 2,500 the number of village residents whose health and general well being are protected through access to adequate sanitation services
- Reduce from 40 to 30, the number of areas where the streams, lakes, marine and other waters are polluted significantly and fail to meet standards for protection of health or plant and animal life

DATA (Water Programs - Cont.)

Objectives: (Cont.)

- Reduce from 8,000,000 to 7,500,000 persons who die from exposure to offensive and obnoxious conditions and water exceeding nuisance related standards

Programs:

- Obtain $500,000 in federal grant funds to support the department's public water program (PL93-523)
- Administer State grants for construction of adequate water supply systems
- Administer $537,500 in operation, maintenance, and management grants to ten villages, with village safe water facilities
- Provide technical and management assistance to ten villages with village safe water facilities such that the facilities suffer only reasonable, or incidental failure
- Prepare a continuing plan for the prevention and abatement of non point source water pollution (DEC has established water quality standards containing criteria that are evaluated and adjusted according to Alaska's natural water characteristics, public need, and the needs of fish and other aquatic life. Site evalution ensures that discharges will cause the least possible alteration to local water characteristics. Monitoring and inspection checks to see if discharges meet State criteria and that public uses of State waters, including fishery resources and other aquatic life, are protected.)
- Provide technical assistance to regional offices, on water polution problems
- Administer State and federal grants for construction of adequate sewage systems
- Obtain $750,000 in federal 208 grant funds to support development of water quality management plans and for control and prevention of non-point sources of pollution
- Develop a comprehensive water quality data management system to help measure progress toward meeting objectives and reporting on the status of water quality in Alaska

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Water Programs - Cont.)

Programs: (cont.)

- Prepare 30 DEC waste water disposal permits
- Prepare 401 certifications for 154 new draft federal permits and modifications
- Prepare the 1981 water quality management plan
- Conduct a certification and training program for water and waste water works operators

Accomplishments:

- Previously, all fresh water was required to meet the same water quality standards to protect fish and wildlife, but new water quality standards recognize two types of stream; fish and non-fish
- No significant streams and lakes now with pollution problems
- Emphasis on preventing degradation and pollution has to date generally succeeded

Type:

- State agency

Size:

- 33 PFT requested for FY 80
- 1 PFT requested for FY 80

Structure:

- Division within the Department of Environmental Conservation

Geographical Location:

- Statewide responsibilities
- Staff located statewide

Funds:

- $935,000 federal receipts requested for FY 80
- $235,000 General Fund match requested for FY 80
- $1,091,000 General Fund requested for FY 80

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Water Programs - Cont.)

Primary Constituents:

- Humans consuming water in Alaska
- Fish, wildlife and aquatic life using Alaska's water resources

Problems:

- Coordination between Department of Natural Resources, Department of Fish and Game, Department of Environmental Conservation on water permits and discharge permits has been less than desirable (agencies currently drafting a memo of understanding to help solve this problem)
- Should protect minimum stream flows (bill introduced into legislature for the past two years to accomplish this has not passed)

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

LAND AND WATER MANAGEMENT PROGRAM

DATA

- Cites general authority of AS Title 29 (municipal land selection)
- Cites general authority of AS Title 34 (property)
- Cites general authority of AS Title 38 (public lands)
- Cites general authority of AS Title 40 (public roads)
- Cites general authority of AS Title 45 (trade and commerce)
- Cites general authority of AS Title 46 (water, air and environmental conservation)

Goals:

- Identify and manage State public lands and water related resources
- Devise and implement resource acquisition, conveyance and management programs and procedures for meeting present and future public and private needs through selection, retention, and disposal of interest by lease, sale or exchange, permit or other available means
- Assure that present and future public benefits from land and water management programs are optimal and in the best interests of the State

Objectives:

- Review 100% of land case files forwarded to central office within two weeks from receipt
- Review 100% of water files forwarded to water management within two weeks from receipt
- Prepare a complete procedures manual for adjudication actions
- Select 20 million acres of State land from the public domain
- Complete five land exchanges
- Complete four major studies of specific water bodies for navigability purposes
- Develop a flood plain program in concert with disposal programs

DATA (Land and Water Management Program - Cont.)

Primary Constituents:

- Owners of land
- Owners of water rights
- People who desire State lands
- General public as owners in common of State land and resources managed by these programs

Problems:

- Tremendous backlog for all permits despite $1.2 million appropriation to reduce backlog
- About 25% of above appropriation went to reduced backlog of water rights permits
- Some water rights issued to nonexistent users or for water not fully utilized
- Water rights permits issued upstream may interfere with water rights usage downstream (Ship Creek Hatchery in Anchorage may have to shut down as an example)
- Future State land sales of 50,000 acres per year of upland areas will require water rights adjudication
- No good comprehensive program for collection of hydrologic data (agency looking at a cooperative venture with other governmental agencies, private sector, and USGS)
- Makes use of Department of Fish and Game and Department of Environmental Conservation to assist in field work necessary for land classification
- Preference given to public water supply over other uses (AS 46.15.150)
- Should consider specifying priority use of water in certain geographic regions either by passage of new statutes or adoption of administrative regulations
- Need authority to set conditions on water permits so that stream flow doesn't drop below a minimal level at certain times (see HB118, current legislature)
- Possess only limited resources to comply with Forest Practices Act requirement that fish habitat not be degraded (some work must be done by the Department of Fish and Game that doesn't always have hydrology expertise)

DATA (Land and Water Management Program - Cont.)

Objectives: (cont.)

- Enforce 100% of actions to protect the rights of prior appropriators and the public interest
- Maintain 15,000 files
- Manage 45 million acres of State land
- Perform 50% of the water resource assessment and manning studies in critical use areas of the Kenai borough, Mat-su borough, North Slope, Tanana River Basin and Kotzebue
- Establish annual disposal schedule to dispose of 50,000 acres of State land
- Dispose of 50,000 acres of State land
- Prepare land fact brochures for public distribution
- Initiate 100 ANSCA appeals and provide data to support challenge of 80 native allotment cases
- Review 100% of municipal selection cases completed by district offices

Programs:

- Central office is responsible for the management protection of all State land including contract administration (handling leases, land sale contracts, assignments, patents, various permits) title administration (State land selections, defending State titles against competing claims, and navigability and enforcement activities), and project coordination (coordination of all statewide land activities, synthesis of regulations, development of management criteria, coordination with other governmental agencies, and review of all proposed disposal actions)
- Water management has responsibility for review and administration of all programs and proposals relating to water resource management, planning and appropriation and includes inventory responsibilities (collection of surface, ground water, precipitation, and run off data from governmental and private monitoring programs), permitting and adjudication (process and adjudicate application to appropriate water, recording and maintenance of water rights files, and enforcement of water laws and regulations), and water resource planning (development of water planning

DATA (Land and Water Management Program - Cont.)

Programs: (cont.)

guides for different regions of the State (forecasting of water needs and development of alternatives to meet those needs, identifying potential conflicts between competing uses, preparation of management programs, and coordination with other governmental planning programs and State Water Resources Board)

- Land and Water Director responsible for management of surface resources including land, water, forests, tidelands, submerged lands in shorelands, and for selection, inventory, and disposal of State land and related surface resources

Type:

- Sections within the State Department of Natural Resources

Size:

- 47 PFT requested for FY 80

Structure:

- Sections within the Division of Forest, Land, and Water Management

Geographical Location:

- Statewide responsibilities
- Staff located primarily in Anchorage

Funds:

- $90,000 federal receipts requested for FY 80
- $14,000 General Fund match requested for FY 80
- $1,836,000 General Fund requested for FY 80
- $1,366,000 allocated to central office for FY 80
- $404,000 allocated to water management for FY 80
- $170,000 allocated to land and water, directive for FY 80

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

DISTRICT OPERATIONS - DIVISION OF LANDS

DATA

- Cites authority of Title 38 of the Alaska Statutes as general authority to operate program
- Division shall manage State forests and regulate operations on private forest land (AS 41.04.020)
- Division shall make available on an annual basis, 50,000 acres of State land for private use (AS 38.04.020)
- Department shall determine and appropriate water rights in the State (AS 46.15.0101)
- (AS 41.14.010 through 030) designates the State of Alaska as being responsible for controlling or managing fires on State lands and aiding rural land owners in controlling wild land fires

Goals:

- Identify resources available on public lands and waters and devise and implement logical management programs for meeting public and private needs for allocation of these resources, while optimizing current and future public benefits and complying with constitutional mandate for sustained yield management

Objectives:

- Improve response time to land use applications filed and reduce the number of unprocessed cases becoming backlogged
- Improved response time for water related applications filed and reduce the number of unprocessed cases
- Proved sufficient timber within sustained yield limitations to meet increased industrial needs by increasing the number of commercial sales
- Provide timber to the extent available under sustained yield management to supply increased demand for individual use of firewood, house logs etc., by increasing the number of personal use permits for timber

DATA (District Operations - Division of Lands - Cont.)

Objectives: (cont.)

- Improve overall management programs to enhance the opportunities and meet the needs for individual, industrial, municipal, and other State agency use of State lands and resources
- Maintain number of contacts for fire prevention at current level through schools, individuals, and mass media
- Continue fire permit program as a means of controlling man caused fires and promoting fire prevention
- Increase number of fires kept to less than one quarter acre
- Increase number of fires kept to less than ten acres
- Increase public information assistance offered by office visits, written and telephone requests

Programs:

- Management responsibility includes administering programs for grazing leases, land leases, land sales, municipal selection, right of way, timber sales, etc.
- Water Diversions Program includes permitting large scale water diversions, structures and periodically inspecting structures for continued safe operation
- Forest Practices Act includes managing State forests and private forest land and developing regulations in compliance with recently passed statutes
- Land disposal programs include auction, homesites, open to entry, lottery and agricultural programs
- Land use planning includes long-range planning for classifying and using land at its highest and best use
- Public information programs
- Issue water right permits for ground or surface water
- Conduct fire pre-suppression and suppression programs in cooperation with the BLM throughout the State of Alaska

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (District Operations - Division of Lands - Cont.)

Type:

- Section within the Department of Natural Resources

Size:

- 117 PFT requested for FY 80
- 83 PPT requested for FY 80

Structure:

- Regional operations organized into three districts
- District offices are sections within the Division of Forest, Land, and Water Management
- Three districts (southeast, south central, north central)

Geographical Location:

- Statewide responsibilities
- District offices located in Juneau, Anchorage and Fairbanks

Funds:

- $400,000 federal receipts requested for FY 80
- $400,000 General Fund match requested for FY 80
- $4,818,000 General Fund requested for FY 80

Primary Constituents:

- General public as owners in common of State land
- General public who desire private ownership of State land
- Industry desiring timber sales

D. REGULATION/ALLOCATION INSTITUTIONS

These institutions represent the police powers of the state in the management and preservation of the salmon resource. These institutions predominately effect the harvester segment of the industry.

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

FISH AND WILDLIFE PROTECTION-DIRECTOR'S OFFICE

DATA

- Not specifically established by Alaska Statutes
- Authorized by the Commissioner of the Department of Fish and Game to enforce fish and game regulations (AS 16.05.150-160)
- Protection functions formally located within the Department of Fish and Game transferred by Administrative Order Number 16, to the Department of Public Safety in 1972

Goals:

- Supervise and administer the fish and wildlife resource enforcement efforts statewide

Objectives:

- Maintain level of protection in enforcement adequate to ensure optimum opportunity for fishery management success. Assure maintenance of continued surveillance of the commercial fisheries with the divisions, vessels, and charter vessels
- Increase public awareness of regulations, management concepts, and how to participate in apprehension of illegal acts

Programs:

- Program planning
- Provide general supervision for regional offices

Type:

- Section within the Division of fish and Wildlife Protection of the State Department of Public Safety

Size:

- 12 PFT requested for FY 80

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Fish and Wildlife Protection - Director's Office - Cont.)

Structure:

- Division organized into four components.
- Director's office uses 8% of division's total resources
- Other components are Enforcement Section, Aircraft Section, and Marine Enforcement Section

Geographical Location:

- Statewide responsibilities
- Headquartered in Anchorage

Objectives:

- Maintain level of protection in enforcement adequate to ensure optimum opportunity for fishery management success
- Assure maintenance of continued surveillance of the commercial fisheries with the division's vessels and charter vessels
- Increase public awareness of regulations, management concepts, and how to participate in apprehension of illegal acts

Funds:

- $607,000 General Fund requested for FY 80

Primary Constituents:

- Hunters, fishermen, and guides

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

MARINE ENFORCEMENT SECTION

DATA

- Not specifically authorized in Alaska Statutes
- Cites enforcement authority authorized by the Commissioner of Fish and Game per AS16.05.150-160
- Protection functions previously residing with the Department of Fish and Game transferred by Administrative Order Number 16, to the Department of Public Safety 1972

Goals:

- Enforce the laws and regulations promulgated as necessary to achieve management objectives for the State's commercial fisheries resources

Objectives:

- Maintain level of protection and enforcement adequate to ensure optimum opportunity for fishery management success
- Maintain surveillance effort with the three larger vessels at 700 operational days for FY 80

Programs:

- Operate the 100 ft. vessel for 250 days and the two 65 ft. vessels for 225 days each (these three vessels intended primarily for year round off-shore patrol)
- Operate one 42 ft. and three 38 ft. vessels on limited year in-shore patrol
- Operate one 30 ft. and three 25 ft. vessels on summer patrol of in-shore salmon fishery
- Vessels provide prevention and apprehension of violators in all major commercial fisheries

Type:

- Section within the Division of Fish and Wildlife Protection in the Department of Public Safety

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Marine Enforcement Section - Cont.)

Size:

- 17 PFT requested for FY 80
- 3 Temp requested for FY 80

Structure:

- Section within the Division of Fish and Wildlife Protection

Geographical Location:

- Statewide responsibilities
- Stafr located statewide

Funds:

- $173,000 federal receipts requested for FY 80
- $1,275,000 General Fund requested for FY 80

Primary Constituents:

- Commercial fishermen
- Other users of the fishery resource that is adequately protected and maintained

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

AIRCRAFT SECTION

DATA

- Not specifically established by Alaska Statutes
- Cites enforcement authority authorized by the Commissioner of Fish and Game per AS 16.05.150-160

Goals:

- To provide aircraft services where and when required by the varied patrol or emergency responsibilities of the Department of Public Safety

Objectives:

- Provide the Division of Fish and Wildlife Protection with 6,500 hours of flying time (will meet approximately 82% of Fish and Wildlife Protection needs)
- Provide Alaska State Troopers with 2,500 hours of flying time (will meet approximately 71% of trooper needs)

Programs:

- Provide 9,000 hours of departmental aircraft flying hours
- Coordinate rental and charter of aircraft flying hours
- Screens and trains all Department of Public Safety pilots
- Provides specialized aircraft such as PA 18, Cessna 180, and Beaver for use in remot outposts and where required to land on rivers, lakes, gravel bars, and mountain tops

Type:

- Section within the Division of Fish and Wildlife Protection within the State Department of Public Safety

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Aircraft Section - Cont.)

Size:

- 11 PFT requested for FY 80
- 1 Temp requested for FY 80

Structure:

- Section within the Division of Fish and Wildlife Protection

Geographical Location:

- Statewide responsibilities
- Staff located primarily in Anchorage

Funds:

- $821,000 General Fund requested for FY 80

Primary Constituents:

- Division of Fish and Wildlife Protection Enforcement Section
- Alaska State Troopers

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

FISH AND WILDLIFE PROTECTION DETACHMENTS

DATA

- Not specifically authorized in Alaska Statutes
- Cite general enforcement authority by Commissioner of Fish and Game per AS 16.05.150-160
- Protection functions transferred from the Department of Fish and Game to the Department of Public Safety per Administrative Order Number 16

Goals:

- Protect renewable resources of the State and provide an adequate level of enforcement to ensure optimum opportunity for management of fish and wildlife resources on a sustained yield basis
- Provide surveillance of activities of the resource using public to ensure compliance with the statutes and regulations of groups using commercial fishing, sport fishing, guiding, hunting, and trapping resources

Objectives:

- Maintain the level of protection and enforcement adequate to ensure optimum opportunity for fishery management success
- Permanently assigned two additional offices to the Haul road area and increase patrol frequency
- Continue present level of enforcement of sport fishing activities
- Maintain present level of surveillance of hunting activities
- Maintain present level of attention and surveillance to guiding activity
- Increase public awareness of regulations, management concepts, and methods of apprehension of persons committing illegal acts

Programs

- Provide commissioned personnel to operate 30 vessels for fishery patrols
- Provide temporary and seasonal employees for stream guards statewide

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Fish and Wildlife Protection Detachments - Cont.)

Programs: (cont.)

- Provide commissioned personnel to fly and charter aircraft for fishery patrols
- Provide other commissioned personnel, vehicles, aircraft, boats and vessels, as well as operating costs for efficient program operation

Type:

- Section within the Division of Fish and Wildlife Protection

Size:

- 128 PFT requested for FY 80
- 41 Temp requested for FY 80

Structure:

- Section with the Division of Fish and Wildlife Protection
- Sub-units located in 33 locations throughout the State

Geographical Location:

- Statewide responsibilities
- 33 regional offices located statewide

Funds:

- $173,000 federal receipts requested for FY 80
- $827,000 General Fund requested for FY 80

Primary Constituents:

- Fish and wildlife resources of the State
- Commercial, sports, and subsistence users of fish and wildlife resources

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

BOARD OF FISHERIES

DATA

- Established by AS 16.05.221 to conserve and develop the fishery resources of the State
- Composed of seven citizens appointed by the governor and confirmed by the legislature without regard to political affiliation or geographical location of residence
- Has regulation making powers, but not administrative, budgeting, or fiscal powers (AS 16.05.241)
- Regulations must be in accordance with the Administrative Procedure Act for the purposes cited in AS 16.05.251
- Board shall adopt regulations for subsistence fishery and must give subsistence priority over other uses (AS 16.05.260)
- Commissioner of Fish and Game shall delegate authority to advisory committees for emergency closures during established seasons (AS 16.05.260)
- Commissioner of Fish and Game is empowered to set aside only opening of seasons set by advisory committees (AS 16.05.260)
- Board of Fisheries may delegate authority to Commissioner of Fish and Game (AS 16.05.270)
- Conflicts between Board and Commissioner are decided by the Governor (AS 16.05.270)

Type:

- Board of seven appointed by the Governor
- Independent of any other State agency
- 57 Fish and Game Advisory Committees have been established by the Board and make recommendations to the Board

Size:

- 5 PFT requested for FY 80 for Board of Fisheries, Board of Game, and Fish and Game Advisory Committees

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Board of Fisheries - Cont.)

Structure:

- Committee of seven with one member being chairperson
- Commissioner of Fish and Game serves as ex-officio secretary

Geographical Location:

- Statewide responsibilities
- Meetings and hearing held in numerous locations (AS 16.05.300)

Funds:

- $400,000 General Fund request for FY 80 for Board of Fisheries, Board of Game, and Fish and Game Advisory Committees

Primary Constituents:

- Commercial fishermen and seafood processors
- Subsistence fishermen
- Sports fishermen
- General public as consumers of commercial salmon products

Goals:

- Regulate fish resources while responding to public needs and adhering to principles of scientific management and optimum sustainable yield

Objectives:

- Maintain regulations to accomplish above goals
- Maintain regulations to govern the formation and activities of the advisory committees

Programs:

- Contiruously review, revise, and modify fishing regulations
- Hold public hearings annually for comment from Department of Fish and Game staff and general public on fishing regulations

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Board of Fisheries - Cont.)

Programs: (cont.)

- Receive and review recommendations from 57 advisory committees
- Establish a pilot program to evaluate the effectiveness of a Regional Fish and Game Council

E. SPORT USERS

These institutions represent individuals of the state whose primary use of the salmon is for sport as defined by the state in it's Fish and Game Statutes and regulations (Title 16).

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

SPORT FISH PROGRAM

DATA

- Established by AS 16.05.090 but powers and duties not statutorily specified

Type:

- Division within the State Department of Fish and Game

Size:

- 61 PFT requested for FY 80
- 2 PFT requested for FY 80
- 30 Temp requested for FY 80

Structure:

- Division organized into four components
- 71% of resources in investigations and research component
- 21% of resources in management component
- 2% of resources in restoration component
- 6% of resources in administration component

Geographical Location:

- Staff located statewide
- Statewide responsibilities

Funds:

- $1,673,000 federal receipts requested for FY 80
- $312,000 General Fund requested for FY 80
- $1,864,000 Fish and Game Fund requested for FY 80

Primary Contituents

- Public in general and sports fishermen in particular

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Sport Fish Program - Cont.)

Goals:

- Maintain present level of natural sport fishery resources
- Enhance sport fishing opportunities to satisfy present and future angler demands
- Promote and maintain an economically viable sport fishery industry

Objectives:

- Fishery habitat is maintained and well managed
- Maintain present level of naturally produced recreational fish stocks
- Identify, acquire and develop access to desirable and important recreational fisheries

Programs:

- Protection of aquatic habitat by completing various studies (such as review of logging and road construction plans; logging debris studies; impact studies of: Devils Canyon hydro dam, Chena River flood control facility, U.S. Borax proposed molybdenum mine; numerous road construction, sewer construction, and industrial development projects; fish inventory surveys in Pet 4)
- Harvest study of recreationally caught fish
- Management report and harvest regulations recommendations to Board of Fisheries (includes assessment of needs & pressures)
- Population and biological studies (such as life history studies of cutthroat and steelhead, tagging of Chinook smolts and fingerlings to determine rearing areas, monitor sockeye escapement to Russian Lake)
- Develop three regional comprehensive sport fisheries plans
- Inform the public of recreational fishing opportunities
- Promote sport fishing industry with displays, trophy programs, publications, and travel shows in cooperation with other State agencies
- Perform stocking research and stock 120 lakes with 4.5 million fish

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Sport Fish Program - Cont.)

Goals:

- Maintain present level of natural sport fishery resources
- Enhance sport fishing opportunities to satisfy present and future angler demands
- Promote and maintain an economically viable sport fishery industry

Objectives:

- Fishery habitat is maintained and well managed
- Maintain present level of naturally produced recreational fish stocks
- Identify, acquire and develop access to desirable and important recreational fisheries

Programs:

- Protection of aquatic habitat by completing various studies (such as review of logging and road construction plans; logging debris studies; impact studies of: Devils Canyon hydro dam, Chena River flood control facility, U.S. Borax proposed molybdenum mine; numerous road construction, sewer construction, and industrial development projects; fish inventory surveys in Pet 4)
- Harvest study of recreationally caught fish
- Management report and harvest regulations recommendations to Board of Fisheries (includes assessment of needs & pressures)
- Population and biological studies (such as life history studies of cutthroat and steelhead, tagging of Chinook smolts and fingerlings to determine rearing areas, monitor sockeye escapement to Russian Lake)
- Develop three regional comprehensive sport fisheries plans
- Inform the public of recreational fishing opportunities
- Promote sport fishing industry with displays, trophy programs, publications, and travel shows in cooperation with other State agencies
- Perform stocking research and stock 120 lakes with 4.5 million fish

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Sport Fish Program - Cont.)

Programs: (cont.)

- Assist in artificial propagation of 5 million natural spawn eggs

Problems:

- Not enough funds for adequate research on life cycle of species and habitat
- Not a lead agency -- reactive to access and biological problems

F. COMMERCIAL USERS

These institutions represent any individual or corporation which derives economic gain from the harvest, processing or sale of salmon taken in Alaskan waters. Commercial users are also defined in Alaskan Fish and Game Statutes and regulations (Title 16).

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

COMMERCIAL FISHERIES PROGRAM

DATA

- Established by AS 16.05.090 but powers and duties not statutorily specified

Type:

- Division within the State Department of Fish and Game

Size:

- 160 PFT requested for FY 80
- 3 PPT requested for FY 80
- 140 Temp requested for FY 80

Structure:

- Division organized into five components
- 25% of resources in research component
- 45% of resources in management component
- 10% of resources in administration component
- 14% of resources in federal aid programs component
- 7% of resources in special projects (primarily federal aid)

Geographical Location:

- $1,374,000 federal receipts requested for FY 80
- $443,000 General Fund requested for FY 80 (exclusively matching funds)
- $9,137,000 General Fund requested for FY 80
- $25,000 program receipts requested for FY 80

Primary Constituents:

- Commercial fishermen and seafood processors
- General public as consumers of commercial salmon products
- General public as sport users of adequately protected and maintained natural resources
- Subsistence fishermen as users of adequately protected and maintained natural resources

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Commercial Fisheries Program - Cont.)

Goals:

- Protection of fisheries resources through prevention of loss due to inappropriate harvest methods and regulation of other fisheries to prevent unacceptable incidental harvests
- Maintenance of fisheries resources through maintenance of brood stock levels of resources currently capable of producing optimum yield
- Rehabilitation of fisheries resources by selectively protecting depressed stocks from harvest to increase the level of brood stock available to levels capable of producing optimum yield
- Development of new fisheries through research and regulation efforts

Objectives:

- Maintain statewide commercial natural stock salmon harvests at an average annual level equal to or above 49 million
- Rehabilitate depressed stocks to increase average annual commercial harvest to 69 million of natural stock by 1990
- Maintain statewide subsistence harvest of 600,000 to 1,000,000 salmon annually
- Maintain Cook Inlet commercial harvest of salmon at 4 million annually and rehabilitate fishery gradually to 4.7 million annual natural stock harvest
- Maintain Arctic-Yukon-Kuskokwim harvest of salmon at 2 million annually and rehabilitate fishery gradually to 4 million annual harvest
- Maintain Bristol Bay harvest of salmon at 9.8 million annually and rehabilitate fishery gradually to 14 million

Programs:

- Primary strategy, in concert with the Board of Fisheries, is stock regulation by allocation of resources to users (total allocation is surplus beyond brood stock needed to maintain optimum resource yield)
- Stock regulation accomplished through regulation of season openings and closures, harvest methods, and rehabilitate fishery gradually to 14 million

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Commercial Fisheries Program - Cont.)

Programs: (cont.)

- Research and federal aid programs generate new knowledge on various aspects of fish species life history and provide the necessary knowledge and methodology for scientific management of fish resources
- Assess total population abundance, distribution, migration routes, and timing of major salmon stocks
- Apply biometrics and computer technology to data analysis to improve effectiveness of management and research programs

Problems:

- Not enough funds for adequate research of life cycle of species and habitat
- Not a lead agency -- reactive once problems develop

G. OTHER USERS

These individuals and institutions represent all non-sport and non-commercial users of salmon. The inclusion of these institutions, individuals and loosely knit segments of Alaska expands the traditional concept of "user" in order to encompass those who, through their actions, impact salmon without in some cases, having consumption of the salmon as their primary concern. These users include subsistence users, wildlife observers, conservationists and preservationists, other fisherman to whom salmon are an incidental catch, users of salmon habitat which may conflict with salmon propogation, supporters of enhancement of salmon predators and competitors, and the Alaska taxpayer in general.

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

INSTITUTION

SUBSISTENCE PROGRAM

DATA

- AS 16.05.090 established a section of subsistence hunting and fishing in the Department of Fish and Game
- Subsistence Section shall compile data and conduct studies on subsistence hunting and fishing (AS 16.05.094)
- Subsistence Section shall quantify the amount, nutritional value, and extent of dependence on food acquired through subsistence hunting and fishing (AS 16.05.094)
- Subsistence Section shall assist in defining the term subsistence uses, users and methods (AS 16.05.094)
- Subsistence Section shall make recommendations regarding regulations affecting subsistence hunting and fishing (AS 16.05.094)
- Subsistence Section shall quantify the amount, nutritional value, and extent of dependence on food acquired through subsistence hunting and fishing (AS 16.05.094)
- Subsistence Section shall assist in defining the term subsistence uses, users and methods (AS 16.05.094)
- Subsistence Section shall make recommendations regarding regulations affecting subsistence hunting and fishing (AS 16.05.094)
- Subsistence Section shall participate with other divisions in the preparation of statewide and regional management plans to incorporate needs of subsistence users (AS 16.05.094)

Goals:

- Develop a statewide policy on the utilization, development, and conservation of fish and game resources recognizing the needs, customs, and traditions of Alaska residents
- Make recommendations on regulations affecting the resources with as much input as possible from users

INSTITUTIONS INVOLVED IN THE SALMON FISHERY

DATA (Subsistence Program - Cont.)

Objectives:

- o Not yet developed

Programs:

- o Not yet developed

Type:

- o Section within the Commissioner's Office in the State Department of Fish and Game

Size:

- o 15 PFT requested for FY 80
- o 2 Temp requested for FY 80

Structure:

- o Section located within administrative control of the Commissioner's Office
- o Headquarters unit and seven regional offices

Geographical Location:

- o Statewide responsibilities
- o Headquarters located in Juneau
- o Regional offices in Juneau, Bethel, Dillingham, Barrow, Nome, Kotzebue and Gallena

Funds:

- o $846,000 General Fund requested for FY 80

Primary Constituents:

- o Subsistence users of fish and game resources

Problems:

- o New program, just beginning to hire staff -- administrative structure and program plans will be completed when staffing is completed

OTHER INSTITUTIONS

Introduction

The following list of institutions and noted characteristics was derived from a mail survey to all institutions not covered in our primary research. The purpose of this mail survey was to test and quantify the level of interest on the part of many groups in salmon resource development.

Methodology

A detailed mailing list was developed including all native and village corporations, all user groups, all groups involved in habitat interests, and other public and private sector organizations which we felt had a potential interest in the salmon fishery. To each of these groups a postcard with the following format was mailed. Those responding positively were recorded in the following list.

SECONDARY INSTITUTIONS

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Alaska Aquaculture Foundation, Inc. P.O. Box 1288 Wrangell, Alaska 99929 Tod Jones 907/874-2013	X	X		X
Alaska Chapter Sierra Club P.O. Box 2025 Anchorage, Alaska 99510 Jim Barnett 907/265-0432 or 907/349-1720			X	
Alaska Conservation Society P.O. Box 80192 College Branch Fairbanks, Alaska 99708 Mr. Ed Murphy, President 907/452-2240				X
Alaska Federation of Natives 1675 C. Street Anchorage, Alaska 99501 Byron Mallott 907/586-1512			X	X
Alaska Independent Fishermen's Marketing Association 6333 Sugar Maple Street Olympia, Washington 98503				X

SECONDARY INSTITUTIONS

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Alaska Trollers Association P.O. Box 825 Ketchikan, Alaska 99901 Sharon Newsome			X	
Alaska Wildlife Federation and Sportsmen's Council 1700 Glacier Avenue Juneau, Alaska 99801	X	X	X	X
Aleutian/Pribilof Island Association 1689 C. Street Anchorage, Alaska 99501 James D. Milne, Phd., Director Fisheries Program 907/276-2700			X	X
Association of Village Council Presidents P.O. Box 219 Bethel, Alaska 99559 Carl Jack, John Malone, Harold Sparcks	X	X		
Bristol Bay Native Association P.O. Box 237 Dillingham, Alaska 99756 Ted Angasan, Executive Director 907/842-5258	X			

SECONDARY INSTITUTIONS

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Bristol Bay Native Association P.O. Box 179 Dillingham, Alaska 99576 Andrew Golia 907/842-5257/5258	X	X	X	X
Burro Creek Farms P.O. Box 8324 Ketchikan, Alaska 99901 Eugene Richards Home 907/225-2405 Bus. 225-9696	X			
Central Council of Tlingit and Haida Indains of Alaska Division of Fisheries and Natural Resources One Sealaska Plaza, Suite 200 Juneau, Alaska 99803 Dr. Nayudu 907/586-1432		X		
Cook Inlet Aquaculture Association P.O. Box 850 Soldotna, Alaska 99669 Floyd Heimbuch 907/262-4441 Ex 257	X	X		X
Cook Inlet Native Association 1057 West Fireweed Lane Anchorage, Alaska 99503 Jake Lestenkof, Executive Director			X	

SECONDARY INSTITUTIONS

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Copper River Native Association Drawer H. Copper Center, Alaska 99573 Tom Craig, Executive Director 907/822-3949			X	
Cordova District Fisheries Union P.O. Box 939 Cordova, Alaska 99574 Bob Blake 907/424-3447 or 7473	X	X	X	X
Douglas Island Pink & Chum, Inc. RR 4, Box 4754 Juneau, Alaska 99803 Ladd Macaulay 907/789-9443	X			
Fairbanks Environmental Center 431 Steese Highway Fairbanks, Alaska 99701 John Adams, Executive Director 907/452-5021			X	X
Fish Fry, Inc. Southeast Gillnet Federation 583 Basin Road Juneau, Alaska 99801 Jev Shelton 907/586-2242	X	X		

SECONDARY INSTITUTIONS

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Haida Corporation Box 91 Hydaburg, Alaska 99929				X
Halibut Producers Cooperative P.O. Box 1235 Bellingham, Washington 98225 206/733-0120				X
Huna Totem Corporation Box 290 Hoonah, Alaska 99829 John Hinchman, Jr., President 907/945-3330		X		X
Hungwitchim Corporation Eagle, Alaska 99738			X	X
Ingalik, Inc. Anvik, Alaska 99558 907/462-8001				X

SECONDARY INSTITUTIONS

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Izaak Walton League 336 East 23rd Avenue Anchorage, Alaska 99503 907/279-1923			X	X
Juneau Audubon Society P.C. Box 1725 Juneau, Alaska 99801	X	X	X	X
Juneau Group of the Sierra Club Route 6, P.O. Box 3552 Juneau, Alaska 99803 Dr. Clifford Lobaugh, Chairman				X
Kake City Schools Kake, Alaska 99830 Chuck Larson 907/785-3741				X
Kake Nonprofit Fishery Development Corporation P.O. Box 263 Kake, Alaska 99803 Clarence Jackson 907/785-3221	X			

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Kenai Peninsula Fishermen's Cooperative Association Rt. 2, P.O. Box 752 Soldotna, Alaska 99669	X	X		X
Klawock Heenya Corporation P.O. Box 25 Klawock, Alaska 99925			X	
Kodiak Area Native Association P.O. Box 172 Kodiak, Alaska 99615 Bill Osborne			X	X
Kuitsarak, Inc. Goodnews Bay, Alaska 99620				X
Mauneluk Association P.O. Box 256 Kotzebue, Alaska 99752 Bob Knoll, EDA Planner 907/442-3311			X	X

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Meyers Chuck Aquaculture Association P.O. Box 15 Meyers Chuck, Alaska 99903 Robert Meyer	X			
National Park Service 540 West 5th Avenue Anchorage, Alaska 99501 Ross C. Kavanagh 907/271-4215				X
Nerka, Inc. P.O. Box 80165 College, Alaska 99708 Dr. Jack Van Hyning 907/479-2476		X		X
Nondalton Native Corporation Nondalton, Alaska 99640		X		
Northern Southeast Regional Aquaculture Association P.O. Box 786 Sitka, Alaska 99835 Dr. Derek Poon 907/747-6850	X	X	X	X

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Nunam Kitlutsisti P.O. Box 267 Bethel, Alaska 99559 907/543-2956			X	
Petersburg Gillnet Association P.O. Box 535 Petersburg, Alaska 99833 Alan Stein 907/772-3151			X	X
Pacific Seafood Processors Association 120 West First Street Juneau, Alaska 99801 Richard B. Lauber, Alaska Manager 907/586-6366	X	X	X	
Prince William Sound Aquaculture Association P.O. Box 1110 Cordova, Alaska 99574 907/424-7511	X	X	X	X

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Ruralcap P.O. Box 3-3908 Anchorage, Alaska 99501 Norman Cohen 907/279-2511			X	
Sand Point Aquaculture Association P.O. Box 132 Sand Point, Alaska 99661 Robert W. Barclay 907/383-3545			X	
Sealaska Corporation One Sealaska Plaza Juneau, Alaska 99801 907/586-1512			X	
Shee Atika, Inc. P.O. Box 578 Mt. Edgecumbe, Alaska 99835 907/747-3534	X	X	X	X
Sheldon Jackson College Aquaculture Program P.O. Box 479 Sitka, Alaska 99835 Mel Seifert	X	X		

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Sierra Club Legal Defense Fund 419 Sixth Street, Suite 321 Juneau, Alaska 99801 Stephan C. Volker, Esq. 907/586-2751			X	X
Southeast Alaska Conservation Council, Inc. P.O. Box 1692 Juneau, Alaska 99802 Leonard Steinberg			X	X
Southeast Alaska Seine Boat Owners & Operators 728 Water Street Ketchikan, Alaska 99901 Michelle Zerbetz 907/225-6618			X	X
Southern Southeast Regional Aquaculture Association 307 Mill Street, #5 Ketchikan, Alaska 99901 Ron Wendte	X	X		X
Stikine Gillnet Association P.O. Box 131 Wrangell, Alaska 99929 Bill Byford	X			

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
Tanana Valley Sportsmen Club SR, Box 30202 Fairbanks, Alaska 99701 Joe Nava			X	
Tenana Chiefs Conference, Inc. First & Hall Fairbanks, Alaska 99701 Eddie Mayo or Henry Mitchell 907/452-8251 ext. 65	X	X	X	
Tongess Conservation Society P.O. Box 7282 Ketchikan, Alaska 99901 Peter Mjos 907/225-2275			X	X
Twin Creek Salmon Ranch, Inc. P.O. Box 90 Petersburg, Alaska 99833 Darline M. Clausen 907/772-3282		X		
United Fishermen of Alaska 197 South Franklin Juneau, Alaska 99801 907/586-2820			X	X

Institution	Active In The Following			
	(1) Rehabilitation of existing salmon runs	(2) Enhancement of salmon runs	(3) Advocacy activities	(4) Other related activities
United Fishermen of Alaska 197 South Franklin Juneau, Alaska 99801 907/586-2820			X	X
United Southeastern Alaska Gillnetters Association 328 West 10th Juneau, Alaska 99801 Geron Bruce 907/586-3864	X	X	X	
Yugtuk Corporation P.O. Box 666 Bethel, Alaska 99550 Thad Tikiuw 907/543-2647				X

APPENDIX III

FEDERAL INSTITUTIONS

M E M O R A N D U M

TO: WALLY MILLER

FROM: WILLIAM R. WILKERSON

DATE: May 2, 1979

RE: OUTLINE OF PRESENTATION ON FEDERAL INSTITUTIONS

I. INTRODUCTORY REMARKS

A. Summary of findings.

B. Summary of conclusions.

II. DIRECT FISHERIES PROGRAMS

A. General authority.

1. U.S. Department of Commerce Organic Act.

2. Fish and Wildlife Act of 1956 (reorganization plan No. 4, 84 Stat. 2090, October 3, 1970).

3. Agricultural Marketing Act of 1946.

4. Saltonstall-Kennedy Act of 1954.

B. Fisheries management and enforcement.

1. Fish and Wildlife Act of 1956.

2. General authority of National Oceanographic and Atmospheric Administration (NOAA).

3. Fishery Conservation and Management Act of 1976 (FCMA).

4. Black Bass Act.

C. Fish production.

1. Fishery research and experimentation program.
2. Food and Agriculture Act of 1977.
3. Loans for production of fish (Consolidated Farm and Rural Development Act).

D. Research and cooperation in resource development.

1. Cooperative agreements with nonprofit organizations, etc. (15 U.S.C. §1525).
2. Harvest Development Research (16 U.S.C. §§744 & 745).
3. Sea Grant Programs (33 U.S.C. §§1121 et seq.).
4. Commercial Fisheries Research and Development Act of 1964 (16 U.S.C §779).
5. The Food and Agriculture Act of 1977 (7 U.S.C. §3171).
6. The Defense Production Act of 1950.
7. The Anadromous Fish Conservation Act (16 U.S.C. §757).

E. Financial and technical assistance.

1. Section 607 of the Merchant Marine Act of 1936, as amended (46 U.S.C. §1177).
2. Title XI of the Merchant Marine Act of 1936, as amended (46 U.S.C. §§1271-80).
3. Fish and Wildlife Act of 1956 (16 U.S.C. §742c).

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.

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 consistanc" 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.

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

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) Plan in earliest stage of development.

H. Federal CZM program requires coordination among federal and state agencies on fisheries matters, 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 adversary.

M. Relationship between ADF&G and Regional Aquaculture Association largely adversary.

N. State legislature hesitant 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, problem of mixed stocks not

adequately addressed - raises political problems.

Q. Impact of D_2 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.

SCOMM 54: SENATE SELECT INTERIM COMMITTEE ON PROCUREMENT PRACTICE AND PROCEDURES, 1985

Tapes were received in 1988. Other materials were received in December 1990 from the office of Senator Jan Faiks, who was chairman of the committee.

MEMBERSHIP:

SENATOR JAN FAIKS, CHAIR
SENATOR JALMAR KERTTULA, VICE-CHAIR
SENATOR EDNA DEVRIES
SENATOR RICK HALFORD
SENATOR JOE JOSEPHSON
SENATOR FRED ZHAROFF

Established by SR 6, 1985

Contents: 3 1/2 inches of files. 29 cassette tapes are also available. Tapes are of 9 meetings held August through November, 1985. Tape logs are available for 3 of these meetings, but only a rough list of who testified is available for the other meetings.

LIST OF FILES (PAGE 1) MICROFICHE #

1. SB 341, 1986
2. REPORT: SB 341 POSITION PAPERS AND FISCAL NOTES
3. ABA MODEL PROCUREMENT CODE
4. TAPE LOGS